Flood County Park Landscape Plan

Draft Revised Environmental Impact Report

SCH#2016112040

prepared by

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Executive Summary

This section summarizes the characteristics of the project as well as the environmental impacts, mitigation measures, and residual impacts associated with implementation of the project.

Project Synopsis

Project Applicant

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455 County Center – Fourth Floor
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Project Location

The project site consists of the 24.5-acre Flood County Park, located in the city of Menlo Park in San Mateo County. Single-family residences primarily surround the park, and Bay Road bounds the site to the southwest. The Town of Atherton is located adjacent to and southwest of the park, across Bay Road. A San Francisco Public Utilities Commission (SFPUC) right-of-way for water pipelines crosses the site and the surrounding area.

Project Description

The proposed project entails a Landscape Plan for the long-term redevelopment of San Mateo County's Flood County Park in the city of Menlo Park. This plan is intended to optimize preservation of large oak and bay trees, increase offerings of sports, and provide a variety of active and passive uses for a range of user groups. It is anticipated that the proposed recreational facilities would be developed within ten years. The largest recreational facilities would be sited in the northern portion of the park, where the existing ballfield would be reconstructed and a soccer/lacrosse field would be installed at the eastern corner, replacing the existing pétanque court and a portion of the existing tennis courts. A promenade would run eastward across the center of the park from the parking lot. Picnic areas clustered in the southern half of the park would be reconstructed. The Parks Department would preserve existing adobe buildings on-site, with the exception of demolishing the adobe Restroom D located west of the existing tennis courts. The adobe administrative building in the southwest part of the park would be rehabilitated for seismic stability.

More detail about the proposed project is included in Section 2, *Project Description.*

Areas of Controversy

Primary areas of controversy known to the lead agency include noise from athletic and other park events, loss of visual quality, impacts to historic adobe structures, air pollution, loss of mature trees, traffic congestion, traffic safety, and parking availability on local streets. A summary of comments received during the scoping process for this Revised EIR is included in Table 2.

Project Objectives

The objectives of the proposed project are to:

- To repair and update park features and core infrastructure components
- To meet demand for active recreation facilities in San Mateo County by increasing offerings of sports
- To provide a variety of uses for a range of user groups, including youth
- To optimize preservation of oak woodland

Alternatives

Pursuant to Section 15126.6 of the State *CEQA Guidelines*, the County considered the following alternatives to the proposed project:

- Alternative 1: No Project (no change to existing conditions)
- Alternative 2: Reduced Athletic Programming
- Alternative 3: Multi-Use Field

The No Project Alternative assumes that the proposed Landscape Plan is not implemented and that the County continues operating and maintaining Flood County Park in its current condition. The Reduced Athletic Programming Alternative would introduce the same new recreational facilities as planned for in the Landscape Plan, and in the same phases of construction, but would prohibit the organized use of proposed athletic fields on weekdays during afternoon peak hours (4-6 P.M.). The Multi-Use Field Alternative would introduce a new multi-use athletic field in the location of the existing ballfield, while eliminating the Landscape Plan's proposed soccer/lacrosse field.

Among the park redevelopment options, the Reduced Athletic Programming Alternative would be the most environmentally superior relative to the proposed project. This alternative would substantially reduce vehicle trips associated with athletic activity, avoiding a significant and unavoidable impact on traffic congestion at the intersection of Bay Road and Ringwood Avenue during Saturday peak hours under cumulative traffic conditions. However, the Reduced Athletic Programming Alternative would not avoid a significant and unavoidable impact on traffic congestion at this intersection during weekday P.M. peak hours under existing plus project traffic conditions or cumulative traffic scenarios. Because this alternative would have a significant and unavoidable impact, a Statement of Overriding Considerations would still be required for approval of this alternative. The Multi-Use Field Alternative also would be environmentally preferable to the proposed project, yet it would not avoid the project's significant and unavoidable impact on traffic congestion. Neither alternative for improving recreational facilities at the park would fully meet the project objectives.

Refer to Chapter 7, *Alternatives*, for the complete alternatives analysis.

Summary of Impacts and Mitigation Measures

Table 1 includes a brief description of the environmental issues analyzed both in this Revised EIR and in the original EIR, the identified environmental impacts, proposed mitigation measures, and residual impacts. Impacts are categorized by significance. Significant and unavoidable impacts require a statement of overriding considerations to be issued per *CEQA Guidelines* Section 15093 if the project is approved. Impacts that are less than significant after mitigation can be feasibly mitigated to less than significant levels and require findings to be made under *CEQA Guidelines* Section 15091. Less than significant impacts would not exceed significance thresholds and therefore would not require mitigation.

The summary table provides a comprehensive list of environmental impacts analyzed in both the original Flood County Park Landscape Plan Draft EIR, published in September 2017, and in this Revised EIR. Section 3, *Environmental Impact Analysis*, of the Revised EIR analyzes impacts related to air quality, energy, greenhouse gas emissions, noise, transportation and circulation, and wildfire. Refer to the original Draft EIR for an analysis of impacts related to aesthetics, biological resources, cultural resources, geology and soils, and tribal cultural resources.

Table 1 Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts

Impact	Mitigation Measure	Residual Impact
Aesthetics		
Impact AES-1: The Landscape Plan would not affect scenic vistas or corridors; however, it would alter views from existing residences, primarily by the removal of mature trees and installation of netting around the proposed soccer/lacrosse field. This impact would be less than significant with mitigation for tree replacement and appropriate netting design.	**Mitigation Measure AES-1: Athletic Netting Color.** If the County installs athletic netting around the proposed soccer/lacrosse field, this netting shall have a neutral color (e.g., forest green, black, gray) that blends in with the natural environment at Flood County Park. **Mitigation Measure BIO-2(a): Tree Replacement** (see full measure under Impact BIO-2)	Less than significant after mitigation
Impact AES-2: While the Landscape Plan would largely preserve historic adobe building, it would involve removal of mature trees that serve as scenic resources. This impact on scenic resources would be less than significant with mitigation to replant trees of suitable species and protect remaining trees from construction activity.	**Mitigation Measure BIO-2(a): Tree Replacement** (see full measure under Impact BIO-2) **Mitigation Measure BIO-2(b): Tree Avoidance and Minimization Measures** (see full measure under Impact BIO-2)	Less than significant after mitigation
Impact AES-3: The Landscape Plan would preserve the majority of scenic mature trees and adobe buildings as well as open fields for passive recreational use, maintaining the park's overall existing visual character. The impact on visual character or quality would be less than significant.	None required	Less than significant without mitigation
Air Quality		
Impact AQ-1: The project would not contribute to population growth and would be consistent with the growth assumptions in the BAAQMD 2017 Clean Air Plan. This impact would be less than significant.	None required	Less than significant without mitigation
Impact AQ-2: While Project construction would generate temporary increases in localized air pollutant emissions, these emissions would not exceed BAAQMD's significance thresholds. Therefore, this impact would be less than significant. However, implementation of BAAQMD's Basic Construction Mitigation Measures to reduce fugitive dust and NO_x emissions is recommended to further reduce construction emissions.	None required; however, the BAAQMD's Basic Construction Mitigation Measures are recommended to reduce fugitive dust and NO_x emissions.	Less than significant without mitigation

Impact	Mitigation Measure	Residual Impact
Impact AQ-3: Operation of the proposed project would generate air pollutant emissions, but emissions would not exceed BAAQMD significance thresholds. Impacts related to operational emissions would be less than significant.	None required	Less than significant without mitigation
Impact AQ-4: The project would not expose sensitive receptors to substantial pollutant concentrations associated with construction dust, CO hotspots, or toxic air contaminants. Impacts related to these localized pollutants would be less than significant.	None required	Less than significant without mitigation
Biological Resources		
Impact BIO-1: The Landscape Plan may result in direct and indirect impacts to listed special-status species. Impacts would be less than significant with mitigation to protect nesting birds and roosting bats.	**Mitigation Measure BIO-1(a): Bird Protection Measures.** This mitigation measure shall apply to all proposed Phase I, II, and III recreational elements. a. If possible, trees and shrubs that would be impacted by construction activities shall be removed during the non-nesting season (typically between September 1 and January 31). b. If trees and shrubs are removed during the nesting season (February 1 to August 31), all suitable nesting habitat within the limits of work shall be surveyed by a qualified biologist prior to initiating construction-related activities. A pre-construction survey shall be conducted within five days prior to the start of work. If no nests are observed, construction activities shall be initiated within five days. If more than five days pass and construction has not been initiated, another survey will be required. c. If, during the nesting season, an active nest is discovered in trees or shrubs to be removed, the vegetation shall be protected using orange construction fence or the equivalent. The protective fencing shall be placed around the vegetation at the following distance(s) depending on species and upon recommendation from a qualified biologist: 100-250 feet from the drip line of the vegetation for passerines and non-raptors; and 300-500 feet from the drip line of the vegetation for raptors. No parking, storage of materials, or work would be allowed within this area until the end of the nesting season or until the young have fledged, as determined by a qualified biologist. **Mitigation Measure BIO-1(b): Bat Protection Measures.** This mitigation measure shall apply to construction under the Landscape Plan that involves tree removal. a. A qualified biologist shall conduct a pre-	Less than significant after mitigation

Impact	Mitigation Measure	Residual Impact
	construction survey for roosting bats at least two weeks prior to, but not more than 30 days prior to, the start of construction. The pallid bat could potentially roost in hollow trees. The survey shall be conducted within 200 feet of all planned construction activities within two weeks prior to any removal of trees (particularly trees 12 inches in diameter or greater at 4.5 feet above grade with loose bark or other cavities). b. A buffer zone of 100 feet that excludes construction activities or other disturbances shall be established around active bat roosts. c. If active maternity roosts or non-breeding bat hibernacula are found in trees scheduled to be removed, relocation or other measures shall be determined in consultation with the County of San Mateo and/or CDFW, as appropriate, and a qualified biologist.	
Impact BIO-2: Construction of proposed recreational improvements may directly or indirectly affect heritage trees protected by San Mateo County. The impact on protected trees would be less than significant with mitigation to replace protected trees that are removed and to protect remaining trees during construction.	**Mitigation Measure BIO-2(a): Tree Replacement.** The County shall replace protected trees that are removed from Flood County Park at 1:1 ratio. Suitable replacement trees shall be those species specified as heritage trees. Where mature trees are removed within 25 feet of residential property lines, the County shall plant replacement trees that upon maturation would be sufficient to restore the pre-existing level of privacy of adjacent residents. **Mitigation Measure BIO-2(b): Tree Avoidance and Minimization Measures.** The following measures to avoid and protect trees shall apply to individual recreational elements of all proposed Phase I, II, and III improvements: a. The County shall monitor heritage trees with CRZs impacted by construction activities (canopies and roots) during construction for signs of distress. The CRZ is defined as the area of soil around a tree trunk where roots are located that provide stability and uptake of water and minerals required for tree survival by the ISA's Best Management Practices – Managing Trees During Construction handbook. b. Excavation/Trenching shall avoid CRZs to the greatest extent feasible. The following measures shall be applied when excavation and trenching occurs near heritage trees: ▪ Where appropriate tunneling shall be used to preserve roots two inches in diameter, and wherever possible	Less than significant after mitigation

Impact	Mitigation Measure	Residual Impact
	underground lines shall occupy common trenches. ▪ When root cutting occurs, exposed major roots (greater than two inches in diameter or within five feet of the trunk) shall not be ripped by construction equipment. Roots shall be cleanly cut and made at right angles to the roots. ▪ A Certified Arborist shall be present if more than 30 percent of the root zone is impacted or roots greater than two inches or within five feet of the trunk will be cut, to document impacts to the CRZ. ▪ Absorbent tarp or heavy cloth fabric shall cover new grade cuts and be overlain by compost or woodchip mulch. c. The County shall stage construction equipment outside of the CRZs and apply precautions, such as steel traffic plates and fencing, to protect sensitive root zones. d. The County shall install protective fencing around heritage trees prior to any earthwork and remain until all work is complete, or until adjacent construction activity no longer threatens tree health. Fencing shall be six foot high chain link fencing (or comparable material) and installed at the outermost edge of the CRZ, or eight feet from the trunk of the heritage tree, whichever is greatest. Signs stating “Tree Protection Zone – Keep Out” shall be posted on the fence. e. Pruning for clearance, if needed, shall be done to prevent damage to branches with large equipment. All above-ground pruning shall be in accordance with the Tree Pruning Guidelines (International Society of Arboriculture) and/or the ANSI A300 Pruning Standard (American National Standard for Tree Care Operations) and adhere to the most recent edition of ANSI Z133.1. Pruning cuts or damaged bark shall be cut clean to heal. No tree seal or paint shall be used after pruning.	

Impact	Mitigation Measure	Residual Impact
Cultural Resources		
Impact CUL-1: The Landscape Plan would preserve existing adobe buildings that contribute to Flood County Park's eligibility as an historical resource, except for the proposed demolition of the Restroom D building. By documenting historical resources for archival purposes and adhering to the Secretary of the Interior's Standards for rehabilitation of the administrative office building, the project would have a less that significant impact on historical resources with mitigation incorporated.	**Mitigation Measure CUL-1(a): Historic Documentation Package.** Prior to issuance of demolition permits, the County shall ensure that documentation of the buildings proposed for demolition is completed in the form of a Historic American Building Survey (HABS)-like documentation that shall comply with the Secretary of the Interior's *Standards for Architectural and Engineering Documentation* (National Park Service [NPS] 1990). The documentation shall generally follow the HABS Level III requirements and include digital photographic recordation, detailed historic narrative report, and compilation of historic research. The documentation shall be completed by a qualified architectural historian or historian who meets the Secretary of the Interior's *Professional Qualification Standards for History and/or Architectural History* (NPS 1983). The original archival-quality documentation shall be offered as donated material to the County of San Mateo Parks Department where it would be available for current and future generations. Archival copies of the documentation also shall be submitted to the City of San Mateo Library and the San Mateo County History Museum where they would be available to local researchers. Completion of this mitigation measure shall be monitored and enforced by the lead agency. **Mitigation Measure CUL-1(b): Standards of Review.** The seismic retrofit of the adobe administrative office building shall be consistent with the Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (Standards), thereby avoiding significant adverse direct or indirect impacts to historical resources. An architectural historian or historic architect meeting the Secretary of the Interior's Professional Qualifications Standards shall be retained to prior to the start of the seismic retrofit to review proposed plans and provide input to the County to avoid any direct or indirect physical changes to the building. The findings and recommendations of the architectural historian or historic architect shall be documented in a Standards Project Review Memorandum, at the schematic design phase. This memorandum shall analyze all project components for compliance with the Standards. Should design modifications be	Less than significant after mitigation

Impact	Mitigation Measure	Residual Impact
	necessary to bring projects into compliance with the Standards, the memorandum shall document those recommendations. The document shall be subsequently submitted to County of San Mateo Parks Department for review and comment.	
Impact CUL-2: Ground-disturbing activities under the Landscape Plan could result in damage to or destruction of unanticipated archaeological resources or human remains. Impacts would be less than significant with mitigation incorporated.	**Mitigation Measure CUL-2(a): Archaeological Resources.** If archaeological resources are encountered during ground-disturbing activities, work in the immediate area shall be halted and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (NPS 1983) shall be contacted immediately to evaluate the find. If necessary, the evaluation may require preparation of a treatment plan and archaeological testing for CRHR eligibility. If the discovery proves to be significant under CEQA and cannot be avoided by the proposed project, additional work such as data recovery excavation may be warranted to mitigate any significant impacts to historical resources. **Mitigation Measure CUL-2(b): Unanticipated Discovery of Human Remains.** If human remains are found, State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner shall be notified immediately. If the human remains are determined to be prehistoric, the coroner shall notify the Native American Heritage Commission, which will determine and notify a most likely descendant (MLD). The MLD shall complete the inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.	Less than significant after mitigation
Impact CUL-3: Ground-disturbing activities associated with development under the Landscape Plan could result in damage to or destruction of potential fossil resources within rock units or geologic features. This impact would be less than significant with mitigation incorporated.	**Mitigation Measure CUL-3: Unanticipated Discovery of Paleontological Resources.** In the event of a fossil discovery by construction personnel, all work in the immediate vicinity of the find shall cease and a qualified paleontologist shall be contacted to evaluate the find before restarting work in the area. The qualified paleontologist shall be an individual with an M.S. or Ph.D. in paleontology or geology who is experienced with paleontological procedures and techniques, who is knowledgeable in the geology of California, and who has worked as	Less than significant after mitigation

Impact	Mitigation Measure	Residual Impact
	a paleontological mitigation project supervisor for a least one year (SVP 2010). If the qualified paleontologist determines that the fossil(s) is (are) scientifically significant, the find shall be recovered under his/her supervision. The paleontologist shall have the authority to temporarily direct, divert or halt construction activity to ensure that the fossil(s) can be removed in a safe and timely manner. Once salvaged, significant fossils shall be identified to the lowest possible taxonomic level, prepared to a curation-ready condition and curated in a scientific institution with a permanent paleontological collection (such as the University of California Museum of Paleontology), along with all pertinent field notes, photos, data, and maps. Fossils of undetermined significance at the time of collection may also warrant curation at the discretion of the project paleontologist.	
Energy		
Impact E-1: The construction and operation of recreational elements under the Landscape Plan would consume energy. However, adherence to State requirements would minimize energy use from construction equipment. The Landscape Plan also would not add recreational elements that require substantially higher on-site energy use or increase vehicle miles traveled in the County. Therefore, it would not result in the wasteful, inefficient, or unnecessary consumption of energy, and this impact would be less than significant.	None required	Less than significant without mitigation
Impact E-2: The project would be consistent with energy efficiency goals contained in the San Mateo County Energy Efficiency Climate Action Plan. Construction and operation of the project would comply with relevant provisions of Title 24 of the California Energy Code. Impacts would be less than significant.	None required	Less than significant without mitigation
Geology and Soils		
Impact GEO-1: The Landscape Plan would reconstruct or rehabilitate some existing recreational facilities and on-site structures and would add new recreational facilities. Redevelopment of Flood County Park would result in an incremental increase in recreational users at the park, which would slightly increase the number of people at the project site that could be exposed to strong ground shaking. However, redevelopment of the park would not include construction of habitable structures and impacts related to strong ground shaking would be less than significant.	None required	Less than significant without mitigation

Impact	Mitigation Measure	Residual Impact
Impact GEO-2: Flood County Park is located in a mapped Liquefaction Zone and redevelopment of the park could result in damage to reconstructed or rehabilitated structures due to seismically induced liquefaction. However, redevelopment of the park would not include the construction of habitable structures and adherence to California Building Codes would minimize the potential for damage of uninhabited structures from liquefaction. Impacts related to seismically induced liquefaction would be less than significant.	None required	Less than significant without mitigation
Impact GEO-3: Implementation of the Landscape Plan would involve soil disturbance that could result in soil erosion or the loss of topsoil. However, compliance with existing regulations, including the NPDES Construction General Permit, would ensure that disturbed soil is properly managed to minimize the potential for erosion. Impacts related to soil erosion or the loss of topsoil would be less than significant.	None required	Less than significant without mitigation
Impact GEO-4: The Landscape Plan would involve the rehabilitation or reconstruction of structures that could be located on expansive soils. However, soils would be evaluated for their expansive potential during grading and would be removed and replaced with non-expansive soils as necessary. Also, the Landscape Plan would not include construction of habitable structures and therefore would not place people at risk to safety hazards from expansive soils. Adherence to California Building Codes would ensure that impacts related to expansive soils would be less than significant.	None required	Less than significant without mitigation
Greenhouse Gas Emissions		
Impact GHG-1: Construction and operation of the proposed recreational facilities in the Landscape Plan would generate GHG emissions. These emissions would not hinder or delay achievement of state GHG reduction targets established by AB 32 or SB 32. Therefore, the project's impact to climate change would be less than significant.	None required	Less than significant without mitigation
Impact GHG-2: Construction and operation of the proposed recreational facilities in the Landscape Plan would be consistent with the San Mateo County Energy Efficiency Climate Action Plan. Therefore, the project's impact related to consistency with plans to address climate change would be less than significant.	None required	Less than significant without mitigation
Hydrology and Water Quality		
Impact HWQ-1: Construction and operation of the proposed recreational facilities could result in storm water runoff of pollutants such as sediment and nutrients. However, compliance with NPDES permit requirements and County landscaping standards would control sediment flow and maintain water quality. The project would have a less than significant impact on water quality.	None required	Less than significant without mitigation

Impact	Mitigation Measure	Residual Impact
Impact HWQ-2: The proposed recreational improvements would incrementally increase the area of impervious surface at Flood County Park but to the extent that groundwater recharge would be reduced. The project also would not draw its water supply from groundwater. Therefore, the Impact to groundwater supply and recharge would be less than significant.	None required	Less than significant without mitigation
Impact HWQ-3: The Landscape Plan would alter existing drainage patterns by grading activity and the addition of impervious surfaces. However, compliance with NPDES requirements would minimize erosion and avoid a substantial increase in surface runoff. Impacts would be less than significant.	None required	Less than significant without mitigation
Noise		
Impact N-1: Construction of proposed recreational facilities would generate high noise levels on and adjacent to the project site. However, construction noise would be temporary, and adherence to the County's allowed hours of construction would prevent noise disturbance during sensitive evening and nighttime hours. Therefore, the impact from construction noise would be less than significant.	None required	Less than significant without mitigation
Impact N-2: Grading activity would temporarily generate groundborne vibration on and adjacent to Flood County Park. Because construction of proposed recreational elements would occur inside the hours allowed in the County Code of Ordinances, it would not generate vibration when people normally sleep. Construction vibration would not exceed levels that may cause structural damage to historic adobe buildings on-site. The Landscape Plan would have a less than significant vibration impact.	None required	Less than significant without mitigation
Impact N-3: The Landscape Plan would add new sources of on-site operational noise from organized practices and games at the proposed athletic fields and performances at the proposed gathering meadow. Noise from whistles, sound amplification equipment, or air horns could disturb nearby residents. The impact from on-site operational noise would be less than significant with mitigation to prohibit the loudest equipment and restrict the timing of athletic events.	**Mitigation Measure N-3(a): Restrict Sound Amplification Equipment and Prohibit Air Horns.** The County shall only allow the use of sound amplification equipment at organized athletic games and practices and at the gathering meadow with the procurement of a special event permit in accordance with County of San Mateo Parks Department procedures. The County shall notify all groups using the proposed soccer/lacrosse field, ballfield, and gathering meadow of this requirement. The County shall prohibit the use of air horns at any park events. County staff shall periodically patrol the park during organized athletic events and performances to verify that park users are not operating air horns and are not operating sound amplification equipment without an approved Special Event Permit. Special Event Permits are required for any use of a space beyond what is considered typical use. This could include such activities as:	Less than significant after mitigation

Impact	Mitigation Measure	Residual Impact
	bounce houses, amplified sound, large events (walks, runs) and those that require additional staffing or support from other agencies. Depending on the scale of the event, notification may be posted in park kiosks, on the Parks Department website or by using other communication vehicles. **Mitigation Measure N-3(b): Timing of Athletic Events.** To minimize noise that may disturb neighbors of Flood County Park, the County shall restrict athletic practices and games at the park to the hours of 9 A.M. to 8 P.M.	
Impact N-4: Vehicle trips associated with operation of the proposed recreational elements would increase traffic volumes on nearby roadways, resulting in greater traffic noise audible to existing noise-sensitive residences. Based on the conservative (high) estimate of new vehicle trips presented in this EIR, it is anticipated that the increase of vehicle trips from the project relative to existing traffic on Ringwood Avenue during Saturday peak hours in the summer would exceed the applicable FTA standard of 1 dBA L_{eq}. Therefore, traffic noise impacts would be significant and unavoidable.	None required	Less than significant without mitigation
Transportation and Circulation		
Impact T-1: Traffic generated by the project would cause traffic delay exceeding the City of Menlo Park's standards at the intersection of Bay Road and Ringwood Avenue under all modeled traffic scenarios. Queuing of vehicles at the park's entrance gate also would cause temporary traffic delay on Bay Road. Although new parking fee collection practices would minimize queuing, mitigation measures at the affected intersection would be infeasible. Therefore, the project would have a significant and unavoidable impact on traffic under existing plus project conditions.	The installation of a northbound left-turn lane at the intersection of Bay Road and Ringwood Avenue would improve traffic conditions during P.M. peak hours from LOS D to B under existing plus project conditions, from LOS E to C under near-term 2021 plus project conditions, and from LOS F to D under cumulative 2040 plus project conditions. However, physical constraints at the affected intersection could make implementation of such a measure infeasible. To minimize queuing on Bay Road, Mitigation Measure T-1 would be required. **Mitigation Measure T-1: Parking Fee Collection Practices.** The County shall implement parking fee collection practices to avoid the back up of vehicles entering Flood County Park onto local streets. These practices may include automated fee machines, paying upon exiting the park, or a combination of both to move the queues associated with fee collection off of City streets and on-site.	It may be infeasible to reconfigure the intersection of Bay Road and Ringwood Avenue to avoid a significant impact from traffic congestion. Therefore, the Landscape Plan would have a significant and unavoidable impact.

Impact	Mitigation Measure	Residual Impact
Impact T-2: Project-generated traffic would have a negligible effect on vehicle miles traveled in San Mateo County. Therefore, the Landscape Plan would have a less than significant impact related to vehicle miles traveled.	None required	Less than significant without mitigation
Impact T-3: Vehicle trips generated by implementation of the Landscape Plan would not adversely affect roadways designated under the Congestion Management Plan for San Mateo County. Therefore, the project would have a less than significant impact related to conflicts with this plan.	None required	Less than significant without mitigation
Impact T-4: The project would not introduce design features that increase traffic hazards. No impact would occur.	None required	Less than significant without mitigation
Impact T-5: The project would not decrease the performance of existing or planned transit, bicycle, or pedestrian facilities. However, the lack of bicycle storage on-site and a sidewalk gap on Bay Road could result in unsafe conditions for bicyclists and pedestrians accessing the park. Impacts to transit, bicycle, and pedestrian systems would be less than significant with mitigation to install bicycle storage and pedestrian signage.	**Mitigation Measure T-5(a): Bicycle Storage.** The County shall install a minimum of six bicycle racks near the proposed gathering plaza. **Mitigation Measure T-5(b): Pedestrian Signage.** The County shall install signage in a central location in Flood County Park that informs visitors of an alternative pedestrian route to the segment of Bay Road between Del Norte Avenue and Sonoma Avenue which lacks a sidewalk. This signage shall include a map of the alternative pedestrian route on Del Norte Avenue, Oakwood Place, and Sonoma Avenue.	Less than significant after mitigation
Impact T-6: While it is estimated that parking demand during peak summer days at Flood County Park would not exceed the on-site parking supply, the Landscape Plan could result in increased parking on local residential streets. The impact on parking capacity would be less than significant impact with mitigation measures to facilitate on-site parking and discourage on-street parking by visitors to Flood County Park.	**Mitigation Measure T-1: Parking Fee Collection Practices** (see full measure under Impact T-1) **Mitigation Measure T-6: Parking Education and Enforcement.** The County shall inform park visitors of on-street parking restrictions on nearby residential streets and shall post this information in a clearly visible location on-site. The County also shall coordinate with the City of Menlo Park to reduce parking in the adjacent neighborhoods, including proactive communication when peak use of Flood County Park is anticipated (i.e., on weekday evenings and on weekend days when all picnic areas are reserved and all athletic fields are scheduled for concurrent use) and encouraging increased random enforcement of on-street parking restrictions.	Less than significant after mitigation

Impact	Mitigation Measure	Residual Impact
Tribal Cultural Resources		
Impact TCR-1: Construction of recreational improvements proposed in the Landscape Plan would involve surface excavation, which has the potential to impact previously unidentified tribal cultural resources. Impacts would be less than significant with mitigation to protect such resources in the event of their discovery.	**Mitigation Measure TCR-1: Protection of Tribal Cultural Resources.** In the event that archaeological resources of Native American origin are identified during construction of recreational improvements proposed in the Landscape Plan, the qualified archaeologist will consult with the County to begin or continue Native American consultation procedures. If, in consultation with the County, a discovery is determined to be a tribal cultural resource and thus significant under CEQA, the County shall avoid the resource if feasible. If the resource cannot be avoided, the County shall prepare and implement a mitigation plan in accordance with State guidelines and in consultation with Native American groups.	Less than significant after mitigation
Wildfire		
Impact WFR-1: Recreational improvements under the Landscape Plan would be designed to meet all emergency evacuation requirements and would not impair the City's Emergency Operation Plan. Impacts related to emergency access and response would be less than significant.	None required	Less than significant without mitigation
Impact WFR-2: Flood County Park is not located in a wildfire risk area and would not be altered in a way that would exacerbate fire risk. Redevelopment of the park would maintain the relatively flat topography and wildfire risk would not be increased by wind patterns. Impacts related to wildfire risks would be less than significant.	None required	Less than significant without mitigation
Impact WFR-3: Flood County Park would result in development on the project site in an urbanized area where infrastructure and roads currently exist. Installation and maintenance of new utility infrastructure would not exacerbate fire risk. Impacts would be less than significant.	None required	Less than significant without mitigation
Impact WFR-4: Being located in a relatively flat urbanized area at low risk of fires, the project would not expose people or structures to risks from downslope or downstream post-fire impacts. This impact would be less than significant.	None required	Less than significant without mitigation

1 Introduction

This document is a Revised Environmental Impact Report (EIR) for the proposed Flood County Park Landscape Plan (the "project"). The project site is located northeast of Bay Road in the city of Menlo Park in San Mateo County. It is regionally accessible from U.S. Highway 101 (U.S. 101) and locally accessible from Bay Road. The proposed project consists of a Landscape Plan for the long-term redevelopment of San Mateo County's Flood County Park. Under the Landscape Plan, the County Parks Department would develop new recreational facilities in three phases over an anticipated ten-year period. Improvements would include a variety of active and passive recreation features. The project is described in greater detail in Section 2, *Project Description*. This section discusses:

(1) The environmental impact report background;

(2) The legal basis for preparing an EIR;

(3) The scope and content of the EIR;

(4) Lead, responsible, and trustee agencies; and

(5) The environmental review process required under the California Environmental Quality Act (CEQA).

1.1 Environmental Impact Report Background

The County published a Draft EIR for the Flood County Park Landscape Plan on the County's Reimagine Flood Park website in September 2017. In response to public and agency comment on the Draft EIR, the County published a Final EIR in May 2018. Both previous documents are available at https://parks.smcgov.org/reimagine-flood-park. The Final EIR was accepted by the County's Parks Commission at its August 2, 2018, meeting. However, the Final EIR was not ultimately submitted to the County Board of Supervisors for certification because the Parks Department decided that public concerns warranted further analysis of the proposed project. Key concerns raised by neighbors on the Draft and Final EIR related to 1) projected growth in park visitation and use resulting from improvements accommodated under the Landscape Plan, including traffic impacts and parking demand, and 2) noise generated on-site from concurrent park events. The *State of California CEQA Guidelines* were also updated in December 2018, adding two issue areas to the Appendix G checklist of environmental issues when analyzing a project's environmental impacts: wildfire and energy.

Therefore, the County is revising and recirculating a limited portion of the original EIR that will rely on more conservative assumptions with regard to park visitation (i.e., assumptions that will more effectively capture the increased use that may result from the project and the effects associated with such use) and that will explicitly address potential wildfire and energy impacts. A Notice of Preparation (NOP) of a recirculated portion of the EIR was distributed for agency and public review for a 30-day review period that began on May 8, 2019. The NOP and responses are presented in Appendix A to the EIR. The County received 13 comment letters responding to the NOP. Table 2 summarizes the contents of letters and oral comments as relevant to the CEQA analysis.

Table 2 Notice of Preparation Comments and Environmental Impact Report Response

Topic	Comment/Request	Where Addressed in EIR
Project Description	Commenters requested a full evaluation of all phases of the Landscape Plan and of peak use of the park. A commenter requested that dogs be allowed at the park.	As discussed in Section 2, *Project Description*, the Revised EIR evaluates Phases 1, 2, and 3 of the Landscape Plan. Each impact analysis in Section 3, *Environmental Impact Analysis*, of the Revised EIR considers all phases. This EIR assumes a conservative amount of park use under the Landscape Plan, as shown in Table 6. The Landscape Plan would not involve changing the park rules to permit dogs on-site, so the EIR does not address this concern.
Biological Resources	One commenter expressed concern about the number of trees to be removed under different field configurations and impacts on flora and fauna.	See Section 4.3, *Biological Resources*, in the original Draft EIR for an analysis of impacts on biological resources and estimates of tree removal during each phase of the Landscape Plan. See Section 4.4 of this EIR for a discussion of tree removal under an alternative layout of the Landscape Plan.
Noise	Commenters expressed concern about impulse noise from park events, the buffer between residents and the soccer/lacrosse field, combined noise from simultaneous events, and the type and frequency of events that may generate noise at the gathering meadow.	See Section 3.4, *Noise*, in this EIR for analysis of these noise impacts and mitigation measures where applicable.
Transportation/ Circulation	Several commenters expressed concern about traffic impacts, including traffic safety related to drop-off activity at side gates, parking availability, parking mitigation, and traffic congestion from park events.	See Section 3.5, *Transportation and Circulation*, in this EIR for analysis of these traffic impacts and mitigation measures where applicable.
Tribal Cultural Resources	A commenter noted regulatory requirements to protect tribal cultural resources.	See Section 4.10, *Tribal Cultural Resources*, in the original Draft EIR for a discussion of impacts to tribal cultural resources.
Alternatives	Commenters suggested alternative site layouts to the proposed Landscape Plan.	See Section 4, *Alternatives*, in this EIR for an analysis of a reasonable range of alternatives.

1.2 Purpose and Legal Authority

The project requires the discretionary approval of the County. Therefore, it is subject to the requirements of CEQA. In accordance with Section 15121 of the *CEQA Guidelines,* the purpose of this Revised EIR is to serve as an informational document that:

> ...will inform public agency decision-makers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project.

This EIR has been prepared as a Project EIR (although limited in scope pursuant to CEQA, as discussed further below) pursuant to Section 15161. A Project EIR is appropriate for a specific development project. As stated in the *CEQA Guidelines* in Section 15161*:*

This type of EIR should focus primarily on the changes in the environment that would result from the development project. The EIR shall examine all phases of the project, including planning, construction, and operation.

This limited scope EIR includes the analysis of the environmental impacts, mitigation measures, and project alternatives addressing the impacts. This EIR is to serve as an informational document for the public and County decision-makers. The process will culminate with a County hearing to consider certification of a Final EIR and approval of the project.

1.3 Scope and Content

This Revised EIR addresses the following six environmental issues that the County has determined to be potentially significant and that require revision from, or addition to, the original EIR:

- Air Quality
- Energy
- Greenhouse Gas Emissions
- Noise
- Traffic and Circulation
- Wildfire

The EIR addresses the project's potentially significant site-specific and cumulative effects in these areas, in accordance with the *CEQA Guidelines*. It recommends feasible mitigation measures, where needed and possible, that would eliminate or reduce adverse environmental effects. Outside of the six environmental issues listed above, this EIR does not address the remaining environmental issues covered in the original EIR that the County published in September 2017. The analysis of such remaining issues in the original EIR stands and does not require revisiting in this Revised EIR.

In preparing the EIR, pertinent local policies and guidelines, and other background documents were used. A full reference list is contained in Section 5, *References*.

The Alternatives section of the EIR was prepared in accordance with Section 15126.6 of the *CEQA Guidelines* and focuses on alternatives that are capable of eliminating or reducing significant adverse effects associated with the project while feasibly attaining most of the basic project objectives. In addition, the Alternatives section identifies the "environmentally superior" alternative among the alternatives assessed. The alternatives evaluated include the CEQA required "No Project" Alternative and two project alternatives.

The level of detail contained throughout this EIR is consistent with the requirements of CEQA and applicable court decisions. The *CEQA Guidelines* provide the standard of adequacy on which this document is based. The *Guidelines* state:

> An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of the proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection, but for adequacy, completeness, and a good faith effort at full disclosure. (Section 15151)

1.4 Lead, Responsible, and Trustee Agencies

The *CEQA Guidelines* require the identification of “lead,” “responsible,” and “trustee” agencies. The County is the “lead agency” for the proposed project because it has the principal responsibility for approving the project.

A responsible agency refers to a public agency other than the lead agency that has discretionary approval over the project. A trustee agency refers to a state agency having jurisdiction by law over natural resources affected by a project. There are no responsible or trustee agencies for the project, although the cooperation of other agencies including SFPUC and the City of Menlo Park may be required while implementing the Landscape Plan or implementing mitigation measures in this EIR.

1.5 Standards of Review

As a distinct governmental entity and lead agency for this project, the County has immunity from local standards upheld by the City of Menlo Park and the Town of Atherton. Furthermore, the County has discretion as to which standards to apply to this project when reviewing its environmental impacts. In general, this EIR applies relevant standards from the County of San Mateo’s General Plan (1986) and the San Mateo County Code of Ordinances. For example, Section 3.4, *Noise*, analyzes the Landscape Plan’s impact on sensitive land uses from construction noise based on consistency with the County’s noise ordinance. Nevertheless, the County recognizes that local standards from affected jurisdictions are routinely applied in the project vicinity. Therefore, the County has elected to apply City standards where applicable in this EIR. In Section 3.5, *Transportation and Circulation*, the County applies City of Menlo Park standards for traffic congestion because vehicle trips associated with park use would affect intersections managed by the City.

1.6 Environmental Review Process

The environmental impact review process, as required under CEQA, is summarized below and illustrated in Figure 1. The steps are presented in sequential order.

1 **Notice of Preparation (NOP) Distributed.** Immediately after deciding that an EIR is required, the lead agency must file a NOP soliciting input on the EIR scope to "responsible," "trustee," and involved federal agencies; to the State Clearinghouse, if one or more state agencies is a responsible or trustee agency; and to parties previously requesting notice in writing. The NOP must be posted in the County Clerk's office for 30 days. A scoping meeting to solicit public input on the issues to be assessed in the EIR is not required, but may be conducted by the lead agency.

2 **Draft EIR Prepared.** The Draft EIR must contain: a) table of contents or index; b) summary; c) project description; d) environmental setting; e) significant impacts (direct, indirect, cumulative, growth-inducing and unavoidable impacts); f) alternatives; g) mitigation measures; and h) irreversible changes.

3 **Public Notice and Review.** The lead agency must prepare a Public Notice of Availability of an EIR. The Notice must be placed in the County Clerk's office for 30 days (Public Resources Code Section 21092) and sent to anyone requesting it. Additionally, public notice of Draft EIR availability must be given through at least one of the following procedures: a) publication in a

newspaper of general circulation; b) posting on and off the project site; and c) direct mailing to owners and occupants of contiguous properties. The lead agency must consult with and request comments on the Draft EIR from responsible and trustee agencies, and adjacent cities and counties. The minimum public review period for a Draft EIR is 30 days. When a Draft EIR is sent to the State Clearinghouse for review, the public review period must be 45 days, unless a shorter period is approved by the Clearinghouse (Public Resources Code 21091). Distribution of the Draft EIR may be required through the State Clearinghouse.

4 **Notice of Completion.** The lead agency must file a Notice of Completion with the State Clearinghouse as soon as it completes a Draft EIR.

5 **Final EIR.** A Final EIR must include: a) the Draft EIR; b) copies of comments received during public review; c) list of persons and entities commenting; and d) responses to comments.

6 **Certification of Final EIR.** The lead agency shall certify that: a) the Final EIR has been completed in compliance with CEQA; b) the Final EIR was presented to the decision-making body of the lead agency; and c) the decision-making body reviewed and considered the information in the Final EIR prior to approving a project (*CEQA Guidelines* Section 15090). At the final County hearing, the CEQA documents to be certified would include the new Final EIR, with appendices showing the unmodified sections of the original Draft EIR from September 2017, as well as subsequent text changes in the May 2018 Final EIR.

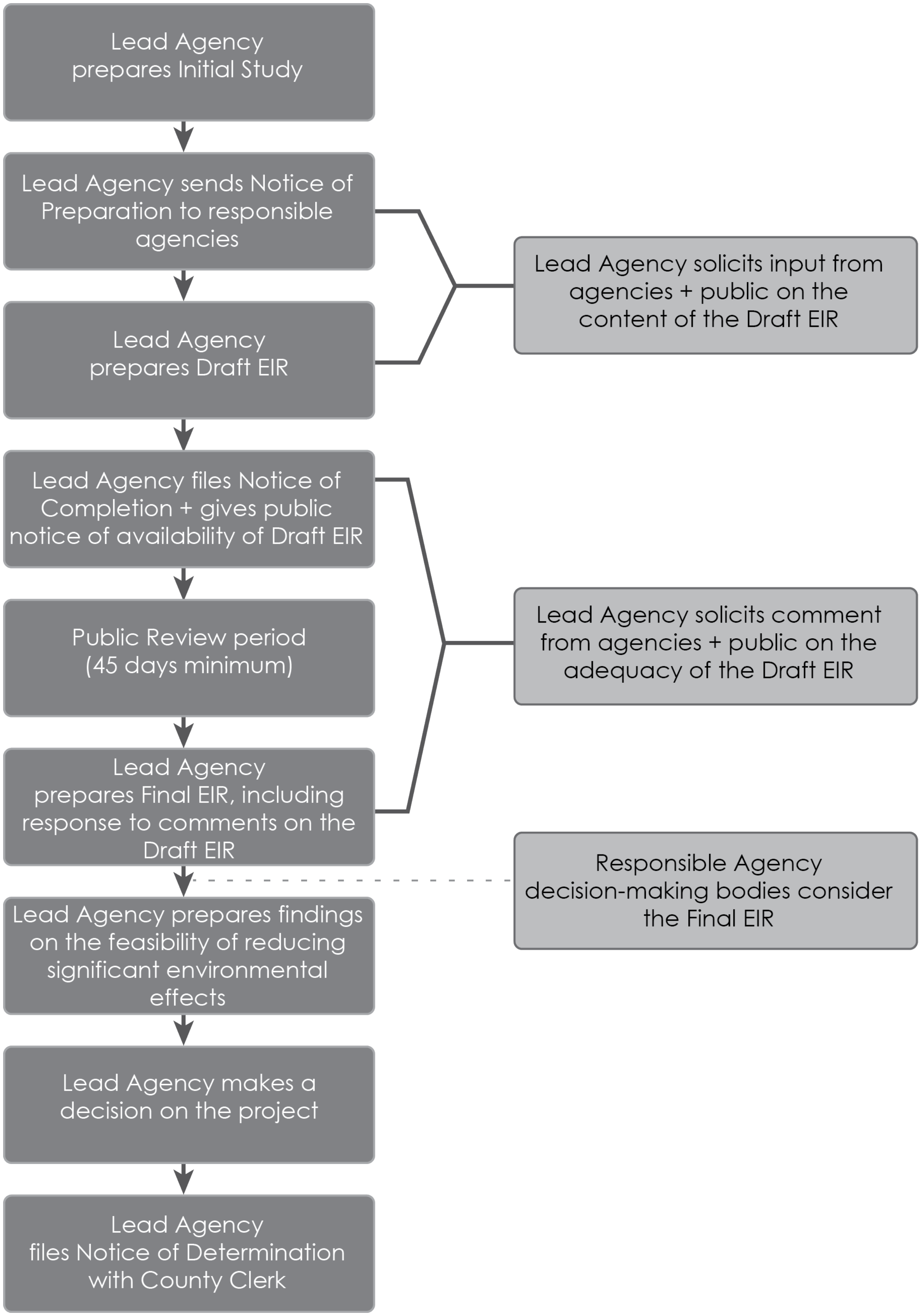
7 **Lead Agency Project Decision.** The lead agency may: a) disapprove a project because of its significant environmental effects; b) require changes to a project to reduce or avoid significant environmental effects; or c) approve a project despite its significant environmental effects, if the proper findings and statement of overriding considerations are adopted (*CEQA Guidelines* Sections 15042 and 15043).

8 **Findings/Statement of Overriding Considerations.** For each significant impact of the project identified in the EIR, the lead or responsible agency must find, based on substantial evidence, that either: a) the project has been changed to avoid or substantially reduce the magnitude of the impact; b) changes to the project are within another agency's jurisdiction and such changes have or should be adopted; or c) specific economic, social, or other considerations make the mitigation measures or project alternatives infeasible. If an agency approves a project with unavoidable significant environmental effects, it must prepare a written Statement of Overriding Considerations that set forth the specific social, economic or other reasons supporting the agency's decision.

9 **Mitigation Monitoring/Reporting Program.** When the lead agency makes findings on significant effects identified in the EIR, it must adopt a reporting or monitoring program for mitigation measures that were adopted or made conditions of project approval to mitigate significant effects.

10 **Notice of Determination.** The lead agency must file a Notice of Determination after deciding to approve a project for which an EIR is prepared (*CEQA Guidelines* Section 15094). A local agency must file the Notice with the County Clerk. The Notice must be posted for 30 days and sent to anyone previously requesting notice. Posting of the Notice starts a 30-day statute of limitations on CEQA challenges (Public Resources Code Section 21167[c]).

Figure 1 Environmental Review Process



2 Project Description

This section provides a description of the project, including information regarding the applicant, the location and characteristics of the project site, major project features, preliminary phasing plan, project objectives, and discretionary approvals needed.

2.1 Project Applicant

County of San Mateo Parks Department
455 County Center – Fourth Floor
Redwood City, California 94063

2.2 Project Location

The project site consists of the 24.5-acre Flood County Park, located in the city of Menlo Park in San Mateo County. Figure 2 shows the regional location of Flood County Park, which is about 20 miles southeast of San Francisco. The project site is regionally accessible from U.S. Highway 101 (U.S. 101) and locally accessible from Bay Road. Figure 3, Project Location, shows an aerial view of the project site, the San Francisco Public Utilities Commission (SFPUC) right-of-way for water pipelines that crosses the site, and the surrounding area. The Town of Atherton is located adjacent to and southwest of the park, across Bay Road.

The 24.5-acre project site includes four parcels as shown in Table 3. This table further identifies each Assessor's Parcel Numbers, ownership, and acreage.

Table 3 Parcels within the Project Site

Assessor's Parcel Number	Ownership	Acreage
055-311-010	County of San Mateo	5.0
055-312-010	County of San Mateo	16.3
093-551-020	City & County of San Francisco	1.9
093-551-030	City & County of San Francisco	1.4
Total		24.5

Note: The individual parcel acreages may not sum to 100% of the total because of rounding.

As shown in Table 3, Flood County Park includes two parcels owned by the City & County of San Francisco. Through the SFPUC, San Francisco owns these linear parcels as part of approximately 3.3 acres of real property in fee that cross the park for the Hetch Hetchy Regional Water System. The 80-foot-wide SFPUC right-of-way bisects the park in an east-to-west alignment through the existing baseball field and parking lot. The primary purpose of this right-of-way is to serve as a utility corridor with three large subsurface water transmission pipelines. This utility corridor provides dedicated land accommodating the water pipelines to enable the reliable delivery of water to the SFPUC's 2.6 million customers. The County currently holds a five-year Revocable License (#3631B), issued by SFPUC in June 2015, for the recreational use of this on-site right-of-way.

Figure 2 Regional Location

Figure 3 Project Location

Imagery provided by Google and its licensors © 2017.

2.3 Existing Site Characteristics

The current characteristics of Flood County Park are summarized in Table 4 and in the discussion that follows.

Table 4 Characteristics of the Project Site and Vicinity

Project Site	
Existing Use	County Park
Land Use Designation	Parks and Recreation (City of Menlo Park General Plan)[1]
Zoning Designation	Open Space and Conservation District
Built Features	▪ Adobe structures (administrative office, ranger residence, maintenance and electrical buildings, restrooms, wall) ▪ Ballfield (closed for renovation) ▪ Group picnic areas ▪ Individual picnic areas ▪ Tennis courts (4) ▪ Pétanque court ▪ Playground ▪ Surface parking lot ▪ Entrance gate ▪ Sand volleyball courts (3) ▪ Asphalt trails ▪ Water fountains
Vicinity	
Surrounding Land Uses	Northeast: vacant school site, Haven Family House Southeast: single-family residences, Iris Lane Southwest: Bay Road, single-family residences Northwest: single-family residences
Surrounding Land Use Designations	Northeast: Low Density Residential (City of Menlo Park) Southeast: Low Density Residential (City of Menlo Park) Southwest: Low Density Single Family Residential (Town of Atherton) Northwest: Low Density Residential (City of Menlo Park)
Surrounding Zoning Designations	Northeast: Single Family Urban Residential District, R-1-U (City of Menlo Park) Southeast: Single Family Urban Residential District, R-1-U (City of Menlo Park) Southwest: Residential District, R-1A (Town of Atherton) Northwest: Single Family Urban Residential District, R-1-U (City of Menlo Park)

[1] The San Mateo County General Plan (1986) also recognizes the project site as a County Park.
Sources: City of Menlo Park, Zoning Map and General Plan Land Use Diagram, Sheet 5, April 2015; Town of Atherton, General Plan, November 2002; Town of Atherton, Zoning Map, December 2011.

The project site is a neighborhood park located in a single-family residential neighborhood in the city of Menlo Park. Flood County Park originally opened in the early 1930s, and existing adobe structures on-site were constructed during that era as Works Progress Administration (WPA) projects. These adobe structures include an administrative office, a ranger residence, maintenance and electrical buildings, restrooms, and remaining fragments of an adobe wall adjacent to Bay Road. The adobe administrative office is uninhabited but used occasionally for storage.

The park has a mixture of passive recreational facilities, such as group and individual picnic areas and trails, and active recreation facilities like a ballfield, tennis courts, a playground, sand volleyball courts, and a gravel pétanque court. An asphalt trail loops eastward from the central playground through picnic areas in the southern part of the park back to the western parking lot. Chain-link fencing approximately five to nine feet tall encloses the park in all directions.

Flood County Park has an open, spacious visual character with large patches of woodland, especially in its southern half. Prominent heritage trees of the following species abound at the park:

- *Quercus agrifolia* (coast live oak)
- *Quercus lobata* (valley oak)
- *Quercus ilex* (holly oak)
- *Sequoia sempervirens* (coast redwood)
- *Umbellularia californica* (California bay laurel)
- *Ulmus genus* (elm)
- *Platanus x acerifolia* (London plane tree)
- *Pyrus calleryana* (Callery pear)
- *Fraxinus genus* (ash)
- *Acacia melanoxylon* (Australian blackwood)
- *Callitris* genus (pine)

A 2015 assessment of the property revealed that many park features and core infrastructure components are in need of major repair or replacement. The ballfield, for example, is currently in disrepair and was last used in 2010. Current visitorship is lower than its peak from the late 1990s and early 2000s; however, the number of visitors has been steadily rebounding following the park's 2011 reopening after a year-long closure for replacement of the Hetch Hetchy water pipeline in the SFPUC right-of-way.

Lands immediately surrounding the project site are occupied primarily by single-family residences with the exception of a vacant former school site and the Haven Family House to the northeast. The Haven Family House consists of two-story buildings that provide transitional housing to homeless people. The vacant school is in a deferred maintenance condition, with broken windows and graffiti. Nearby residences range from one to two stories in height. Trees and shrubs near the property lines partially obstruct views of Flood County Park from adjacent residences. The centerline of U.S. 101 is approximately 350 feet northeast of the park.

2.4 Project Features

The proposed project entails a Landscape Plan for the long-term redevelopment of San Mateo County's Flood County Park in the city of Menlo Park. The planning process for development of the Landscape Plan took place between May and December 2015. On April 7, 2016, the County Parks and Recreation Commission voted to approve this plan as the Draft Preferred Alternative for improving Flood County Park. The Landscape Plan was refined through a series of community outreach efforts structured to identify community values, preferred uses, and site layout preferences. In response to public comment, the County has refined the proposed plan to optimize preservation of large oak and bay trees, increase offerings of sports, and provide a variety of active and passive uses for a range of user groups.

Table 5 lists the proposed recreational facilities in the Landscape Plan and their anticipated phasing.

Table 5 Proposed Recreational Facilities and Phasing

Phase	Improvements
Phase I	Baseball field replacement and bathroom
	Soccer/lacrosse field
	Two tennis courts
	Sand volleyball court replacement
	Basketball court
	Pump track
	Asphalt paths
	Adobe bathroom renovation
	Tree-lined promenade
	Drop off at playground area
	New utilities: water, electric, gas, greywater piping[1]
Phase II	Restrooms
	Demonstration gardens
	Playground replacement
	Individual picnic area renovations
	Gathering meadow (performance space)
Phase III	Rehabilitation of adobe administrative building[2]
	Group picnic area renovations with shade shelters
	Completion of all pathways with exercise stations
	Gathering plazas
	Focal element (may incorporate existing water pump feature)

[1] Purple piping may be installed for the future use of greywater.

[2] The adobe administrative building would be rehabilitated for seismic stability and use by park visitors.

This EIR evaluates environmental impacts from all phases of the Landscape Plan, including construction and operation of the proposed improvements. Because the Landscape Plan is a high-level plan intended to guide the long-term redevelopment of the park and would not directly involve the construction of recreational facilities listed in Table 5, the EIR evaluates the environmental impacts of Phase II and III improvements at a programmatic level. At the time that Phase II or III elements are proposed for construction, the County would be required to conduct further CEQA review for any elements only if they are substantially different than described in the Landscape Plan and if they could have environmental impacts beyond those anticipated in the EIR. However, the EIR evaluates proposed Phase I improvements at a more detailed, project-specific level to the extent feasible, as they would be constructed in the near term and their scope of physical disturbance and their construction schedule are more defined.

Figure 4 shows the layout of recreational facilities in the proposed Landscape Plan. The largest recreational facilities would be sited in the northern portion of the park, where the existing ballfield would be reconstructed (approximately 450 feet long on each side) and the soccer/lacrosse field (approximately 430 feet long by 260 feet wide) would be installed at the eastern corner, replacing the existing pétanque court and a portion of the existing tennis courts. The County has committed to siting the soccer/lacrosse field at least 100 feet away from the property line adjacent to residences on Del Norte Avenue. The promenade would run eastward across the center of the park from the parking lot. Picnic areas clustered in the southern half of the park would be reconstructed. A demonstration garden would be established in the western part of the park, near the parking lot entrance off Bay Road. In addition, the following recreational facilities would be located within the SFPUC right-of-way outlined in Figure 4: a ballfield, soccer/lacrosse field, basketball court, and promenade. The Parks Department would preserve existing adobe buildings on-site, with the exception of demolishing the adobe Restroom D located west of the existing tennis courts. The adobe administrative building in the southwest part of the park would be rehabilitated for seismic stability.

Fencing and/or netting would be installed around the proposed athletic fields. The reconstructed ballfield would be bordered by chain-link fencing of similar height and placement to the existing field. Based on the industry standard for soccer and lacrosse fields, it is assumed that fencing four to six feet in height would ring the soccer/lacrosse field (Sprecher 2012). Netting would likely be installed to contain soccer and lacrosse balls within this field. This netting is often set at a 20-foot height at the ends of the field or encircling the field (Sprecher 2012). This analysis conservatively assumes the installation of 20 to 30-foot-tall netting that encircles the soccer/lacrosse field.

Table 6 shows the estimated number of visitors to use proposed elements of the Landscape Plan during peak summer days, organized by phase of construction. These estimates of the potential seasonal capacity of recreational facilities were prepared in April 2019 by Gates + Associates, the consultant that assisted the County in designing the Landscape Plan, based on use patterns at other existing parks with similar features in the nearby cities of Belmont, Redwood City, and San Mateo. Background data collected for other existing parks included the type of athletic events, their seasonal and daily timing, peak use hours, and the number of events per day. The estimates of total use during each phase of the Landscape Plan are intended to be conservative, assuming concurrent use of multiple park features. Regular daily use over the course of a year would be considerably less than the estimated total use in Table 6. However, estimated peak use is appropriate for the purpose of a conservative analysis of impacts related to transportation and noise.

The use of athletic field improvements under the Landscape Plan (i.e., a reconstructed ballfield and new soccer/lacrosse field) would generally be highest during the summer, when the Menlo Park Legends or other athletic groups would be most active at the reconstructed ballfield. The County also anticipates that lacrosse would typically occur during the spring and fall seasons, with practices usually taking place during the week and games on the weekends. Concurrent use of the baseball and soccer/lacrosse field is anticipated. The park would typically accommodate either soccer or lacrosse use at any given time; however, soccer and lacrosse events could be concurrent on weekdays if one group were to use the ballfield. It should be noted that the proposed Landscape Plan would not, in itself, include programming and scheduling of athletic events, but the proposed athletic fields would accommodate anticipated demand from local user groups.

Figure 4 Proposed Landscape Plan

The Flood Park Preferred Plan reflects the community feedback received on the three alternatives. The plan provides a wide range of uses, both active and passive, for a variety of user groups. Fields sports (soccer and lacrosse) have been added, as wella number elements targeted to youth (basketball, pump track, adventure play).

Based on community feedback, uses have been located to minimize the removal of large Oak and Bay trees.

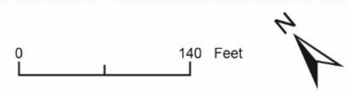


Table 6 Projected Peak Use of Flood County Park under Landscape Plan

Landscape Plan Element	Weekend Summer Daily	Weekend Summer Maximum Capacity per Event	Weekday Summer Daily	Weekday Summer Maximum Capacity per Event	Weekend Assumptions	Weekday Assumptions
Shade/market structure	200	75	N/A	N/A	1 event/day	N/A
Play area universal (2-5)	60	20	30	15	4 cycles/day	2 cycles/day
Play area universal (5-12)	120	40	60	30	4 cycles, 1 parent/2 kids	4 cycles, 1 parent/2 kids
Adventure play	70	35	40	20	2 cycles/day	2 cycles/day
Event/group picnic area	200	200	N/A	N/A	1 event	N/A
Small group picnic	120	120	N/A	N/A	8 areas, 15 people/area, 1 cycle/day	N/A
Tennis courts	48	16	32	16	10 playing, 10 waiting, 3 cycles/day	10 playing, 10 waiting, 1 cycle/day
Basketball	60	20	10	10	2 courts, 6 playing, 1 cycle/day	N/A
Sand volleyball	12	12	N/A	N/A		
Pump track	60	30	40	20	N/A	N/A
Ballfield	225	75	60	60	30 players, 45 spectators, 3 cycles/day	30 players, 30 parents, 1 cycle/day
Soccer/lacrosse field	225	75	60	60	30 players, 45 spectators, 3 cycles/day	30 players, 30 parents, 1 cycle/day
Demonstration garden/other passive uses	30	15	10	10	N/A	N/A
Total	**1,430**	**733**	**342**	**241**		

Source: Gates + Associates 2019

It is anticipated that organized activities at the athletic fields would occur no earlier than 9 A.M. and no later than 8 P.M. No additional lighting that would enable nighttime use of athletic facilities is proposed as part of the Landscape Plan, although path lights that could be manually turned on and off for special events may be installed. The park's existing hours of use would not change.

2.4.1 Grading and Construction

It is anticipated that implementation of the Landscape Plan would occur in three phases: Phase I, Phase II, and Phase III, The Phase I improvements are expected to be completed in approximately the first two years. The County anticipates initiating the improvements identified under Phase I within one to two years after issuance of the EIR, with construction estimated to take from a year to eighteen months. During this construction period, the portion of the park to be improved would be closed to public access. Phases II and III would be implemented subsequent to Phase I, as funding permits. While precise timeframes are uncertain, the County's goal would be to implement Phase II within five to seven years and Phase III within seven to ten years so that the revitalization of Flood County Park is completed within ten years of issuance of the EIR.

During Phase I, the northern portion of the park stretching from the proposed central promenade to the north and east would be graded. The area of grading in this phase would total approximately nine acres, including 3.4 acres at the ballfield and 1.6 acres at the soccer/lacrosse field. Grading activity would be required primarily to raise the ground surface above the SFPUC pipelines; reconstruct the ballfield; install a soccer/lacrosse field, pump track, and new underground utilities; demolish the existing playground, the adobe restroom next to the existing tennis courts, and asphalt paths; remove the foundations at the existing tennis courts; and reuse base rock from the existing pétanque court.

It is assumed that up to eight inches of existing soil would be excavated and exported offsite to prepare for construction of the ballfield and soccer/lacrosse field, and two feet of excavation would be required for the new sand volleyball courts. Soil export during construction would total an estimated 5,630 cubic yards. Based on February 2015 potholing in the SFPUC right-of-way at the ballfield, the ground surface at the reconstructed ballfield and the new soccer/lacrosse field would need to be raised by approximately six inches to provide adequate soil cover over the water pipelines. It is conservatively estimated that the County would need to import 4,370 cubic yards of soil to provide six inches of additional soil cover at the ballfield and soccer/lacrosse field, and to provide a two-foot base for the sand volleyball courts.

SFPUC's Land Engineering Requirements would restrict the type of construction activity allowed within 20 feet of the centerline of its pipelines. No mechanical excavation is allowed within 24 inches of SFPUC pipelines, and digging within 24 inches of pipeline must be done with hand tool. In addition, vibratory compaction equipment is prohibited within the right-of-way except with written approval from the Commission. SFPUC also restricts the weight class of vehicles in its right-of-way to no greater than the American Association of State Highway and Transportation Officials (AASHTO) Standard H-10 Loading.

As documented in the Tree Report prepared by Gates + Associates for the Landscape Plan in July 2016, ground disturbance for the proposed recreational facilities would involve removal of an estimated 78 trees from the Flood County Park. The Parks Department would plant or replant trees for accenting, screening, or other purposes as space allows, with a preference for native trees.

2.4.2 Site Access

The Landscape Plan would not involve changes to parking and access, except for a new drop-off area on-site. Flood County Park's existing vehicular access from Bay Road, via the entrance gate at the southwest corner of the park, would be retained, as would the existing asphalt parking lot on the western edge of the site. Pedestrians also would retain access to the park through gaps in a chain-link fence along Bay Road and at the eastern gate from Iris Lane.

2.5 Project Objectives

The applicant's objectives for the proposed Landscape Plan are as follows:

- To repair and update park features and core infrastructure components
- To meet demand for active recreation facilities in San Mateo County by increasing offerings of sports
- To provide a variety of uses for a range of user groups, including youth
- To optimize preservation of oak woodland

2.6 Required Approvals

The proposed project would require the discretionary approval of the County of San Mateo, who holds approval authority with respect to the Landscape Plan and EIR certification. In addition, the project may require approval by SFPUC of an updated Revocable License for secondary recreational use of its pipeline right-of-way.

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3 Environmental Impact Analysis

This section discusses the possible environmental effects of the project for the issue areas that were identified through the NOP process as having the potential to experience significant impacts. "Significant effect" is defined by the *CEQA Guidelines* Section 15382 as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment, but may be considered in determining whether the physical change is significant."

The assessment of environmental effects contained in each issue area begins with a discussion of the setting. Following the setting is a discussion of the project's impacts. Within the impact analysis, the first subsection identifies the methodologies used and the "significance thresholds," which are those criteria used for this analysis to determine whether potential impacts are significant. The next subsection describes the impact of the proposed project, mitigation measures for significant impacts, and the level of significance after mitigation. The significance of the project's environmental impacts was identified based on the following classifications:

- **Significant and Unavoidable.** An impact that cannot be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires a Statement of Overriding Considerations to be issued if the project is approved.
- **Less than Significant with Mitigation.** An impact that can be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires findings to be made.
- **Less than Significant.** An impact that may be adverse, but does not exceed the threshold levels and does not require mitigation measures. However, mitigation measures that could further lessen the environmental effect may be suggested if readily available and easily achievable.
- **Beneficial.** An impact that would reduce existing environmental problems or hazards.

The impact analysis concludes with a discussion of cumulative effects, which evaluates the impacts associated with the proposed project in conjunction with other future development in the area.

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3.1 Air Quality

This section discusses the Landscape Plan's potential impacts to regional and local air quality. Both temporary impacts related to construction and long-term impacts associated with the project are discussed. Traffic projections used in emissions estimates are based on the revised Traffic Impact Study for the Flood County Park Landscape Plan prepared by W-Trans (June 2019). The traffic study is included as Appendix D to this EIR.

3.1.1 Setting

Regional Climate and Meteorology

The project site is in San Mateo County, which is located on the peninsula region of the San Francisco Bay Area Air Basin (SFBAAB). The Santa Cruz Mountains extend to the center of the peninsula, with elevations above 2,000 feet at the southern end of the peninsula, decreasing to 500 feet around South San Francisco. Coastal towns experience cool, foggy weather during the summer, while cities along the southeastern part of the peninsula experience warmer temperatures and fewer foggy days due to the ridgeline blocking the marine layer. The average daytime high temperature in the summer is in the high 70s, while the average nighttime low temperature in the winter is in the high 30s and low 40s. The winds also play a large role in controlling the climate in the area, and annual average winds range between five and ten miles per hour in this region (BAAQMD 2017a).

Air pollutant emissions within the SFBAAB are generated primarily by stationary and mobile sources. Stationary sources can be divided into two major subcategories: point and area sources. Point sources occur at a specific location and are often identified by an exhaust vent or stack. Examples include boilers or combustion equipment that produce electricity or generate heat. Area sources are widely distributed and include sources such as residential and commercial water heaters, painting operations, lawn mowers, agricultural fields, landfills, and some consumer products. Mobile sources refer to emissions from motor vehicles, including tailpipe and evaporative emissions, and are classified as either on-road or off-road. On-road sources are operated on roadways and highways. Off-road sources include aircraft, ships, trains, and self-propelled construction equipment. Air pollutants can also be generated by the natural environment such as when high winds suspend fine dust particles.

Air Pollutants of Primary Concern

The federal and State Clean Air Acts mandate the control and reduction of certain air pollutants. Under these Acts, the U.S. Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (CARB) have established ambient air quality standards for certain "criteria" pollutants. Ambient air pollutant concentrations are affected by the rates and distributions of corresponding air pollutant emissions, as well as by the climatic and topographic influences discussed above. The primary determinant of concentrations of non-reactive pollutants (such as carbon monoxide and suspended particulate matter) is proximity to major sources. Ambient CO levels in particular usually closely follow the spatial and temporal distributions of vehicular traffic. A discussion of primary criteria pollutants is provided below.

Ozone

Ozone is a colorless gas with a pungent odor. Most ozone in the atmosphere is formed as a result of the interaction of ultraviolet light, reactive organic gases (ROG), and oxides of nitrogen (NO_X). ROG (the organic compound fraction relevant to ozone formation, and sufficiently equivalent for the purposes of this analysis to volatile organic compounds, or VOC) is composed of non-methane hydrocarbons (with some specific exclusions). NO_X is made of different chemical combinations of nitrogen and oxygen, mainly NO and NO_2. A highly reactive molecule, ozone readily combines with many different components of the atmosphere. Consequently, high levels of ozone tend to exist only while high ROG and NO_X levels are present to sustain the ozone formation process. Once the precursors have been depleted, ozone levels rapidly decline. Because these reactions occur on a regional rather than local scale, ozone is considered a regional pollutant.

Carbon Monoxide

Carbon monoxide (CO) is an odorless, colorless gas. CO causes a number of health problems including fatigue, headache, confusion, and dizziness. The incomplete combustion of petroleum fuels in on-road vehicles and at power plants is a major cause of CO. CO is also produced from burning wood in wood stoves and fireplaces. CO tends to dissipate rapidly into the atmosphere; consequently, violations of the State CO standard are generally associated with major roadway intersections during peak-hour traffic conditions. Localized carbon monoxide “hotspots” can occur at intersections and along roadway segment with heavy peak-hour traffic moving at slow speeds.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a by-product of fuel combustion, with the primary source being motor vehicles and industrial boilers and furnaces. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. NO_2 is an acute irritant. A relationship between NO_2 and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. NO_2 absorbs blue light and causes a reddish brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of PM_{10} and acid rain.

Suspended Particulates

PM_{10} is small particulate matter measuring 10 microns in diameter or less, while $PM_{2.5}$ is fine particulate matter measuring 2.5 microns in diameter or less. Suspended particulates are mostly dust particles, nitrates, and sulfates. They are a by-product of fuel combustion and wind erosion of soil and unpaved roads, and are directly emitted into the atmosphere through these processes. Suspended particulates are also created in the atmosphere through chemical reactions. The characteristics, sources, and potential health effects associated with the small particulates (those between 2.5 and 10 microns in diameter) and fine particulates ($PM_{2.5}$) can be very different. The small particulates generally come from windblown dust and dust kicked up from mobile sources. The fine particulates are generally associated with combustion processes as well as being formed in the atmosphere as a secondary pollutant through chemical reactions. Fine particulate matter is more likely to penetrate deeply into the lungs and poses a serious health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the small and fine particulate matter that is inhaled into the lungs remains there, which can cause permanent lung damage. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

Lead

Lead is a metal found naturally in the environment, as well as in manufacturing products. The major sources of lead emissions historically have been mobile and industrial sources. As a result of the phase-out of leaded gasoline, as discussed below, metal processing currently is the primary source of lead emissions. The highest level of lead in the air is generally found near lead smelters. Other stationary sources include waste incinerators, utilities, and lead-acid battery manufacturers.

In the early 1970s, the U.S. EPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The U.S. EPA completed the ban prohibiting the use of leaded gasoline in highway vehicles in December 1995. As a result of the U.S. EPA's regulatory efforts to remove lead from gasoline, lead concentrations have declined substantially over the past several decades. The most dramatic reductions in lead emissions occurred prior to 1990 due to the removal of lead from gasoline sold for most highway vehicles. Lead emissions were further reduced substantially between 1990 and 2008, with reductions occurring in the metals industries at least in part as a result of national emissions standards for hazardous air pollutants (U.S. EPA 2013).

Current Ambient Air Quality

CARB and the U.S. EPA established ambient air quality standards for major pollutants, including ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead, and fine particulates (PM_{10} and $PM_{2.5}$). Standards have been set at levels intended to be protective of public health. California standards are generally more restrictive than federal standards for each of these pollutants.

Local air districts and CARB monitor ambient air quality to assure that air quality standards are met and, if they are not met, to also develop strategies to meet the standards. Air quality monitoring stations measure pollutant ground-level concentrations (typically, ten feet above ground level). Depending on whether the standards are met or exceeded, the local air basin is classified as in "attainment" or "non-attainment." Some areas are unclassified, which means no monitoring data are available. Unclassified areas are considered to be in attainment. Table 7 summarizes the California Ambient Air Quality Standards (CAAQS) and the National Ambient Air Quality Standards (NAAQS) for each of these pollutants as well as the attainment status of the SFBAAB, which is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD).

Table 7 Ambient Air Quality Standards & Basin Attainment Status

		California Standards		National Standards	
Pollutant	**Averaging Time**	**Concentration**	**Attainment Status**	**Concentration**	**Attainment Status**
Ozone	8 Hour	0.070 ppm	N	0.070 ppm	N
	1 Hour	0.09 ppm	N		
Carbon Monoxide	8 Hour	9.0 ppm	A	9 ppm	A
	1 Hour	20 ppm	A	35 ppm	A
Nitrogen Dioxide	1 Hour	0.18 ppm	A	0.100 ppm	U
	Annual Arithmetic Mean	0.030 ppm		0.053 ppm	A
Sulfur Dioxide	24 Hour	0.04 ppm	A	0.14 ppm	A
	1 Hour	0.25 ppm	A	0.075 ppm	A
Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 $\mu g/m^3$	N		
	24 Hour	50 $\mu g/m^3$	N	150 $\mu g/m^3$	U
Particulate Matter - Fine ($PM_{2.5}$)	Annual Arithmetic Mean	12 $\mu g/m^3$	N	12 $\mu g/m^3$	U/A
	24 Hour			35 $\mu g/m^3$	N
Sulfates	24 Hour	25 $\mu g/m^3$	A		
Lead	Rolling 3 Month Average			0.15 $\mu g/m^3$	
	30 Day Average	1.5 $\mu g/m^3$			A
Hydrogen Sulfide	1 Hour	0.03 ppm	U		
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm	No information available		
Visibility Reducing particles	8 Hour (10:00 to 18:00 PST)		U		

A=Attainment; N=Nonattainment; U=Unclassified; mg/m^3=milligrams per cubic meter; ppm=parts per million; $\mu g/m^3$=micrograms per cubic meter

Sources: BAAQMD 2017b

As shown in Table 7, the SFBAAB is in nonattainment for the federal standards for ozone and $PM_{2.5}$. The SFBAAB is also in nonattainment for the State standard for ozone as well as PM_{10} and $PM_{2.5}$.

The Redwood City Monitoring Station is the only BAAQMD-operated monitoring station located in San Mateo County and is approximately 1.7 miles southeast of the project site. Table 8 summarizes the representative annual air quality data for the project site between the years 2016 and 2018 at the Redwood City Monitoring Station for all criteria pollutants, except PM_{10} since it was unavailable. Data for PM_{10} was obtained from the next closest station, the San Jose-Jackson Street Monitoring Station, which is located approximately 17.7 miles southeast of the project site. As shown in Table 8, 1-hour ozone exceeded the State threshold twice in 2017, 8-hour ozone exceeded State and federal thresholds twice in 2017, PM_{10} exceeded the State threshold six times in 2017 and four times in 2018, and $PM_{2.5}$ exceeded the federal threshold six times in 2017 and 13 times in 2018. The impact analysis below considers the project's contributions to excessive concentrations of air pollutants.

Table 8 Current Ambient Air Quality Data

Pollutant	2016	2017	2018
Ozone (ppm), Worst 1-Hour	0.075	0.115	0.067
Number of days of State exceedances (>0.09 ppm)	0	2	0
Ozone (ppm), 8-Hour Average	0.060	0.086	0.049
Number of days of State exceedances (>0.07 ppm)	0	2	0
Number of days of Federal exceedances (>0.07 ppm)	0	2	0
Carbon Monoxide (ppm), Highest 8-Hour Average	1.1	1.4	1.7
Number of days of above State or Federal standard (>9.0 ppm)	0	0	0
Particulate Matter <10 microns, μg/m3, Worst 24 Hours	41	70	122
Number of days above State standard (>50 μg/m^3)	0	6	4
Number of days above Federal standard (>150 μg/m^3)	0	0	0
Particulate Matter <2.5 microns, μg/m^3, Worst 24 Hours	19.5	60.8	120.9
Number of days above Federal standard (>35 μg/m^3)	0	6	13

ppm = parts per million; μg/m^3 = micrograms per cubic meter

Redwood City Monitoring Station was used for all pollutants except PM_{10}, which used data from the San Jose-Jackson Street Monitoring Station.

Source: CARB 2019

3.1.2 Regulatory Setting

The Federal Clean Air Act (CAA) governs air quality in the United States. In addition to being subject to federal requirements, air quality in California is also governed by more stringent regulations under the California Clean Air Act. These laws are administered by the CARB at the State level and by the Air Quality Management Districts at the regional and local levels. The BAAQMD regulates air quality at the regional level, which includes the nine-county Bay Area.

Federal

The U.S. EPA is responsible for enforcing the federal CAA. The U.S. EPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS). The NAAQS are required under the 1977 CAA and subsequent amendments. The EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. The agency has jurisdiction over emission sources outside state waters (e.g. beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by the CARB.

State

In California, the CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for meeting the State requirements of the federal CAA, administering the California CAA, and establishing the California Ambient Air Quality Standards (CAAQS). The California CAA, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain the CAAQS. The CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. The CARB regulates mobile air pollution sources, such as motor vehicles. The agency is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. The CARB established passenger vehicle fuel specifications, which became effective on March 1996. The CARB oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level.

Regional

The BAAQMD is primarily responsible for assuring that the federal and State ambient air quality standards are attained and maintained in the Bay Area. The BAAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, conducting public education campaigns, as well as many other activities.

The BAAQMD adopted the 2017 Clean Air Plan (2017 Plan) on April 19, 2017 as an update to the 2010 Clean Air Plan. The 2017 Plan, which focuses on protecting public health and the climate, defines an integrated, multi-pollutant control strategy that includes all feasible measures to reduce emissions of ozone precursors (including transport of ozone and its precursors to neighboring air basins), fine particulate matter (PM), and toxic air contaminants (TACs). To protect public health, the control strategy will decrease population exposure to PM and TACs in communities that are most impacted by air pollution with the goal of eliminating disparities in exposure to air pollution between communities. The control strategy will protect the climate by reducing greenhouse gas emissions and developing a long-range vision of how the Bay Area could look and function in a year 2050 post-carbon economy (BAAQMD 2017c).

3.1.3 Sensitive Receptors

Certain population groups are more sensitive to air pollution than the general population; in particular, children, the elderly, and acutely ill and chronically ill persons, especially those with cardio-respiratory diseases, are considered sensitive receptors. Sensitive receptors that are in proximity to localized sources of particulate matter, toxics, and carbon monoxide are of particular concern. According to BAAQMD, sensitive receptors include residences, schools and school yards, parks and playgrounds, daycare centers, nursing homes, and medical facilities (BAAQMD 2017a). Since the project is a park in a residential neighborhood, sensitive receptors would be located at the park as well as the surrounding residences.

3.1.4 Impact Analysis

Methodology and Significance Thresholds

This analysis uses the BAAQMD's May 2017 CEQA Air Quality Guidelines to evaluate air quality. The May 2017 CEQA Air Quality Guidelines include revisions made to the 2010 Guidelines, addressing the California Supreme Court's 2015 opinion in the *Cal. Bldg. Indus. Ass'n vs. Bay Area Air Quality Mgmt. Dist., 62 Cal. 4th 369* (BAAQMD 2017a).

Significance Thresholds

Based on San Mateo County's *Initial Study Environmental Evaluation Checklist*, impacts related to air quality from the proposed project would be significant if the project would:

1. Conflict with or obstruct implementation of the applicable air quality plan;
2. Violate any air quality standard or contribute significantly to an existing or projected air quality violation;
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
4. Expose sensitive receptors to significant pollutant concentrations, as defined by BAAQMD;
5. Create objectionable odors affecting a significant number of people; and/or
6. Generate pollutants (hydrocarbon, thermal odor, dust or smoke particulates, radiation, etc.) that will violate existing standards of air quality on-site or in the surrounding area.

Because the project would not add new sources of odors, expose people to any existing sources of odors, or generate industrial pollutants, Thresholds 5 and 6 are discussed in Section 5, *Effects Found Not to Be Significant*, in the original Draft EIR that was published in September 2017.

The BAAQMD CEQA Air Quality Guidelines quantify air quality thresholds with defined numeric values and evaluation criteria for pollutant emissions. Although plan-level thresholds would be most appropriate for the proposed long-term Landscape Plan, the BAAQMD CEQA Air Quality Guidelines have no plan-level significance thresholds; instead, this analysis compares expected emissions from recreational elements in the Landscape Plan to quantitative project-level thresholds in the Air Quality Guidelines. These project-level thresholds, listed below, represent the levels at which a project's individual emissions of criteria air pollutants or precursors would result in a cumulatively considerable contribution to the Basin's existing air quality conditions.

Construction Emissions

Impacts related to the project's construction emissions would be significant if these emissions exceeded the following thresholds:

- 54 pounds per day reactive organic gases (ROG)
- 54 pounds per day oxides of nitrogen (NO_X)
- 82 pounds per day PM_{10} (exhaust only)
- 54 pounds per day $PM_{2.5}$ (exhaust only)

Operational Emissions

Impacts from the project's direct and/or indirect operational emissions would be significant if they exceeded the following thresholds:

- 54 pounds per day reactive organic gases (ROG)
- 54 pounds per day oxides of nitrogen (NO_X)
- 82 pounds per day PM_{10}
- 54 pounds per day $PM_{2.5}$

Direct emissions are emitted on a site and include emissions from stationary sources and on-site mobile equipment, if applicable. Examples of land uses and activities that generate direct emissions are industrial operations and sources subject to an operating permit by the BAAQMD. Indirect emissions come from mobile sources that access the project site, but generally are emitted off-site. For many types of land development projects, the principal source of air pollutant emissions is the motor vehicle trips generated by the project.

Localized Carbon Monoxide Concentrations

A project's indirect CO emissions would be significant if they contribute to a violation of the State standards for CO (9.0 ppm averaged over 8 hours and 20 ppm over 1 hour).

Toxic Air Contaminant Emissions

Toxic air contaminants (TACs), including fine diesel particulates ($PM_{2.5}$), can have significant health impacts on local communities. The BAAQMD's CEQA Air Quality Guidelines sets thresholds applicable to projects that would site new sensitive receptors in proximity to permitted or non-permitted sources of TAC or $PM_{2.5}$ emissions. If impacts due to emissions of TACs or $PM_{2.5}$ from any individual source would exceed any of the thresholds listed below, the project would result in a significant impact:

- Non-compliance with a Community Risk Reduction Plan
- An excess cancer risk level of more than 10 in one million (10E-06), or a non-cancer (i.e., chronic or acute) hazard index greater than 1.0 from any individual source would be a significant cumulatively considerable contribution
- An incremental increase of greater than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average $PM_{2.5}$ from any individual source would be a significant cumulatively considerable contribution

Methodology

The significance thresholds described in the previous section represent the levels at which a project's individual emissions of criteria air pollutants or precursors would result in a cumulatively considerable contribution to the Basin's existing air quality conditions. All proposed recreational improvements in the Landscape Plan would result in temporary construction-related and long-term operational emissions. At this time, only the Phase I improvements are defined to an extent that would warrant project-level analysis. This phase is analyzed on a project-level basis. However, the proposed Phase II and III improvements are not defined to a level that would warrant project-level analysis and thus it would be speculative to include project-level impacts as part of this analysis. Rather, impacts for Phases II and III are discussed qualitatively. Because Phase I includes the most substantial recreational improvements in the Landscape Plan, the elements in following phases are assumed to result in similar or fewer emissions.

Construction Emissions

Emissions from construction activity during Phase I were calculated using the California Emissions Estimator Model (CalEEMod) version 2016.3.2. Construction was modeled to begin in November 2019 and end in February 2021.[1] Phase I would involve demolition of structures including the

[1] Although construction of Phase I elements could begin as late as 2021, the EIR's modeling of air pollutant and greenhouse gas emissions makes a conservative assumption that construction would begin in 2019. This assumption is more conservative because State standards for energy use become progressively more stringent and fuel economy in motor vehicles is projected to improve in future years.

existing playground, tennis courts, adobe Restroom D building, asphalt paths, and concrete, which total approximately 54,000 square feet in surface area. Demolition would occur first, followed by site preparation, grading, construction of recreational facilities, and paving. Since approximately nine acres would be graded during Phase I, the grading phase was extended to 60 days based on the number of hauling trips required to account for approximately 4,370 cubic yards imported to the site and approximately 5,630 cubic yards exported from the site. Average daily emissions from project construction were calculated using CalEEMod, including both on-site and off-site activities. On-site activities would consist of the operation of off-road construction equipment, as well as on-site truck travel (e.g., haul trucks, water trucks, dump trucks, and concrete trucks), whereas off-site sources would be emissions from construction vehicle trips.

Operational Emissions

CalEEMod was used to estimate emissions from the long-term operation of Phase I improvements. Operational emissions included mobile source emissions, area source emissions, and emissions from energy use. Mobile source emissions would be generated by the increase in motor vehicle trips to and from the project site associated with operation of the project. This analysis used projections of daily project-generated vehicle trips from the Traffic Impact Study prepared by W-Trans in June 2019 (see Appendix D). Area source emissions are generated by landscape maintenance including pesticide and fertilizer use. Emissions attributed to energy use include natural gas consumption for space and water heating.

Localized Carbon Monoxide Concentrations

The BAAQMD recommends CO “hotspot” analysis for a project if the addition of project traffic would increase traffic volumes at affected intersections to more than 44,000 vehicles per hour. Based on the existing peak-hour turning volumes at intersections presented in the Traffic Impact Study prepared by W-Trans, no intersections affected by the project would handle more than 44,000 vehicles per hour (Appendix D); therefore, no intersection-specific CO modeling is required.

Toxic Air Contaminant Emissions

Local community risk and hazard impacts are associated with toxic air contaminants (TACs) and $PM_{2.5}$ because emissions of these pollutants can have significant health impacts at the local level. BAAQMD’s CEQA Air Quality Guidelines include risk and hazard thresholds that are intended to apply to projects that would site new permitted or non-permitted sources in proximity to receptors and for projects that would site new sensitive receptors in proximity to permitted or non-permitted sources of TAC or $PM_{2.5}$ emissions. According to CARB, parks are considered land uses where sensitive individuals are most likely to spend time. The main source of TACs at the project site is U.S. 101, which is located approximately 350 feet northeast of the project boundary.

Project Impacts

Threshold 1 Conflict with or obstruct implementation of the applicable air quality plan.

Impact AQ-1	The project would not contribute to population growth and would be consistent with the growth assumptions in the BAAQMD 2017 Clean Air Plan. This impact would be less than significant.

To be consistent with an air quality management plan (AQMP), a project must conform to the local General Plan and must not result in or contribute to an exceedance of the local jurisdiction's forecasted future population. A project may be inconsistent with the AQMP if it would generate population, housing, or employment growth exceeding the forecasts used in the development of the AQMP. Population growth would lead to increased vehicle use, energy consumption, and associated air pollutant emissions.

As discussed in Section 5, *Effects Found Not to Be Significant*, in the original Draft EIR that was published in September 2017, the Landscape Plan would not involve the construction of infrastructure that could induce substantial population growth, such as new or increased capacity sewer or water lines, or the construction of new streets and roads. While the proposed improvements to Flood County Park would make the area more attractive future residents, the improvements in the Landscape Plan would not be a substantial growth-inducing effect in San Mateo County. Therefore, no phases of the Landscape Plan would result in or contribute to an exceedance of San Mateo County's forecasted population, housing, or employment, and the project would thereby be consistent with the BAAQMD's 2017 Clean Air Plan.

Mitigation Measure

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Thresholds 2, 3, 6

Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).

Generate pollutants (hydrocarbon, thermal odor, dust or smoke particulates, radiation, etc.) that will violate existing standards of air quality on-site or in the surrounding area.

Impact AQ-2	While Project construction would generate temporary increases in localized air pollutant emissions, these emissions would not exceed BAAQMD's significance thresholds. Therefore, this impact would be less than significant. However, implementation of BAAQMD's Basic Construction Mitigation Measures to reduce fugitive dust and NO_x emissions is recommended to further reduce construction emissions.

Phase I

The construction of proposed recreational improvements during Phase I would generate temporary emissions from three primary sources: the operation of construction vehicles (e.g., scrapers, loaders, and dump trucks); ground disturbance during clearing and grading, which creates fugitive dust; and the application of asphalt, paint, or other oil-based substances. The extent of daily emissions, particularly ROGs and NO_X emissions, generated by construction equipment, would depend on the quantity of equipment used and the hours of operation for each project. The extent of fugitive dust emissions would depend upon the following factors: 1) the amount of disturbed soils; 2) the length of disturbance time; 3) whether existing structures are demolished; 4) whether excavation is involved; and 5) whether transporting excavated materials offsite is necessary.

Construction activities would result in temporary air quality impacts that may vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Construction equipment that would generate criteria air pollutants includes excavators and graders. It is assumed that all construction equipment used would be diesel-powered. Electrically-powered equipment would not result in criteria pollutant or ozone precursor emissions. Therefore, the assumption that equipment would be diesel-powered represents a worst-case assumption for project construction activity.

Table 9 summarizes the estimated maximum daily construction emissions that would occur during Phase I.

Table 9 Construction Emissions – Phase I

Pollutant	Maximum Daily Emissions (pounds per day)	Significance Threshold (pounds per day)	Significant Impact?
ROG	4.4	54	No
NO_x	45.6	54	No
PM_{10} (exhaust)	2.4	82	No
PM_{10} (total)	20.6	N/A	N/A
$PM_{2.5}$ (exhaust)	2.2	54	No
$PM_{2.5}$ (total)	12.2	N/A	N/A

See Appendix B for CalEEMod worksheets. For a conservative estimate, winter emissions were used.

As shown in Table 9, construction emissions during Phase I would not exceed BAAQMD project-level thresholds for construction. Furthermore, the maximum daily construction emissions provide a conservative estimate because grading for all Phase I improvements were modeled over a continuous 60-day period. Construction activities would not generate substantial amounts of pollutants such as hydrocarbons, thermal odor, dust or smoke particulates, or radiation. Therefore, Phase I would have a less than significant impact from construction emissions.

Phases II and III

The construction of recreational improvements during Phases II and III of the Landscape Plan would generate short-term emissions. Specific details of each improvement are not known at this time, except for Phase I, and thus emissions from Phases II and III cannot be estimated. Phase I would involve the most intensive development under the Landscape Plan, including grading of nine acres within an estimated 60 days and construction of new sports fields. Phases II and III would involve smaller-scale improvement projects such as picnic area renovations and pathways. Projects during Phases II and III would involve far less grading and would be more distributed over time, as the County plans to implement Phase II within five to seven years and Phase III within seven to ten years. Because of the smaller scale of remaining recreational improvements, it is anticipated that they would generate fewer emissions than those shown in Table 9 for Phase I. Therefore, Phases II and III would also have a less than significant impact from construction emissions.

Mitigation Measures

Although no mitigation is required, BAAQMD recommends that all projects implement the following Basic Construction Mitigation Measures to meet the best management practices threshold for fugitive dust (BAAQMD 2017a):

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.
- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

In addition, the following BAAQMD measure suggested is recommended to reduce NO_x emissions from off-road equipment because these emissions would be near the threshold of 54 pounds per day (BAAQMD 2017a):

- The project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NO_X reduction and 45 percent PM reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.

Significance After Mitigation

This impact would be less than significant without mitigation. Nonetheless, implementation of measures recommended by BAAQMD for fugitive dust and NO_x would further reduce this less than significant impact.

Thresholds 2, 3

Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).

Impact AQ-3	Operation of the proposed project would generate air pollutant emissions, but emissions would not exceed BAAQMD significance thresholds. Impacts related to operational emissions would be less than significant.

Phase I

Operational emissions primarily include mobile source emissions, which are generated by the increase in motor vehicle trips to and from the project site. Operational emissions would also result from area sources, which would increase due to landscaping maintenance (pesticide and fertilizer use). To determine whether a regional air quality impact would occur, operational emissions were compared with the BAAQMD's project-level thresholds.

Table 10 summarizes the estimated daily operational emissions that would occur during Phase I of the Landscape Plan.

Table 10 Operational Emissions – Phase I

Pollutant	Maximum Daily Emissions (pounds per day)	Significance Threshold (pounds per day)	Significant Impact?
ROG	0.9	54	No
NO_x	2.7	54	No
PM_{10}	3.1	82	No
$PM_{2.5}$	0.8	54	No

See Appendix B for CalEEMod worksheets. For a conservative estimate, winter emissions were used.

Because maximum daily operational emissions would not exceed the BAAQMD's project-level thresholds, Phase I would have a less than significant impact from operational emissions.

Phases II and III

As discussed above, the specific details of recreational improvements proposed for Phases II and III are not known at this time. The operation of Phase I improvements would generate the most vehicle trips and associated mobile emissions because of organized activities at the proposed athletic fields. In comparison, the smaller passive recreational facilities proposed in Phases II and III, such as picnic areas and a new playground, would generate fewer vehicle trips and mobile emissions. Thus, Phases II and III are anticipated to generate fewer operational emissions of criteria air pollutants (less than 3.1 pounds per day) as compared to the Phase I emissions shown in Table 10. Therefore, operation of Phases II and III would not have an individually or cumulatively significant impact on air quality. In combination, Phases I through III would generate operational emissions of criteria air pollutants of no greater than 6 pounds per day, which would not exceed the significance thresholds shown in Table 10. Therefore, the Landscape Plan as a whole would have a less than significant impact from operational emissions.

Mitigation Measure

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Threshold 4

Expose sensitive receptors to significant pollutant concentrations, as defined by BAAQMD.

Impact AQ-4	The project would not expose sensitive receptors to substantial pollutant concentrations associated with construction dust, CO hotspots, or toxic air contaminants. Impacts related to these localized pollutants would be less than significant.

Certain population groups, such as children, the elderly, and people with health problems, are particularly sensitive to air pollution. Construction-related emissions such as dust could result in adverse health risks to nearby sensitive receptors; however, emissions during Phase I as shown in Table 9 would not exceed BAAQMD thresholds, and emissions during Phases II and III would not exceed those of Phase I. Adherence to BAAQMD's Basic Construction Mitigation Measures, as recommended in Impact AQ-2, would further reduce exposure to construction dust.

Since the project would add athletic facilities and improve existing park features, an increase in attendance at the park would be expected. Increased attendance could lead to an increase in traffic at congested roadways or intersections. The BAAQMD recommends a CO "hotspot" analysis for a project if the addition of project traffic would increase traffic volumes at affected intersections to more than 44,000 vehicles per hours. However, based on the intersection turning volumes presented in the Traffic Impact Study prepared by W-Trans, vehicle trips generated by the Landscape Plan would not result in more than 44,000 vehicles per hour at nearby intersections. Thus, the project does not require intersection-specific CO modeling and would not generate localized carbon monoxide concentrations.

The main source of toxic air contaminants (TACs) at the project site is U.S. 101, which runs approximately 350 feet northeast of the project boundary. Since an increase in public use would be expected, new users may be exposed to TACs near the project site. However, it is expected that, at a maximum, park users would only visit for a couple of hours per day (or even per week). Due to this low duration of exposure, park users would not be exposed to TACs for long periods of time that would result in an increase in cancer risk of greater than 10 in a million or a non-cancer hazard index greater than 1.0.

Mitigation Measure

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Cumulative Impacts

The SFBAAB is in nonattainment for the federal and state standards for ozone, as well as the state standard for particulate matter (PM_{10} and $PM_{2.5}$) and the federal standard for 24-hour concentrations of $PM_{2.5}$. Any growth within the SFBAAB would contribute to existing exceedances of ambient air quality standards when taken as a whole with existing development. However, the project would not result in an increase in regional population or other growth that is not anticipated under the 2017 Clean Air Plan; therefore, implementation of the Clean Air Plan. In addition, according to BAAQMD Air Quality CEQA Guidelines, “if a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region’s existing air quality conditions.” As described above in this section, all air pollutant emissions would be below BAAQMD thresholds, and the Landscape Plan would not result in increased regional population beyond that anticipated in the Clean Air Plan. Therefore, the project’s contribution to cumulative regional air quality impacts would not be cumulatively considerable.

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3.2 Energy

This section discusses the energy impacts of proposed project, following the updated guidance for evaluation of energy impacts in Appendix G of the State *CEQA Guidelines*. Data used to prepare this section were obtained from the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR), the California Energy Commission (CEC), the U.S. Department of Energy (DOE), and California Gas and Electric Utilities (CGEU).

3.2.1 Environmental Setting

Energy relates directly to environmental quality. Energy use, when sourced from fossil fuels, can adversely affect air quality and can generate greenhouse gas (GHG) emissions that contribute to climate change. Fossil fuels are burned to create electricity that powers residences and commercial/industrial buildings, heats and cools buildings, and powers vehicles. Transportation energy use is related to the fuel efficiency of cars, trucks, and public transportation; choice of different travel modes such as auto, carpool, and public transit; and miles traveled by these modes. Construction and routine operation and maintenance of transportation infrastructure also consume energy.

Energy Supply

Petroleum

California

California is one of the top producers of petroleum in the nation, with drilling operations occurring throughout the State, but primarily concentrated in Kern and Los Angeles counties. A network of crude oil pipelines connects production areas to oil refineries in the Los Angeles area, the San Francisco Bay area, and the Central Valley. California oil refineries also process Alaskan and foreign crude oil received in ports in Los Angeles, Long Beach, and the San Francisco Bay area. Crude oil production in California and Alaska is in decline, and California refineries have become increasingly dependent on foreign imports (CEC 2018a). Led by Saudi Arabia and Ecuador, foreign suppliers now produce more than half of the crude oil refined in California (CEC 2018b). According to the U.S. Energy Information Administration (EIA), California's field production of crude oil totaled 174.1 million barrels in 2017 (EIA 2018a).

Menlo Park

In Menlo Park petroleum fuels are generally purchased by residents and employees. There are nine gas stations located within the city limits. There are existing natural gas transmissions lines, but no gasoline or oil pipelines in city (National Pipeline Mapping System [NPMS] 2019). According to the Division of Oil, Gas, and Geothermal Resources (DOGGR), no abandoned, orphaned, or operating oil wells exist in the city (DOGGR 2019).

Alternative Fuels

A variety of alternative fuels are used to reduce petroleum-based fuel demand. The use of these fuels is encouraged through various statewide regulations and plans, such as the Low Carbon Fuel

Standard and Senate Bill 32. Conventional gasoline and diesel may be replaced, depending on the capability of the vehicle with transportation fuels discussed below.

Hydrogen

Hydrogen is being explored for use in combustion engines and fuel cell electric vehicles. The interest in hydrogen as an alternative transportation fuel stems from its clean-burning qualities, its potential for domestic production, and the fuel cell vehicle's potential for high efficiency, which is two to three times more efficient than gasoline vehicles. Currently, 35 hydrogen refueling stations are located in California; however, none are located in Menlo Park (DOE 2018).

Biodiesel

Biodiesel is a renewable alternative fuel that can be manufactured from vegetable oils, animal fats, or recycled restaurant greases. Biodiesel is biodegradable and cleaner-burning than petroleum-based diesel fuel. Biodiesel can run in any diesel engine generally without alterations, but fueling stations have been slow to make it available. There are currently 10 biodiesel refueling stations in California, none of which is located in Menlo Park (DOE 2018).

Electric Vehicles

Electricity can be used to power electric and plug-in hybrid electric vehicles directly from the power grid. Electricity used to power vehicles is generally provided by the electricity grid and stored in the vehicle's batteries. Fuel cells are being explored as a way to use electricity generated onboard the vehicle to power electric motors. There are two electrical charging stations in Menlo Park (DOE 2018).

Electricity

CALIFORNIA

In 2017, California's in-state electric generation totaled 206,328 gigawatt-hours (GWh) (CEC 2018c). Primary fuel sources for the State's electricity generation in 2017 included natural gas (43.4 percent), large hydro (17.9 percent), solar polar voltaic (PV) (10.6 percent), nuclear (8.7 percent), wind (6.2 percent), geothermal (5.7 percent), small hydro (3.1 percent), biomass (2.8 percent), solar thermal (1.2 percent), coal (<1 percent), petroleum coke (<1 percent), waste heat (<1 percent), and oil (<1 percent) (CEC 2018c). In-state electricity generation capacity reached 79,644 megawatts (MW) in 2017 (CEC 2018c).

CALIFORNIA'S 2018 INTEGRATED ENERGY POLICY REPORT

Every two years, the CEC prepares the Integrated Energy Policy Report (IEPR). This year's update to the IEPR highlights the implementation of California's innovative policies and the role the State played in establishing a clean energy economy. Volume II of the 2018 IEPR was adopted in February of 2019 and provides more detail on several key energy issues and encompasses new analyses, as well as opportunities for public participation. According to the 2018 IEPR, California's electric grid relies increasingly on clean sources of energy such as solar, wind, geothermal, hydroelectricity, and biomass (CEC 2018d). As this transition advances, the grid is also expanding to serve new sectors including electric vehicles, rail, and space and water heating. California has installed more renewable energy than any other state in the United States with 22,250 MW of utility-scale systems operational (CEC 2018d). California's Renewables Portfolio Standard (RPS) establishes increasing renewable energy procurement requirements for electricity utilities and other load-serving entities. The 2018 IEPR identifies RPS targets of 33 percent renewable energy sources by 2020 and 50 percent renewable energy sources by 2030 (CEC 2018d); however, with the adoption of Senate Bill (SB) 100, discussed further under *Regulatory Setting*, the RPS targets have been amended to 33 percent renewable sources by 2020, 50 percent renewable sources by 2026, 60 percent renewable sources by 2030, and 100 percent carbon-free sources by 2045 (California Legislative Information 2018).

MENLO PARK

Pacific Gas and Electric (PG&E) is responsible for providing power supply to the City of Menlo Park while complying with San Mateo County, State, and federal regulations. PG&E's power system is one of the nation's largest electric and gas utilities and maintains 106,681 circuit miles of electric distribution lines and 18,466 circuit miles of interconnected transmission lines (PG&E 2019a). In 2018, PG&E's power mix, including all PG&E-owned generation plus PG&E's power purchases, consisted of 33 percent renewable resources, including wind, geothermal, biomass, solar, and small hydro, 27 percent nuclear generation, 20 percent natural gas, 18 percent large hydroelectric facilities, and 2 percent unspecified power that is not traceable to specific sources by any auditable contract trail (PG&E 2019b). Although Menlo Park lies within PG&E's electricity service area, the City is a participant to the Peninsula Clean Energy program (Menlo Park 2019).

PENINSULA CLEAN ENERGY

Peninsula Clean Energy (PCE) is a community choice energy (CCE) program that uses PG&E infrastructure to deliver electricity services for energy customers in San Mateo County. PCE provides cleaner energy from renewable resources like water, wind and solar with two power mix options for consumers: one is 50 percent renewable energy (default option), and the second is 100 percent renewable energy at a higher rate. PCE member cities include Atherton, Belmont, Brisbane, Burlingame, Colma, Daly City, East Palo Alto, Foster City, Half Moon Bay, Hillsborough, Menlo Park, Millbrae, Pacifica, Portola Valley, Redwood City, San Bruno, San Carlos, San Mateo, Woodside, South San Francisco, and Unincorporated San Mateo County. PCE began providing services to customers in Menlo Park in 2016. PCE has an ambitious goal of designing a diverse power portfolio that will be 100 percent GHG free by 2021 (PCE 2019).

PG&E'S 2018 INTEGRATED RESOURCE PLAN

PG&E's 2018 Integrated Resource Plan serves as a roadmap through 2030 that guides PG&E's efforts to supply reliable electricity in an environmentally responsible and cost-effective manner. The Integrated Resource Plan introduces new constraints and considerations into the power system planning process and is intended to help applicable parties understand how load serving entities plan to shape their future energy portfolios to meet the State's clean energy goals. In the 2018 Integrated Resource Plan, PG&E analyzes three scenarios for 2030 that differ in various aspects, including the share of electric vehicles in the statewide fleet and availability of different energy sources. According to these scenarios, PG&E anticipates meeting a 2030 energy load demand of between 36,922 gigawatt hours (GWh) and 37,370 GWh (PG&E 2018c).

Natural Gas

CALIFORNIA

Natural gas continues to play an important and varied role in California. The State's net natural gas production for 2017 was 162.7 billion cubic feet, or approximately 168,720 billion British thermal units (Btu), representing an increase of 3.6 percent from 2016 production (DOGGR 2018b).

The 2018 California Gas Report presents a comprehensive outlook for natural gas requirements and supplies for California through the year 2035. The report is prepared in even-numbered years, followed by a supplemental report in odd-numbered years, in compliance with California Public Utilities Commission (CPUC) Decision D.95-01-039. The projections contained in the California Gas Report are for long-term planning and do not necessarily reflect the day-to-day operational plans of the utilities (CGEU 2018).

California natural gas demand, including volumes not served by utility systems, is expected to decrease at a rate of 0.5 percent per year from 2018 to 2035. The forecast decline is due to a combination of moderate growth in the Natural Gas Vehicle market and across-the-board declines in all other market segments: residential, commercial, electric generation, and industrial markets (CGEU 2018).

Residential gas demand is expected to decrease at an annual average rate of 1.4 percent. Demand in the commercial and industrial markets are expected to increase slightly at an annual rate of 0.2 percent. Stricter codes and standards coupled with more aggressive energy efficiency programs and new goals laid out in SB 350, discussed further under *Regulatory Setting*, are making a significant impact on the forecasted load for the residential, commercial, and industrial markets (CGEU 2018).

For the purposes of load-following as well as backstopping intermittent renewable resource generation, gas-fired generation will continue to be the primary technology to meet the ever-growing demand for electric power; however, overall gas demand for electric generation is expected to decline at 1.4 percent per year for the next 17 years due to more efficient power plants, statewide efforts to minimize greenhouse gas (GHG) emissions through aggressive programs pursuing demand-side reductions, and the acquisition of preferred power generation resources that produce little or no carbon emissions (CGEU 2018).

California's existing gas supply portfolio is regionally diverse and includes supplies from California onshore and offshore sources, Southwestern United States supply sources, the Rocky Mountains, and Canada. Natural gas supplied by PG&E to Menlo Park is sourced primarily by reserves in the Rocky Mountains and Canada (CGEU 2018).

ROCKY MOUNTAIN GAS SUPPLIES

Natural gas obtained from the Rocky Mountain sources is considered to be a viable alternative to the traditional source of natural gas in the Southwestern United States. These natural gas supplies are delivered to the PG&E service area through the Ruby Pipeline via Malin. Access to Rocky Mountain gas is also available through pipeline interconnections with the San Juan Basin and through the Kern River Pipeline. Rocky Mountain gas has increasingly flowed to Midwestern and Pacific Northwest markets (CGEU 2018).

Canadian Gas Supplies

Natural gas obtained from Canada and delivered to California is not expected to change significantly. Access to natural gas supplies in Canada are delivered to the PG&E service area through the Gas Transmission Northwest Pipeline via Malin. Only a small share of California gas supplies come from Canada due to the high cost of transport (CGEU 2018).

Biogas

There is growing interest regarding biogas[2] production potential in California from the following activities:

- Non-hazardous-waste landfills,
- Landfill diversion of organic waste material,
- Wastewater treatment,
- Concentrated animal feeding operations, and
- Food and green waste processing.

When biogas is conditioned and upgraded to pipeline quality specifications, it can be interconnected to a gas utility's pipeline and distributed to a specific customer. Biomethane may also be consumed on-site for a variety of uses, including electrical power generation from internal combustion engines, fuel cells, and turbines, or as a fuel source for natural gas vehicles. Currently, there are instances where biogas is being vented naturally or flared to the atmosphere, rather than being utilized as a valuable renewable resource (CGEU 2018).

Menlo Park

As no abandoned, orphaned, or active gas wells are located within the City of Menlo Park (DOGGR 2019), the city does not produce any natural gas. The city also does not have any natural gas fueling stations. The closest natural gas fueling station to the city is located in San Carlos, CA (DOE 2019).

Energy Demand

Petroleum

California

Transportation accounted for nearly 40 percent of California's total energy demand, amounting to approximately 3,116 trillion Btu in 2016 (EIA 2018b). California's transportation sector, including rail and aviation, consumed roughly 574 million barrels of petroleum fuels in 2016 (EIA 2018c). In 2016, petroleum-based fuels were used for approximately 98.4 percent of the State's total transportation activity (EIA 2018c). The CEC produces the California Annual Retail Fuel Outlet Report, which is a compilation of gasoline and diesel fuel sales data from across the State available at the county level. According to the CEC, California's 2017 fuel sales totaled 15,584 million gallons of gasoline and 3,798 million gallons of diesel (CEC 2018e).

[2] Biogas is a mixture of methane and carbon dioxide produced by the bacterial degradation of organic matter.

SAN MATEO COUNTY

Table 11 shows State and countywide fuel consumption. San Mateo County consumed an estimated 326 million gallons of gasoline and 17 million gallons of diesel fuel in 2017 (CEC 2018e). As the County had a 2017 population of 772,372 (California Department of Finance [DOF] 2018), its annual per capita fuel consumption in 2017 was 422.1 gallons of gasoline and 22.0 gallons of diesel fuel. As shown in Table 11, each person in San Mateo County consumed approximately 53.85 million Btu in transportation fuel in 2017.

Table 11 2017 Annual Gasoline and Diesel Consumption

Fuel Type	San Mateo County	California	Proportion of Statewide Consumption	County per Capita Consumption	County per Capita Consumption (MMBtu)
Gasoline	326,000,000	15,936,000,000	2.0%	422.1	50.83
Diesel	17,000,000	3,798,040,000	0.4%	22.0	3.02
Total	343,000,000	19,734,040,000	–	444.1	53.85

Notes: Diesel and gasoline volumes are expressed in gallons while Btu volumes are expressed in millions of Btu (MMBtu).
Source: CEC 2018e

Electricity

CALIFORNIA

According to the CEC, California consumed approximately 288,613 gigawatt-hours (GWh) in 2017, or approximately 984,749 billion Btu (CEC 2017a). According to the CEC's Energy Consumption Database, residential electricity demand accounted for approximately 32.7 percent of California's electricity consumption in 2017 while non-residential demand account for approximately 67.3 percent (CEC 2017a).

SAN MATEO COUNTY

According to the CEC, San Mateo County consumed approximately 4,367.54 GWh in 2017, or approximately 14,902 billion Btu (CEC 2017a). With a population of 772,372 in 2017 (DOF 2018), San Mateo County's 2017 per capita electricity consumption was approximately 5.6 MWh. As shown in Table 12, San Mateo County's per capita electricity consumption was approximately 19.1 million Btu in 2017.

Table 12 2017 Annual Electricity Consumption

Energy Type	San Mateo County (MWh)	California (MWh)	Proportion of Statewide Consumption	County per Capita Consumption (kWh)	County per Capita Consumption (MMBtu)
Electricity (MWh)	4,367,500	288,613,480.22	1.5%	5,600	19.1

Notes: Electricity consumption volumes for Alameda County and California are expressed in megawatt-hours (MWh) while County per capita consumption is expressed in kilowatt-hours (kWh) and millions of Btu (MMBtu).

Source: CEC 2017a

Natural Gas

CALIFORNIA

In 2017, California consumed a total of 12,571 million U.S. Therms of natural gas, or approximately 1,169 trillion Btu (CEC 2017b). According to the CEC's Energy Consumption Database, residential natural gas demand accounted for approximately 35.5 percent of California's total natural gas demand while non-residential natural gas demand accounted for approximately 64.5 percent (CEC 2017b).

SAN MATEO COUNTY

As shown in Table 13, San Mateo County consumed approximately 211.25 million U.S. Therms of natural gas in 2017, or approximately 21,120 billion Btu (CEC 2017b). With a population of 772,372 in 2017 (DOF 2018), San Mateo County's 2017 per capita natural gas consumption was approximately 27.3 million Btu

Table 13 2017 Annual Natural Gas Consumption

Energy Type	San Mateo County (U.S. Therms)	California (U.S. Therms)	Proportion of Statewide Consumption	County per Capita Consumption (U.S. Therms)	County per Capita Consumption (MMBtu)
Natural Gas	211,250,000	12,571,045,754	1.7%	273.51	27.34

Notes: Natural gas consumption volumes for Alameda County and California are expressed in U.S Therms while County per capita consumption is expressed in U.S. Therms and millions of Btu (MMBtu).

Source: CEC 2017b

3.2.2 Regulatory Setting

Federal

Energy Independence and Security Act of 2007

The Energy Independence and Security Act, enacted in 2007, is designed to improve vehicle fuel economy and help reduce U.S. dependence on foreign oil. It expands the production of renewable fuels, reducing dependence on oil, and confronting global climate change. Specifically, it does the following:

- Increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard, requiring fuel producers to use at least 36 billion gallons of biofuel in 2022, which represents a nearly five-fold increase over current levels
- Reduces U.S. demand for oil by setting a national fuel economy standard of 35 miles per gallon by 2020 – an increase in fuel economy standards of 40 percent

Energy Policy and Conservation Act

Enacted in 1975, this legislation established fuel economy standards for new light-duty vehicles sold in the U.S. The law placed responsibility on the National Highway Traffic and Safety Administration, a part of the U.S. Department of Transportation, for establishing and regularly updating vehicle standards. The U.S. EPA administers the Corporate Average Fuel Economy program, which determines vehicle manufacturers' compliance with existing fuel economy standards. Since the inception of the Corporate Average Fuel Economy program, the average fuel economy for new light-duty vehicles steadily increased from 13.1 miles per gallon for the 1975 model year to 30.7 miles per gallon for the 2014 model year and is proposed to increase to 54.5 by 2025. Light-duty vehicles include autos, pickups, vans, and sport-utility vehicles.

Energy Star Program

In 1992, the U.S. EPA introduced Energy Star as a voluntary labeling program designed to identify and promote energy-efficient products to reduce GHG emissions. The program applies to major household appliances, lighting, computers, and building components such as windows, doors, roofs, and heating and cooling systems. Under this program, appliances that meet specification for maximum energy use established under the program are certified to display the Energy Star label. In 1996, the U.S. EPA joined with the Energy Department to expand the program, which now also includes qualifying commercial and industrial buildings, and homes.

State

California Energy Plan

The CEC is responsible for preparing the California Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The 2008 California Energy Plan calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero-emission vehicles and addressing their infrastructure needs; and encouragement of urban designs that reduce vehicle miles travelled (VMT) and accommodate pedestrian and bicycle access.

Assembly Bill 2076: Reducing Dependence on Petroleum

Pursuant to Assembly Bill (AB) 2076 (Chapter 936, Statutes of 2000), the CEC and CARB prepared and adopted in 2003 a joint agency report, *Reducing California's Petroleum Dependence*. Included in this report are recommendations to increase the use of alternative fuels to 20 percent of on-road transportation fuel use by 2020 and 30 percent by 2030, significantly increase the efficiency of motor vehicles, and reduce per capita VMT. One of the performance-based goals of AB 2076 is to reduce petroleum demand to 15 percent below 2003 demand. Furthermore, in response to the CEC's 2003 and 2005 *Integrated Energy Policy Reports*, the Governor directed the CEC to take the lead in developing a long-term plan to increase alternative fuel use.

Integrated Energy Policy Report

SB 1389 (Chapter 568, Statutes of 2002) required the CEC to conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The CEC uses these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety. The most recent assessment, the *2018 Integrated Energy Policy Report*, contains two volumes. Volume I highlights the implementation of California's innovative policies and the role they have played in establishing a clean energy economy. Volume II, scheduled for completion in February 2019, will provide more detail on several key energy issues and will encompass new analyses, as well as significant opportunities for public participation (CEC 2018d).

Senate Bill 1078: California Renewables Portfolio Standard Program

SB 1078 (Chapter 516, Statutes of 2002), and as expanded under SB 2, established the RPS for electricity supply. The RPS requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. SB 2 expanded this law and required procurement from eligible renewable energy resources to 33 percent by 2020. In addition, electricity providers subject to the RPS must increase their renewable share by at least one percent each year.

Senate Bill X1-2: California Renewable Energy Portfolio Standard

In 2011, the Governor signed SB X1-2, which requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 33 percent of their electricity supply from renewable sources by 2020. The California Public Utilities Commission (CPUC) and CEC jointly implement the statewide RPS program through rulemakings and monitoring the activities of electric energy utilities in the State.

Senate Bill 350: Clean Energy and Pollution Reduction Act of 2015

The Clean Energy and Pollution Reduction Act of 2015 (SB 350) requires the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources to be increased to 50 percent by December 31, 2030. This act also requires doubling of the energy efficiency savings in electricity and natural gas for retail customers through energy efficiency and conservation by December 31, 2030.

Senate Bill 100: California Renewable Energy Portfolio Standard Program: Emissions of Greenhouse Gases

Approved by the Governor on September 10, 2018, SB 100 amends the State's RPS program, which originally called for electricity retailers to ensure 33 percent of electricity generation was sourced from renewable sources by 2020, 40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. With implementation of SB 100, electricity retailers must ensure 33 percent of electricity generation is sourced from renewable sources by 2020, 44 percent by 2024, 50 percent by 2026, 52 percent by

2027, and 60 percent by 2030. SB 100 further requires electricity retailers to provide 100 percent zero-carbon electricity generation by 2045.

Assembly Bill 1493: Reduction of Greenhouse Gas Emissions

AB 1493 (Chapter 200, Statutes of 2002), known as the Pavley bill, amended Health and Safety Code sections 42823 and 43018.5 requiring CARB to develop and adopt regulations that achieve maximum feasible and cost-effective reduction of GHG emissions from passenger vehicles, light-duty trucks, and other vehicles used for noncommercial personal transportation in California.

Implementation of new regulations prescribed by AB 1493 required that the state of California apply for a waiver under the federal Clean Air Act. Although the U.S. EPA initially denied the waiver in 2008, EPA approved a waiver in June 2009, and in September 2009, CARB approved amendments to its initially adopted regulations to apply the Pavley standards that reduce GHG emissions to new passenger vehicles in model years 2009 through 2016. According to CARB, implementation of the Pavley regulations is expected to reduce fuel consumption while also reducing GHG emissions.

Energy Action Plan

In the October 2005 *Energy Action Plan (EAP) II*, the CEC and CPUC updated their energy policy vision by adding some important dimensions to the policy areas included in the original EAP, such as the emerging importance of climate change, transportation-related energy issues and research and development activities. The CEC adopted an update to the EAP II in February 2008 that supplements the earlier EAPs and examines the State's ongoing actions in the context of global climate change.

Assembly Bill 1007: State Alternative Fuels Plan

AB 1007 (Chapter 371, Statutes of 2005) required the CEC to prepare a plan to increase the use of alternative fuels in California. The CEC prepared the State Alternative Fuels Plan in partnership with CARB and in consultation with other federal, State, and local agencies. The State Alternative Fuels Plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The State Alternative Fuels Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce GHG emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

Bioenergy Action Plan, Executive Order S-06-06

Executive Order (EO) S-06-06, April 25, 2006, establishes targets for the use and production of biofuels and biopower, and directs State agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The EO establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels in California by 2010, 40 percent by 2020, and 75 percent by 2050. EO S-06-06 also calls for the State to meet a target for use of biomass electricity. The 2011 Bioenergy Action Plan identifies those barriers and recommends actions to address them so that the State can meet its clean energy, waste reduction, and climate protection goals. The 2012 Bioenergy Action Plan updates the 2011 Plan and provides a more detailed action plan to achieve the following goals:

- Increase environmentally and economically sustainable energy production from organic waste
- Encourage development of diverse bioenergy technologies that increase local electricity generation, combined heat and power facilities, renewable natural gas, and renewable liquid fuels for transportation and fuel cell applications
- Create jobs and stimulate economic development, especially in rural regions of the state
- Reduce fire danger, improve air and water quality, and reduce waste

Title 24, California Code of Regulations

California Code of Regulations, Title 24, Part 6, is California's Energy Efficiency Standards for Residential and Non-residential Buildings. The CEC established Title 24 in 1978 in response to a legislative mandate to create uniform building codes to reduce California's energy consumption and provide energy efficiency standards for residential and nonresidential buildings. The standards are updated on an approximately three-year cycle to allow consideration and possible incorporation of new efficient technologies and methods. In 2019, the CEC is updating Title 24 standards with more stringent requirements effective January 1, 2020. All buildings for which an application for a building permit is submitted on or after January 1, 2020, must follow the 2019 standards. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. Nonresidential buildings will use about 30 percent less energy than under the 2016 standards, due mainly to lighting upgrades (CEC 2018f).The building efficiency standards are enforced through the local plan check and building permit process. Local government agencies may adopt and enforce additional energy standards for new buildings as reasonably necessary due to local climatologic, geologic, or topographic conditions, provided these standards exceed those provided in Title 24.

California Green Building Standards Code (2016), California Code of Regulations Title 24, Part 11

California's Green Building Code, referred to as CALGreen, was developed to provide a consistent approach to green building in the State. Having taken effect in January 2016, the most recent version of CALGreen lays out the minimum requirements for newly constructed residential and nonresidential buildings to reduce GHG emissions through improved energy efficiency and process improvements. It also includes voluntary tiers to further encourage building practices that improve public health, safety, and general welfare by promoting a more sustainable design.

Local

San Mateo County Energy Efficiency Climate Action Plan

San Mateo County adopted an Energy Efficiency Climate Action Plan (EECAP) in June 2013. The EECAP's strategies to reduce GHG emissions would also increase energy efficiency. These strategies were based on the County's GHG emissions inventory completed for the baseline year 2005, which quantified community-wide emissions by sector. Reduction measures included in the EECAP provide a diverse mix of regulatory and incentive-based programs to help the County reach its reduction goal of 17 percent below baseline emissions by 2020. The consistency of the Landscape Plan with the EECAP's Reduction Measures 2.4, 3.3, and 3.5 is discussed below in Table 14.

3.2.3 Impact Analysis

Methodology

This analysis categorizes energy consumption in terms of "direct" and "indirect" energy. Direct energy accounts for energy consumed during operation of the project, such as fuel consumed by vehicles, natural gas consumed for power, and electricity consumed for power. Indirect energy is the energy needed for construction and maintenance of the project. The analysis of direct energy involves the quantification of anticipated transportation fuel, natural gas, and electricity consumption for the project and a qualitative discussion of the efficiency, necessity, and wastefulness of the energy consumption. Analysis of indirect energy involves a qualitative discussion of construction and maintenance energy requirements anticipated for the project.

Significance Thresholds

The following thresholds of significance were developed in accordance with Appendix G of the *CEQA Guidelines*. Energy-related impacts would be significant if the project would:

7 Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation

8 Conflict with or obstruct a State or local plan for renewable energy or energy efficiency

Project Impacts and Mitigation Measures

Threshold 1

Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.

Impact E-1	The construction and operation of recreational elements under the Landscape Plan would consume energy. However, adherence to State requirements would minimize energy use from construction equipment. The Landscape Plan also would not add recreational elements that require substantially higher on-site energy use or increase vehicle miles traveled in the County. Therefore, it would not result in the wasteful, inefficient, or unnecessary consumption of energy, and this impact would be less than significant.

Phases I, II, and III

The project would involve the use of energy during construction and operation. Energy use during construction would be primarily in the form of fuel consumption to operate heavy equipment, light-duty vehicles, machinery, and generators. Temporary grid power may also be provided to construction trailers or electric construction equipment. Construction of the project would result in short-term consumption of energy from the use of construction equipment. Title 24 of the California Energy Code, including CALGreen, has specific recycling, construction materials, and energy efficiency standards that would apply to project construction and would minimize wasteful, inefficient, and unnecessary energy consumption. Therefore, construction of the project would not result in potentially significant environmental effects from wasteful, inefficient, or unnecessary consumption of energy.

The long-term operation of recreational facilities would not substantially increase energy consumption. The installation of new utility connections for water, electricity, and natural gas service during Phase I would replace existing connections that already serve the park. Passive recreational improvements proposed under Phases II and III would not require substantial new energy consumption. No additional lighting that would enable nighttime use of athletic facilities is proposed as part of the Landscape Plan, so the proposed athletic fields would not require additional electricity use. Consumption of water could incrementally increase as visitorship to the park rises, but the primary water demand for maintenance of landscaping would not substantially change from existing conditions.

In addition, operation of the project would not substantially increase fuel consumption in San Mateo County. Based on modeling of the Landscape Plan's operational emissions, it is estimated that drivers would accumulate 803,955 vehicle miles traveled to and from Flood County Park on an annual basis. These vehicle miles traveled would result in consumption of approximately 37,000 gallons of gasoline and 6,700 gallons of diesel fuel per year (Appendix B). As discussed in Impact T-2 in Section 3.5, *Transportation and Circulation*, the Landscape Plan would have a negligible effect on existing vehicle miles traveled in San Mateo County (W-Trans 2019). The renovation of the baseball field would shorten trips from active recreation users local to Menlo Park who would no longer have to travel outside the city to access quality athletic fields. It is expected that the main user of the athletic fields would be the Menlo Legends Baseball team that currently uses other fields in Menlo Park and Atherton. Therefore, the Landscape Plan would not result in a substantial increase in fuel consumption from during project operation. This impact would be less than significant.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Threshold 2

Conflict with or obstruct a State or local plan for renewable energy or energy efficiency.

Impact E-2	The project would be consistent with energy efficiency goals contained in the San Mateo County Energy Efficiency Climate Action Plan. Construction and operation of the project would comply with relevant provisions of Title 24 of the California Energy Code. Impacts would be less than significant.

Phases I, II, and III

As discussed above, San Mateo County adopted the Energy Efficiency Climate Action Plan (EECAP) in 2013. The EECAP builds on local and statewide planning efforts and demonstrates the County's commitment to achieve energy efficiency and mitigate its impact on climate change. Reduction measures and policies included in the EECAP provide a diverse mix of regulatory and incentive-based programs to help the County reach its goal of reducing baseline GHG emissions 17 percent by 2020. As shown in Table 14, the project would be consistent with the EECAP's GHG reduction strategies that specifically target energy efficiency. Although the EECAP's primary purpose is to reduce GHG emissions, many of the GHG reduction strategies in the EECAP target energy efficiency and renewable energy as means to achieving GHG reduction goals.

Table 14 Project Consistency with Applicable San Mateo County's Energy Efficiency Climate Action Plan Measures

EECAP GHG Reduction Strategies	Project Consistency
Reduction Measure 2.4. Facilitate energy efficiency in large institutional energy users, including golf courses, airports, and schools.	**Consistent.** The Landscape Plan would not involve construction of new buildings that require energy, except for minor restroom facilities.
Reduction Measure 3.3. Require tree planting, shading design, solar orientation, and "cool" hardscapes.	**Consistent.** A tree-lined promenade is proposed for development during Phase I. In addition, the County would replace protected trees that are removed at a 2 to 1 ratio. New and replacement trees would help meet Goal 3 of the EECAP for energy efficiency in new construction.
Reduction Measure 3.5. Promote green building practices and develop community-wide capacity for energy efficiency in new construction.	**Consistent.** The Landscape Plan would not involve construction of new buildings that require energy, except for minor restroom facilities.

The project would be consistent with the EECAP and the energy efficiency strategies contained therein. As described in Impact E-1, above, project construction and operation would be required to comply with relevant provisions of Title 24 of the California Energy Code, including CALGreen standards. Therefore, this impact would be less than significant.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Cumulative Impacts

Cumulative development in the project vicinity, especially new residential and commercial projects in the Menlo Park area, would result in increased energy use. However, as for the Landscape Plan, these cumulative projects would be subject to statewide standards in Title 24 and CALGreen to minimize wasteful, inefficient, and unnecessary energy consumption. Operation of the project also would not contribute to a cumulative waste of energy because it would minimally increase energy use beyond existing conditions at Flood County Park and would have a negligible effect on vehicle miles traveled. Therefore, the Landscape Plan in combination with other Menlo Park projects would not result in wasteful or inefficient use of energy, and the project would not result in cumulatively considerable impacts related to energy.

3.3 Greenhouse Gas Emissions

3.3.1 Environmental Setting

Climate Change and Greenhouse Gases

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills.

Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and SF_6 (California Environmental Protection Agency [CalEPA] 2006). Different types of GHGs have varying global warming potentials (GWPs). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as “carbon dioxide equivalent” (CO_2e), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane CH_4 has a GWP of 25, meaning its global warming effect is 25 times greater than carbon dioxide on a molecule per molecule basis (IPCC 2007).

Greenhouse Gas Emissions Inventories

Federal Emissions Inventory

Total U.S. GHG emissions were 6,586.7 million metric tons (MMT or gigatonne) CO_2e in 2015 (U.S. EPA 2017). Total U.S. emissions have increased by 3.5 percent since 1990; emissions decreased by 2.3 percent from 2014 to 2015 (U.S. EPA 2017). The decrease from 2014 to 2015 was a result of multiple factors, including: (1) substitution from coal to natural gas consumption in the electric power sector; (2) warmer winter conditions in 2015 resulting in a decreased demand for heating fuel in the residential and commercial sectors; and (3) a slight decrease in electricity demand (U.S. EPA 2017). Since 1990, U.S. emissions have increased at an average annual rate of 0.2 percent. In 2015, the industrial and transportation end-use sectors accounted for 29 percent and 27 percent of CO_2 emissions (with electricity-related emissions distributed), respectively. Meanwhile, the residential and commercial end-use sectors accounted for 16 percent and 17 percent of CO_2 emissions, respectively (U.S. EPA 2017).

California Emissions Inventory

Based on the California Air Resources Board (CARB) California Greenhouse Gas Inventory for 2000-2016, California produced 429.4 million metric tons (MMT) of CO_2e in 2016, achieving its 2020 GHG emission reduction target as emissions fell below 431 MMT of CO_2e (CARB 2018). The major source of greenhouse gas (GHG) emissions in California is associated with transportation, which contributes

41 percent of the state's total GHG emissions. The industrial sector is the second largest source, contributing 23 percent of the state's GHG emissions. Electric power accounts for approximately 16 percent of the total emissions. California's emissions are due in part to its large size and large population compared to other states. However, a factor that reduces California's per-capita fuel use and GHG emissions, as compared to other states, is its relatively mild climate. The annual 2030 statewide target emissions level is 260 MMT of CO_2e (CARB 2017). With implementation of the State's 2017 Scoping Plan, regulated GHG emissions are projected to decline to 260 MMT of CO_2e per year by 2030.

San Mateo County Emissions Inventory

San Mateo County developed an inventory of community-wide emissions for the baseline year 2005, which was used to develop appropriate GHG emissions reduction strategies in the County's 2014 Energy Efficiency and Climate Action Plan. In 2005, San Mateo County produced an estimated 782,080 MT CO_2e (San Mateo County 2014). The transportation sector had the largest contribution at 61 percent, followed by commercial and industrial energy at 21 percent. Residential energy represented 12 percent while off-road represented 5 percent. Solid waste contributed only 1 percent, and agriculture, water, and wastewater represented less than 1 percent.

Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Long-term trends have found that each of the past three decades has been warmer than all the previous decades in the instrumental record, and the decade from 2000 through 2010 has been the warmest. The global combined land and ocean temperature data show an increase of about 0.89°C (0.69°C–1.08°C) over the period 1901–2012 and about 0.72°C (0.49°C–0.89°C) over the period 1951–2012 when described by a linear trend. Several independently analyzed data records of global and regional Land-Surface Air Temperature (LSAT) obtained from station observations are in agreement that LSAT as well as sea surface temperatures have increased. In addition to these findings, there are identifiable signs that global warming is currently taking place, including substantial ice loss in the Arctic over the past two decades (IPCC 2014).

Potential impacts of climate change in California may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (CalEPA 2010). Below is a summary of some of the potential effects that could be experienced in California as a result of climate change.

Air Quality

Higher temperatures, which are conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thereby ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state (California Energy Commission [CEC] 2009).

Water Supply

Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future water supplies in California. However, the average early spring snowpack in the Sierra Nevada decreased by about 10 percent during the last century, a loss of 1.5 million acre-feet of snowpack storage. During the same period, sea level rose eight inches along California's coast. California's temperature has risen 1°F, mostly at night and during the winter, with higher elevations experiencing the highest increase. Many Southern California cities have experienced their lowest recorded annual precipitation twice within the past decade. In a span of only two years, Los Angeles experienced both its driest and wettest years on record (California Department of Water Resources [DWR] 2008; CCCC 2009).

This uncertainty complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The Sierra snowpack provides the majority of California's water supply by accumulating snow during the state's wet winters and releasing it slowly during the state's dry springs and summers. Based on historical data and modeling DWR projects that the Sierra snowpack will experience a 25 to 40 percent reduction from its historic average by 2050. Climate change is also anticipated to bring warmer storms that result in less snowfall at lower elevations, reducing the total snowpack (DWR 2008).

Hydrology and Sea Level Rise

As discussed above, climate change could potentially affect: the amount of snowfall, rainfall, and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. According to The Impacts of Sea-Level Rise on the California Coast, prepared by the California Climate Change Center (CCCC) (CCCC 2009), climate change has the potential to induce substantial sea level rise in the coming century. The rising sea level increases the likelihood and risk of flooding. The rate of increase of global mean sea levels over the 2001-2010 decade, as observed by satellites, ocean buoys and land gauges, was approximately 3.2 mm per year, which is double the observed 20th century trend of 1.6 mm per year (World Meteorological Organization [WMO] 2013). As a result, sea levels averaged over the last decade were about 8 inches higher than those of 1880 (WMO 2013). Sea levels are rising faster now than in the previous two millennia, and the rise is expected to accelerate, even with robust GHG emission control measures. The most recent IPCC report (2013) predicts a mean sea–level rise of 11-38 inches by 2100. This prediction is more than 50 percent higher than earlier projections of 7-23 inches, when comparing the same emissions scenarios and time periods. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply due to salt water intrusion. In addition, increased CO_2 emissions can cause oceans to acidify due to the carbonic acid it forms. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture

California has a $30 billion annual agricultural industry that produces half of the country's fruits and vegetables. Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater air pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (CCCC 2006).

Ecosystems and Wildlife

Climate change and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Increasing concentrations of GHGs are likely to accelerate the rate of climate change. Scientists project that the average global surface temperature could rise by 1.0-4.5°F (0.6-2.5°C) in the next 50 years, and 2.2-10°F (1.4-5.8°C) in the next century, with substantial regional variation. Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes, such as carbon cycling and storage (Parmesan 2006).

3.3.2 Regulatory Setting

The following regulations address both climate change and GHG emissions.

Federal

The U.S. Supreme Court in *Massachusetts et al. v. Environmental Protection Agency et al*. ([2007] 549 U.S. 05-1120) held that the U.S. EPA has the authority to regulate motor-vehicle GHG emissions under the federal Clean Air Act. The U.S. EPA issued a Final Rule for mandatory reporting of GHG emissions in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines, and requires annual reporting of emissions. In 2012 the U.S. EPA issued a Final Rule that establishes the GHG permitting thresholds that determine when Clean Air Act permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

In 2014, the U.S. Supreme Court in *Utility Air Regulatory Group v. EPA* (134 S. Ct. 2427 [2014]) held that U.S. EPA may not treat GHGs as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or Title V permit. The Court also held that PSD permits that are otherwise required (based on emissions of other pollutants) may continue to require limitations on GHG emissions based on the application of Best Available Control Technology (BACT).

State

CARB is responsible for the coordination and oversight of State and local air pollution control programs in California. California has a numerous regulations aimed at reducing the state's GHG emissions. These initiatives are summarized below.

California Advanced Clean Cars Program

Assembly Bill (AB) 1493 (2002), California's Advanced Clean Cars program (referred to as "Pavley"), requires CARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, U.S. EPA granted the waiver of Clean Air Act preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year. Pavley I regulates model years from 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG" regulates model years from 2017 to 2025. The Advanced Clean Cars program coordinates the goals of the Low Emissions Vehicles (LEV), Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs, and would provide major reductions in GHG emissions. By 2025, when the rules will be fully implemented, new automobiles will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions from their model year 2016 levels (CARB 2011).

Assembly Bill 32

California's major initiative for reducing GHG emissions is outlined in Assembly Bill 32 (AB 32), the "California Global Warming Solutions Act of 2006," signed into law in 2006. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020, and requires CARB to prepare a Scoping Plan that outlines the main State strategies for reducing GHGs to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions. Based on this guidance, CARB approved a 1990 statewide GHG level and 2020 limit of 427 MMT CO_2e. The Scoping Plan was approved by CARB on December 11, 2008, and included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since approval of the Scoping Plan.

In May 2014, CARB approved the first update to the AB 32 Scoping Plan. The 2013 Scoping Plan update defines CARB's climate change priorities for the next five years and sets the groundwork to reach post-2020 statewide goals. The update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluates how to align the State's longer-term GHG reduction strategies with other State policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use (CARB 2017). As noted in the 2017 Climate Change Scoping Plan, California is on track to achieve its 2020 GHG emission reduction targets outlined in AB 32.

Senate Bill 97

Senate Bill (SB) 97, signed in August 2007, acknowledges that climate change is an environmental issue that requires analysis in California Environmental Quality Act (CEQA) documents. In March 2010, the California Resources Agency (Resources Agency) adopted amendments to the State *CEQA Guidelines* for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHG and climate change impacts.

Senate Bill 375

Senate Bill (SB) 375, signed in August 2008, enhances the state's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles for 2020 and 2035. In addition, SB 375 directs each of the state's 18 major Metropolitan

Planning Organizations (MPO) to prepare a "sustainable communities strategy" (SCS) that contains a growth strategy to meet these emission targets for inclusion in the Regional Transportation Plan (RTP).

The Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC) were assigned targets of a 7 percent reduction in GHGs from transportation sources by 2020 and a 15 percent reduction by 2035. ABAG and MTC adopted a RTP/SCS, called Plan Bay Area, which, when implemented, would meet the assigned targets by achieving a 10 percent per capita GHG emissions reduction in 2020 and a 16 percent reduction in 2035.

Senate Bill 32

On September 8, 2016, the governor signed Senate Bill 32 (SB 32) into law, extending AB 32 by requiring the State to further reduce GHGs to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, CARB adopted the 2017 Climate Change Scoping Plan, which provides a framework for achieving the 2030 target (CARB 2017). To meet reduction targets, the 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently adopted policies and policies, such as SB 1383 and SB 100. The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies.

For more information on the Senate and Assembly Bills, Executive Orders, and reports discussed above, and to view reports and research referenced above, please refer to the following websites: www.climatechange.ca.gov and www.arb.ca.gov/cc/cc.htm.

California Environmental Quality Act

Pursuant to the requirements of SB 97, the Resources Agency has adopted amendments to the *State CEQA Guidelines* for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted *CEQA Guidelines* provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. To date, a variety of air districts have adopted quantitative significance thresholds for GHGs.

Regional Regulations

Consistent with statewide goals, the Bay Area Air Quality Management District (BAAQMD) has set goals in the 2017 Clean Air Plan to reduce GHG emissions to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050. The 2017 Clean Air Plan, which identifies potential rules, programs, and strategies to reduce GHG emissions, includes 85 control measures to decrease fossil fuel consumption, improve energy efficiency, and decrease emissions of potent GHGs and other pollutants.

Local Regulations

The Energy and Climate Change Element of the San Mateo County General Plan demonstrates the County's commitment to achieve energy efficiency and mitigate its impact on climate change. The Element includes goals, policies, and implementation strategies to reduce greenhouse gases. In addition, San Mateo County adopted an Energy Efficiency Climate Action Plan (EECAP) in June 2013. The EECAP reductions strategies were based on the GHG emissions inventory completed for the baseline year 2005, which quantified community-wide emissions by sector. Reduction measures included in the EECAP provide a diverse mix of regulatory and incentive-based programs to help the County reach its reduction goal of 17 percent below baseline emissions by 2020.

3.3.3 Impact Analysis

Based on San Mateo County's *Initial Study Environmental Evaluation Checklist*, impacts related to GHG emissions from the proposed project would be significant if the project would:

1 Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment;
2 Conflict with an applicable plan (including a local climate plan), policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases;
3 Result in the loss of forestland or conversion of forestland to non-forest uses, such that it would release significant amounts of GHG emissions, or significantly reduce GHG sequestering;
4 Expose new or existing structures and/or infrastructure (e.g., leach fields) to accelerated coastal cliff/bluff erosion due to rising sea levels;
5 Expose people or structures to a significant risk of loss, injury, or death involving sea level rise;
6 Place structures within an anticipated 100-year flood area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map; and/or
7 Place within an anticipated 100-year flood hazard area structures that would impede or redirect flood flows.

Thresholds 3 through 7 are discussed in Section 5, *Effects Found Not to Be Significant,* in the original Draft EIR that was published in September 2017.

The vast majority of individual projects do not generate sufficient GHG emissions to directly influence climate change. However, physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (State *CEQA Guidelines*, Section 15355).

Significance Thresholds

In late 2015, the California Supreme Court's Newhall Ranch decision confirmed that there are multiple potential pathways for evaluating GHG emissions consistent with CEQA, depending on the circumstances of a given project (Center for Biological Diversity v. Department of Fish and Wildlife (2015) 62 Cal. 4th 204). The decision also identified the need to analyze both near term and post-2020 emissions, as applicable, stating that an "EIR taking a goal-consistency approach to CEQA significance may in the near future need to consider the project's effects on meeting longer term emissions reduction targets." While not legally binding on local land use agencies, SB 32 extends the statewide AB 32 reduction goal, requiring the State to further reduce GHGs to 40 percent below 1990 levels by 2030, and Executive Order S-03-05 has set forth a long-term reduction target to reduce GHG emissions in California by 80 percent below 1990 levels by the year 2050.

Given the recent legislative attention and judicial action regarding post-2020 goals and the scientific evidence that additional GHG reductions are needed through the year 2050, the Association of Environmental Professionals' (AEP) Climate Change Committee published a white paper in October 2016 to provide guidance on defensible GHG thresholds for use in CEQA analyses and GHG reduction targets in climate action plans in light of the change in focus on the 2030 reduction target and questions raised in the Newhall Ranch case. The following methods for assessing construction and operational emissions are described below.

Construction Emissions

The AEP Climate Change Committee white paper stated that construction emissions can be evaluated in one of two methods.

(1) **Using best management practices (BMPs).** Construction-related emissions would be less than significant if a project implements all feasible BMPs, including alternatively fueled vehicles, reduction of worker trips, and sourcing construction materials from local sources when possible (without substantial cost implications).

(2) **Amortizing construction emissions over the operational lifetime**. Construction-related emissions are quantified and amortized over the lifetime of a project. The amortized construction emissions are added to the operational emissions to calculate the total annualized emissions. If the annualized emissions are below quantitative thresholds, GHG emissions would be less than significant.

This analysis uses method (2) for construction emissions since it may not be possible to apply all feasible BMPs. Construction emissions were amortized over the operational lifetime in order to quantify GHG emissions.

Operational Emissions

The AEP Climate Change Committee white paper identified seven thresholds for operational emissions. The following four methods described are the most widely used evaluation criteria.

(1) **Consistency with a qualified GHG reduction plan**. For a project located within a jurisdiction that has adopted a qualified GHG reduction plan (as defined by *CEQA Guidelines* Section 15183.5), GHG emissions would be less than significant if the project is anticipated by the plan and fully consistent with the plan. However, projects with a horizon year beyond 2020 should not tier from a plan that is qualified up to 2020.

(2) **Bright line thresholds.** There are two types of bright line thresholds:

   a. Standalone threshold: Emissions exceeding standalone thresholds would be considered significant.

   b. Screening threshold: Emissions exceeding screening thresholds would require evaluation using a second tier threshold, such as an efficiency threshold or other threshold concept to determine whether project emissions would be considered significant.

   However, projects with a horizon year beyond 2020 should take into account the type and amount of land use projects and their expected emissions out to the year 2030.

(3) **Efficiency thresholds.** Land use sector efficiency thresholds are currently based on AB 32 targets and should not be used for projects with a horizon year beyond 2020. Efficiency metrics should be adjusted for 2030 and include applicable land uses.

(4) **Percent below "Business as Usual" (BAU).** GHG emissions would be less than significant if the project reduces BAU emissions by the same amount as the statewide 2020 reductions. However, this method is no longer recommended following the Newhall Ranch ruling.

Operational emissions methods (1), (3), and (4) were not applicable. Although the City of Menlo Park has a CAP, it is not considered a qualified GHG reduction plan by BAAQMD standards. The BAAQMD has adopted efficiency thresholds of 4.6 metric tons of carbon dioxide equivalent (MT CO_2e) per service population per year; however, this threshold was based on AB 32 targets and is not applicable for SB 32 consistency. BAU emissions are no longer recommended following the Newhall Ranch ruling.

Although the BAAQMD has adopted a bright line threshold of 1,100 MT CO_2e, this figure is also based on AB 32. A conservative approach would be to assume the threshold would reduce by 40 percent, consistent with SB 32. This would mean that the project's emissions would not be significant if emissions do not exceed 660 MT CO_2e in 2030.

3.3.4 Methodology

The significance thresholds described in the previous section represent the levels at which a project's individual emissions of criteria air pollutants or precursors would result in a cumulatively considerable contribution to the Basin's existing air quality conditions. All proposed recreational improvements in the Landscape Plan would result in temporary construction-related and long-term operational emissions. At this time, only the Phase I improvements are defined to an extent that would warrant project-level analysis. This phase is analyzed on a project-level basis. However, the proposed Phase II and III improvements are not defined to a level that would warrant project-level analysis and thus it would be speculative to include project-level impacts as part of this analysis. Rather, impacts for Phases II and III are broadly estimated. Because Phase I includes the most substantial recreational improvements in the Landscape Plan, the elements in following phases are assumed to result in similar or fewer emissions. The California Emissions Estimator Model (CalEEMod) version 2016.3.2 was used to calculate construction and operational emissions for Phase I. The analysis focuses on CO_2, CH_4, and N_2O because these make up 98.9 percent of all GHG emissions by volume (IPCC 2007) and are the GHG emissions that would be emitted in the largest quantities. Fluorinated gases, such as HFCs, PFCs, and SF_6, were also considered for the analysis. However, because the project is a Landscape Plan for a park, the quantity of fluorinated gases would not be significant since fluorinated gases are primarily associated with industrial processes. Emissions of all GHGs were converted into their equivalent GWP in terms of CO_2 (CO_2e). Minimal amounts of other GHGs (such as chlorofluorocarbons [CFCs]) would be emitted; however, these other GHG emissions would not substantially add to the total calculated CO_2e amounts. Calculations were based on the methodologies discussed in the California Air Pollution Control Officers Association (CAPCOA) *CEQA and Climate Change* white paper (CAPCOA 2008) and included the use of the California Climate Action Registry (CCAR) General Reporting Protocol (CCAR 2009).

Operational Emissions

CalEEMod provides operational emissions of CO_2, N_2O, and CH_4. Emissions associated with area sources, including landscape maintenance, were calculated in CalEEMod and utilize standard emission rates from CARB, U.S. EPA, and emission factor values provided by the local air district (CalEEMod User Guide 2016).

Emissions from energy use include electricity and natural gas use. The emissions factors for natural gas combustion are based on EPA's AP-42, (*Compilation of Air Pollutant Emissions Factors*) and CCAR. Electricity emissions are calculated by multiplying the energy use times the carbon intensity of the utility district per kilowatt hour (CalEEMod User Guide 2016). The default electricity consumption values in CalEEMod include the CEC-sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies.

Emissions from waste generation were also calculated in CalEEMod and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CalEEMod User Guide 2016). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle).

Emissions from water and wastewater usage calculated in CalEEMod were based on the default electricity intensity from the CEC's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for Northern and Southern California.

For mobile sources, CO_2 and CH_4 emissions were quantified in CalEEMod. Because CalEEMod does not calculate N_2O emissions from mobile sources, N_2O emissions were quantified using the California Climate Action Registry General Reporting Protocol (CAPCOA 2009) direct emissions factors for mobile combustion (see Appendix B for calculations). The estimate of total daily trips associated with the proposed project was based on the traffic study (see Appendix D) and was calculated and extrapolated to derive total annual mileage in CalEEMod. Emission rates for N_2O emissions were based on the vehicle mix output generated by CalEEMod and the emission factors found in the California Climate Action Registry General Reporting Protocol.

Construction Emissions

Construction of the proposed project would generate GHG emissions on a temporary basis primarily due to the operation of construction equipment on-site as well as from vehicles transporting construction workers to and from the project site and heavy trucks to export earth materials offsite. Site preparation and grading typically generate the greatest amount of emissions due to the use of grading equipment and soil hauling. CalEEMod was used to estimate emissions resulting from project construction. BAAQMD recommends disclosing construction emissions. These emissions were amortized over a 30-year period and added to operational emissions to calculate the total annualized emissions, as recommended by the AEP Climate Change Committee white paper.

Project Impacts

Threshold 1

Generate greenhouse gas (GHG) emissions (including methane), either directly or indirectly, that may have a significant impact on the environment.

Impact GHG-1	Construction and operation of the proposed recreational facilities in the Landscape Plan would generate GHG emissions. These emissions would not hinder or delay achievement of state GHG reduction targets established by AB 32 or SB 32. Therefore, the project's impact to climate change would be less than significant.

Phase I

CONSTRUCTION EMISSIONS

Project-related construction emissions are confined to a relatively short period of time in relation to the overall life of the proposed improvements at Flood County Park. Construction of recreational improvements during Phase I would generate temporary GHG emissions primarily due to the operation of construction equipment and truck trips. As shown in Table 15, this phase of construction would generate an estimated 808 MT CO_2e. Amortized over a 30-year period, construction would generate an estimated 27 MT CO_2e per year.

Table 15 Construction GHG Emissions – Phase I

Year	Phase I Emissions (MT CO_2e)
2019	94
2020	655[1]
2021	59
Total	808 MT CO_2e total
Total Amortized over 30 Years	27 MT CO_2e per year

See Appendix B for CalEEMod worksheets.
[1] Estimated GHG emissions would be highest in 2020 because it is assumed that most Phase I construction activity would occur in that year.

Combined Construction, Stationary, and Mobile Source Emissions

Table 16 combines the construction, operational, and mobile GHG emissions associated with Phase I. The combined annual emissions for Phase I improvements would be approximately 354 MT CO_2e per year. Since Phase I emissions would not exceed the adjusted BAAQMD threshold, the project would not hinder or delay achievement of state GHG reduction targets established by AB 32 or SB 32.

Table 16 Total GHG Emissions – Phase I

Emission Source	Phase I Emissions ($MT\ CO_2e$)
Construction	27
Operational	
Area	<1
Energy	0
Solid Waste	<1
Water	11
Mobile	
CO_2 and CH_4	299
N_2O	17
Total Emissions	354
BAAQMD Threshold	1,100
Adjusted 2030 BAAQMD Threshold (40% below existing threshold)	660
Threshold Exceeded?	No

See Appendix B for CalEEMod worksheets.

Phases II and III

At this time, the recreational improvements during Phases II and III are not defined to a level that would enable project-level analysis of associated GHG emissions. However, it is possible to broadly estimate emissions from these phases using Phase I emissions as a point of comparison. As shown in Table 16, the majority of GHG emissions in Phase I would result from increased mobile trips to the project site, driven primarily by new mobile trips associated with use of the proposed athletic fields. These trips to and from athletic fields would be additional to existing use, since Flood County Park does not currently have programmed events at athletic fields. Phases II and III would generate trips associated with use of passive recreational facilities. Most of these facilities would replace or refurbish existing passive recreational elements at Flood County Park (e.g., a children's playground, picnic areas, pathways) which already generate trips. Whereas the athletic fields in Phase I would have regular events that generate trips throughout the week, the gathering meadow and rehabilitated adobe administrative office building in Phases II and III would have infrequent programmed events and would not generate mobile emissions on a regular basis. Therefore, Phases II and III would generate substantially fewer additional trips and associated mobile emissions than would Phase I.

Phases II and III of the Landscape Plan also would not involve construction of new facilities that demand energy and water, with the exception of a new restroom facility. Additional restrooms would result in a minimal increase in GHG emissions during Phases II and III. However, these phases would not involve construction of new facilities that substantially increase emissions from area sources, energy, solid waste, and water use. Because Phases II and III would generate fewer mobile emissions than Phase I and would minimally increase other operational emissions, it is anticipated that their GHG emissions would be substantially less than the estimated 354 MT CO_2e from Phase I. Therefore, emissions from Phases II and III would not exceed the threshold of 660 MT CO_2e, and would have a less than significant impact. It is anticipated that additional GHG emissions from all phases of the Landscape Plan combined also would not exceed this threshold. Therefore, overall GHG emissions would also have a less than significant impact.

Mitigation Measure

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Threshold 2

Conflict with an applicable plan (including a local climate action plan), policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Impact GHG-2	Construction and operation of the proposed recreational facilities in the Landscape Plan would be consistent with the San Mateo County Energy Efficiency Climate Action Plan. Therefore, the project's impact related to consistency with plans to address climate change would be less than significant.

As discussed above, San Mateo County adopted the Energy Efficiency Climate Action Plan (EECAP) in 2013. The County's EECAP is a Qualified GHG Reduction Strategy that builds on local and statewide planning efforts. The project would follow Bay-Friendly principles and be consistent with applicable measures listed in the EECAP, as shown in Table 17. Therefore, although the project would generate GHG emissions, project-generated emissions would not hinder or delay achievement of state and GHG reduction targets, and the project would consistent with the EECAP. This impact would be less than significant.

Table 17 Project Consistency with Applicable San Mateo County's Energy Efficiency Climate Action Plan Measures

EECAP GHG Reduction Strategies	Project Consistency
Reduction Measure 2.4. Facilitate energy efficiency in large institutional energy users, including golf courses, airports, and schools.	**Consistent.** The Landscape Plan would not involve construction of new buildings that require energy, except for minor restroom facilities. New restrooms would incrementally increase the park's use of energy for lighting and water transport. As discussed in Impact E-1, watering for landscaping would not substantially increase beyond existing conditions at the park and therefore would not require additional energy for the movement of water.
Reduction Measure 3.3. Require tree planting, shading design, solar orientation, and "cool" hardscapes.	**Consistent.** A tree-lined promenade is proposed for development during Phase I. In addition, protected trees removed for the proposed recreational facilities would be replaced for accenting, screening, or other purposes as space allows, with a preference for native trees.
Reduction Measure 3.5. Promote green building practices and develop community-wide capacity for energy efficiency in new construction.	**Consistent.** The Landscape Plan would not involve construction of new buildings that require energy, except for minor restroom facilities that would be designed consistent with the State's more stringent energy efficiency standards in the 2019 version of Title 24.
Reduction Measure 6.2. Require larger new projects (including existing projects with major renovations) to evaluate and implement appropriate traffic calming measures at the site, as determined through the plan review process.	**Consistent.** The Traffic Impact Study prepared by W-Trans for the project did not identify traffic calming measures as necessary to ensure traffic safety. However, Mitigation Measure T-1 to avoid queuing of motor vehicles entering the park gate would minimize the project's effects on traffic congestion and traffic safety. See Section 3.5, *Transportation and Circulation*, for more details regarding traffic.
Reduction Measure 14.2. Increase the use of grey, rain, and recycled water for landscaping and agricultural purposes throughout the community to reduce the use of potable water.	**Consistent.** During Phase I, the park would install new facilities, including water, electric, gas, and potentially greywater piping. Greywater piping, if used, would allow the park to use greywater for landscaping.

Mitigation Measure

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Cumulative Impacts

GHG and climate change are by definition cumulative impacts, as they affect the accumulation of greenhouse gases in the atmosphere. As discussed above, emissions associated with the proposed project would be less than significant, and the project's impacts are therefore also cumulatively less than significant.

3.4 Noise

This section evaluates the project's potential impact to local noise conditions. Both temporary construction noise and long-term noise generated by the project are evaluated.

3.4.1 Setting

Overview of Noise and Vibration Measurement

Noise

Noise is defined as unwanted sound that disturbs human activity. Noise level (or volume) is generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound power levels to be consistent with human hearing response, which is most sensitive to frequencies around 4,000 Hertz (similar to the highest note on a piano) and less sensitive to frequencies below 100 Hertz (similar to a transformer hum).

Sound pressure level is measured on a logarithmic scale with the 0 dB level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of 3 dB, and a sound that is 10 dB less than the ambient sound level has no effect on ambient noise. Because of the nature of the human ear, a sound must be about 10 dB greater than the reference sound to be judged as twice as loud. In general, a 3 dBA change in community noise levels is barely perceivable, while 5 dBA changes is considered readily perceivable. Quiet suburban areas typically have noise levels in the range of 40-50 dBA, while those along arterial streets are in the 50-60+ dBA range. Normal conversational levels are in the 60-65 dBA range, and ambient noise levels greater than 65 dBA can interrupt conversations.

Noise levels typically attenuate (drop off) at a rate of 6 dB per doubling of distance from point sources such as industrial machinery. Noise from heavily traveled roads typically attenuates at about 3 dB per doubling of distance.

In addition to the instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. One of the most frequently used noise metrics that considers both duration and sound power level is the equivalent noise level (L_{eq}). The L_{eq} is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time. Typically, L_{eq} is summed over a one-hour period unless noted.

The time period in which noise occurs is also important since nighttime noise tends to disturb people more than daytime noise. Two commonly used noise metrics – the Day-Night average level (Ldn) and the Community Noise Equivalent Level (CNEL) - recognize this fact by weighting hourly noise level over a 24-hour period. The Ldn is a 24-hour average noise level that adds 10 dB to actual nighttime (10:00 P.M. to 7:00 A.M.) noise levels to account for the greater sensitivity to noise during that time period. The CNEL is similar to Ldn, except it also adds a 5 dB penalty for noise occurring during the evening (7:00 P.M. to 10:00 P.M.). Noise levels described by Ldn and CNEL differ by 0.5 dBA, with CNEL being higher.

Vibration

Vibration is sound radiated through the ground. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. Groundborne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors. Groundborne vibration related to human annoyance is generally related to root mean square (RMS) velocity levels expressed in vibration decibels (VdB). However, construction-related groundborne vibration in relation to its potential for building damage can also be measured in inches per second (in/sec) peak particle velocity (PPV) (Federal Transit Administration 2006). Based on the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment* and the Caltrans') *1992 Transportation-Related Earthborne Vibration, Technical Advisory*, vibration levels decrease by 6 VdB with every doubling of distance.

The background vibration velocity level in residential and educational areas is usually 50 VdB or lower. (FTA 2018). The threshold of perception for humans is approximately 65 VdB. A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.

Noise-Sensitive Receptors

Policy 16.7 in the County of San Mateo's General Plan (1986) defines noise-sensitive land uses as including, but not limited to, residences and institutional uses such as hospitals, schools, and libraries. Flood County Park is surrounded by single-family residential neighborhoods that are sensitive to noise. The nearest single-family residences to the project site are located adjacent to the southeast edge of Flood County Park on Del Norte Avenue and to the northwest on Hedge Road, both within the city limits of Menlo Park, and across Bay Road to the southwest in the town of Atherton. At the residences south of Bay Road, outdoor activity areas such as front yards and basketball courts are located as close as approximately 75 feet from Flood County Park. In addition, the Haven Family House, which provides transitional housing to homeless people, is located adjacent to the northeast side of the park.

Local jurisdictions apply more stringent standards for noise exposure to noise-sensitive receptors than to commercial or industrial uses that are not susceptible to sleep disturbance or other adverse effects. Sensitive land uses generally should not be subjected to noise levels that would be considered intrusive in character. Therefore, the location, hours of operation, type of use, and extent of new development warrant close analysis.

It is important to acknowledge that noise-sensitivity varies not only among land uses but also among individual people at each land use (Menlo Park 2013). For example, individual residents may have high sensitivity to noise for physiological reasons or because of unusual sleeping hours that result in greater sensitivity to daytime noise. Nonetheless, the quantitative noise standards in local ordinances are set with the intention of preserving the peace and quiet of "persons of normal sensitivities," as phrased in Section 4.88.220 of the San Mateo County Ordinance Code.

Existing Noise Conditions and Sources

The primary existing sources of noise near Flood County Park are motor vehicles (e.g., automobiles, buses, trucks, and motorcycles) and aircraft overflights. Roadways that generate noise at Flood County Park and surrounding neighborhoods include U.S. 101, Bay Road, and other local residential streets such as Del Norte Avenue. Motor vehicle noise is of concern because it is characterized by a high number of individual events, which often create a sustained noise level, and because of its proximity to noise-sensitive uses. Airplanes also fly over and near Flood County Park on a frequent basis, taking off from and descending to airports such as San Francisco International Airport (about 13.5 miles to the northwest) and San Carlos Airport (about 4.5 miles to the northwest). Secondary sources of noise in the vicinity include recreational use and maintenance activities at Flood County Park and the operation of landscaping equipment at nearby residences.

To quantify existing noise levels on and near the project site, five 15-minute noise measurements (L_{eq} dBA) were taken using an ANSI Type II integrating sound level meter. Three measurements were taken on a Sunday afternoon at Flood County Park, April 9, 2017. These measurements were located at the children's playground, a picnic area at the southeast edge of the site, and the tennis court near the eastern corner of the site. These measurement locations were intended to be representative of on-site noise levels from weekend recreational activities, U.S. 101, and aircraft overflights. An additional two weekday measurements were taken on January 19, 2017, along Bay Road and Del Norte Avenue during P.M. peak hours, and two further measurements were taken on Bay Road and Ringwood Avenue during midday Saturday hours on June 29 and July 13, 2019. These measurements are representative of existing exposure of adjacent single-family residences to traffic noise. Figure 5 shows the location of these noise measurements, and Table 18 summarizes the noise monitoring results.

Table 18 Noise Measurement Results

Measurement Location[1]	Description	Primary Noise Sources	Approximate Sample Time	L_{eq} dBA[2]
1	Flood County Park: children's playground	Children shouting	1:50 – 2:05 P.M.	58.6
2	Flood County Park: southeast picnic area	Airplanes	2:13 – 2:28 P.M.	54.8
3	Flood County Park: east of tennis courts	U.S. 101 traffic, airplanes	2:32 – 2:47 P.M.	56.3
4	Bay Road adjacent to park	Bay Road traffic	5:29 – 5:44 P.M.	70.0
5	Del Norte Avenue near Iris Lane	U.S. 101 traffic, airplanes	5:51 – 6:06 P.M.	56.1
6	Bay Road near Oakland Avenue	Bay Road traffic	12:00 – 12:15 P.M.	61.4
7	Ringwood Avenue near Fredrick Avenue	Ringwood Avenue traffic	12:59 – 1:14 P.M.	66.7

[1] Figure 5 shows the noise measurement locations.

[2] Measurements 1-3 were taken on April 9, 2017, measurements 4-5 were taken on January 19, 2017, measurement 6 was taken on July 13, 2019, and measurement 7 was taken on June 29, 2019.

Refer to Appendix C for noise measurement results.

As shown in Table 18, existing sound levels at Flood County Park vary by location. Near popular park amenities like the children's playground, the primary noise source is recreational activity. In passive recreational areas near Del Norte Road, where human recreational activity is more dispersed, the primary noise sources are constant traffic flow on U.S. 101 and occasional aircraft overflights.

Figure 5 Noise Measurement Locations

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Fig 12 Noise Measurement Locs

Because of the proximity of Flood County Park to airports such as San Francisco International, San Carlos Airport, and Palo Alto Airport, aircraft fly over and near the site at a relatively low altitude and generate more noise do than typical overflights. Peak-hour traffic on Bay Road generates the highest noise levels near the project site (up to approximately 70 dBA L_{eq}), as indicated by noise measurement 4 taken next to a single-family residence on Bay Road, adjacent to the park's southern corner.

3.4.2 Regulatory Setting

State

Title 24 of the California Code of Regulations codifies Sound Transmission Control requirements establishing uniform minimum noise insulation performance standards for new hotels, motels, dormitories, apartment houses, and dwellings other than single-family dwellings. Specifically, Section 1207.4 in Title 24 states that interior noise levels attributable to exterior noise sources shall not exceed 45 dBA Ldn or CNEL in any habitable room of a new building.

While there are no State standards for vibration, for continuous, frequent, and intermittent vibration, Caltrans considers the architectural damage risk level to be somewhere between 0.08 and 0.5 inches per second (in/sec) peak particle velocity (PPV) depending on the type of building that is affected.

Local

San Mateo County Code of Ordinances

Chapter 4.88 (Noise Control) of the San Mateo County Code of Ordinances is intended to protect noise-sensitive receptors from annoying or disturbing noise generated at nearby properties. Section 4.88.330 sets maximum exterior noise levels for activities on properties in the unincorporated County, as measured at noise-sensitive receptors in either incorporated or unincorporated areas. Table 19 shows these exterior noise standards. Higher noise levels are permitted for shorter amounts of time in any one-hour time period. The exterior noise standards are more stringent during nighttime hours from 10 P.M. to 7 A.M.

Table 19 Exterior Noise Standards, dBA

Category	Cumulative Number of Minutes in Any One Hour Time Period	Daytime 7 A.M.—10 P.M.	Nighttime 10 P.M.—7 A.M.
1	30	55	50
2	15	60	55
3	5	65	60
4	1	70	65
5	0	75	70

Source: San Mateo Code of Ordinances, Section 4.88.330.

In the event the measured background noise level exceeds the applicable noise level standard in any category above, the County adjusts the applicable standard in five (5) dBA increments so as to encompass the background noise level.

Table 20 shows the County's interior noise standards at dwelling units, as written in Section 4.88.340.

Table 20 Interior Noise Standards, dBA

Category	Cumulative Number of Minutes in Any One Hour Time Period	Daytime 7 A.M.—10 P.M.	Nighttime 10 P.M.—7 A.M.
1	5	45	40
2	1	50	45
3	0	55	50

Source: San Mateo Code of Ordinances, Section 4.88.340

In addition to these quantitative noise standards, Section 4.88.350 sets a qualitative standard prohibiting "any unreasonably loud, unnecessary, or unusual noise which disturbs the peace and quiet of any neighborhood or which causes any discomfort or annoyance to any person of normal sensitivity residing in the area." The following criteria factor into determining a disturbance to peace and quiet:

- The sound level of the objectionable noise.
- The sound level of the background noise.
- The proximity of the noise to residential sleeping or hospital facilities.
- The nature and zoning of the area from which the noise emanates and upon which the noise impacts.
- The number of persons affected by the noise sources.
- The time of day or night the noise occurs.
- The duration of the noise and its tonal, informational, or musical content.
- Whether the noise is continuous, recurrent, or intermittent.
- Whether the noise is produced by a commercial or non-commercial entity.

The County's noise ordinance also exempts certain activities from quantitative noise standards. Section 4.88.360(c) exempts noise generated by "activities conducted on parks, public playgrounds and school grounds provided such parks, playgrounds and school grounds are owned and operated by a public entity." According to this County standard, noise generated by recreational and maintenance activities at Flood County Park would not be subject to exterior or interior standards. Section 4.88.360(e) also exempts construction activity, provided that such activity does not take place between the hours of 6:00 P.M. and 7:00 A.M. on weekdays, 5:00 P.M. and 9:00 A.M. on Saturdays, or at any time on Sundays, Thanksgiving and Christmas.

3.4.3 Impact Analysis

Methodology and Significance Thresholds

The analysis of noise impacts considers the effects of both temporary construction-related noise and long-term noise associated with operation of the project. Impacts would be significant if they would exceed the following significance criteria, based on San Mateo County's *Initial Study Environmental Evaluation Checklist*:

1. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
2. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels;
3. A significant permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
4. A significant temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
5. For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, exposure to people residing or working in the project area to excessive noise levels; or
6. For a project within the vicinity of a private airstrip, exposure to people residing or working in the project area to excessive noise levels.

Because Flood County Park is not located within the area covered by an airport land use plan, the proposed Landscape Plan would not increase recreational users' exposure to excessive aircraft noise. Criteria 5 and 6 related to aircraft noise are discussed in Section 5, *Effects Found Not to Be Significant*, in the original Draft EIR that was published in September 2017.

Construction Noise

This analysis estimates noise levels generated by the use of expected heavy equipment during construction of Landscape Plan elements. A preliminary list of construction equipment was derived from the California Emissions Model (CalEEMod) run prepared for the project (see Section 3.1, *Air Quality*). Construction noise is quantified based on reference noise levels reported by the Federal Transit Administration (FTA 2018) for various pieces of construction equipment at a distance of 50 feet between source and receiver. Reference noise levels from the FTA's *Noise and Vibration Impact Assessment* are used to estimate noise levels at nearby sensitive receptors, assuming a standard noise attenuation rate of 6 dBA per doubling of distance for point sources. For the purpose of this analysis, it is assumed that construction equipment would operate no closer than 25 feet to residences adjacent to Flood County Park, for two reasons. First, construction activity would typically occur in the body of the park, rather than at property lines. Second, when calculating construction noise based on reference noise levels that apply to a 50-foot distance, noise levels begin to artificially inflate at much closer distances.

As a reasonable worst-case scenario, this analysis also estimates cumulative noise from the simultaneous construction of three recreational facilities at Flood County Park. The Landscape Plan would have a significant impact if construction noise occurs outside of the County's allowed hours (i.e., between 6:00 P.M. and 7:00 A.M. on weekdays, 5:00 P.M. and 9:00 A.M. on Saturdays, or at any time on Sundays, Thanksgiving and Christmas).

Groundborne Vibration

In the absence of County standards for sources of vibration, this analysis of vibration generated during construction of recreational facilities relies on federal standards. The following vibration thresholds established by the FTA for disturbance of people are applied: 65 VdB for buildings where low ambient vibration is essential for interior operations (such as hospitals and recording studios), 72 VdB for residences and buildings where people normally sleep, including hotels, and 75 VdB for institutional land uses with primary daytime use (such as churches and schools). These thresholds apply to "frequent events," which the FTA defines as vibration events occurring more than 70 times per day. The thresholds for frequent events are considered appropriate because it is assumed that bulldozers would be used during grading of proposed athletic fields and that they could make more than 70 discrete movements per day when moving earth.

In addition, this analysis applies thresholds in the FTA's *Transit Noise and Vibration Impact Assessment* (2018) for potential damage to historic adobe buildings at Flood County Park. These thresholds are expressed in terms of both maximum inches per second (in/sec) of peak particle velocity (PPV) and VdB:

Table 21 Thresholds for Building Damage from Construction Vibration

Building Category	Maximum PPV (in/sec)	Approximate L_v
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

[1] Magnitude of vibration is expressed in decibel notation (VdB), in terms of "root-mean-square" amplitude referenced to 1 micro-inch per second.

in/sec = inches per second

PPV = peak particle velocity

Source: FTA 2018

Vibration generated by construction equipment would have a potentially significant impact from damage to adobe buildings if it exceeds the FTA threshold of 0.2 PPV (in/sec) for non-engineered timber and masonry buildings. A formula provided by FTA is used to calculate the attenuation of vibration from a reference distance of 25 feet to the distances of the nearest noise-sensitive receptors:

$$PPV = PPV_{ref} \times (25/D)^{1.5} \text{ (in/sec)}$$

This formula takes into account the reference vibration level (PPV_{ref}), the distance from vibration-generating equipment to the receptor (D), and a constant value related to the attenuation rate through the ground (1.5).

On-Site Operational Noise

It is assumed that the operation of recreational facilities proposed in the Landscape Plan would generate on-site noise from organized athletic activities and maintenance equipment such as leaf blowers. In addition, it is assumed that the use of athletic field could involve temporary use of sound-amplifying equipment during events. This analysis estimates noise levels from athletic activities at the proposed soccer/lacrosse field based primarily on reference noise levels reported in a comprehensive noise study prepared by RGD Acoustics in August 2016 for lacrosse and soccer practices and games at Marin Catholic High School in Kentfield, California. This noise study graphs the fluctuation of noise levels during individual athletic events and breaks noise into components of crowd noise and whistles. Using these reference noise levels, this analysis estimates noise levels at the distance of the nearest noise-sensitive receptors along Del Norte Avenue assuming 6 dBA attenuation of noise per doubling of distance. In addition, anticipated noise from athletic events is compared to existing measured ambient noise levels in the vicinity of Flood County Park. Noise from leaf blowers is estimated at the nearest residences based on noise measurements taken at the park.

This section evaluates on-site operational noise based on qualitative standards in the County Code of Ordinances. Because the County as lead agency is applying its noise standards to this project, and Section 4.88.360(c) of the San Mateo County Code of Ordinances exempts noise generated by activities conducted at publicly owned and operated parks, recreational and maintenance activities at Flood County Park would not be subject to quantitative noise standards. However, pursuant to Section 4.88.350 of the County Code of Ordinances, on-site operational noise would be significant if it “disturbs the peace and quiet of any neighborhood or which causes any discomfort or annoyance to any person of normal sensitivity residing in the area.”

Roadway Noise

Noise levels associated with existing and future traffic along area roadways are estimated by completing a screening analysis for traffic generated by the Landscape Plan. This analysis considers the project’s impacts under three highest-use traffic scenarios analyzed in the Traffic Impact Study prepared by W-Trans in June 2019 (see Appendix D). Typical use of the facilities during non-peak periods would result in fewer trip and lower traffic related noise levels, thus the analysis is considered conservative. The traffic noise impact under the Existing + Project scenario is discussed for informational purposes. Because the Landscape Plan would be implemented in phases, the project would not immediately add vehicle trips to existing traffic conditions. The Near-Term 2021 + Project scenario, discussed in the cumulative noise analysis, is reflective of the addition of vehicle trips associated with Phase I to existing traffic and already approved cumulative projects. In addition, the cumulative noise analysis considers the Landscape Plan’s long-term effect on traffic noise under Cumulative 2040 + Project conditions. This cumulative forecast was developed assuming the development of approved and pending projects in the Menlo Park area and a growth rate to account for growth in regional traffic. The analysis of traffic noise assumes that project-generated trips would be distributed among area roadways as shown in Table 9 in the Traffic Impact Study (W-Trans 2019).

The effect of additional vehicle trips on ambient noise depends on the relative increase in traffic volumes. This analysis estimates the relative increase in traffic volumes due to the Landscape Plan on Bay Road and Ringwood Avenue, then estimates the corresponding increase in ambient noise along these roadways. Modeling of traffic noise indicates that, in general, a 10 percent increase in traffic volume would raise traffic noise by approximately 0.4 dBA, a 20 percent increase would raise traffic noise by about 0.8 dBA, a 30 percent increase would result in an approximately 1.1 dBA increase in traffic noise, a 40 percent increase would increase traffic noise by about 1.5 dBA, a 50 percent increase would increase traffic noise by about 1.8 dBA, and so forth. While the County has not adopted standards for an increase in traffic noise due to a project, this screening analysis evaluates the Landscape Plan’s effect on traffic noise based on the FTA’s recommended standards. The FTA recommendations, listed in Table 22, are based on the idea that the allowable increase in exposure to traffic noise depends on existing noise levels; as the existing noise level rises, the allowable increase in noise exposure decreases.

Table 22 Significance of Changes in Operational Roadway Noise Exposure

Existing Noise Exposure (dBA Ldn or L_{eq})	Maximum Noise Exposure Increase (dBA Ldn or L_{eq})
45-50	7
50-55	5
55-60	3
60-65	2
65-74	1
75+	0

Source: FTA 2018.

This analysis also considers the effects on residential exposure to traffic noise from the proposed removal of redwood trees on-site.

Project Impacts and Mitigation Measures

Threshold 4

A significant temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Impact N-1	Construction of proposed recreational facilities would generate high noise levels on and adjacent to the project site. However, construction noise would be temporary, and adherence to the County's allowed hours of construction would prevent noise disturbance during sensitive evening and nighttime hours. Therefore, the impact from construction noise would be less than significant.

Phase I

Construction of the proposed Phase I elements over an anticipated two-year period would intermittently generate high noise levels on and adjacent to Flood County Park. Construction activity would primarily occur in the northern portion of the park for the ballfield replacement, new soccer/lacrosse field, and new tennis courts. During the demolition phase, the County would use jackhammers to break up existing paved surfaces in the northern part of the park, including the two tennis courts and asphalt paths, and bulldozers or similar heavy equipment to demolish the existing Restroom D building. It is expected that site preparation and grading for new utilities and athletic fields would involve the use of bulldozers, excavators, graders, and backhoes. The construction of new asphalt paths, tennis courts, and a basketball court could require the use of pavers and rollers.

Table 23 estimates maximum noise levels from construction equipment based on the combined use of construction equipment anticipated to be used concurrently during each phase of construction. Noise levels are shown for a reference distance of 50 feet from the source equipment and at other distances that correspond to various noise-sensitive receptors. Forty feet is representative of the distance between the closest edge of the existing tennis courts (to be demolished) to the adjacent residence on Del Norte Avenue, 50 feet is representative of the closest potential utility work to residences south of Bay Road, 80 feet is representative of the estimated distance between grading activity at the southeastern edge of the park and residences on Del Norte Avenue, and 115 feet is representative of the distance between paving activity at the new tennis courts and adjacent residences on Del Norte Avenue. The noise levels shown in Table 23 are conservative because they assume the use of construction equipment next to the nearest residences, even though most construction activity would occur farther from the site boundary, and they assume simultaneous grading and construction of three recreational facilities.

Table 23 Maximum Estimated Noise Levels by Construction Phase

Construction Phase	Equipment	Estimated Noise Levels at Nearest Sensitive Receptors (dBA L_{eq})			
		40 feet	50 feet	80 feet	115 feet
Demolition	Dozer, Jackhammer, Saw	86	84	80	77
Site Preparation	Backhoe, Dozer	82	80	81	78
Grading	Backhoe, Dozer, Excavator, Grader	86	84	85	82
Facility Construction	Backhoe, Forklift, Generator, Welder	82	81	81	78
Paving	Cement Mixer, Paver, Roller	85	83	79	75

Source: FTA 2018 and 2012. See Appendix C for equipment noise impact data sheets and assumptions.

Based on Table 23, noise-sensitive receptors would experience the loudest noise during demolition of the existing tennis courts, with noise levels reaching an estimated 86 dBA L_{eq} at the nearest residences located 40 feet to the southeast. Grading would cause noise levels estimated at 85 dBA L_{eq} at residences on Del Norte Avenue. In addition, grading and excavation for new utilities extending from Bay Road also would generate estimated noise levels approaching 84 dBA L_{eq} at residences located 50 feet to the south.

These temporary noise levels during construction would exceed the existing ambient noise levels of approximately 56 dBA L_{eq} along Del Norte Avenue and 70 dBA L_{eq} during peak-hour traffic on Bay Road. However, construction activity would be prohibited outside of the County's allowed daytime hours (i.e., between 6:00 P.M. and 7:00 A.M. on weekdays, 5:00 P.M. and 9:00 A.M. on Saturdays, or at any time on Sundays, Thanksgiving and Christmas). This timing restriction would prevent construction noise during the most sensitive evening and nighttime hours. Therefore, the construction of Phase I elements would have a less than significant impact on nearby noise-sensitive receptors.

Phases II and III

Phases II and III of the Landscape Plan would involve less intensive ground disturbance than would Phase I. No demolition of buildings would occur, paving activity would be limited to new pathways and potentially gathering plazas, and grading activity would be of a smaller scale than for Phase I (restricted to individual recreational improvements such as restrooms, a playground, and gathering plazas). Because the impact from construction noise would be less than significant for Phase I, and construction activity would be of smaller scale during later phases, this impact would also be less than significant for Phases II and III.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Threshold 2

Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.

Impact N-2	Grading activity would temporarily generate groundborne vibration on and adjacent to Flood County Park. Because construction of proposed recreational elements would occur inside the hours allowed in the County Code of Ordinances, it would not generate vibration when people normally sleep. Construction vibration would not exceed levels that may cause structural damage to historic adobe buildings on-site. The Landscape Plan would have a less than significant vibration impact.

Phase I

During Phase I of the Landscape Plan, construction of the proposed recreational elements would involve the temporary use of equipment that generates groundborne vibration. The County would use jackhammers to break up existing paved surfaces in the northern part of the park, including the two tennis courts and asphalt paths, and bulldozers to move earth over approximately nine acres. Bulldozers or similar heavy equipment might be used to demolish the existing Restroom D building.

Table 24 identifies vibration velocity levels at a reference distance of 25 feet and at distances that correspond to various noise-sensitive receptors. Forty (40) feet is representative of the distance between the closest edge of the existing tennis courts (to be demolished) to the adjacent residence on Del Norte Avenue and 80 feet is representative of the estimated distance between grading activity at the southeastern edge of the park and residences on Del Norte Avenue. The vibration levels shown in Table 24 are conservative because they assume the use of construction equipment next to the nearest residences, even though most construction activity would occur farther from the site boundary, and the use of large as well as small bulldozers.

Table 24 Vibration Levels for Construction Equipment at Noise-Sensitive Receptors

	Estimated VdB at Nearest Sensitive Receptors		
Equipment	**25 Feet**	**40 Feet**	**80 Feet**
Large Bulldozer	87	81	72
Jackhammer	79	73	64
Small Bulldozer	58	51	42

Source: FTA 2018

Based on Table 24, noise-sensitive receptors would experience the strongest vibration during the use of jackhammers to demolish the existing tennis courts, with vibration levels reaching an estimated 73 VdB at the nearest residence located 40 feet to the southeast. The use of large bulldozers during grading near the southeastern property line for the proposed soccer/lacrosse field would generate similar vibration levels of approximately 72 VdB at residences on Del Norte Avenue.

Compliance with Section 4.88.360(e) of the San Mateo County Code of Ordinances would restrict construction activities to daytime hours that are generally outside of normal sleeping hours, i.e., 7:00 A.M. to 6:00 P.M. on weekdays and 9:00 A.M. to 5:00 P.M. on Saturdays. This timing restriction on construction activity would limit the exposure of nearby residences to vibration. Vibration levels would not exceed the FTA's threshold of 72 VdB for residences during normal sleeping hours. As discussed in the Setting, it is acknowledged that individual neighbors of Flood County Park may have unusual sleeping hours that result in greater sensitivity to daytime noise and vibration. Nonetheless, noise standards are typically drafted with normal sensitivity in mind. Therefore, vibration would not have significant adverse effects on residences.

Construction equipment would also generate vibration that affects nearby structures. High vibration levels could damage the structural integrity of adobe buildings at the park. Table 25 shows vibration levels at adobe buildings at distances of 25, 50, and 350 feet. The 25-foot reference distance is conservatively representative of the nearest distance between construction activity that generates vibration and adobe buildings that would remain under the Landscape Plan, such as the adobe electrical and maintenance buildings. Three hundred fifty feet is representative of the distance between vibratory rollers used to pave and compact asphalt at the new tennis courts and the nearest remaining adobe building (the electrical building).

Table 25 Vibration Levels for Construction Equipment at Adobe Buildings

	Approximate in/sec PPV at Nearest Noise-Sensitive Receptors		
Equipment	25 Feet	50 Feet	350 Feet
Vibratory Roller	0.210	0.074	0.004
Large Bulldozer	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Small Bulldozer	0.003	0.001	0.000

Source: FTA 2018

As shown in Table 25, vibration levels of up to an estimated 0.089 in/sec PPV at adobe buildings would not exceed the FTA threshold of 0.2 PPV (in/sec) for non-engineered timber and masonry buildings. Although rollers generate substantial vibration at close range, they would generate minimal vibration (0.004 in/sec PPV) at a distance of 350 feet from the nearest remaining adobe building. Therefore, construction activities during Phase I would not be expected to generate vibration levels that cause structural damage to historic adobe buildings. Vibration impacts during Phase I would be less than significant.

Phases II and III

Phases II and III of the Landscape Plan would involve less intensive ground disturbance than would Phase I. No demolition of buildings would occur, paving activity would be limited to new pathways and potentially gathering plazas, and grading activity would be of a smaller scale than for Phase I (restricted to individual recreational improvements such as restrooms, a playground, and gathering plazas). Because vibration impacts would be less than significant for Phase I, and construction activity would be of smaller scale during later phases, vibration impacts would also be less than significant for Phases II and III.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Thresholds 1 and 3

Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

A significant permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Impact N-3	The Landscape Plan would add new sources of on-site operational noise from organized practices and games at the proposed athletic fields and performances at the proposed gathering meadow. Noise from whistles, sound amplification equipment, or air horns could disturb nearby residents. The impact from on-site operational noise would be less than significant with mitigation to prohibit the loudest equipment and restrict the timing of athletic events.

Phase I

The operation of recreational facilities proposed in Phase I of the Landscape Plan would add new sources of noise at Flood County Park. Whereas existing ballfields at the park are not open for programmed athletic use, the proposed ballfield and soccer/lacrosse field would be available for organized athletic activities that would generate noise. Maintenance equipment such as leaf blowers also would generate noise at new locations in the park, depending on the siting of proposed tennis courts and asphalt paths. In addition, human activity at new passive recreational facilities would generate noise. These noise sources are analyzed below.

ATHLETIC ACTIVITIES

Organized practices and games at the proposed ballfield and soccer/lacrosse field would generate noise. Programmed athletic activities would occur throughout the year, although the County anticipates that they would generally be most frequent during the summer. It is anticipated that organized activities at the athletic fields would typically occur no earlier than 9 A.M. and no later than 8 P.M. No additional lighting that would enable nighttime use of athletic facilities is proposed as part of the Landscape Plan.

Specific noise sources associated with athletic practices and games include shouting and conversations by players, coaches, referees, and spectators, and whistles to control play. Other potential sources are air horns used by fans and sound amplification equipment to broadcast music or play-by-play commentary. These noise sources would be intermittent during athletic events, adding to background ambient noise from passive recreational use of the park, nearby traffic, aircraft overflights, and residential activities.

Noise from the proposed soccer/lacrosse field would occur as close as approximately 100 feet from the backyards of single-family residences on Del Norte Avenue to the southeast. It is assumed that this distance is representative of the nearest activity on the proposed field with respect to these residences, as well as of spectators lining the southeastern side of the field. In addition, athletic activity at the reconstructed ballfield would generate noise as close as approximately 150 feet from residents at Haven Family House on Van Buren Road to the northeast, 175 feet from residences on Hedge Road to the northwest, and 330 feet from residences on Del Norte Avenue to the southeast.

The primary athletic facility of concern with regard to noise is the proposed soccer/lacrosse field, due to its proximity to residences and the prevalence of loud impulse sounds such as whistles, shouts, and air horns. Based on noise measurements taken in 2016 at a playoff lacrosse game with 162 spectators at a representative suburban Bay Area site, Marin Catholic High School, a lacrosse game generates overall noise levels of 65-70 dBA L_{eq} at the edge of the stadium while a lacrosse practice creates noise levels of 55-60 dBA L_{eq} (RGD Acoustics 2016). These noise measurements were taken at a distance of approximately 50 feet from the edge of the lacrosse field. Based on a noise attenuation of 6 dBA per doubling distance noise levels from athletic activity, it is estimated that lacrosse activity at Flood County Park would generate noise levels of up to 64 dBA L_{eq} during games and up to 54 dBA L_{eq} during practices, as perceived at residences located 100 feet away on Del Norte Avenue. Noise levels measured from the lacrosse playoff game are also considered representative of noise from soccer games.

Average sound energy levels during lacrosse and soccer games may exceed existing ambient noise levels in the vicinity of Flood County Park. As shown in Table 18, ambient noise was measured at approximately 55-56 dBA L_{eq} on a Saturday afternoon at the southeastern edge of the park, next to residential backyards, and at approximately 56 dBA L_{eq} on Del Norte Avenue on a weekday late afternoon. Anticipated noise levels of 59-64 dBA L_{eq} during lacrosse and soccer games would exceed existing ambient noise levels by an estimated 3 to 8 dBA L_{eq}. These short-term increases in ambient noise would be perceptible to residents adjacent to the park.

In addition to events at the soccer/lacrosse field, athletic games and practices at the reconstructed ballfield would generate noise. Based on noise measurements taken at a school in Sherman Oaks, California, softball games generate an average noise level of 72 dBA L_{eq} at a distance of 20 feet from the center of activities (Arup 2006). As noted above, the ballfield would be located approximately 330 feet from residences on Del Norte Avenue. At this distance, assuming that noise from athletic activity attenuates by 6 dBA per doubling of distance from the source, it is estimated that softball activity at Flood County Park would generate an average noise level of 48 dBA L_{eq}. At the Haven Family House located approximately 150 feet from the ballfield, it is estimated that average noise from softball events would reach 55 dBA L_{eq}. These estimated noise levels from ballfield activity would not exceed the existing measured ambient noise levels of 55-56 dBA L_{eq} on a Saturday afternoon at the southeastern edge of the park. Therefore, noise from ballfield activity, in itself, would not substantially affect ambient noise levels experienced by residents.

This analysis makes the conservative assumption that athletic events generating noise at the ballfield and soccer/lacrosse field could take place concurrently. Under this scenario, the nearest residences on Del Norte Avenue would be exposed to estimated average noise levels of up to 64 dBA L_{eq} from soccer and lacrosse games, and 48 dBA L_{eq} from softball games. The combined average noise level from both types of events would be approximately 64 dBA L_{eq}. This is because the softball game noise levels would be 16 dBA lower than the soccer/lacrosse game and thus would not perceptibly increase average ambient noise relative to soccer/lacrosse noise. However, combined noise levels would exceed existing ambient noise levels by up to 8 dBA L_{eq}.

In addition to increasing average noise levels, athletic activity would generate short-term spikes in noise, such as impulse noise, that may annoy or disturb residents. Impulse noise is a sudden burst of loud noise that can startle people by its fast and surprising nature (Cirrus Research 2015). Sources of impulse noise may include shouting, whistles, and air horns. Whistles could be especially intrusive because of their shrill pitch. Spectators could use portable air horns that produce loud blasts of sound. Sound amplification equipment also could broadcast commentary or music at high volume. However, Section 3.68.130(b) of the County's noise ordinance prohibits the use of sound amplification equipment in any County Park, except if allowed under a special event permit issued by the County of San Mateo Parks Department to regulate park events. The Parks Department generally does not allow the use of sound amplification equipment even with procurement of a special event permit. This restriction would limit the exposure of residents to noise from sound amplification.

Although Section 4.88.360(c) of the County Code of Ordinances would exempt activities at Flood County Park from quantitative noise standards, the County has determined that the qualitative standard in Section 4.88.350 of disturbing the peace and quiet of neighbors would still apply to the Landscape Plan. The anticipated timing of athletic events – between 9 A.M. and 8 P.M. – would minimize disturbance to neighbors by avoiding normal sleeping hours. Perceptible athletic noise also would not necessarily disturb the peace and quiet of the surrounding neighborhood, as defined by the criteria in Section 4.88.350 of the County Code of Ordinances. The City of Menlo Park manages athletic fields located within 100 feet of nearby residences and has received few if any complaints regarding programmed athletic activities from residents since 2010 (Keith 2017). The County also would restrict the use of sound amplification equipment by athletic teams through individual agreements with teams that use the new fields. However, the use of whistles, air horns, and sound amplification equipment could result in an audible, albeit temporary, increase in ambient noise levels in the area. Furthermore, without explicit allowable hours for athletic events, early-morning and late-evening events could disturb the peace and quiet of neighbors.

For informational purposes only, this section also analyzes the impact of noise from new athletic facilities based on standards in the City of Menlo Park's noise ordinance (Section 8.06 of the Menlo Park Municipal Code). As discussed in Section 1.5, *Standards of Review*, the County has discretion as to which standards to apply to the project when reviewing its environmental impacts, and it has decided to apply the County's noise standards to the project. Nonetheless, the City's noise ordinance has an exemption for parks that is similar to that set forth in Section 4.88.360(c) of the County Code of Ordinances. Section 8.06.050(g) of the Menlo Park Municipal Code exempts from its noise standards organized athletic events or activities at parks that are owned or operated by the County, with the exception of amplified music or sound systems. Based on this provision, the use of sound amplification equipment could still disturb the peace and quiet of neighbors.

MAINTENANCE ACTIVITIES

Current maintenance activities at Flood County Park, especially the use of lawn mowers and leaf blowers, periodically generate noise. After the construction of proposed recreational facilities, the County would operate such maintenance equipment in new locations within the park. Lawn mowers would be used to cut grass in fields used for passive recreation and in athletic fields (unless artificial turf is installed). Because County employees currently use this equipment to cut grass adjacent to the southeastern park boundary, the proposed Landscape Plan would not result in the use of lawn mowers closer to residences on Del Norte Avenue. Noise levels would lawn mowers would not increase over existing conditions.

The County also uses leaf blowers to clear paved surfaces such as the existing tennis courts and asphalt paths. The existing tennis courts are located as close as approximately 40 feet from the backyards of residences on Del Norte Avenue. Based on the proposed Landscape Plan shown in Figure 4, it is estimated that new asphalt paths would be built approximately 75 feet from the backyards of residences on Del Norte Avenue, and the new tennis courts would be located about 115 feet from these noise-sensitive receptors. Current noise levels from leaf blowers at Flood County Park's existing tennis courts were measured at up to 76 dBA at a distance of 140 feet. Assuming that noise from this source attenuates by 6 dBA per doubling of distance, it is estimated that leaf blowers would generate a maximum noise level of 81 dBA at a distance of 75 feet from residential backyards. However, noise levels from leaf blowers would not increase over existing conditions because the proposed asphalt paths would be located no closer to residences than the existing tennis courts, which are as close as approximately 15 feet to residential backyards.

PASSIVE RECREATION

Phase I of the Landscape Plan would involve the construction of new passive recreational facilities including walking paths and a promenade. Similar to existing paths at the park, these features would provide opportunities for walking, bicycling, and human conversations. Therefore, they would not result in increased noise levels from recreational activity.

CONCLUSION

During organized athletic practices and games, the use of whistles, air horns, and sound amplification equipment could cause substantial temporary increase at nearby residents. Early-morning or late-evening athletic events also could result in substantial noise levels increases over ambient noise levels during those times at local residents. These adverse effects would represent a significant impact from on-site operational noise.

Phases II and III

While Phase I would involve the construction of large athletic fields, the second and third phases would add lower-intensity recreational elements such as gardens, a playground, picnic areas, gathering plazas, a gathering meadow, and pathways with exercise stations. These elements would largely support activities similar to those in the existing playground, group and individual picnic areas, and pathways. However, the gathering meadow in Phase II would be a space suitable for infrequent events including Junior Rangers, Parks Rx with County Health, and movie nights, which could involve the use of sound amplification equipment for music or commentary, although the County typically does not allow this equipment during either County-sponsored or private events at Flood County Park. The central location of this gathering meadow at the park, approximately 475 feet from the nearest residences on Del Norte Avenue, Bay Road, and Hedge Road, would reduce the exposure of noise-sensitive receptors to noise from this facility. Nonetheless, the use of sound amplification equipment at high volume during large events could produce noise that disturbs nearby residents.

Mitigation Measures

MM N-3(A) RESTRICT SOUND AMPLIFICATION EQUIPMENT AND PROHIBIT AIR HORNS

The County shall only allow the use of sound amplification equipment at organized athletic games and practices and at the gathering meadow with the procurement of a special event permit in accordance with County of San Mateo Parks Department procedures. The County shall notify all groups using the proposed soccer/lacrosse field, ballfield, and gathering meadow of this requirement. The County shall prohibit the use of air horns at any park events. County staff shall periodically patrol the park during organized athletic events and performances to verify that park users are not operating air horns and are not operating sound amplification equipment without an approved Special Event Permit.

Special Event Permits are required for any use of a space beyond what is considered typical use. This could include such activities as: bounce houses, amplified sound, large events (walks, runs) and those that require additional staffing or support from other agencies. Depending on the scale of the event, notification may be posted in park kiosks, on the Parks Department website or by using other communication vehicles.

MM N-3(B) TIMING OF ATHLETIC EVENTS

To minimize noise that may disturb neighbors of Flood County Park, the County shall restrict athletic practices and games at the park to the hours of 9 A.M. to 8 P.M.

Significance after Mitigation

Mitigation Measure N-3(a) would restrict the use of equipment that generates especially loud impulse noise during organized athletic events and performances without approval of a special event permit, while Mitigation Measure N-3(b) would restrict the timing of athletic events to prevent noise during normally quiet early-morning or late-evening hours. Even with implementation of these measures, events at Flood County Park would incrementally increase ambient noise levels. However, these measures would prevent the most adverse effects from loud equipment or the timing of events at proposed recreational facilities, reducing on-site operational noise to a less than significant level.

Thresholds 1 and 3

Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

A significant permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Impact N-4	Vehicle trips associated with operation of the proposed recreational elements would increase traffic volumes on nearby roadways, resulting in greater traffic noise audible to existing noise-sensitive residences. Based on the conservative (high) estimate of new vehicle trips presented in this EIR, it is anticipated that the increase of vehicle trips from the project relative to existing traffic on Ringwood Avenue during Saturday peak hours in the summer would exceed the applicable FTA standard of 1 dBA L_{eq}. Therefore, traffic noise impacts would be significant and unavoidable.

New vehicle trips associated with organized athletic events at the proposed athletic fields and with continued growth in passive recreational use under the Landscape Plan would increase traffic volumes on roadways near Flood County Park. This increase in traffic volumes would result in greater traffic noise at nearby noise-sensitive receptors.

Table 26 shows the estimated net increase in peak-hour traffic volumes on the studied roadway segments, according to traffic data in the Traffic Impact Study prepared by W-Trans in June 2019 (see Appendix D).

Table 26 Increase in Existing Roadway Traffic Volumes with Project during Weekday P.M. and Saturday Peak Hours

Roadway Segment	Existing Trips	Net Increase in Trips	Increase in Noise Level (dBA L_{eq})
Weekday P.M. Peak Hour			
Bay Road: Marsh Road to Ringwood Avenue	465	55	< 1
Bay Road: Ringwood Avenue to Willow Road	909	38	< 1
Ringwood Avenue south of Bay Road	865	102	< 1
Saturday Peak Hour			
Bay Road: Marsh Road to Ringwood Avenue	313	118	1
Bay Road: Ringwood Avenue to Willow Road	304	84	1
Ringwood Avenue south of Bay Road	322	212	2

Source: W-Trans 2019; see Appendix D.

As shown in Table 26, Phase I of the Landscape Plan would generate the highest estimated noise level increase (2 dBA), relative to existing traffic conditions, on Ringwood Avenue south of Bay Road during peak Saturday hours of park use. Because Phase I would increase traffic volumes on nearby streets by less than the amount on Ringwood Avenue, it would not increase traffic noise by more than 2 dBA L_{eq}. Along Ringwood Avenue, existing ambient noise was measured at 66.7 dBA L_{eq} during midday Saturday hours. This noise level falls within the range of 65-74 dBA L_{eq}, in which the FTA standard of a 1 dBA L_{eq} increase in traffic noise applies. It is estimated that during peak use of Flood County Park on summer weekends, the increase in traffic noise on Ringwood Avenue would exceed the applicable standard of 1 dBA L_{eq}.

During Saturday peak hours on Bay Road, Table 26 shows that the traffic volume would increase noise levels by 1 dBA. With existing ambient noise during Saturday peak hours measured at 61.4 dBA L_{eq} along Bay Road, the FTA standard of a 2 dBA L_{eq} increase in traffic noise would apply. It is estimated that traffic generated by the Landscape Plan would not exceed this standard during peak use of Flood County Park on summer weekends.

During weekday P.M. peak hours, Table 26 shows that traffic volumes on Bay Road and Ringwood Avenue would increase noise levels by less than 1 dBA. At no time in the week would noise levels substantially exceed the 70.0 dBA L_{eq} measured at Bay Road during weekday peak hours, which are the busiest traffic period on nearby roadways. At this noise level, the FTA standard of a 1 dBA L_{eq} increase in traffic noise would apply. The expected increase in traffic noise of less than 0.4 dBA L_{eq} would not exceed the 1 dBA L_{eq} standard.

Site preparation and grading under Phase I also would involve the removal of a belt of evergreen redwood trees in the eastern corner of the park, which partially screen residences on Del Norte Avenue from exposure to highway noise from U.S. 101. Typically, vegetation does not substantially buffer noise-sensitive receptors from ambient noise. In noise modeling, at least two staggered rows of evergreen trees are required to noticeably reduce traffic noise. Because the existing redwood trees are irregularly arranged in single row, they do not substantially attenuate highway noise. The removal of this belt of trees would not expose residents to substantially higher traffic noise levels.

Because it is anticipated that increases in traffic noise would exceed FTA standards during Saturday peak hours on summer weekends, when Flood County Park would generate the highest amount of traffic, Phase I of the Landscape Plan would have a significant impact related to traffic noise.

Phases II and III

In contrast to Phase I, in which programmed active recreation would generate the lion's share of vehicle trips, Phases II and II of the Landscape Plan would generate an incremental increase in vehicle trips from continued growth in passive recreation. The cumulative analysis below estimates traffic noise generated by Phases II and II, as part of the Near-Term 2021 and Cumulative 2040 traffic scenarios.

Mitigation Measures

No mitigation is feasible to substantially reduce increases in traffic noise associated with the Landscape Plan during Saturday peak hours. Restricting the weekend use of athletic fields at Flood County Park would reduce traffic noise, but this option would not fulfill the project objective to meet demand for active recreation facilities in San Mateo County.

Significance After Mitigation

As noted above, mitigation to reduce traffic noise during Saturday peak hours would not be feasible. Therefore, the Landscape Plan would generate an increase in weekend traffic noise that exceeds applicable standards. Although this analysis is based on highly conservative estimates of trip generation that apply to peak summer days at Flood County Park, the impact would nonetheless be significant and unavoidable during that time period.

Cumulative Impacts

Long-term development in Menlo Park and Atherton, including the proposed Landscape Plan, would generate temporary noise during construction. Construction activities on cumulative residential and commercial projects in the area could generate higher noise levels than would construction of the proposed recreational facilities because of the need for more intensive demolition, grading, and building construction. However, construction noise and vibration is localized and rapidly attenuates within an urban environment. Because Flood County Park is surrounded by settled single-family residential neighborhoods that are fully built out, construction of other major projects would not occur sufficiently close to the park or its neighbors to result in a cumulative impact. Therefore, the project would not contribute considerably to temporary cumulative construction noise and vibration impacts.

Traffic associated with cumulative development through the years 2021 and 2040 would incrementally increase noise levels along roadways. Table 27 shows the project's cumulative contribution to traffic volumes on nearby road segments in the Near-Term 2021 traffic scenario.

Table 27 Cumulative Contribution to Area Roadway Traffic Levels during Weekday P.M. and Saturday Peak Hours in Near-Term 2021 Conditions

Roadway Segment	Existing Peak Hour (trips)	Cumulative + Project Increase in Peak Hour Trips	Increased Noise Level from Cumulative Trips (dBA L_{eq})	Increased Cumulative Noise Level Due to Project (dBA L_{eq})
P.M. Peak Hour				
Bay Road: Marsh Road to Ringwood Avenue	465	73	0.6	0.4
Bay Road: Ringwood Avenue to Willow Road	909	120	0.5	0.1
Ringwood Avenue south of Bay Road	865	164	0.8	0.5
Saturday Peak Hour				
Bay Road: Marsh Road to Ringwood Avenue	313	118	1.5	1.1
Bay Road: Ringwood Avenue to Willow Road	304	114	1.5	1.1
Ringwood Avenue south of Bay Road	322	182[1]	1.9	1.8

[1] The traffic study estimates that the increase in peak-hour trips on Ringwood Avenue would be slightly lower in the Near-Term 2021 Plus Project scenario than in the Existing Plus Project scenario. This result occurs because cumulative commercial development in the Menlo Park area would draw some existing trips on Bay Road onto other roadways, resulting in a slight reduction in local traffic near the park.

Source: W-Trans 2019; see Appendix D

As shown in Table 27, under Near-Term 2021 traffic conditions on all studied roadways, cumulative growth in combination with the Landscape Plan would increase traffic noise during weekday P.M. peak hours by up to 0.8 dBA L_{eq}, along Ringwood Avenue. It is assumed that existing ambient noise during weekday P.M. peak hours along Ringwood Avenue is similar to existing noise along Bay Road, which was measured at 70.0 dBA L_{eq} during this time frame. With this existing ambient noise level, the applicable FTA standard for an increase in traffic noise would be 1 dBA L_{eq}. Therefore, the cumulative increase in traffic noise would be less than significant in this time frame, and the Landscape Plan would not have a considerable contribution to a significant impact.

Under Near-Term 2021 traffic conditions during Saturday peak hours, cumulative growth in combination with the Landscape Plan would raise traffic noise by up to 1.9 dBA along Ringwood Avenue. The existing ambient noise level during Saturday peak hours on this road segment was measured at 66.7 dBA L_{eq}. With this existing noise level, the applicable FTA standard for an increase in traffic noise would be 1 dBA L_{eq}. Therefore, the anticipated 1.9-dBA increase in traffic noise from cumulative growth would have a significant impact on noise-sensitive receptors under Near-Term 2021 conditions. Furthermore, Table 27 estimates that the Landscape Plan would be responsible for most of this increase in traffic noise (1.8 dBA L_{eq}). As a result, the Landscape Plan would have a considerable contribution to a significant cumulative impact related to traffic noise along Ringwood Avenue during Saturday peak hours.

Under Near-Term 2021 traffic conditions on Bay Road, cumulative growth in combination with the Landscape Plan would increase traffic noise along Bay Road by an estimated 1.5 dBA L_{eq} during Saturday peak hours. The existing ambient noise level during Saturday peak hours on this road segment was measured at 61.4 dBA L_{eq}. With this existing noise level, the applicable FTA standard for an increase in traffic noise would be 2 dBA L_{eq}. Therefore, the cumulative impact related to traffic noise along Bay Road during Saturday peak hours would be less than significant, and the Landscape Plan would not have a considerable contribution to an impact at this roadway.

Table 28 shows the project's contribution in the Cumulative 2040 traffic scenario.

Table 28 Cumulative Contribution to Area Roadway Traffic Levels during Weekday P.M. and Saturday Peak Hours in Year 2040 Conditions

Roadway Segment	Existing Peak Hour (trips)	Cumulative + Project Increase in Peak Hour Trips	Increased Noise Level from Cumulative Trips (dBA L_{eq})	Increased Cumulative Noise Level Due to Project (dBA L_{eq})
P.M. Peak Hour				
Bay Road: Marsh Road to Ringwood Avenue	465	232	1.8	0.8
Bay Road: Ringwood Avenue to Willow Road	909	416	1.7	0.3
Ringwood Avenue south of Bay Road	865	463	1.9	0.7
Saturday Peak Hour				
Bay Road: Marsh Road to Ringwood Avenue	313	272	2.7	2.1
Bay Road: Ringwood Avenue to Willow Road	304	222	2.4	1.6
Ringwood Avenue south of Bay Road	322	410	3.7	3.1

Source: W-Trans 2019; see Appendix D.

As shown in Table 28, under Cumulative 2040 conditions, cumulative growth in combination with the Landscape Plan would increase traffic noise during weekday P.M. peak hours by an estimated 1.9 dBA L_{eq} on Ringwood Avenue south of Bay Road. It is assumed that existing ambient noise on this segment of Ringwood Avenue during weekday P.M. peak hours is similar to existing traffic noise on Bay Road, which was measured at 70.0 dBA L_{eq}. At this noise level, the applicable FTA standard for an increase in traffic noise would be 1 dBA L_{eq}. The cumulative increase in traffic noise would exceed 1 dBA L_{eq} and therefore would have a significant impact. Implementation of the Landscape Plan would contribute a large portion of the cumulative 1.9 dBA L_{eq} increase in traffic noise on Ringwood Avenue (estimated 0.7 dBA L_{eq}), which would considerably contribute to this significant cumulative impact.

On Bay Road under Cumulative 2040 traffic conditions, cumulative growth in combination with the Landscape Plan would increase traffic noise during weekday P.M. peak hours by up to an estimated 1.8 dBA L_{eq}. The cumulative increase in traffic noise would exceed the applicable FTA standard of 1 dBA L_{eq} and therefore would have a significant impact. Implementation of the Landscape Plan would contribute almost half of this increase in traffic noise on Bay Road (0.8 dBA L_{eq}), which would considerably contribute to this significant cumulative impact.

Table 28 shows that under Cumulative 2040 traffic conditions, cumulative growth in combination with the Landscape Plan would increase traffic noise by between 2.4 dBA L_{eq} and 3.7 dBA L_{eq} during Saturday peak hours on Bay Road and Ringwood Avenue. This cumulative increase in traffic noise would exceed the applicable FTA standards of 1 dBA L_{eq} along Ringwood Avenue and 2 dBA L_{eq} along

Bay Road, and therefore would have a significant impact. Implementation of the Landscape Plan would generate most of the increase in traffic noise, which would considerably contribute to this significant cumulative impact.

The operation of cumulative residential and commercial development would also add sources of on-site noise on properties in Menlo Park and Atherton. Noise sources associated with new private development may include heating, ventilation, and cooling (HVAC) equipment from new private development; loading activity; trash compactors; and parking lot activity. Concentrated new development could generate on-site operational noise that substantially increases ambient noise levels near noise-sensitive receptors. However, new development would be subject to local noise ordinances that are intended to prevent the generation of disturbing noise near such receptors. Furthermore, as noted above, because Flood County Park is surrounded by settled single-family residential neighborhoods that are fully built out, it is not anticipated that major new developments would occur in proximity to the park or its neighbors. Therefore, the Landscape Plan would not contribute considerably to a significant cumulative impact.

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3.5 Transportation and Circulation

This section evaluates potential impacts relating to transportation and traffic on and around the project site. The analysis is based on the Flood County Park Landscape Plan Traffic Impact Study revised by W-Trans in June 2019 (Appendix D).

3.5.1 Environmental Setting

Roadway Network

Studied Intersections

The nearest freeway to the project site is US Highway 101, and its centerline is approximately 350 feet north of the park. Based on the characteristics of the project, the project site location, and consultation with County staff, the following three intersections (shown in Figure 6) were selected for assessment of potential impacts within the study area:

- **Bay Road/Marsh Road** is a four-way signalized intersection with protected left-turn phasing on the southbound approach of Marsh Road and permitted left-turn phasing on all other approaches. Marked crosswalks, pedestrian signals, and curb ramps are provided across all four legs. Bicycle detection is marked for both approaches on Bay Road.
- **Bay Road/ Ringwood Avenue** is a five-way stop controlled intersection. Marked crosswalks are provided across all legs except the northbound Ringwood Avenue approach. Curb ramps are provided at the northwest and northeast corners of the intersection.
- **Bay Road/Willow Road** is a T-shaped signalized intersection with protected left-turn phasing on the northbound approach of Willow Road. The right-turn movement on the southbound approach of Willow Road is yield controlled. Pedestrian crossing is only permitted across Bay Road where a crosswalk, pedestrian signals, and curb ramps are provided.

Intersection Level of Service

Intersection level of service (LOS) is a qualitative assessment of an intersection's performance based on traffic volumes and roadway capacity. An intersection is characterized by a letter grade ranging from A to F, where LOS A represents free flow conditions and LOS F represents forced flow or breakdown conditions. The LOS rating is also accompanied by the level of delay.

The study intersections were analyzed using methodologies in the Highway Capacity Manual (HCM) (Transportation Research Board 2000). For intersection with a stop sign on all approaches, an "All-Way Stop-Controlled" method was used, which evaluates delay based on turning movements, opposing and conflicting traffic volumes, and the number of lanes. Average vehicle delay is computed for the intersection as a whole, which is then related to a LOS grade. Signalized intersections were evaluated based on traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. This method was based on average stopped delay per vehicle in seconds, which was calculated using optimized signal timing. Table 29 summarizes the ranges of delay associated with LOS A through F.

Figure 6 Studied Intersections and Lane Configurations

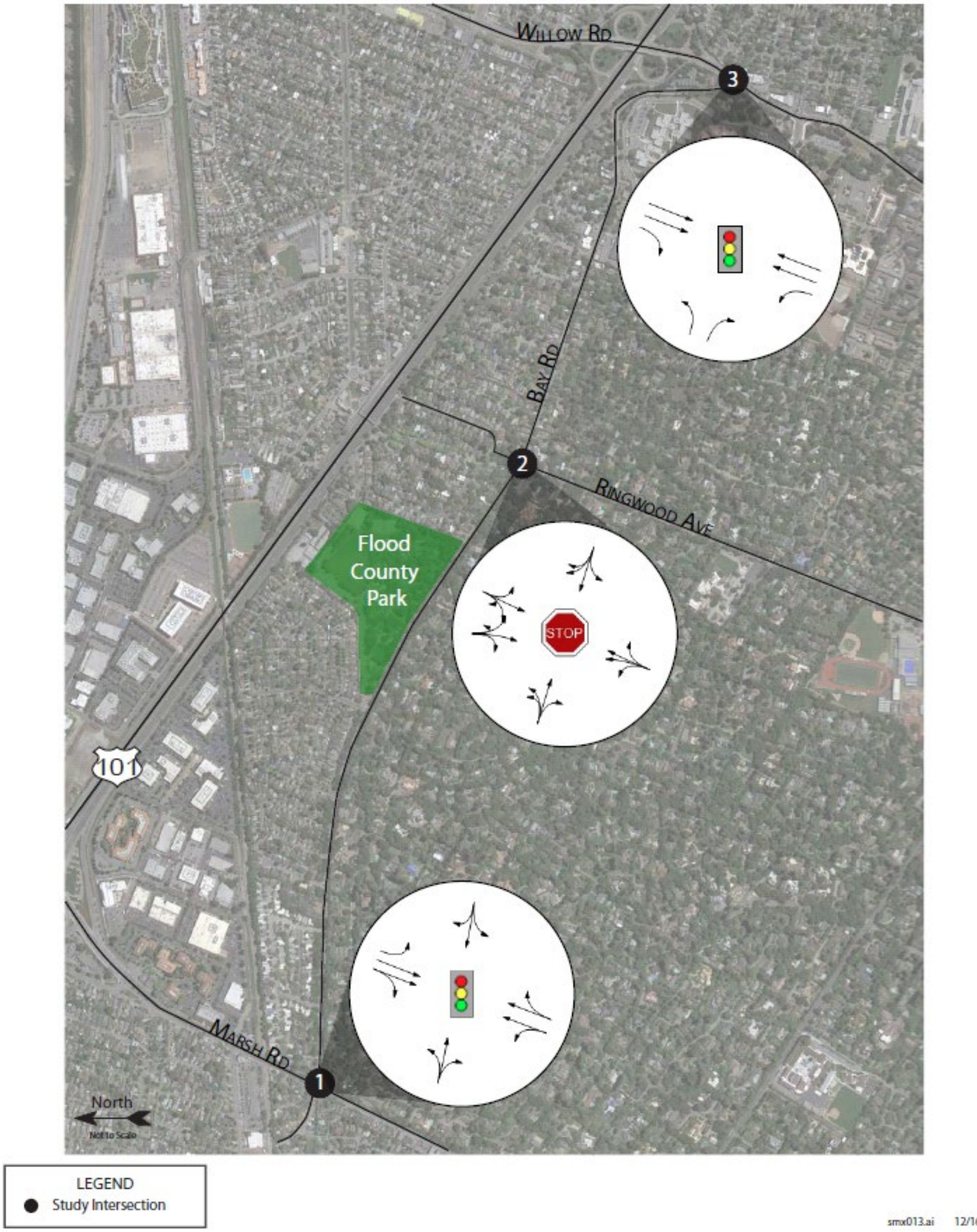

Table 29 Intersection Level of Service Criteria

LOS	All-Way Stop-Controlled	Signalized
A	Delay of 0 to 10 seconds. Upon stopping, drivers are immediately able to proceed.	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
B	Delay of 10 to 15 seconds. Drivers may wait for one or two vehicles to clear the intersection before proceeding from a stop.	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
C	Delay of 15 to 25 seconds. Drivers will enter a queue of one or two vehicles on the same approach, and wait for vehicle to clear from one or more approaches prior to entering the intersection.	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
D	Delay of 25 to 35 seconds. Queues of more than two vehicles are encountered on one or more approaches.	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.
E	Delay of 35 to 50 seconds. Longer queues are encountered on more than one approach to the intersection.	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.
F	Delay of more than 50 seconds. Drivers enter long queues on all approaches.	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Source: W-Trans 2019; see Appendix D

Existing Operating Conditions

Existing operating conditions at three nearby intersections were evaluated during weekday P.M. peak (between 4:00 P.M. and 6:00 P.M.) and Saturday midday peak (between 12:00 P.M. and 4:00 P.M.) periods, using the City of Menlo Park's Vistro traffic analysis network. The weekday P.M. peak hour was selected for analysis as representative of the worst rush hour traffic conditions in the area, while the Saturday midday peak hour was selected because it aligns with peak weekly use of Flood County Park. Table 30 summarizes existing peak-hour intersection LOS.

Table 30 Existing Peak-Hour Intersection Levels of Service

	P.M. Peak		SAT Peak	
Study Intersection	Delay	LOS	Delay	LOS
Bay Road/Marsh Road	16.0	B	13.7	B
Bay Road/Ringwood Avenue	21.2	C	8.8	A
Bay Road/Willow Road	>80*	F	9.4	A

Note: Delay is measured in average seconds per vehicle; LOS = Level of Service.

* LOS is based on unserved demand.

Source: W-Trans 2019; see Appendix D

While the Bay Road/Marsh Road and Bay Road/Ringwood Avenue intersections currently operate at an acceptable LOS, the intersection of Bay Road and Willow Road operates at an unacceptable LOS during the P.M. peak hour. According to City of Menlo Park staff, traffic conditions modeled in the

Vistro program for the Willow Road corridor during the P.M. peak hour do not accurately reflect the full extent of congestion because of "unserved demand" (Menlo Park 2016). Unserved demand is a condition of most traffic simulation models when traffic demand exceeds the capacity of a roadway (Kim and Suh 2014). In this situation, the model does not allow additional vehicles to enter an already congested roadway. Therefore, unserved demand refers to additional vehicle trips beyond those accounted for in the Vistro model.

Near-Term 2021 Conditions

The near-term scenario represents projected traffic conditions without implementation of the Landscape Plan in the year 2021, which is the assumed completion year for the proposed recreational elements that would generate the most new vehicle trips. This scenario includes traffic that would be generated by approved projects with the City. Traffic volumes that would be generated by these approved projects were obtained from the City's Vistro traffic analysis network, where available, or developed from data published by ITE in the 9th edition of the Trip Generation Manual (2012).

In addition, a growth rate was based on the C/CAG Travel Forecast Model, which accounted for growth in regional traffic until 2021. The growth rate applied was 0.8 percent per year for both weekday P.M. peak-hour and Saturday peak-hour volumes. As shown in Table 31, near-term 2021 conditions show that Bay Road and Ringwood Avenue would operate at LOS D during the P.M. peak hour. Moreover, as in the existing conditions shown in Table 30, the Bay Road and Willow Road intersection is expected to continue operating unacceptable due to "unserved demand."

Table 31 Near-Term 2021 Peak-Hour Intersection Levels of Service

	P.M. Peak		SAT Peak	
Study Intersection	**Delay**	**LOS**	**Delay**	**LOS**
Bay Road/Marsh Road	19.1	B	14.2	B
Bay Road/Ringwood Avenue	34.4	D	9.1	A
Bay Road/Willow Road	>80*	F	9.9	A

Source: W-Trans 2019; see Appendix D.
Note: Delay is measured in average seconds per vehicle; LOS = Level of Service.
* LOS is based on unserved demand.

Cumulative 2040 Conditions

The cumulative scenario represents projected traffic volumes without implementation of the Landscape Plan for the horizon year 2040. This scenario includes traffic that would be generated by approved developments that were identified in the near-term scenario, traffic that would be generated by developments that are currently pending approval, and a growth rate to account for growth in regional traffic. As in the near-term 2021 scenario, the growth rate applied was 0.8 percent per year for peak-hour volumes.

Table 32 summarizes the cumulative 2040 peak-hour LOS. The Bay Road and Ringwood Avenue intersection would operate at LOS F during the P.M. peak hour under cumulative conditions. As in the existing and near-term conditions, the Bay Road and Willow Road intersection during P.M. peak hours is expected to continue operating unacceptable due to "unserved demand," even after implementation of General Plan Goals, Policies, and Programs.

Table 32 Cumulative 2040 Peak-Hour Intersection Levels of Service

	P.M. Peak		SAT Peak	
Study Intersection	Delay	LOS	Delay	LOS
Bay Road/Marsh Road	29.1	C	16.0	B
Bay Road/Ringwood Avenue	108.9	F	9.7	A
Bay Road/Willow Road	>80*	F	10.9	B

Note: Delay is measured in average seconds per vehicle; LOS = Level of Service.
* LOS is based on unserved demand.
Source: W-Trans 2019; see Appendix D.

Pedestrian Network

Bay Road has intermittent sidewalk coverage with substantial gaps on both sides of the street between Marsh Road and Willow Road. A sidewalk is present on the north side of Bay Road along the park frontage. A marked crosswalk connects this sidewalk with a San Mateo County Transit District (SamTrans) bus stop on the south side of Bay Road, adjacent to Greenwood Drive. In addition to the main entrance gate, pedestrian access points to Flood County Park are located at the southern corner of the park from Bay Road and at the eastern corner from Iris Lane.

Bicycle Network

A network of bike lanes provides access to and from Flood County Park. In the vicinity of the park, Bay Road has 1.7 miles of bike lanes between Marsh Road and Van Buren Road, Ringwood Avenue has 0.9 mile of bike lanes between Bay Road and Middlefield Road, and Willow Road has 1.4 miles of bike lanes between Durham Street and Bay Road. A planned extension of the Willow Road bike lanes north of Durham Street would connect to Bay Road. In addition, a mixture of separated bikeways and bike lanes are planned on Marsh Road between Middlefield Road and the Bayshore Expressway, which would connect with the existing Bay Road bike lanes.

Transit

SamTrans provides fixed route bus service in the project area. SamTrans Local Route 281 stops on Newbridge Street at Pierce Road, which is a 0.25 mile walk from Flood County Park across the U.S. 101 pedestrian bridge. This route operates weekdays with approximately 20-30 minute headways between 6:00 A.M. and 8:00 A.M. and 6:00 P.M. and 10:30 P.M., and 15 minute headways between 8:00 A.M. and 6:00 P.M. Saturday service operates with 30 minutes headways between 8:00 A.M. and 7:30 P.M., while Sunday service operates with 30 minutes headways between 8:30 A.M. and 6:30 P.M.

SamTrans Local Route 82, 83, and 88 all stop on Bay Road near the project site and also provide school bus service in Atherton and Menlo Park to Hillview Middle School and Encinal Elementary School. Routes 82 and 88 directly serve the park and operate on schooldays.

3.5.2 Regulatory Setting

State

On September 27, 2013, Governor Brown signed Senate Bill (SB) 743 (Steinberg, 2013). SB 743 changes the way that public agencies evaluate the transportation impacts of projects under CEQA, recognizing that roadway congestion, while an inconvenience to drivers, is not itself an environmental impact (see Pub. Resource Code, Section 21099, subd. (b)(2)). In addition to new exemptions for projects that are consistent with specific plans, the SB 743 guidelines replace congestion based metrics, such as auto delay and level of service, with vehicle miles traveled (VMT) as the basis for determining significant impacts, unless the guidelines provide specific exceptions. The deadline for transitioning to VMT for CEQA analysis is July 2020. Therefore, for the sake of thoroughness, the County has evaluated the Landscape Plan using both LOS and VMT analysis. This approach is consistent with the City of Menlo Park's currently adopted thresholds for traffic conditions, which use intersection LOS to determine impacts on the transportation system.

Local

City of Menlo Park General Plan

The City's General Plan has adopted policies and plans that apply to public transit, bicycle, and pedestrian facilities in city limits. The following General Plan Circulation Element policies are relevant to the Landscape Plan and alternative transportation modes:

Policy CIRC-1.8 **Pedestrian Safety**. Maintain and create a connected network of safe sidewalks and walkways within the public right of way ensure that appropriate facilities, traffic control, and street lighting are provided for pedestrian safety and convenience, including for sensitive populations.

Policy CIRC-4.3 **Active Transportation**. Promote active lifestyles and active transportation, focusing on the role of walking and bicycling, to improve public health and lower obesity.

Policy CIRC-5.2 **Transit Proximity to Activity Centers**. Promote the clustering of as many activities as possible within easy walking distance of transit stops, and locate any new transit stops as close as possible to housing, jobs, shopping areas, open space, and parks.

3.5.3 Impact Analysis

Methodology and Significance Thresholds

Operating conditions during the weekday P.M. and Saturday midday peak periods were evaluated at the study intersections to capture the highest potential impacts of the proposed project as well as the highest volumes on the local transportation network. The weekday P.M. peak hour occurs between 4:00 and 6:00 P.M. and reflects conditions during the homeward bound commute, while the Saturday midday peak hour occurs between noon and 4:00 P.M. and typically reflects the highest level of weekend activity for a park. The following scenarios were analyzed as part of this study:

- Existing conditions
- Existing plus project conditions
- Near-term 2021 conditions
- Near-term 2021 plus project conditions
- Cumulative 2040 conditions
- Cumulative 2040 plus project conditions

The near-term 2021 scenarios were analyzed to reflect prevailing traffic conditions once Phase I of the Landscape Plan would be implemented, while the cumulative 2040 scenarios were analyzed to reflect long-term growth in traffic volumes in the Menlo Park and Atherton area.

Trip Generation

Trip generation estimates are typically developed using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 9th Edition, 2012. However, standard rates are not available or applicable to the improvements planned at the park; therefore, trip generation estimates were developed for individual recreational elements in the Landscape Plan, as detailed below..

The existing conditions at Flood County Park were derived using historic park visitor statistics from 2011 through 2015. During this time period the baseball field was not in programmed use and this time period was assumed to represent the existing conditions at the park. Driveway counts collected in November 2016 were used to validate these assumptions. This data was used to understand the magnitude of the maximum increase in park visitors. For the purposes of this traffic analysis, the maximum anticipated number of park visitors during each phase of implementing the Landscape Plan was derived from park industry data provided by Gates + Associates in April 2019. The maximum anticipated number of park users at individual elements of the Landscape Plan is shown in Appendix C of the Traffic Impact Study.

Park visitor statistics and anticipated vehicle occupancy were used to convert the maximum number of users into trip generation estimates based on the assumptions summarized in Appendix C of the Traffic Impact Study. It is anticipated that the programmed active recreation would be implemented as soon as the construction of Phase I is complete, and would generate trips under both existing and near-term conditions. Maximum trip generation for Phase II and Phase III was also developed. These estimates were only analyzed for cumulative conditions, inclusive of the Phase I trips.

The trip generation estimates were developed to be conservative, assuming that multiple activities would start and end during the same peak-hour period. The weekday P.M. trip generation estimates assume that scheduled events on both the ballfield and soccer/lacrosse field start and end during the peak hour. It was also assumed that visitors would be concurrently using the non-scheduled activity centers at the park. This weekday case represents a very busy but plausible trip generation estimate for all phases of the Landscape Plan.

The Saturday peak-hour trip generation estimates assume that scheduled games on both the ballfield and soccer/lacrosse field start and end during the peak hour. It was also assumed that visitors would concurrently use the non-scheduled activity centers. Regarding the scheduled picnic areas, it was assumed that only a quarter of the picnic area and shade structure visitors would arrive or leave the park during the peak hour. This weekend case represents a very busy but plausible trip generation estimate for all project phases during the peak summer months.

This conservative analysis does not represent typical park operations, but highlights the few instances through the year when Flood County Park has the potential to operate at maximum capacity. During the summer months, the park would be expected to have peak visitation for both passive and active recreation on weekends. During the low months, November through February, traffic impacts would be expected to be minimal. Table 33 estimates trip generation for all phases of the Landscape Plan.

Table 33 Trip Generation Summary

Park Use	Weekday Daily Trips	Weekday P.M. Peak Hour			Saturday Daily Trips	SAT Peak Hour		
		Trips	In	Out		Trips	In	Out
Phase I								
Ballfield	90	60	30	30	226	150	75	75
Soccer/lacrosse field	90	60	30	30	226	150	75	75
Tennis courts	32	32	16	16	48	32	16	16
Sand volleyball	0	0	0	0	20	20	10	10
Basketball	16	16	8	8	100	66	33	33
Pump track	32	32	16	16	48	48	24	24
Phase I Subtotal	**260**	**200**	**100**	**100**	**668**	**466**	**233**	**233**
Phase II								
Demonstration garden	16	16	8	8	50	50	25	25
Play area universal (2-5)	30	30	15	15	60	40	20	20
Play area universal (5-12)	48	32	16	16	96	64	32	32
Adventure play	40	40	20	20	70	70	35	35
Small group picnic	0	0	0	0	96	24	12	12
Phase II Subtotal	**134**	**118**	**59**	**59**	**372**	**248**	**124**	**124**
Phase III								
Shade/market structure	0	0	0	0	160	30	15	15
Event/group picnic area	0	0	0	0	160	40	20	20
Phase III Subtotal	**0**	**0**	**0**	**0**	**320**	**70**	**35**	**35**
Total Phase I, II, III Trips	**394**	**318**	**159**	**159**	**1,360**	**784**	**392**	**392**

Source: W-Trans 2019; see Appendix D.

Trip Distribution

It was assumed that a majority of trips to and from Flood County Park under the Landscape Plan would originate locally in the Menlo Park area. These local trips would occur on local streets, while park trips from regional locations, accounting for 10 percent of all trips, would utilize U.S. 101 or I-

280 before travelling on local streets to access the park. Table 34 shows the applied trip distribution assumptions.

Table 34 Assumed Distribution of Trips Generated by Landscape Plan

Route	Percent	Weekday Daily Trips	Weekday P.M. Peak-Hour Trips	SAT Peak-Hour Trips
To/From Marsh Road east of Bay Road	12%	48	38	94
To/From Marsh Road west of Bay Road	8%	32	25	63
To/From Bay Road north of Marsh Road	5%	20	16	39
To/From Flood Park Triangle	9%	35	29	71
To/From Ringwood Avenue west of Bay Road	48%	189	153	376
To/From Willow Road east of Bay Road	13%	51	41	102
To/From Willow Road west of Bay Road	5%	20	16	39
Total	**100%**	**394**	**318**	**784**

Note: The sum of individual trip numbers may not perfectly match total trips because of rounding.
Source: W-Trans 2019; see Appendix D

Vehicle Miles Traveled

Vehicle miles traveled (VMT) is the measure of miles traveled within a specific geographic area for a given period and it provides an indication of automobile and truck travel on a transportation system. This metric is often used in noise, air quality, and greenhouse gas emissions analyses. VMT can also be used to quantify the impact of a project or plan on the larger transportation system. The California Governor's Office of Planning and Research in the *Final Adopted Text Revisions to the CEQA Guidelines* 2018, introduced VMT as the metric to quantify a project's impact in place of level of service. However, local jurisdictions are required to adopt the updated guidelines and San Mateo County has yet to update its own CEQA guidelines. Nonetheless, for the sake of thoroughness, this analysis includes a discussion of the Landscape Plan's effects on countywide VMT for informational purposes.

According to the Metropolitan Transportation Commission (MTC), on average residents of the Bay Area as a whole travel a total of approximately 23 miles daily, while residents of San Mateo Country drive over 25 miles daily. Land use planning in San Mateo County has historically followed a typical suburban pattern of development, and is therefore has a higher average VMT per capita than the rest of the region.

Traffic Signal Warrants

This analysis applies guidance in Chapter 4C of the *California Manual on Uniform Traffic Control Devices* (CA-MUTCD) to determine whether installation of a traffic signal should be considered at intersections.

Warrant 3 (Peak Hour Volume), which is often the first warrant to be met, has a notice that this signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time. Under the Peak Hour Warrant the need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

A. If all three of the following conditions exist for the same one hour (any four consecutive 15-minute periods) of an average day:

    1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: four vehicle-hours for a one-lane approach; or five vehicle-hours for a two-lane approach, and
    2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
    3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

Thresholds of Significance

Based on San Mateo County's *Initial Study Environmental Evaluation Checklist*, impacts related to transportation or traffic would be significant if the Landscape Plan would:

1 Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

2 Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the County congestion management agency for designated roads or highways;

3 Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in significant safety risks;

4 Significantly increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);

5 Result in inadequate emergency access;

6 Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities;

7 Cause noticeable increase in pedestrian traffic or a change in pedestrian patterns; and/or

8 Result in inadequate parking capacity.

Thresholds 3 and 5 are discussed separately in Section 5.16, *Transportation and Circulation*, in the original Draft EIR that was published in September 2017.

Traffic Operation Standards

As discussed in Section 1, *Introduction*, whereas this EIR generally applies the County's standards to the proposed Landscape Plan, for the purposes of transportation analysis the County has chosen to rely on the City of Menlo Park's standards. The City's standards are most appropriate in this issue area because the proposed Landscape Plan would affect the transportation network within the city limits of Menlo Park and the City's traffic standards are stringent relative to other nearby jurisdictions. The City's 2004 Circulation System Assessment establishes standards of significance for analyzing a project's impact on the circulation network. A potentially significant impact would occur if the addition of project traffic causes an intersection or collector street operating to LOS A through C to operate at an unacceptable level (LOS D, E, or F) or have an increase of 23 seconds or greater in average vehicle delay, whichever comes first. In addition, a potentially significant impact would occur if a project causes an intersection on arterial streets or local approaches to state-controlled signalized intersections operating at LOS A through D to operate at an unacceptable level (LOS E or F) or have an increase of 23 seconds or greater in average vehicle delay, whichever comes first.

Moreover, a project can have a potentially significant impact if the addition of project traffic causes an increase of more than 0.8 second seconds of average delay to vehicles on all critical movements for intersections operating at near term LOS D through F for collector streets and at a near term LOS E or F for arterial streets. A critical movement is the phase or leg of an intersection that requires the most green time. For local approaches to state-controlled signalized intersections, a project is considered to have a potentially significant impact if the addition of project traffic causes an increase of more than 0.8 second of delay to vehicles on the critical movements for intersections operating a near term LOS E or F. Table 35 summarizes the LOS thresholds applied to the study intersections.

Table 35 Level of Service Significance

Study Intersection	Jurisdiction	LOS Significance Threshold	Significance Threshold for Unacceptable LOS
Bay Road/Marsh Road	City of Menlo Park	D	LOS becomes E or worse or delay increases by 23 seconds or more or, if LOS is currently E or F, all critical movement delay increases by 0.8 seconds.
Bay Road/Ringwood Avenue	City of Menlo Park	C	LOS becomes D or worse or delay increases by 23 seconds or more or, if LOS is currently D, E, or F, all critical movement delay increases by 0.8 seconds
Bay Road/Willow Road	State (local approach)	D	LOS becomes E or F or, if LOS is currently E or F, all critical movement delay increases by 0.8 seconds

Source: W-Trans 2019; see Appendix D.

Project Impacts

Threshold 1

Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

Impact T-1	Traffic generated by the project would cause traffic delay exceeding the City of Menlo Park's standards at the intersection of Bay Road and Ringwood Avenue under all modeled traffic scenarios. Queuing of vehicles at the park's entrance gate also would cause temporary traffic delay on Bay Road. Although new parking fee collection practices would minimize queuing, mitigation measures at the affected intersection would be infeasible. Therefore, the project would have a significant and unavoidable impact on traffic under existing plus project conditions.

Phases I, II, and III

Table 36, Table 37, and Table 38 show modeled traffic conditions at the three studied intersections near Flood County Park under existing, near-term 2021, and cumulative 2040 scenarios, respectively, both with and without implementation of the Landscape Plan.

Table 36 Existing and Existing Plus Project Peak-Hour Intersection Level of Service

Study Intersection	Existing Conditions				Existing Plus Project			
	P.M. Peak		SAT Peak		P.M. Peak		SAT Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Bay Road/Marsh Road	16.0	B	13.7	B	17.0	B	15.6	B
Bay Road/Ringwood Avenue	21.2	C	8.8	A	35.7	D	12.6	B
Addition of Northbound Left-Turn Lane	–	–	–	–	**15.3**	**B**	**12.2**	**A**
Bay Road/Willow Road	>80*	F	9.4	A	>80*	F	10.3	B

Note: Delay is measured in average seconds per vehicle; LOS = Level of Service.

* LOS is based on unserved demand.

Source: W-Trans 2019; see Appendix D

Table 37 Near-Term 2021 and Near-Term 2021 Plus Project Peak-Hour Intersection Level of Service

Study Intersection	Near-Term Conditions				Near-Term Plus Project			
	P.M. Peak		SAT Peak		P.M. Peak		SAT Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Bay Road/Marsh Road	19.1	B	14.2	B	19.9	B	15.3	B
Bay Road/Ringwood Avenue	34.4	D	9.1	A	48.6	E	12.2	B
Addition of Northbound Left-Turn Lane	**15.0**	**C**	**9.0**	**A**	**17.0**	**C**	**11.7**	**B**
Bay Road/Willow Road	>80*	F	9.9	A	>80*	F	10.8	B

Note: Delay is measured in average seconds per vehicle; LOS = Level of Service.

* LOS is based on unserved demand.

Source: W-Trans 2019; see Appendix D

Table 38 Cumulative 2040 and Cumulative 2040 Plus Project Peak-Hour Intersection Level of Service

Study Intersection	Cumulative Conditions				Cumulative Plus Project			
	P.M. Peak		SAT Peak		P.M. Peak		SAT Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Bay Road/ Marsh Road	29.1	C	16.0	B	34.9	C	21.1	C
Bay Road/ Ringwood Avenue	108.9	F	9.7	A	**	F	27.2	D
Addition of Northbound Left-Turn Lane	**24.7**	**C**	**9.5**	**A**	**34.0**	**C**	**22.6**	**C**
Signalization	**13.9**	**B**	**12.0**	**B**	**15.7**	**B**	**14.7**	**B**
Bay Road/ Willow Road	>80*	F	10.9	B	>80*	F	12.7	B

Note: Delay is measured in average seconds per vehicle; LOS = Level of Service.

* LOS is based on unserved demand.

** = delay exceeds 120 seconds.

Source: W-Trans 2019; see Appendix D

During weekday P.M. peak hours, the addition of new trips generated by the Landscape Plan is expected to degrade traffic conditions at the intersection of Bay Road and Ringwood Avenue from an acceptable LOS C to an unacceptable LOS D under existing plus project conditions and from an unacceptable LOS D to E under near-term 2021 plus project conditions. Furthermore, new vehicle trips at this intersection would exacerbate unacceptable LOS F conditions under cumulative 2040 plus project conditions. It is worth noting that existing traffic conditions at this intersection during weekday P.M. peak hours are already approaching the City of Menlo Park's threshold of LOS D for unsignalized intersections. The addition of only 25 P.M. peak-hour trips associated with active and passive recreational use at Flood County Park would push operating conditions from LOS C to D, causing an exceedance of the City's traffic standards. For reference, one adult baseball game would generate approximately 30 P.M. peak-hour inbound trips. However, a signal warrant analysis indicates that projected traffic volumes at this intersection would not necessitate installation of a traffic signal under any traffic scenario.

The intersection of Bay Road and Willow Road is expected to continue to operate at LOS F during the P.M. peak hour under all traffic scenarios, due to "unserved demand." As discussed in the Setting, this intersection now operates unacceptably without the addition of project-generated traffic and would continue to operate deficiently due to "unserved demand" upon the addition of project-generated traffic. The project would not be responsible for pre-existing unacceptable traffic conditions at Bay Road and Willow Road and would not substantially exacerbate traffic congestion at the intersection relative to existing conditions.

The project also could increase traffic congestion on Bay Road for brief periods as vehicles queue up at the park's main entrance, waiting for admission at the fee collection booth. The County plans to move the existing entrance gate to Flood County Park farther back from Bay Road, which would increase the driveway's storage capacity for vehicles waiting to enter the park. However, queuing behavior could still occur during peak summer months, especially with the operation of the proposed athletic fields in Phase I of the Landscape Plan. Because of increased traffic congestion at the intersection of Bay Road and Ringwood Avenue and temporary queuing on Bay Road, the Landscape Plan would have a potentially significant impact under existing plus project conditions.

As a caveat to the finding of a potentially significant impact related to traffic congestion, this analysis is predicated on locally adopted LOS standards that will change in the near future. The deadline for local jurisdictions to transition to VMT as the primary metric for evaluating traffic impacts under CEQA analysis is July 2020. At present time, locally adopted traffic standards are still in terms of LOS. As discussed in Impact T-2, project-generated traffic would have a negligible effect on VMT in San Mateo County. Therefore, the Landscape Plan would have a less than significant impact related to traffic using VMT as the standard of analysis. Nevertheless, this EIR relies on the City of Menlo Park's existing adopted LOS standards for traffic congestion.

Mitigation Measures

As shown in Table 36, Table 37, and Table 38, the installation of a northbound left-turn lane at the intersection of Bay Road and Ringwood Avenue would improve traffic conditions during P.M. peak hours from LOS D to B under existing plus project conditions, from LOS E to C under near-term 2021 plus project conditions, and from LOS F to C under cumulative 2040 plus project conditions. This reconfiguration of the intersection would reduce traffic congestion relative to without-project conditions. However, physical constraints at the affected intersection would make implementation of such a measure less feasible. The San Mateo County Assessor Map confirms that Ringwood Avenue has 55 feet of right-of-way approaching Bay Road. In this right-of-way, the removal of an existing parking lane and street trees on the east side of Ringwood Avenue would be required to make room for a northbound left-turn lane. This reconfiguration also would require the relocation of existing utility poles and street drainage. Additionally, this measure would require coordination with, and approval, by the City of Menlo Park and the Town of Atherton, which cannot be guaranteed. Therefore, it is conservatively assumed that installing a new turn lane at the intersection would be infeasible.

To minimize queuing on Bay Road, Mitigation Measure T-1 would be required.

MM T-1 Parking Fee Collection Practices

The County shall implement parking fee collection practices to avoid the back up of vehicles entering Flood County Park onto local streets. These practices may include automated fee machines, paying upon exiting the park, or a combination of both to move the queues associated with fee collection off of City streets and on-site.

Significance After Mitigation

Implementation of Mitigation Measure T-1 would reduce temporary congestion on Bay Road from queuing of vehicles at the park gate. Nevertheless, as discussed above, it may be infeasible to reconfigure the intersection of Bay Road and Ringwood Avenue to avoid a significant impact from traffic congestion. Therefore, the Landscape Plan would have a significant and unavoidable impact on traffic under existing plus project, near-term 2021 plus project, and cumulative 2040 plus project conditions.

Impact T-2	Project-generated traffic would have a negligible effect on vehicle miles traveled in San Mateo County. Therefore, the Landscape Plan would have a less than significant impact related to vehicle miles traveled.

Phases I, II, and III

It is expected that the Landscape Plan would have a negligible effect on vehicle miles traveled in San Mateo County. The reconstruction of the existing out-of-service ballfield and addition of a new soccer/lacrosse field could shorten trips by local sports teams and programs that would no longer have to travel to most distant sites to access quality athletic fields. It is expected that the main user of the athletic fields would be the Menlo Park Legends community baseball program, which currently uses other fields in Menlo Park and Atherton. Furthermore, the Landscape Plan would maintain and revitalize passive recreational elements likely to be used by local residents who would travel short distances to the park. Existing SamTrans bus stops are also available within acceptable walking distance of Flood County Park, which would incentivize the use of transit rather than driving to the site. In addition, because the City of Menlo Park has not yet adopted VMT as its primary metric for evaluating the traffic impacts on projects, there is no local significance threshold against which to judge the Landscape Plan's effects on VMT. Therefore, the project would have a less than significant impact related to VMT.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Threshold 2

Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the County congestion management agency for designated roads or highways.

Impact T-3	Vehicle trips generated by implementation of the Landscape Plan would not adversely affect roadways designated under the Congestion Management Plan for San Mateo County. Therefore, the project would have a less than significant impact related to conflicts with this plan.

Phases I, II, and III

The City/County Association of Governments of San Mateo County (C/CAG) serves as the Congestion Management Agency (CMA) for San Mateo County. C/CAG's most recent Congestion Management Plan (CMP), referred to as the 2013 CMP Monitoring Report, establishes the designated CMP Roadway network, which includes I-280, U.S. 101, the Bayfront Expressway (SR 84), El Camino Real (SR 82), and Willow Road (SR 114), and the LOS standard for each roadway in the network. It is expected that local residents would account for the majority of new trips associated with the Landscape Plan. Therefore, project-generated trips would not substantially affect traffic on designated CMP roadways that serve as regional corridors. The project would not conflict with C/CAG's Congestion Management Program.

Mitigation Measures

No mitigation is required.

Significance after Mitigation

This impact would be less than significant without mitigation.

Threshold 4

Significantly increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

Impact T-4	The project would not introduce design features that increase traffic hazards. No impact would occur.

Phases I, II, and III

The Landscape Plan would not alter the offsite circulation system and would introduce minor modifications to the on-site surface parking lot, including a pick-up and drop-off area. No potential design hazards such as sharp curves, dangerous intersections, or new incompatible uses are proposed. Existing bike lanes and sidewalks on Bay Road would safely accommodate bicyclists and pedestrians en route to the park. Therefore, the project would have no impact related to traffic hazards.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

No impact would occur without mitigation.

Thresholds 6 and 7

Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Cause noticeable increase in pedestrian traffic or a change in pedestrian patterns.

Impact T-5	The project would not decrease the performance of existing or planned transit, bicycle, or pedestrian facilities. However, the lack of bicycle storage on-site and a sidewalk gap on Bay Road could result in unsafe conditions for bicyclists and pedestrians accessing the park. Impacts to transit, bicycle, and pedestrian systems would be less than significant with mitigation to install bicycle storage and pedestrian signage.

Phases I, II, and III

TRANSIT

Due to the nature and location of the Park, it is expected that the majority of park visitors would be from the nearby residential neighborhoods and would access the park via foot, bike, or vehicle, rather than by transit. Existing SamTrans bus stops are available within acceptable walking distance of the site for those visitors who choose to access the site via transit. Therefore, transit service to the project site would be adequate, and new transit users would not result in overcrowding on buses.

BICYCLE FACILITIES

Existing bicycle facilities, including bike lanes on Bay Road, Ringwood Avenue, Middlefield Road, and Willow Road, together with shared use of minor streets, provide adequate access for bicyclists to Flood County Park. Planned separated bikeways and bike lanes on Marsh Road and a planned extension of existing bike lanes on Willow Road, northward to Bay Road, would provide additional access to the site. Although bicyclists would easily be able to access the site, the Landscape Plan does not identify any bicycle parking or storage facilities in the park. This lack of dedicated bicycle parking may result in unsafe storage for bicyclists traveling to the park.

Pedestrian Facilities

The proposed project is not expected to generate noticeable increases in pedestrian traffic or travel patterns in the vicinity of Flood County Park. Visitors who currently live within reasonable walking distance would continue to utilize the pedestrian network to access the Park, including access points at the entrance gate, the southern corner of the park along Bay Road, and at the eastern corner of the park at the terminus of Iris Lane. However, new pedestrian trips to the park may be subject to unsafe conditions because of a gap in the existing sidewalk on the north side of Bay Road between Del Norte Avenue and Ringwood Avenue. At this gap, pedestrians must walk along the roadway shoulder or in the bike lane. Therefore, the Landscape Plan could have adverse effects on pedestrians.

The Landscape Plan would not have substantial adverse effects on public transit, bicycle, or pedestrian facilities. However, the lack of dedicated bicycle parking may result in unsafe storage for bicyclists traveling to the park. This impact would be potentially significant.

Mitigation Measures

To provide safe bicycle storage for park users, Mitigation Measure T-5(a) would require the installation of bicycle racks on-site. To protect pedestrian safety, an existing gap in the sidewalk on the north side of Bay Road between Del Norte Avenue and Ringwood Avenue could be closed; however, the removal of two mature oak trees located in the Bay Road right-of-way would be necessary to complete the sidewalk; therefore, it would not be feasible to complete the sidewalk along Bay Road. Instead of sidewalk closure, Mitigation Measure T-5(b) would require the County to install signage to inform park users of safe pedestrian routes.

MM T-5(a) Bicycle Storage

The County shall install a minimum of six bicycle racks near the proposed gathering plaza.

MM T-5(b) Pedestrian Signage

The County shall install signage in a central location in Flood County Park that informs visitors of an alternative pedestrian route to the segment of Bay Road between Del Norte Avenue and Sonoma Avenue which lacks a sidewalk. This signage shall include a map of the alternative pedestrian route on Del Norte Avenue, Oakwood Place, and Sonoma Avenue.

Significance After Mitigation

Installation of bicycle storage and pedestrian signage would improve access to the park for bicyclists and pedestrians and reduce safety hazards for these users. Therefore, impacts related to public transit, bicycle, and pedestrian facilities would be less than significant after mitigation.

Threshold 8

Result in inadequate parking capacity.

Impact T-6	While it is estimated that parking demand during peak summer days at Flood County Park would not typically exceed the on-site parking supply, the Landscape Plan could result in increased parking on local residential streets. The impact on parking capacity would be less than significant impact with mitigation measures to facilitate on-site parking and discourage on-street parking by visitors to Flood County Park.

Phases I, II, and III

The Traffic Impact Study prepared for the Revised EIR identifies 375 existing parking spaces at Flood County Park, based on a November 2016 count. This amount excludes a northeastern portion of the on-site parking lot behind the ballfield, which was paved and striped for parking spaces at the time of the survey, but temporarily enclosed with chain-link fencing and covered by storage materials. This area is currently available for visitor parking. Based on site photos taken in August 2016 and Google Earth aerial imagery, the formerly closed portion of the parking lot includes approximately 20 parking spaces. Therefore, in practice Flood County Park has roughly 395 parking spaces. This analysis of parking availability is conservative in assuming an on-site parking supply of only 375 spaces.

Maximum parking demand during peak summer days under the Landscape Plan was estimated using the maximum anticipated visitor projections provided by Gates + Associates in April 2019. The user capacity of the park and the assumed vehicle occupancy by amenity was used to derive the maximum parking demand for each recreational element of the Landscape Plan. The assumption is that all activities would be utilized at the same time, resulting in the maximum parking demand on the weekend.

Based on this data, the anticipated typical peak parking demand for the proposed project is 344 parking spaces. For a conservative analysis, no deductions to parking demand were taken for motorists that would drop off and pick up visitors rather than park in the on-site lot. In practice, pick-up and drop-off activity may occur on a daily basis for athletic events in the summer. Additionally no deductions were taken for alternative modes, although the site is generally accessible by walking and bicycling. The estimated peak demand of 344 parking spaces would not exceed the on-site parking supply of at least 375 spaces. Therefore, it is anticipated that the existing parking supply would be adequate to accommodate peak parking demand under the Landscape Plan. However, it should be noted the parking demand could still potentially exceed the capacity during very large scheduled events.

Despite the adequate supply of parking spaces on-site, new vehicle trips generated by the Landscape Plan could increase the number of visitors to Flood County Park who park on nearby residential streets. Under existing conditions, some visitors park on local streets like Del Norte Avenue rather than pay for on-site parking, including during the permit parking season on these streets.

The County would encourage on-site parking under the Landscape Plan by allowing participants in programmed active recreational activities to be dropped off and picked up inside the park without paying an entrance fee. This practice would minimize pick-up and drop-off activity near the Iris Lane gate to Flood County Park. However, off-site parking could still increase, resulting in a reduced parking capacity for residents on local streets.

Mitigation Measures

Mitigation Measure T-1 to implement parking fee collection practices, such as automated fee machines and paying upon exiting the park, would facilitate on-site parking and could reduce the incentive for off-site parking. In addition, Mitigation Measure T-6 would require education of park visitors about on-street parking restrictions and coordination with the City of Menlo Park on enforcement of parking violations.

MM T-6 PARKING EDUCATION AND ENFORCEMENT

The County shall inform park visitors of on-street parking restrictions on nearby residential streets and shall post this information in a clearly visible location on-site. The County also shall coordinate with the City of Menlo Park to reduce parking in the adjacent neighborhoods, including proactive communication when peak use of Flood County Park is anticipated (i.e., on weekday evenings and on weekend days when all picnic areas are reserved and all athletic fields are scheduled for concurrent use) and encouraging increased targeted enforcement of on-street parking restrictions.

Significance After Mitigation

With implementation of mitigation measures to facilitate on-site parking and discourage on-street parking, the Landscape Plan would have a less than significant impact related to parking capacity.

Cumulative Impacts

As discussed in Impact T-1, cumulative traffic impacts at the intersection of Bay Road and Ringwood Avenue would be significant and unavoidable under the near-term 2021 and 2040 scenarios with the addition of project-generated vehicle trips. New trips by park users would contribute to a future exceedance of the City of Menlo Park's LOS D threshold at this unsignalized intersection. Although the installation of a northbound left-turn lane on Ringwood Avenue would successfully mitigate the project's contribution to this impact, such a mitigation measure may be infeasible. Therefore, the project would have a considerable contribution to a significant cumulative traffic impact.

3.6 Wildfire

This section addresses the potential for the project to exacerbate wildfire risks. Additionally, the potential impacts related to exposure to wildfire, including smoke and subsequent flooding and runoff are assessed in this section. Data used to prepare this section were obtained from the California Department of Forestry and Fire Protection (CAL FIRE), the Western Regional Climate Center, and the County of San Mateo Hazard Mitigation Plan.

3.6.1 Environmental Setting

Overview of Wildfire

A wildfire is an uncontrolled fire in an area of combustible vegetation that is generally extensive in size. Wildfires differ from other fires in that they take place outdoors in areas of grassland, woodlands, brush land, scrubland, peatland, and other wooded areas that act as a source of fuel, or combustible material. Buildings may become involved if a wildfire spreads to adjacent communities. The primary factors that increase an area's susceptibility to wildfire include slope and topography, vegetation type and condition, and weather and atmospheric conditions. These factors, as they exist and occur relative the project site, are described below.

Slope and Aspect

Sloping land increases susceptibility to wildfire because fire typically burns faster up steep slopes (CAL FIRE 2000). Additionally, steep slopes may hinder firefighting efforts. Following severe wildfires, sloping land is also more susceptible to landslide or flooding from increased runoff during substantial precipitation events. Aspect is the direction that a slope faces, and it determines how much radiated heat the slope will receive from the sun. Slopes facing south to southwest will receive the most solar radiation. As a result, this slope is warmer and the vegetation drier than on slopes facing a northerly to northeasterly direction, increasing the potential for wildfire ignition and spread (CAL FIRE 2000). Because the project site is relatively flat and not sloping, it has no distinguishable aspect.

Vegetation

Vegetation is "fuel" to a wildfire and it changes over time. The relationship between vegetation and wildfire is complex, but generally some vegetation is naturally fire resistant, while other types are very flammable. For example, cured grass is much more flammable than standing trees (CAL FIRE 2017). Grass is considered an open fuel, in which oxygen has free access to promote the spread of fire. Additionally, weather and climate conditions, such as drought, can lead to increasing dry vegetation with low moisture content, increasing its flammability.

Vegetation cover throughout Flood County Park is ruderal and characterized by an extensive area of lawn with non-native grasses and native and non-native trees. Dominant native trees at the park included old growth valley oak, coast live oak, California bay laurel, and coast redwood. While the non-native. While the lawn area does not present a high risk of wildland fire fuel, the trees in the project site and other minor vegetative cover are susceptible to wildfire.

Weather and Atmospheric Conditions

Wind, temperature, and relative humidity are the most influential weather elements in fire behavior and susceptibility (CAL FIRE 2016). Fire moves faster under hot, dry, and windy conditions. Wind may also blow burning embers ahead of a fire, causing its spread. Drought conditions also lead to extended periods of excessively dry vegetation, increasing the fuel load and ignition potential.

The average annual precipitation in Redwood City is 19.16 inches (Western Regional Climate Center 2016).[3] Generally, in an average or typical year, most precipitation is received from October through April. May through September is the driest parts of the year, and coincide with what has traditionally been considered the fire season in California. However, increasingly persistent drought and climatic changes in California have resulted in drier winters and fires during the autumn, winter, and spring months are become more common. For example, the devastating Camp Fire in Butte County ignited during November 2018.

Prevailing winds in Menlo Park are generally westerly to northwesterly (CARB 1984). Westerly to northwesterly prevailing wind means that winds generally move across the project site from the west to the east, from the Bay toward the hillside areas to the east.

Wildfire Hazards

In California, responsibility for wildfire prevention and suppression is shared by federal, state and local agencies. Federal agencies are responsible for federal lands in Federal Responsibility Areas. The State of California has determined that some non-federal lands in unincorporated areas with watershed value are of statewide interest and have classified those lands as State Responsibility Areas (SRA), which are managed by CAL FIRE. All incorporated areas and other unincorporated lands are classified as Local Responsibility Areas (LRA).

While nearly all of California is subject to some degree of wildfire hazard, there are specific features that make certain areas more hazardous. CAL FIRE is required by law to map areas of significant fire hazards based on fuels, terrain, weather and other relevant factors (Public Resources Code [PRC] 4201-4204 and California Government Code 51175-89). As described above, the primary factors that increase an area’s susceptibility to fire hazards include slope, vegetation type and condition, and atmospheric conditions. CAL FIRE maps fire hazards based on zones, referred to as Fire Hazard Severity Zones. CAL FIRE maps three zones on SRA: 1) Moderate Fire Hazard Severity Zones; 2) High Fire Hazard Severity Zones; and 3) Very High Fire Hazard Severity Zones. Only the Very High Fire Hazard Severity Zones are mapped on LRA. Each of the zones influence how people construct buildings and protect property to reduce risk associated with wildland fires. Under state regulations, areas within very high fire hazard risk zones must comply with specific building and vegetation management requirements intended to reduce property damage and loss of life within these areas.

According to LRA mapping, the project site is not designated as a Very High Fire Hazard Severity Zone (CAL FIRE 2008). Additionally, according to CAL FIRE, there are no SRA mapped within or around the project site (CAL FIRE 2007).

[3] Redwood City is the closest Western Regional Climate Center monitoring station to Menlo Park with recent weather data.

3.6.2 Regulatory Setting

Federal

The Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 requires a State mitigation plan as a condition of disaster assistance. There are two different levels of State disaster plans: "Standard" and "Enhanced." States that develop an approved Enhanced State Plan can increase the amount of funding available through the Hazard Mitigation Grant Program. The Act has also established new requirements for local mitigation plans

National Fire Plan

The National Fire Plan was developed under Executive Order 11246 in August 2000, following a historic wildland fire season. Its intent is to establish plans for active response to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity. The plan addresses firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability.

State

The California Fire Plan

The Strategic Fire Plan for California is the State's road map for reducing the risk of wildfire. The most recent version of the Plan was finalized in August 2018, and directs each CAL FIRE Unit to prepare a locally specific Fire Management Plan (CAL FIRE 2018). In compliance with the California Fire Plan, individual CAL FIRE units are required to develop Fire Management Plans for their areas of responsibility. These documents assess the fire situation within each of the 21 CAL FIRE units and six contract counties. The plans include stakeholder contributions and priorities, and identify strategic areas for pre-fire planning and fuel treatment as defined by the people who live and work with the local fire problem. The plans are required to be updated annually.

California Office of Emergency Services

The California Office of Emergency Services (OES) prepares the State of California Multi-Hazard Mitigation Plan (SHMP). The SHMP identifies hazard risks, and includes a vulnerability analysis and a hazard mitigation strategy. The SHMP is federally required under the Disaster Mitigation Act of 2000 in order for the State to receive Federal funding. The Disaster Mitigation Act of 2000 requires a State mitigation plan as a condition of disaster assistance.

Wildland Urban Interface Building Standard

On September 20, 2007 the Building Standards Commission approved the Office of the State Fire Marshal emergency regulations amending the California Code of Regulations, Title 24, Part 2, known as the 2007 California Building Code (CBC). These codes include provisions for ignition-resistant construction standards in the wildland urban interface.

California Building Code (2016)

The 2016 Fire Code establishes the minimum requirements consistent with nationally recognized good practices to safeguard the public health, safety, and general welfare for the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures and premises, and to provide safety and assistance to firefighters and emergency responders during emergency operations. The provisions of this code apply to some construction, alteration, movement enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, and demolition of buildings or structures or any appurtenances connected or attached to such building structures throughout California.

Regional and Local

Association of Bay Area Governments Multi-Jurisdictional Local Hazard Mitigation Plan

The Association of Bay Area Governments' (ABAG) Multi-Jurisdictional Local Hazard Mitigation Plan covers mitigation measures that should be adopted by participating municipalities across the San Francisco Bay Area. The mitigation measures focus on hazards such as earthquake, fire, flood, and tsunami (ABAG 2011). The ABAG hazard mitigation planning process provided local governments with the tools necessary to meet federal hazard mitigation planning requirements, and this regional template has been used by numerous counties and cities within the ABAG planning area, including Union City.

San Mateo County Hazard Mitigation Plan

In August 2016, the Menlo Park City Council adopted a resolution approving an update to the Menlo Park Local Hazard Mitigation Plan Annex to the San Mateo County Hazard Mitigation Plan. In 2015 San Mateo County jurisdictions teamed together to prepare an updated countywide hazard mitigation plan. Chapter 10 of the San Mateo County Hazard Mitigation Plan addresses wildfire in the county and does not identify the population of Menlo Park as a population at high risk from wildland fire (San Mateo County 2016).

3.6.3 Impact Analysis

Methodology

The assessment of impacts related to wildfire hazards and risks were evaluated using fire hazard severity zone mapping for San Mateo County (CAL FIRE 2007), aerial imagery, and topographic mapping. Additionally, weather patterns related to prevailing winds and precipitation trends were evaluated as they relate to the spread and magnitude of wildfire.

Significance Thresholds

Based on Appendix G to the *CEQA Guidelines*, as updated in December 2018, impacts related to wildfire would be significant if the project would be located in or near SRAs or lands classified as Very High Fire Hazard Severity Zones, and would:

1 Substantially impair an adopted emergency response plan or emergency evacuation plan

2 Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire

3 Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment

4 Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes

5 Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires

Project Impacts and Mitigation Measures

Threshold 1

Substantially impair an adopted emergency response plan or emergency evacuation plan.

Impact WFR-1	Recreational improvements under the Landscape Plan would be designed to meet all emergency evacuation requirements and would not impair the City's Emergency Operation Plan. Impacts related to emergency access and response would be less than significant.

Phases I, II, and III

The City of Menlo Park Emergency Operation Plan (EOP) describes how the City will manage and coordinate resources and personnel responding to emergency situations (Menlo Park 2011). The goals of the EOP are to provide effective safety measures and reduce property loss; provide the rapid resumption of basic services; and provide accurate documentation and records required for cost recovery efforts. The proposed recreational improvements would not alter existing hazardous conditions on the site, including wildfire hazards, in a way that would impair implementation of the EOP.

The design of the Landscape Plan also would ensure emergency vehicle access to the site. Emergency access to Flood County Park is available through the main gate and the fire access entryway at the Iris Lane gate. The Landscape Plan would maintain these emergency access points, and park users would still be able to evacuate through the main gate and other pedestrian gateways. Furthermore, the project would not involve modification of Bay Road and other nearby roadways that provide emergency access in Menlo Park. The project site also is not located in or near a SRA or a Very High Fire Hazard Severity Zone. Therefore, the proposed recreational improvements would not substantially impair an adopted emergency response plan or emergency evacuation plan, and this impact would be less than significant.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Threshold 2

Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.

Impact WFR-2	Flood County Park is not located in a wildfire risk area and would not be altered in a way that would exacerbate fire risk. Redevelopment of the park would maintain the relatively flat topography and wildfire risk would not be increased by wind patterns. Impacts related to wildfire risks would be less than significant.

Phases I, II, and III

The risk of wildfires occurring in or near the project site is low due to the site's flat topography and location in an urbanized setting in Menlo Park. The San Mateo County Hazard Mitigation Plan ranks wildfire as the lowest hazard risk for the area (San Mateo County 2011). Although Flood County Park contains large trees and other vegetative areas that may be susceptible to wildland fire, the project would not increase the number of trees that could provide fuel for fire. As described above, prevailing winds in Menlo Park are generally westerly to northwesterly (CARB 1984), moving west to east across the City. The prevailing winds would move wildfire from areas of high risk in the County west of the site and the related smoke and air pollutants eastward toward developed areas of Menlo Park. However, the project would not introduce a new land use that could exacerbate fire risk due to slope, prevailing wind, or vegetative conditions. Furthermore, the park is not located in or near a SRA or a Very High Fire Hazard Severity Zone. Therefore, the project would not exacerbate wildfire risks on the site due to slope, prevailing winds, or other factors.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Threshold 3

Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.

Impact WFR-3	Flood County Park would result in development on the project site in an urbanized area where infrastructure and roads currently exist. Installation and maintenance of new utility infrastructure would not exacerbate fire risk. Impacts would be less than significant.

Phase I

During Phase I of the Landscape Plan new utility lines including water, electric gas, and greywater piping would be installed. These features would be constructed in Flood County Park and accessed from existing infrastructure inside and outside the park in currently developed areas. Because this development would occur in urbanized areas where large tracts of vegetation cover are not present, the installation and maintenance of utility lines would not exacerbate the risk of wildfire. This impact would be less than significant.

Phases II and III

Phase II and III of the Landscape Plan would include development of restrooms and a focal element, such as a pump feature, that may require utilities. For example, new restrooms could require new piping or an emergency water source. Similar to Phase I, project implementation under Phases II and III would be located on the project site in an urbanized area. Because this development would occur in urbanized areas where large tracts of vegetation cover are not present, the installation and maintenance of utility lines would not exacerbate the risk of wildfire. This impact would be less than significant.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Thresholds 4 and 5

Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

Impact WFR-4	Being located in a relatively flat urbanized area at low risk of fires, the project would not expose people or structures to risks from downslope or downstream post-fire impacts. This impact would be less than significant.

Phases I, II, and III

Severe wildfires damage the forest or shrub canopy, the plants below, as well as the soil. This can result in increased runoff after intense rainfall, which can put homes and other structures below a burned area at risk of localized floods and landslides. The project site and areas surrounding the project site are relatively flat and the project site is not located in an area identified with a high fire risk (CAL FIRE 2007, 2008). In addition, the area surrounding the project site is developed with minimal wildfire fuels and vegetation cover prone to ignition. If a structural fire or large urban fire were to occur near the project site the risk of flooding or landslides afterward would be negligible because of the nearly flat topography and because little soil would be exposed due to the developed conditions. In addition, Flood County Park is not identified in the San Mateo County Hazard Mitigation Plan as a facility at high risk of wildfire (San Mateo County 2016). The Hazard Mitigation Plan ranks wildfire as the lowest hazard risk for the area. This impact would be less than significant.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

This impact would be less than significant without mitigation.

Cumulative Impacts

Cumulative development in the project vicinity would not increase the risk of wildfire because the surrounding area is already urbanized and at low risk of fires. New development would consist of redevelopment or infill development that would reduce wildfire fuel such as trees and vegetation. Therefore, cumulative development would have less than significant impacts related to exacerbating fire risk, and the proposed project would not considerably contribute to this risk.

4 Alternatives

This section identifies alternatives to the proposed Landscape Plan and evaluates their potential environmental impacts. Through comparison of these alternatives to the proposed project, the relative environmental advantages and disadvantages of each are weighed and analyzed.

As required by Section 15126.6 of the *CEQA Guidelines*, this section examines a reasonable range of alternatives. Not every conceivable alternative must be addressed, nor do infeasible alternatives need to be considered (*CEQA Guidelines* Section 15126.6(a)). Based on the *CEQA Guidelines*, several factors need to be considered in determining the range of alternatives to be analyzed in the EIR and the level of analytical detail that should be provided for each alternative. These factors include: (1) the nature of the significant impacts of the proposed project, (2) the ability of alternatives to avoid or reduce the project's significant impacts, (3) the ability of the alternatives to meet the objectives of the proposed project, and (4) the feasibility of the alternatives.

The discussion of alternatives must focus on alternatives capable of either avoiding or substantially lessening any significant environmental effects of the project, even if the alternative would impede, to some degree, the attainment of the project objectives or would be more costly (*CEQA Guidelines* Section 15126.6(b)). The analysis of alternatives need not be presented in the same level of detail as the assessment of the proposed project. Section 15126.6 of the *CEQA Guidelines* states that the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency or other plans or regulatory limitations, and jurisdictional boundaries.

The analysis in this EIR shows that the proposed Landscape Plan would result in a significant and unavoidable impact with respect to traffic congestion and traffic noise; all other impacts of the project would either be less than significant or could be mitigated to a less than significant level. A Reduced Athletic Programming Alternative (Alternative 2) is intended to reduce the project's significant and unavoidable impact from traffic congestion to the extent feasible, by prohibiting programmed use of athletic fields during P.M. peak traffic hours. In addition, a Multi-Use Field Alternative (Alternative 3) is intended to consolidate athletic activities that generate noise farther from residences adjacent to Flood County Park, reducing the project's already less than significant impact from on-site operational noise.

The following alternatives are evaluated in this section:

- Alternative 1: No Project (no change to existing conditions)
- Alternative 2: Reduced Athletic Programming
- Alternative 3: Multi-Use Field

Table 39 provides a summary comparison of the development characteristics of the project and the alternatives. A more detailed description of the alternatives is included in the impact analysis for each alternative.

Table 39 Comparison of Project Alternatives' Buildout Characteristics

Characteristic	Alternatives			
	Proposed Project	No Project	Reduced Athletic Programming	Multi-Use Field
Athletic Fields	Reconstructed ballfield New soccer/lacrosse field	Existing ballfield closed indefinitely	Reconstructed ballfield New soccer/lacrosse field	Multi-use field for softball, soccer, lacrosse
Area of Phase I Grading	9 acres	None	9 acres	7-9 acres
Timing of Programmed Athletic Activities	Full park hours	None	Morning and afternoon park hours except for 4-6 P.M. on weekdays	Full park hours

Among the alternatives shown in Table 39, this section also identifies the Environmentally Superior Alternative as required by the *CEQA Guidelines*.

As indicated above, project alternatives should feasibly be able to attain "most of the basic objectives of the project" (Section 15126.6(a) of the *CEQA Guidelines*), even though implementation of the project alternatives might, to some degree, impede the attainment of those objectives or be more costly (Section 15126.6(b) of the *CEQA Guidelines*). The following are the project objectives as described in Section 2, *Project Description*.

- To repair and update park features and core infrastructure components
- To meet demand for active recreation facilities in San Mateo County by increasing offerings of sports
- To provide a variety of uses for a range of user groups, including youth
- To optimize preservation of oak woodland

4.1 Alternatives Considered but Rejected

In addition to the Reduced Athletic Programming and Multi-Use Field alternatives, the County considered two other options for alternatives analysis. One option was to swap the proposed placement of the reconstructed ballfield and the new soccer/lacrosse field. This alternative site layout was considered with the intention of reducing the exposure of adjacent residents to noise from soccer and lacrosse activity. Whereas the proposed soccer/lacrosse field would be located approximately 100 feet away from the backyards of the nearest residences, the swapped field would be approximately 150 feet away from the nearest residences. The field-swapping alternative was rejected primarily because it is infeasible. The new ballfield would be constructed over two existing concrete hatches within the San Francisco Public Utilities Commission's (SFPUC) pipeline right-of-way. First, the County would have to import additional soil to raise the new field to the level of the concrete hatches, which provide access to the pipelines. Second, to protect the safety of recreational users, grass or artificial plugs would need to be installed above the hatches. The County anticipates that SFPUC would not approve this restriction to pipeline access in its right-of-way. Finally, the Multi-Use Field Alternative would accomplish the same purpose of reducing noise exposure, without necessitating more grading or interfering with pipeline access.

The County also considered an alternative to increase preservation of natural and cultural resources. This resource-preservation alternative would remove the proposed soccer/lacrosse field to protect an existing grove of redwood trees and retain existing adobe structures. The primary intention would be to retain the historic feeling associated with adobe structures at Flood County Park. However, since publishing a Notice of Preparation of a Draft EIR in November 2016, the County has amended the Landscaped Plan to increase adobe preservation. When that notice was issued, the Landscape Plan called for partial demolition of the adobe administrative office building and complete demolition of an adobe maintenance building. The County has since revised the Landscape Plan to preserve these features and to repair the administrative office building for seismic stability. With these changes to the Landscape Plan, impacts related to cultural resources would be less than significant, as discussed in Section 4.4, *Cultural Resources*, of the original EIR. In addition, impacts to protected trees would be less than significant with mitigation, as discussed in Section 4.3, *Biological Resources*, of the original EIR. Because the currently proposed project would not have significant impacts on biological or cultural resources after mitigation, a resource-preservation alternative would not be necessary to analyze.

4.2 Alternative 1: No Project

This alternative assumes that the proposed Landscape Plan is not implemented and that the County continues operating and maintaining Flood County Park in its current condition. No existing elements would be removed or demolished, and no new structures or recreational elements would be constructed. It is assumed that, for safety reasons, the existing ballfield would remain indefinitely closed for use. Consistent with the recent trend of steadily increasing visitorship since a temporary closure of the park in 2011, it is likely that the number of park users and use of existing recreational facilities would continue to grow in the future.

Because the No Project Alternative would maintain Flood County Park in its current conditions, it would not alter existing residential views, visual resources, or cultural and paleontological resources. While the project would require mitigation to reduce aesthetic and cultural impacts to less than significant, this alternative would have no impact on these issue areas. Without the construction of proposed recreational improvements, the No Project Alternative would have no impact on nesting birds or roosting bats from vegetation removal, and no impact on air quality from construction emissions. Mitigation measures to protect biological resources and air quality would be unnecessary. By not constructing new athletic facilities, the No Project Alternative also would have no impact related to athletic noise or traffic congestion from athletic participants queuing at the entrance gate. This would avoid the need for mitigation to restrict the timing of programmed athletic events and to implement new parking fee collection practices. Although vehicle trips to and from the park would continue to incrementally increase, the No Project Alternative would avoid the Landscape Plan's significant and unavoidable impact related to traffic noise. This alternative also would not involve energy consumption for construction activities and would not increase on-site energy consumption during operation of the park. Therefore, impacts related to energy use would still be less than significant.

The continuation of existing conditions at Flood County Park may result in infrequent disturbance of neighbors from the use of sound amplification equipment at the park, occasional shortages in on-street parking capacity from park visitors, and safety concerns for bicyclists and pedestrians. Mitigation measures to limit sound amplification, install bicycle storage on-site, and post signage on Bay Road for pedestrians would still be applicable. Nevertheless, the No Project Alternative's overall impacts would be lower than those of the proposed project.

The No Project Alternative also would not achieve most objectives of the proposed project. Although it would optimize preserve of oak woodland, this alternative would not repair or update park features, meet demand for additional active recreation facilities in San Mateo County, or provide a greater variety of uses for a range of user groups.

4.3 Alternative 2: Reduced Athletic Programming

4.3.1 Description

The Reduced Athletic Programming Alternative focuses on revising the programming of the recreational facilities to address identified adverse traffic impacts. This alternative would introduce the same new recreational facilities as planned for in the Landscape Plan, and in the same phases of construction, but would prohibit the organized use of proposed athletic fields on weekdays during afternoon peak hours (4-6 P.M.). This alternative is intended to limit active recreational use that contributes to existing traffic congestion during the afternoon rush hour. The proposed ballfield and soccer/lacrosse field would remain available for informal, non-programmed use at this time.

This alternative would meet the proposed objectives to repair and update park features, to provide a variety of use for a range of user groups, and to optimize preservation of oak woodland. However, by closing athletic fields to programmed use during weekday late afternoons, it would not meet demand for active recreation facilities to the same extent as would the proposed project.

4.3.2 Impact Analysis

Aesthetics

Similar to the proposed Landscape Plan, this alternative would involve the installation of 20-to-30-foot netting around the soccer/lacrosse field to retain lacrosse balls and protect the safety of nearby people. Because of its height, the netting could be a prominent feature in residential views of Flood County Park, especially from adjacent properties on Del Norte Avenue. Mature trees in the eastern part of the park, which enhance the privacy of adjacent residences on Del Norte Avenue, also would be removed to clear room for the soccer/lacrosse field. Like the proposed project, the impact on residential views and privacy would be less than significant with implementation of Mitigation Measure AES-1 to use athletic netting with neutral colors and Mitigation Measure BIO-2(a) to replace removed mature trees along residential property lines.

The Reduced Athletic Programming Alternative would result in the loss of the same number of scenic mature trees as would the proposed project. Ground disturbance during construction also could encroach on the root zone of remaining mature trees, impairing their health. Therefore, similar to the project, the impact on scenic resources would be less than significant with implementation of Mitigation Measures BIO-3(a) and BIO-3(b) to replace protected trees once removed and to avoid the root zone of remaining protected trees during construction.

Air Quality

The Reduced Athletic Programming Alternative would involve the same scale of demolition, site preparation, grading, and construction as would the proposed project. Therefore, construction emissions also would not exceed BAAQMD’s significance thresholds and would have a less than significant impact on air quality. Implementation of BAAQMD’s basic construction mitigation measures and reduction measures for NO_x and fugitive dust would still be recommended to further reduce emissions.

During the operation of new recreational elements, the Reduced Athletic Programming Alternative would substantially decrease the number of vehicle trips associated with athletic events by prohibiting programmed athletic activities during weekday P.M. peak hours. This restriction in athletic use relative to the project would reduce emissions of air pollutants from vehicle trips. Operational emissions would not exceed BAAQMD's significance thresholds. Therefore, this alternative would further reduce the project's already less than significant operational impact on air quality.

Similar to the proposed project, this alternative would lead to an increase in recreational users who may be exposed to toxic air contaminants (TACs) from traffic on U.S. 101. However, it is expected that, at a maximum, park users would only visit for a couple of hours per day (or even per week). Due to this low duration of exposure, park users would not be exposed to TACs for long periods of time that would affect health. The impact from exposure to substantial pollutant concentrations would still be less than significant.

Biological Resources

Similar to the proposed project, the removal of trees, shrubs, and structures during the construction of recreational facilities could adversely affect nesting birds and roosting birds if present. The impact on special-status species would still be less than significant with implementation of Mitigation Measures BIO-1(a) and BIO-1(b) to conduct surveys to identify nesting birds and roosting bats and to protect such species if present.

Similar to the proposed project, this alternative would involve the removal of approximately 80 trees, including some heritage trees protected by the County. The County would prepare a permit application for the removal of protected trees and would be subject to Mitigation Measure BIO-2(a) to replace protected trees at a 2 to 1 ratio. Construction activities also could disturb the root zone of remaining protected trees, so Mitigation Measure BIO-2(b) would still be required to avoid and protect such trees. Like the proposed project, the impact on protected trees would be less than significant with implementation of these measures.

Cultural Resources

Both the proposed Landscape Plan and this alternative would largely preserve existing adobe buildings that contribute to Flood County Park's eligibility as an historical resource, while rehabilitating the adobe administrative office building for seismic safety. Because one adobe building, Restroom D, would be demolished, this alternative also would be subject to Mitigation Measure CUL-1(a) to document historical resources. In addition, Mitigation Measure CUL-1(b) would apply to ensure that rehabilitation of the administrative office building adheres to the Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings*. Therefore, the impact on historical resources would still be less than significant with implementation of these measures.

Similar to the proposed project, ground-disturbing activities for the construction of recreational elements could result in the discovery of unanticipated archaeological resources, human remains, or fossils. Mitigation Measures CUL-2(a), CUL-2(b), and CUL-3 would be applicable to protect such resources in the event of their discovery. These impacts would still be less than significant with mitigation.

Energy

Similar to the proposed project, this alternative would consume energy for the construction and operation of new recreational facilities at Flood County Park. The scale of construction activity and associated energy use would be similar to that of the Landscape Plan. Prohibiting athletic events during afternoon peak hours on weekdays would reduce motor vehicle trips, and associated fuel consumption, to and from the park. However, these trips would effectively be displaced to events at other destinations with athletic fields in San Mateo County. Overall fuel consumption would not substantially differ from that caused by the proposed project. Therefore, this alternative would still have less than significant impacts related to energy use.

Geology and Soils

Similar to the proposed project, this alternative would not include construction of habitable structures and would adhere to applicable California Building Codes for the safety of uninhabited structures like the adobe administrative office building. Therefore, impacts from the exposure of people or structures to seismic-related hazards and expansive soils would still be less than significant. Although soil disturbance during construction also could result in erosion, compliance with existing regulations, including the NPDES Construction General Plan, would minimize the potential for erosion. Therefore, the impact related to erosion would also be less than significant.

Greenhouse Gas Emissions

The Reduced Athletic Programming Alternative would involve the same scale of demolition, site preparation, grading, and construction as would the proposed project. Therefore, construction-period GHG emissions would be equivalent to those of the project. During the operation of new recreational elements, this alternative would substantially reduce vehicle trips associated with athletic events by prohibiting programmed athletic activities in weekday P.M. peak hours. This restriction in athletic use relative to the project would reduce emissions of air pollutants from vehicle trips. Similar to the project, operational emissions would not exceed BAAQMD's significance thresholds. Therefore, this alternative would further reduce the project's already less than significant impact on climate change from GHG emissions.

Hydrology and Water Quality

Similar to the proposed project, storm water runoff from disturbed soils during construction could lead to sedimentation. However, because ground disturbance would cover more than one acre, this alternative would also be subject to erosion control requirements stipulated in the NPDES Construction General Permit. Adherence to the County's MS4 regulations and landscaping standards would protect water quality during the operation of recreational elements. Therefore, this alternative would still have a less than significant impact on water quality.

Phases I through III of this alternative would introduce a similar amount of grading activity and new impervious surfaces (e.g., basketball court, promenade, pathways) relative to the proposed project. Compliance with NPDES requirements for storm water discharges during construction and operation also would result in a less than significant impact related to changes in drainage patterns, storm water runoff flow, and storm water drainage systems. Because impervious surfaces would incrementally increase, this alternative would not substantially affect groundwater recharge. Like the project, this alternative would be served by water supplied by the SFPUC's Hetch Hetchy

Regional Water System, rather than by local groundwater. Therefore, the impact on groundwater supplies or recharge would still be less than significant.

Noise

This alternative would involve construction of the same recreational elements as the proposed Landscape Plan, in the same layout at Flood County Park. Construction would generate similarly high noise levels on and adjacent to the project site. However, construction noise would be temporary, and adherence to the County’s allowed hours of construction would prevent noise disturbance during sensitive evening and nighttime hours. Therefore, the impact from construction noise would still be less than significant.

Similar to the proposed project, grading activity for proposed recreational elements would generate groundborne vibration. Because construction would occur inside the County’s allowed hours, it would not generate vibration when people normally sleep. Like for the project, construction vibration would not exceed levels that may cause structural damage to historic adobe buildings on-site. Therefore, this alternative would also have a less than significant vibration impact.

Since the Reduced Athletic Programming Alternative would involve construction of the same recreational facilities as proposed, it would also add new sources of on-site operational noise from organized practices and games at athletic fields and performances at a gathering meadow. The prohibition on programmed athletic activity during weekday P.M. peak hours would avoid associated noise at that time. During scheduled events, however, noise from whistles, sound amplification equipment, or air horns could disturb nearby residents. Similar to the proposed project, the impact from on-site operational noise would be less than significant with implementation of Mitigation Measures N-3(a) and N-3(b) to restrict the loudest equipment without an approved special event permit and to further restrict the timing of athletic events.

Relative to the proposed project, this alternative would substantially reduce new vehicle trips during weekday P.M. peak hours by prohibiting organized athletic events. This would further reduce the project’s incremental increase in weekday traffic volumes on nearby roadways, under existing plus project conditions. However, reducing vehicle trips during weekday P.M. peak hours would not affect trips to and from Flood County Park during Saturday peak hours, which would still increase ambient noise by at least 1 dBA L_{eq}. This increase in traffic noise would exceed the applicable standard. Therefore, this alternative would not avoid the Landscape Plan's significant and unavoidable impact on noise-sensitive receptors. It would also have a considerable contribution to a significant cumulative impact from weekend traffic noise.

Transportation and Circulation

Traffic Congestion

The Reduced Athletic Programming Alternative is intended to generate fewer new vehicle trips on already congested roadways during weekday P.M. peak hours. In that time frame, the alternative would prevent new trips associated with organized athletic events while, similar to the proposed project, facilitating incremental growth in trips for passive recreation. Table 40 shows the change in delay and LOS at nearby intersections under existing conditions.

Table 40 Existing and Existing Plus Alternative 2 Intersection Level of Service During P.M. Peak Hours

	Existing Conditions P.M. Peak		Existing Plus Project P.M. Peak		Existing Plus Alternative P.M. Peak	
Study Intersection	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
Bay Road/Marsh Road	16.0	B	17.0	B	16.3	B
Bay Road/Ringwood Avenue	21.2	C	35.7	D	25.9	D
Addition of Northbound Left-Turn Lane	–	–	15.3	C	13.8	B
Bay Road/Willow Road	>80*	F	>80*	F	>80*	F

Note: Delay is measured in average seconds per vehicle; LOS = Level of Service.
* LOS is based on unserved demand.
Source: W-Trans 2019; see Appendix D

As shown in Table 40, the Reduced Athletic Programming Alternative would substantially reduce traffic congestion at the intersection of Bay Road and Ringwood Avenue during weekday P.M. peak hours, relative to the Landscape Plan. However, traffic delay would still exceed the City of Menlo Park's threshold of LOS D for unsignalized intersections. This alternative would not avoid the project's significant and unavoidable impact under existing plus project conditions.

Table 41 and Table 42 show that traffic delay would also still exceed LOS D at this intersection under near-term 2021 and cumulative 2040 conditions. Similar to the proposed project, a potential mitigation measure to install at northbound left-turn lane on Ringwood Avenue, approaching Bay Road, may be infeasible. Therefore, this alternative would still have a significant and unavoidable traffic impact during weekday P.M. peak hours under near-term 2021 and cumulative 2040 conditions. Mitigation Measure T-1 also would be applicable to minimize queuing of vehicles on Bay Road by facilitating on-site parking.

Because the Reduced Athletic Programming Alternative would not reduce new trip generation on weekends, relative to the Landscape Plan, traffic delay under cumulative 2040 conditions would still reach LOS D at the intersection of Bay Road and Ringwood Avenue during Saturday peak hours. Therefore, this alternative would also have a significant and unavoidable traffic impact during Saturday peak hours under cumulative 2040 conditions.

Table 41 Near-Term 2021 and Near-Term 2021 Plus Alternative 2 Intersection Level of Service During P.M. Peak Hours

Study Intersection	Near-Term Conditions P.M. Peak		Near-Term Plus Project P.M. Peak		Near-Term Plus Alternative P.M. Peak	
	Delay	LOS	Delay	LOS	Delay	LOS
Bay Road/Marsh Road	19.1	B	19.9	B	19.2	B
Bay Road/Ringwood Avenue	34.4	D	48.6	E	36.9	E
Addition of Northbound Left-Turn Lane	15.0	C	17.0	C	15.1	C
Bay Road/Willow Road	>80*	F	>80*	F	>80*	F

Note: Delay is measured in average seconds per vehicle; LOS = Level of Service.

* LOS is based on unserved demand.

Source: W-Trans 2019; see Appendix D

Table 42 Cumulative 2040 and Cumulative 2040 Plus Alternative 2 Intersection Level of Service During P.M. Peak Hours

Study Intersection	Cumulative 2040 Conditions P.M. Peak		Cumulative 2040 Plus Project P.M. Peak		Cumulative 2040 Plus Alternative P.M. Peak	
	Delay	LOS	Delay	LOS	Delay	LOS
Bay Road/Marsh Road	29.1	C	34.9	C	32.6	C
Bay Road/Ringwood Avenue	108.9	F	**	F	**	F
Addition of Northbound Left-Turn Lane	24.7	C	34.0	C	28.8	C
Bay Road/Willow Road	>80*	F	>80*	F	>80*	F

Note: Delay is measured in average seconds per vehicle; LOS = Level of Service.

* LOS is based on unserved demand.

** delays exceeds 120 seconds.

Source: W-Trans 2019; see Appendix D

Transit, Bicycle, Pedestrian Facilities

This alternative would not generate more transit, bicycle, or pedestrian trips than would the proposed project and therefore would not decrease the performance of existing or planned transit, bicycle, or pedestrian facilities. These facilities would remain adequate to serve visitors to Flood County Park and other destinations. However, similar to the project, the lack of bicycle storage on-site and a sidewalk gap on Bay Road could result in unsafe conditions for bicyclists and pedestrians accessing the park. These impacts would be less than significant with implementation of Mitigation Measure T-5(a) to install bicycle storage on-site and Mitigation Measure T-5(b) for the County to install signage for pedestrians.

Parking Capacity

Since this alternative would not generate additional vehicle trips relative to the proposed Landscape Plan, the on-site parking supply would remain adequate. However, new vehicle trips could still result in increased parking on local residential streets. Similar to the project, this impact on parking capacity would be less than significant with implementation of Mitigation Measure T-1 to facilitate on-site parking and reduce the incentive for on-street parking and Mitigation Measure T-6 to discourage on-street parking by visitors to Flood County Park.

Tribal Cultural Resources

Like the proposed project, the construction of recreational facilities would involve surface excavation with the potential to unearth previously unidentified tribal cultural resources. This impact would also be less than significant with implementation of Mitigation Measure TCR-1 for the protection of such resources in the event of their discovery during construction.

Wildfire

Similar to the proposed project, this alternative would retain adequate emergency access to the park through the main gate and the fire access entryway at the Iris Lane gate, while not modifying Bay Road and other nearby roadways that provide emergency access in Menlo Park. The project site also is not located in or near a SRA or a Very High Fire Hazard Severity Zone. Therefore, new recreational facilities would not expose park users to substantial risks from wildfire. Impacts related to wildfire would still be less than significant.

4.4 Alternative 3: Multi-Use Field

4.4.1 Description

The Multi-Use Field Alternative would introduce a new multi-use athletic field in the location of the existing ballfield, while eliminating the Landscape Plan’s proposed soccer/lacrosse field. A multi-use field would cater to softball, soccer, and lacrosse without the need for additional separate athletic fields. This field would fit approximately within the dimensions of the existing ballfield, with an estimated width of 400 feet and a length of 360 feet. The Multi-Use Field Alternative would retain all other planned recreational elements in the Landscape Plan. In the eastern part of the park, the alternative could potentially involve demolition of the existing pétanque and tennis courts and construction of new passive recreational elements in lieu of the proposed soccer/lacrosse field.

This alternative would meet all four proposed objectives: to repair and update park features, to meet demand for active recreational facilities in San Mateo County, to provide a variety of use for a range of user groups, and to optimize preservation of oak woodland. It would meet demand for active recreational facilities to a lesser degree than would the proposed project because the multi-use field would have less capacity to host simultaneous athletic events.

4.4.2 Impact Analysis

Aesthetics

Similar to the proposed Landscape Plan, this alternative could involve the installation of 20-to-30-foot netting around the multi-use field to retain lacrosse balls and protect the safety of nearby people. This netting would be installed as close as an estimated 150 feet from residences on Hedge Road and Van Buren Road and an estimated 300 feet from residences on Del Norte Avenue. Because of its height, the netting could be a prominent feature in residential views of Flood County Park, especially from two-story residences. Mature trees in the eastern part of the park, which enhance the privacy of adjacent residences on Del Norte Avenue, also could be removed for the installation of additional passive recreational facilities. Like the proposed project, the impact on residential views and privacy would be less than significant with implementation of Mitigation Measure AES-1 to use athletic netting with neutral colors and Mitigation Measure BIO-2(a) to replace removed mature trees along residential property lines.

The Multi-Use Field Alternative could reduce the loss of mature trees that serve as scenic resources at Flood County Park. If the existing pétanque and tennis courts were left in place, the County would retain a grove of redwood trees between these facilities in the eastern corner of the park. However, other mature trees would still be removed for construction of other facilities like volleyball courts and the multi-use field. Ground disturbance during construction also could encroach on the root zone of remaining mature trees, impairing their health. Therefore, similar to the project, the impact on scenic resources would be less than significant with implementation of Mitigation Measures BIO-3(a) and BIO-3(b) to replace protected trees once removed and to avoid the root zone of remaining protected trees during construction. This alternative could further reduce this less than significant impact if mature trees near the existing tennis courts are preserved.

Air Quality

As shown in Table 39, whereas Phase I of the proposed Landscape Plan would involve grading of an estimated nine acres for the construction of athletic fields, the Multi-Use Field Alternative would require grading of an estimated seven to nine acres for this phase. If no new recreational elements are constructed in lieu of the proposed soccer/lacrosse field, then the area of grading in Phase I would decrease by approximately two acres. Therefore, this alternative could incrementally reduce emissions of air pollutants during construction. Like the project, construction emissions would not exceed BAAQMD's significance thresholds and would have a less than significant impact on air quality. Implementation of BAAQMD's basic construction mitigation measures and reduction measures for NO_x and fugitive dust would still be recommended to further reduce emissions.

During the operation of new recreational elements, this alternative would incrementally reduce vehicle trips associated with athletic events. Whereas the proposed reconstructed ballfield and soccer/lacrosse field would enable simultaneous athletic events on each field, it is assumed that a multi-use field would typically accommodate one event at a time. Relative to the project, this change in athletic capacity would incrementally reduce emissions of air pollutants from vehicle trips. Similar to the project, operational emissions would not exceed BAAQMD's significance thresholds and would have a less than significant impact on air quality.

Similar to the proposed project, this alternative would lead to an increase in recreational users who may be exposed to toxic air contaminants (TACs) from traffic on U.S. 101. However, it is expected that, at a maximum, park users would only visit for a couple of hours per day (or even per week). Due to this low duration of exposure, park users would not be exposed to TACs for long periods of time that would affect health. The impact from exposure to substantial pollutant concentrations would still be less than significant.

Biological Resources

Similar to the proposed project, the removal of trees, shrubs, and structures during the construction of recreational facilities could adversely affect nesting birds and roosting birds if present. The impact on special-status species would still be less than significant with implementation of Mitigation Measures BIO-1(a) and BIO-1(b) to conduct surveys to identify nesting birds and roosting bats and to protect such species if present.

As discussed in Section 4.3, *Biological Resources*, of the original EIR, it is estimated that construction of the proposed recreational elements would involve the removal of approximately 80 trees. Because this alternative could preserve the grove of redwood trees between the existing pétanque and tennis courts, it could incrementally reduce the removal of County-protected trees. However, similar to the proposed project, the County would prepare a permit application for the removal of protected trees and would be subject to Mitigation Measure BIO-2(a) to replace protected trees at a 2 to 1 ratio. Construction activities also could disturb the root zone of remaining protected trees, so Mitigation Measure BIO-2(b) would still be required to avoid and protect such trees. Like the proposed project, the impact on protected trees would be less than significant with implementation of these measures. This alternative could further reduce the less than significant impact if mature trees near the existing tennis courts are preserved.

Cultural Resources

Both the proposed Landscape Plan and this alternative would preserve existing adobe buildings that contribute to Flood County Park's eligibility as an historical resource, while rehabilitating the adobe administrative office building for seismic safety. Similar to the proposed project, this alternative would involve demolition of one adobe building (Restroom D) to clear room for the proposed soccer/lacrosse field in the eastern corner of the park but would preserve other adobe buildings at the park. Also similar to the proposed project, this alternative would be subject to Mitigation Measure CUL-1(a) to document historical resources upon demolition of Restroom D and to Mitigation Measure CUL-1(b) to ensure that rehabilitation of the administrative office building adheres to the Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings*. Therefore, the impact on historical resources would still be less than significant with implementation of these measures, as applicable.

Similar to the proposed project, ground-disturbing activities for the construction of recreational elements could result in the discovery of unanticipated archaeological resources, human remains, or fossils. Mitigation Measures CUL-2(a), CUL-2(b), and CUL-3 would be applicable to protect such resources in the event of their discovery. These impacts would still be less than significant with mitigation.

Energy

Similar to the proposed project, this alternative would consume energy for the construction and operation of new recreational facilities at Flood County Park. The scale of construction activity and associated energy use would be similar to that of the Landscape Plan. By constructing only one athletic field, the Multi-Use Field Alternative would accommodate fewer simultaneous athletic events than would the proposed ballfield and soccer/lacrosse field. Therefore, it would generate incrementally fewer new vehicle trips for active recreation than would the Landscape Plan. However, these trips would effectively be displaced to events at other destinations with athletic fields in San Mateo County. Overall fuel consumption would not substantially differ from that caused by the proposed project. Therefore, this alternative would still have less than significant impacts related to energy use.

Geology and Soils

Similar to the proposed project, this alternative would not include construction of habitable structures and would adhere to applicable California Building Codes for the safety of uninhabited structures like the adobe administrative office building. Therefore, impacts from the exposure of people or structures to seismic-related hazards and expansive soils would still be less than significant. Although soil disturbance during construction also could result in erosion, compliance with existing regulations, including the NPDES Construction General Plan, would minimize the potential for erosion. Therefore, the impact related to erosion would also be less than significant.

Greenhouse Gas Emissions

As shown in Table 39, whereas Phase I of the proposed Landscape Plan would involve grading of an estimated nine acres for the construction of athletic fields, the Multi-Use Field Alternative would require grading of an estimated seven to nine acres for this phase. If no new recreational elements are constructed in lieu of the proposed soccer/lacrosse field, then the area of grading in Phase I would decrease by approximately two acres. Therefore, this alternative could incrementally reduce greenhouse gas emissions (GHGs) associated with construction equipment.

During the operation of new recreational elements, this alternative also would incrementally reduce vehicle trips associated with athletic events. Whereas the proposed reconstructed ballfield and soccer/lacrosse field would enable simultaneous athletic events on each field, it is assumed that a multi-use field would typically accommodate one event at a time. Relative to the project, this change in athletic capacity would incrementally reduce GHGs from vehicle trips. Like the project, GHG emissions would not hinder or delay achievement of State GHG reduction targets, and the alternative would be consistent with the County's Energy Efficiency Climate Action Plan. Therefore, the alternative's impact to climate change would still be less than significant.

Hydrology and Water Quality

Similar to the proposed project, storm water runoff from disturbed soils during construction could lead to sedimentation. However, because ground disturbance would cover more than one acre, this alternative would also be subject to erosion control requirements stipulated in the NPDES Construction General Permit. Adherence to the County's MS4 regulations and landscaping standards would protect water quality during the operation of recreational elements. Therefore, this alternative would still have a less than significant impact on water quality.

Phases I through III of this alternative would introduce a similar amount of grading activity and new impervious surfaces (e.g., basketball court, promenade, pathways) to the proposed project. Compliance with NPDES requirements for storm water discharges during construction and operation also would result in a less than significant impact related to changes in drainage patterns, storm water runoff flow, and storm water drainage systems. Because impervious surfaces would incrementally increase, this alternative would not substantially affect groundwater recharge. Like the project, this alternative would be served by water supplied by the SFPUC's Hetch Hetchy Regional Water System, rather than by local groundwater. Therefore, the impact on groundwater supplies or recharge would still be less than significant.

Noise

The Multi-Use Field Alternative could incrementally reduce construction noise relative to the proposed project. Whereas the project would involve demolition of existing tennis courts within approximately 40 feet of residents on Del Norte Avenue, this alternative could leave intact these courts and other existing facilities in the eastern corner of the park. Other construction activity, however, would take place at similar distances to noise-sensitive receptors as under the project: grading activity for utility work as close as 50 feet from residences south of Bay Road; grading activity at the southeastern edge of the park, approximately 80 feet from residences on Del Norte Avenue; and paving activity at new tennis courts, approximately 115 feet from those residences. As discussed in Section 3.4, *Noise*, the demolition of tennis courts could generate estimated noise levels of 86 dBA L_{eq} at the nearest residences, while other construction activity would cause noise levels up to an estimated 85 dBA L_{eq} at a distance of 50 feet from the source. These construction noise levels would not exceed those for the proposed project. Furthermore, construction activity would be temporary and would adhere to the County's allowed hours of construction, preventing noise disturbance during sensitive evening and nighttime hours. Therefore, the impact from construction noise would still be less than significant.

Grading activity for new recreational elements would generate groundborne vibration no closer to nearby residents than for the proposed project. Because construction would occur inside the County's allowed hours, it would not generate vibration when people normally sleep. Like for the project, construction vibration would not exceed levels that may cause structural damage to historic adobe buildings on-site. Therefore, this alternative would also have a less than significant vibration impact.

The Multi-Use Field Alternative is intended to increase the distance between nearby residents and organized athletic activities that generate noise at Flood County Park. While the proposed project would plan for construction of a soccer/lacrosse field an estimated 100 feet away from residents on Del Norte Avenue, this alternative would eliminate that proposed facility. In place of a reconstructed ballfield, this alternative would add a multi-use field that caters to softball, soccer, and lacrosse, located as close as approximately 150 feet from residents on Hedge Road and Van Buren Road and an estimated 300 feet from residences on Del Norte Avenue. Because the multi-use field would be about 50 feet farther from noise-sensitive receptors than would the soccer/lacrosse field, it is estimated that average noise from lacrosse and soccer games would decrease from 59-64 dBA L_{eq} to 56-61 dBA L_{eq} at the nearest receptors. At residences located approximately 300 feet away on Del Norte Avenue, such noise would decrease to 50-55 dBA L_{eq}. Despite this reduction in average noise levels, impulse noise from whistles, sound amplification equipment, or air horns at either athletic events or the gathering meadow could still disturb nearby residents. This alternative would further reduce the project's already less than significant impact from on-site operational noise with implementation of Mitigation Measures N-3(a) and N-3(b) to restrict the loudest equipment without an approved special event permit and to further restrict the timing of athletic events.

Relative to the proposed project, this alternative would incrementally reduce new vehicle trips because the multi-use field would accommodate fewer simultaneous athletic events. This would further reduce the project's incremental increase in traffic volumes on nearby roadways, under existing plus project conditions. However, trips to and from Flood County Park during Saturday peak hours would still increase traffic noise by more than 1 dBA L_{eq}, which would exceed the applicable standard. Therefore, this alternative would not avoid the Landscape Plan's significant and unavoidable impact on noise-sensitive receptors. It would also have a considerable contribution to a significant cumulative impact from traffic noise.

Transportation and Circulation

Traffic Congestion

The Multi-Use Field Alternative would generate incrementally fewer new vehicle trips for active recreation than would the proposed Landscape Plan because it would accommodate less simultaneous athletic events. It would generate a similar amount of trips associated with passive recreation at other proposed facilities. Despite incrementally reducing new vehicle trips, this alternative would not avoid the project's significant impacts at the intersection of Bay Road and Ringwood Avenue under existing, near-term 2021, or cumulative 2040 conditions. As discussed under Impact T-1 in Section 3.5, *Transportation and Circulation*, the addition of only 25 P.M. peak-hour trips would push operating conditions at this intersection from LOS C to D, causing an exceedance of the City of Menlo Park's traffic standards. Even one adult baseball or softball game would generate an estimated 30 P.M. inbound trips (Appendix D). Therefore, a reduction in simultaneous athletic events at the park would not be sufficient to retain LOS C conditions at the affected intersection. It would be necessary to eliminate athletic events during weekday P.M. peak hours to avoid a significant impact under existing conditions. Similar to the proposed project, a potential mitigation measure to install at northbound left-turn lane on Ringwood Avenue, approaching Bay Road, may be infeasible. Therefore, this alternative would still have significant and unavoidable traffic impacts under existing, near-term 2021, and cumulative 2040 conditions.

Transit, Bicycle, Pedestrian Facilities

This alternative would not generate more transit, bicycle, or pedestrian trips than would the proposed project and therefore would not decrease the performance of existing or planned transit, bicycle, or pedestrian facilities. These facilities would remain adequate to serve visitors to Flood County Park and other destinations. However, similar to the project, the lack of bicycle storage on-site and a sidewalk gap on Bay Road could result in unsafe conditions for bicyclists and pedestrians accessing the park. These impacts would be less than significant with implementation of Mitigation Measure T-5(a) to install bicycle storage on-site and Mitigation Measure T-5(b) for the County to install signage for pedestrians.

Parking Capacity

Since this alternative would not generate additional vehicle trips relative to the proposed Landscape Plan, the on-site parking supply would remain adequate. However, new vehicle trips could still result in increased parking on local residential streets. Similar to the project, this impact on parking capacity would be less than significant with implementation of Mitigation Measure T-1 to facilitate on-site parking and reduce the incentive for on-street parking and Mitigation Measure T-6 to discourage on-street parking by visitors to Flood County Park.

Tribal Cultural Resources

Like the proposed project, the construction of recreational facilities would involve surface excavation with the potential to unearth previously unidentified tribal cultural resources. This impact would also be less than significant with implementation of Mitigation Measure TCR-1 for the protection of such resources in the event of their discovery during construction.

Wildfire

Similar to the proposed project, this alternative would retain adequate emergency access to the park through the main gate and the fire access entryway at the Iris Lane gate, while not modifying Bay Road and other nearby roadways that provide emergency access in Menlo Park. The project site also is not located in or near a SRA or a Very High Fire Hazard Severity Zone. Therefore, new recreational facilities would not expose park users to substantial risks from wildfire. Impacts related to wildfire would still be less than significant.

4.5 Environmentally Superior Alternative

Table 43 compares the physical impacts for each of the alternatives to the physical impacts of the proposed project. The No Project Alternative would be the overall environmentally superior alternative since it would avoid all project impacts. However, the No Project Alternative would not achieve most project objectives as stated in Section 2, *Project Description*.

Among the park redevelopment options, Alternative 2 (Reduced Athletic Programming) would be the most environmentally superior relative to the proposed project. This alternative would substantially reduce vehicle trips associated with athletic activity, avoiding a significant and unavoidable impact on traffic congestion at the intersection of Bay Road and Ringwood Avenue during weekday P.M. peak hours under existing plus project traffic conditions. However, this impact would still be significant and unavoidable under cumulative traffic scenarios. The reduction in vehicle trips also would avoid the project’s significant and unavoidable impact from traffic noise, and its considerable contribution to a significant cumulative impact from traffic noise. In addition, reducing trips would incrementally decrease emissions of air pollutants and GHGs, further reducing the project’s less than significant impacts in these resource areas. This alternative would partially meet the proposed objectives but would not make athletic fields available on weekday late afternoons. Therefore, it would not meet demand for active recreation facilities to the same extent as would the proposed project.

Alternative 3 (Multi-Use Field) also would be environmentally preferable to the proposed project, although it would not avoid the project’s significant and unavoidable impacts related to traffic congestion and traffic noise. Without construction of the proposed soccer/lacrosse field near residences on Del Norte Avenue, this alternative would reduce people’s exposure to operational noise. This alternative would meet all four proposed objectives: to repair and update park features, to meet demand for active recreational facilities in San Mateo County, to provide a variety of use for a range of user groups, and to optimize preservation of oak woodland. It would meet demand for active recreational facilities to a lesser degree than would the proposed project because the multi-use field would have less capacity to host simultaneous athletic events.

Table 43 Impact Comparison of Alternatives

Issue	Proposed Project Impact Classification	Alternative 1: No Project	Alternative 2: Reduced Athletic Programming	Alternative 3: Multi-Use Field
Aesthetics	Less than Significant with Mitigation	+ (Less than Significant)	= (Less than Significant with Mitigation)	= (Less than Significant with Mitigation)
Air Quality	Less than Significant	+ (Less than Significant)	+/= (Less than Significant)	= (Less than Significant)
Biological Resources	Less than Significant with Mitigation	+ (Less than Significant)	= (Less than Significant with Mitigation)	= (Less than Significant with Mitigation)
Cultural Resources	Less than Significant with Mitigation	+ (Less than Significant)	= (Less than Significant with Mitigation)	= (Less than Significant with Mitigation)
Energy	Less than Significant	= (Less than Significant)	= (Less than Significant)	= (Less than Significant)
Geology and Soils	Less than Significant	+ (Less than Significant)	= (Less than Significant)	= (Less than Significant)
Greenhouse Gas Emissions	Less than Significant	+ (Less than Significant)	+/= (Less than Significant)	= (Less than Significant)
Hydrology and Water Quality	Less than Significant	+ (Less than Significant)	= (Less than Significant)	= (Less than Significant)
Noise	Significant and Unavoidable	+ (Less than Significant with Mitigation)	+/= (Significant and Unavoidable)	+/= (Significant and Unavoidable)
Transportation and Circulation	Significant and Unavoidable	+ (Less than Significant)	+/= (Significant and Unavoidable)	= (Significant and Unavoidable)
Tribal Cultural Resources	Less than Significant with Mitigation	+ (Less than Significant)	= (Less than Significant)	= (Less than Significant)
Wildfire	Less than Significant	= (Less than Significant)	= (Less than Significant)	= (Less than Significant)

+ Superior to the proposed project (reduced level of impact)
- Inferior to the proposed project (increased level of impact)
= Similar level of impact to the proposed project

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5.2 List of Preparers

RINCON CONSULTANTS, INC.

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W-TRANS

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Nick Bleich, Assistant Engineer

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Appendix A

Notice of Preparation (NOP) and Responses to the NOP

Notice of Preparation

POSTING
ONLY

MAY 08 2019

BESZ DE LA VEGA

TO:	State Clearinghouse, Office of Planning and Research; County Clerk - San Mateo County; and All Interested Parties	FROM:	County of San Mateo Parks Department 455 County Center – Fourth Floor Redwood City, CA 94063

Subject: **Notice of Preparation – Recirculated Draft Environmental Impact Report**

The County of San Mateo as the Lead Agency is issuing this notice of preparation (NOP) of a recirculated portion of the Environmental Impact Report (EIR) for the proposed Flood County Park Landscape Plan, a project pursuant to the California Environmental Quality Act (CEQA). The purpose of this notice of preparation is to inform the public and responsible and interested agencies about the project, the significant new information, and intent to prepare a recirculated portion of the EIR pursuant to *CEQA Guidelines* Section 15088.5.

Project Title: Flood County Park Landscape Plan

Project Applicant: County of San Mateo Parks Department

Project Location: The project site consists of the 24.5-acre Flood County Park, located at 215 Bay Road in the City of Menlo Park in San Mateo County. This neighborhood park includes two County-owned parcels totaling 21.3 acres and two linear parcels owned by the City and County of San Francisco as part of its right-of-way for the Hetch Hetchy Regional Water System. These linear parcels bisect Flood County Park, on an east-west axis. The park lies entirely within the City of Menlo Park. The Town of Atherton is located adjacent to and southwest of the park, across Bay Road. The park is located about 20 miles to the southeast of San Francisco.

Background: The County of San Mateo Parks Department (Parks) published a Final EIR for the Flood County Park Landscape Plan (proposed project) on the County's Reimagine Flood Park website in May 2018. Key concerns raised by neighbors on the Draft and Final EIR related to 1) projected growth in park visitation and use resulting from improvements accommodated under the Landscape Plan, including traffic impacts and parking demand, and 2) noise generated on-site from concurrent park events. County staff believes that these concerns warrant further analysis of the proposed project. The CEQA Guidelines were also updated in December 2018, adding two issue areas to the Appendix G checklist of environmental issues when analyzing a project's environmental impacts: wildfire and energy. Therefore, the County will revise and recirculate a limited portion of the May 2018 EIR that will rely on more conservative assumptions with regard to park visitation (i.e., assumptions that will more effectively capture the increased use that may result from the project and the effects associated with such use) and that will explicitly address potential wildfire and energy impacts.

Project Description: The proposed project consists of a Landscape Plan for the long-term redevelopment of San Mateo County's Flood County Park. On April 7, 2016, the County Parks and Recreation Commission voted to approve this plan as the Draft Preferred Alternative for improving Flood County Park. The Landscape Plan evolved through a series of community outreach efforts designed to identify community values, preferred uses, and site layout preferences.

It is anticipated that implementation of the Landscape Plan would occur in three phases: Phase I, Phase II, and Phase III. The Phase I improvements are expected to be completed in approximately the first two years. Table 1 lists the proposed recreational facilities in the Landscape Plan and their anticipated phasing:

Table 1
Proposed Recreational Facilities and Phasing

Phase	Improvements
Phase I	Baseball field replacement and bathroom
	Soccer/lacrosse field
	Two tennis courts
	Sand volleyball court replacement
	Basketball court
	Pump track
	Asphalt paths
	Adobe bathroom renovation
	Tree-lined promenade
	Drop off at playground area
	New utilities: water, electric, gas, greywater piping[1]
Phase II	Restrooms
	Demonstration gardens
	Playground replacement
	Individual picnic area renovations
	Gathering meadow (performance space)
Phase III	Conversion of adobe administrative building to open-air shade/market structure[2]
	Group picnic area renovations with shade shelters
	Completion of all pathways with exercise stations
	Gathering plazas
	Focal element (may incorporate existing water pump feature)

1. Purple piping may be installed for the future use of greywater.
2. The adobe administrative building is seismically unsafe as an enclosed, inhabited building, but would be partially preserved as an open-air market structure.

The largest recreational facilities would be sited in the northern portion of the park, where the existing ballfield would be reconstructed and the soccer/lacrosse field would be installed at the northeast corner, replacing the existing pétanque court and a portion of the existing tennis courts. The proposed athletic field improvements (i.e., a reconstructed ballfield and new soccer/lacrosse field) would increase use of the park relative to existing conditions. Organized activities at the athletic fields would occur no earlier than 9 a.m. and no later than 8 p.m. No additional lighting that would enable nighttime use of athletic facilities is proposed as part of the Landscape Plan, although path lights that could be manually turned on and off for special events may be installed.

Environmental Review Process: As described above under *Background*, the County prepared a Final EIR in May 2018 that evaluated the environmental effects of the proposed project. Three issues were raised by the public that warrant recirculation of the EIR: 1) the projected number of visitors at Flood County Park and resulting impacts related to traffic and parking, and 2) the combined effect of noise resulting from concurrent park events. The County will also evaluate the project's impacts related to wildfire and energy, consistent with the updated CEQA Guidelines. Therefore, the recirculated portion of the revised EIR will include only those chapters that are contemplated to change based on the more conservative assumptions for future use of the park, as well as new chapters for wildfire and energy impacts. Accordingly, the recirculated portion of the EIR will include changes to the Executive Summary, Introduction and Environmental Setting, Air Quality, Greenhouse Gas Emissions, Noise, Traffic, and Alternatives chapters, and new Wildfire and Energy chapters. All other issues were adequately addressed in the May 2018 EIR and do not merit further analysis. Therefore, these issues will not be included in the recirculated portion of the EIR.

The recirculated portion of the EIR will augment the May 2018 EIR for use as an informational document by government agencies and the public to aid in the planning and decision-making process. The recirculated portion of the EIR, in combination with unchanged portions of the May 2018 EIR, will disclose the potential environmental effects of the project and identify possible ways to reduce or avoid potentially significant impacts.

Public Scoping Process: Pursuant to the *CEQA Guidelines* Section 15082, this notice of preparation provides sufficient information describing the proposed project with respect to revisions to the June 2018 EIR. Pursuant to *CEQA Guidelines* Section 15082(b), your comments regarding the scope and content of the environmental analysis must be submitted no later than 30 days after receipt of this notice. The public review period is from May 8, 2019, until June 7, 2019. Please send your comments no later than June 7 directly to:

Sam Herzberg, AICP, Senior Planner
County of San Mateo Parks Department
455 County Center – Fourth Floor
Redwood City, CA 94063

Fax: (650) 599-1721
Email: sherzberg@smcgov.org

Date 5/8/19

Signature

Title Senior Planner, AICP, Parks Department

Telephone (650) 363-1823

Samuel Herzberg

From: Daniel Meehan <meehandaniel@hotmail.com>
Sent: Monday, June 10, 2019 3:42 PM
To: Samuel Herzberg
Subject: Flood Park NOP.

Dear Mr. Herzberg,

My concerns still remain. The amount of traffic generated by the proposed changes (in an area where traffic is currently problematic), the parking capacity for busy periods of time, and amount of noise generated from sporting events combined with general park usage. These will have a negative impact on the local neighborhoods quality of life.

I feel that leaving the park as is, or with small changes/enhancements would be the best approach. I use the park every day, I walk the trails and enjoy the natural aspects, the trees, the birds and the peaceful open space. On weekends during the warm months, the park takes on a nice party atmosphere, with many families celebrating birthdays, weddings, graduations, church services and general family gatherings.

I would also like to state, that walking in the park I have meet several neighbors (from the Flood Triangle, Atherton and Suburban/Lorelei Manor areas). And talking with them, they all question the need and wisdom of making these changes to what is currently a good adequate useful peaceful park.

I attached my email to the supervisors, from February of this year, it states my concerns regarding the Flood Reimagine project and the related EIR).

Thank you
Respectfully

Daniel Meehan

****

This document is feedback to the Draft EIR for Reimagine Flood Park, and the Reimagine Flood Park project.

My name is Daniel Meehan, I live at 1023 Del Norte Avenue. I have lived here with my wife Alice Newton and our children, Carmela and Kenny for 30 years. My back yard borders Flood park.

I think it would be appropriate and wise to leave the park as is. It is one of the last pieces of open savannah on the Peninsula and with historical adobe structures from the WPA period. I usually walk through the park, and on weekends in the summer it is well used by many groups and parties of various sizes. We should remember that the people who use the park for parties or family picnics are not well represented in these changes. I think that some of the proposals would reduce the number of picnic areas. But I realize that "Doing nothing" is not realistic for most people.

I would prefer and support the following:

. A dual use play field for baseball and soccer, placed far from the homes on Del Norte and Hedge road. This can be done. It has been done in many places with good results. Having a dual use field will also help with traffic as it reduces visitors. Also, dual use moves the soccer field away from the residences and thereby reduces sound.

.The children's play ground is heavily used by the community and the visiting picnickers. It would be wonderful to see it upgraded in Phase one. And please add picnic tables that are lower for children to sit at.

.The traffic here in this part of Menlo Park at morning and evening commute time is terrible. I don't understand how an increase would work. This issue needs to be addressed before any increase to the parks visitors is made.

.Please consider free parking. This would help the neighborhood street parking related to activities in the park.

.The picnic areas could be improved, expanded and updated. Actually it would be fine to just take what is there now and cleaned it up and revitalized it. I like the old style or flavor of the park, and will miss it. The proposal shows 4 picnic sites, and there are currently 9. Can this be changed and increased?
.The Gathering Meadow, please insure that sound emitted from this area is directed away from the residences on Del Norte and Hedge Road.
.Number 16 on the proposed plan, the trail through the redwoods. Please keep the trail as far away as possible from the fence that borders the park and yards on Del Norte. Please leave this Redwood forest area in place.
186
General comments. I have been to most of the meetings, and have read many emails from many people regarding these changes to Flood park. I have been surprised by the small numbers of neighbors and residents of the two neighborhoods attending the meetings. At the last DEIR meeting there were two people, a couple from the Suburban Park – Lorelei Manor neighborhoods. Given the change to traffic on Bay Road, I would think more people would be concerned about an increase.

Regards

Daniel Meehan
1023 Del Norte Ave. Menlo Park, CA
meehandaniel@hotmail.com

Samuel Herzberg

From: Alice Newton <alicenewton62@hotmail.com>
Sent: Monday, June 10, 2019 4:43 PM
To: Samuel Herzberg
Subject: Comments for SM County Parks Department re: NOP of Final EIR of Flood Park
Attachments: thumbnail_P1160430.jpg; P1160432.jpg

To Sam Herzberg, AICP, Senior Planner
County of San Mateo Parks Department

Thank you for providing another review of these problematic aspects of the Preferred Plan for Flood Park as stated in the NOP: "1) projected growth in park visitation and use resulting from improvements accommodated under the Landscape Plan, including traffic impacts and parking demand, and 2) noise generated on-site from concurrent park events as well as analyzing impacts related to wildfire and energy." We have lived immediately adjacent to the border of Flood Park for several decades as have the majority of our neighbors. We love this park. What happens in this park has a direct impact on our lives and that of our neighbors.

RE: 1) Projected serious increase in traffic congestion on Ringwood, Bay, and Marsh roads is well documented in the Final EIR especially during evening commute hours M-F by sports teams using the park as well as people using other new amenities. This congestion is already often a frustration and safety issue for residents surrounding Flood Park and commuters heading toward the Dumbarton Bridge. What impact this will have on development plans for the park?

Re: adequacy of the parking lot for more vehicles due to sports and other new amenities - My husband, Danny Meehan, and I counted 364-366 total spaces including 10 handicap spaces. On Easter Sunday, April 21st, at 3:45 pm when all reservable picnic sites were used plus all drop-in areas and picnic sites for which people brought their own tables and chairs, there were just 15 empty parking spaces in the entire lot = 96% full! On Sat. 6/1, most group picnic sites were used and the parking lot was 2/3 full at 7:00 pm. On Sat., 6/8, all reservable sites were used plus other sizable groups in drop-in sites and at 6:00 p.m., the parking lot was again 2/3 full. The Flood Park group picnic online reservations site shows all 8 group sites already booked for Sat., June 15, and 22, and just 3 sites available for Sat., June 29th. Many of the group sites are already booked for Saturdays in July and August too. (Sundays are half booked.) **Based on this data, the current parking lot would not be adequate for so many new concurrent activities in addition to the current use level of the picnic areas. As a county park, Flood Park must be accessible to all. Sports groups representing relatively few county residents shouldn't get priority to park acreage or parking. It is essential to resolve this potentially inadequate parking situation before adding amenities.**

Overflow parking will occur on neighborhood streets like it does now despite restrictions but worse, and Menlo Park police don't do regular or random ticketing. **We, neighbors of the park, know it doesn't keep people from parking on our streets.**

The $6/day/car parking fee needs to be analyzed. It discriminates against people who can't afford it and people who want to come for a short time to the playground or for a picnic and encourages people to defy the restricted parking signs on neighboring streets. It needs to be recognized that this park serves a different purpose than other county parks. I suggest using a ticket machine like those in parking garages and have the first 2 hours in the park be free parking.

RE: 2) impact of "noise generated on-site from concurrent park events." The Parks Dept.'s Preferred Plan (green attachment) shows both the baseball field which would be renovated and a full-size lacrosse/soccer field located in the NE corner of the park (the Iris Lane corner which is sometimes referred to as the SE corner). The Final EIR states that concurrent games would be possible with this plan which would add traffic, parking, and impulse noise to other occurring park events (e.g. concurrent picnics etc). According to the Final EIR, lacrosse or soccer practices or games are expected to occur every weekday afternoon and every Sat and Sunday all day, every day, year-round. The baseball field would be in frequent use most of the year too. Those would be in addition to basketball, volleyball, and other sports with spectators. In the given plan, the close proximity of these sports fields and courts to many of the picnic areas would likely negatively impact conversations in those areas as well as degrade the quiet, natural retreat-type ambience of the wooded picnic section of the park. **The natural environment with it's many heritage trees was highly valued in the voting during the community input meetings of 2015. Soccer was a medium priority at that those meetings and lacrosse was not on the list at all. The full-size lacrosse/soccer field was suddenly presented in 12/2015 and has been contentious since then due to its location in the park.**

In early 2016, around 96% of my neighbors signed a petition opposing the proposed new lacrosse/soccer field location in the NE corner of the park for noise and traffic reasons. In November 2018, neighbor Nettie Wijsman was told by Sam Herzberg, Senior Planner for the Co. Parks Dept., that the county is committed to providing a 100 foot buffer to neighbors and stated in the EIR presentation, "noise from the proposed soccer/lacrosse field would occur as close as approximately 100 feet from the backyards of single-family residences." Careful measurements done by Nettie make this 100 ft. buffer seem unlikely to be possible. Would spectators be within that area? If so, that would negate it's purpose as an impulse noise buffer. Teams and spectators would come and go, but residents would hear impulse noise of shouting and whistles every afternoon plus over and over every weekend year- round. Impulse noise would likely be audible east to Sonoma Avenue (maybe farther) and south to Bay Road. This would be an intolerable negative impact on our neighborhood as well as to Life Moves Haven Family House (Transition Housing Center) which is adjacent to the north corner of the park and to picnic groups on the east side of the park. Sometimes we even hear noise from Kelly Park across Hwy. 101, but that is infrequent.

Page 268 of the Final EIR states regarding impulse noise from the lacrosse/soccer field where proposed, "However, perceptible athletic noise would not necessarily cause a nuisance at nearby residences. The City of Menlo Park manages athletic fields located within 100 feet of nearby residences and has received few if any complaints regarding programmed athletic activities from residents since 2010." (K. Keith, 11/15/2017). I believe that this statement does not reflect a clear picture of the ballfield/residents situation in Menlo Park. Most of the ballfields in Menlo Park are located across parking lots or streets from homes. A specific exception is the soccer field at Encinal School where an 8' wooden fence was erected in May, 2018, in response to many complaints from adjacent residents of impulse noise. (This fence was erected by the school district, not the city of Menlo Park. Although it is within the city limits of Menlo Park, Menlo Park officials may not have been aware of it.) Like at the Encinal field, spectators could gather and shout alongside the field behind Del Norte Avenue backyards in the proposed location in Flood Park.

Another potential problem that would inevitably occur if a lacrosse/soccer field is installed in the NE corner of the park (Iris Lane corner) is traffic on Del Norte, Iris Lane, and nearby streets to use the Iris Lane pedestrian gate for convenient drop--offs/pickups. This gate must remain open for neighbors and people coming across Hwy. 101 on the footbridge, but simply "educating" sports groups not to use it will not override its convenience and prevent a problem for neighbors.

Holbrook-Palmer Park in Atherton is a good example of a "hybrid park" with a baseball field, plus field space for soccer (lacrosse too?), and tennis courts as well as wooded areas and group venues, but the sports fields are located on the opposite side of the park from the adjacent homes and wooded areas. <u>This is a design model that could work well for Flood Park - locate the sports fields as far away as possible from the homes and picnic areas.</u> The baseball field in the Preferred Plan for Flood Park is already in that location and already has youth soccer fields included in the Plan in its interior, i.e. a multipurpose field. A lacrosse/soccer field could fit within the baseball field. Del Norte Avenue neighbor, Nettie Wijsman, has thoroughly researched alternative locations in the park for various sizes of soccer fields and previously submitted her diagrams to the Co. Parks Dept. These alternative sites are closer to the parking lot and minimal tree removal is involved to accommodate them. (The Final EIR lists 36 trees would have to be removed to install the lacrosse/soccer field in the NE corner of the park.) <u>In early February, 2019, the Menlo Park Fire Marshall, Jon Johnston, told me a sports field should be located near a parking lot for safety reasons.</u>

We, neighbors on the east side of the park, want to see detailed analyses with specific numbers regarding size(s) of proposed field(s), other potential field locations (possibly in addition to within the baseball field), and size of park space between possible locations and other park amenities as well as distance to the nearest park boundaries. We want to see specific numbers regarding tree removal required to accommodate fields in various locations. My neighbors and I request that if there is to be a lacrosse/soccer field in Flood Park in addition to what's planned within the baseball field, that it be located near the parking lot for noise, accessibility, and safety reasons. We want to see the above analyses of location options. We have been told that these specific numbers will be determined during the design phase for Flood Park, <u>but we don't think the Preferred Plan should be approved without the specific analyses described above.</u>

<u>The proposed location of the "gathering meadow" (aka "amphitheater") in the middle of the wooded circle of group picnic sites makes no sense</u>. An event in that location at the same time as group picnics were occurring would create conflicting sounds for all. A good site for a "gathering meadow" would be in front of the central adobe building where there is plenty of space to buffer sound. Sounds from movies shown there have not been audible at our house on Del Norte Avenue near Bay Road. Sounds from the occasional corporate parties located in the western part of the group picnic circle (i.e. closer to the center of the park) have also not

been very audible at our house despite amplified sound as long as such amplified sound is aimed toward the middle of the park. Note that corporate parties using this part of the park have been scheduled on weekdays when they don't conflict with group picnics in that area.

Pathways, tennis courts, volleyball courts, etc. and any regularly used amenity should not be closer than 75' to the eastern border and neighbors' backyards. The county uses a powerful gas-powered leaf blower once or twice/week which is very loud and blows dust and weed seeds into the air. In addition, voices will bother neighbors if located closer to back yards. The Final EIR contends that since the current tennis courts are just 15' from back yards, that distance should be acceptable for new paths and amenities requiring blowing. **This bad situation needs changing, not continuing and used to justify future plans.**

Re: importance of the EIR analyzing impacts of new amenities in all 3 phases - Flood Triangle neighbor Doug But who served earlier on the Menlo Park Planning Commission, wrote previously to the Co. Supervisors pointing out that only Phase I (most of the new sports areas and other new amenities) was analyzed in the EIR, but not Phases II & III which were listed as "programatic." However a performance space, new playground, gathering plazas, new uses of the central adobe building, and some other new items slated for those latter phases will inevitably impact the traffic, parking, and noise conditions of the rest of the park and visa versa. **Doug Bui insists that Phases II & III must be analyzed in the Final EIR prior to approval and that this should be requested again now. I agree.**

Pertinent to the scope of this NOP related to wildfire, **another aspect of the Preferred Plan that I feel is insufficiently analyzed is the significant increase of impervious surfaces from all the planned new amenities and the impact on the flora and fauna of the park.** Page 268 of the revised Final EIR mentions significant increase in impervious surfaces regarding Phase I installations but does not address this issue regarding installations in phases II and III. Already this month, June 2019, three heritage redwood trees in the SE corner of the park that were dying from drought followed by beetle infection were removed. Two other redwoods in other areas of the park were also removed. The foxtails that cover the ground are dry now. **Water management in the park is a paramount issue warranting further analysis and priority funding to preserve the park and make sure that all new developments in each construction phase employ state-of-the-art water conservation techniques that are part of a comprehensive park plan.** (Suggest minimizing solid pavement, use semi-permeable pavers, install water catchment systems and swales instead of draining water to the bay, add only drought-tolerant fire-resistant plants especially native plants, etc. Have new sports fields and courts be permeable.) Since I live adjacent to the park, I will be very interested to see analyses of wildfire issues (dry foxtails?) and energy. **Make Flood Park a shining example of 21st century green technology.**

The Flood Park School site? This could be used for the proposed lacrosse/soccer field, an additional parking lot, or an addition to Haven House. It could be worth the time to explore options that could benefit both Flood Park and the Ravenswood School District.

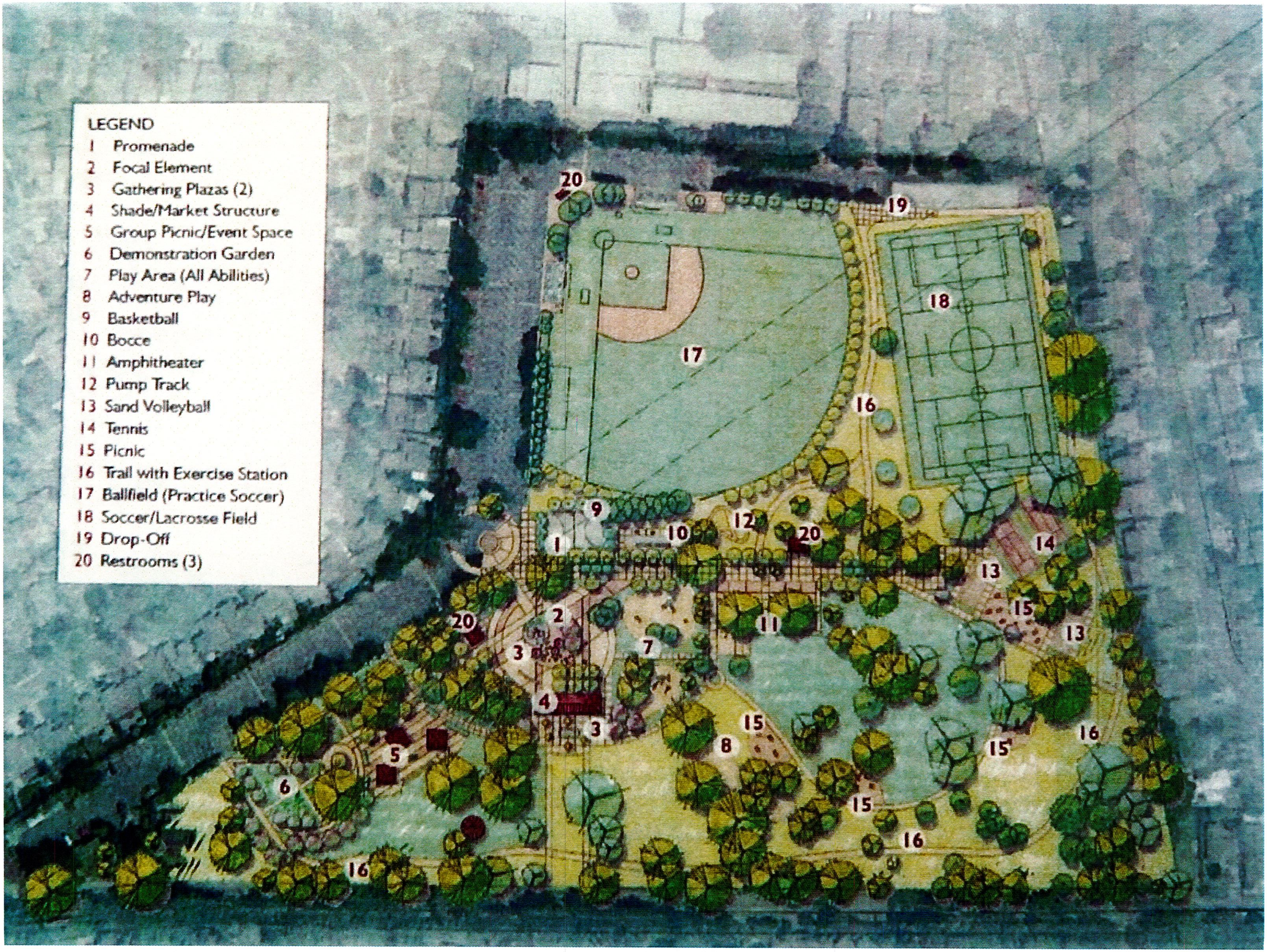
The Parks Dept. has said that after the Final EIR is approved, the design process will begin and that community members and neighbors will be involved. Since neighbors of the park are very aware of the use and needs of both the park and surrounding areas, I request that neighbors be directly involved with a "seat at the table" in creating the design.

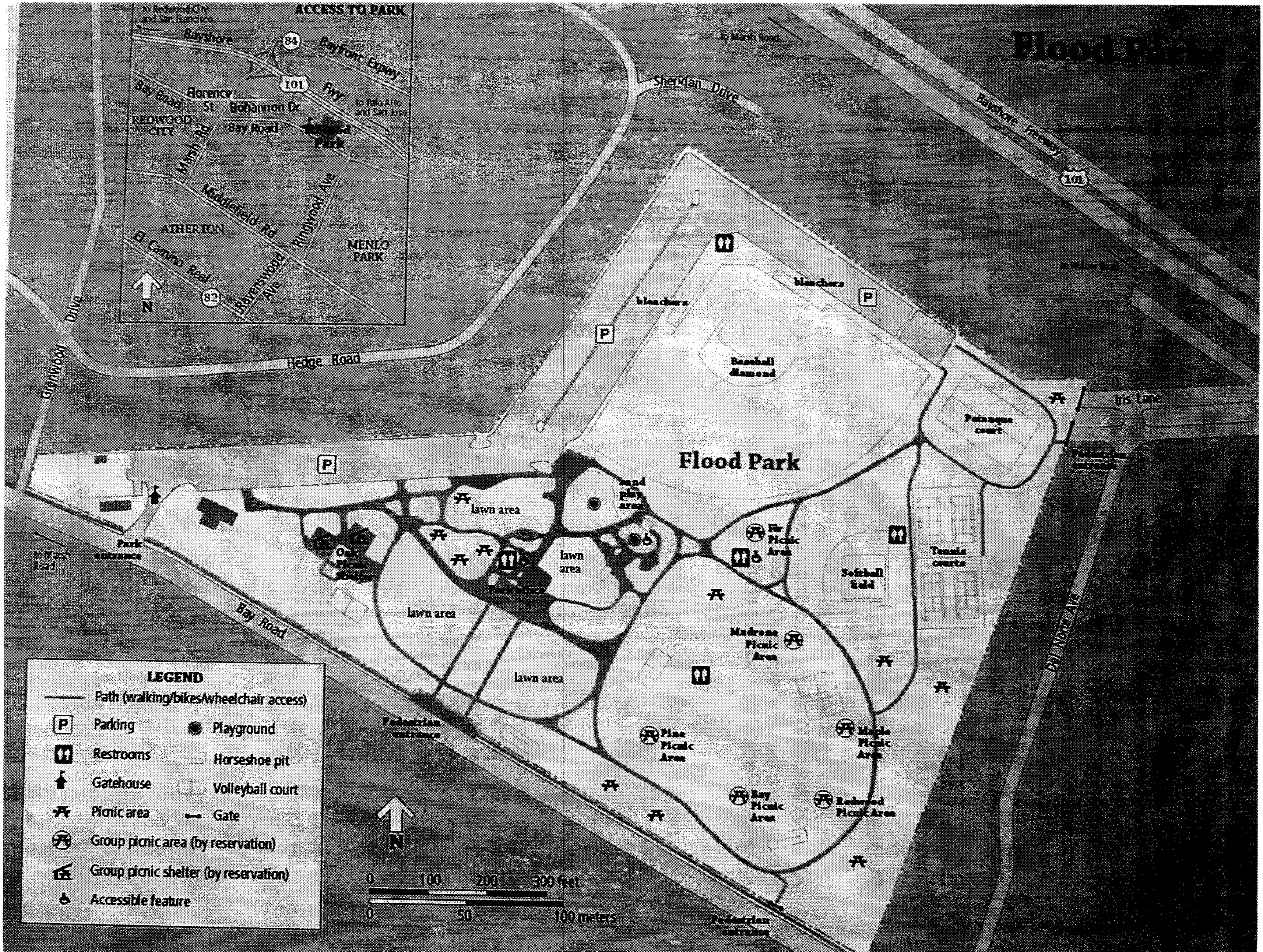
Flood Park is a historic treasure and an environmental retreat from the increasingly dense development in our county. It's heritage trees and open grounds are just as important as sports fields and courts. I'm confident that balance is possible, but the current "Preferred Plan" needs revising to achieve this.

Please make this letter available to the public.

Sincerely,

Alice Newton
1023 Del Norte Avenue
Menlo Park, CA 95025


LEGEND
1 Promenade
2 Focal Element
3 Gathering Plazas (2)
4 Shade/Market Structure
5 Group Picnic/Event Space
6 Demonstration Garden
7 Play Area (All Abilities)
8 Adventure Play
9 Basketball
10 Bocce
11 Amphitheater
12 Pump Track
13 Sand Volleyball
14 Tennis
15 Picnic
16 Trail with Exercise Station
17 Ballfield (Practice Soccer)
18 Soccer/Lacrosse Field
19 Drop-Off
20 Restrooms (3)



Flood Park
ACCESS TO PARK
to Redwood City and San Francisco
Bayshore
Bayfront Expwy
Fwy
to Palo Alto and San Jose
Bay Road
Florence St
Bohannon Dr
Bay Road
REDWOOD CITY
Marsh Rd
Middlefield Rd
Ringwood Ave
ATHERTON
MENLO PARK
El Camino Real
Ravenswood Ave
N
to Marsh Road
Sheridan Drive
Bayshore Freeway
101
Hedge Road
Glenwood Drive
blanchers
blanchers
Baseball diamond
Iris Lane
Petanque court
Pedestrian entrance
Flood Park
sand play area
lawn area
lawn area
lawn area
lawn area
Fir Picnic Area
Softball field
Tennis courts
Madrone Picnic Area
Pine Picnic Area
Maple Picnic Area
Bay Picnic Area
Redwood Picnic Area
Oak Picnic Shelter
Park office
Park entrance
to Marsh Road
Bay Road
Del Norte Ave
Pedestrian entrance
Pedestrian entrance
LEGEND
Path (walking/bikes/wheelchair access)
Parking
Playground
Restrooms
Horseshoe pit
Gatehouse
Volleyball court
Picnic area
Gate
Group picnic area (by reservation)
Group picnic shelter (by reservation)
Accessible feature
0 100 200 300 feet
0 50 100 meters

Samuel Herzberg

From: Bill Lamkin <billlamkin@yahoo.com>
Sent: Monday, June 10, 2019 5:36 PM
To: Samuel Herzberg
Subject: Final EIR of Flood Park

To Sam Herzberg, AICP, Senior Planner
County of San Mateo Parks Department

I know that you have been sent comments from Alice Newton and Nettie Wijsman both of whom live on Del Norte Ave. backing up to Flood Park. I have also reviewed the EIR and public documents and as a 32 year resident two streets from the park, I could not agree more with these two ladies comments and evaluations! They are spot on. Please give their thoughts and questions great consideration. Thank you.

Regards,

Bill Lamkin
1055 Tehama Ave.
Menlo Park, CA94025

Samuel Herzberg

From: Nettie Wijsman <nwijsman@outlook.com>
Sent: Monday, June 10, 2019 9:14 AM
To: Samuel Herzberg
Subject: Re: EIR Questions and Comments

Sam, I made two corrections to the comments I sent you yesterday. It has to do with calling the part of the park the southeast versus northeast side. The EIR refers to the section of the park where you have propose the new soccer/lacrosse field as the northeast part, so I just made this change to one of my paragraphs. Please use this set of questions. Thanks Nettie

Sent from my iPhone

On Jun 10, 2019, at 8:17 AM, Samuel Herzberg <sherzberg@smcgov.org> wrote:

> Received.
>
> Thank you
>
> **From:** Nettie Wijsman [mailto:nwijsman@outlook.com]
> **Sent:** Sunday, June 09, 2019 11:10 PM
> **To:** Samuel Herzberg <sherzberg@smcgov.org>
> **Subject:** EIR Questions and Comments
>
> This is a project level EIR, not a project/programmatic EIR. **Complete a full analysis of all activities being proposed in equal, project specific level of detail from all three phases, even if to be built at different times.** The current EIR only mentions activities from phases II and III but provides no analysis of any of these activities. Phase II activities include picnic and playground use, the most used activities now. The gathering meadow, also in phase II was not evaluated and could be a high use activity. All three of these activities are identified as high priority items per the community process, but none of them fully evaluated. Activities in phase I were poorly evaluated as they did not include spectators in any analysis, and did not evaluate total occupancy of the park.
>
> **Evaluate total occupancy of the park** during low and high season based on the highest occupancy expected and how having multiple games/picnics and other activities going on at the same time will affect parking, traffic, and noise.
>
> Fully evaluate picnic use and define how many picnic tables and group areas (numbers of group areas and tables within them and number of tables in non-reservable sites) will be in the final plan. The area for picnic use is much smaller in the "Preferred Plan" than what is in the park now. The current picnic areas are used frequently during the spring/summer/fall.
>
> Evaluate parking space needs associated with picnic activity. Currently there are 8 reservable group areas, and at least 15 non-reservable sites that are used frequently. Other park users will create their own picnic areas by bringing foldable tables, chairs and grills. Please include these park participants when evaluating picnic users.
>
> Gathering meadow – define what types of events will be taking place in this area, frequency, when events may occur and how many participants may attend. Evaluate parking, traffic, and noise from these

events and tie them into the total park use (movies, weddings, school performances, concerts etc). Will amplification be allowed? Although the Parks Department says amplification is only allowed with a special permit, it happens frequently now. Therefore either the rule is not enforced or permits are easy to obtain.

Evaluate trip counts and parking on the weekends versus the weekday. Data should not be averaged over a total year or several years to come up with trip counts but should accurately reflect weekday use, weekend use, high season versus low season. You have been provided with information from the 1983 master plan showing the use in the different seasons of the year.

Analyze the effect of the "collision" factor on parking and traffic, that is when teams are changing players and cars are coming and going at the same time. Even if there is not a pay gate at the front entrance, there is only one lane in and out. Cars entering or leaving have to go by parking spaces where cars will be pulling in or out. The drop off turn around is deep within the park. In 11/2017, I parked next to a park in San Mateo on E 28th street during the morning. I left during the afternoon during soccer team practice. It took me 15 minutes to travel one block because cars were leaving at the same time as others were arriving. The parking lot at Flood Park is similar, where a car coming in will have to wait for a car pulling out before moving forward. This was a true example of the collision factor.

Analyze backup congestion of cars coming eastward on Bay Road wanting to turn left into the park entrance and having to wait for cars turning right from Bay Road. Mitigation?

In analysis, use recent historical data from a time when the park was fully open such as 2008 to 2009, not during a period of time when the park was closed or just recovering from being closed (as was used in the draft EIR). Also recognize that the park has been in disrepair for many years, and that this has affected use. Because there is historical data from a time when the baseball field and park was in excellent shape, this data should be used as a reference even if old. You have been provided with data from the last master plan of 1983. There is no reason to believe the park use will be less than it was as evaluated by the 1983 Master Plan. There will be a whole new park, two new sports fields instead of one, and many other new activities. Consider using data from the Magical Bridge all-abilities playground in Mitchell Park in Palo Alto to help evaluate additional parking required for the new all-abilities and adventure playgrounds in the "Preferred Plan.

Define the types of teams that will be using the fields and evaluate parking, traffic and noise based on use of a given activity i.e. league teams versus youth/adult practice. Evaluate parking and traffic as it relates to the different uses of the fields and when multiple activities are taking place at the same time. A league style baseball field is being planned for, and the park used to hold league style games. The park reached it maximum capacity. Restricted parking was not in effect at that time.

Evaluate soccer/lacrosse games on both weekends and weekdays. What is the maximum number of games that might potentially be scheduled on weekends as well as weekdays? Evaluate traffic and parking with the maximum number of games/practices.

What is the maximum number of baseball/softball games that could be scheduled, during the week and weekend? Evaluate traffic and parking with the maximum number of games/practices.

Include spectator data when evaluating use of any sports fields. Make projections as to the numbers of spectators for youth, adult and league style practices and games; and how these numbers will impact the total park use, traffic, parking, and noise.

The ITE parking table used in the EIR does not represent the actual parking at Flood Park. Flood Park is not a new park. Utilize parking data from Flood Park and extrapolate from this when adding additional activities. Use data from the same period of time as was used when evaluating past baseball field use.

The current data from Flood Park should be representative of non-active recreation; such as picnic and playground use.

There is an assumption that noise from soccer games should be the same as lacrosse games. There is no real basis for this. Please provide noise studies as it pertains to soccer games for youth and adults.

Accurately evaluate where trips are currently coming from to the park. If players on teams or picnic/play ground use are not coming from Menlo Park, include that data. Historical data does not support that the majority of trips come from Menlo Park. The majority of park users now are not from Menlo Park.

Evaluate whether the proposed park changes are going to change the demographics of park users. The majority of users now are primarily ethnic minorities of our communities. The 1983 Master Plan stated "when Saturday and Sunday attendance reaches about 1800 people and a baseball double header game is being played, space for picnic activity is limited." Are current park users going to be "squeezed out" with the proposed changes? Now two fields are being proposed instead of one.

Evaluate the traffic and parking impact of dropping off players on the Northeast side of the park if any field is constructed close to the gate on Iris Lane. Educating participants to not use the Iris Lane gate is likely to be only partially effective, as it will be just too convenient given the proximity of a field so close to the Iris Lane gate. For many people convenience will trump cost. The structure of the main entrance on Bay Road, with only one car in and out at a time will make dropping off players here time consuming. The drop off area is deep within the parking lot, requiring a driver go by parked cars that will be pulling in and out. Most parking in the park is far from the Northeast side of the park where the second field is being proposed.

Stating that Menlo Park police will ticket parked cars as a mitigation will not have any impact on cars dropping off players at the Iris Lane gate.

As Menlo Park police do not enforce the no parking rules now, citing this as a mitigation measure is completely inaccurate. Menlo Park police did site during the early days of the no parking ordinance, but stopped after a few years. There is no reason to believe this won't happen again even if they do enforce parking initially.

If any field will be used for multiple team practices/games at one time, include the impact of the maximum number of players/participants/spectators if more than one group/field.

Evaluate how placing noisy activities close to residences will not intrude on the qualitative noise standard of section 4.88.350 of disturbing the peace and quiet of neighbors. People have different individual standards as to what kind of noise and volume would be considered intrusive and bothersome.

Nettie Wijsman

Samuel Herzberg

From: Carolyn Ordonez <cardord@gmail.com>
Sent: Monday, June 10, 2019 7:00 AM
To: Samuel Herzberg
Subject: Flood Park

Dear Mr. Herzberg,

I live in the Flood Triangle next to Flood Park. I have lived here for 35 years. For me, since I do not live on DelNorte, the park has been a good neighbor.

I love the fact that those people in the county that are not able to visit the other county parks are able to enjoy a wooded park and the outdoors. Especially youth. I don't understand why sports, played by relatively few is more important than enjoying a unique outdoor, passive experience that Flood Park offers now.

The Flood Triangle is right next to the 101 freeway. It has gotten wider and louder and more polluting over the last 35 years. We now have jets flying over us, and I mean right over my house, thanks to nexgen. As I have said before, I do not want any noise from Flood Park. I don't hear any noise now and do not want to hear any noise in the future.

Kelly Park, on the other side of the freeway, in Belle Haven allows amplified noise. We hear it loud and clear and late into the evening. Amplified noise needs to be not allowed at anytime. No permits for amplified noise should be allowed. Generally not allowed is not good enough.

The idea that the Menlo Park police department is going to enforce the permit required parking in the neighborhood is a dream. I have witnessed the lack of enforcement first hand. While walking on DelNorte I was passing a couple getting a stroller out of their car. They were going into the park via the Iris gate. I told them they could get a ticket if a permit is not displayed. They went into the park. As I continued to walk on Del Norte a Menlo Park patrol car was coming down the street. Perfect timing I thought. The patrol car stopped across the street from the car without a permit. The officer never got out of the car to check for a permit but drove away. No enforcement happened.

Another area with potential drop off problems is a gate on Bay Road just past the Flood Triangle homes. I see cars parked here now unloading items. Where the no parking on Bay Rd. starts is not clear. This gate has the potential to be a pick up drop off point. If cars are parked or standing on Bay Rd they are in the bike lane. The county claims many young people will ride their bikes to the park and cars parked or standing on Bay Rd. create a hazard for bicyclists.

The traffic on Bay Rd. at Ringwood has gotten so much worse as the east side of Menlo Park has been developing. The EIR has not addressed the time of day when Menlo Atherton high school is dismissed in the afternoon. This would be the same time children would be driven to practice or games at Flood Park. The intersection of Bay and Ringwood is heavily used by the high school students when school lets out.

As mentioned, the 101 freeway and jets flying over are a reality for those of us in this area. We need to keep trees to counter act the pollution from traffic and jets. Removal of so many heritage trees should not be allowed.

The EIR reports that wildlife is non existent in Flood Park. That can not be true. I have seen first hand hawks and owls and of course the smaller birds in this area. They have to be living and nesting somewhere.

As stated in the EIR the potential impacts on the areas surrounding Flood Park have been conservatively studied. That is not good enough for those residents who live surrounding Flood Park. We have to use Bay Rd. just to leave our neighborhood.

Flood Park is a unique respite from the urban chaos of the Bay Area. Even for youths. Why not teach young people to relax in a park. Do we always have to have a park as active as possible?

The EIR does not study the entire projected future use of Flood Park. It has addressed a portion only of what is planned. That is is unacceptable. This project is huge and so different from past uses of the park. The entire projected plans for Flood Park need to be included in the EIR.

Please make this email regarding the Flood Park EIR public.

Sincerely,
Carolyn Ordonez

Sent from my iPad

Samuel Herzberg

From: Gina Parks <ginaparks@me.com>
Sent: Thursday, June 06, 2019 4:22 PM
To: Samuel Herzberg
Subject: New Flood Park Proposal

Dear Sam Herzberg,

As a resident of the Flood Park area, I wanted to provide some important feedback about the new proposal for the park. I absolutely love this park and believe that the green space is important to the health of our neighborhood. My family has enjoyed the park over the years and I'm in favor of some upgrades to the park. However..I have some important concerns:

1. REMOVAL OF 80 TREES
My biggest concern with the plan is the removal fo 80 trees. This will not only hurt the planet as every treee provides great value to the environment (oxygen), it also affects the noise pollution. Could we consider keeping these old and beautiful trees? It is so difficult to remove trees with home renovations, I believe that the same consideration should be made for this park - and avoid too many trees being cut down. I would like to know what can be done to save at least 50% of those trees.

2. INCREASE IN TRAFFIC
I am also concerned about the impact that the changes will have on traffic in our neighborhood. We have experienced more traffic over the years. I believe that this traffic needs to be considered. I do not think we should even begin renovations of the park until the Willow Road project is complete. The traffic concerns from this project has been challenging.

3. ON-SITE PARKING AVAILABILITY
I want to be sure that there will be enough space for parking to accommodate the increased usage of the park. We do not want the neighborhoods to be a place for extra on-street parking.

The upgrade of the park could add to the property value, if done correctly. If the traffic/parking and noise impact are not considered carefully, we could be harming our community.

If you have any questions, please do not hesitate to let me know.

Sincerely,
Gina Parks
1035 Tehama Ave.
Menlo Park, CA
94025
(650) 838-0501

Samuel Herzberg

From: dougbui <dougbui@pacbell.net>
Sent: Thursday, June 06, 2019 8:12 AM
To: Samuel Herzberg
Subject: Flood Park EIR

In preparation for the up coming County Board of Supervisor's meeting, I am emphasizing certain concerns contained in my email to the Board for the original EIR presentation in August 2018.

Capitalized words are my comments and non-capitalized words are from the draft EIR

1. THE EIR NEEDS TO INCLUDE A FULL ANALYSIS OF ALL THREE PHASES TO DETERMINE THE FULL IMPACT OF THE PROJECT. A DETAILED ANALYSIS WAS ONLY DONE FOR PHASE I WHEREAS THE ENVIRONMENTAL IMPACTS OF PHASE II AND III IMPROVEMENTS ARE DONE AT A PROGRAMMATIC LEVEL. PHASE II AND III WILL BOTH HAVE A SIGNIFICANT IMPACT ON THE USE OF THE PARK. APPROVAL OF THE EIR IS TANTAMOUNT TO APPROVAL OF PHASE II AND III WITHOUT FULLY KNOWING USER POPULATION, FREQUENCY AND IMPACT ON THE LOCAL RESIDENTS.

2. THERE IS A SERIOUS QUESTION AS TO WHETHER OR NOT THERE IS AN ADEQUATE ON-SITE PARKING SUPPLY SINCE THE EIR DOES NOT CONSIDER THE TOTAL OCCUPANY OF THE PARK. THE 1983 MASTER PLAN DOES A MUCH BETTER JOB AND SHOULD BE THE FORMAT TO USE IN DETERMINING PARKING CAPACITY.

3. MENLO PARK RESIDENTS AFFECTED BY THE ON STREET PARKING RESTRICTIONS SHOULD NOT HAVE TO PURCHASE AN ANNUAL PERMIT. THERE SHOULD BE NO CHARGE.

4. EIR, Page 157:
"The existing conditions at Flood County Park were derived using historic park visitor statistics from 2011 through 2015. During this time period the baseball field was not in programmed use and this time period was assumed to represents the existing conditions at the park."

5. USING HISTORIC VISITIOR DATA FROM 2011 THROUGH 2015 MISREPRESENTS THE TRUE HISTORIFAL USE OF THE PARK. DURING THIS TIME, THE PARK WAS NOT PROPERLY MAINTAINED AND THE FACILITY BECAME RUN DOWN. THIS IS NOT REPRESENTATIVE OF THE CORRECT BASELINE USE FOR THIS EIR.

6. EIR, Page 182:
"Flood County Park currently hosts social events that may include more than 50 participants at its group picnic areas. The proposed Landscape Plan could increase the frequency of events with more than 50 people by introducing a reconstructed ballfield, a soccer/lacrosse field, and a gathering meadow for performances." (page 182).

7. THE PROPOSED PLAN **WILL** INCREASE THE FREQUENCY OF LARGE PEOPLE EVENTS PARTICULARLY WHEN THE PARK UPGRADES IT FACILITIES. TO SAY IT "would not result in environmental impacts directly associated with the number of people at specific park events" (page 182) IS TO SAY THAT THERE IS NO RELATIONSHIP BETWEEN PEOPLE AND IMPACTS.

There is no question that the draft EIR was deficient in representing what the true impacts would be without doing an analysis following the same format, concept as the 1983 Master Plan.

From my experience as a Planning Commissioner and being involved in real estate development, I do not believe any EIR consulting firm can, with a high degree of confidence, say that the Draft EIR will be representative of the impacts when Flood Park is fully developed.

My comments should be made available to the public.

Regards

Douglas Bui
319 Oakwood Place
Menlo Park

Samuel Herzberg

From:	Whitney Thwaite <wthwaite@llesd.org>
Sent:	Wednesday, June 05, 2019 8:52 AM
To:	Samuel Herzberg
Subject:	Flood Park

Dear Mr.Herzberg,

I am writing to you with my concerns over the new planned design of flood park.
Concerns:
1.With the baseball field and soccer field being located in the northeast corner of the park, numerous people will be using the Iris lane entrance to drop off players. This will significantly increase traffic in the hours that our children play outside. This creates an unsafe situation.

2. With the soccer field being placed just behind Del Norte and being used all day on both weekend days and every afternoon on weekdays there will no longer be any off work hours of quiet for the houses along Del Norte and Iris. This burden is avoidable if the field is moved to an area away from houses. This is how the fields are set up at Holbrook Palmer park.

Please consider the relocation of the fields to an area closer to Bay Road or the center of the park, away from residential sites.

Thank you for your consideration,

Whitney Thwaite

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Samuel Herzberg

From: websupport@smcgov.org on behalf of Parks Department <websupport@smcgov.org>
Sent: Wednesday, May 22, 2019 2:08 PM
To: Samuel Herzberg
Subject: Form submission from:

Hi, Sam.

Someone has submitted feedback on the Flood Park EIR NOP. Here is what they had to say:

Submitted on Wednesday, May 22, 2019 - 2:08pm
Submitted by user: Anonymous
Submitted values are:

First Name: Meredith
Last Name: Bailey
Your Email Address: meredithbergin@gmail.com
Your Feedback:

We live in Flood Triangle and absolutely love our neighborhood. We have an annual Halloween parade, block parties, and a neighborhood walking group to Laurel Elementary. Plus a huge park right next door! It is an idyllic place to be a kid.

I'm concerned about the impact that the proposed renovation and field placement will have on our sleepy street. We have three children, 6 and under. Many of our neighbors have similarly young children. They scooter and bike with their friends, easily visiting each other after school and on weekends.

My traffic concerns are with 1) the five way stop on Ringwood + Bay as well as 2) access to the Iris Lane gate.

At the five way stop we have witnessed some fairly bad behavior on the part of motorists during walks to and from school as well as during the evening commute. The increase in park usage seems guaranteed to add additional stress to this intersection. My understanding is that the Bay + Ringwood intersection is already at a "C" level and would likely be downgraded to an unacceptable "D" with this plan.

But my main concern is our neighborhood. If the playing fields stay on the Del Norte side it is inconceivable that rushed parents won't use the pedestrian access gate on Iris Lane to get their kid to practice. I'm deeply concerned about the children in our neighborhood as they run around in increased traffic.

There was some talk about “educating” parents, players and coaches about not using the gate, but as a rushed parent myself that feels like a pipe dream.

It seems that placing the playing fields away from Del Norte and closer to the main entrance would be a very satisfactory solution.

Thank you for your time,

Meredith Bergin Bailey
Document Attachment:

The results of this submission may be viewed at:
https://parks.smcgov.org/node/5466/submission/12276

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691 Phone (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov
Twitter: @CA_NAHC

May 20, 2019

Sam Herzberg
San Mateo County
455 County Center - Fourth Floor
Redwood City, CA 94063

RE: SCH# 2016112040 Flood County Park Landscape Plan, San Mateo County

Dear Mr. Herzberg:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
    a. A brief description of the project.
    b. The lead agency contact information.
    c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
    d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).
    a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
    a. Alternatives to the project.
    b. Recommended mitigation measures.
    c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
    a. Type of environmental review necessary.
    b. Significance of the tribal cultural resources.
    c. Significance of the project's impacts on tribal cultural resources.
    d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
    a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
    b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
    a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
    b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    a. Avoidance and preservation of the resources in place, including, but not limited to:
        i. Planning and construction to avoid the resources and protect the cultural and natural context.
        ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
        i. Protecting the cultural character and integrity of the resource.
        ii. Protecting the traditional use of the resource.
        iii. Protecting the confidentiality of the resource.
    c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).
    e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).
    f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.
    b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
   a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
   b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Gayle.Totton@nahc.ca.gov.

Sincerely,

Nancy Gonzalez

for
Gayle Totton
Associate Governmental Program Analyst

cc: State Clearinghouse

Samuel Herzberg

From: websupport@smcgov.org on behalf of Parks Department <websupport@smcgov.org>
Sent: Saturday, May 18, 2019 4:03 PM
To: Samuel Herzberg
Subject: Form submission from:

Hi, Sam.

Someone has submitted feedback on the Flood Park EIR NOP. Here is what they had to say:

Submitted on Saturday, May 18, 2019 - 4:03pm
Submitted by user: Anonymous
Submitted values are:

First Name: Jinghan
Last Name: Hao
Your Email Address: haograce111@gmail.com
Your Feedback:
I'm about to move from New York city to Menlo Park and my new home will be right next to Flood Park. At first I was so excited because I have a pug who goes to Central Park everyday and he can run free of leash before 9am. Everyone is telling me California is as dog friendly and my pug would be just as happy. However, I am so disappointed when I found out that Flood Park doesn't allow dogs. What kind of park doesn't allow dogs? Is it still a park if you can't even walk your dog or enjoy the picnic with your dog? I'm not even asking you to have a dog run or dog park, but at least permit dogs in the park on leash as they are part of the family and they deserve to be with their family enjoying the outdoor activities in the park. There are no other options nearby where I can walk my dog and he can socialize with other dogs and humans. Will he be grounded to our backyard for the next two years? Please, please allow dogs in the park. 70% of US households own at least a dog. They are our friends, they are our family and they should be able to enjoy the park just like us.

Thank you!
Document Attachment:

The results of this submission may be viewed at:
https://parks.smcgov.org/node/5466/submission/12201

Samuel Herzberg

From: S Conrad <sconrad@pacbell.net>
Sent: Thursday, May 16, 2019 11:34 AM
To: Samuel Herzberg
Cc: drew@drewcombs.com; 'Nettie Wijsman'
Subject: Flood Park

Dear Mr. Herzberg,

Thank you for requesting input from the neighbors of Flood Park. We are grateful that you are looking at the Food Park plans to help it become the best facility for all its users and its neighbors.

Please do not put the new soccer field next to the fence line of our neighborhood on Del Norte Ave. We have a mostly quiet neighborhood with tons of very small children and many pets. Children play in the street, because the lots are generally small. There are several basketball hoops that face the street. Numerous children ride bikes and there is a walking pool to nearby Laurel school. There is a friendly neighborhood cat who is constantly crossing the street. The neighbors all know to look out for him and for the numerous children who ride bikes and shoot baskets and play in the neighborhood. If you place the soccer field near the fence you will turn our neighborhood into a drop off lane every hour on the hour, every week day after school and all day on the weekends.

The cars will speed through the neighborhood because their kid might be late for soccer or lacrosse. They will come angry and distracted since the traffic all around town is a very heavy that time of day and they do not know or care about our neighborhood cat or the kids who live here. They will use the gate at the end of our street as a drop off zone because it is closest and they want to watch their kid make it to the field. Then they will race off to try and get something done during the hour their child is at soccer. Then they will race back for pick up. There will be absolutely no way to stop this. If you lock the fence, they will climb it. For every soccer practice, you are adding 90 trips through our quiet neighborhood every hour. (approx. 15 kids on a team. One trip to drop off, another trip to leave, another trip to pick up and then another trip to leave). If two teams practice at the same time, you are now adding 180 trips. Goodbye basketball in the street, goodbye kids playing safely in our neighborhood, goodbye pets being safe.

The current plan WILL RUIN OUR NEIGHBORHOOD.

If instead you put the soccer field near the existing parking lot, then the parents will use the parking lot and will use Bay road to get there. There are currently no kids playing on Bay Road. I see no pets on Bay Road. Everyone already knows to stay away from Bay Road since it is already a thoroughfare. I can't understand why the soccer field would not be placed near the existing parking lot where it would be easy for kids to be dropped off, easy for snacks to be wheeled in coolers to the field and much better from a noise situation. The parking lot is a natural buffer from the soccer field and the fans and the ref's whistle who will provide a great deal of noise. Placing the field next to the parking lot will ensure that the local neighborhoods are not destroyed by drive through traffic that will occur if you proceed with your current plan.

I believe our neighborhood has tried to explain this situation to people, but the people seem to keep changing and no one seems to be listening. We are not against the park being turned into a better facility serving more people. I understand more traffic is the price to pay for that and I am ready to pay that price. However, I don't think it's necessary to ruin the quiet atmosphere of our neighborhood. If you place the soccer field near the parking lot, we still have the extra car trips, but they don't come down our street and make it unsafe for our children and pets.

Please make the right choice. Move the soccer field.

Thank you for your attention,

Shari Conrad
1031 Del Norte Ave
Menlo Park, CA 94025
415-999-9110

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Gavin Newsom
Governor

Kate Gordon
Director

Notice of Preparation

May 10, 2019

To: Reviewing Agencies

Re: Flood County Park Landscape Plan
SCH# 2016112040

Attached for your review and comment is the Notice of Preparation (NOP) for the Flood County Park Landscape Plan draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Sam Herzberg
San Mateo County
455 County Center - Fourth Floor
Redwood City, CA 94063

with a copy to the State Clearinghouse in the Office of Planning and Research at state.clearinghouse@opr.ca.gov. Please refer to the SCH number noted above in all correspondence concerning this project on our website: https://ceqanet.opr.ca.gov/2016112040/3.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

cc: Lead Agency

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2016112040

Project Title: Flood County Park Landscape Plan

Lead Agency: County of San Mateo — Contact Person: Sam Herzberg
Mailing Address: 455 County Center - Fourth Floor — Phone: 650-363-1823
City: Redwood City — Zip: 94063 — County: San Mateo

Project Location: County: San Mateo — City/Nearest Community: Menlo Park
Cross Streets: Bay Road between Del Norte Avenue and Greenwood Drive — Zip Code: 94025
Longitude/Latitude (degrees, minutes and seconds): ___° ___′ ___″ N / ___° ___′ ___″ W — Total Acres: 24.5
Assessor's Parcel No.: 055311010, -2010, 093551020, 030 — Section: ___ Twp.: ___ Range: ___ Base: ___
Within 2 Miles: State Hwy #: 82, 101, 109, 114 — Waterways: San Francisco Bay, San Fracisquito Creek
Airports: N/A — Railways: Caltrain, Dumbarton — Schools: Encinal Elem. + multiple

Document Type:

CEQA: [X] NOP [ ] Early Cons [ ] Neg Dec [ ] Mit Neg Dec [ ] Draft EIR [ ] Supplement/Subsequent EIR (Prior SCH No.) ___ Other: ___
NEPA: [ ] NOI [ ] EA [ ] Draft EIS [ ] FONSI
Other: [ ] Joint Document [ ] Final Document [ ] Other: ___

Governor's Office of Planning & Research

MAY 10 2019

STATE CLEARINGHOUSE

Local Action Type:

[ ] General Plan Update [ ] General Plan Amendment [ ] General Plan Element [ ] Community Plan
[ ] Specific Plan [ ] Master Plan [ ] Planned Unit Development [X] Site Plan
[ ] Rezone [ ] Prezone [ ] Use Permit [ ] Land Division (Subdivision, etc.)
[ ] Annexation [X] Redevelopment [ ] Coastal Permit [ ] Other: ___

Development Type:

[ ] Residential: Units ___ Acres ___
[ ] Office: Sq.ft. ___ Acres ___ Employees ___
[ ] Commercial: Sq.ft. ___ Acres ___ Employees ___
[ ] Industrial: Sq.ft. ___ Acres ___ Employees ___
[ ] Educational: ___
[X] Recreational: Redevelop existing park
[ ] Water Facilities: Type ___ MGD ___
[ ] Transportation: Type ___
[ ] Mining: Mineral ___
[ ] Power: Type ___ MW ___
[ ] Waste Treatment: Type ___ MGD ___
[ ] Hazardous Waste: Type ___
[ ] Other: ___

Project Issues Discussed in Document:

[ ] Aesthetic/Visual
[ ] Agricultural Land
[X] Air Quality
[ ] Archeological/Historical
[ ] Biological Resources
[ ] Coastal Zone
[ ] Drainage/Absorption
[ ] Economic/Jobs
[ ] Fiscal
[ ] Flood Plain/Flooding
[X] Forest Land/Fire Hazard
[ ] Geologic/Seismic
[ ] Minerals
[X] Noise
[ ] Population/Housing Balance
[ ] Public Services/Facilities
[ ] Recreation/Parks
[ ] Schools/Universities
[ ] Septic Systems
[ ] Sewer Capacity
[ ] Soil Erosion/Compaction/Grading
[ ] Solid Waste
[ ] Toxic/Hazardous
[X] Traffic/Circulation
[ ] Vegetation
[ ] Water Quality
[ ] Water Supply/Groundwater
[ ] Wetland/Riparian
[ ] Growth Inducement
[ ] Land Use
[X] Cumulative Effects
[X] Other: Energy

Present Land Use/Zoning/General Plan Designation:

Land Use: County park. Zoning: Open Space and Conservation District. General Plan Designation: Parks and Recreation.

Project Description: *(please use a separate page if necessary)*

The proposed project entails a Landscape Plan for the long-term redevelopment of San Mateo County's Flood County Park in the city of Menlo Park. It is anticipated that the proposed recreational facilities would be developed within ten years. The largest recreational facilities would be sited in the northern portion of the park, where the existing ballfield would be reconstructed and a soccer/lacrosse field would be installed at the northeast corner, replacing the existing pétanque court and a portion of the existing tennis courts. Picnic areas clustered in the southern half of the park would be reconstructed. The Parks Department would preserve existing adobe buildings on-site, with the exception of demolishing the adobe Restroom D located west of the existing tennis courts.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

NOP Distribution List

County: San Mateo

SCH# 2016112040

Resources Agency

- [x] **Resources Agency** Nadell Gayou
  - [ ] **Dept. of Boating & Waterways** Denise Peterson
  - [ ] **California Coastal Commission** Allyson Hitt
  - [ ] **Colorado River Board** Elsa Contreras
  - [ ] **Dept. of Conservation** Crina Chan
  - [ ] **Cal Fire** Dan Foster
  - [ ] **Central Valley Flood Protection Board** James Herota
  - [ ] **Office of Historic Preservation** Ron Parsons
- [x] **Dept of Parks & Recreation** Environmental Stewardship Section
  - [ ] **S.F. Bay Conservation & Dev't. Comm.** Steve Goldbeck
  - [ ] **Dept. of Water Resources** Resources Agency Nadell Gayou

Fish and Wildlife

- [ ] **Depart. of Fish & Wildlife** Scott Flint, Environmental Services Division
- [ ] **Fish & Wildlife Region 1** Curt Babcock
- [ ] **Fish & Wildlife Region 1E** Laurie Harnsberger
- [ ] **Fish & Wildlife Region 2** Jeff Drongesen
- [x] **Fish & Wildlife Region 3** Craig Weightman
- [ ] **Fish & Wildlife Region 4** Julie Vance
- [ ] **Fish & Wildlife Region 5** Leslie Newton-Reed, Habitat Conservation Program
- [ ] **Fish & Wildlife Region 6** Tiffany Ellis, Habitat Conservation Program
- [ ] **Fish & Wildlife Region 6 I/M** Heidi Calvert, Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Wildlife M** William Paznokas, Marine Region

Other Departments

- [ ] **California Department of Education** Lesley Taylor
- [ ] **OES (Office of Emergency Services)** Monique Wilber
- [ ] **Food & Agriculture** Sandra Schubert, Dept. of Food and Agriculture
- [ ] **Dept. of General Services** Cathy Buck, Environmental Services Section
- [ ] **Housing & Comm. Dev.** CEQA Coordinator, Housing Policy Division

Independent Commissions, Boards

- [ ] **Delta Protection Commission** Erik Vink
- [ ] **Delta Stewardship Council** Anthony Navasero
- [ ] **California Energy Commission** Eric Knight
- [x] **Native American Heritage Comm.** Debbie Treadway
  - [x] **Public Utilities Commission** Supervisor
  - [ ] **Santa Monica Bay Restoration** Guangyu Wang
  - [ ] **State Lands Commission** Jennifer Deleong
  - [ ] **Tahoe Regional Planning Agency (TRPA)** Cherry Jacques

Cal State Transportation Agency CalSTA

- [ ] **Caltrans - Division of Aeronautics** Philip Crimmins
- [ ] **Caltrans – Planning HQ LD-IGR** Christian Bushong
- [x] **California Highway Patrol** Suzann Ikeuchi, Office of Special Projects

Dept. of Transportation

- [ ] **Caltrans, District 1** Rex Jackman
- [ ] **Caltrans, District 2** Marcelino Gonzalez
- [ ] **Caltrans, District 3** Susan Zanchi
- [x] **Caltrans, District 4** Patricia Maurice
- [ ] **Caltrans, District 5** Larry Newland
- [ ] **Caltrans, District 6** Michael Navarro
- [ ] **Caltrans, District 7** Dianna Watson
- [ ] **Caltrans, District 8** Mark Roberts
- [ ] **Caltrans, District 9** Gayle Rosander
- [ ] **Caltrans, District 10** Tom Dumas
- [ ] **Caltrans, District 11** Jacob Armstrong
- [ ] **Caltrans, District 12** Maureen El Harake

Cal EPA

Air Resources Board

- [ ] **Airport & Freight** Jack Wursten
  - [x] **Transportation Projects** Nesamani Kalandiyur
  - [ ] **Industrial/Energy Projects** Mike Tollstrup
- [ ] **California Department of Resources, Recycling & Recovery** Kevin Taylor/Jeff Esquivel
- [ ] **State Water Resources Control Board** Regional Programs Unit, Division of Financial Assistance
- [x] **State Water Resources Control Board** Cindy Forbes – Asst Deputy, Division of Drinking Water
- [ ] **State Water Resources Control Board** **Div. Drinking Water #**________
- [ ] **State Water Resources Control Board** Student Intern, 401 Water Quality Certification Unit, Division of Water Quality
- [ ] **State Water Resouces Control Board** Phil Crader, Division of Water Rights
- [ ] **Dept. of Toxic Substances Control Reg. #**________ CEQA Tracking Center
- [ ] **Department of Pesticide Regulation** CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1** Cathleen Hudson, North Coast Region (1)
- [x] **RWQCB 2** Environmental Document Coordinator, San Francisco Bay Region (2)
- [ ] **RWQCB 3** Central Coast Region (3)
- [ ] **RWQCB 4** Teresa Rodgers, Los Angeles Region (4)
- [ ] **RWQCB 5S** Central Valley Region (5)
  - [ ] **RWQCB 5F** Central Valley Region (5), Fresno Branch Office
  - [ ] **RWQCB 5R** Central Valley Region (5), Redding Branch Office
- [ ] **RWQCB 6** Lahontan Region (6)
  - [ ] **RWQCB 6V** Lahontan Region (6), Victorville Branch Office
- [ ] **RWQCB 7** Colorado River Basin Region (7)
- [ ] **RWQCB 8** Santa Ana Region (8)
- [ ] **RWQCB 9** San Diego Region (9)

- [ ] **Other** ________________
- [ ] ________________ Conservancy

Last Updated 5/22/18

Appendix B

Air Quality Modeling Results

Flood County Park Landscape Plan

San Mateo County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	9.00	Acre	9.00	392,040.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	70
Climate Zone	5			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Extend grading phase to 60 days based on number of hauling trips

Off-road Equipment -

Demolition -

Grading - Import 4,370 cy, export 5,630 cy on 9 acres

Vehicle Trips - Traffic study: 260 weekday trips/day = 28.9 trips/acre/day
668 weekend trips/day = 74.2 trips/acre/day

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	60.00
tblConstructionPhase	PhaseEndDate	1/9/2020	3/5/2020
tblConstructionPhase	PhaseEndDate	11/26/2020	1/21/2021
tblConstructionPhase	PhaseEndDate	12/24/2020	2/18/2021
tblConstructionPhase	PhaseStartDate	1/10/2020	3/6/2020
tblConstructionPhase	PhaseStartDate	11/27/2020	1/22/2021
tblGrading	AcresOfGrading	30.00	9.00
tblGrading	MaterialExported	0.00	5,630.00
tblGrading	MaterialImported	0.00	4,370.00
tblVehicleTrips	ST_TR	22.75	74.20
tblVehicleTrips	SU_TR	16.74	74.20
tblVehicleTrips	WD_TR	1.89	28.90

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.3947	45.6135	24.0742	0.0501	18.2141	2.3913	20.6054	9.9699	2.2000	12.1699	0.0000	5,070.1416	5,070.1416	1.2052	0.0000	5,100.2717
2020	2.8791	33.1819	23.2388	0.0557	6.7611	1.2954	8.0565	3.4806	1.1925	4.6732	0.0000	5,591.2680	5,591.2680	1.1716	0.0000	5,611.5345
2021	2.5839	24.3943	22.6077	0.0550	1.7874	0.9822	2.7696	0.4838	0.9236	1.4074	0.0000	5,526.4197	5,526.4197	0.7984	0.0000	5,546.3786
Maximum	**4.3947**	**45.6135**	**24.0742**	**0.0557**	**18.2141**	**2.3913**	**20.6054**	**9.9699**	**2.2000**	**12.1699**	**0.0000**	**5,591.2680**	**5,591.2680**	**1.2052**	**0.0000**	**5,611.5345**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.3947	45.6135	24.0742	0.0501	18.2141	2.3913	20.6054	9.9699	2.2000	12.1699	0.0000	5,070.1416	5,070.1416	1.2052	0.0000	5,100.2717
2020	2.8791	33.1819	23.2388	0.0557	6.7611	1.2954	8.0565	3.4806	1.1925	4.6732	0.0000	5,591.2680	5,591.2680	1.1716	0.0000	5,611.5344
2021	2.5839	24.3943	22.6077	0.0550	1.7874	0.9822	2.7696	0.4838	0.9236	1.4074	0.0000	5,526.4197	5,526.4197	0.7984	0.0000	5,546.3785
Maximum	**4.3947**	**45.6135**	**24.0742**	**0.0557**	**18.2141**	**2.3913**	**20.6054**	**9.9699**	**2.2000**	**12.1699**	**0.0000**	**5,591.2680**	**5,591.2680**	**1.2052**	**0.0000**	**5,611.5344**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0203	1.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.9700e-003	1.9700e-003	1.0000e-005		2.1000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.8803	2.7023	10.1001	0.0317	3.0281	0.0275	3.0556	0.8108	0.0257	0.8365		3,198.3964	3,198.3964	0.1211		3,201.4243
Total	**0.9006**	**2.7023**	**10.1010**	**0.0317**	**3.0281**	**0.0275**	**3.0556**	**0.8108**	**0.0257**	**0.8365**		**3,198.3984**	**3,198.3984**	**0.1211**	**0.0000**	**3,201.4264**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0203	1.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.9700e-003	1.9700e-003	1.0000e-005		2.1000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.8803	2.7023	10.1001	0.0317	3.0281	0.0275	3.0556	0.8108	0.0257	0.8365		3,198.3964	3,198.3964	0.1211		3,201.4243
Total	**0.9006**	**2.7023**	**10.1010**	**0.0317**	**3.0281**	**0.0275**	**3.0556**	**0.8108**	**0.0257**	**0.8365**		**3,198.3984**	**3,198.3984**	**0.1211**	**0.0000**	**3,201.4264**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	11/1/2019	11/28/2019	5	20	
2	Site Preparation	Site Preparation	11/29/2019	12/12/2019	5	10	
3	Grading	Grading	12/13/2019	3/5/2020	5	60	
4	Building Construction	Building Construction	3/6/2020	1/21/2021	5	230	
5	Paving	Paving	1/22/2021	2/18/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 9

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	9	165.00	64.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	1,250.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	15.00	0.00	246.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.6578	0.0000	2.6578	0.4024	0.0000	0.4024			0.0000			0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697		3,816.899 4	3,816.899 4	1.0618		3,843.445 1
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**	**2.6578**	**1.7949**	**4.4527**	**0.4024**	**1.6697**	**2.0721**		**3,816.899 4**	**3,816.899 4**	**1.0618**		**3,843.445 1**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1249	4.3234	1.6822	0.0101	0.2135	0.0174	0.2309	0.0584	0.0166	0.0751		1,141.721 3	1,141.721 3	0.1410		1,145.245 4
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0497	0.0340	0.3319	1.1200e-003	0.1232	7.6000e-004	0.1240	0.0327	7.0000e-004	0.0334		111.5209	111.5209	2.4100e-003		111.5812
Total	**0.1746**	**4.3574**	**2.0142**	**0.0113**	**0.3368**	**0.0181**	**0.3549**	**0.0911**	**0.0173**	**0.1084**		**1,253.242 2**	**1,253.242 2**	**0.1434**		**1,256.826 6**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.6578	0.0000	2.6578	0.4024	0.0000	0.4024			0.0000			0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697	0.0000	3,816.899 4	3,816.899 4	1.0618		3,843.445 1
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**	**2.6578**	**1.7949**	**4.4527**	**0.4024**	**1.6697**	**2.0721**	**0.0000**	**3,816.899 4**	**3,816.899 4**	**1.0618**		**3,843.445 1**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1249	4.3234	1.6822	0.0101	0.2135	0.0174	0.2309	0.0584	0.0166	0.0751		1,141.7213	1,141.7213	0.1410		1,145.2454
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0497	0.0340	0.3319	1.1200e-003	0.1232	7.6000e-004	0.1240	0.0327	7.0000e-004	0.0334		111.5209	111.5209	2.4100e-003		111.5812
Total	**0.1746**	**4.3574**	**2.0142**	**0.0113**	**0.3368**	**0.0181**	**0.3549**	**0.0911**	**0.0173**	**0.1084**		**1,253.2422**	**1,253.2422**	**0.1434**		**1,256.8266**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991		3,766.4529	3,766.4529	1.1917		3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**18.0663**	**2.3904**	**20.4566**	**9.9307**	**2.1991**	**12.1298**		**3,766.4529**	**3,766.4529**	**1.1917**		**3,796.2445**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0596	0.0408	0.3983	1.3400e-003	0.1479	9.1000e-004	0.1488	0.0392	8.4000e-004	0.0401		133.8251	133.8251	2.8900e-003		133.8975
Total	**0.0596**	**0.0408**	**0.3983**	**1.3400e-003**	**0.1479**	**9.1000e-004**	**0.1488**	**0.0392**	**8.4000e-004**	**0.0401**		**133.8251**	**133.8251**	**2.8900e-003**		**133.8975**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991	0.0000	3,766.4529	3,766.4529	1.1917		3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**18.0663**	**2.3904**	**20.4566**	**9.9307**	**2.1991**	**12.1298**	**0.0000**	**3,766.4529**	**3,766.4529**	**1.1917**		**3,796.2445**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0596	0.0408	0.3983	1.3400e-003	0.1479	9.1000e-004	0.1488	0.0392	8.4000e-004	0.0401		133.8251	133.8251	2.8900e-003		133.8975
Total	**0.0596**	**0.0408**	**0.3983**	**1.3400e-003**	**0.1479**	**9.1000e-004**	**0.1488**	**0.0392**	**8.4000e-004**	**0.0401**		**133.8251**	**133.8251**	**2.8900e-003**		**133.8975**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2000	0.0000	6.2000	3.3303	0.0000	3.3303			0.0000			0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856		2,936.8068	2,936.8068	0.9292		2,960.0361
Total	**2.5805**	**28.3480**	**16.2934**	**0.0297**	**6.2000**	**1.3974**	**7.5974**	**3.3303**	**1.2856**	**4.6158**		**2,936.8068**	**2,936.8068**	**0.9292**		**2,960.0361**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2116	7.3229	2.8493	0.0172	1.3575	0.0294	1.3869	0.3434	0.0282	0.3716		1,933.809 7	1,933.809 7	0.2388		1,939.778 7
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0497	0.0340	0.3319	1.1200e-003	0.1232	7.6000e-004	0.1240	0.0327	7.0000e-004	0.0334		111.5209	111.5209	2.4100e-003		111.5812
Total	**0.2613**	**7.3569**	**3.1812**	**0.0183**	**1.4807**	**0.0302**	**1.5109**	**0.3761**	**0.0289**	**0.4049**		**2,045.330 7**	**2,045.330 7**	**0.2412**		**2,051.359 9**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2000	0.0000	6.2000	3.3303	0.0000	3.3303			0.0000			0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856	0.0000	2,936.806 8	2,936.806 8	0.9292		2,960.036 1
Total	**2.5805**	**28.3480**	**16.2934**	**0.0297**	**6.2000**	**1.3974**	**7.5974**	**3.3303**	**1.2856**	**4.6158**	**0.0000**	**2,936.806 8**	**2,936.806 8**	**0.9292**		**2,960.036 1**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2116	7.3229	2.8493	0.0172	1.3575	0.0294	1.3869	0.3434	0.0282	0.3716		1,933.809 7	1,933.809 7	0.2388		1,939.778 7
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0497	0.0340	0.3319	1.1200e-003	0.1232	7.6000e-004	0.1240	0.0327	7.0000e-004	0.0334		111.5209	111.5209	2.4100e-003		111.5812
Total	**0.2613**	**7.3569**	**3.1812**	**0.0183**	**1.4807**	**0.0302**	**1.5109**	**0.3761**	**0.0289**	**0.4049**		**2,045.330 7**	**2,045.330 7**	**0.2412**		**2,051.359 9**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2000	0.0000	6.2000	3.3303	0.0000	3.3303			0.0000			0.0000
Off-Road	2.4288	26.3859	16.0530	0.0297		1.2734	1.2734		1.1716	1.1716		2,872.485 1	2,872.485 1	0.9290		2,895.710 6
Total	**2.4288**	**26.3859**	**16.0530**	**0.0297**	**6.2000**	**1.2734**	**7.4734**	**3.3303**	**1.1716**	**4.5018**		**2,872.485 1**	**2,872.485 1**	**0.9290**		**2,895.710 6**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1867	6.7659	2.8424	0.0168	0.4379	0.0212	0.4591	0.1177	0.0203	0.1380		1,906.408 6	1,906.408 6	0.2405		1,912.420 6
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0459	0.0302	0.3006	1.0800e-003	0.1232	7.4000e-004	0.1240	0.0327	6.8000e-004	0.0334		107.9793	107.9793	2.1200e-003		108.0323
Total	**0.2326**	**6.7960**	**3.1430**	**0.0179**	**0.5611**	**0.0220**	**0.5831**	**0.1504**	**0.0210**	**0.1714**		**2,014.387 8**	**2,014.387 8**	**0.2426**		**2,020.452 9**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2000	0.0000	6.2000	3.3303	0.0000	3.3303			0.0000			0.0000
Off-Road	2.4288	26.3859	16.0530	0.0297		1.2734	1.2734		1.1716	1.1716	0.0000	2,872.485 1	2,872.485 1	0.9290		2,895.710 6
Total	**2.4288**	**26.3859**	**16.0530**	**0.0297**	**6.2000**	**1.2734**	**7.4734**	**3.3303**	**1.1716**	**4.5018**	**0.0000**	**2,872.485 1**	**2,872.485 1**	**0.9290**		**2,895.710 6**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1867	6.7659	2.8424	0.0168	0.4379	0.0212	0.4591	0.1177	0.0203	0.1380		1,906.408 6	1,906.408 6	0.2405		1,912.420 6
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0459	0.0302	0.3006	1.0800e-003	0.1232	7.4000e-004	0.1240	0.0327	6.8000e-004	0.0334		107.9793	107.9793	2.1200e-003		108.0323
Total	**0.2326**	**6.7960**	**3.1430**	**0.0179**	**0.5611**	**0.0220**	**0.5831**	**0.1504**	**0.0210**	**0.1714**		**2,014.387 8**	**2,014.387 8**	**0.2426**		**2,020.452 9**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.063 1	2,553.063 1	0.6229		2,568.634 5
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.063 1**	**2,553.063 1**	**0.6229**		**2,568.634 5**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2547	7.4254	3.0840	0.0169	0.4320	0.0375	0.4695	0.1243	0.0359	0.1602		1,850.433 2	1,850.433 2	0.1645		1,854.544 6
Worker	0.5046	0.3318	3.3063	0.0119	1.3554	8.1600e-003	1.3636	0.3595	7.5200e-003	0.3670		1,187.771 8	1,187.771 8	0.0233		1,188.355 4
Total	**0.7593**	**7.7572**	**6.3903**	**0.0288**	**1.7874**	**0.0457**	**1.8331**	**0.4838**	**0.0434**	**0.5272**		**3,038.204 9**	**3,038.204 9**	**0.1878**		**3,042.900 0**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.063 1	2,553.063 1	0.6229		2,568.634 5
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.063 1**	**2,553.063 1**	**0.6229**		**2,568.634 5**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2547	7.4254	3.0840	0.0169	0.4320	0.0375	0.4695	0.1243	0.0359	0.1602		1,850.433 2	1,850.433 2	0.1645		1,854.544 6
Worker	0.5046	0.3318	3.3063	0.0119	1.3554	8.1600e-003	1.3636	0.3595	7.5200e-003	0.3670		1,187.771 8	1,187.771 8	0.0233		1,188.355 4
Total	**0.7593**	**7.7572**	**6.3903**	**0.0288**	**1.7874**	**0.0457**	**1.8331**	**0.4838**	**0.0434**	**0.5272**		**3,038.204 9**	**3,038.204 9**	**0.1878**		**3,042.900 0**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.363 9	2,553.363 9	0.6160		2,568.764 3
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.363 9**	**2,553.363 9**	**0.6160**		**2,568.764 3**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2106	6.6645	2.9831	0.0166	0.4320	0.0157	0.4477	0.1243	0.0150	0.1393		1,827.5294	1,827.5294	0.1614		1,831.5645
Worker	0.4724	0.2977	3.0494	0.0115	1.3554	7.9100e-003	1.3633	0.3595	7.2800e-003	0.3668		1,145.5264	1,145.5264	0.0209		1,146.0498
Total	**0.6830**	**6.9622**	**6.0325**	**0.0281**	**1.7874**	**0.0236**	**1.8110**	**0.4838**	**0.0223**	**0.5061**		**2,973.0558**	**2,973.0558**	**0.1823**		**2,977.6143**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2106	6.6645	2.9831	0.0166	0.4320	0.0157	0.4477	0.1243	0.0150	0.1393		1,827.529 4	1,827.529 4	0.1614		1,831.564 5
Worker	0.4724	0.2977	3.0494	0.0115	1.3554	7.9100e-003	1.3633	0.3595	7.2800e-003	0.3668		1,145.526 4	1,145.526 4	0.0209		1,146.049 8
Total	**0.6830**	**6.9622**	**6.0325**	**0.0281**	**1.7874**	**0.0236**	**1.8110**	**0.4838**	**0.0223**	**0.5061**		**2,973.055 8**	**2,973.055 8**	**0.1823**		**2,977.614 3**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235		2,207.210 9	2,207.210 9	0.7139		2,225.057 3
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2556**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**		**2,207.210 9**	**2,207.210 9**	**0.7139**		**2,225.057 3**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0430	0.0271	0.2772	1.0400e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0334		104.1388	104.1388	1.9000e-003		104.1864
Total	**0.0430**	**0.0271**	**0.2772**	**1.0400e-003**	**0.1232**	**7.2000e-004**	**0.1239**	**0.0327**	**6.6000e-004**	**0.0334**		**104.1388**	**104.1388**	**1.9000e-003**		**104.1864**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235	0.0000	2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2556**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**	**0.0000**	**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0430	0.0271	0.2772	1.0400e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0334		104.1388	104.1388	1.9000e-003		104.1864
Total	**0.0430**	**0.0271**	**0.2772**	**1.0400e-003**	**0.1232**	**7.2000e-004**	**0.1239**	**0.0327**	**6.6000e-004**	**0.0334**		**104.1388**	**104.1388**	**1.9000e-003**		**104.1864**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.8803	2.7023	10.1001	0.0317	3.0281	0.0275	3.0556	0.8108	0.0257	0.8365		3,198.396 4	3,198.396 4	0.1211		3,201.424 3
Unmitigated	0.8803	2.7023	10.1001	0.0317	3.0281	0.0275	3.0556	0.8108	0.0257	0.8365		3,198.396 4	3,198.396 4	0.1211		3,201.424 3

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	260.10	667.80	667.80	803,955	803,955
Total	260.10	667.80	667.80	803,955	803,955

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.482816	0.049967	0.258264	0.138365	0.017696	0.006700	0.022365	0.006431	0.004044	0.003214	0.008927	0.000452	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0203	1.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.9700e-003	1.9700e-003	1.0000e-005		2.1000e-003
Unmitigated	0.0203	1.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.9700e-003	1.9700e-003	1.0000e-005		2.1000e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0202					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.0000e-005	1.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.9700e-003	1.9700e-003	1.0000e-005		2.1000e-003
Total	**0.0203**	**1.0000e-005**	**9.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.9700e-003**	**1.9700e-003**	**1.0000e-005**		**2.1000e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0202					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.0000e-005	1.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.9700e-003	1.9700e-003	1.0000e-005		2.1000e-003
Total	**0.0203**	**1.0000e-005**	**9.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.9700e-003**	**1.9700e-003**	**1.0000e-005**		**2.1000e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Flood County Park Landscape Plan

San Mateo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	9.00	Acre	9.00	392,040.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	70
Climate Zone	5			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Extend grading phase to 60 days based on number of hauling trips

Off-road Equipment -

Demolition -

Grading - Import 4,370 cy, export 5,630 cy on 9 acres

Vehicle Trips - Traffic study: 260 weekday trips/day = 28.9 trips/acre/day
668 weekend trips/day = 74.2 trips/acre/day

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	60.00
tblConstructionPhase	PhaseEndDate	1/9/2020	3/5/2020
tblConstructionPhase	PhaseEndDate	11/26/2020	1/21/2021
tblConstructionPhase	PhaseEndDate	12/24/2020	2/18/2021
tblConstructionPhase	PhaseStartDate	1/10/2020	3/6/2020
tblConstructionPhase	PhaseStartDate	11/27/2020	1/22/2021
tblGrading	AcresOfGrading	30.00	9.00
tblGrading	MaterialExported	0.00	5,630.00
tblGrading	MaterialImported	0.00	4,370.00
tblVehicleTrips	ST_TR	22.75	74.20
tblVehicleTrips	SU_TR	16.74	74.20
tblVehicleTrips	WD_TR	1.89	28.90

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0772	0.8609	0.4788	1.0100e-003	0.1745	0.0394	0.2139	0.0792	0.0364	0.1156	0.0000	93.2062	93.2062	0.0232	0.0000	93.7871
2020	0.3653	3.6718	2.9240	7.1300e-003	0.3440	0.1554	0.4994	0.1319	0.1455	0.2775	0.0000	652.0154	652.0154	0.1038	0.0000	654.6105
2021	0.0319	0.3122	0.3172	6.5000e-004	0.0141	0.0142	0.0282	3.8100e-003	0.0132	0.0170	0.0000	58.7300	58.7300	0.0119	0.0000	59.0278
Maximum	**0.3653**	**3.6718**	**2.9240**	**7.1300e-003**	**0.3440**	**0.1554**	**0.4994**	**0.1319**	**0.1455**	**0.2775**	**0.0000**	**652.0154**	**652.0154**	**0.1038**	**0.0000**	**654.6105**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0772	0.8609	0.4788	1.0100e-003	0.1745	0.0394	0.2139	0.0792	0.0364	0.1156	0.0000	93.2061	93.2061	0.0232	0.0000	93.7871
2020	0.3653	3.6718	2.9240	7.1300e-003	0.3440	0.1554	0.4994	0.1319	0.1455	0.2775	0.0000	652.0150	652.0150	0.1038	0.0000	654.6101
2021	0.0319	0.3122	0.3172	6.5000e-004	0.0141	0.0142	0.0282	3.8100e-003	0.0132	0.0170	0.0000	58.7299	58.7299	0.0119	0.0000	59.0277
Maximum	**0.3653**	**3.6718**	**2.9240**	**7.1300e-003**	**0.3440**	**0.1554**	**0.4994**	**0.1319**	**0.1455**	**0.2775**	**0.0000**	**652.0150**	**652.0150**	**0.1038**	**0.0000**	**654.6101**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**11-1-2019**	**1-31-2020**	1.3467	1.3467
2	**2-1-2020**	**4-30-2020**	1.0291	1.0291
3	**5-1-2020**	**7-31-2020**	0.9719	0.9719
4	**8-1-2020**	**10-31-2020**	0.9746	0.9746
5	**11-1-2020**	**1-31-2021**	0.9029	0.9029
6	**2-1-2021**	**4-30-2021**	0.0916	0.0916
		Highest	1.3467	1.3467

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.6900e-003	0.0000	8.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.6000e-004	1.6000e-004	0.0000	0.0000	1.7000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0895	0.2693	0.9866	3.2600e-003	0.2980	2.8100e-003	0.3009	0.0801	2.6200e-003	0.0827	0.0000	298.5862	298.5862	0.0111	0.0000	298.8624
Waste						0.0000	0.0000		0.0000	0.0000	0.1563	0.0000	0.1563	9.2400e-003	0.0000	0.3872
Water						0.0000	0.0000		0.0000	0.0000	0.0000	10.9184	10.9184	4.9000e-004	1.0000e-004	10.9612
Total	**0.0932**	**0.2693**	**0.9867**	**3.2600e-003**	**0.2980**	**2.8100e-003**	**0.3009**	**0.0801**	**2.6200e-003**	**0.0827**	**0.1563**	**309.5048**	**309.6611**	**0.0208**	**1.0000e-004**	**310.2110**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.6900e-003	0.0000	8.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.6000e-004	1.6000e-004	0.0000	0.0000	1.7000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0895	0.2693	0.9866	3.2600e-003	0.2980	2.8100e-003	0.3009	0.0801	2.6200e-003	0.0827	0.0000	298.5862	298.5862	0.0111	0.0000	298.8624
Waste						0.0000	0.0000		0.0000	0.0000	0.1563	0.0000	0.1563	9.2400e-003	0.0000	0.3872
Water						0.0000	0.0000		0.0000	0.0000	0.0000	10.9184	10.9184	4.9000e-004	1.0000e-004	10.9612
Total	**0.0932**	**0.2693**	**0.9867**	**3.2600e-003**	**0.2980**	**2.8100e-003**	**0.3009**	**0.0801**	**2.6200e-003**	**0.0827**	**0.1563**	**309.5048**	**309.6611**	**0.0208**	**1.0000e-004**	**310.2110**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	11/1/2019	11/28/2019	5	20	
2	Site Preparation	Site Preparation	11/29/2019	12/12/2019	5	10	
3	Grading	Grading	12/13/2019	3/5/2020	5	60	
4	Building Construction	Building Construction	3/6/2020	1/21/2021	5	230	
5	Paving	Paving	1/22/2021	2/18/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 9

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	9	165.00	64.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	1,250.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	15.00	0.00	246.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0266	0.0000	0.0266	4.0200e-003	0.0000	4.0200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0351	0.3578	0.2206	3.9000e-004		0.0180	0.0180		0.0167	0.0167	0.0000	34.6263	34.6263	9.6300e-003	0.0000	34.8672
Total	**0.0351**	**0.3578**	**0.2206**	**3.9000e-004**	**0.0266**	**0.0180**	**0.0445**	**4.0200e-003**	**0.0167**	**0.0207**	**0.0000**	**34.6263**	**34.6263**	**9.6300e-003**	**0.0000**	**34.8672**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2300e-003	0.0430	0.0165	1.0000e-004	2.0600e-003	1.7000e-004	2.2300e-003	5.7000e-004	1.6000e-004	7.3000e-004	0.0000	10.4206	10.4206	1.2700e-003	0.0000	10.4524
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	3.1000e-004	3.2200e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.0156	1.0156	2.0000e-005	0.0000	1.0161
Total	**1.6700e-003**	**0.0433**	**0.0197**	**1.1000e-004**	**3.2400e-003**	**1.8000e-004**	**3.4200e-003**	**8.8000e-004**	**1.7000e-004**	**1.0500e-003**	**0.0000**	**11.4361**	**11.4361**	**1.2900e-003**	**0.0000**	**11.4684**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0266	0.0000	0.0266	4.0200e-003	0.0000	4.0200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0351	0.3578	0.2206	3.9000e-004		0.0180	0.0180		0.0167	0.0167	0.0000	34.6263	34.6263	9.6300e-003	0.0000	34.8671
Total	**0.0351**	**0.3578**	**0.2206**	**3.9000e-004**	**0.0266**	**0.0180**	**0.0445**	**4.0200e-003**	**0.0167**	**0.0207**	**0.0000**	**34.6263**	**34.6263**	**9.6300e-003**	**0.0000**	**34.8671**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2300e-003	0.0430	0.0165	1.0000e-004	2.0600e-003	1.7000e-004	2.2300e-003	5.7000e-004	1.6000e-004	7.3000e-004	0.0000	10.4206	10.4206	1.2700e-003	0.0000	10.4524
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	3.1000e-004	3.2200e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	1.0156	1.0156	2.0000e-005	0.0000	1.0161
Total	**1.6700e-003**	**0.0433**	**0.0197**	**1.1000e-004**	**3.2400e-003**	**1.8000e-004**	**3.4200e-003**	**8.8000e-004**	**1.7000e-004**	**1.0500e-003**	**0.0000**	**11.4361**	**11.4361**	**1.2900e-003**	**0.0000**	**11.4684**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0217	0.2279	0.1103	1.9000e-004		0.0120	0.0120		0.0110	0.0110	0.0000	17.0843	17.0843	5.4100e-003	0.0000	17.2195
Total	**0.0217**	**0.2279**	**0.1103**	**1.9000e-004**	**0.0903**	**0.0120**	**0.1023**	**0.0497**	**0.0110**	**0.0607**	**0.0000**	**17.0843**	**17.0843**	**5.4100e-003**	**0.0000**	**17.2195**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	1.9000e-004	1.9300e-003	1.0000e-005	7.1000e-004	0.0000	7.1000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6093	0.6093	1.0000e-005	0.0000	0.6097
Total	**2.7000e-004**	**1.9000e-004**	**1.9300e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6093**	**0.6093**	**1.0000e-005**	**0.0000**	**0.6097**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0217	0.2279	0.1103	1.9000e-004		0.0120	0.0120		0.0110	0.0110	0.0000	17.0843	17.0843	5.4100e-003	0.0000	17.2195
Total	**0.0217**	**0.2279**	**0.1103**	**1.9000e-004**	**0.0903**	**0.0120**	**0.1023**	**0.0497**	**0.0110**	**0.0607**	**0.0000**	**17.0843**	**17.0843**	**5.4100e-003**	**0.0000**	**17.2195**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	1.9000e-004	1.9300e-003	1.0000e-005	7.1000e-004	0.0000	7.1000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6093	0.6093	1.0000e-005	0.0000	0.6097
Total	**2.7000e-004**	**1.9000e-004**	**1.9300e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6093**	**0.6093**	**1.0000e-005**	**0.0000**	**0.6097**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0445	0.0000	0.0445	0.0221	0.0000	0.0221	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0168	0.1843	0.1059	1.9000e-004		9.0800e-003	9.0800e-003		8.3600e-003	8.3600e-003	0.0000	17.3175	17.3175	5.4800e-003	0.0000	17.4545
Total	**0.0168**	**0.1843**	**0.1059**	**1.9000e-004**	**0.0445**	**9.0800e-003**	**0.0536**	**0.0221**	**8.3600e-003**	**0.0305**	**0.0000**	**17.3175**	**17.3175**	**5.4800e-003**	**0.0000**	**17.4545**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.3600e-003	0.0473	0.0182	1.1000e-004	8.4300e-003	1.9000e-004	8.6200e-003	2.1300e-003	1.8000e-004	2.3200e-003	0.0000	11.4725	11.4725	1.4000e-003	0.0000	11.5075
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	2.0000e-004	2.0900e-003	1.0000e-005	7.7000e-004	0.0000	7.7000e-004	2.0000e-004	0.0000	2.1000e-004	0.0000	0.6601	0.6601	1.0000e-005	0.0000	0.6605
Total	**1.6500e-003**	**0.0475**	**0.0203**	**1.2000e-004**	**9.2000e-003**	**1.9000e-004**	**9.3900e-003**	**2.3300e-003**	**1.8000e-004**	**2.5300e-003**	**0.0000**	**12.1326**	**12.1326**	**1.4100e-003**	**0.0000**	**12.1680**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0445	0.0000	0.0445	0.0221	0.0000	0.0221	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0168	0.1843	0.1059	1.9000e-004		9.0800e-003	9.0800e-003		8.3600e-003	8.3600e-003	0.0000	17.3175	17.3175	5.4800e-003	0.0000	17.4544
Total	**0.0168**	**0.1843**	**0.1059**	**1.9000e-004**	**0.0445**	**9.0800e-003**	**0.0536**	**0.0221**	**8.3600e-003**	**0.0305**	**0.0000**	**17.3175**	**17.3175**	**5.4800e-003**	**0.0000**	**17.4544**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.3600e-003	0.0473	0.0182	1.1000e-004	8.4300e-003	1.9000e-004	8.6200e-003	2.1300e-003	1.8000e-004	2.3200e-003	0.0000	11.4725	11.4725	1.4000e-003	0.0000	11.5075
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	2.0000e-004	2.0900e-003	1.0000e-005	7.7000e-004	0.0000	7.7000e-004	2.0000e-004	0.0000	2.1000e-004	0.0000	0.6601	0.6601	1.0000e-005	0.0000	0.6605
Total	**1.6500e-003**	**0.0475**	**0.0203**	**1.2000e-004**	**9.2000e-003**	**1.9000e-004**	**9.3900e-003**	**2.3300e-003**	**1.8000e-004**	**2.5300e-003**	**0.0000**	**12.1326**	**12.1326**	**1.4100e-003**	**0.0000**	**12.1680**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1469	0.0000	0.1469	0.0784	0.0000	0.0784	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0571	0.6201	0.3772	7.0000e-004		0.0299	0.0299		0.0275	0.0275	0.0000	61.2381	61.2381	0.0198	0.0000	61.7332
Total	**0.0571**	**0.6201**	**0.3772**	**7.0000e-004**	**0.1469**	**0.0299**	**0.1768**	**0.0784**	**0.0275**	**0.1059**	**0.0000**	**61.2381**	**61.2381**	**0.0198**	**0.0000**	**61.7332**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.3400e-003	0.1580	0.0659	4.0000e-004	9.8900e-003	4.9000e-004	0.0104	2.6700e-003	4.7000e-004	3.1400e-003	0.0000	40.8956	40.8956	5.1000e-003	0.0000	41.0232
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	6.5000e-004	6.8600e-003	3.0000e-005	2.7800e-003	2.0000e-005	2.7900e-003	7.4000e-004	2.0000e-005	7.5000e-004	0.0000	2.3107	2.3107	5.0000e-005	0.0000	2.3119
Total	**5.3000e-003**	**0.1587**	**0.0727**	**4.3000e-004**	**0.0127**	**5.1000e-004**	**0.0132**	**3.4100e-003**	**4.9000e-004**	**3.8900e-003**	**0.0000**	**43.2063**	**43.2063**	**5.1500e-003**	**0.0000**	**43.3351**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1469	0.0000	0.1469	0.0784	0.0000	0.0784	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0571	0.6201	0.3772	7.0000e-004		0.0299	0.0299		0.0275	0.0275	0.0000	61.2380	61.2380	0.0198	0.0000	61.7331
Total	**0.0571**	**0.6201**	**0.3772**	**7.0000e-004**	**0.1469**	**0.0299**	**0.1768**	**0.0784**	**0.0275**	**0.1059**	**0.0000**	**61.2380**	**61.2380**	**0.0198**	**0.0000**	**61.7331**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.3400e-003	0.1580	0.0659	4.0000e-004	9.8900e-003	4.9000e-004	0.0104	2.6700e-003	4.7000e-004	3.1400e-003	0.0000	40.8956	40.8956	5.1000e-003	0.0000	41.0232
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	6.5000e-004	6.8600e-003	3.0000e-005	2.7800e-003	2.0000e-005	2.7900e-003	7.4000e-004	2.0000e-005	7.5000e-004	0.0000	2.3107	2.3107	5.0000e-005	0.0000	2.3119
Total	**5.3000e-003**	**0.1587**	**0.0727**	**4.3000e-004**	**0.0127**	**5.1000e-004**	**0.0132**	**3.4100e-003**	**4.9000e-004**	**3.8900e-003**	**0.0000**	**43.2063**	**43.2063**	**5.1500e-003**	**0.0000**	**43.3351**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2279	2.0625	1.8112	2.8900e-003		0.1201	0.1201		0.1129	0.1129	0.0000	248.9807	248.9807	0.0607	0.0000	250.4993
Total	**0.2279**	**2.0625**	**1.8112**	**2.8900e-003**		**0.1201**	**0.1201**		**0.1129**	**0.1129**	**0.0000**	**248.9807**	**248.9807**	**0.0607**	**0.0000**	**250.4993**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0267	0.7978	0.3176	1.8300e-003	0.0448	3.9800e-003	0.0488	0.0130	3.8000e-003	0.0168	0.0000	182.3158	182.3158	0.0158	0.0000	182.7118
Worker	0.0484	0.0328	0.3452	1.2800e-003	0.1396	8.8000e-004	0.1405	0.0372	8.1000e-004	0.0380	0.0000	116.2745	116.2745	2.2700e-003	0.0000	116.3312
Total	**0.0750**	**0.8306**	**0.6628**	**3.1100e-003**	**0.1845**	**4.8600e-003**	**0.1893**	**0.0501**	**4.6100e-003**	**0.0547**	**0.0000**	**298.5903**	**298.5903**	**0.0181**	**0.0000**	**299.0429**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2279	2.0625	1.8112	2.8900e-003		0.1201	0.1201		0.1129	0.1129	0.0000	248.9804	248.9804	0.0607	0.0000	250.4990
Total	**0.2279**	**2.0625**	**1.8112**	**2.8900e-003**		**0.1201**	**0.1201**		**0.1129**	**0.1129**	**0.0000**	**248.9804**	**248.9804**	**0.0607**	**0.0000**	**250.4990**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0267	0.7978	0.3176	1.8300e-003	0.0448	3.9800e-003	0.0488	0.0130	3.8000e-003	0.0168	0.0000	182.3158	182.3158	0.0158	0.0000	182.7118
Worker	0.0484	0.0328	0.3452	1.2800e-003	0.1396	8.8000e-004	0.1405	0.0372	8.1000e-004	0.0380	0.0000	116.2745	116.2745	2.2700e-003	0.0000	116.3312
Total	**0.0750**	**0.8306**	**0.6628**	**3.1100e-003**	**0.1845**	**4.8600e-003**	**0.1893**	**0.0501**	**4.6100e-003**	**0.0547**	**0.0000**	**298.5903**	**298.5903**	**0.0181**	**0.0000**	**299.0429**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0143	0.1307	0.1243	2.0000e-004		7.1900e-003	7.1900e-003		6.7600e-003	6.7600e-003	0.0000	17.3728	17.3728	4.1900e-003	0.0000	17.4776
Total	**0.0143**	**0.1307**	**0.1243**	**2.0000e-004**		**7.1900e-003**	**7.1900e-003**		**6.7600e-003**	**6.7600e-003**	**0.0000**	**17.3728**	**17.3728**	**4.1900e-003**	**0.0000**	**17.4776**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5300e-003	0.0500	0.0215	1.3000e-004	3.1300e-003	1.1000e-004	3.2400e-003	9.0000e-004	1.1000e-004	1.0100e-003	0.0000	12.5618	12.5618	1.0900e-003	0.0000	12.5889
Worker	3.1500e-003	2.0500e-003	0.0222	9.0000e-005	9.7400e-003	6.0000e-005	9.8000e-003	2.5900e-003	5.0000e-005	2.6500e-003	0.0000	7.8236	7.8236	1.4000e-004	0.0000	7.8272
Total	**4.6800e-003**	**0.0520**	**0.0437**	**2.2000e-004**	**0.0129**	**1.7000e-004**	**0.0130**	**3.4900e-003**	**1.6000e-004**	**3.6600e-003**	**0.0000**	**20.3854**	**20.3854**	**1.2300e-003**	**0.0000**	**20.4161**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0143	0.1307	0.1243	2.0000e-004		7.1900e-003	7.1900e-003		6.7600e-003	6.7600e-003	0.0000	17.3728	17.3728	4.1900e-003	0.0000	17.4776
Total	**0.0143**	**0.1307**	**0.1243**	**2.0000e-004**		**7.1900e-003**	**7.1900e-003**		**6.7600e-003**	**6.7600e-003**	**0.0000**	**17.3728**	**17.3728**	**4.1900e-003**	**0.0000**	**17.4776**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5300e-003	0.0500	0.0215	1.3000e-004	3.1300e-003	1.1000e-004	3.2400e-003	9.0000e-004	1.1000e-004	1.0100e-003	0.0000	12.5618	12.5618	1.0900e-003	0.0000	12.5889
Worker	3.1500e-003	2.0500e-003	0.0222	9.0000e-005	9.7400e-003	6.0000e-005	9.8000e-003	2.5900e-003	5.0000e-005	2.6500e-003	0.0000	7.8236	7.8236	1.4000e-004	0.0000	7.8272
Total	**4.6800e-003**	**0.0520**	**0.0437**	**2.2000e-004**	**0.0129**	**1.7000e-004**	**0.0130**	**3.4900e-003**	**1.6000e-004**	**3.6600e-003**	**0.0000**	**20.3854**	**20.3854**	**1.2300e-003**	**0.0000**	**20.4161**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0126**	**0.1292**	**0.1465**	**2.3000e-004**		**6.7800e-003**	**6.7800e-003**		**6.2400e-003**	**6.2400e-003**	**0.0000**	**20.0235**	**20.0235**	**6.4800e-003**	**0.0000**	**20.1854**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	2.5000e-004	2.7000e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	0.9483	0.9483	2.0000e-005	0.0000	0.9488
Total	**3.8000e-004**	**2.5000e-004**	**2.7000e-003**	**1.0000e-005**	**1.1800e-003**	**1.0000e-005**	**1.1900e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9483**	**0.9483**	**2.0000e-005**	**0.0000**	**0.9488**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0126**	**0.1292**	**0.1465**	**2.3000e-004**		**6.7800e-003**	**6.7800e-003**		**6.2400e-003**	**6.2400e-003**	**0.0000**	**20.0235**	**20.0235**	**6.4800e-003**	**0.0000**	**20.1854**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	2.5000e-004	2.7000e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	0.9483	0.9483	2.0000e-005	0.0000	0.9488
Total	**3.8000e-004**	**2.5000e-004**	**2.7000e-003**	**1.0000e-005**	**1.1800e-003**	**1.0000e-005**	**1.1900e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9483**	**0.9483**	**2.0000e-005**	**0.0000**	**0.9488**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0895	0.2693	0.9866	3.2600e-003	0.2980	2.8100e-003	0.3009	0.0801	2.6200e-003	0.0827	0.0000	298.5862	298.5862	0.0111	0.0000	298.8624
Unmitigated	0.0895	0.2693	0.9866	3.2600e-003	0.2980	2.8100e-003	0.3009	0.0801	2.6200e-003	0.0827	0.0000	298.5862	298.5862	0.0111	0.0000	298.8624

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	260.10	667.80	667.80	803,955	803,955
Total	260.10	667.80	667.80	803,955	803,955

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.482816	0.049967	0.258264	0.138365	0.017696	0.006700	0.022365	0.006431	0.004044	0.003214	0.008927	0.000452	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.6900e-003	0.0000	8.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.6000e-004	1.6000e-004	0.0000	0.0000	1.7000e-004
Unmitigated	3.6900e-003	0.0000	8.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.6000e-004	1.6000e-004	0.0000	0.0000	1.7000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.6900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	8.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.6000e-004	1.6000e-004	0.0000	0.0000	1.7000e-004
Total	**3.7000e-003**	**0.0000**	**8.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.6000e-004**	**1.6000e-004**	**0.0000**	**0.0000**	**1.7000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.6900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	8.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.6000e-004	1.6000e-004	0.0000	0.0000	1.7000e-004
Total	**3.7000e-003**	**0.0000**	**8.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.6000e-004**	**1.6000e-004**	**0.0000**	**0.0000**	**1.7000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	10.9184	4.9000e-004	1.0000e-004	10.9612
Unmitigated	10.9184	4.9000e-004	1.0000e-004	10.9612

7.2 Water by Land Use

<u>Unmitigated</u>

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 10.7233	10.9184	4.9000e-004	1.0000e-004	10.9612
Total		**10.9184**	**4.9000e-004**	**1.0000e-004**	**10.9612**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 10.7233	10.9184	4.9000e-004	1.0000e-004	10.9612
Total		**10.9184**	**4.9000e-004**	**1.0000e-004**	**10.9612**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.1563	9.2400e-003	0.0000	0.3872
Unmitigated	0.1563	9.2400e-003	0.0000	0.3872

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.77	0.1563	9.2400e-003	0.0000	0.3872
Total		**0.1563**	**9.2400e-003**	**0.0000**	**0.3872**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.77	0.1563	9.2400e-003	0.0000	0.3872
Total		**0.1563**	**9.2400e-003**	**0.0000**	**0.3872**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Greenhouse Gas Emission Worksheet
N2O Mobile Emissions Flood County Park Landscape Plan

From CalEEMod 2016.3.1 Vehicle Fleet Mix Output:

Annual VMT: 803,955

Vehicle Type	Percent Type	CH4 Emission Factor (g/mile)*	CH4 Emission (g/mile)**	N2O Emission Factor (g/mile)*	N2O Emission (g/mile)**
Light Auto	49.90%	0.04	0.0199587	0.04	0.019959
Light Truck < 3750 lbs	4.95%	0.05	0.0024757	0.06	0.002971
Light Truck 3751-5750 lbs	24.83%	0.05	0.0124139	0.06	0.014897
Med Truck 5751-8500 lbs	13.49%	0.12	0.0161891	0.2	0.026982
Lite-Heavy Truck 8501-10,000 lbs	1.82%	0.12	0.0021821	0.2	0.003637
Lite-Heavy Truck 10,001-14,000 lbs	0.63%	0.09	0.0005693	0.125	0.000791
Med-Heavy Truck 14,001-33,000 lbs	2.07%	0.06	0.0012402	0.05	0.001034
Heavy-Heavy Truck 33,001-60,000 lbs	0.63%	0.06	0.0003752	0.05	0.000313
Other Bus	0.38%	0.06	0.0002297	0.05	0.000191
Urban Bus	0.34%	0.06	0.0002012	0.05	0.000168
Motorcycle	0.86%	0.09	0.0007719	0.01	8.58E-05
School Bus	0.04%	0.06	2.508E-05	0.05	2.09E-05
Motor Home	0.07%	0.09	6.498E-05	0.125	9.03E-05
Total	**100.0%**		**0.0566971**		**0.071138**

Total Emissions (metric tons) =
Emission Factor by Vehicle Mix (g/mi) x Annual VMT(mi) x 0.000001 metric tons/g

Conversion to Carbon Dioxide Equivalency (CO2e) Units based on Global Warming Potential (GWP)

CH4	25	GWP
N2O	298	GWP
1 ton (short, US) =	0.90718474	metric ton

Annual Mobile Emissions:

	Total Emissions		Total CO2e units	
N2O Emissions:	0.0572	metric tons N2O	**17.04**	metric tons CO2e
		Project Total:	***17.04***	***metric tons CO2e***

References

* from Table C.4: Methane and Nitrous Oxide Emission Factors for Mobile Sources by Vehicle and Fuel Type (g/mile).
in California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.
Assume Model year 2000-present, gasoline fueled.

** Source: California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.

Flood Park

Last Updated: July 2, 2019

Populate one of the following tables (Leave the other blank):

Annual VMT - Residential	
Annual VMT:	803,955

OR

Daily Vehicle Trips	
Daily Vehicle Trips:	
Average Trip Distance:	

Fleet Class	Fleet Mix
Light Duty Auto (LDA)	0.482816
Light Duty Truck 1 (LDT1)	0.049967
Light Duty Truck 2 (LDT2)	0.258264
Medium Duty Vehicle (MDV)	0.138365
Light Heavy Duty 1 (LHD1)	0.017696
Light Heavy Duty 2 (LHD2)	0.006700
Medium Heavy Duty (MHD)	0.022365
Heavy Heavy Duty (HHD)	0.006431
Other Bus (OBUS)	0.004044
Urban Bus (UBUS)	0.003214
School Bus (SBUS)	0.000452
Motorhome (MH)	0.000759
Motorcycle (MCY)	0.008927

Fuel Economy (MPG)	
Passenger Vehicles	24.0
Light-Med Duty Trucks	17.4
Heavy Trucks/Other	7.4
Motorcycles	43.9

Fleet Mix

Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	*48.28%*	*Gasoline*	388,162	0.00	16,173.43
Light-Medium Duty Trucks	*44.66%*	*Gasoline*	359,043	0.00	20,634.66
Heavy Trucks/Other	*6.17%*	*Diesel*	49,573	0.00	6,699.01
Motorcycle	*0.89%*	*Gasoline*	7,177	0.00	163.48

Total Gasoline Consumption (gallons)	**36,971.57**
Total Diesel Consumption (gallons)	**6,699.01**

Appendix C

Noise Results

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 80.5 - 2017/01/19 18:34:16
- Level Range : 40-100
- SEL : 99.5
- Leq : 70.0

No.s	Date Time	(dB)
1	2017/01/19 18:20:44	64.1
2	2017/01/19 18:20:45	67.1
3	2017/01/19 18:20:46	73.1
4	2017/01/19 18:20:47	73.3
5	2017/01/19 18:20:48	67.5
6	2017/01/19 18:20:49	65.7
7	2017/01/19 18:20:50	69.4
8	2017/01/19 18:20:51	73.2
9	2017/01/19 18:20:52	74.1
10	2017/01/19 18:20:53	71.3
11	2017/01/19 18:20:54	68.3
12	2017/01/19 18:20:55	68.5
13	2017/01/19 18:20:56	72.0
14	2017/01/19 18:20:57	69.8
15	2017/01/19 18:20:58	65.4
16	2017/01/19 18:20:59	63.4
17	2017/01/19 18:21:00	61.9
18	2017/01/19 18:21:01	60.8
19	2017/01/19 18:21:02	61.3
20	2017/01/19 18:21:03	62.3
21	2017/01/19 18:21:04	65.5
22	2017/01/19 18:21:05	66.6
23	2017/01/19 18:21:06	68.6
24	2017/01/19 18:21:07	67.1
25	2017/01/19 18:21:08	62.8
26	2017/01/19 18:21:09	61.2
27	2017/01/19 18:21:10	61.7
28	2017/01/19 18:21:11	61.7
29	2017/01/19 18:21:12	63.1
30	2017/01/19 18:21:13	65.3
31	2017/01/19 18:21:14	66.6
32	2017/01/19 18:21:15	64.1
33	2017/01/19 18:21:16	60.3
34	2017/01/19 18:21:17	56.9
35	2017/01/19 18:21:18	55.5
36	2017/01/19 18:21:19	54.3
37	2017/01/19 18:21:20	53.7
38	2017/01/19 18:21:21	53.9
39	2017/01/19 18:21:22	53.5
40	2017/01/19 18:21:23	53.7
41	2017/01/19 18:21:24	53.4
42	2017/01/19 18:21:25	53.2
43	2017/01/19 18:21:26	53.3
44	2017/01/19 18:21:27	52.9
45	2017/01/19 18:21:28	54.1
46	2017/01/19 18:21:29	55.2
47	2017/01/19 18:21:30	55.5
48	2017/01/19 18:21:31	57.3
49	2017/01/19 18:21:32	60.3
50	2017/01/19 18:21:33	63.4
51	2017/01/19 18:21:34	68.2
52	2017/01/19 18:21:35	71.9
53	2017/01/19 18:21:36	67.5
54	2017/01/19 18:21:37	65.5
55	2017/01/19 18:21:38	70.7
56	2017/01/19 18:21:39	75.9
57	2017/01/19 18:21:40	76.6
58	2017/01/19 18:21:41	71.3
59	2017/01/19 18:21:42	66.8
60	2017/01/19 18:21:43	62.1
61	2017/01/19 18:21:44	61.2
62	2017/01/19 18:21:45	60.5
63	2017/01/19 18:21:46	61.3
64	2017/01/19 18:21:47	65.0
65	2017/01/19 18:21:48	70.7
66	2017/01/19 18:21:49	71.7
67	2017/01/19 18:21:50	66.2
68	2017/01/19 18:21:51	63.2
69	2017/01/19 18:21:52	61.3
70	2017/01/19 18:21:53	61.7
71	2017/01/19 18:21:54	60.6
72	2017/01/19 18:21:55	60.8
73	2017/01/19 18:21:56	56.7
74	2017/01/19 18:21:57	53.7
75	2017/01/19 18:21:58	53.1
76	2017/01/19 18:21:59	53.7
77	2017/01/19 18:22:00	54.4
78	2017/01/19 18:22:01	53.9
79	2017/01/19 18:22:02	54.1
80	2017/01/19 18:22:03	57.1
81	2017/01/19 18:22:04	55.8
82	2017/01/19 18:22:05	56.6
83	2017/01/19 18:22:06	57.7
84	2017/01/19 18:22:07	59.0
85	2017/01/19 18:22:08	60.6

86	2017/01/19	18:22:09	64.2
87	2017/01/19	18:22:10	71.0
88	2017/01/19	18:22:11	74.8
89	2017/01/19	18:22:12	68.4
90	2017/01/19	18:22:13	66.2
91	2017/01/19	18:22:14	67.6
92	2017/01/19	18:22:15	73.1
93	2017/01/19	18:22:16	74.4
94	2017/01/19	18:22:17	68.5
95	2017/01/19	18:22:18	64.8
96	2017/01/19	18:22:19	64.2
97	2017/01/19	18:22:20	64.6
98	2017/01/19	18:22:21	63.4
99	2017/01/19	18:22:22	61.5
100	2017/01/19	18:22:23	61.0
101	2017/01/19	18:22:24	60.6
102	2017/01/19	18:22:25	61.7
103	2017/01/19	18:22:26	65.6
104	2017/01/19	18:22:27	73.0
105	2017/01/19	18:22:28	77.0
106	2017/01/19	18:22:29	74.6
107	2017/01/19	18:22:30	75.4
108	2017/01/19	18:22:31	77.2
109	2017/01/19	18:22:32	70.1
110	2017/01/19	18:22:33	67.8
111	2017/01/19	18:22:34	66.3
112	2017/01/19	18:22:35	67.0
113	2017/01/19	18:22:36	63.6
114	2017/01/19	18:22:37	62.6
115	2017/01/19	18:22:38	60.5
116	2017/01/19	18:22:39	57.9
117	2017/01/19	18:22:40	55.8
118	2017/01/19	18:22:41	55.0
119	2017/01/19	18:22:42	55.2
120	2017/01/19	18:22:43	55.0
121	2017/01/19	18:22:44	55.5
122	2017/01/19	18:22:45	55.5
123	2017/01/19	18:22:46	57.6
124	2017/01/19	18:22:47	59.3
125	2017/01/19	18:22:48	61.7
126	2017/01/19	18:22:49	66.6
127	2017/01/19	18:22:50	72.0
128	2017/01/19	18:22:51	73.0
129	2017/01/19	18:22:52	71.8
130	2017/01/19	18:22:53	72.3
131	2017/01/19	18:22:54	73.6
132	2017/01/19	18:22:55	71.5
133	2017/01/19	18:22:56	73.3
134	2017/01/19	18:22:57	71.4
135	2017/01/19	18:22:58	67.1
136	2017/01/19	18:22:59	64.1
137	2017/01/19	18:23:00	62.7
138	2017/01/19	18:23:01	63.4
139	2017/01/19	18:23:02	65.6
140	2017/01/19	18:23:03	69.8
141	2017/01/19	18:23:04	70.1
142	2017/01/19	18:23:05	65.0
143	2017/01/19	18:23:06	64.0
144	2017/01/19	18:23:07	65.4
145	2017/01/19	18:23:08	68.0
146	2017/01/19	18:23:09	71.1
147	2017/01/19	18:23:10	73.2
148	2017/01/19	18:23:11	71.2
149	2017/01/19	18:23:12	72.2
150	2017/01/19	18:23:13	70.3
151	2017/01/19	18:23:14	71.5
152	2017/01/19	18:23:15	71.9
153	2017/01/19	18:23:16	68.0
154	2017/01/19	18:23:17	63.9
155	2017/01/19	18:23:18	62.3
156	2017/01/19	18:23:19	61.6
157	2017/01/19	18:23:20	61.3
158	2017/01/19	18:23:21	59.3
159	2017/01/19	18:23:22	59.0
160	2017/01/19	18:23:23	60.2
161	2017/01/19	18:23:24	63.8
162	2017/01/19	18:23:25	67.8
163	2017/01/19	18:23:26	69.8
164	2017/01/19	18:23:27	68.7
165	2017/01/19	18:23:28	69.5
166	2017/01/19	18:23:29	65.3
167	2017/01/19	18:23:30	61.5
168	2017/01/19	18:23:31	59.0
169	2017/01/19	18:23:32	57.6
170	2017/01/19	18:23:33	56.9
171	2017/01/19	18:23:34	57.3
172	2017/01/19	18:23:35	58.5
173	2017/01/19	18:23:36	60.5
174	2017/01/19	18:23:37	64.1
175	2017/01/19	18:23:38	70.8
176	2017/01/19	18:23:39	70.8
177	2017/01/19	18:23:40	65.7
178	2017/01/19	18:23:41	62.6
179	2017/01/19	18:23:42	60.6
180	2017/01/19	18:23:43	60.0
181	2017/01/19	18:23:44	59.7
182	2017/01/19	18:23:45	59.3
183	2017/01/19	18:23:46	58.3
184	2017/01/19	18:23:47	57.0

185	2017/01/19	18:23:48	58.7
186	2017/01/19	18:23:49	55.2
187	2017/01/19	18:23:50	54.7
188	2017/01/19	18:23:51	56.5
189	2017/01/19	18:23:52	53.0
190	2017/01/19	18:23:53	51.8
191	2017/01/19	18:23:54	51.1
192	2017/01/19	18:23:55	51.1
193	2017/01/19	18:23:56	49.6
194	2017/01/19	18:23:57	49.1
195	2017/01/19	18:23:58	48.8
196	2017/01/19	18:23:59	48.8
197	2017/01/19	18:24:00	47.9
198	2017/01/19	18:24:01	47.8
199	2017/01/19	18:24:02	47.3
200	2017/01/19	18:24:03	47.0
201	2017/01/19	18:24:04	47.5
202	2017/01/19	18:24:05	47.2
203	2017/01/19	18:24:06	47.0
204	2017/01/19	18:24:07	45.4
205	2017/01/19	18:24:08	47.4
206	2017/01/19	18:24:09	45.9
207	2017/01/19	18:24:10	45.5
208	2017/01/19	18:24:11	45.8
209	2017/01/19	18:24:12	45.7
210	2017/01/19	18:24:13	44.1
211	2017/01/19	18:24:14	44.1
212	2017/01/19	18:24:15	44.8
213	2017/01/19	18:24:16	42.5
214	2017/01/19	18:24:17	43.4
215	2017/01/19	18:24:18	46.2
216	2017/01/19	18:24:19	47.0
217	2017/01/19	18:24:20	48.6
218	2017/01/19	18:24:21	52.1
219	2017/01/19	18:24:22	52.8
220	2017/01/19	18:24:23	57.2
221	2017/01/19	18:24:24	60.7
222	2017/01/19	18:24:25	66.9
223	2017/01/19	18:24:26	68.6
224	2017/01/19	18:24:27	64.7
225	2017/01/19	18:24:28	61.1
226	2017/01/19	18:24:29	58.6
227	2017/01/19	18:24:30	57.9
228	2017/01/19	18:24:31	58.4
229	2017/01/19	18:24:32	56.4
230	2017/01/19	18:24:33	55.0
231	2017/01/19	18:24:34	53.3
232	2017/01/19	18:24:35	52.5
233	2017/01/19	18:24:36	54.2
234	2017/01/19	18:24:37	53.3
235	2017/01/19	18:24:38	54.1
236	2017/01/19	18:24:39	53.4
237	2017/01/19	18:24:40	54.6
238	2017/01/19	18:24:41	55.8
239	2017/01/19	18:24:42	57.2
240	2017/01/19	18:24:43	57.8
241	2017/01/19	18:24:44	60.8
242	2017/01/19	18:24:45	66.1
243	2017/01/19	18:24:46	72.8
244	2017/01/19	18:24:47	72.1
245	2017/01/19	18:24:48	65.2
246	2017/01/19	18:24:49	63.0
247	2017/01/19	18:24:50	62.0
248	2017/01/19	18:24:51	61.3
249	2017/01/19	18:24:52	59.7
250	2017/01/19	18:24:53	59.1
251	2017/01/19	18:24:54	57.6
252	2017/01/19	18:24:55	57.2
253	2017/01/19	18:24:56	58.7
254	2017/01/19	18:24:57	60.3
255	2017/01/19	18:24:58	61.1
256	2017/01/19	18:24:59	62.8
257	2017/01/19	18:25:00	65.7
258	2017/01/19	18:25:01	67.4
259	2017/01/19	18:25:02	68.6
260	2017/01/19	18:25:03	68.3
261	2017/01/19	18:25:04	66.7
262	2017/01/19	18:25:05	67.8
263	2017/01/19	18:25:06	66.7
264	2017/01/19	18:25:07	66.5
265	2017/01/19	18:25:08	71.5
266	2017/01/19	18:25:09	71.0
267	2017/01/19	18:25:10	65.2*
268	2017/01/19	18:25:11	62.8*
269	2017/01/19	18:25:12	64.2*
270	2017/01/19	18:25:13	63.4*
271	2017/01/19	18:25:14	65.6*
272	2017/01/19	18:25:15	67.2
273	2017/01/19	18:25:16	73.0
274	2017/01/19	18:25:17	77.7
275	2017/01/19	18:25:18	75.9
276	2017/01/19	18:25:19	70.6
277	2017/01/19	18:25:20	69.4
278	2017/01/19	18:25:21	71.7
279	2017/01/19	18:25:22	70.1
280	2017/01/19	18:25:23	68.8
281	2017/01/19	18:25:24	71.0
282	2017/01/19	18:25:25	70.5
283	2017/01/19	18:25:26	68.5

284	2017/01/19	18:25:27	69.9
285	2017/01/19	18:25:28	70.7
286	2017/01/19	18:25:29	70.3
287	2017/01/19	18:25:30	69.6
288	2017/01/19	18:25:31	72.4
289	2017/01/19	18:25:32	69.7
290	2017/01/19	18:25:33	67.8
291	2017/01/19	18:25:34	71.3
292	2017/01/19	18:25:35	74.4
293	2017/01/19	18:25:36	74.3
294	2017/01/19	18:25:37	74.3
295	2017/01/19	18:25:38	72.1
296	2017/01/19	18:25:39	69.7
297	2017/01/19	18:25:40	66.0
298	2017/01/19	18:25:41	65.5
299	2017/01/19	18:25:42	66.3
300	2017/01/19	18:25:43	68.9
301	2017/01/19	18:25:44	71.8
302	2017/01/19	18:25:45	71.9
303	2017/01/19	18:25:46	70.7
304	2017/01/19	18:25:47	72.6
305	2017/01/19	18:25:48	72.2
306	2017/01/19	18:25:49	68.8
307	2017/01/19	18:25:50	66.9
308	2017/01/19	18:25:51	69.0
309	2017/01/19	18:25:52	71.5
310	2017/01/19	18:25:53	71.9
311	2017/01/19	18:25:54	69.4
312	2017/01/19	18:25:55	72.3
313	2017/01/19	18:25:56	70.1
314	2017/01/19	18:25:57	68.2
315	2017/01/19	18:25:58	69.6
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743	2017/01/19	18:33:06	64.5
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745	2017/01/19	18:33:08	68.8
746	2017/01/19	18:33:09	71.8
747	2017/01/19	18:33:10	67.9
748	2017/01/19	18:33:11	64.4
749	2017/01/19	18:33:12	63.8
750	2017/01/19	18:33:13	64.4
751	2017/01/19	18:33:14	66.4
752	2017/01/19	18:33:15	70.0
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754	2017/01/19	18:33:17	71.8
755	2017/01/19	18:33:18	73.9
756	2017/01/19	18:33:19	68.8
757	2017/01/19	18:33:20	65.7
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759	2017/01/19	18:33:22	62.9
760	2017/01/19	18:33:23	60.7
761	2017/01/19	18:33:24	59.3
762	2017/01/19	18:33:25	59.0
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764	2017/01/19	18:33:27	64.0
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766	2017/01/19	18:33:29	73.3
767	2017/01/19	18:33:30	69.3
768	2017/01/19	18:33:31	64.0
769	2017/01/19	18:33:32	61.6
770	2017/01/19	18:33:33	60.2
771	2017/01/19	18:33:34	61.2
772	2017/01/19	18:33:35	64.0
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774	2017/01/19	18:33:37	73.1
775	2017/01/19	18:33:38	67.4
776	2017/01/19	18:33:39	65.3
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778	2017/01/19	18:33:41	69.9

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783	2017/01/19	18:33:46	63.3
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798	2017/01/19	18:34:01	65.6
799	2017/01/19	18:34:02	69.5
800	2017/01/19	18:34:03	72.5
801	2017/01/19	18:34:04	71.8
802	2017/01/19	18:34:05	68.9
803	2017/01/19	18:34:06	64.0
804	2017/01/19	18:34:07	63.0
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810	2017/01/19	18:34:13	67.4
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812	2017/01/19	18:34:15	75.9
813	2017/01/19	18:34:16	80.0
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815	2017/01/19	18:34:18	70.7
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817	2017/01/19	18:34:20	62.8
818	2017/01/19	18:34:21	63.7
819	2017/01/19	18:34:22	69.4
820	2017/01/19	18:34:23	72.0
821	2017/01/19	18:34:24	67.0
822	2017/01/19	18:34:25	64.4
823	2017/01/19	18:34:26	65.4
824	2017/01/19	18:34:27	71.8
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836	2017/01/19	18:34:39	73.7
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845	2017/01/19	18:34:48	63.9
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847	2017/01/19	18:34:50	69.0
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857	2017/01/19	18:35:00	59.3
858	2017/01/19	18:35:01	59.1
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861	2017/01/19	18:35:04	63.1
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872	2017/01/19	18:35:15	71.2
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876	2017/01/19	18:35:19	68.6
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885	2017/01/19	18:35:28	71.3
886	2017/01/19	18:35:29	74.9
887	2017/01/19	18:35:30	74.9
888	2017/01/19	18:35:31	75.4
889	2017/01/19	18:35:32	71.0
890	2017/01/19	18:35:33	70.5
891	2017/01/19	18:35:34	68.3
892	2017/01/19	18:35:35	67.9
893	2017/01/19	18:35:36	69.3
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896	2017/01/19	18:35:39	70.8
897	2017/01/19	18:35:40	67.6
898	2017/01/19	18:35:41	65.9
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901	2017/01/19	18:35:44	71.9
902	2017/01/19	18:35:45	72.4
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905	2017/01/19	18:35:48	64.9

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 69.5 - 2017/01/19 18:57:45
- Level Range : 40-100
- SEL : 85.6
- Leq : 56.1
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843	2017/01/19	18:57:01	63.2
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Time Weight : FAST
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Max dB : 70.3 - 2017/04/09 14:20:35
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Level Range : 40-100
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SEL : 84.3
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Leq : 54.8
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235	2017/04/09	14:16:33	53.9
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647	2017/04/09	14:23:25	52.1
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649	2017/04/09	14:23:27	52.1
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651	2017/04/09	14:23:29	51.2
652	2017/04/09	14:23:30	52.1
653	2017/04/09	14:23:31	52.2
654	2017/04/09	14:23:32	59.2
655	2017/04/09	14:23:33	54.0
656	2017/04/09	14:23:34	54.4
657	2017/04/09	14:23:35	53.4
658	2017/04/09	14:23:36	54.2
659	2017/04/09	14:23:37	56.2
660	2017/04/09	14:23:38	55.5
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667	2017/04/09	14:23:45	52.8
668	2017/04/09	14:23:46	52.4
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670	2017/04/09	14:23:48	52.6
671	2017/04/09	14:23:49	53.1
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674	2017/04/09	14:23:52	52.4
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678	2017/04/09	14:23:56	52.2
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741	2017/04/09	14:24:59	54.4
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794	2017/04/09	14:25:52	51.0
795	2017/04/09	14:25:53	52.2
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798	2017/04/09	14:25:56	50.3
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824	2017/04/09	14:26:22	51.6
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838	2017/04/09	14:26:36	51.4
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854	2017/04/09	14:26:52	53.0
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882	2017/ 04/ 09	14: 27: 20	52. 3
883	2017/ 04/ 09	14: 27: 21	51. 5
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885	2017/ 04/ 09	14: 27: 23	53. 4
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892	2017/ 04/ 09	14: 27: 30	52. 4
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894	2017/ 04/ 09	14: 27: 32	51. 6
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896	2017/ 04/ 09	14: 27: 34	51. 8
897	2017/ 04/ 09	14: 27: 35	52. 8
898	2017/ 04/ 09	14: 27: 36	52. 7
899	2017/ 04/ 09	14: 27: 37	52. 0
900	2017/ 04/ 09	14: 27: 38	50. 7

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- Time Weight : FAST
- Level Range : 40-100
- Max dB : 66.1 - 2017/04/09 14:46:10
- Level Range : 40-100
- SEL : 85.8
- Leq : 56.3
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3	2017/04/09 14:31:35	55.5
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17	2017/04/09 14:31:49	54.4
18	2017/04/09 14:31:50	54.4
19	2017/04/09 14:31:51	55.6
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23	2017/04/09 14:31:55	55.1
24	2017/04/09 14:31:56	55.8
25	2017/04/09 14:31:57	56.0
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27	2017/04/09 14:31:59	55.9
28	2017/04/09 14:32:00	56.3
29	2017/04/09 14:32:01	55.9
30	2017/04/09 14:32:02	55.3
31	2017/04/09 14:32:03	56.0
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Time Weight : FAST
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Level Range : 40-100
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SEL : 88.1
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Time Weight : FAST
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Level Range : 40-100
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SEL : 90.9
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Leq : 61.4
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19	2019/12/08 12:00:59	60.4
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50	2019/12/08 12:02:32	62.7
51	2019/12/08 12:02:35	75.3
52	2019/12/08 12:02:38	66.3
53	2019/12/08 12:02:41	65.1
54	2019/12/08 12:02:44	64.1
55	2019/12/08 12:02:47	57.3
56	2019/12/08 12:02:50	69.7
57	2019/12/08 12:02:53	59.5
58	2019/12/08 12:02:56	54.1
59	2019/12/08 12:02:59	55.3
60	2019/12/08 12:03:02	65.0
61	2019/12/08 12:03:05	57.3
62	2019/12/08 12:03:08	55.9
63	2019/12/08 12:03:11	62.7
64	2019/12/08 12:03:14	62.0
65	2019/12/08 12:03:17	53.5
66	2019/12/08 12:03:20	52.1
67	2019/12/08 12:03:23	53.0
68	2019/12/08 12:03:26	52.0
69	2019/12/08 12:03:29	50.5
70	2019/12/08 12:03:32	49.5
71	2019/12/08 12:03:35	50.1
72	2019/12/08 12:03:38	50.0
73	2019/12/08 12:03:41	52.0
74	2019/12/08 12:03:44	55.5
75	2019/12/08 12:03:47	65.0
76	2019/12/08 12:03:50	58.1
77	2019/12/08 12:03:53	55.3
78	2019/12/08 12:03:56	56.0
79	2019/12/08 12:03:59	64.2
80	2019/12/08 12:04:02	64.2
81	2019/12/08 12:04:05	60.1
82	2019/12/08 12:04:08	57.2
83	2019/12/08 12:04:11	59.6
84	2019/12/08 12:04:14	57.2

85	2019/12/08	12:04:17	58.4
86	2019/12/08	12:04:20	53.6
87	2019/12/08	12:04:23	53.6
88	2019/12/08	12:04:26	54.1
89	2019/12/08	12:04:29	54.6
90	2019/12/08	12:04:32	60.8
91	2019/12/08	12:04:35	68.5
92	2019/12/08	12:04:38	67.5
93	2019/12/08	12:04:41	66.3
94	2019/12/08	12:04:44	63.3
95	2019/12/08	12:04:47	63.7
96	2019/12/08	12:04:50	56.4
97	2019/12/08	12:04:53	50.0
98	2019/12/08	12:04:56	49.6
99	2019/12/08	12:04:59	48.7
100	2019/12/08	12:05:02	48.4
101	2019/12/08	12:05:05	47.4
102	2019/12/08	12:05:08	48.2
103	2019/12/08	12:05:11	48.5
104	2019/12/08	12:05:14	48.1
105	2019/12/08	12:05:17	47.0
106	2019/12/08	12:05:20	48.0
107	2019/12/08	12:05:23	51.2
108	2019/12/08	12:05:26	59.8
109	2019/12/08	12:05:29	69.6
110	2019/12/08	12:05:32	58.1
111	2019/12/08	12:05:35	50.4
112	2019/12/08	12:05:38	50.5
113	2019/12/08	12:05:41	48.9
114	2019/12/08	12:05:44	49.6
115	2019/12/08	12:05:47	49.1
116	2019/12/08	12:05:50	47.7
117	2019/12/08	12:05:53	47.1
118	2019/12/08	12:05:56	48.2
119	2019/12/08	12:05:59	49.3
120	2019/12/08	12:06:02	51.0
121	2019/12/08	12:06:05	58.6
122	2019/12/08	12:06:08	62.0
123	2019/12/08	12:06:11	71.6
124	2019/12/08	12:06:14	65.4
125	2019/12/08	12:06:17	59.5
126	2019/12/08	12:06:20	59.2
127	2019/12/08	12:06:23	63.5
128	2019/12/08	12:06:26	54.9
129	2019/12/08	12:06:29	61.3
130	2019/12/08	12:06:32	67.1
131	2019/12/08	12:06:35	57.8
132	2019/12/08	12:06:38	51.3
133	2019/12/08	12:06:41	50.2
134	2019/12/08	12:06:44	49.5
135	2019/12/08	12:06:47	63.1
136	2019/12/08	12:06:50	64.0
137	2019/12/08	12:06:53	57.4
138	2019/12/08	12:06:56	50.1
139	2019/12/08	12:06:59	49.9
140	2019/12/08	12:07:02	48.8
141	2019/12/08	12:07:05	49.6
142	2019/12/08	12:07:08	50.2
143	2019/12/08	12:07:11	49.5
144	2019/12/08	12:07:14	49.2
145	2019/12/08	12:07:17	47.7
146	2019/12/08	12:07:20	48.2
147	2019/12/08	12:07:23	48.4
148	2019/12/08	12:07:26	47.8
149	2019/12/08	12:07:29	46.7
150	2019/12/08	12:07:32	47.4
151	2019/12/08	12:07:35	49.4
152	2019/12/08	12:07:38	54.9
153	2019/12/08	12:07:41	66.9
154	2019/12/08	12:07:44	55.4
155	2019/12/08	12:07:47	51.9
156	2019/12/08	12:07:50	54.9
157	2019/12/08	12:07:53	63.8
158	2019/12/08	12:07:56	64.5
159	2019/12/08	12:07:59	51.2
160	2019/12/08	12:08:02	51.1
161	2019/12/08	12:08:05	50.1
162	2019/12/08	12:08:08	50.2
163	2019/12/08	12:08:11	58.8
164	2019/12/08	12:08:14	71.4
165	2019/12/08	12:08:17	59.6
166	2019/12/08	12:08:20	51.5
167	2019/12/08	12:08:23	52.5
168	2019/12/08	12:08:26	65.8
169	2019/12/08	12:08:29	65.1
170	2019/12/08	12:08:32	67.1
171	2019/12/08	12:08:35	56.0
172	2019/12/08	12:08:38	60.2
173	2019/12/08	12:08:41	49.7
174	2019/12/08	12:08:44	47.1
175	2019/12/08	12:08:47	47.9
176	2019/12/08	12:08:50	48.4
177	2019/12/08	12:08:53	52.0
178	2019/12/08	12:08:56	48.8
179	2019/12/08	12:08:59	50.4
180	2019/12/08	12:09:02	56.4
181	2019/12/08	12:09:05	67.2
182	2019/12/08	12:09:08	59.4

183	2019/12/08	12:09:11	58.0
184	2019/12/08	12:09:14	70.8
185	2019/12/08	12:09:17	59.6
186	2019/12/08	12:09:20	50.2
187	2019/12/08	12:09:23	48.3
188	2019/12/08	12:09:26	48.8
189	2019/12/08	12:09:29	47.0
190	2019/12/08	12:09:32	47.5
191	2019/12/08	12:09:35	48.5
192	2019/12/08	12:09:38	47.0
193	2019/12/08	12:09:41	48.4
194	2019/12/08	12:09:44	49.4
195	2019/12/08	12:09:47	57.8
196	2019/12/08	12:09:50	66.3
197	2019/12/08	12:09:53	59.8
198	2019/12/08	12:09:56	68.6
199	2019/12/08	12:09:59	59.9
200	2019/12/08	12:10:02	52.5
201	2019/12/08	12:10:05	51.6
202	2019/12/08	12:10:08	51.9
203	2019/12/08	12:10:11	51.1
204	2019/12/08	12:10:14	48.5
205	2019/12/08	12:10:17	48.4
206	2019/12/08	12:10:20	48.6
207	2019/12/08	12:10:23	47.2
208	2019/12/08	12:10:26	46.4
209	2019/12/08	12:10:29	48.1
210	2019/12/08	12:10:32	47.5
211	2019/12/08	12:10:35	49.3
212	2019/12/08	12:10:38	49.6
213	2019/12/08	12:10:41	59.9
214	2019/12/08	12:10:44	66.6
215	2019/12/08	12:10:47	56.5
216	2019/12/08	12:10:50	62.4
217	2019/12/08	12:10:53	64.1
218	2019/12/08	12:10:56	69.4
219	2019/12/08	12:10:59	56.6
220	2019/12/08	12:11:02	51.7
221	2019/12/08	12:11:05	48.1
222	2019/12/08	12:11:08	48.7
223	2019/12/08	12:11:11	47.9
224	2019/12/08	12:11:14	48.0
225	2019/12/08	12:11:17	46.7
226	2019/12/08	12:11:20	47.0
227	2019/12/08	12:11:23	46.4
228	2019/12/08	12:11:26	46.6
229	2019/12/08	12:11:29	47.1
230	2019/12/08	12:11:32	47.0
231	2019/12/08	12:11:35	47.2
232	2019/12/08	12:11:38	48.3
233	2019/12/08	12:11:41	53.2
234	2019/12/08	12:11:44	64.6
235	2019/12/08	12:11:47	58.4
236	2019/12/08	12:11:50	51.5
237	2019/12/08	12:11:53	53.9
238	2019/12/08	12:11:56	62.8
239	2019/12/08	12:11:59	63.0
240	2019/12/08	12:12:02	63.5
241	2019/12/08	12:12:05	59.6
242	2019/12/08	12:12:08	50.6
243	2019/12/08	12:12:11	47.1
244	2019/12/08	12:12:14	46.8
245	2019/12/08	12:12:17	47.4
246	2019/12/08	12:12:20	49.7
247	2019/12/08	12:12:23	47.7
248	2019/12/08	12:12:26	47.7
249	2019/12/08	12:12:29	48.3
250	2019/12/08	12:12:32	48.9
251	2019/12/08	12:12:35	48.9
252	2019/12/08	12:12:38	50.8
253	2019/12/08	12:12:41	51.1
254	2019/12/08	12:12:44	54.7
255	2019/12/08	12:12:47	63.5
256	2019/12/08	12:12:50	60.1
257	2019/12/08	12:12:53	56.2
258	2019/12/08	12:12:56	65.8
259	2019/12/08	12:12:59	58.2
260	2019/12/08	12:13:02	52.2
261	2019/12/08	12:13:05	51.2
262	2019/12/08	12:13:08	50.8
263	2019/12/08	12:13:11	58.2
264	2019/12/08	12:13:14	65.4
265	2019/12/08	12:13:17	55.8
266	2019/12/08	12:13:20	63.6
267	2019/12/08	12:13:23	60.6
268	2019/12/08	12:13:26	51.2
269	2019/12/08	12:13:29	48.7
270	2019/12/08	12:13:32	55.9
271	2019/12/08	12:13:35	67.2
272	2019/12/08	12:13:38	55.5
273	2019/12/08	12:13:41	50.3
274	2019/12/08	12:13:44	52.4
275	2019/12/08	12:13:47	60.6
276	2019/12/08	12:13:50	61.3
277	2019/12/08	12:13:53	53.2
278	2019/12/08	12:13:56	49.2
279	2019/12/08	12:13:59	50.4
280	2019/12/08	12:14:02	48.0

281	2019/12/08	12:14:05	47.4
282	2019/12/08	12:14:08	48.0
283	2019/12/08	12:14:11	48.6
284	2019/12/08	12:14:14	51.1
285	2019/12/08	12:14:17	54.4
286	2019/12/08	12:14:20	65.5
287	2019/12/08	12:14:23	61.8
288	2019/12/08	12:14:26	65.2
289	2019/12/08	12:14:29	61.0
290	2019/12/08	12:14:32	67.7
291	2019/12/08	12:14:35	58.2
292	2019/12/08	12:14:38	50.7
293	2019/12/08	12:14:41	51.3
294	2019/12/08	12:14:44	52.2
295	2019/12/08	12:14:47	61.5
296	2019/12/08	12:14:50	63.7
297	2019/12/08	12:14:53	55.6
298	2019/12/08	12:14:56	50.2
299	2019/12/08	12:14:59	48.9
300	2019/12/08	12:15:02	48.1

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Demolition
Receptor Location: Del Norte residences at 40 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	40	#N/A
Aerial Lift [1]	80	0	0.5	0.5	40	#N/A
Backhoe [1]	80	0	0.5	0.5	40	#N/A
Cement Mixer [2]	85	0	0.5	0.5	40	#N/A
Crane [2]	88	0	0.5	0.5	40	#N/A
Dozer [2]	85	1	0.5	0.5	40	81
Excavator [3]	85	0	0.5	0.5	40	#N/A
Forklift [2]	83	0	0.5	0.5	40	#N/A
Grader [2]	85	0	0.5	0.5	40	#N/A
Generator [2]	81	0	0.5	0.5	40	#N/A
Jackhammer [2]	88	1	0.5	0.5	40	84
Paver [1]	85	0	0.5	0.5	40	#N/A
Roller [2]	80	0	0.5	0.5	40	#N/A
Saw [2]	70	0	0.5	0.5	40	#N/A
Welder [2]	74	0	0.5	0.5	40	#N/A

TOTAL Leq DURING NORMAL OPERATIOI	**86**	**dBA**
Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	86	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***81***	***dBA***
ESTIMATED CNEL:	***81***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Site Preparation
Receptor Location: Del Norte residences at 40 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	40	#N/A
Aerial Lift [1]	80	0	0.5	0.5	40	#N/A
Backhoe [1]	80	1	0.5	0.5	40	76
Cement Mixer [2]	85	0	0.5	0.5	40	#N/A
Crane [2]	88	0	0.5	0.5	40	#N/A
Dozer [2]	85	1	0.5	0.5	40	81
Excavator [3]	85	1	0.5	0.5	40	81
Forklift [2]	83	0	0.5	0.5	40	#N/A
Grader [2]	85	0	0.5	0.5	40	#N/A
Generator [2]	81	0	0.5	0.5	40	#N/A
Paver [1]	85	0	0.5	0.5	40	#N/A
Roller [2]	80	0	0.5	0.5	40	#N/A
Saw [2]	70	0	0.5	0.5	40	#N/A
Welder [2]	74	0	0.5	0.5	40	#N/A

TOTAL Leq DURING NORMAL OPERATIOI	**85**	**dBA**
Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	85	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***80***	***dBA***
ESTIMATED CNEL:	***80***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Grading/Excavation and Trenching
Receptor Location: Del Norte residences at 40 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	40	#N/A
Aerial Lift [1]	80	0	0.5	0.5	40	#N/A
Backhoe [1]	80	1	0.5	0.5	40	76
Cement Mixer [2]	85	0	0.5	0.5	40	#N/A
Crane [2]	88	0	0.5	0.5	40	#N/A
Dozer [2]	85	1	0.5	0.5	40	81
Excavator [3]	85	1	0.5	0.5	40	81
Forklift [2]	83	0	0.5	0.5	40	#N/A
Grader [2]	85	1	0.5	0.5	40	81
Generator [2]	81	0	0.5	0.5	40	#N/A
Paver [1]	85	0	0.5	0.5	40	#N/A
Roller [2]	80	0	0.5	0.5	40	#N/A
Saw [2]	70	0	0.5	0.5	40	#N/A
Welder [2]	74	0	0.5	0.5	40	#N/A

TOTAL Leq DURING NORMAL OPERATIOI	**86**	**dBA**
Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	86	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***81***	***dBA***
ESTIMATED CNEL:	***81***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Building Construction (Interior and Exterior) and Architectural Coating
Receptor Location: Del Norte residences at 40 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	40	#N/A
Aerial Lift [1]	80	0	0.5	0.5	40	#N/A
Backhoe [1]	80	1	0.5	0.5	40	76
Cement Mixer [2]	85	0	0.5	0.5	40	#N/A
Crane [2]	88	0	0.5	0.5	40	#N/A
Dozer [2]	85	0	0.5	0.5	40	#N/A
Excavator [3]	85	0	0.5	0.5	40	#N/A
Forklift [2]	83	1	0.5	0.5	40	79
Grader [2]	85	0	0.5	0.5	40	#N/A
Generator [2]	81	1	0.5	0.5	40	77
Paver [1]	85	0	0.5	0.5	40	#N/A
Roller [2]	80	0	0.5	0.5	40	#N/A
Saw [2]	70	0	0.5	0.5	40	#N/A
Welder [2]	74	1	0.5	0.5	40	70

TOTAL Leq DURING NORMAL OPERATIOI	**82**	**dBA**
Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	82	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***78***	***dBA***
ESTIMATED CNEL:	***78***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Paving
Receptor Location: Del Norte residences at 40 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	40	#N/A
Aerial Lift [1]	80	0	0.5	0.5	40	#N/A
Backhoe [1]	80	0	0.5	0.5	40	#N/A
Cement Mixer [2]	85	1	0.5	0.5	40	81
Crane [2]	88	0	0.5	0.5	40	#N/A
Dozer [2]	85	0	0.5	0.5	40	#N/A
Excavator [3]	85	0	0.5	0.5	40	#N/A
Forklift [2]	83	0	0.5	0.5	40	#N/A
Grader [2]	85	0	0.5	0.5	40	#N/A
Generator [2]	81	0	0.5	0.5	40	#N/A
Paver [1]	85	1	0.5	0.5	40	81
Roller [2]	80	1	0.5	0.5	40	76
Saw [2]	70	0	0.5	0.5	40	#N/A
Welder [2]	74	0	0.5	0.5	40	#N/A

TOTAL Leq DURING NORMAL OPERATIOI	**85**	**dBA**
Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	85	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***80***	***dBA***
ESTIMATED CNEL:	***80***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Demolition
Receptor Location: Bay Road residences at 50 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	50	#N/A
Aerial Lift [1]	80	0	0.5	0.5	50	#N/A
Backhoe [1]	80	0	0.5	0.5	50	#N/A
Cement Mixer [2]	85	0	0.5	0.5	50	#N/A
Crane [2]	88	0	0.5	0.5	50	#N/A
Dozer [2]	85	1	0.5	0.5	50	79
Excavator [3]	85	0	0.5	0.5	50	#N/A
Forklift [2]	83	0	0.5	0.5	50	#N/A
Grader [2]	85	0	0.5	0.5	50	#N/A
Generator [2]	81	0	0.5	0.5	50	#N/A
Jackhammer [2]	88	1	0.5	0.5	50	82
Paver [1]	85	0	0.5	0.5	50	#N/A
Roller [2]	80	0	0.5	0.5	50	#N/A
Saw [2]	70	1	0.5	0.5	50	64
Welder [2]	74	0	0.5	0.5	50	#N/A

TOTAL Leq DURING NORMAL OPERATIONS:	**84**	**dBA**
Daytime Ambient without Equipment Operation:	70	dBA
Nighttime Ambient without Equipment Operation	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	84	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***79***	***dBA***
ESTIMATED CNEL:	***79***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Site Preparation
Receptor Location: Bay Road residences at 50 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	50	#N/A
Aerial Lift [1]	80	0	0.5	0.5	50	#N/A
Backhoe [1]	80	1	0.5	0.5	50	74
Cement Mixer [2]	85	0	0.5	0.5	50	#N/A
Crane [2]	88	0	0.5	0.5	50	#N/A
Dozer [2]	85	1	0.5	0.5	50	79
Excavator [3]	85	0	0.5	0.5	50	#N/A
Forklift [2]	83	0	0.5	0.5	50	#N/A
Grader [2]	85	0	0.5	0.5	50	#N/A
Generator [2]	81	0	0.5	0.5	50	#N/A
Paver [1]	85	0	0.5	0.5	50	#N/A
Roller [2]	80	0	0.5	0.5	50	#N/A
Saw [2]	70	0	0.5	0.5	50	#N/A
Welder [2]	74	0	0.5	0.5	50	#N/A

TOTAL Leq DURING NORMAL OPERATIONS:	**80**	**dBA**
Daytime Ambient without Equipment Operation:	70	dBA
Nighttime Ambient without Equipment Operation	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	81	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***76***	***dBA***
ESTIMATED CNEL:	***76***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Grading/Excavation and Trenching
Receptor Location: Bay Road residences at 50 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	50	#N/A
Aerial Lift [1]	80	0	0.5	0.5	50	#N/A
Backhoe [1]	80	1	0.5	0.5	50	74
Cement Mixer [2]	85	0	0.5	0.5	50	#N/A
Crane [2]	88	0	0.5	0.5	50	#N/A
Dozer [2]	85	1	0.5	0.5	50	79
Excavator [3]	85	1	0.5	0.5	50	79
Forklift [2]	83	0	0.5	0.5	50	#N/A
Grader [2]	85	1	0.5	0.5	50	79
Generator [2]	81	0	0.5	0.5	50	#N/A
Paver [1]	85	0	0.5	0.5	50	#N/A
Roller [2]	80	0	0.5	0.5	50	#N/A
Saw [2]	70	0	0.5	0.5	50	#N/A
Welder [2]	74	0	0.5	0.5	50	#N/A

TOTAL Leq DURING NORMAL OPERATIONS:	**84**	**dBA**
Daytime Ambient without Equipment Operation:	70	dBA
Nighttime Ambient without Equipment Operation	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	84	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***80***	***dBA***
ESTIMATED CNEL:	***80***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Building Construction (Interior and Exterior) and Architectural Coating
Receptor Location: Bay Road residences at 50 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	50	#N/A
Aerial Lift [1]	80	0	0.5	0.5	50	#N/A
Backhoe [1]	80	1	0.5	0.5	50	74
Cement Mixer [2]	85	0	0.5	0.5	50	#N/A
Crane [2]	88	0	0.5	0.5	50	#N/A
Dozer [2]	85	0	0.5	0.5	50	#N/A
Excavator [3]	85	0	0.5	0.5	50	#N/A
Forklift [2]	83	1	0.5	0.5	50	77
Grader [2]	85	0	0.5	0.5	50	#N/A
Generator [2]	81	1	0.5	0.5	50	75
Paver [1]	85	0	0.5	0.5	50	#N/A
Roller [2]	80	0	0.5	0.5	50	#N/A
Saw [2]	70	0	0.5	0.5	50	#N/A
Welder [2]	74	1	0.5	0.5	50	68

TOTAL Leq DURING NORMAL OPERATIONS:	**81**	**dBA**
Daytime Ambient without Equipment Operation:	70	dBA
Nighttime Ambient without Equipment Operation	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	81	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***76***	***dBA***
ESTIMATED CNEL:	***76***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Paving
Receptor Location: Bay Road residences at 50 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	50	#N/A
Aerial Lift [1]	80	0	0.5	0.5	50	#N/A
Backhoe [1]	80	0	0.5	0.5	50	#N/A
Cement Mixer [2]	85	1	0.5	0.5	50	79
Crane [2]	88	0	0.5	0.5	50	#N/A
Dozer [2]	85	0	0.5	0.5	50	#N/A
Excavator [3]	85	0	0.5	0.5	50	#N/A
Forklift [2]	83	0	0.5	0.5	50	#N/A
Grader [2]	85	0	0.5	0.5	50	#N/A
Generator [2]	81	0	0.5	0.5	50	#N/A
Paver [1]	85	1	0.5	0.5	50	79
Roller [2]	80	1	0.5	0.5	50	74
Saw [2]	70	0	0.5	0.5	50	#N/A
Welder [2]	74	0	0.5	0.5	50	#N/A

TOTAL Leq DURING NORMAL OPERATIONS:	**83**	**dBA**
Daytime Ambient without Equipment Operation:	70	dBA
Nighttime Ambient without Equipment Operation	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	83	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***78***	***dBA***
ESTIMATED CNEL:	***78***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Demolition
Receptor Location: Del Norte residences at 80 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	80	#N/A
Aerial Lift [1]	80	0	0.5	0.5	80	#N/A
Backhoe [1]	80	0	0.5	0.5	80	#N/A
Cement Mixer [2]	85	0	0.5	0.5	80	#N/A
Crane [2]	88	0	0.5	0.5	80	#N/A
Dozer [2]	85	1	0.5	0.5	80	75
Excavator [3]	85	0	0.5	0.5	80	#N/A
Forklift [2]	83	0	0.5	0.5	80	#N/A
Grader [2]	85	0	0.5	0.5	80	#N/A
Generator [2]	81	0	0.5	0.5	80	#N/A
Jackhammer [2]	88	1	0.5	0.5	80	78
Paver [1]	85	0	0.5	0.5	80	#N/A
Roller [2]	80	0	0.5	0.5	80	#N/A
Saw [2]	70	1	0.5	0.5	80	60
Welder [2]	74	0	0.5	0.5	80	#N/A

TOTAL Leq DURING NORMAL OPERATIOI	**80**	**dBA**
Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	80	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***75***	***dBA***
ESTIMATED CNEL:	***75***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Site Preparation
Receptor Location: Del Norte residences at 80 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	80	#N/A
Aerial Lift [1]	80	0	0.5	0.5	80	#N/A
Backhoe [1]	80	3	0.5	0.5	80	75
Cement Mixer [2]	85	0	0.5	0.5	80	#N/A
Crane [2]	88	0	0.5	0.5	80	#N/A
Dozer [2]	85	3	0.5	0.5	80	80
Excavator [3]	85	0	0.5	0.5	80	#N/A
Forklift [2]	83	0	0.5	0.5	80	#N/A
Grader [2]	85	0	0.5	0.5	80	#N/A
Generator [2]	81	0	0.5	0.5	80	#N/A
Paver [1]	85	0	0.5	0.5	80	#N/A
Roller [2]	80	0	0.5	0.5	80	#N/A
Saw [2]	70	0	0.5	0.5	80	#N/A
Welder [2]	74	0	0.5	0.5	80	#N/A
					80	

TOTAL Leq DURING NORMAL OPERATIOI	**81**	**dBA**
Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	81	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***76***	***dBA***
ESTIMATED CNEL:	***76***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Grading/Excavation and Trenching
Receptor Location: Del Norte residences at 80 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	80	#N/A
Aerial Lift [1]	80	0	0.5	0.5	80	#N/A
Backhoe [1]	80	3	0.5	0.5	80	75
Cement Mixer [2]	85	0	0.5	0.5	80	#N/A
Crane [2]	88	0	0.5	0.5	80	#N/A
Dozer [2]	85	3	0.5	0.5	80	80
Excavator [3]	85	3	0.5	0.5	80	80
Forklift [2]	83	0	0.5	0.5	80	#N/A
Grader [2]	85	3	0.5	0.5	80	80
Generator [2]	81	0	0.5	0.5	80	#N/A
Paver [1]	85	0	0.5	0.5	80	#N/A
Roller [2]	80	0	0.5	0.5	80	#N/A
Saw [2]	70	0	0.5	0.5	80	#N/A
Welder [2]	74	0	0.5	0.5	80	#N/A
					80	

TOTAL Leq DURING NORMAL OPERATIOI	**85**	**dBA**
Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	85	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***80***	***dBA***
ESTIMATED CNEL:	***80***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Building Construction (Interior and Exterior) and Architectural Coating
Receptor Location: Del Norte residences at 80 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	80	#N/A
Aerial Lift [1]	80	0	0.5	0.5	80	#N/A
Backhoe [1]	80	3	0.5	0.5	80	75
Cement Mixer [2]	85	0	0.5	0.5	80	#N/A
Crane [2]	88	0	0.5	0.5	80	#N/A
Dozer [2]	85	0	0.5	0.5	80	#N/A
Excavator [3]	85	0	0.5	0.5	80	#N/A
Forklift [2]	83	3	0.5	0.5	80	78
Grader [2]	85	0	0.5	0.5	80	#N/A
Generator [2]	81	3	0.5	0.5	80	76
Paver [1]	85	0	0.5	0.5	80	#N/A
Roller [2]	80	0	0.5	0.5	80	#N/A
Saw [2]	70	0	0.5	0.5	80	#N/A
Welder [2]	74	3	0.5	0.5	80	69
					80	

TOTAL Leq DURING NORMAL OPERATIOI	**81**	**dBA**
Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	81	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***76***	***dBA***
ESTIMATED CNEL:	***76***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Paving
Receptor Location: Del Norte residences at 80 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	80	#N/A
Aerial Lift [1]	80	0	0.5	0.5	80	#N/A
Backhoe [1]	80	0	0.5	0.5	80	#N/A
Cement Mixer [2]	85	1	0.5	0.5	80	75
Crane [2]	88	0	0.5	0.5	80	#N/A
Dozer [2]	85	0	0.5	0.5	80	#N/A
Excavator [3]	85	0	0.5	0.5	80	#N/A
Forklift [2]	83	0	0.5	0.5	80	#N/A
Grader [2]	85	0	0.5	0.5	80	#N/A
Generator [2]	81	0	0.5	0.5	80	#N/A
Paver [1]	85	1	0.5	0.5	80	75
Roller [2]	80	1	0.5	0.5	80	70
Saw [2]	70	0	0.5	0.5	80	#N/A
Welder [2]	74	0	0.5	0.5	80	#N/A
					80	
TOTAL Leq DURING NORMAL OPERATIOI	**79**	**dBA**				

Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	79	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***74***	***dBA***
ESTIMATED CNEL:	***74***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Demolition
Receptor Location: Del Norte residences at 115 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	115	#N/A
Aerial Lift [1]	80	0	0.5	0.5	115	#N/A
Backhoe [1]	80	0	0.5	0.5	115	#N/A
Cement Mixer [2]	85	0	0.5	0.5	115	#N/A
Crane [2]	88	0	0.5	0.5	115	#N/A
Dozer [2]	85	1	0.5	0.5	115	72
Excavator [3]	85	0	0.5	0.5	115	#N/A
Forklift [2]	83	0	0.5	0.5	115	#N/A
Grader [2]	85	0	0.5	0.5	115	#N/A
Generator [2]	81	0	0.5	0.5	115	#N/A
Jackhammer [2]	88	1	0.5	0.5	115	75
Paver [1]	85	0	0.5	0.5	115	#N/A
Roller [2]	80	0	0.5	0.5	115	#N/A
Saw [2]	70	1	0.5	0.5	115	57
Welder [2]	74	0	0.5	0.5	115	#N/A

TOTAL Leq DURING NORMAL OPERATIOI	**77**	**dBA**
Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	77	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***72***	***dBA***
ESTIMATED CNEL:	***72***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Site Preparation
Receptor Location: Del Norte residences at 115 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	115	#N/A
Aerial Lift [1]	80	0	0.5	0.5	115	#N/A
Backhoe [1]	80	3	0.5	0.5	115	72
Cement Mixer [2]	85	0	0.5	0.5	115	#N/A
Crane [2]	88	0	0.5	0.5	115	#N/A
Dozer [2]	85	3	0.5	0.5	115	77
Excavator [3]	85	0	0.5	0.5	115	#N/A
Forklift [2]	83	0	0.5	0.5	115	#N/A
Grader [2]	85	0	0.5	0.5	115	#N/A
Generator [2]	81	0	0.5	0.5	115	#N/A
Paver [1]	85	0	0.5	0.5	115	#N/A
Roller [2]	80	0	0.5	0.5	115	#N/A
Saw [2]	70	0	0.5	0.5	115	#N/A
Welder [2]	74	0	0.5	0.5	115	#N/A

TOTAL Leq DURING NORMAL OPERATIOI	**78**	**dBA**
Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	78	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***73***	***dBA***
ESTIMATED CNEL:	***73***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Grading/Excavation and Trenching
Receptor Location: Del Norte residences at 115 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	115	#N/A
Aerial Lift [1]	80	0	0.5	0.5	115	#N/A
Backhoe [1]	80	3	0.5	0.5	115	72
Cement Mixer [2]	85	0	0.5	0.5	115	#N/A
Crane [2]	88	0	0.5	0.5	115	#N/A
Dozer [2]	85	3	0.5	0.5	115	77
Excavator [3]	85	3	0.5	0.5	115	77
Forklift [2]	83	0	0.5	0.5	115	#N/A
Grader [2]	85	3	0.5	0.5	115	77
Generator [2]	81	0	0.5	0.5	115	#N/A
Paver [1]	85	0	0.5	0.5	115	#N/A
Roller [2]	80	0	0.5	0.5	115	#N/A
Saw [2]	70	0	0.5	0.5	115	#N/A
Welder [2]	74	0	0.5	0.5	115	#N/A

TOTAL Leq DURING NORMAL OPERATIOI	**82**	**dBA**
Daytime Ambient without Equipment Operatic	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	82	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***77***	***dBA***
ESTIMATED CNEL:	***77***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Building Construction (Interior and Exterior) and Architectural Coating
Receptor Location: Del Norte residences at 115 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	115	#N/A
Aerial Lift [1]	80	0	0.5	0.5	115	#N/A
Backhoe [1]	80	3	0.5	0.5	115	72
Cement Mixer [2]	85	0	0.5	0.5	115	#N/A
Crane [2]	88	0	0.5	0.5	115	#N/A
Dozer [2]	85	0	0.5	0.5	115	#N/A
Excavator [3]	85	0	0.5	0.5	115	#N/A
Forklift [2]	83	3	0.5	0.5	115	75
Grader [2]	85	0	0.5	0.5	115	#N/A
Generator [2]	81	3	0.5	0.5	115	73
Paver [1]	85	0	0.5	0.5	115	#N/A
Roller [2]	80	0	0.5	0.5	115	#N/A
Saw [2]	70	0	0.5	0.5	115	#N/A
Welder [2]	74	3	0.5	0.5	115	66

TOTAL Leq DURING NORMAL OPERATIOI	**78**	**dBA**
Daytime Ambient without Equipment Operatio	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	78	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***73***	***dBA***
ESTIMATED CNEL:	***73***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

FLOOD PARK HEAVY EQUIPMENT NOISE IMPACT ESTIMATION

Scenario: Paving
Receptor Location: Del Norte residences at 115 feet

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Air Compressor [2]	81	0	0.5	0.5	115	#N/A
Aerial Lift [1]	80	0	0.5	0.5	115	#N/A
Backhoe [1]	80	0	0.5	0.5	115	#N/A
Cement Mixer [2]	85	1	0.5	0.5	115	72
Crane [2]	88	0	0.5	0.5	115	#N/A
Dozer [2]	85	0	0.5	0.5	115	#N/A
Excavator [3]	85	0	0.5	0.5	115	#N/A
Forklift [2]	83	0	0.5	0.5	115	#N/A
Grader [2]	85	0	0.5	0.5	115	#N/A
Generator [2]	81	0	0.5	0.5	115	#N/A
Paver [1]	85	1	0.5	0.5	115	72
Roller [2]	80	1	0.5	0.5	115	67
Saw [2]	70	0	0.5	0.5	115	#N/A
Welder [2]	74	0	0.5	0.5	115	#N/A

TOTAL Leq DURING NORMAL OPERATIOI	**75**	**dBA**
Daytime Ambient without Equipment Operatio	56	dBA
Nighttime Ambient without Equipment Operat	45	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	75	*dBA*
Combined Nighttime Hourly Leq:	45	*dBA*
ESTIMATED Ldn:	***71***	***dBA***
ESTIMATED CNEL:	***71***	***dBA***

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

Note: calculations assume a decrease in ambient evening noise levels over the assumed daytime level, nighttime ambient noise levels assumed to be 45 dBA Leq

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per applicant supplied information

Appendix D

Traffic Impact Study

Traffic Impact Study for Flood Park County Park Landscape Plan

Prepared for the San Mateo County Parks Department

Submitted by
W-Trans

July 8, 2019

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Appendices

A. Intersection Level of Service Calculations
B. Menlo Park Approved/Pending Projects
C. Trip Generation Assumptions
D. Turn-Lane Warrants
E. Traffic Signal Warrants

Introduction

This report presents an analysis of the potential traffic impacts that would be associated with development of a Landscape Plan for the long-term redevelopment of San Mateo County's Flood County Park located at located at 215 Bay Road in the City of Menlo Park. The traffic study was completed in accordance with the criteria established by the City of Menlo Park and the County of San Mateo, and is consistent with standard traffic engineering techniques.

Prelude

The purpose of a traffic impact study is to provide City and County staff, community stakeholders and policy makers with data that they can use to make an informed decision regarding the potential circulation impacts of a proposed project, and any associated improvements that would be required in order to mitigate these impacts to a level of insignificance as defined by the City General Plan or other policies. Vehicular traffic impacts are typically evaluated by determining the number of new trips that the proposed project would be expected to generate, distributing these trips to the surrounding street system based on existing travel patterns or anticipated travel patterns specific to the proposed project, then analyzing the impact the new traffic would be expected to have on critical intersections or roadway segments. Impacts relative to access for pedestrians, bicyclists, and to transit are also addressed.

Project Profile

The San Mateo County Parks and Recreation Commission voted to approve the proposed Landscape Plan as the Draft Preferred Alternative for Flood County Park on April 7, 2016. The Draft Preferred Alternative was developed through extensive community outreach and public comment. The Landscape Plan was optimized to preserve large oak and bay trees, increase sports offerings, and provide a variety of active and passive uses for a range of user groups. Table 1 lists the proposed recreational features outlined in the Landscape Plan. The Landscape Plan does not include any changes to the existing parking lot and access driveway. Vehicular traffic would continue to access the Park from Bay Road and pedestrians would retain access to the park through gaps in a chain-link fence along Bay Road and Iris Lane.

Table 1 – Flood County Park Proposed Recreational Facilities and Phasing	
Phase	**Improvements**
Phase I	Baseball field replacement and bathroom
	Soccer/lacrosse field
	Two tennis courts
	Sand volleyball court replacement
	Basketball court
	Pump track
	Asphalt paths
	Adobe bathroom renovation
	Tree-lined promenade
	Drop-off at playground area
	New utilities: water, electric, gas, greywater piping
Phase II	Additional Restrooms
	Demonstration gardens
	Playground replacement
	Gathering meadow
	Individual picnic area renovations
Phase III	Rehabilitation of adobe administrative building
	Group picnic area renovations with shade shelters
	Gathering plazas with focal elements
	Completion of all pathways with exercise stations

Source: *Flood Park Preferred Plan,* San Mateo County Parks, 2015

Transportation Setting

Operational Analysis

Study Area and Periods

Based on a review of the project description, project site location, and consultation with County staff, the following three study intersections were selected for assessment of potential significant transportation impacts, as they represent the facilities most likely to be potentially impacted by the proposed project.

1. Bay Road/Marsh Road
2. Bay Road/Ringwood Avenue
3. Bay Road/Willow Road

Operating conditions during the weekday p.m. and Saturday midday peak periods were evaluated at the study intersections to capture the highest potential impacts of the proposed project as well as the highest volumes on the local transportation network. The weekday p.m. peak hour occurs between 4:00 and 6:00 p.m. and reflects conditions during the homeward bound commute, while the Saturday midday peak hour occurs between noon and 4:00 p.m. and typically reflects the highest level of weekend activity for a park.

Study Intersections

Bay Road/ Marsh Road is a four-legged signalized intersection with protected left-turn phasing on the southbound approach of Marsh Road and permitted left-turn phasing on all other approaches. Marked crosswalks, pedestrian signals, and curb ramps are provided across all four legs. Bicycle detection is marked for both approaches on Bay Road.

Bay Road/ Ringwood Avenue is a five-legged all-way stop controlled intersection. Marked Crosswalks are provided across all legs except the northbound Ringwood Avenue approach. Curb ramps are provided at the northwest and northeast corners of the intersection.

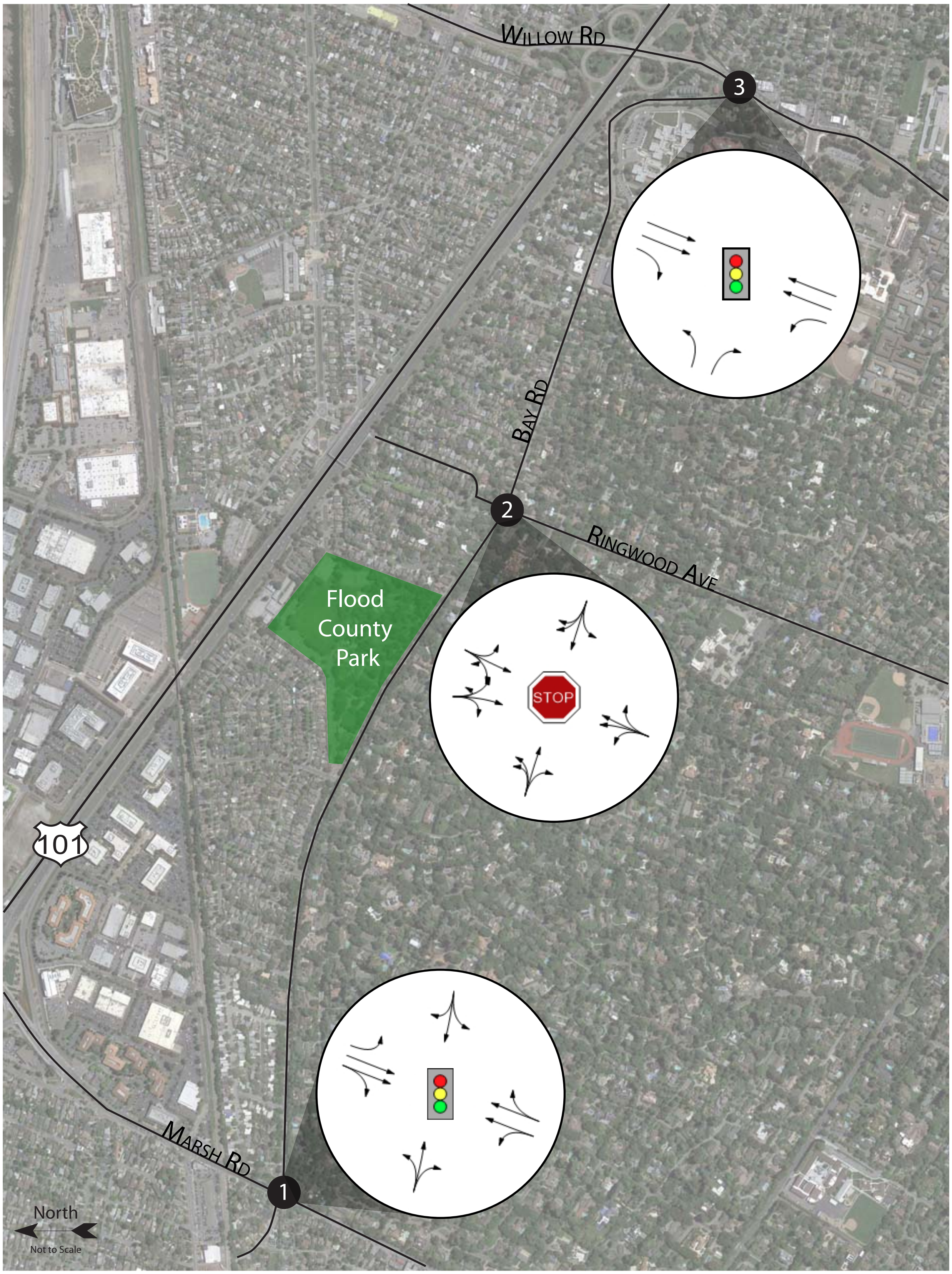
Bay Road/ Willow Road is a tee signalized with protected left-turn phasing on the northbound approach of Willow Road. The right-turn movement on the southbound approach of Willow Road is yield controlled. Pedestrian crossing is only permitted across Bay Road where a crosswalk, pedestrian signals, and curb ramps are provided.

The locations of the study intersections and the existing lane configurations and controls are shown in Figure 1.

Alternative Modes

Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. In general, a network of sidewalks, crosswalks, and curb ramps provide access for pedestrians along the park frontage; however, sidewalk gaps can be found along nearly all of the roadways connecting to the project site. Existing gaps and obstacles along the connecting roadways impact convenient and continuous access for pedestrians and present safety concerns in those locations where appropriate pedestrian infrastructure would address potential conflict points.



LEGEND
● Study Intersection

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Traffic Impact Study for the Flood County Park Landscape Plan

Figure 1 – Study Area and Lane Configurations

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- **Bay Road** – Intermittent sidewalk coverage is provided on Bay Road with significant gaps on both sides of the street between Marsh Road and Willow Road. Sidewalks are provided along the park frontage. Curb ramps and crosswalks at side street approaches within direct vicinity of the park. Lighting is non-existent on roadways within the vicinity of the park.
- **Marsh Road** – Continuous sidewalks are provided on both sides of Marsh Road north of Bay Road, and only on the west side of Marsh Road from May Road to Fair Oaks Avenue. Curb ramps and crosswalks are provided at Bay Road, but only curb ramps are provided at Fifteenth Avenue and at Fair Oaks Avenue. Sparse lighting is provided form Bay Road to Fair Oaks Avenue, with no lighting south of Fair Oaks Avenue.
- **Ringwood Avenue** – No sidewalks are provided on Ringwood Avenue north of Arlington Way, but a path is provided on the west side that often doubles as parking. Crosswalks are provided at several intersections near Laurel Elementary School, however. South of Arlington Way, crosswalks, curb ramps, and sidewalks on both sides are provided. Sparse lighting is provided.
- **Willow Road** – Continuous sidewalks are provided on both sides of Willow Road throughout the project area, often with planters separating the sidewalk from the road. Curb ramps are provided at all intersections, as are crosswalks at all major intersections. Lighting is provided on Willow Road.
- **Middlefield Road –** A continuous sidewalk is provided on the south side of Middlefield Road from Willow Road to Ravenswood Avenue. West of Ravenswood Avenue, the sidewalk turns into an unpaved intermittent path. A mostly unpaved continuous path is provided on the north side of Middlefield Road from Willow Road to Marsh Road. Curb ramps and crosswalks are provided at major intersections. Lighting is provided on Middlefield Road from Willow Road to Ravenswood Avenue, with no lighting west of Ravenswood Avenue.

Bicycle Facilities

The *Highway Design Manual*, California Department of Transportation (Caltrans), 2012, classifies bikeways into three categories:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route** – signing only for shared use with motor vehicles within the same travel lane on a street or highway.

Guidance for Class IV Bikeways is provided in *Design Information Bulletin Number 89: Class IV Bikeway Guidance (Separated Bikeways/Cycle Tracks)*, Caltrans, 2015.

- **Class IV Bikeway** – also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

In the project area, Class II bike lanes exist on Bay Road between Marsh Road and Van Buren Road, Ringwood Avenue between Middlefield Road and Bay Road, Willow Road between Durham Street and Alma Street, Middlefield Road between the Atherton city limits and Willow Road, Encinal Avenue between the PCJPB tracks and Middlefield Road, Ravenswood Avenue between Noel Drive and Middlefield Road, Laurel Street between Encinal Avenue and Burgess Drive, Alma Street between Ravenswood Avenue and East Creek Drive, and Glenwood Avenue between Laurel Street and El Camino Real. Bicyclists ride in the roadway and/or on sidewalks along all other streets within the project study area. Table 2 summarizes the existing and planned bicycle facilities in the project vicinity, as contained in the *Menlo Park Comprehensive Bicycle Development Plan*, and *Town of Atherton Bicycle/Pedestrian Master Plan*.

Table 2 – Bicycle Facility Summary				
Status **Facility**	**Class**	**Length (miles)**	**Begin Point**	**End Point**
Existing				
US101 Bike/Ped Bridge	I	0.18	Van Buren Road	Pierce Road
El Palo Alto Park Bike Trail	I	0.11	East Creek Drive	Palo Alto Avenue
Bay Road	II	1.72	Marsh Road	Van Buren Road
Ringwood Avenue	II	0.89	Middlefield Road	Bay Road
Willow Road	II	1.43	Durham Street	Alma Street
Middlefield Road	II	2.26	Atherton City Limits	Willow Road
Encinal Avenue	II	0.46	PCJPB Tracks	Middlefield Road
Ravenswood Avenue	II	0.46	Noel Drive	Middlefield Road
Laurel Street	II	0.93	Encinal Avenue	Burgess Drive
Alma Street	II	0.66	Ravenswood Avenue	East Creek Drive
Glenwood Avenue	II	0.22	Laurel Street	El Camino Real
Ravenswood Avenue	III	0.08	PCJPB Tracks	Noel Drive
Laurel Street	III	0.23	Burgess Drive	Willow Road
Planned				
El Camino Real/PCJPB Tracks Undercrossing	I	0.04	Middle Avenue	Alma Street
Marsh Road	I	0.62	Bay Road	Middlefield Road
Watkins Avenue	I	0.30	Middlefield Road	Holbrook-Palmer Park
Marsh Road	II	0.79	Bayshore Expressway	Bay Road
Ringwood Avenue	II	0.23	Van Buren Road	Bay Road
Bay Road	II	0.21	Van Buren Road	Willow Road
Willow Road	II	0.46	Durham Street	US 101 NB Ramps
Willow Place	II	0.07	Willow Road	San Francisquito Creek Crossing

Source: *Menlo Park Comprehensive Bicycle Development Plan*, City of Menlo Park, 2005; *Town of Atherton Bicycle/Pedestrian Master Plan*, Town of Atherton, 2014

Transit Facilities

The San Mateo County Transit District (SamTrans) provides fixed route bus service in the project area. SamTrans Local Route 281 provides line service to destinations throughout Menlo Park and Palo Alto and stops on Newbridge Street at Pierce Road, a quarter-mile walk from Flood Park across the US 101 Pedestrian Bridge. Route 281 operates Monday through Friday with approximately 20-30 minute headways between 6:00 a.m. and 8:00 a.m. and 6:00 p.m. and 10:30 p.m., and 15 minute headways between 8:00 a.m. and 6:00 p.m. Saturday service operates with approximately one-half hour headways between 8:00 a.m. and 7:30 p.m. Sunday service operates with approximately one-half hour headways between 8:30 a.m. and 6:30 p.m.

Routes 82, 83, and 88 provide school bus service in Atherton and Menlo Park to Hillview Middle School and Encinal Elementary School. Each route stops on Bay Road near the project site, with Routes 82 and 88 directly serving the park, and operates schooldays only with one or two runs in the mornings before school begins, and one or two runs in the afternoon after school ends.

Two bicycles can be carried on most SamTrans buses. Bike rack space is on a first come, first served basis. Two additional bicycles are allowed on SamTrans buses depending on passenger loads.

Dial-a-ride, also known as paratransit, or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. Redi-Wheels is designed to serve the needs of individuals with disabilities on the bayside area of San Mateo County, including the project area.

Capacity Analysis

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2000. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The study intersections with stop signs on all approaches were analyzed using the "All-Way Stop-Controlled" Intersection methodology from the HCM. This methodology evaluates delay for each approach based on turning movements, opposing and conflicting traffic volumes, and the number of lanes. Average vehicle delay is computed for the intersection as a whole, and is then related to a Level of Service.

The study intersections that are currently controlled by a traffic signal, or may be in the future, were evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using optimized signal timing.

The ranges of delay associated with the various levels of service are indicated in Table 3.

Table 3 – Intersection Level of Service Criteria

LOS	All-Way Stop-Controlled	Signalized
A	Delay of 0 to 10 seconds. Upon stopping, drivers are immediately able to proceed.	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
B	Delay of 10 to 15 seconds. Drivers may wait for one or two vehicles to clear the intersection before proceeding from a stop.	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
C	Delay of 15 to 25 seconds. Drivers will enter a queue of one or two vehicles on the same approach, and wait for vehicle to clear from one or more approaches prior to entering the intersection.	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
D	Delay of 25 to 35 seconds. Queues of more than two vehicles are encountered on one or more approaches.	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.
E	Delay of 35 to 50 seconds. Longer queues are encountered on more than one approach to the intersection.	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.
F	Delay of more than 50 seconds. Drivers enter long queues on all approaches.	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Reference: *Highway Capacity Manual,* Transportation Research Board, 2000

Traffic Operation Standards

The City of Menlo Park's traffic impact analysis guidelines are contained in the 2004 Circulation System Assessment document. Within the Circulation System Assessment, the City has established detailed standards of significance, which are to be used when analyzing a project's impact on the City's circulation network.

Intersections

A Project is considered to have a potentially significant traffic impact if the addition of project traffic causes an intersection on a collector street operating at LOS A through C to operate at an unacceptable level (LOS D, E, or F) or have an increase of 23 seconds or greater in average vehicle delay, whichever comes first. A potential significant traffic impact shall also include a project that causes an intersection on arterial streets or local approaches to state-controlled signalized intersections operating at LOS A through D to operate at an unacceptable level (LOS E or F) or have an increase of 23 seconds or greater in average vehicle delay, whichever comes first.

A project is also considered to have a potentially significant traffic impact if the addition of project traffic causes an increase of more than 0.8 second of average delay to vehicles on all critical movements for intersections operating at a near term LOS D through F for collector streets and at a near term LOS E or F for arterial streets. The movement for a given phase or leg of the intersection that requires the most green time is known as the critical movement. For local approaches to state-controlled signalized intersections, a project is considered to have a potentially significant impact if the addition of project traffic causes an increase of more than 0.8 second of delay to vehicles on the most critical movements for intersections operating at a near term LOS E or F.

The LOS thresholds that were applied to the study intersections are summarized in Table 4.

Table 4 – LOS Significance

Study Intersection	Jurisdiction	LOS Significance Threshold	Significance Threshold for Unacceptable LOS
1. Bay Road/Marsh Road	City of Menlo Park	D[1]	LOS becomes E or worse or delay increases by 23 seconds or more or, if LOS is currently E or F, all critical movement delay increases by 0.8 seconds
2. Bay Road/Ringwood Avenue	City of Menlo Park	C[1]	LOS becomes D or worse or delay increases by 23 seconds or more or, if LOS is currently D, E or F, all critical movement delay increases by 0.8 seconds
3. Bay Road/Willow Road	State (local approach)	D[1]	LOS becomes E or F or, if LOS is currently E or F, all critical movement delay increases by 0.8 seconds

Source: [1]Transportation Impact Analysis Guidelines, *City of Menlo Park*, 2014

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the p.m. and Saturday afternoon peak periods. This condition does not include project-generated traffic volumes. Volume data was collected during in November 2016 while local schools were in session.

Intersection Levels of Service

Under existing conditions, all study intersections are operating acceptably, with the exception of the intersection of Bay Road and Willow Road during the p.m. peak hour. City staff indicated in the 2016 *Public Review Draft EIR*

Connect Menlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update that counted traffic volumes along the Willow Road corridor "do not appropriately reflect demand, and isolated intersection operations limit the ability of the Vistro program to capture these results." (The City of Menlo Park requires the use of Vistro for traffic analysis.) Due to these limitations, the p.m. peak hour level of service reflects "unserved demand" as identified by City staff. Unserved demand refers to congestion upstream and downstream of a given intersection that results in delays that are not captured by Vistro program. The existing traffic volumes are shown in Figure 2 (p.m.) and Figure 3 (Saturday). A summary of the intersection level of service calculations is contained in Table 5, and copies of the Level of Service calculations are provided in Appendix A.

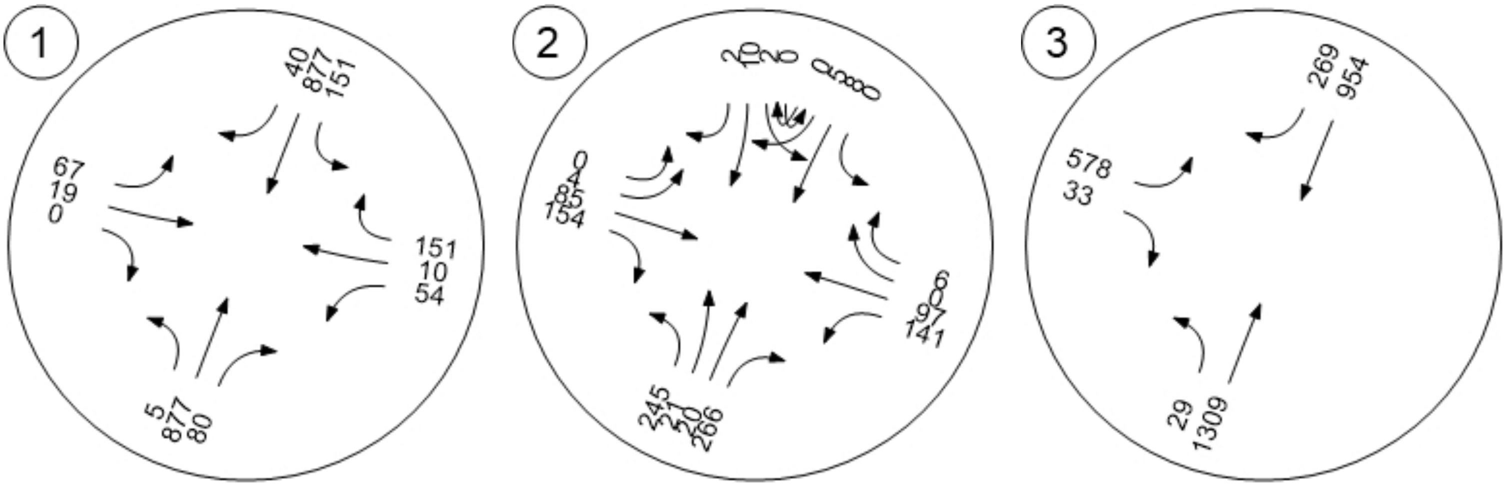
Table 5 – Existing Peak Hour Intersection Levels of Service

Study Intersection	PM Peak		SAT Peak	
	Delay	LOS	Delay	LOS
1. Bay Road/Marsh Road	16.0	B	13.7	B
2. Bay Road/Ringwood Avenue	21.2	C	8.8	A
3. Bay Road/Willow Road	**>80*1**	**F1**	9.4	A

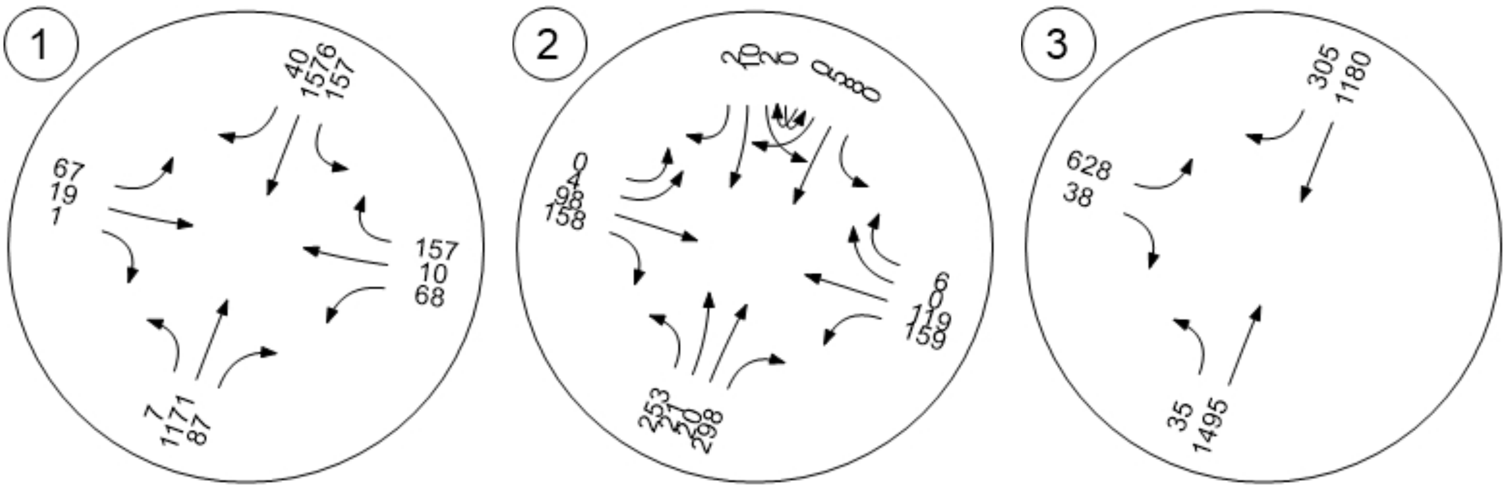
Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation; *Indicates LOS based on unserved demand. At these locations, upstream & downstream congestions results in delay not captured by VISTRO analysis.

Source: [1]Public Review Draft EIR Connect Menlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update

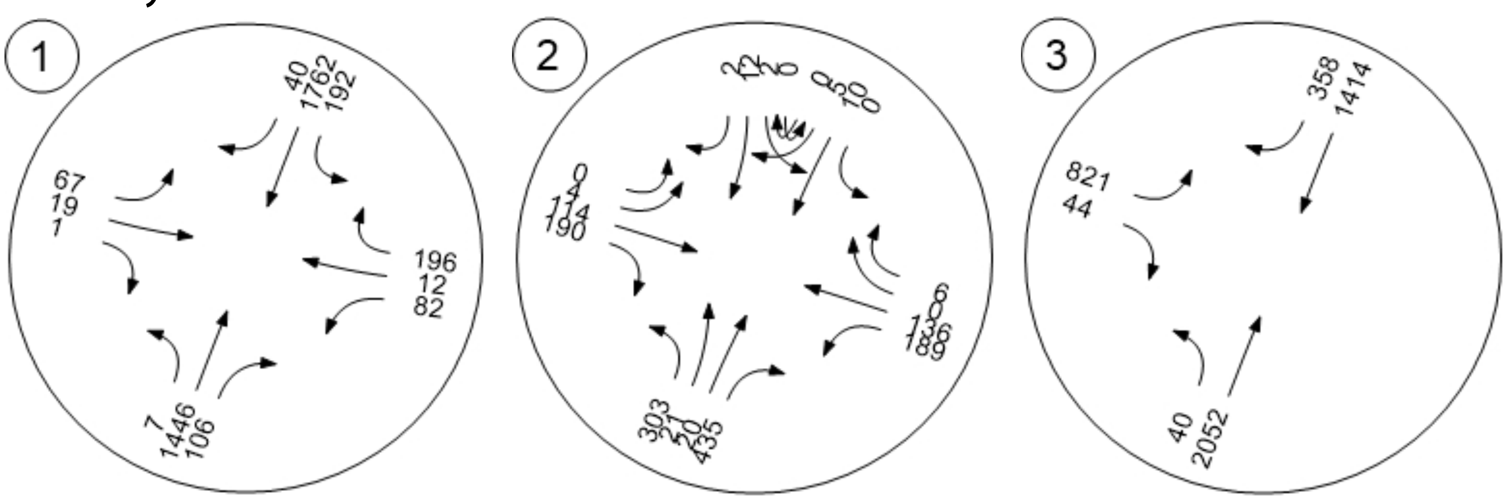
Weekday PM Existing Traffic Volumes



Weekday PM Near-Term Traffic Volumes



Weekday PM Cumulative Traffic Volumes



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Traffic Impact Study for the Flood County Park Landscape Plan

Figure 2 – Weekday PM Existing, Near-Term, & Cumulative Traffic Volumes

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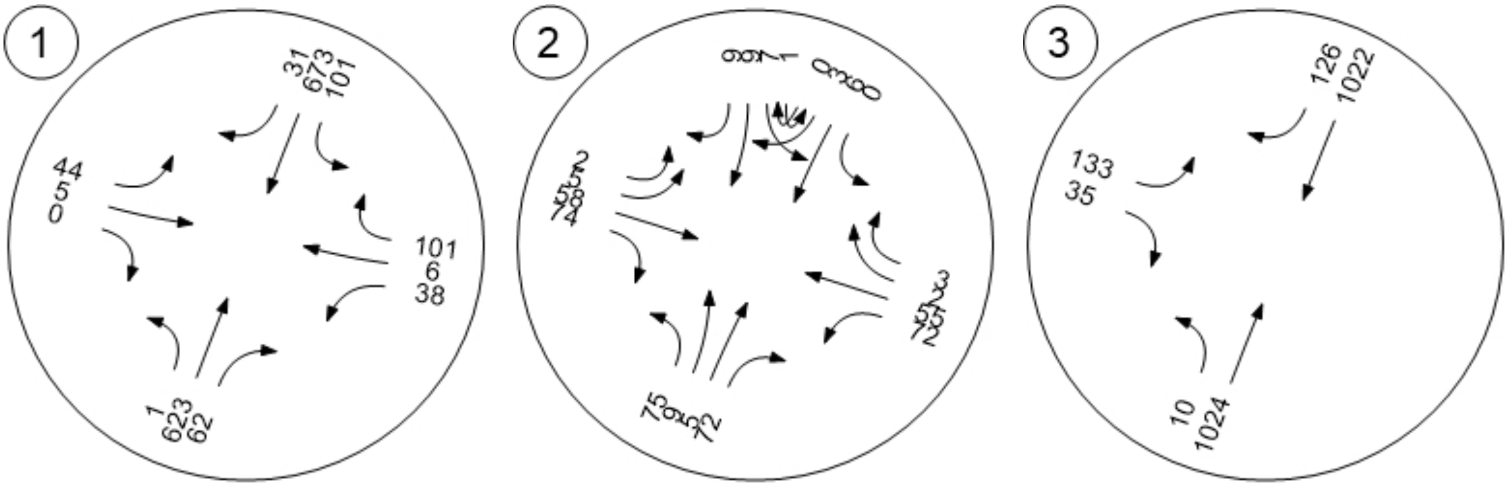
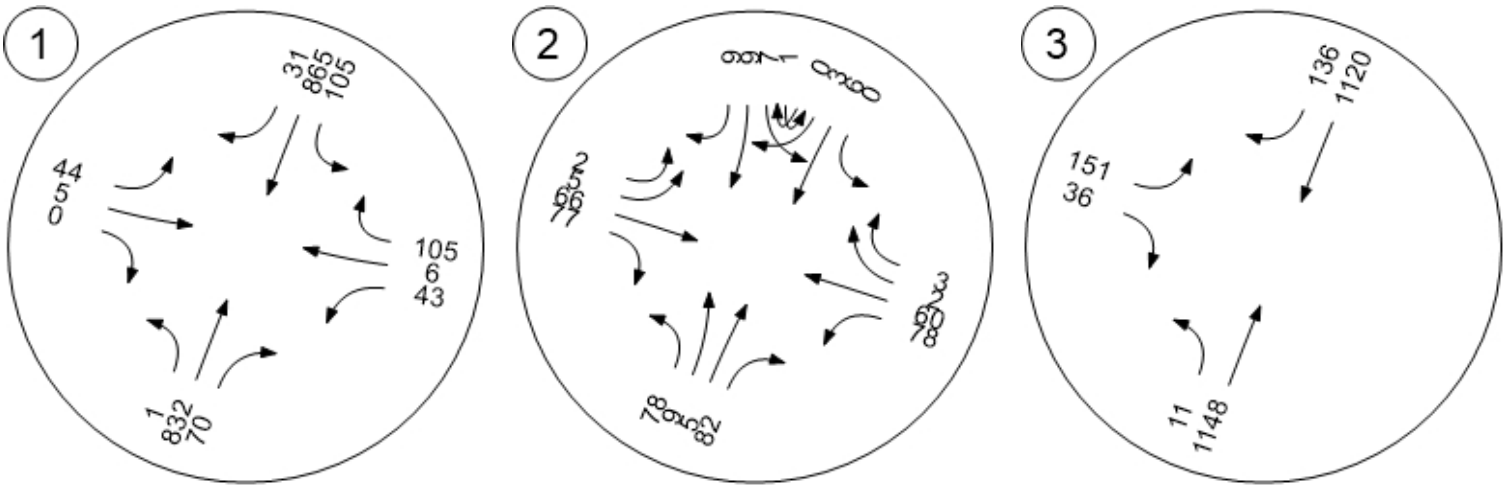
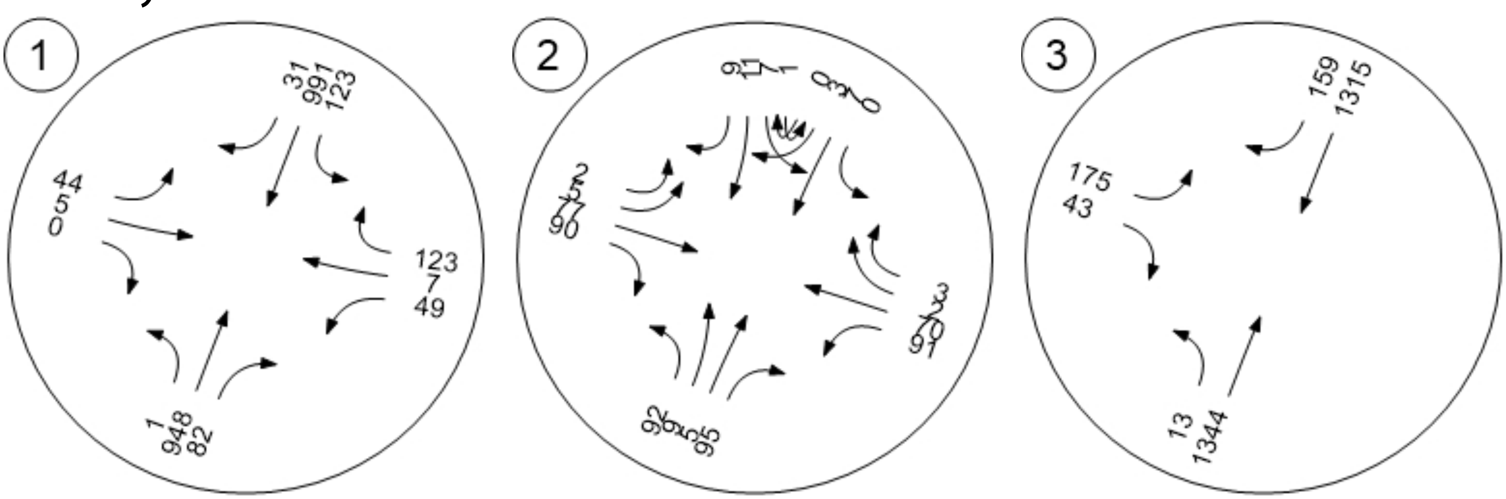
Saturday Existing Traffic Volumes



Saturday Near-Term Traffic Volumes



Saturday Cumulative Traffic Volumes



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Traffic Impact Study for the Flood County Park Landscape Plan

Figure 3 – Saturday Existing, Near-Term, & Cumulative Traffic Volumes

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Near-Term 2021 Conditions

The near-term scenario represents a short-term horizon year of 2021, the assumed completion date for Phase 1 of the Plan. The near-term scenario includes traffic that would be generated by approved projects within the City of Menlo Park. In addition, traffic from approved projects from the Town of Atherton were included in the near-term scenario for all projects expected to add 10 or more trips to the study intersections. A list of developments was provided by the City of Menlo Park. Detailed information regarding the land uses that are being replaced was also provided by the City of Menlo Park, included as Appendix B. The traffic volumes that would be generated by these approved projects was obtained from the City's Vistro analysis network, where available, or developed from data published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 9th Edition, 2012.

Additionally, a growth rate, provided by the City of Menlo Park, based on the C/CAG Travel Forecast Model was applied to account for growth in regional traffic until the horizon year of 2021. The growth rate applied was 0.8 percent per year for both p.m. and Saturday peak hour volumes.

Under these conditions, Bay Road and Ringwood Avenue is expected to operate at an unacceptable level of service, LOS D, during the p.m. peak hour. Same as the existing conditions scenario, Bay Road and Willow Road is expected to continue to operate unacceptably due to "unserved demand." These results are summarized in Table 6 and Near-Term volumes are shown in Figure 2 (p.m.) and Figure 3 (Saturday).

Table 6 – Near-Term 2021 Peak Hour Intersection Levels of Service

Study Intersection	PM Peak		SAT Peak	
	Delay	LOS	Delay	LOS
1. Bay Road/Marsh Road	19.1	B	14.2	B
2. Bay Road/Ringwood Avenue	**34.4**	**D**	9.1	A
Addition of Northbound Left-Turn Lane	15.0	C	9.0	A
3. Bay Road/Willow Road	**>80*[1]**	**F[1]**	9.9	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation; Shaded cells = conditions with potential improvements; *Indicates LOS based on unserved demand. At these locations, upstream & downstream congestions results in delay not captured by VISTRO analysis.
Source: [1]Public Review Draft EIR Connect Menlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update

In order to achieve acceptable operation at Bay Road and Ringwood Avenue, the northbound approach on Ringwood Avenue would have to be restriped to include a left-turn lane. This intersection improvement is included as a mitigation measure under Existing plus Project Conditions and would require the removal of the on-street parking and street trees on the eastside of Ringwood Avenue, relocation of exiting utility poles, and redesign of the existing roadway drainage.

Cumulative 2040 Conditions

The cumulative scenario includes an analysis of projected traffic volumes for the horizon year of 2040. This scenario includes traffic that would be generated by approved developments that were identified in the near-term scenario, traffic that would be generated by developments that are currently pending approval, as well as a growth rate to account for growth in regional traffic. A list of developments was provided by the City of Menlo Park, included as Appendix B. This list included projects that are already identified in the near-term scenario as well as pending projects that are not yet approved. The growth rate applied, as determined by a review of the C/CAG Travel Forecast Model, was 0.8 percent per year for both p.m. and Saturday peak hour volumes.

The intersection of Bay Road and Ringwood Avenue under the anticipated cumulative conditions, with the addition of a left-turn lane on the northbound approach of Ringwood Avenue at Bay Road, outlined under near-term conditions, is expected to operate at an acceptable level of service, LOS C, during the p.m. peak hour. The 2016 *Public Review Draft EIR Connect Menlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update* reported that the intersection of Bay Road and Willow Road will continue to operate unacceptably at LOS F in 2040 due to "unserved demand" after the implementation of General Plan Goals, Policies, and Programs. Cumulative volumes are shown in Figure 2 (p.m.) and Figure 3 (Saturday) and operating conditions are summarized in Table 7.

Table 7 – Cumulative 2040 Peak Hour Intersection Levels of Service				
Study Intersection	**PM Peak**		**SAT Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. Bay Road/Marsh Road	29.1	C	16.0	B
2. Bay Road/Ringwood Avenue	**108.9**	**F**	9.7	A
Addition of Northbound Left-Turn Lane	24.7	C	9.5	A
Signalization	13.9	B	9.3	A
3. Bay Road/Willow Road	**>80*[1]**	**F[1]**	10.9	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation; Shaded cells = conditions with potential improvements; *Indicates LOS based on unserved demand. At these locations, upstream & downstream congestions results in delay not captured by VISTRO analysis.
Source: [1]Public Review Draft EIR Connect Menlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update

Traffic volumes at the intersection of Bay Road and Ringwood Avenue, under anticipated cumulative conditions, would satisfy peak-hour traffic signal warrant criteria, as discussed in the Traffic Signal Warrants section. The impact would be reduced to a less-than-significant level with the implementation of a traffic signal and the addition of left-turn lanes on two approaches. However, this improvement may require the acquisition of additional rights-of-way to install traffic signal equipment and a add left-turn lane to the northbound approach of Ringwood Avenue and to the westbound approach of Bay Road. The existing two-way southbound approaches of Sonoma Avenue and Ringwood Avenue would need to be converted into one-way couplets, utilizing Oakwood Place to complete the connection, in order to facilitate efficient traffic signal operations. This measure would require coordination with, and approval, by the City of Menlo Park and the Town of Atherton, which cannot be guaranteed. Therefore, the installation of a traffic signal is not feasible as an intersection improvement.

Project Description

The proposed project will redevelop Flood County Park to preserve large oak and bay trees, provide a variety of active and passive uses, and construct new athletic fields to hold programmed events. The existing park currently has a mixture of passive recreation facilities, such as picnic areas and trails, and active recreation facilities like athletic fields, tennis courts, a playground, sand volleyball courts, and a gravel pétanque (bocce) court. An asphalt loop trail connects the parking lot to the central and southern sections of the park. The Landscape Plan, during Phase I, proposes improvements to a majority of the existing facilities, the installation of a pump track for bicycles, the reconstruction of the baseball field and the development of a new soccer/lacrosse field to allow for programmed use of the athletic fields and the addition of a drop off zone for programmed events. Phase II and III will add additional gathering plazas and focal elements, as well as, renovate the existing playground and picnic areas.

The Landscape Plan does not involve any physical changes to parking and site access. The existing vehicular access point on Bay Road would be retained. A new drop off zone is proposed near the playground. Visitors dropping off activity participants would be allowed to enter the park, without paying the entrance fee, for drop-off and pick-up. The parking supply would remain unchanged, field observations in November 2016 counted approximately 375 spaces. The proposed project site plan is shown in Figure 4.

Trip Generation

Trip generation estimates are typically developed using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 10th Edition, 2017. However, standard rates are not available or applicable to the improvements planned at the park; therefore, trip generation rates were developed based on historic park visitor statistics, estimated peak use numbers, and anticipated future programing schedules.

The existing conditions at Flood County Park were derived using historic park visitor statistics from 2011 through 2015. During this time period the baseball field was not in programmed use and this time period was assumed to represents the existing conditions at the park. Driveway counts collected in November 2016 were used to validate these assumptions. This data was used to understand the magnitude of the maximum increase in park visitors. For the purposes of this traffic study, the maximum anticipated park visitor statistics were derived from the Plan phasing information and park industry data by Gates and Associates.

W-Trans utilized the park visitor statistics and anticipated vehicle occupancy to convert the maximum number of users into trip generation estimates based on the assumptions summarized in Appendix C. It is anticipated that the programmed active recreation would be implemented as soon as the construction for Phase I is complete, analyzed both for Existing Conditions and Near-Term Conditions. The maximum trip generation estimates for Phase 2 and Phase 3 was also developed. These estimated were only analyzed for Cumulative Conditions, inclusive of the Phase I trips.

The trip generation estimates were developed to be reasonably conservative, assuming that multiple activities would start and end during the same hour. The weekday p.m. trip generation estimates assume that scheduled events on both the baseball/softball and soccer/lacrosse fields start and end during the peak hour. It was also assumed that the non-scheduled activity centers would be utilized at the same time as well. This weekday case represents a busy, but not unreasonable, trip generation estimate for all project phases.

The Saturday peak hour trip generation estimates assume that scheduled games on both the baseball/softball and soccer/lacrosse fields start and end during the peak hour. It was also assumed that the non-scheduled activity centers would be utilized at the same time as well. Regarding the scheduled picnic areas, it was assumed that only a quarter of the picnic area and shade structure visitors would arrive or leave the park during the peak hour. This weekend case represents a very busy, but not unreasonable, trip generation estimate for all project phases during the peak summer months.

This reasonably conservative analysis does not represent typical park operations, but highlights the few instances through the year when Flood Park has the potential to operate at maximum capacity.

Trip generation estimates are presented in Appendix C and summarized in Table 8. Overall, the park would be expected to generate a maximum of 200 weekday p.m. peak hour trips and 466 Saturday peak hour trips during Phase 1. Upon full buildout, the park would be expected to generate a maximum of 318 p.m. peak hour trips and 784 weekend peak hour trips.

The Flood Park Preferred Plan reflects the community feedback received on the three alternatives. The plan provides a wide range of uses, both active and passive, for a variety of user groups. Fields sports (soccer and lacrosse) have been added, as wella number elements targeted to youth (basketball, pump track, adventure play).

Based on community feedback, uses have been located to minimize the removal of large Oak and Bay trees.

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Figure 4 – Site Plan

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Table 8 – Phase 1, 2, and 3 Maximum Trip Generation Summary								
Land Use	**Weekday Daily Trips**	**PM Peak Hour**			**Saturday Daily Trips**	**SAT Peak Hour**		
		Trips	**In**	**Out**		**Trips**	**In**	**Out**
Phase 1								
Synthetic Baseball/Softball Field	90	60	30	30	226	150	75	75
Synthetic Soccer/Lacrosse Field	90	60	30	30	226	150	75	75
Tennis Courts	32	32	16	16	48	32	16	16
Sand Volleyball	0	0	0	0	20	20	10	10
Basketball	16	16	8	8	100	66	33	33
Pump Track	32	32	16	16	48	48	24	24
Phase 1 Total Trips	**260**	**200**	**100**	**100**	**668**	**466**	**233**	**233**
Phase 2								
Demonstration Garden	16	16	8	8	50	50	25	25
Play Area Universal (2-5)	30	30	15	15	60	40	20	20
Play Area Universal (5-12)	48	32	16	16	96	64	32	32
Adventure Play	40	40	20	20	70	70	35	35
Small Group Picnic	0	0	0	0	96	24	12	12
Phase 2 Total Trips	**134**	**118**	**59**	**59**	**372**	**248**	**124**	**124**
Phase 3								
Shade / Market Structure	0	0	0	0	160	30	15	15
Event / Group Picnic Area	0	0	0	0	160	40	20	20
Phase 3 Total Trips	**0**	**0**	**0**	**0**	**320**	**70**	**35**	**35**
Total Trips from Phase 1, 2, and 3	**394**	**318**	**159**	**159**	**1360**	**784**	**392**	**392**

Trip Distribution

Flood County Park is expected to be both a local-serving passive recreation park and a regional programmed active recreation park. It was assumed that a majority of project trips would originate locally in Menlo Park. Traffic utilizing local streets, while regional park trips accounting for ten percent of all trips, would utilize US 101 or I-280 before travelling on local streets to access the park. During the p.m. peak hour approximately four trips would be oriented to/from US 101 northbound and approximately four trips would be oriented to/from US 101 southbound. These trips represent approximately five-one hundredths of a percent (0.05%) of the estimated directional capacity of US 101 based on five travel lanes. As part of the analysis, no trips were directly routed to I-280. The applied distribution assumptions and resulting trips are shown in Table 9.

Table 9 – Trip Distribution Assumptions	
Route	**Percent**
To/From Marsh Road east of Bay Road	12%
To/From Marsh Road west of Bay Road	8%
To/From Bay Road north of Marsh Road	5%
To/From Flood Park Triangle	9%
To/From Ringwood Avenue west of Bay Road	48%
To/From Willow Road east of Bay Road	13%
To/From Willow Road west of Bay Road	5%
TOTAL	**100%**

Intersection Operation

Existing plus Project Conditions

Upon the addition of project-related traffic to the Existing volumes, the intersection of Bay Road and Ringwood Avenue is expected to operate unacceptably at LOS D during the p.m. peak hour. The intersection of Bay Road and Willow Road is expected to continue to operate at LOS F during the p.m. peak hour due to "unserved demand." These results are summarized in Table 10. Existing plus project traffic volumes are shown in Figure 5 (p.m.) and Figure 6 (Saturday).

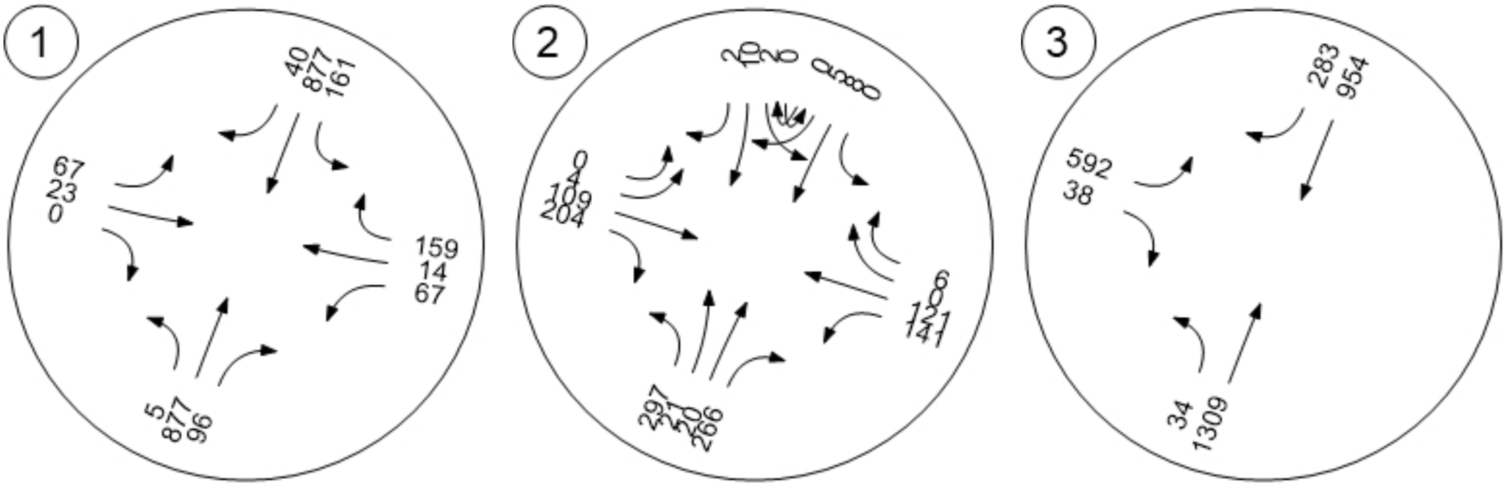
Table 10 – Existing and Existing plus Project Peak Hour Intersection Levels of Service								
Study Intersection	**Existing Conditions**				**Existing plus Project**			
	PM Peak		**SAT Peak**		**PM Peak**		**SAT Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Bay Road/Marsh Road	16.0	B	13.7	B	17.0	B	15.6	B
2. Bay Road/Ringwood Avenue	21.2	C	8.8	A	**35.7**	**D**	12.6	B
Addition of Northbound Left-Turn Lane	-	-	-	-	15.3	B	12.2	A
3. Bay Road/Willow Road	**>80*[1]**	**F[1]**	9.4	A	**>80*[1]**	**F[1]**	10.3	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation; Shaded cells = conditions with potential improvements; *Indicates LOS based on unserved demand. At these locations, upstream & downstream congestions results in delay not captured by VISTRO analysis.
Source: [1]Public Review Draft EIR Connect Menlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update

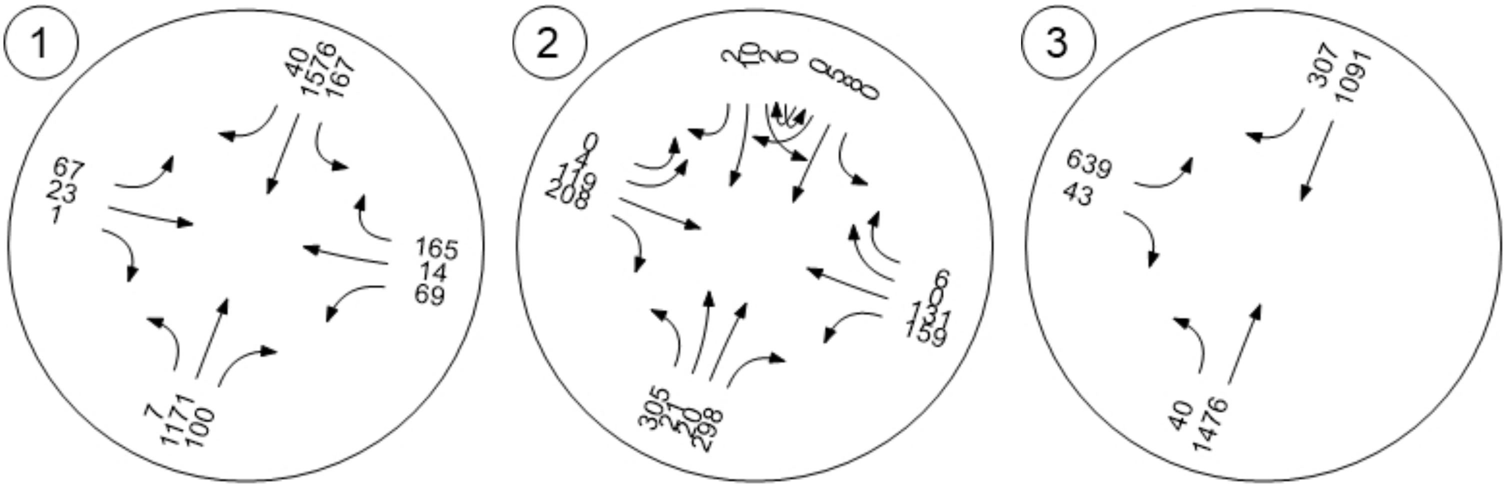
Finding – The intersection of Bay Road and Ringwood Avenue is expected to operate unacceptably at LOS D upon the addition of project-generated traffic. The intersection of Bay Road and Willow Road is expected to continue operating at LOS F during the p.m. peak hour. This intersection operates unacceptably without the addition of project-generated traffic and would continue to operate deficiently due to "unserved demand" upon the addition of project-generated traffic.

A sensitivity analysis was conducted to determine the threshold for a significant impact at the intersection of Bay Road and Ringwood Avenue based on project-generated traffic, utilizing the existing lane configuration and all-way stop control. In order to maintain LOS C, the project could generate up to 25 p.m. peak hour trips (13 outbound and 12 inbound trips) from passive and active recreation combined.

Weekday PM Existing plus Project Traffic Volumes



Weekday PM Near-Term plus Project Traffic Volumes



Weekday PM Cumulative plus Project Traffic Volumes

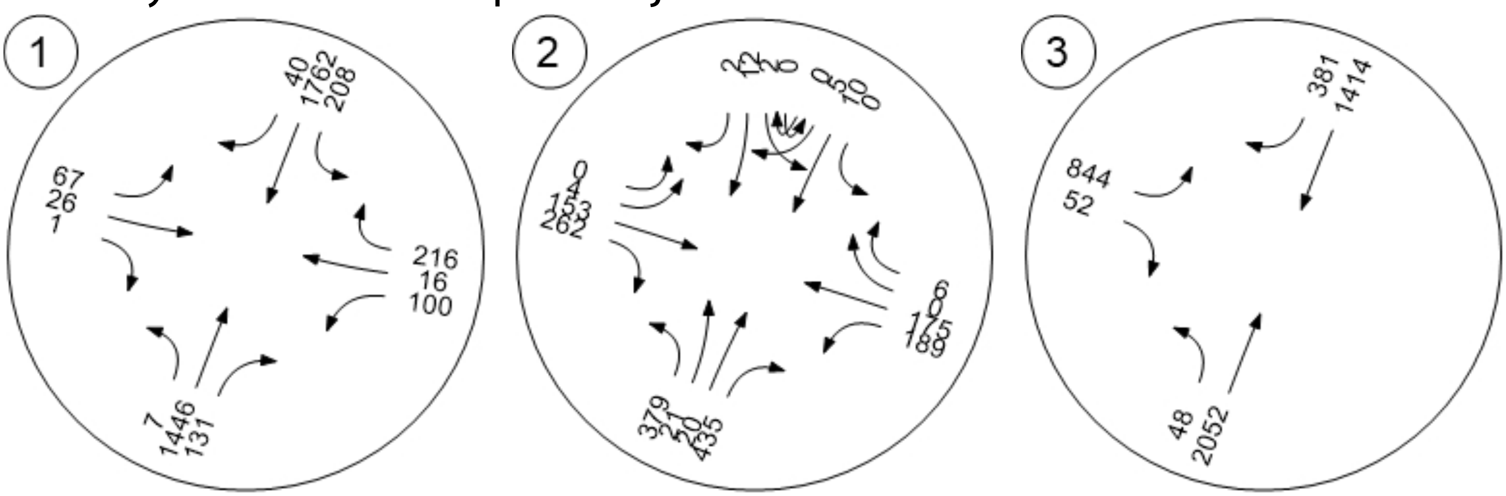


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Figure 5 – Weekday PM Existing plus Project, Near-Term plus Project, & Cumulative plus Project Traffic Volumes

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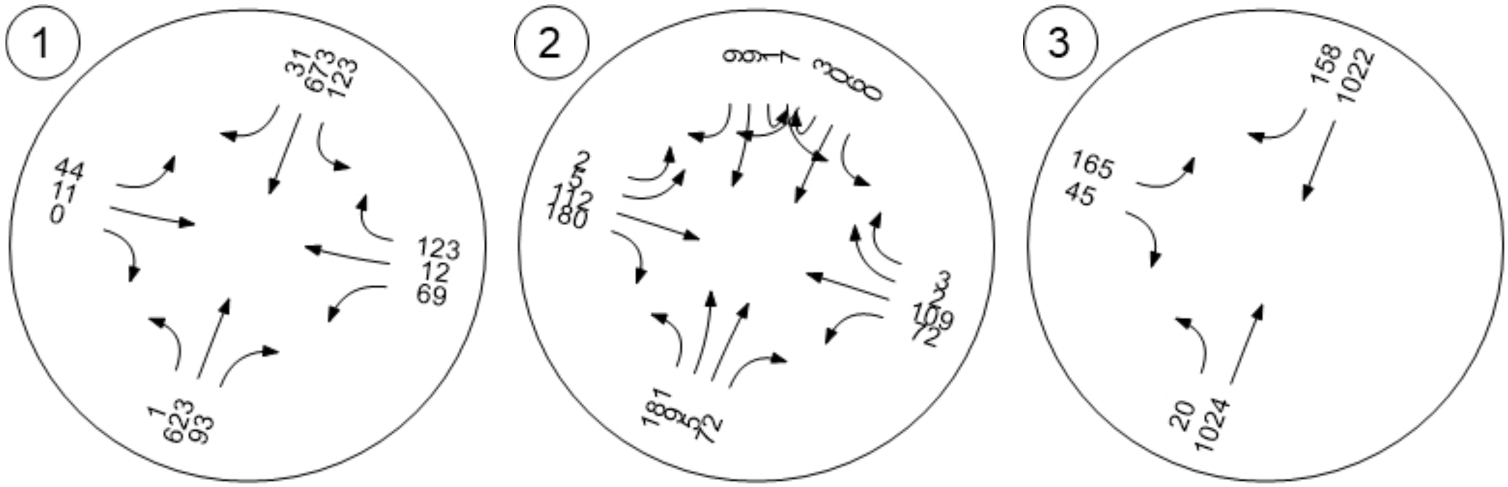
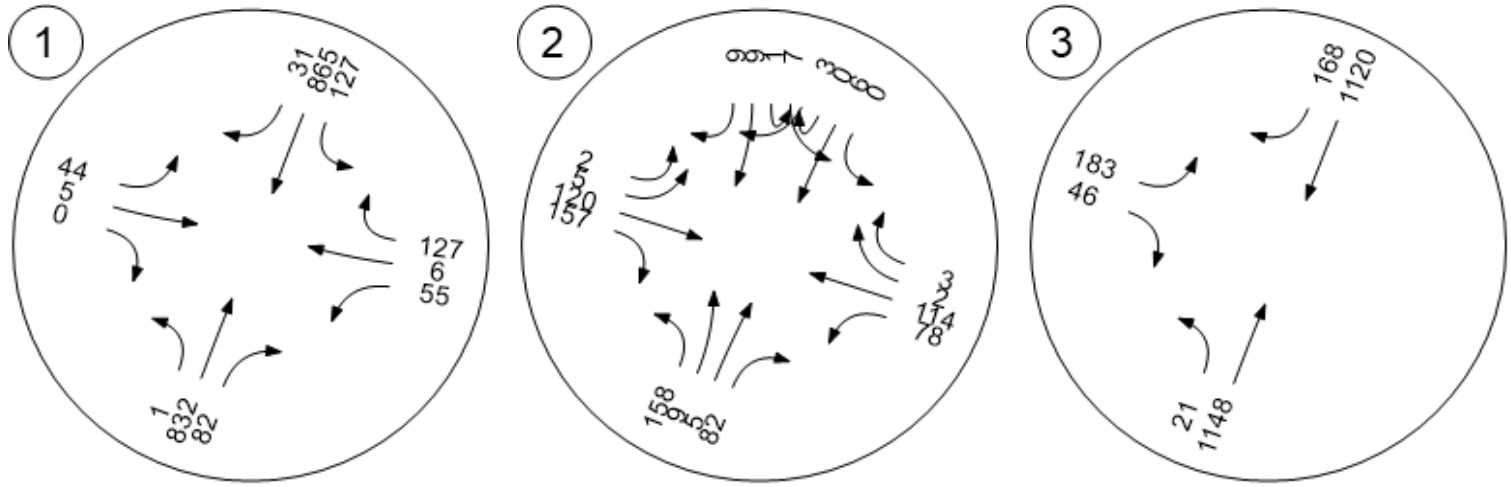
Saturday Existing plus Project Traffic Volumes



Saturday Near-Term plus Project Traffic Volumes



Saturday Cumulative plus Project Traffic Volumes

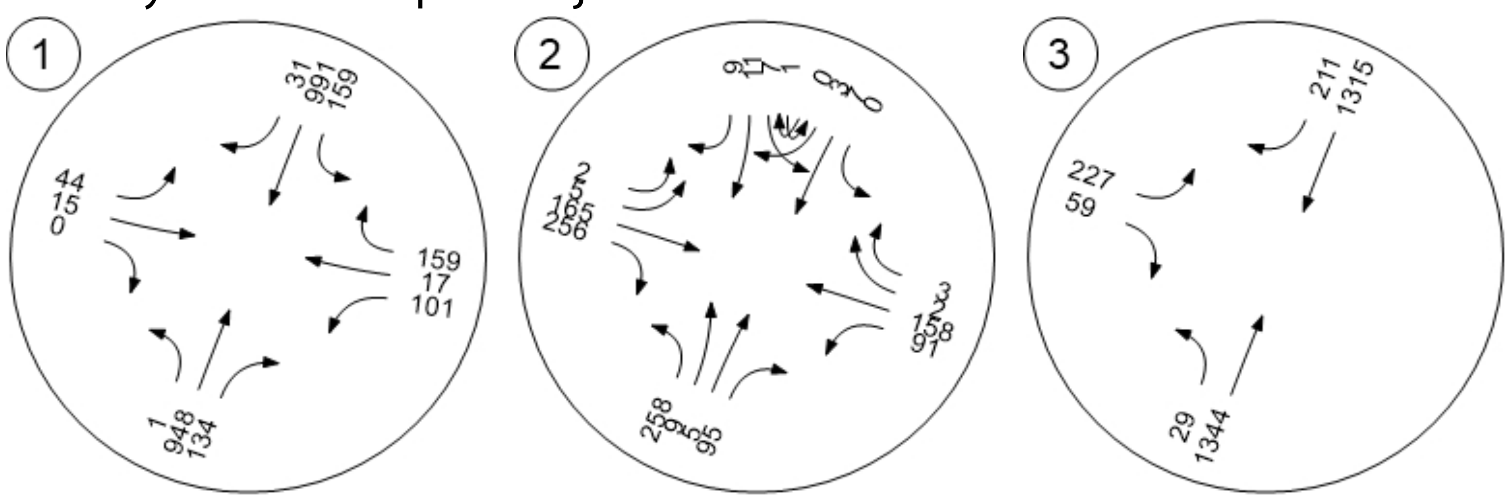


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Figure 6 – Saturday Existing plus Project, Near-Term plus Project, & Cumulative plus Project Traffic Volumes

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Based on the project description and planned programmed activity, it would not be feasible to maintain LOS C at this intersection, based on the potential trip generation. For reference, one adult baseball game would generate approximately 30 p.m. peak hour inbound trips. Without lighting, weekday evening programmed would have to start during the p.m. peak hour in order to be completed within the defined programmed activity hours, 9 a.m. to 8 p.m.

Recommendation – In order to achieve acceptable operation at Bay Road and Ringwood Avenue, the northbound approach on Ringwood Avenue would have to be restriped to include a left-turn lane. The San Mateo County Assessor Map confirms that Ringwood Avenue has 55 feet of right-of-way and although the impact would be reduced to a less-than-significant level with the implementation of this intersection improvement, the removal of the parking lane and street trees on the east side of Ringwood Avenue at the intersection of Bay Road would be required. This improvement would also require the relocation of existing utility poles and street drainage. Additionally, this measure would require coordination with, and approval, by the City of Menlo Park and the Town of Atherton, which cannot be guaranteed. Therefore, the impact would be significant and unavoidable.

Near-Term 2021 plus Project Conditions

With project-related traffic added to Near-Term volumes, the intersection of Bay Road and Ringwood Avenue is expected to operate unacceptably at LOS E during the p.m. peak hour. The intersection of Bay Road and Willow Road is expected to continue to operate at LOS F during the p.m. peak hour due to "unserved demand." These results are summarized in Table 11. Near-term plus project traffic volumes are shown in Figure 5 (p.m.) and Figure 6 (Saturday).

Table 11 – Near-Term 2021 and Near-Term 2021 plus Project Peak Hour Intersection Levels of Service

Study Intersection	Near-Term Conditions				Near-Term plus Project			
	PM Peak		SAT Peak		PM Peak		SAT Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Bay Road/Marsh Road	19.1	B	14.2	B	19.9	B	15.3	B
2. Bay Road/Ringwood Avenue	**34.4**	**D**	9.1	A	**48.6**	**E**	12.2	B
Addition of Northbound Left-Turn Lane	15.0	C	9.0	A	17.0	C	11.7	B
3. Bay Road/Willow Road	**>80*[1]**	**F[1]**	9.9	A	**>80*[1]**	**F[1]**	10.8	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation; Shaded cells = conditions with potential improvements; *Indicates LOS based on unserved demand. At these locations, upstream & downstream congestions results in delay not captured by VISTRO analysis.
Source: [1]Public Review Draft EIR Connect Menlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update

Finding – The study intersections are expected to continue operating at the same levels of service upon the addition of project-generated traffic, with the exception of Bay Road at Ringwood Avenue which is expected to operate at LOS E. The significant impact would remain significant and unavoidable.

Cumulative 2040 plus Project Conditions

Upon the addition of project-generated traffic to the anticipated Cumulative volumes, the intersection of Bay Road and Ringwood Avenue is expected to continue operating unacceptably at LOS F during the p.m. peak hour and operate unacceptably at LOS F during the Saturday peak hour. The intersection of Bay Road and Willow Road is expected to continue to operate at LOS F during the p.m. peak hour due to "unserved demand." The Future plus Project operating conditions are summarized in Table 12. Cumulative plus project traffic volumes are shown in Figure 5 (p.m.) and Figure 6 (Saturday).

Table 12 – Cumulative 2040 and Cumulative 2040 plus Project Peak Hour Levels of Service								
Study Intersection	**Cumulative Conditions**				**Cumulative plus Project**			
Approach	**PM Peak**		**SAT Peak**		**PM Peak**		**SAT Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Bay Road/Marsh Road	29.1	C	16.0	B	34.9	C	21.1	C
2. Bay Road/Ringwood Avenue	**108.9**	**F**	9.7	A	**	**F**	**27.2**	**D**
Addition of Northbound Left-Turn Lane	24.7	C	9.5	A	34.0	C	22.6	C
Signalization	13.9	B	12.0	B	15.7	B	14.7	B
3. Bay Road/Willow Road	**>80*[1]**	**F[1]**	10.9	B	**>80*[1]**	**F[1]**	12.7	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation; ** = delay exceeds 120 seconds; Shaded cells = conditions with potential improvements; *Indicates LOS based on unserved demand. At these locations, upstream & downstream congestions results in delay not captured by VISTRO analysis.

Source: [1]Public Review Draft EIR Connect Menlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update

Finding – The study intersections are expected to continue operating at the same levels of service upon the addition of project-generated traffic, with the exception Bay Road/Ringwood Avenue during the Saturday peak hour. Traffic volumes at the Bay Road and Ringwood Avenue would satisfy peak-hour traffic signal warrant criteria, as discussed in the Traffic Signal Warrants section. However, as discussed under Cumulative 2040 Conditions, this intersection improvement is not feasible. The significant impact would remain significant and unavoidable.

Analysis of Alternatives

An alternative to the Flood County Park Landscape Plan was considered and analyzed which would prohibit programmed activities on the park's athletic fields to be scheduled or take place during the p.m. peak hour on weekdays. The trip generation for this alternative removes the baseball/softball field and soccer/lacrosse field trips from the weekday p.m. peak period trip generation estimates. Under this alternative, no changes would be made to the trip generation or park operations during the Saturday peak hour. Therefore, the Saturday peak hour analysis was not reanalyzed as part of the analysis of alternatives as the level of service would not change. The intent of this alternative is to lessen the significant impact at the intersection of Bay Road and Ringwood Avenue while maintaining basic park functionality.

Upon the addition of the alternative trip generation to the Existing volumes, during the p.m. peak hour, the study intersections are expected to continue to operate acceptably at the same levels of service as without project generated trips, with the exception of Bay Road and Ringwood Avenue which is still expected to operate unacceptably at LOS D during the p.m. peak hour.. The alternative would not be expected result in a less than significant impact at the intersection of Bay Road and Ringwood Avenue. These results are summarized in Table 13.

Table 13 – Alternative Existing plus Project Peak Hour Intersection Levels of Service – Weekday Peak							
Study Intersection		**Existing Conditions**		**Existing plus Project**		**Alternative Existing plus Project**	
		PM Peak		**PM Peak**		**PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1.	Bay Road/Marsh Road	16.0	B	17.0	B	16.3	B
2.	Bay Road/Ringwood Avenue	21.2	C	**35.7**	**D**	**25.9**	**D**
	Addition of Northbound Left-Turn Lane	-	-	15.3	C	13.8	B
3.	Bay Road/Willow Road	**>80*[1]**	**F[1]**	**>80*[1]**	**F[1]**	**>80*[1]**	**F[1]**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation; Shaded cells = conditions with potential improvements; *Indicates LOS based on unserved demand. At these locations, upstream & downstream congestions results in delay not captured by VISTRO analysis.
Source: [1]Public Review Draft EIR Connect Menlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update

Upon the addition of the passive recreation trips to the Near-Term volumes, the intersection of Bay Road and Ringwood Avenue is expected to operate unacceptably at LOS E during the p.m. peak hour (as it would under the proposed project condition). The intersection of Bay Road and Willow Road is expected to continue to operate at LOS F during the p.m. peak hour due to "unserved demand." These results are summarized in Table 14.

Table 14 – Alternative Near-Term plus Project Peak Hour Intersection Levels of Service – Weekday Peak							
Study Intersection		**Near-Term Conditions**		**Near-Term plus Project**		**Alternative Near-Term plus Project**	
		PM Peak		**PM Peak**		**PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1.	Bay Road/Marsh Road	19.1	B	19.9	B	19.2	B
2.	Bay Road/Ringwood Avenue	**34.4**	**D**	**48.6**	**E**	**36.9**	**E**
	Addition of Northbound Left-Turn Lane	15.0	C	17.0	C	15.1	C
3.	Bay Road/Willow Road	**>80*[1]**	**F[1]**	**>80*[1]**	**F[1]**	**>80*[1]**	**F[1]**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation; Shaded cells = conditions with potential improvements; *Indicates LOS based on unserved demand. At these locations, upstream & downstream congestions results in delay not captured by VISTRO analysis.
Source: [1]Public Review Draft EIR Connect Menlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update

Upon the addition of the passive recreation trips to the Cumulative volumes, the intersection of Bay Road and Ringwood Avenue is expected to continue operating unacceptably at LOS F during the p.m. peak hour. The intersection of Bay Road and Willow Road is expected to continue to operate at LOS F during the p.m. peak hour due to "unserved demand." These results are summarized in Table 15.

Table 15 – Alternative Cumulative plus Project Peak Hour Intersection Levels of Service – Weekday Peak						
Study Intersection	**Cumulative Conditions**		**Cumulative plus Project**		**Alt Cumulative plus Project**	
	PM Peak		**PM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Bay Road/Marsh Road	29.1	C	34.9	C	32.6	C
2. Bay Road/Ringwood Avenue	**108.9**	**F**	**	**F**	**	**F**
Addition of Northbound Left-Turn Lane	24.7	C	34.0	C	28.8	C
Signalization	13.9	C	15.7	B	14.9	B
3. Bay Road/Willow Road	**>80*[1]**	**F[1]**	**>80*[1]**	**F[1]**	**>80*[1]**	**F[1]**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation; ** = delay exceeds 120 seconds; Shaded cells = conditions with potential improvements; *Indicates LOS based on unserved demand. At these locations, upstream & downstream congestions results in delay not captured by VISTRO analysis.

Source: [1]Public Review Draft EIR Connect Menlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update

Finding – The project alternative would result in similar impacts to the proposed project under Existing, Near-Term and Cumulative plus Project conditions during the p.m. peak hour.

Recommendation – In order to achieve acceptable operation at Bay Road and Ringwood Avenue, under Existing and Near-Term Conditions, during the p.m. peak hour, the northbound approach on Ringwood Avenue would have to be restriped to include a left-turn lane and under Cumulative Conditions, during the p.m. peak hour, the intersection would have to be signalized. The San Mateo County Assessor Map confirms that Ringwood Avenue has 55 feet of right-of-way and although the impact would be reduced to a less-than-significant level with the implementation of this intersection improvement, the removal of the parking lane and street trees on the east side of Ringwood Avenue at the intersection of Bay Road would be required. This improvement would also require the relocation of existing utility poles and street drainage. Additionally, this measure would require coordination with, and approval, by the City of Menlo Park and the Town of Atherton, which cannot be guaranteed. Therefore, the project alternative impact would be significant and unavoidable.

Vehicle Miles Traveled

Vehicle miles traveled (VMT) is the measure of miles traveled within a specific geographic area for a given period and it provides an indication of automobile and truck travel on a transportation system. This metric is often used in noise, air quality, and greenhouse gas emissions analyses. VMT can also be used to quantify the impact of a project or plan on the larger transportation system. The California Governor's Office of Planning and Research in the *Final Adopted Text Revisions to the CEQA Guidelines* 2018, introduced VMT as the metric to quantify a project's impact in place of level of service. However, local jurisdictions are required to adopt the updated guidelines and San Mateo County has yet to update their CEQA guidelines.

According to the Metropolitan Transportation Commission (MTC), on average residents of the Bay Area as a whole travel a total of approximately 23 miles daily, while residents of San Mateo Country drive over 25 miles daily. Land use planning in San Mateo County has historically followed a typical suburban pattern of development, and is therefore expected to have a higher average VMT per capita than the region. The Flood County Park Landscape Plan would be expected to have a negligible impact on the VMT of San Mateo County. The renovation of the baseball field could shorten the trip of active recreation users who no longer have to travel outside of Menlo Park to access quality athletic fields. The main user of the athletic fields would be the Menlo Legends Baseball who currently use other fields in Menlo Park and Atherton. The Plan is maintaining and revitalizing the passive recreation elements likely to be used by local residents.

Alternative Modes

Pedestrian Facilities

Given the proximity of single-family residential homes surrounding Flood County Park, it is reasonable to assume that some park visitors will want to walk and/or bicycle to reach the Park.

Flood County Park Landscape Plan – Three pedestrian access points are located along Bay Road and one access point is located at the terminus of Iris Lane at the eastern corner of the Park. The Landscape Plan proposes a network of paved walkways that would enable a park user to go from one park feature to another. A pedestrian path currently exists along the edge of the parking lot, no improvements are planned for the parking lot as part of the Landscape Plan.

Project Vicinity – Sidewalks exist along the project frontage, the north side of Bay Road, from Del Norte Avenue to Marsh Road. Sidewalks are not provided on the south side of Bay Road. Between Del Norte Avenue and Ringwood Avenue no sidewalks exist, pedestrians have to walk along the roadway shoulder or in the bike lane. Sidewalks are provided along Iris Lane to connect the Park to the pedestrian bridge over US 101. Complete sidewalk networks exist in the Menlo Park neighborhoods to the northwest and southeast of the Park. Atherton neighborhoods, located south of Bay Road, do not have sidewalks.

Finding – Onsite pedestrian facilities within Flood County Park are expected to be adequate; however, a gap exists in the sidewalk network on the north side of Bay Road, a route which could be utilized by pedestrians to access the Park. There are two mature oak trees located within the right of way along Bay Road which would have to be removed to complete the sidewalk; therefore, it would not be feasible to complete the sidewalk along Bay Road.

Recommendation – Install signage along the north side of Bay Road between Del Norte Avenue and Ringwood Avenue to inform motorists and bicyclist of pedestrians walking along the shoulder and in the bike lane.

Bicycle Facilities

Existing bicycle facilities, including bike lanes on Bay Road, Ringwood Avenue, Middlefield Road, and Willow Road together with shared use of minor streets provide adequate access for bicyclists.

Bicycle Storage

The Flood County Park Landscape Plan does not identify any bicycle parking or storage facilities in the park, restricting the amenities for park visitors who may which may wish to travel to and from the park via a bicycle.

Finding – Bicycle storage should be provided for patrons due to the recreational nature of the project. All other bicycle facilities serving the project site are expected to be adequate.

Recommendation – Install racks that can accommodate a minimum of six bicycles near the gathering plaza.

Transit

Due to the nature and location of the Park, the majority of park visitors would be from the nearby residential neighborhoods and would access the Park via foot, bike or vehicle. Existing stops are available within acceptable walking distance of the site for those visitors who choose to access the site via transit.

Finding – Transit facilities serving the project site are expected to be adequate.

Access and Circulation

Site Access

The Landscape Plan does not involve any physical changes to parking and site access. The existing vehicular access point on Bay Road will be retained. A new drop off zone is proposed near the playground. Visitors dropping off activity participants will be allowed to enter the park, without paying the entrance fee, for drop-off and pick-up. The parking supply will remain unchanged, field observations in November 2016 counted approximately 375 spaces.

Access Analysis

Left-Turn Lane Warrants

The need for left-turn lanes on Bay Road at the Flood County Park driveway was evaluated based on criteria contained in the *Intersection Channelization Design Guide*, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985, as well as a more recent update of the methodology developed by the Washington State Department of Transportation. The NCHRP report references a methodology developed by M. D. Harmelink that includes equations that can be applied to expected or actual traffic volumes in order to determine the need for a left-turn pocket based on safety issues. Based on our research and discussions with Caltrans staff, this methodology is consistent with the "Guidelines for Reconstruction of Intersections," August 1985, which was referenced in Section 405.2, Left-turn Channelization, of previous editions of the Caltrans *Highway Design Manual*, though this reference has been deleted from the most recent edition of this manual.

The need for left-turn channelization in the form of a left-turn pocket on Bay Road was evaluated based on Near-Term 2021 peak hour volumes as well as safety criteria. Under Near-Term conditions, which includes traffic generated by both passive and programed active recreation, a left-turn lane is not warranted on Bay Road at the Flood County Park driveway during either of the peak periods evaluated.

Right-Turn Lane Warrants

The need for a right-turn lane or taper was evaluated based on criteria contained in the *Intersection Channelization Design Guide*, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985. A right-turn lane would consist of a lane installed to the right of the travel lane and would be a minimum of ten feet wide, plus a shoulder where not adjacent to a curb. A right-turn taper is a shoulder area that gets progressively wider as the motorist drives toward the intersection. Both improvements are meant to provide an area for motorists turning right to move out of the traffic lane without impeding through traffic.

The need for a right-turn lane or taper was evaluated for the Flood County Park driveway on Bay Road. Using the same criteria contained in the *Intersection Channelization Design Guide*, the warrants were evaluated using Near-Term 2021 plus Project volumes during both the p.m. and Saturday peak hour. Based on these assumptions, no additional facilities in the form of either a right-turn lane or right-turn taper would be warranted.

Traffic Signal Warrants

A signal warrant analysis was performed to determine potential need for a traffic signal at Bay Road and Ringwood Avenue.

Chapter 4C of the *California Manual on Uniform Traffic Control Devices* (CA-MUTCD) provides guidance on when a traffic signal should be considered. There are nine different warrants, or criteria, presented, as follows:

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour Volume
- Warrant 4, Pedestrian Volume
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal System
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network
- Warrant 9, Intersection Near a Grade Crossing

Warrant 3, which is often the first warrant to be met, has a notice that this signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time. Under the Peak Hour Warrant the need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

A. If all three of the following conditions exist for the same one hour (any four consecutive 15-minute periods) of an average day:

   1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: four vehicle-hours for a one-lane approach; or five vehicle-hours for a two-lane approach, and
   2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
   3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

For the purposes of this study, Warrant 3, the Peak Hour volume warrant, which determines the need for traffic control based on the highest volume hour of the day, was used as an initial indication of traffic control needs under Cumulative 2040 conditions. The use of this signal warrant is common practice for planning studies. Other warrants, which are more generally applicable to existing traffic issues, require collection of traffic volumes for the highest four or eight hours of the day, review of the collision history, and evaluation of the system surrounding the location. The traffic volume at Bay Road and Ringwood Avenue do not satisfy the warrant under Existing, Existing plus Project, Near-Term 2021, and Near-Term 2021 plus Project conditions.

Parking

Flood County Park was analyzed to determine whether the proposed parking supply would be sufficient for the anticipated parking demand. The City of Menlo Park Municipal Code does not specify parking requirements for a park. The existing Park, and as proposed, would provide approximately 375 parking spaces. During the parking utilization surveys conducted in November 2016, a portion of the parking lot was being used for long-term storage. This storage did not allow for a complete survey of the parking facilities. However, the long-term storage has been removed and more parking is available. The surveyed total was used in the parking analysis to provide a conservative analysis.

Parking demand using the maximum anticipated park visitor statistics were derived from the Plan phasing information and park industry data by Gates and Associates. The user capacity of the park and the assumed vehicle occupancy by amenity was used to derive the maximum parking demand for each amenity. The assumption is that all activities would be utilized at the same time, resulting in the maximum parking demand on the weekend. For a conservative analysis, no deductions were taken for motorists that would drop-off and pick-up park visitors and not park in the lot. Additionally no deductions were taken for alternative modes, although the site is generally accessible by walking and bicycling. Based on this data, the anticipated typical peak parking demand for the proposed project is 344 parking spaces. Using these calculations, it is anticipated that the existing parking supply would be adequate. However, it should be noted the parking supply could still potentially exceed the capacity during very large scheduled events.

The proposed Plan includes a drop-off zone for loading and unloading at the existing playground. Visitors dropping off activity participants would be allowed to enter the park, without paying the entrance fee, for drop-off and pick-up.

During peak summer demand, the use of the fee collection booth at the main entrance may cause temporary queue spillback on to City streets. In order to accommodate high demand, the Park could allow visitors to enter the park without paying the entrance fee and collect the fee upon vehicle exit. This would move the queue related to park visitors on-site. Additionally, the self-registration fee collection station could be converted into an automated fee machine to collect and print daily or multiple day passes. Park visitors could either be required to display this pass while parked or present the pass upon exit. Since the park has set hours and is staffed during peak periods, a combination of the automated and manual strategies could be used to mitigate queue spillback on to City streets.

The parking utilization surveys conducted in November 2016 identified the number of vehicles parked on City streets surrounding Flood County Park which were not displaying a residential parking permit. During the six-hour weekday count, an average of seven cars per hour, not displaying a permit, were parked within the vicinity of the park. During the six-hour Saturday count, an average of 10 cars per hour, not displaying a permit, were parked within the vicinity of the park. While it is not possible to know the final destination of the drivers of the parked vehicles, daytime parking is not allowed on the surveyed streets without a parking permit. County Parks should work with the City of Menlo Park and the Town of Atherton to educate park visitors about the parking restrictions, as well as, increase random enforcement of the parking restrictions.

Finding – The parking supply would be adequate based on the estimated parking demand rate. While temporary queue spillback on to City streets may occur during peak summer demand, the impact can be mitigated to a less than significant level with the implantation of new fee collection practices.

Recommendation – Implement parking fee collection practices; automated fee machines, pay on exit, or a combination of both to move the queues associated with fee collection off of City streets and on-site. Develop a mechanism to inform park visitors about on-street parking restrictions on City streets within the vicinity of the Park. Clearly mark drop-off and pick-up zone.

CEQA Checklist

The 2010 California Environmental Quality Act (CEQA) Guidelines lists six criteria to be considered when determining if a project would result in a significant impact on transportation. Additionally, consideration should be given to the impacts of congestion on greenhouse gases.

XVI. TRANSPORTATION/TRAFFIC

a. *Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?*

   Potentially Significant. As detailed in the Intersection Operations section, the proposed project is expected to result in a significant impact to the performance of the circulation system. Project generated trips are expected to cause a significant impact at the intersection of Bay Road and Ringwood Avenue. Under Existing plus Project conditions, the intersection is expected to operate at LOS D during the p.m. peak hour. The addition of a northbound left-turn lane on Ringwood Avenue and the installation of a traffic signal were investigated as possible mitigation measures. However, both were deemed infeasible due to the acquisition of right-of-way, removal of existing street trees, and relocation of utilities required to implement the improvements. Additionally, this measure would require coordination with, and approval, by the City of Menlo Park and the Town of Atherton, which cannot be guaranteed. Therefore, the impact would be significant and unavoidable. The proposed project is not expected to hinder efforts to encourage walking, bicycling, or public transit use, but rather it supports non-vehicular trips by providing a destination within walking or bicycling distance of many local residents. The project is therefore expected to have a less-than-significant impact on pedestrians, bicyclists, and public transit by providing a destination within walking or bicycling distance of many local residents and nearby transit stops.

b. *Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?*

   Less than significant. The City/County Association of Governments of San Mateo County (C/CAG) serves at the Congestion Management Agency (CMA) for San Mateo County. C/CAG's most recent Congestion Management Plan (CMP), referred to as the 2013 CMP Monitoring Report, establishes the designated CMP Roadway network, which includes I-280, US 101, Bayfront Expressway (SR 84), El Camino Real (SR 82), and Willow Road (SR 114) and the LOS standard for each roadway in the network. The project is expected to generate the majority of trips from local residents. Traffic on the designated CMP roadway network is not expected to be impacted. Therefore, the proposed project is not expected to conflict with C/CAG's Congestion Management Program.

c. *Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?*

   No Impact. The project site is not located near any airports; therefore, the implementation and full buildout of the Flood County Park Landscape Plan would have no impact on air safety or operation of airport facilities.

d. *Significantly increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*

Less than significant. Proposed modifications to the existing transportation facilities, including sidewalks, crosswalk installation, are expected to accommodate any increase in pedestrians and bicyclists travelling along Bay Road.

e. *Result in inadequate emergency access?*

Less than significant. The proposed project does not include any modifications to the exiting transportation and street network. Therefore, the Flood County Park Landscape Plan would not affect emergency access.

f. *Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?*

Less than significant. The proposed project is consistent with adopted policies and plans regarding public transit, bicycle, and pedestrian facilities. As described, any improvements to pedestrian and bicycle facilities are expected to improve access to the project site and would adequately accommodate any increase in pedestrian and bicycle activity in the vicinity of Flood County Park.

g. *Cause noticeable increase in pedestrian traffic or a change in pedestrian patterns?*

Less than significant. The proposed project is not expected to generate noticeable increases in pedestrian traffic or travel patterns in the vicinity of Flood County Park. The mode split for park visitors is expected to remain the same upon implementation of the Landscape Plan. Visitors who currently live within reasonable walking distance would continue to utilize the pedestrian network to access the Park.

h. *Result in inadequate parking capacity?*

Less than significant. As detailed in the Parking Section, the proposed project is expected to provide ad equate parking capacity based the typical peak parking demand calculations. Flood County Park has approximately 375 parking spaces. The Landscape Plan also includes a drop-off zone for loading and unloading, and visitors would be able to access this drop-off zone without paying the entrance fee.

Adopted Policies and Plans

The City of Menlo Park's adopted polices and planes regarding public transit, bicycle and pedestrian facilities are included in the City's General Plan. The General Plan establishes the following policies relevant to the Flood County Park Landscape Plan and alternative transportation modes:

Policy CIRC-1.8 **Pedestrian Safety**. Maintain and create a connected network of safe sidewalks and walkways within the public right of way [Policy CIRC-5.2] ensure that appropriate facilities, traffic control, and street lighting are provided for pedestrian safety and convenience, including for sensitive populations. [Policy CIRC-5.3]

Policy CIRC-4.3 **Active Transportation.** Promote active lifestyles and active transportation, focusing on the role of walking and bicycling, to improve public health and lower obesity.

Policy CIRC-5.2 **Transit Proximity to Activity Centers**. Promote the clustering of as many activities as possible within easy walking distance of transit stops, and locate any new transit stops as close as possible to housing, jobs, shopping areas, open space, and parks. [Policy CIRC-2.2]

Conclusions and Recommendations

Conclusions

- The proposed project is expected to generate a maximum of 200 weekday p.m. peak hour trips and 466 Saturday peak hour trips during Phase 1. Upon full buildout, the park would be expected to generate a maximum of 318 p.m. peak hour trips and 784 weekend peak hour trips.

- Under Existing Conditions, the study intersections operate acceptably during the Saturday peak hour; however, Bay Road/Willow Road operates unacceptably at LOS F due to "unserved demand" during the p.m. peak hour.

- Upon the addition of project-generated traffic to Existing Conditions, the study intersections are expected to continue operating acceptably during the Saturday peak hour, but Bay Road/Willow Road is expected to continue to operate unacceptably at LOS F due to "unserved demand" and Bay Road/Ringwood Avenue is expected to deteriorate to LOS D during the p.m. peak hour.

- Project generated trips are expected to cause a potentially significant impact at the intersection of Bay Road and Ringwood Avenue under Existing plus Project Conditions. Mitigation measures were deemed infeasible due to the acquisition of right-of-way, removal of existing street trees, and relocation of utilities required to implement the improvements. Additionally, intersection improvements would require coordination with, and approval, by the City of Menlo Park and the Town of Atherton, which cannot be guaranteed. Therefore, the impact would be significant and unavoidable.

- Under Near Term 2021, Near Term 2021 plus Project, Cumulative 2040, and Cumulative 2040 plus Project Conditions the study intersections are expected to operate acceptably at the same levels of service upon the addition of project-generated traffic during the Saturday peak hour, with the exception of the intersection of Bay Road/Ringwood Avenue under Cumulative 2040 plus Project Conditions. Under Cumulative 2040 plus Project conditions, during both peak periods, the intersection of Bay Road/Ringwood Avenue is expected to operate unacceptably, these impacts would be significant and unavoidable.

- The project alternative, which would prohibit programmed activities to be scheduled or take place during the weekday p.m. peak hours, would result in similar impacts to the proposed project under Existing, Near-Term and Cumulative plus Project conditions.

- Onsite pedestrian facilities within Flood County Park are expected to be adequate; however, there are gaps in the pedestrian facilities accessing the project vicinity. Bicycle and Transit facilities serving the project site are expected to be adequate.

- The proposed parking supply at Flood County Park would be adequate based on the estimated parking demand rate. During a recent six-hour weekday count, an average of seven cars per hour, not displaying a permit, were parked within the vicinity of the park. During a recent six-hour Saturday count, an average of 10 cars per hour, not displaying a permit, were parked within the vicinity of the park. Temporary queue spillback on to City streets may occur during peak summer demand.

- The Flood County Park Landscape Plan's impacts to the congestion management program, air traffic, hazardous design features, emergency access, and conflicts with adopted policies are considered to be less than significant.

Recommendations

- To address gaps in the pedestrian network, completion of the sidewalk along the north side of Bay Road between Del Norte Avenue and Ringwood Avenue is recommended to provide continuous pedestrian connectivity.

- Install racks that can accommodate a minimum of six bicycles near the gathering plaza.

- The County should implement parking fee collection practices to avoid the back up of entering traffic onto local streets. These may include automated fee machines, pay on exit, or a combination of both to move the queues associated with fee collection off of City streets and on-site. Develop a mechanism to inform park visitors about on-street parking restrictions on City streets within the vicinity of the Park. Clearly mark drop-off and pick-up zone.

- The County also shall coordinate with the City of Menlo Park to reduce parking by park visitors in the adjacent neighborhoods, including communication about large events and encouraging increased random enforcement of on-street parking restrictions. It is recommended that the County of San Mateo Parks Department proactively coordinate with the City of Menlo Park to reduce the potential for queue spillback and parking overflow onto City streets (i.e., on weekday evenings and on weekend days when all picnic areas are reserved and all fields are anticipated to be in use at the same time).

Study Participants and References

Study Participants

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Editing/Formatting	Hannah Yung

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SMX013

Appendix A

Intersection Level of Service Calculations

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro — Scenario 1 PM Existing

Report File: N:\...\PM Existing.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.659	15.9	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NEB Right	0.832	21.2	C
3	Willow Rd/Bay Rd	Signalized	HCM 2000	EB Left	0.815	30.4	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	15.9
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.659

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	5	877	80	151	877	40	67	19	0	54	10	151
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	877	80	151	877	40	67	19	0	54	10	151
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	231	21	40	231	11	18	5	0	14	3	40
Total Analysis Volume [veh/h]	5	923	84	159	923	42	71	20	0	57	11	159
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	68
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	35	35	35	14	49	49	19	19	19	19	19	19
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	68	68	68	68	68
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	10	45	15	15
g / C, Green / Cycle	0.46	0.15	0.66	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.30	0.09	0.27	0.09	0.15
Total Saturation Flow Adjustment	0.88	0.93	0.93	0.52	0.80
s, saturation flow rate [veh/h]	3331	1770	3524	984	1520
c, Capacity [veh/h]	1519	260	2332	217	335
d1, Uniform Delay [s]	14.46	27.18	5.36	22.76	24.28
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.33	10.26	0.54	5.85	10.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.67	0.61	0.41	0.42	0.68
d, Delay for Lane Group [s/veh]	16.79	37.44	5.90	28.61	34.77
Lane Group LOS	B	D	A	C	C
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.38	3.37	5.22	1.71	4.79
50th-Percentile Queue Length [ft/ln]	234.41	84.13	130.42	42.64	119.73
95th-Percentile Queue Length [veh/ln]	16.44	7.10	10.18	3.94	9.50
95th-Percentile Queue Length [ft/ln]	410.99	177.53	254.61	98.53	237.51

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.79	16.79	16.79	37.44	5.90	5.90	28.61	28.61	28.61	34.77	34.77	34.77
Movement LOS	B	B	B	D	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	16.79			10.36			28.61			34.77		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	15.95											
Intersection LOS	B											
Intersection V/C	0.659											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	21.2
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.832

Intersection Setup

Name	Sonoma Avenue				Bay Road				Bay Road			
Approach	Southbound				Eastbound				Westbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00				30.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Sonoma Avenue				Bay Road				Bay Road			
Base Volume Input [veh/h]	0	2	10	2	0	4	85	154	141	97	0	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	2	10	2	0	4	85	154	141	97	0	6
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	3	1	0	1	22	40	36	25	0	2
Total Analysis Volume [veh/h]	0	2	10	2	0	4	88	159	145	100	0	6
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	553	627	582
Degree of Utilization, x	0.03	0.40	0.43

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.08	1.92	2.16
95th-Percentile Queue Length [ft]	1.95	48.12	54.10
Approach Delay [s/veh]	9.68	12.53	13.80
Approach LOS	A	B	B
Intersection Delay [s/veh]	21.18		
Intersection LOS	C		

Intersection Setup

Name	Ringwood Ave				Ringwood Avenue			
Approach	Northeastbound				Southwestbound			
Lane Configuration								
Turning Movement	Left2	Left	Thru	Right	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Ringwood Ave				Ringwood Avenue			
Base Volume Input [veh/h]	245	21	20	266	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	245	21	20	266	0	8	5	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	5	5	69	0	2	1	0
Total Analysis Volume [veh/h]	253	22	21	274	0	8	5	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	685	569
Degree of Utilization, x	0.83	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.11	0.07
95th-Percentile Queue Length [ft]	227.82	1.75
Approach Delay [s/veh]	28.79	9.49
Approach LOS	D	A
Intersection Delay [s/veh]	21.18	
Intersection LOS	C	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	30.4
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.815

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	29	1309	954	269	578	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	29	1309	954	46	578	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	337	246	12	149	0
Total Analysis Volume [veh/h]	30	1349	984	47	596	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Generated with PTV VISTRO
Version 7.00-05

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	10	64	54	54	36	36
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Generated with PTV VISTRO
Version 7.00-05

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	60	50	50	32	32
g / C, Green / Cycle	0.06	0.60	0.50	0.50	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.38	0.28	0.03	0.34	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	106	2128	1773	792	566	507
d1, Uniform Delay [s]	44.94	12.91	17.30	12.88	34.00	23.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.54	1.45	1.26	0.14	52.37	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.28	0.63	0.55	0.06	1.05	0.00
d, Delay for Lane Group [s/veh]	51.49	14.36	18.56	13.03	86.37	23.12
Lane Group LOS	D	B	B	B	F	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.90	14.91	11.35	0.74	26.47	0.00
50th-Percentile Queue Length [ft/ln]	22.41	372.78	283.84	18.47	661.85	0.00
95th-Percentile Queue Length [veh/ln]	2.18	24.61	19.34	1.82	42.49	0.00
95th-Percentile Queue Length [ft/ln]	54.60	615.34	483.45	45.47	1062.29	0.00

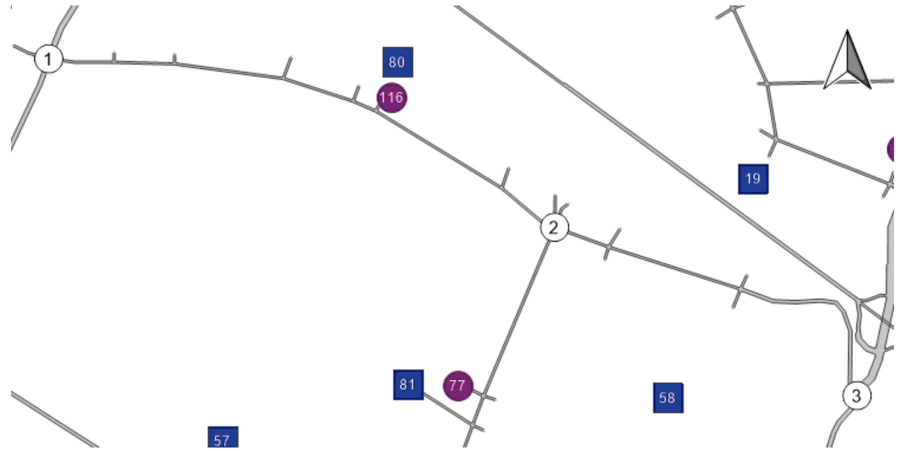
Movement, Approach, & Intersection Results

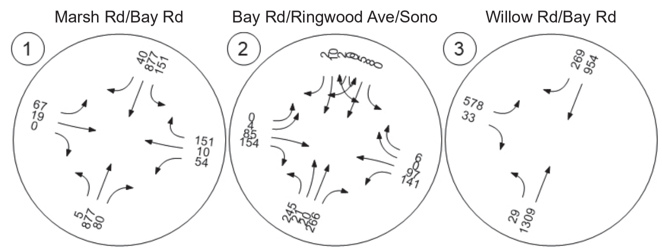
d_M, Delay for Movement [s/veh]	51.49	14.36	18.56	13.03	86.37	23.12
Movement LOS	D	B	B	B	F	C
d_A, Approach Delay [s/veh]	15.17		18.31		86.37	
Approach LOS	B		B		F	
d_I, Intersection Delay [s/veh]	30.36					
Intersection LOS	C					
Intersection V/C	0.815					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Traffic Volume - Future Total Volume





Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro — Scenario 2 PM Existing + Project

Report File: N:\...\PM Existing plus Project.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	WB Right	0.694	17.0	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.983	35.7	E
3	Willow Rd/Bay Rd	Signalized	HCM 2000	EB Left	0.824	32.2	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	17.0
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.694

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	5	877	80	151	877	40	67	19	0	54	10	151
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	16	10	0	0	0	4	0	13	4	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	877	96	161	877	40	67	23	0	67	14	159
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	231	25	42	231	11	18	6	0	18	4	42
Total Analysis Volume [veh/h]	5	923	101	169	923	42	71	24	0	71	15	167
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	68
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	35	35	35	14	49	49	19	19	19	19	19	19
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

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Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	68	68	68	68	68
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	10	45	15	15
g / C, Green / Cycle	0.46	0.15	0.66	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.31	0.10	0.27	0.10	0.17
Total Saturation Flow Adjustment	0.87	0.93	0.93	0.51	0.80
s, saturation flow rate [veh/h]	3324	1770	3524	978	1520
c, Capacity [veh/h]	1515	260	2332	216	335
d1, Uniform Delay [s]	14.58	27.35	5.36	22.88	24.78
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.47	11.91	0.54	6.41	14.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	0.65	0.41	0.44	0.75
d, Delay for Lane Group [s/veh]	17.05	39.26	5.90	29.29	39.35
Lane Group LOS	B	D	A	C	D
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.66	3.65	5.22	1.80	5.67
50th-Percentile Queue Length [ft/ln]	241.41	91.30	130.42	44.94	141.76
95th-Percentile Queue Length [veh/ln]	16.85	7.60	10.18	4.13	10.90
95th-Percentile Queue Length [ft/ln]	421.26	190.05	254.61	103.28	272.43

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	17.05	17.05	17.05	39.26	5.90	5.90	29.29	29.29	29.29	39.35	39.35	39.35
Movement LOS	B	B	B	D	A	A	C	C	C	D	D	D
d_A, Approach Delay [s/veh]	17.05			10.87			29.29			39.35		
Approach LOS	B			B			C			D		
d_I, Intersection Delay [s/veh]	16.97											
Intersection LOS	B											
Intersection V/C	0.694											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	35.7
Analysis Method:	HCM 2000	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.983

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	52	0	0	0	0	0	0	0	0	0	24	50
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	297	21	20	266	0	2	10	2	0	4	109	204
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	77	5	5	69	0	1	3	1	0	1	28	53
Total Analysis Volume [veh/h]	306	22	21	274	0	2	10	2	0	4	112	210
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	634	492	582
Degree of Utilization, x	0.98	0.03	0.56

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	14.63	0.09	3.45
95th-Percentile Queue Length [ft]	365.83	2.19	86.25
Approach Delay [s/veh]	55.18	10.53	16.78
Approach LOS	F	B	C
Intersection Delay [s/veh]	35.73		
Intersection LOS	E		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	141	121	0	6	0	8	5	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	31	0	2	0	2	1	0
Total Analysis Volume [veh/h]	145	125	0	6	0	8	5	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	535	505
Degree of Utilization, x	0.52	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.93	0.08
95th-Percentile Queue Length [ft]	73.33	1.98
Approach Delay [s/veh]	16.69	10.33
Approach LOS	C	B
Intersection Delay [s/veh]	35.73	
Intersection LOS	E	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	32.2
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.824

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	29	1309	954	269	578	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	0	0	14	14	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	34	1309	954	60	592	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	337	246	15	153	0
Total Analysis Volume [veh/h]	35	1349	984	62	610	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	10	64	54	54	36	36
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	60	50	50	32	32
g / C, Green / Cycle	0.06	0.60	0.50	0.50	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.38	0.28	0.04	0.34	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	106	2128	1773	792	566	507
d1, Uniform Delay [s]	45.07	12.91	17.30	13.01	34.00	23.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.12	1.45	1.26	0.19	60.30	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.33	0.63	0.55	0.08	1.08	0.00
d, Delay for Lane Group [s/veh]	53.19	14.36	18.56	13.20	94.30	23.12
Lane Group LOS	D	B	B	B	F	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.06	14.91	11.35	0.98	28.07	0.00
50th-Percentile Queue Length [ft/ln]	26.41	372.78	283.84	24.62	701.75	0.00
95th-Percentile Queue Length [veh/ln]	2.55	24.61	19.34	2.38	45.01	0.00
95th-Percentile Queue Length [ft/ln]	63.64	615.34	483.45	59.61	1125.36	0.00

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.19	14.36	18.56	13.20	94.30	23.12
Movement LOS	D	B	B	B	F	C
d_A, Approach Delay [s/veh]	15.34		18.24		94.30	
Approach LOS	B		B		F	
d_I, Intersection Delay [s/veh]	32.18					
Intersection LOS	C					
Intersection V/C	0.824					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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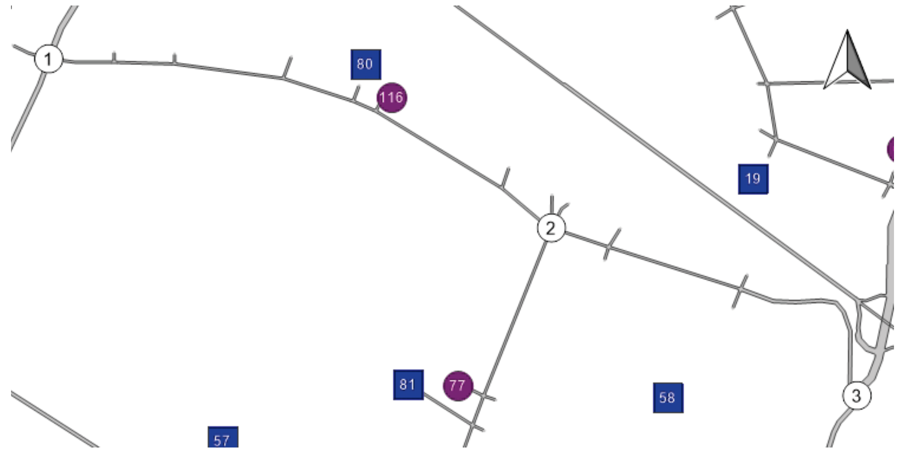
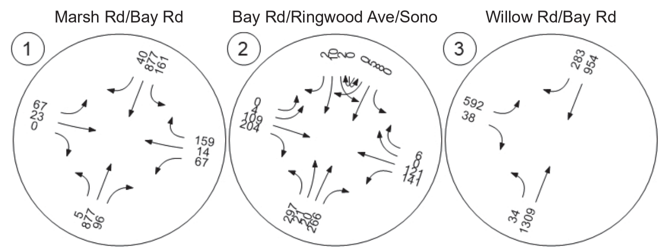
Traffic Volume - Future Total Volume





Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro — Scenario 7 PM Existing + Project (Mit)

Report File: N:\...\PM Existing plus Project - Mitigation.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.579	15.3	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	15.3
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.579

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	52	0	0	0	0	0	0	0	0	0	24	50
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	297	21	20	266	0	2	10	2	0	4	109	204
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	77	5	5	69	0	1	3	1	0	1	28	53
Total Analysis Volume [veh/h]	306	22	21	274	0	2	10	2	0	4	112	210
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	529	629	489	637
Degree of Utilization, x	0.58	0.50	0.03	0.51

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.64	2.84	0.09	2.93
95th-Percentile Queue Length [ft]	91.09	71.11	2.21	73.22
Approach Delay [s/veh]	16.23		10.58	14.44
Approach LOS	C		B	B
Intersection Delay [s/veh]	15.29			
Intersection LOS	C			

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	141	121	0	6	0	8	5	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	31	0	2	0	2	1	0
Total Analysis Volume [veh/h]	145	125	0	6	0	8	5	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	582	501
Degree of Utilization, x	0.47	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.54	0.08
95th-Percentile Queue Length [ft]	63.39	1.99
Approach Delay [s/veh]	14.63	10.37
Approach LOS	B	B
Intersection Delay [s/veh]	15.29	
Intersection LOS	C	

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro — Scenario 14 PM Existing + Project Alternative

Report File: N:\...\PM Existing plus Project Alternative.pdf — 6/5/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.674	16.3	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.894	25.9	D
3	Willow Rd/Bay Rd	Signalized	HCM 2000	EB Left	0.819	31.1	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	16.3
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.674

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	5	877	80	151	877	40	67	19	0	54	10	151
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	7	4	0	0	0	2	0	6	2	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	877	87	155	877	40	67	21	0	60	12	153
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	231	23	41	231	11	18	6	0	16	3	40
Total Analysis Volume [veh/h]	5	923	92	163	923	42	71	22	0	63	13	161
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	68
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	35	35	35	14	49	49	19	19	19	19	19	19
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

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Version 7.00-05

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	68	68	68	68	68
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	10	45	15	15
g / C, Green / Cycle	0.46	0.15	0.66	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.31	0.09	0.27	0.09	0.16
Total Saturation Flow Adjustment	0.88	0.93	0.93	0.52	0.80
s, saturation flow rate [veh/h]	3328	1770	3524	985	1515
c, Capacity [veh/h]	1517	260	2332	217	334
d1, Uniform Delay [s]	14.52	27.24	5.36	22.81	24.48
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.40	10.89	0.54	6.06	12.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.67	0.63	0.41	0.43	0.71
d, Delay for Lane Group [s/veh]	16.91	38.13	5.90	28.86	36.51
Lane Group LOS	B	D	A	C	D
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.51	3.48	5.22	1.75	5.12
50th-Percentile Queue Length [ft/ln]	237.68	86.94	130.42	43.74	127.99
95th-Percentile Queue Length [veh/ln]	16.63	7.30	10.18	4.03	10.03
95th-Percentile Queue Length [ft/ln]	415.78	182.47	254.61	100.81	250.75

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Version 7.00-05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.91	16.91	16.91	38.13	5.90	5.90	28.86	28.86	28.86	36.51	36.51	36.51
Movement LOS	B	B	B	D	A	A	C	C	C	D	D	D
d_A, Approach Delay [s/veh]	16.91			10.56			28.86			36.51		
Approach LOS	B			B			C			D		
d_I, Intersection Delay [s/veh]	16.34											
Intersection LOS	B											
Intersection V/C	0.674											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	25.9
Analysis Method:	HCM 2000	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.894

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	23	0	0	0	0	0	0	0	0	0	10	22
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	268	21	20	266	0	2	10	2	0	4	95	176
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	5	5	69	0	1	3	1	0	1	24	45
Total Analysis Volume [veh/h]	276	22	21	274	0	2	10	2	0	4	98	181
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	663	527	609
Degree of Utilization, x	0.89	0.03	0.46

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	11.17	0.08	2.46
95th-Percentile Queue Length [ft]	279.17	2.04	61.44
Approach Delay [s/veh]	37.12	10.01	13.94
Approach LOS	E	B	B
Intersection Delay [s/veh]	25.85		
Intersection LOS	D		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	141	107	0	6	0	8	5	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	28	0	2	0	2	1	0
Total Analysis Volume [veh/h]	145	110	0	6	0	8	5	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	563	541
Degree of Utilization, x	0.46	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.44	0.07
95th-Percentile Queue Length [ft]	60.99	1.84
Approach Delay [s/veh]	14.82	9.82
Approach LOS	B	A
Intersection Delay [s/veh]	25.85	
Intersection LOS	D	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	31.1
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.819

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	29	1309	954	269	578	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	6	6	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	31	1309	954	52	584	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	337	246	13	151	0
Total Analysis Volume [veh/h]	32	1349	984	54	602	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	10	64	54	54	36	36
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

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Version 7.00-05

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	60	50	50	32	32
g / C, Green / Cycle	0.06	0.60	0.50	0.50	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.38	0.28	0.03	0.34	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	106	2128	1773	792	566	507
d1, Uniform Delay [s]	44.99	12.91	17.30	12.94	34.00	23.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.15	1.45	1.26	0.17	55.69	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.63	0.55	0.07	1.06	0.00
d, Delay for Lane Group [s/veh]	52.14	14.36	18.56	13.11	89.69	23.12
Lane Group LOS	D	B	B	B	F	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.96	14.91	11.35	0.85	27.15	0.00
50th-Percentile Queue Length [ft/ln]	24.00	372.78	283.84	21.32	678.71	0.00
95th-Percentile Queue Length [veh/ln]	2.33	24.61	19.34	2.08	43.56	0.00
95th-Percentile Queue Length [ft/ln]	58.21	615.34	483.45	52.09	1088.91	0.00

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.14	14.36	18.56	13.11	89.69	23.12
Movement LOS	D	B	B	B	F	C
d_A, Approach Delay [s/veh]	15.24		18.27		89.69	
Approach LOS	B		B		F	
d_I, Intersection Delay [s/veh]	31.12					
Intersection LOS	C					
Intersection V/C	0.819					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro | Scenario 15 PM Existing + Project Alternative (Mit)

Report File: N:\...\PM Existing plus Project Alternative - Mitigation.pdf | 6/5/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.674	16.3	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.507	13.8	B
3	Willow Rd/Bay Rd	Signalized	HCM 2000	EB Left	0.819	31.1	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	16.3
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.674

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	5	877	80	151	877	40	67	19	0	54	10	151
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	7	4	0	0	0	2	0	6	2	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	877	87	155	877	40	67	21	0	60	12	153
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	231	23	41	231	11	18	6	0	16	3	40
Total Analysis Volume [veh/h]	5	923	92	163	923	42	71	22	0	63	13	161
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	68
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	35	35	35	14	49	49	19	19	19	19	19	19
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	68	68	68	68	68
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	10	45	15	15
g / C, Green / Cycle	0.46	0.15	0.66	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.31	0.09	0.27	0.09	0.16
Total Saturation Flow Adjustment	0.88	0.93	0.93	0.52	0.80
s, saturation flow rate [veh/h]	3328	1770	3524	985	1515
c, Capacity [veh/h]	1517	260	2332	217	334
d1, Uniform Delay [s]	14.52	27.24	5.36	22.81	24.48
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.40	10.89	0.54	6.06	12.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.67	0.63	0.41	0.43	0.71
d, Delay for Lane Group [s/veh]	16.91	38.13	5.90	28.86	36.51
Lane Group LOS	B	D	A	C	D
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.51	3.48	5.22	1.75	5.12
50th-Percentile Queue Length [ft/ln]	237.68	86.94	130.42	43.74	127.99
95th-Percentile Queue Length [veh/ln]	16.63	7.30	10.18	4.03	10.03
95th-Percentile Queue Length [ft/ln]	415.78	182.47	254.61	100.81	250.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.91	16.91	16.91	38.13	5.90	5.90	28.86	28.86	28.86	36.51	36.51	36.51
Movement LOS	B	B	B	D	A	A	C	C	C	D	D	D
d_A, Approach Delay [s/veh]	16.91			10.56			28.86			36.51		
Approach LOS	B			B			C			D		
d_I, Intersection Delay [s/veh]	16.34											
Intersection LOS	B											
Intersection V/C	0.674											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.507

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	23	0	0	0	0	0	0	0	0	0	10	22
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	268	21	20	266	0	2	10	2	0	4	95	176
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	5	5	69	0	1	3	1	0	1	24	45
Total Analysis Volume [veh/h]	276	22	21	274	0	2	10	2	0	4	98	181
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	544	650	511	652
Degree of Utilization, x	0.51	0.49	0.03	0.43

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.85	2.68	0.08	2.20
95th-Percentile Queue Length [ft]	71.18	67.07	2.11	54.90
Approach Delay [s/veh]	14.58		10.23	12.69
Approach LOS	B		B	B
Intersection Delay [s/veh]	13.78			
Intersection LOS	B			

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	141	107	0	6	0	8	5	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	28	0	2	0	2	1	0
Total Analysis Volume [veh/h]	145	110	0	6	0	8	5	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	600	525
Degree of Utilization, x	0.44	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.20	0.08
95th-Percentile Queue Length [ft]	54.92	1.90
Approach Delay [s/veh]	13.54	10.04
Approach LOS	B	B
Intersection Delay [s/veh]	13.78	
Intersection LOS	B	

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Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	31.1
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.819

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	29	1309	954	269	578	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	6	6	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	31	1309	954	52	584	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	337	246	13	151	0
Total Analysis Volume [veh/h]	32	1349	984	54	602	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	10	64	54	54	36	36
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	60	50	50	32	32
g / C, Green / Cycle	0.06	0.60	0.50	0.50	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.38	0.28	0.03	0.34	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	106	2128	1773	792	566	507
d1, Uniform Delay [s]	44.99	12.91	17.30	12.94	34.00	23.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.15	1.45	1.26	0.17	55.69	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.63	0.55	0.07	1.06	0.00
d, Delay for Lane Group [s/veh]	52.14	14.36	18.56	13.11	89.69	23.12
Lane Group LOS	D	B	B	B	F	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.96	14.91	11.35	0.85	27.15	0.00
50th-Percentile Queue Length [ft/ln]	24.00	372.78	283.84	21.32	678.71	0.00
95th-Percentile Queue Length [veh/ln]	2.33	24.61	19.34	2.08	43.56	0.00
95th-Percentile Queue Length [ft/ln]	58.21	615.34	483.45	52.09	1088.91	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.14	14.36	18.56	13.11	89.69	23.12
Movement LOS	D	B	B	B	F	C
d_A, Approach Delay [s/veh]	15.24		18.27		89.69	
Approach LOS	B		B		F	
d_I, Intersection Delay [s/veh]	31.12					
Intersection LOS	C					
Intersection V/C	0.819					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro — Scenario 3 Near Term (2021) PM

Report File: N:\...\PM Near Term.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	WB Right	0.801	19.1	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NB Right	0.973	34.4	D
3	Willow Rd/Bay Rd	Signalized	HCM 2000	EB Left	0.909	36.9	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	19.1
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	5	877	80	151	877	40	67	19	0	54	10	151
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0400	1.0400	1.0400	1.0000	1.0000	1.0000	1.0000	1.0400	1.0000	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	259	4	0	664	0	0	0	1	12	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1171	87	157	1576	40	67	19	1	68	10	157
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	308	23	41	415	11	18	5	0	18	3	41
Total Analysis Volume [veh/h]	7	1233	92	165	1659	42	71	20	1	72	11	165
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	68
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	35	35	35	14	49	49	19	19	19	19	19	19
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	68	68	68	68	68
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	10	45	15	15
g / C, Green / Cycle	0.46	0.15	0.66	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.40	0.09	0.48	0.09	0.16
Total Saturation Flow Adjustment	0.87	0.93	0.93	0.52	0.80
s, saturation flow rate [veh/h]	3312	1770	3534	982	1512
c, Capacity [veh/h]	1510	260	2338	217	334
d1, Uniform Delay [s]	16.84	27.28	7.50	22.79	24.71
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.79	11.22	2.02	6.00	13.96
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.63	0.73	0.42	0.74
d, Delay for Lane Group [s/veh]	24.62	38.50	9.52	28.79	38.66
Lane Group LOS	C	D	A	C	D
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	16.38	3.53	13.72	1.73	5.51
50th-Percentile Queue Length [ft/ln]	409.52	88.37	343.05	43.21	137.69
95th-Percentile Queue Length [veh/ln]	26.83	7.40	22.84	3.99	10.64
95th-Percentile Queue Length [ft/ln]	670.71	184.98	570.94	99.73	266.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.62	24.62	24.62	38.50	9.52	9.52	28.79	28.79	28.79	38.66	38.66	38.66
Movement LOS	C	C	C	D	A	A	C	C	C	D	D	D
d_A, Approach Delay [s/veh]	24.62			12.08			28.79			38.66		
Approach LOS	C			B			C			D		
d_I, Intersection Delay [s/veh]	19.10											
Intersection LOS	B											
Intersection V/C	0.801											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	34.4
Analysis Method:	HCM 2000	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.973

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0000	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	-2	0	0	21	0	0	0	0	0	0	10	-2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	253	21	20	298	0	2	10	2	0	4	98	158
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	67	6	5	79	0	1	3	1	0	1	26	42
Total Analysis Volume [veh/h]	269	22	21	317	0	2	11	2	0	4	104	168
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	647	500	577
Degree of Utilization, x	0.97	0.03	0.48

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	14.31	0.09	2.58
95th-Percentile Queue Length [ft]	357.70	2.32	64.39
Approach Delay [s/veh]	52.26	10.42	14.83
Approach LOS	F	B	B
Intersection Delay [s/veh]	34.44		
Intersection LOS	D		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0000	1.0000	1.0000	1.0400	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	18	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	159	119	0	6	0	8	5	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	32	0	2	0	2	1	0
Total Analysis Volume [veh/h]	169	127	0	6	0	9	5	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	544	511
Degree of Utilization, x	0.55	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.37	0.08
95th-Percentile Queue Length [ft]	84.13	2.11
Approach Delay [s/veh]	17.54	10.24
Approach LOS	C	B
Intersection Delay [s/veh]	34.44	
Intersection LOS	D	

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Version 7.00-05

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	36.9
Analysis Method:	HCM 2000	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.909

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	29	1309	954	269	578	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	134	188	25	27	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	35	1495	1180	82	628	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	385	304	21	162	0
Total Analysis Volume [veh/h]	36	1541	1216	85	647	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Generated with PTV VISTRO
Version 7.00-05

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	10	64	54	54	36	36
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Generated with PTV VISTRO
Version 7.00-05

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	60	50	50	32	32
g / C, Green / Cycle	0.06	0.60	0.50	0.50	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.43	0.34	0.05	0.37	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	106	2128	1773	792	566	507
d1, Uniform Delay [s]	45.10	14.15	19.02	13.21	34.00	23.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.46	2.18	2.18	0.27	83.68	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.72	0.69	0.11	1.14	0.00
d, Delay for Lane Group [s/veh]	53.55	16.33	21.20	13.48	117.68	23.12
Lane Group LOS	D	B	C	B	F	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.09	19.12	15.89	1.37	32.62	0.00
50th-Percentile Queue Length [ft/ln]	27.22	478.06	397.35	34.32	815.55	0.00
95th-Percentile Queue Length [veh/ln]	2.62	31.01	26.09	3.24	52.24	0.00
95th-Percentile Queue Length [ft/ln]	65.45	775.33	652.30	81.00	1306.07	0.00

Generated with PTV VISTRO
Version 7.00-05

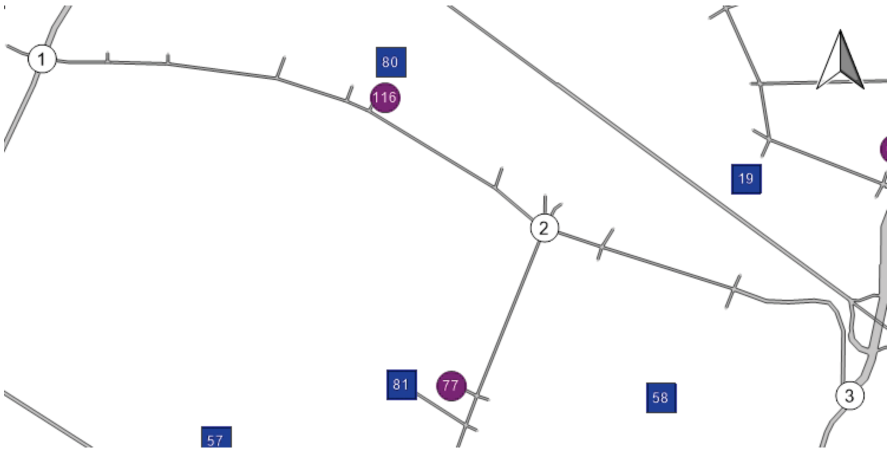
Movement, Approach, & Intersection Results

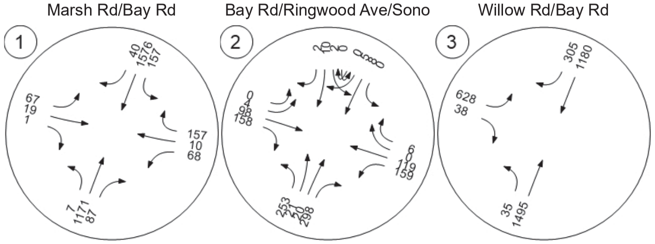
d_M, Delay for Movement [s/veh]	53.55	16.33	21.20	13.48	117.68	23.12
Movement LOS	D	B	C	B	F	C
d_A, Approach Delay [s/veh]	17.18		20.70		117.68	
Approach LOS	B		C		F	
d_I, Intersection Delay [s/veh]	36.92					
Intersection LOS	D					
Intersection V/C	0.909					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Traffic Volume - Future Total Volume





Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro — Scenario 8 Near Term (2021) PM (Mit)

Report File: N:\...\PM Near Term - Mitigation.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.566	14.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	14.9
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.566

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0000	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	-2	0	0	21	0	0	0	0	0	0	10	-2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	253	21	20	298	0	2	10	2	0	4	98	158
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	67	6	5	79	0	1	3	1	0	1	26	42
Total Analysis Volume [veh/h]	269	22	21	317	0	2	11	2	0	4	104	168
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	533	636	495	630
Degree of Utilization, x	0.50	0.57	0.03	0.44

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.82	3.55	0.09	2.23
95th-Percentile Queue Length [ft]	70.42	88.65	2.34	55.72
Approach Delay [s/veh]	15.76		10.50	13.10
Approach LOS	C		B	B
Intersection Delay [s/veh]	14.93			
Intersection LOS	B			

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0000	1.0000	1.0000	1.0400	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	18	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	159	119	0	6	0	8	5	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	32	0	2	0	2	1	0
Total Analysis Volume [veh/h]	169	127	0	6	0	9	5	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	591	506
Degree of Utilization, x	0.51	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.90	0.09
95th-Percentile Queue Length [ft]	72.58	2.13
Approach Delay [s/veh]	15.29	10.32
Approach LOS	C	B
Intersection Delay [s/veh]	14.93	
Intersection LOS	B	

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro — Scenario 4 Near Term (2021) PM + Project

Report File: N:\...\PM Near Term plus Project.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	WB Right	0.824	19.9	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	1.071	48.6	E
3	Willow Rd/Bay Rd	Signalized	HCM 2000	EB Left	0.911	38.9	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	19.9
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.824

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	5	877	80	151	877	40	67	19	0	54	10	151
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0400	1.0400	1.0400	1.0000	1.0000	1.0000	1.0000	1.0400	1.0000	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	259	17	10	664	0	0	4	1	13	4	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1171	100	167	1576	40	67	23	1	69	14	165
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	308	26	44	415	11	18	6	0	18	4	43
Total Analysis Volume [veh/h]	7	1233	105	176	1659	42	71	24	1	73	15	174
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	68
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	35	35	35	14	49	49	19	19	19	19	19	19
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	68	68	68	68	68
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	10	45	15	15
g / C, Green / Cycle	0.46	0.15	0.66	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.41	0.10	0.48	0.10	0.17
Total Saturation Flow Adjustment	0.87	0.93	0.93	0.51	0.80
s, saturation flow rate [veh/h]	3308	1770	3534	962	1521
c, Capacity [veh/h]	1508	260	2338	212	335
d1, Uniform Delay [s]	16.96	27.47	7.50	22.94	24.95
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.40	13.25	2.02	6.81	16.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.89	0.68	0.73	0.45	0.78
d, Delay for Lane Group [s/veh]	25.37	40.71	9.52	29.75	41.37
Lane Group LOS	C	D	A	C	D
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	16.84	3.86	13.72	1.83	6.02
50th-Percentile Queue Length [ft/ln]	420.93	96.61	343.05	45.68	150.47
95th-Percentile Queue Length [veh/ln]	27.52	7.97	22.84	4.19	11.44
95th-Percentile Queue Length [ft/ln]	688.00	199.18	570.94	104.79	285.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	25.37	25.37	25.37	40.71	9.52	9.52	29.75	29.75	29.75	41.37	41.37	41.37
Movement LOS	C	C	C	D	A	A	C	C	C	D	D	D
d_A, Approach Delay [s/veh]	25.37			12.45			29.75			41.37		
Approach LOS	C			B			C			D		
d_I, Intersection Delay [s/veh]	19.88											
Intersection LOS	B											
Intersection V/C	0.824											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	48.6
Analysis Method:	HCM 2000	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.071

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Westbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	141	97	0	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000	1.0400	1.0400	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	50	0	0	21	0	0	0	0	12	30	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	305	21	20	298	0	2	10	2	159	131	0	6
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	79	5	5	77	0	1	3	1	41	34	0	2
Total Analysis Volume [veh/h]	314	22	21	307	0	2	10	2	164	135	0	6
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	664	485	537
Degree of Utilization, x	1.07	0.03	0.57

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	18.75	0.09	3.52
95th-Percentile Queue Length [ft]	468.84	2.23	88.01
Approach Delay [s/veh]	79.92	10.65	18.17
Approach LOS	F	B	C
Intersection Delay [s/veh]	48.57		
Intersection LOS	E		

Intersection Setup

Name	Ringwood Avenue				Bay Road			
Approach	Southwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Ringwood Avenue				Bay Road			
Base Volume Input [veh/h]	0	8	5	0	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0000	1.0000	1.0000	1.0000	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	31	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	8	5	0	0	4	119	208
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	1	0	0	1	31	54
Total Analysis Volume [veh/h]	0	8	5	0	0	4	123	214
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	497	579
Degree of Utilization, x	0.03	0.59

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.08	3.81
95th-Percentile Queue Length [ft]	2.02	95.14
Approach Delay [s/veh]	10.45	17.71
Approach LOS	B	C
Intersection Delay [s/veh]	48.57	
Intersection LOS	E	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	38.9
Analysis Method:	HCM 2000	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.911

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	29	1309	954	269	578	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	115	99	27	38	9
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	40	1476	1091	84	639	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	380	281	22	165	0
Total Analysis Volume [veh/h]	41	1522	1125	87	659	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	10	64	54	54	36	36
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	60	50	50	32	32
g / C, Green / Cycle	0.06	0.60	0.50	0.50	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.43	0.32	0.05	0.37	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	106	2128	1773	792	566	507
d1, Uniform Delay [s]	45.23	14.01	18.31	13.23	34.00	23.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.28	2.09	1.74	0.28	91.82	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.39	0.72	0.63	0.11	1.16	0.00
d, Delay for Lane Group [s/veh]	55.51	16.10	20.05	13.51	125.82	23.12
Lane Group LOS	E	B	C	B	F	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.25	18.66	13.96	1.41	34.18	0.00
50th-Percentile Queue Length [ft/ln]	31.35	466.40	349.01	35.18	854.53	0.00
95th-Percentile Queue Length [veh/ln]	2.98	30.30	23.19	3.31	54.73	0.00
95th-Percentile Queue Length [ft/ln]	74.55	757.41	579.80	82.84	1368.17	0.00

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Version 7.00-05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	55.51	16.10	20.05	13.51	125.82	23.12
Movement LOS	E	B	C	B	F	C
d_A, Approach Delay [s/veh]	17.14		19.58		125.82	
Approach LOS	B		B		F	
d_I, Intersection Delay [s/veh]	38.86					
Intersection LOS	D					
Intersection V/C	0.911					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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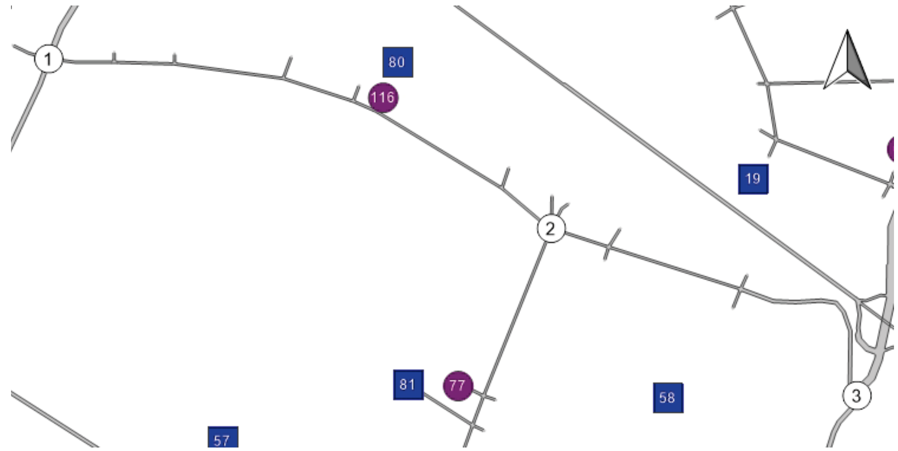
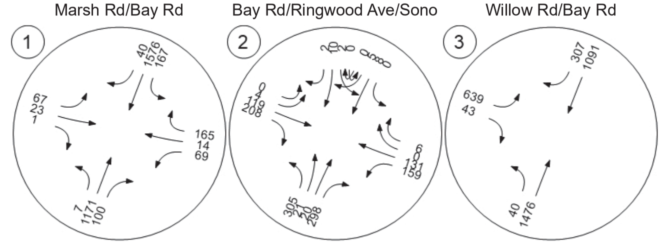
Traffic Volume - Future Total Volume





Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro — Scenario 9 Near Term (2021) PM + Project (Mit)

Report File: N:\...\PM Near Term plus Project - Mitigation.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.610	17.0	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	17.0
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.610

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Westbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	141	97	0	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000	1.0400	1.0400	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	50	0	0	21	0	0	0	0	12	30	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	305	21	20	298	0	2	10	2	159	131	0	6
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	79	5	5	77	0	1	3	1	41	34	0	2
Total Analysis Volume [veh/h]	314	22	21	307	0	2	10	2	164	135	0	6
Pedestrian Volume [ped/h]	0				0				0			

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Version 7.00-05

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	515	611	468	568
Degree of Utilization, x	0.61	0.57	0.03	0.54

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.04	3.62	0.09	3.18
95th-Percentile Queue Length [ft]	100.93	90.61	2.31	79.40
Approach Delay [s/veh]	18.00		10.92	16.46
Approach LOS	C		B	C
Intersection Delay [s/veh]	16.96			
Intersection LOS	C			

Generated with PTV VISTRO

Version 7.00-05

Intersection Setup

Name	Ringwood Avenue				Bay Road			
Approach	Southwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Ringwood Avenue				Bay Road			
Base Volume Input [veh/h]	0	8	5	0	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0000	1.0000	1.0000	1.0000	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	31	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	8	5	0	0	4	119	208
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	1	0	0	1	31	54
Total Analysis Volume [veh/h]	0	8	5	0	0	4	123	214
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	480	616
Degree of Utilization, x	0.03	0.55

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.08	3.39
95th-Percentile Queue Length [ft]	2.09	84.72
Approach Delay [s/veh]	10.72	15.86
Approach LOS	B	C
Intersection Delay [s/veh]	16.96	
Intersection LOS	C	

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro Scenario 16 Near Term (2021) PM + Project Alternative

Report File: N:\...\PM Near Term plus Project Alternative.pdf 6/5/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.802	19.2	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NB Right	0.991	36.9	E
3	Willow Rd/Bay Rd	Signalized	HCM 2000	EB Left	0.906	37.6	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	19.2
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.802

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	5	877	80	151	877	40	67	19	0	54	10	151
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0400	1.0400	1.0400	1.0000	1.0000	1.0000	1.0000	1.0400	1.0000	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	259	8	4	664	0	0	2	1	6	2	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1171	91	161	1576	40	67	21	1	62	12	159
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	308	24	42	415	11	18	6	0	16	3	42
Total Analysis Volume [veh/h]	7	1233	96	169	1659	42	71	22	1	65	13	167
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	68
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	35	35	35	14	49	49	19	19	19	19	19	19
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

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Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	68	68	68	68	68
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	10	45	15	15
g / C, Green / Cycle	0.46	0.15	0.66	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.40	0.10	0.48	0.10	0.16
Total Saturation Flow Adjustment	0.87	0.93	0.93	0.51	0.80
s, saturation flow rate [veh/h]	3311	1770	3534	972	1519
c, Capacity [veh/h]	1509	260	2338	214	335
d1, Uniform Delay [s]	16.88	27.35	7.50	22.87	24.63
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.97	11.91	2.02	6.40	13.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.89	0.65	0.73	0.44	0.73
d, Delay for Lane Group [s/veh]	24.84	39.26	9.52	29.26	37.80
Lane Group LOS	C	D	A	C	D
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	16.52	3.65	13.72	1.78	5.38
50th-Percentile Queue Length [ft/ln]	412.98	91.30	343.05	44.44	134.60
95th-Percentile Queue Length [veh/ln]	27.04	7.60	22.84	4.09	10.45
95th-Percentile Queue Length [ft/ln]	675.94	190.05	570.94	102.24	261.21

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Version 7.00-05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.84	24.84	24.84	39.26	9.52	9.52	29.26	29.26	29.26	37.80	37.80	37.80
Movement LOS	C	C	C	D	A	A	C	C	C	D	D	D
d_A, Approach Delay [s/veh]	24.84			12.21			29.26			37.80		
Approach LOS	C			B			C			D		
d_I, Intersection Delay [s/veh]	19.19											
Intersection LOS	B											
Intersection V/C	0.802											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	36.9
Analysis Method:	HCM 2000	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.991

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Westbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	141	97	0	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000	1.0400	1.0400	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	21	0	0	21	0	0	0	0	12	16	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	276	21	20	298	0	2	10	2	159	117	0	6
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	5	5	77	0	1	3	1	41	30	0	2
Total Analysis Volume [veh/h]	285	22	21	307	0	2	10	2	164	121	0	6
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	640	493	537
Degree of Utilization, x	0.99	0.03	0.54

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	15.09	0.09	3.21
95th-Percentile Queue Length [ft]	377.35	2.19	80.35
Approach Delay [s/veh]	56.82	10.50	17.36
Approach LOS	F	B	C
Intersection Delay [s/veh]	36.86		
Intersection LOS	E		

Intersection Setup

Name	Ringwood Avenue				Bay Road			
Approach	Southwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Ringwood Avenue				Bay Road			
Base Volume Input [veh/h]	0	8	5	0	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0000	1.0000	1.0000	1.0000	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	17	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	8	5	0	0	4	105	180
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	1	0	0	1	27	46
Total Analysis Volume [veh/h]	0	8	5	0	0	4	108	186
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	506	576
Degree of Utilization, x	0.03	0.52

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.08	2.97
95th-Percentile Queue Length [ft]	1.98	74.15
Approach Delay [s/veh]	10.30	15.77
Approach LOS	B	C
Intersection Delay [s/veh]	36.86	
Intersection LOS	E	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	37.6
Analysis Method:	HCM 2000	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.906

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	29	1309	954	269	578	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	115	99	19	30	6
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	37	1476	1091	76	631	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	380	281	20	163	0
Total Analysis Volume [veh/h]	38	1522	1125	78	651	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	10	64	54	54	36	36
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

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Version 7.00-05

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	60	50	50	32	32
g / C, Green / Cycle	0.06	0.60	0.50	0.50	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.43	0.32	0.05	0.37	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	106	2128	1773	792	566	507
d1, Uniform Delay [s]	45.15	14.01	18.31	13.15	34.00	23.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.16	2.09	1.74	0.25	86.37	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.36	0.72	0.63	0.10	1.15	0.00
d, Delay for Lane Group [s/veh]	54.31	16.10	20.05	13.40	120.37	23.12
Lane Group LOS	D	B	C	B	F	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.15	18.66	13.96	1.25	33.14	0.00
50th-Percentile Queue Length [ft/ln]	28.86	466.40	349.01	31.34	828.45	0.00
95th-Percentile Queue Length [veh/ln]	2.76	30.30	23.19	2.98	53.06	0.00
95th-Percentile Queue Length [ft/ln]	69.08	757.41	579.80	74.53	1326.61	0.00

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Version 7.00-05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	54.31	16.10	20.05	13.40	120.37	23.12
Movement LOS	D	B	C	B	F	C
d_A, Approach Delay [s/veh]	17.03		19.62		120.37	
Approach LOS	B		B		F	
d_I, Intersection Delay [s/veh]	37.65					
Intersection LOS	D					
Intersection V/C	0.906					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro   Scenario 17 Near Term (2021) PM + Project Alternative (Mit)

Report File: N:\...\PM Near Term plus Project Alternative - Mitigation.pdf   6/5/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.802	19.2	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.553	15.1	C
3	Willow Rd/Bay Rd	Signalized	HCM 2000	EB Left	0.906	37.6	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	19.2
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.802

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	5	877	80	151	877	40	67	19	0	54	10	151
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0400	1.0400	1.0400	1.0000	1.0000	1.0000	1.0000	1.0400	1.0000	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	259	8	4	664	0	0	2	1	6	2	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1171	91	161	1576	40	67	21	1	62	12	159
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	308	24	42	415	11	18	6	0	16	3	42
Total Analysis Volume [veh/h]	7	1233	96	169	1659	42	71	22	1	65	13	167
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	68
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	35	35	35	14	49	49	19	19	19	19	19	19
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	68	68	68	68	68
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	10	45	15	15
g / C, Green / Cycle	0.46	0.15	0.66	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.40	0.10	0.48	0.10	0.16
Total Saturation Flow Adjustment	0.87	0.93	0.93	0.51	0.80
s, saturation flow rate [veh/h]	3311	1770	3534	972	1519
c, Capacity [veh/h]	1509	260	2338	214	335
d1, Uniform Delay [s]	16.88	27.35	7.50	22.87	24.63
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.97	11.91	2.02	6.40	13.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.89	0.65	0.73	0.44	0.73
d, Delay for Lane Group [s/veh]	24.84	39.26	9.52	29.26	37.80
Lane Group LOS	C	D	A	C	D
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	16.52	3.65	13.72	1.78	5.38
50th-Percentile Queue Length [ft/ln]	412.98	91.30	343.05	44.44	134.60
95th-Percentile Queue Length [veh/ln]	27.04	7.60	22.84	4.09	10.45
95th-Percentile Queue Length [ft/ln]	675.94	190.05	570.94	102.24	261.21

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.84	24.84	24.84	39.26	9.52	9.52	29.26	29.26	29.26	37.80	37.80	37.80
Movement LOS	C	C	C	D	A	A	C	C	C	D	D	D
d_A, Approach Delay [s/veh]	24.84			12.21			29.26			37.80		
Approach LOS	C			B			C			D		
d_I, Intersection Delay [s/veh]	19.19											
Intersection LOS	B											
Intersection V/C	0.802											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	15.1
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.553

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Westbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	141	97	0	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000	1.0400	1.0400	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	21	0	0	21	0	0	0	0	12	16	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	276	21	20	298	0	2	10	2	159	117	0	6
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	5	5	77	0	1	3	1	41	30	0	2
Total Analysis Volume [veh/h]	285	22	21	307	0	2	10	2	164	121	0	6
Pedestrian Volume [ped/h]	0				0				0			

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Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	531	634	492	586
Degree of Utilization, x	0.54	0.55	0.03	0.50

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.15	3.39	0.09	2.75
95th-Percentile Queue Length [ft]	78.82	84.65	2.19	68.86
Approach Delay [s/veh]	16.03		10.53	15.05
Approach LOS	C		B	C
Intersection Delay [s/veh]			15.12	
Intersection LOS			C	

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Version 7.00-05

Intersection Setup

Name	Ringwood Avenue				Bay Road			
Approach	Southwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Ringwood Avenue				Bay Road			
Base Volume Input [veh/h]	0	8	5	0	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0000	1.0000	1.0000	1.0000	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	17	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	8	5	0	0	4	105	180
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	1	0	0	1	27	46
Total Analysis Volume [veh/h]	0	8	5	0	0	4	108	186
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	504	632
Degree of Utilization, x	0.03	0.47

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.08	2.53
95th-Percentile Queue Length [ft]	1.98	63.16
Approach Delay [s/veh]	10.34	13.69
Approach LOS	B	B
Intersection Delay [s/veh]	15.12	
Intersection LOS	C	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	37.6
Analysis Method:	HCM 2000	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.906

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	29	1309	954	269	578	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	115	99	19	30	6
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	37	1476	1091	76	631	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	380	281	20	163	0
Total Analysis Volume [veh/h]	38	1522	1125	78	651	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	10	64	54	54	36	36
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	60	50	50	32	32
g / C, Green / Cycle	0.06	0.60	0.50	0.50	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.43	0.32	0.05	0.37	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	106	2128	1773	792	566	507
d1, Uniform Delay [s]	45.15	14.01	18.31	13.15	34.00	23.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.16	2.09	1.74	0.25	86.37	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.36	0.72	0.63	0.10	1.15	0.00
d, Delay for Lane Group [s/veh]	54.31	16.10	20.05	13.40	120.37	23.12
Lane Group LOS	D	B	C	B	F	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.15	18.66	13.96	1.25	33.14	0.00
50th-Percentile Queue Length [ft/ln]	28.86	466.40	349.01	31.34	828.45	0.00
95th-Percentile Queue Length [veh/ln]	2.76	30.30	23.19	2.98	53.06	0.00
95th-Percentile Queue Length [ft/ln]	69.08	757.41	579.80	74.53	1326.61	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	54.31	16.10	20.05	13.40	120.37	23.12
Movement LOS	D	B	C	B	F	C
d_A, Approach Delay [s/veh]	17.03		19.62		120.37	
Approach LOS	B		B		F	
d_I, Intersection Delay [s/veh]	37.65					
Intersection LOS	D					
Intersection V/C	0.906					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro Scenario 5 Cumulative (2040) PM

Report File: N:\...\PM Cumulative.pdf 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.910	29.1	C
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NB Right	1.349	108.9	F
3	Willow Rd/Bay Rd	Signalized	HCM 2000	EB Left	1.196	83.9	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	29.1
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.910

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	5	877	80	151	877	40	67	19	0	54	10	151
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.2200	1.2200	1.2200	1.2200	1.0000	1.0000	1.0000	1.0000	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	376	8	8	692	0	0	0	1	16	0	12
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1446	106	192	1762	40	67	19	1	82	12	196
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	381	28	51	464	11	18	5	0	22	3	52
Total Analysis Volume [veh/h]	7	1522	112	202	1855	42	71	20	1	86	13	206
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	112
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	65	65	65	18	83	83	29	29	29	29	29	29
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	112	112	112	112	112
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	61	14	79	25	25
g / C, Green / Cycle	0.54	0.13	0.71	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.50	0.11	0.54	0.10	0.20
Total Saturation Flow Adjustment	0.87	0.93	0.93	0.46	0.79
s, saturation flow rate [veh/h]	3309	1770	3535	881	1504
c, Capacity [veh/h]	1802	221	2493	197	336
d1, Uniform Delay [s]	23.03	48.40	10.49	37.73	42.39
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.41	41.51	2.25	7.79	30.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.91	0.91	0.76	0.47	0.91
d, Delay for Lane Group [s/veh]	31.44	89.91	12.74	45.52	72.98
Lane Group LOS	C	F	B	D	E
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	31.81	8.63	24.29	2.85	12.56
50th-Percentile Queue Length [ft/ln]	795.33	215.78	607.23	71.18	313.90
95th-Percentile Queue Length [veh/ln]	50.96	15.35	39.05	6.17	21.11
95th-Percentile Queue Length [ft/ln]	1273.91	383.64	976.29	154.16	527.72

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.44	31.44	31.44	89.91	12.74	12.74	45.52	45.52	45.52	72.98	72.98	72.98
Movement LOS	C	C	C	F	B	B	D	D	D	E	E	E
d_A, Approach Delay [s/veh]	31.44			20.17			45.52			72.98		
Approach LOS	C			C			D			E		
d_I, Intersection Delay [s/veh]	29.10											
Intersection LOS	C											
Intersection V/C	0.910											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	108.9
Analysis Method:	HCM 2000	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.349

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	0	0	110	0	0	0	0	0	0	10	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	303	21	20	435	0	2	12	2	0	4	114	190
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	81	6	5	116	0	1	3	1	0	1	30	51
Total Analysis Volume [veh/h]	322	22	21	463	0	2	13	2	0	4	121	202
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	828	472	566
Degree of Utilization, x	1.35	0.04	0.58

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	35.50	0.11	3.65
95th-Percentile Queue Length [ft]	887.43	2.80	91.37
Approach Delay [s/veh]	185.81	10.91	17.69
Approach LOS	F	B	C
Intersection Delay [s/veh]	108.85		
Intersection LOS	F		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	18	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	189	136	0	6	0	10	5	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	36	0	2	0	3	1	0
Total Analysis Volume [veh/h]	201	145	0	6	0	11	5	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	535	481
Degree of Utilization, x	0.66	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.77	0.10
95th-Percentile Queue Length [ft]	119.19	2.58
Approach Delay [s/veh]	21.70	10.75
Approach LOS	C	B
Intersection Delay [s/veh]	108.85	
Intersection LOS	F	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	83.9
Analysis Method:	HCM 2000	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.196

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	29	1309	954	269	578	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.2200	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	455	250	30	116	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	40	2052	1414	135	821	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	529	364	35	212	0
Total Analysis Volume [veh/h]	41	2115	1458	139	846	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	118
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	8	65	57	57	53	53
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	118	118	118	118	118	118
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	61	53	53	49	49
g / C, Green / Cycle	0.03	0.52	0.45	0.45	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.02	0.60	0.41	0.09	0.48	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	60	1833	1593	711	735	657
d1, Uniform Delay [s]	56.37	28.50	30.40	19.63	34.50	20.17
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	48.37	75.83	9.72	0.61	83.31	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	1.15	0.92	0.20	1.15	0.00
d, Delay for Lane Group [s/veh]	104.74	104.33	40.12	20.24	117.81	20.17
Lane Group LOS	F	F	D	C	F	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.69	62.15	30.72	3.01	47.56	0.00
50th-Percentile Queue Length [ft/ln]	42.25	1553.71	768.01	75.36	1189.00	0.00
95th-Percentile Queue Length [veh/ln]	3.91	99.44	49.22	6.47	76.10	0.00
95th-Percentile Queue Length [ft/ln]	97.74	2485.95	1230.46	161.82	1902.48	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	104.74	104.33	40.12	20.24	117.81	20.17
Movement LOS	F	F	D	C	F	C
d_A, Approach Delay [s/veh]	104.33		38.39		117.81	
Approach LOS	F		D		F	
d_I, Intersection Delay [s/veh]	83.91					
Intersection LOS	F					
Intersection V/C	1.196					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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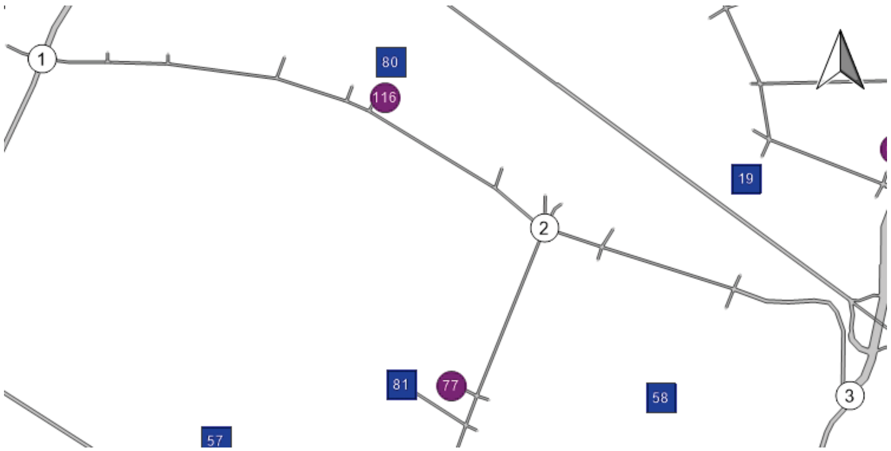
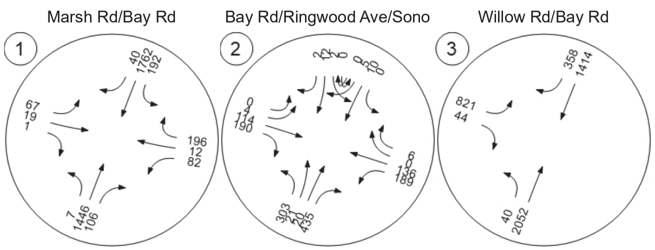
Version 7.00-05

Traffic Volume - Future Total Volume





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Version 7.00-05

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro — Scenario 11 Cumulative (2040) PM (Mit - Signal)
Report File: N:\...\PM Cumulative - Mitigation Signal.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	Signalized	HCM 2010	SB Thru	0.911	13.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	Signalized	Delay (sec / veh):	13.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.911

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left	Thru	Thru	Right	Left2	Left	Thru	Right	Left	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	42	266	0	2	21	7	4	0	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	0	0	110	0	0	0	0	0	0	10	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	303	21	42	435	0	2	26	7	4	0	114	190
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	81	6	11	116	0	1	7	2	1	0	30	51
Total Analysis Volume [veh/h]	322	22	45	463	0	2	28	7	4	0	121	202
Presence of On-Street Parking	No			No	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	7	0	4	0	0	0	8	0	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	0	5	0	0	0	5	0	0	0	5	0
Maximum Green [s]	30	0	30	0	0	0	30	0	0	0	30	0
Amber [s]	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
Split [s]	34	0	43	0	0	0	9	0	0	0	24	0
Vehicle Extension [s]	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	5	0	0	0	5	0	0	0	5	0
Pedestrian Clearance [s]	0	0	10	0	0	0	10	0	0	0	10	0
Rest In Walk			No				No				No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No		No				No				No	
Maximum Recall	No		No				No				No	
Pedestrian Recall	No		No				No				No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

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Version 7.00-05

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	46	46	46	46
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	4	11
g / C, Green / Cycle	0.38	0.38	0.10	0.24
(v / s)_i Volume / Saturation Flow Rate	0.20	0.32	0.04	0.20
s, saturation flow rate [veh/h]	1623	1605	854	1664
c, Capacity [veh/h]	714	609	166	487
d1, Uniform Delay [s]	11.13	12.98	19.22	16.32
k, delay calibration	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.45	3.07	0.67	1.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.45	0.83	0.22	0.67
d, Delay for Lane Group [s/veh]	11.58	16.05	19.90	17.94
Lane Group LOS	B	B	B	B
Critical Lane Group	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	2.07	4.26	0.37	2.96
50th-Percentile Queue Length [ft/ln]	51.72	106.53	9.14	74.10
95th-Percentile Queue Length [veh/ln]	3.72	7.65	0.66	5.34
95th-Percentile Queue Length [ft/ln]	93.09	191.16	16.46	133.38

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Version 7.00-05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.58	0.00	16.05	16.05	0.00	19.90	19.90	19.90	17.94	0.00	17.94	17.94
Movement LOS	B		B	B		B	B	B	B		B	B
d_A, Approach Delay [s/veh]	14.31				19.90				17.94			
Approach LOS	B				B				B			
d_I, Intersection Delay [s/veh]	13.92											
Intersection LOS	B											
Intersection V/C	0.911											

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration	┓┣							
Turning Movement	Left	Thru	Right	Right	Left	Thru	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	0	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	18	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	189	136	0	6	0	10	0	5
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	36	0	2	0	3	0	1
Total Analysis Volume [veh/h]	201	145	0	6	0	11	0	5
Presence of On-Street Parking	No			No				
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Permissive	Permissive	Protected	Permissive	Permissive
Signal Group	1	6	0	0	0	0	0	0
Auxiliary Signal Groups								
Lead / Lag	Lead	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	0	0	0	0	0
Maximum Green [s]	30	30	0	0	0	0	0	0
Amber [s]	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	33	57	0	0	0	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0
Rest In Walk		No						
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall	No	No						
Maximum Recall	No	No						
Pedestrian Recall	No	No						
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

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Version 7.00-05

Lane Group Calculations

Lane Group	L	C	
C, Cycle Length [s]	46	46	
L, Total Lost Time per Cycle [s]	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	
g_i, Effective Green Time [s]	21	21	
g / C, Green / Cycle	0.45	0.45	
(v / s)_i Volume / Saturation Flow Rate	0.15	0.08	
s, saturation flow rate [veh/h]	1308	1850	
c, Capacity [veh/h]	622	826	
d1, Uniform Delay [s]	8.94	7.69	
k, delay calibration	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	
d2, Incremental Delay [s]	0.30	0.11	
d3, Initial Queue Delay [s]	0.00	0.00	
Rp, platoon ratio	1.00	1.00	
PF, progression factor	1.00	1.00	

Lane Group Results

X, volume / capacity	0.32	0.18	
d, Delay for Lane Group [s/veh]	9.24	7.79	
Lane Group LOS	A	A	
Critical Lane Group	Yes	No	
50th-Percentile Queue Length [veh/ln]	1.00	0.71	
50th-Percentile Queue Length [ft/ln]	24.99	17.80	
95th-Percentile Queue Length [veh/ln]	1.80	1.28	
95th-Percentile Queue Length [ft/ln]	44.99	32.04	

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Version 7.00-05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.24	7.79	0.00	7.79	0.00	0.00	0.00	0.00
Movement LOS	A	A		A				
d_A, Approach Delay [s/veh]	8.62				0.00			
Approach LOS	A				A			
d_I, Intersection Delay [s/veh]	13.92							
Intersection LOS	B							
Intersection V/C	0.911							

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro   Scenario 10 Cumulative (2040) PM (Mit - Turn Lane)

Report File: N:\...\PM Cumulative - Mitigation Turn Lane.pdf   6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NB Right	0.855	24.7	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	24.7
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.855

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	0	0	110	0	0	0	0	0	0	10	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	303	21	20	435	0	2	12	2	0	4	114	190
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	81	6	5	116	0	1	3	1	0	1	30	51
Total Analysis Volume [veh/h]	322	22	21	463	0	2	13	2	0	4	121	202
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	499	592	438	573
Degree of Utilization, x	0.65	0.85	0.04	0.57

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.53	9.41	0.12	3.57
95th-Percentile Queue Length [ft]	113.25	235.17	3.02	89.18
Approach Delay [s/veh]	29.64		11.54	17.27
Approach LOS	D		B	C
Intersection Delay [s/veh]	24.69			
Intersection LOS	C			

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	18	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	189	136	0	6	0	10	5	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	36	0	2	0	3	1	0
Total Analysis Volume [veh/h]	201	145	0	6	0	11	5	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	542	446
Degree of Utilization, x	0.65	0.04

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.66	0.11
95th-Percentile Queue Length [ft]	116.39	2.78
Approach Delay [s/veh]	21.15	11.37
Approach LOS	C	B
Intersection Delay [s/veh]	24.69	
Intersection LOS	C	

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro — Scenario 6 Cumulative (2040) PM + Project

Report File: N:\...\PM Cumulative plus Project.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.962	34.9	C
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NB Right	1.548	152.5	F
3	Willow Rd/Bay Rd	Signalized	HCM 2000	NB Left	1.209	86.7	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	34.9
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.962

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	5	877	80	151	877	40	67	19	0	54	10	151
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.2200	1.2200	1.2200	1.2200	1.0000	1.0000	1.0000	1.0000	1.2200	1.0000	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	376	33	24	692	0	0	7	1	34	6	32
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1446	131	208	1762	40	67	26	1	100	16	216
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	381	34	55	464	11	18	7	0	26	4	57
Total Analysis Volume [veh/h]	7	1522	138	219	1855	42	71	27	1	105	17	227
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	118
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	68	68	68	19	87	87	31	31	31	31	31	31
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	118	118	118	118	118
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	64	15	83	27	27
g / C, Green / Cycle	0.54	0.13	0.70	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.50	0.12	0.54	0.11	0.24
Total Saturation Flow Adjustment	0.87	0.93	0.93	0.47	0.78
s, saturation flow rate [veh/h]	3301	1770	3535	897	1481
c, Capacity [veh/h]	1791	225	2486	205	339
d1, Uniform Delay [s]	24.96	51.30	11.20	39.44	45.50
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.20	53.55	2.28	7.91	56.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.93	0.97	0.76	0.48	1.03
d, Delay for Lane Group [s/veh]	35.16	104.86	13.48	47.35	102.20
Lane Group LOS	D	F	B	D	F
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	35.17	10.44	25.67	3.23	17.42
50th-Percentile Queue Length [ft/ln]	879.16	261.12	641.85	80.63	435.43
95th-Percentile Queue Length [veh/ln]	56.30	18.01	41.23	6.85	28.40
95th-Percentile Queue Length [ft/ln]	1407.43	450.13	1030.74	171.30	710.05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	35.16	35.16	35.16	104.86	13.48	13.48	47.35	47.35	47.35	102.20	102.20	102.20
Movement LOS	D	D	D	F	B	B	D	D	D	F	F	F
d_A, Approach Delay [s/veh]	35.16			22.94			47.35			102.20		
Approach LOS	D			C			D			F		
d_I, Intersection Delay [s/veh]	34.86											
Intersection LOS	C											
Intersection V/C	0.962											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	152.5
Analysis Method:	HCM 2000	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.548

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	80	0	0	110	0	0	0	0	0	0	49	74
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	379	21	20	435	0	2	12	2	0	4	153	262
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	98	5	5	112	0	1	3	1	0	1	39	68
Total Analysis Volume [veh/h]	391	22	21	448	0	2	12	2	0	4	158	270
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	882	434	557
Degree of Utilization, x	1.55	0.04	0.78

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	46.18	0.11	7.11
95th-Percentile Queue Length [ft]	1154.61	2.87	177.74
Approach Delay [s/veh]	272.57	11.62	28.23
Approach LOS	F	B	D
Intersection Delay [s/veh]	152.54		
Intersection LOS	F		

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Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	57	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	189	175	0	6	0	10	5	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	45	0	2	0	3	1	0
Total Analysis Volume [veh/h]	195	180	0	6	0	10	5	0
Pedestrian Volume [ped/h]	0				0			

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Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	517	441
Degree of Utilization, x	0.74	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.18	0.11
95th-Percentile Queue Length [ft]	154.50	2.63
Approach Delay [s/veh]	27.09	11.44
Approach LOS	D	B
Intersection Delay [s/veh]	152.54	
Intersection LOS	F	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	86.7
Analysis Method:	HCM 2000	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.209

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┐‖		‖┌		┐┌	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	29	1309	954	269	578	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.2200	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	13	455	250	53	139	12
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	48	2052	1414	158	844	5
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	529	364	41	218	1
Total Analysis Volume [veh/h]	49	2115	1458	163	870	5
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	8	66	58	58	54	54
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	62	54	54	50	50
g / C, Green / Cycle	0.03	0.52	0.45	0.45	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.03	0.60	0.41	0.10	0.49	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	59	1832	1596	712	737	660
d1, Uniform Delay [s]	57.66	29.00	30.82	20.23	35.00	20.48
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	75.30	76.09	9.56	0.75	94.66	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

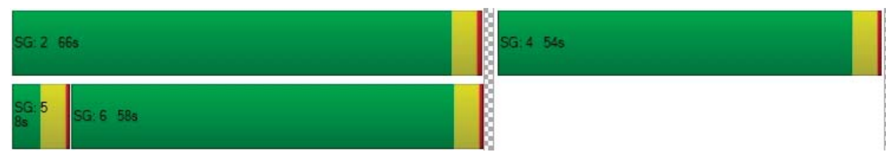
X, volume / capacity	0.83	1.15	0.91	0.23	1.18	0.01
d, Delay for Lane Group [s/veh]	132.96	105.09	40.38	20.98	129.66	20.50
Lane Group LOS	F	F	D	C	F	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.25	62.88	31.09	3.66	51.13	0.11
50th-Percentile Queue Length [ft/ln]	56.31	1572.04	777.15	91.42	1278.24	2.64
95th-Percentile Queue Length [veh/ln]	5.04	100.61	49.80	7.61	81.81	0.27
95th-Percentile Queue Length [ft/ln]	125.99	2515.27	1244.99	190.26	2045.22	6.80

Movement, Approach, & Intersection Results

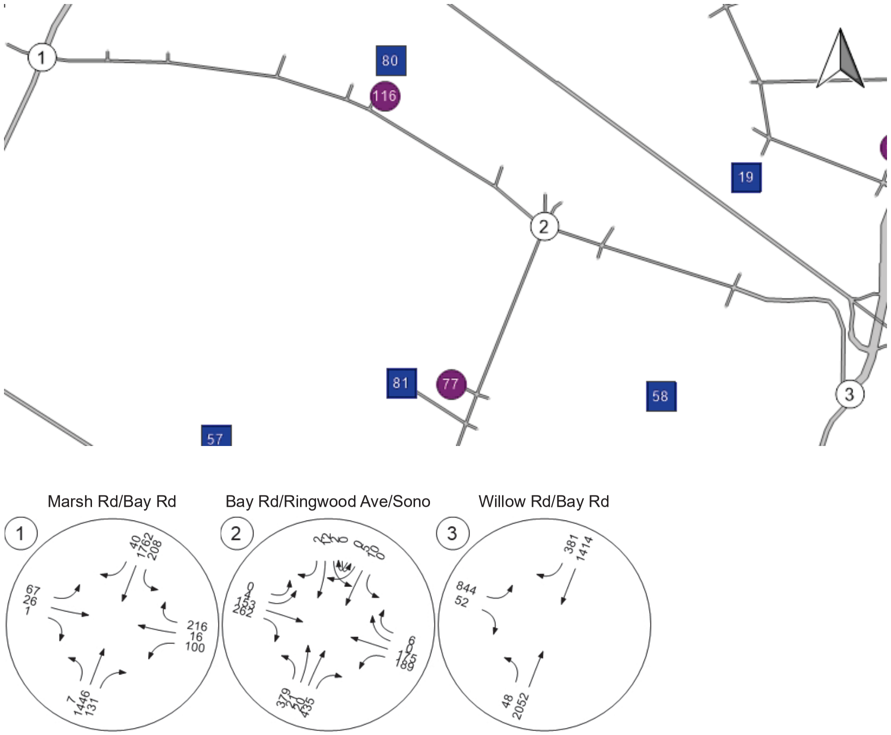
d_M, Delay for Movement [s/veh]	132.96	105.09	40.38	20.98	129.66	20.50
Movement LOS	F	F	D	C	F	C
d_A, Approach Delay [s/veh]	105.72		38.43		129.03	
Approach LOS	F		D		F	
d_I, Intersection Delay [s/veh]	86.69					
Intersection LOS	F					
Intersection V/C	1.209					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Traffic Volume - Future Total Volume



Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro

Scenario 12 Cumulative (2040) PM + Project (Mit - Turn Lane)

Report File: N:\...\PM Cumulative plus Project - Mitigation Turn Lane.pdf

6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NB Right	0.891	34.0	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	34.0
Analysis Method:	HCM 2000	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.891

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	80	0	0	110	0	0	0	0	0	0	49	74
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	379	21	20	435	0	2	12	2	0	4	153	262
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	98	5	5	112	0	1	3	1	0	1	39	68
Total Analysis Volume [veh/h]	391	22	21	448	0	2	12	2	0	4	158	270
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	469	551	398	554
Degree of Utilization, x	0.83	0.89	0.04	0.78

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.18	10.34	0.13	7.21
95th-Percentile Queue Length [ft]	204.40	258.41	3.13	180.28
Approach Delay [s/veh]	40.13		12.43	28.76
Approach LOS	E		B	D
Intersection Delay [s/veh]	34.05			
Intersection LOS	D			

Generated with PTV VISTRO
Version 7.00-05

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	57	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	189	175	0	6	0	10	5	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	45	0	2	0	3	1	0
Total Analysis Volume [veh/h]	195	180	0	6	0	10	5	0
Pedestrian Volume [ped/h]	0				0			

Generated with PTV VISTRO
Version 7.00-05

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	512	405
Degree of Utilization, x	0.74	0.04

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.30	0.12
95th-Percentile Queue Length [ft]	157.46	2.88
Approach Delay [s/veh]	27.74	12.23
Approach LOS	D	B
Intersection Delay [s/veh]	34.05	
Intersection LOS	D	

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro — Scenario 13 Cumulative (2040) PM + Project (Mit - Signal)

Report File: N:\...\PM Cumulative plus Project - Mitigation Signal.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	Signalized	HCM 2010	SB Thru	0.936	15.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	Signalized	Delay (sec / veh):	15.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.936

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left	Thru	Thru	Right	Left2	Left	Thru	Right	Left	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	42	266	0	2	20	7	4	0	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	80	0	0	110	0	0	0	0	0	0	49	74
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	379	21	42	435	0	2	24	7	4	0	153	262
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	98	5	11	112	0	1	6	2	1	0	39	68
Total Analysis Volume [veh/h]	391	22	43	448	0	2	25	7	4	0	158	270
Presence of On-Street Parking	No			No	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	7	0	4	0	0	0	8	0	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	0	5	0	0	0	5	0	0	0	5	0
Maximum Green [s]	30	0	30	0	0	0	30	0	0	0	30	0
Amber [s]	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
Split [s]	34	0	43	0	0	0	9	0	0	0	24	0
Vehicle Extension [s]	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	5	0	0	0	5	0	0	0	5	0
Pedestrian Clearance [s]	0	0	10	0	0	0	10	0	0	0	10	0
Rest In Walk			No				No				No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No		No				No				No	
Maximum Recall	No		No				No				No	
Pedestrian Recall	No		No				No				No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	52	52	52	52
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	19	3	16
g / C, Green / Cycle	0.36	0.36	0.05	0.30
(v / s)_i Volume / Saturation Flow Rate	0.23	0.31	0.12	0.26
s, saturation flow rate [veh/h]	1675	1604	289	1668
c, Capacity [veh/h]	743	583	87	576
d1, Uniform Delay [s]	13.74	15.32	25.17	17.12
k, delay calibration	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.58	3.44	2.81	1.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	0.84	0.39	0.75
d, Delay for Lane Group [s/veh]	14.32	18.77	27.98	19.11
Lane Group LOS	B	B	C	B
Critical Lane Group	Yes	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	3.31	5.06	0.48	4.53
50th-Percentile Queue Length [ft/ln]	82.84	126.59	11.90	113.22
95th-Percentile Queue Length [veh/ln]	5.96	8.75	0.86	8.02
95th-Percentile Queue Length [ft/ln]	149.12	218.85	21.41	200.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.32	0.00	18.77	18.77	0.00	27.98	27.98	27.98	19.11	0.00	19.11	19.11
Movement LOS	B		B	B		C	C	C	B		B	B
d_A, Approach Delay [s/veh]	16.79					27.98			19.11			
Approach LOS	B					C			B			
d_I, Intersection Delay [s/veh]	15.89											
Intersection LOS	B											
Intersection V/C	0.936											

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right	Left	Thru	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	0	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	57	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	189	175	0	6	0	10	0	5
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	45	0	2	0	3	0	1
Total Analysis Volume [veh/h]	195	180	0	6	0	10	0	5
Presence of On-Street Parking	No			No				
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Permissive	Permissive	Protected	Permissive	Permissive
Signal Group	1	6	0	0	0	0	0	0
Auxiliary Signal Groups								
Lead / Lag	Lead	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	0	0	0	0	0
Maximum Green [s]	30	30	0	0	0	0	0	0
Amber [s]	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	33	57	0	0	0	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0
Rest In Walk		No						
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall	No	No						
Maximum Recall	No	No						
Pedestrian Recall	No	No						
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	
C, Cycle Length [s]	52	52	
L, Total Lost Time per Cycle [s]	4.00	4.00	
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	
I2, Clearance Lost Time [s]	0.00	2.00	
g_i, Effective Green Time [s]	25	25	
g / C, Green / Cycle	0.48	0.48	
(v / s)_i Volume / Saturation Flow Rate	0.16	0.10	
s, saturation flow rate [veh/h]	1196	1852	
c, Capacity [veh/h]	551	897	
d1, Uniform Delay [s]	9.80	7.76	
k, delay calibration	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	
d2, Incremental Delay [s]	0.39	0.11	
d3, Initial Queue Delay [s]	0.00	0.00	
Rp, platoon ratio	1.00	1.00	
PF, progression factor	1.00	1.00	

Lane Group Results

X, volume / capacity	0.35	0.21	
d, Delay for Lane Group [s/veh]	10.19	7.87	
Lane Group LOS	B	A	
Critical Lane Group	Yes	No	
50th-Percentile Queue Length [veh/ln]	1.07	0.98	
50th-Percentile Queue Length [ft/ln]	26.75	24.56	
95th-Percentile Queue Length [veh/ln]	1.93	1.77	
95th-Percentile Queue Length [ft/ln]	48.15	44.20	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.19	7.87	0.00	7.87	0.00	0.00	0.00	0.00
Movement LOS	B	A		A				
d_A, Approach Delay [s/veh]	9.06				0.00			
Approach LOS	A				A			
d_I, Intersection Delay [s/veh]	15.89							
Intersection LOS	B							
Intersection V/C	0.936							

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro Scenario 18 Cumulative (2040) PM + Project Alternative

Report File: N:\...\PM Cumulative plus Project Alternative.pdf 6/5/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.939	32.6	C
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NB Right	1.460	132.9	F
3	Willow Rd/Bay Rd	Signalized	HCM 2000	EB Left	1.203	85.7	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	32.6
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.939

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	5	877	80	151	877	40	67	19	0	54	10	151
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.2200	1.2200	1.2200	1.2200	1.0000	1.0000	1.0000	1.0000	1.2200	1.0000	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	376	24	18	692	0	0	4	1	29	4	19
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1446	122	202	1762	40	67	23	1	95	14	203
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	381	32	53	464	11	18	6	0	25	4	53
Total Analysis Volume [veh/h]	7	1522	128	213	1855	42	71	24	1	100	15	214
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	118
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	68	68	68	19	87	87	31	31	31	31	31	31
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

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Version 7.00-05

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	118	118	118	118	118
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	64	15	83	27	27
g / C, Green / Cycle	0.54	0.13	0.70	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.50	0.12	0.54	0.11	0.22
Total Saturation Flow Adjustment	0.87	0.93	0.93	0.48	0.78
s, saturation flow rate [veh/h]	3304	1770	3535	909	1485
c, Capacity [veh/h]	1792	225	2486	208	340
d1, Uniform Delay [s]	24.79	51.10	11.20	39.23	45.07
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.61	47.65	2.28	7.20	41.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.92	0.95	0.76	0.46	0.97
d, Delay for Lane Group [s/veh]	34.39	98.75	13.48	46.43	86.47
Lane Group LOS	C	F	B	D	F
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	34.55	9.85	25.67	3.10	15.21
50th-Percentile Queue Length [ft/ln]	863.66	246.37	641.85	77.42	380.36
95th-Percentile Queue Length [veh/ln]	55.31	17.14	41.23	6.62	25.07
95th-Percentile Queue Length [ft/ln]	1382.73	428.51	1030.74	165.54	626.72

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Version 7.00-05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.39	34.39	34.39	98.75	13.48	13.48	46.43	46.43	46.43	86.47	86.47	86.47
Movement LOS	C	C	C	F	B	B	D	D	D	F	F	F
d_A, Approach Delay [s/veh]	34.39			22.09			46.43			86.47		
Approach LOS	C			C			D			F		
d_I, Intersection Delay [s/veh]	32.56											
Intersection LOS	C											
Intersection V/C	0.939											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	132.9
Analysis Method:	HCM 2000	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.460

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	56	0	0	110	0	0	0	0	0	0	34	52
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	355	21	20	435	0	2	12	2	0	4	138	240
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	91	5	5	112	0	1	3	1	0	1	36	62
Total Analysis Volume [veh/h]	366	22	21	448	0	2	12	2	0	4	142	247
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	857	449	562
Degree of Utilization, x	1.46	0.04	0.70

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	41.51	0.11	5.52
95th-Percentile Queue Length [ft]	1037.67	2.77	138.05
Approach Delay [s/veh]	234.16	11.31	22.91
Approach LOS	F	B	C
Intersection Delay [s/veh]	132.91		
Intersection LOS	F		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	42	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	189	160	0	6	0	10	5	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	41	0	2	0	3	1	0
Total Analysis Volume [veh/h]	195	165	0	6	0	10	5	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	524	458
Degree of Utilization, x	0.70	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.45	0.10
95th-Percentile Queue Length [ft]	136.22	2.54
Approach Delay [s/veh]	24.27	11.14
Approach LOS	C	B
Intersection Delay [s/veh]	132.91	
Intersection LOS	F	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	85.7
Analysis Method:	HCM 2000	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.203

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	29	1309	954	269	578	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.2200	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	455	250	44	130	9
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	45	2052	1414	149	835	2
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	529	364	38	215	1
Total Analysis Volume [veh/h]	46	2115	1458	154	861	2
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	8	66	58	58	54	54
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

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Version 7.00-05

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	62	54	54	50	50
g / C, Green / Cycle	0.03	0.52	0.45	0.45	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.03	0.60	0.41	0.10	0.49	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	59	1832	1596	712	737	660
d1, Uniform Delay [s]	57.56	29.00	30.82	20.11	35.00	20.44
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	65.19	76.09	9.56	0.70	89.76	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	1.15	0.91	0.22	1.17	0.00
d, Delay for Lane Group [s/veh]	122.75	105.09	40.38	20.80	124.76	20.45
Lane Group LOS	F	F	D	C	F	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.04	62.88	31.09	3.43	49.89	0.04
50th-Percentile Queue Length [ft/ln]	50.98	1572.04	777.15	85.75	1247.26	1.05
95th-Percentile Queue Length [veh/ln]	4.62	100.61	49.80	7.22	79.83	0.11
95th-Percentile Queue Length [ft/ln]	115.47	2515.27	1244.99	180.38	1995.67	2.73

Generated with PTV VISTRO
Version 7.00-05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	122.75	105.09	40.38	20.80	124.76	20.45
Movement LOS	F	F	D	C	F	C
d_A, Approach Delay [s/veh]	105.47		38.51		124.52	
Approach LOS	F		D		F	
d_I, Intersection Delay [s/veh]	85.73					
Intersection LOS	F					
Intersection V/C	1.203					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro

Scenario 19 Cumulative (2040) PM + Project Alternative (Mit - Turn Lane)

Report File: N:\...\PM Cumulative plus Project Alternative - Mitigation Turn Lane.pdf

6/5/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NB Right	0.865	28.7	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	28.7
Analysis Method:	HCM 2000	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.865

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	20	266	0	2	10	2	0	4	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	56	0	0	110	0	0	0	0	0	0	34	52
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	355	21	20	435	0	2	12	2	0	4	138	240
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	91	5	5	112	0	1	3	1	0	1	36	62
Total Analysis Volume [veh/h]	366	22	21	448	0	2	12	2	0	4	142	247
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	482	567	415	564
Degree of Utilization, x	0.76	0.87	0.04	0.70

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.55	9.60	0.12	5.49
95th-Percentile Queue Length [ft]	163.67	240.10	3.00	137.20
Approach Delay [s/veh]	34.05		12.03	22.75
Approach LOS	D		B	C
Intersection Delay [s/veh]	28.75			
Intersection LOS	D			

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	5	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	42	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	189	160	0	6	0	10	5	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	41	0	2	0	3	1	0
Total Analysis Volume [veh/h]	195	165	0	6	0	10	5	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	524	422
Degree of Utilization, x	0.70	0.04

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.43	0.11
95th-Percentile Queue Length [ft]	135.82	2.76
Approach Delay [s/veh]	24.19	11.84
Approach LOS	C	B
Intersection Delay [s/veh]	28.75	
Intersection LOS	D	

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 PM-SCB-mit - 1.vistro

Scenario 20 Cumulative (2040) PM + Project Alternative (Mit - Signal)

Report File: N:\...\PM Cumulative plus Project Alternative - Mitigation Signal.pdf

6/5/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	Signalized	HCM 2010	SB Thru	0.914	14.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	Signalized	Delay (sec / veh):	14.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.914

Intersection Setup

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left	Thru	Thru	Right	Left2	Left	Thru	Right	Left	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name	Ringwood Ave				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	245	21	42	266	0	2	20	7	4	0	85	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	56	0	0	110	0	0	0	0	0	0	34	52
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	355	21	42	435	0	2	24	7	4	0	138	240
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	91	5	11	112	0	1	6	2	1	0	36	62
Total Analysis Volume [veh/h]	366	22	43	448	0	2	25	7	4	0	142	247
Presence of On-Street Parking	No			No	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	7	0	4	0	0	0	8	0	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	0	5	0	0	0	5	0	0	0	5	0
Maximum Green [s]	30	0	30	0	0	0	30	0	0	0	30	0
Amber [s]	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
Split [s]	34	0	43	0	0	0	9	0	0	0	24	0
Vehicle Extension [s]	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	5	0	0	0	5	0	0	0	5	0
Pedestrian Clearance [s]	0	0	10	0	0	0	10	0	0	0	10	0
Rest In Walk			No				No				No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No		No				No				No	
Maximum Recall	No		No				No				No	
Pedestrian Recall	No		No				No				No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	49	49	49	49
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	18	3	14
g / C, Green / Cycle	0.37	0.37	0.06	0.28
(v / s)_i Volume / Saturation Flow Rate	0.22	0.31	0.07	0.24
s, saturation flow rate [veh/h]	1660	1604	484	1665
c, Capacity [veh/h]	739	588	108	545
d1, Uniform Delay [s]	12.61	14.27	22.26	16.56
k, delay calibration	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.52	3.21	1.66	1.81
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.50	0.84	0.32	0.72
d, Delay for Lane Group [s/veh]	13.13	17.48	23.92	18.37
Lane Group LOS	B	B	C	B
Critical Lane Group	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	2.77	4.61	0.40	3.82
50th-Percentile Queue Length [ft/ln]	69.21	115.25	10.03	95.62
95th-Percentile Queue Length [veh/ln]	4.98	8.13	0.72	6.88
95th-Percentile Queue Length [ft/ln]	124.57	203.28	18.06	172.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	13.13	0.00	17.48	17.48	0.00	23.92	23.92	23.92	18.37	0.00	18.37	18.37
Movement LOS	B		B	B		C	C	C	B		B	B
d_A, Approach Delay [s/veh]	15.62				23.92				18.37			
Approach LOS	B				C				B			
d_I, Intersection Delay [s/veh]	14.91											
Intersection LOS	B											
Intersection V/C	0.914											

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right	Left	Thru	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	141	97	0	6	0	8	0	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	42	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	189	160	0	6	0	10	0	5
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	41	0	2	0	3	0	1
Total Analysis Volume [veh/h]	195	165	0	6	0	10	0	5
Presence of On-Street Parking	No			No				
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Permissive	Permissive	Protected	Permissive	Permissive
Signal Group	1	6	0	0	0	0	0	0
Auxiliary Signal Groups								
Lead / Lag	Lead	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	0	0	0	0	0
Maximum Green [s]	30	30	0	0	0	0	0	0
Amber [s]	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	33	57	0	0	0	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0
Rest In Walk		No						
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall	No	No						
Maximum Recall	No	No						
Pedestrian Recall	No	No						
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Generated with PTV VISTRO
Version 7.00-05

Lane Group Calculations

Lane Group	L	C	
C, Cycle Length [s]	49	49	
L, Total Lost Time per Cycle [s]	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	
g_i, Effective Green Time [s]	23	23	
g / C, Green / Cycle	0.47	0.47	
(v / s)_i Volume / Saturation Flow Rate	0.16	0.09	
s, saturation flow rate [veh/h]	1236	1851	
c, Capacity [veh/h]	581	873	
d1, Uniform Delay [s]	9.26	7.59	
k, delay calibration	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	
d2, Incremental Delay [s]	0.34	0.11	
d3, Initial Queue Delay [s]	0.00	0.00	
Rp, platoon ratio	1.00	1.00	
PF, progression factor	1.00	1.00	

Lane Group Results

X, volume / capacity	0.34	0.20	
d, Delay for Lane Group [s/veh]	9.60	7.70	
Lane Group LOS	A	A	
Critical Lane Group	Yes	No	
50th-Percentile Queue Length [veh/ln]	1.01	0.84	
50th-Percentile Queue Length [ft/ln]	25.15	21.11	
95th-Percentile Queue Length [veh/ln]	1.81	1.52	
95th-Percentile Queue Length [ft/ln]	45.26	38.00	

Generated with PTV VISTRO
Version 7.00-05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.60	7.70	0.00	7.70	0.00	0.00	0.00	0.00
Movement LOS	A	A		A				
d_A, Approach Delay [s/veh]	8.71				0.00			
Approach LOS	A				A			
d_I, Intersection Delay [s/veh]	14.91							
Intersection LOS	B							
Intersection V/C	0.914							

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro — Scenario 1 SAT Existing

Report File: N:\...\SAT Existing.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.431	13.7	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.247	8.8	A
3	Willow Rd/Bay Rd	Signalized	HCM 2000	NB Left	0.442	9.4	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	13.7
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.431

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	1	623	62	101	673	31	44	5	0	38	6	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	623	62	101	673	31	44	5	0	38	6	101
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	161	16	26	173	8	11	1	0	10	2	26
Total Analysis Volume [veh/h]	1	642	64	104	694	32	45	5	0	39	6	104
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	43	43	43	15	58	58	22	22	22	22	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
I2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	39	11	54	18	18
g / C, Green / Cycle	0.49	0.14	0.68	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.21	0.06	0.21	0.04	0.10
Total Saturation Flow Adjustment	0.88	0.93	0.93	0.67	0.82
s, saturation flow rate [veh/h]	3340	1770	3523	1271	1551
c, Capacity [veh/h]	1628	243	2378	286	349
d1, Uniform Delay [s]	13.33	31.61	5.32	25.01	26.58
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.85	5.41	0.33	1.33	3.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.43	0.31	0.17	0.43
d, Delay for Lane Group [s/veh]	14.17	37.02	5.65	26.34	30.37
Lane Group LOS	B	D	A	C	C
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	6.08	2.40	4.01	0.99	3.21
50th-Percentile Queue Length [ft/ln]	152.00	60.12	100.15	24.72	80.21
95th-Percentile Queue Length [veh/ln]	11.53	5.33	8.21	2.39	6.82
95th-Percentile Queue Length [ft/ln]	288.25	133.37	205.18	59.84	170.57

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.17	14.17	14.17	37.02	5.65	5.65	26.34	26.34	26.34	30.37	30.37	30.37
Movement LOS	B	B	B	D	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	14.17			9.58			26.34			30.37		
Approach LOS	B			A			C			C		
d_I, Intersection Delay [s/veh]	13.72											
Intersection LOS	B											
Intersection V/C	0.431											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Generated with PTV VISTRO
Version 7.00-05

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	8.8
Analysis Method:	HCM 2000	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.247

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	1	7	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	9	5	72	1	7	9	9	2	5	58	74
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	3	2	22	0	2	3	3	1	2	17	22
Total Analysis Volume [veh/h]	90	11	6	87	1	8	11	11	2	6	70	89
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	785	748	820
Degree of Utilization, x	0.25	0.04	0.20

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.97	0.13	0.76
95th-Percentile Queue Length [ft]	24.33	3.24	18.99
Approach Delay [s/veh]	9.09	8.02	8.51
Approach LOS	A	A	A
Intersection Delay [s/veh]		8.82	
Intersection LOS		A	

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	3	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	72	55	2	3	0	6	3	0
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	17	1	1	0	2	1	0
Total Analysis Volume [veh/h]	87	66	2	4	0	7	4	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	753	752
Degree of Utilization, x	0.21	0.01

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.79	0.04
95th-Percentile Queue Length [ft]	19.86	1.11
Approach Delay [s/veh]	9.05	7.86
Approach LOS	A	A
Intersection Delay [s/veh]	8.82	
Intersection LOS	A	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	9.4
Analysis Method:	HCM 2000	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.442

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	10	1024	1022	126	133	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	10	1024	1022	0	133	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	269	269	0	35	0
Total Analysis Volume [veh/h]	11	1078	1076	0	140	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	8	78	70	70	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	74	66	66	18	18
g / C, Green / Cycle	0.04	0.74	0.66	0.66	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.01	0.30	0.30	0.00	0.08	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	71	2625	2341	1045	319	285
d1, Uniform Delay [s]	46.37	4.86	8.30	5.78	36.51	33.62
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.62	0.48	0.65	0.00	4.36	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.16	0.41	0.46	0.00	0.44	0.00
d, Delay for Lane Group [s/veh]	50.99	5.33	8.95	5.78	40.86	33.62
Lane Group LOS	D	A	A	A	D	C
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.33	6.94	8.85	0.00	3.89	0.00
50th-Percentile Queue Length [ft/ln]	8.26	173.41	221.34	0.00	97.19	0.00
95th-Percentile Queue Length [veh/ln]	0.84	12.83	15.67	0.00	8.01	0.00
95th-Percentile Queue Length [ft/ln]	20.95	320.77	391.81	0.00	200.17	0.00

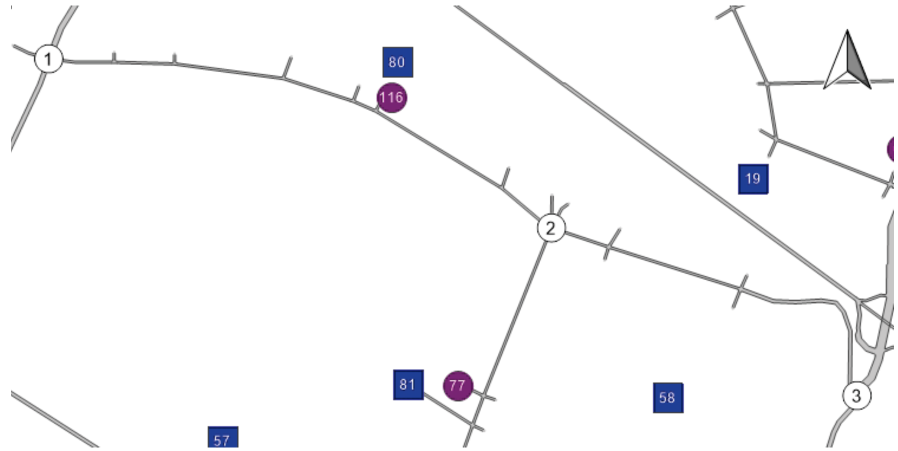
Movement, Approach, & Intersection Results

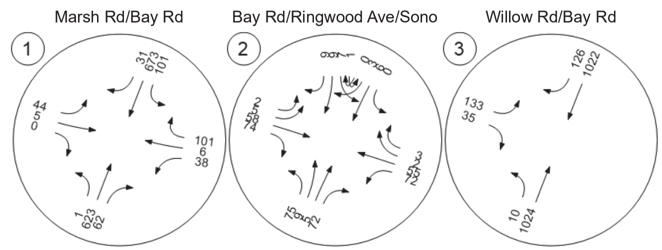
d_M, Delay for Movement [s/veh]	50.99	5.33	8.95	5.78	40.86	33.62
Movement LOS	D	A	A	A	D	C
d_A, Approach Delay [s/veh]	5.79		8.95		40.86	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	9.40					
Intersection LOS	A					
Intersection V/C	0.442					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Traffic Volume - Future Total Volume





Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro | Scenario 2 SAT Existing + Project

Report File: N:\...\SAT Existing plus Project.pdf | 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.511	15.6	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.499	12.6	B
3	Willow Rd/Bay Rd	Signalized	HCM 2000	NB Left	0.470	10.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	15.6
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.511

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	1	623	62	101	673	31	44	5	0	38	6	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	31	22	0	0	0	6	0	31	6	22
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	623	93	123	673	31	44	11	0	69	12	123
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	161	24	32	173	8	11	3	0	18	3	32
Total Analysis Volume [veh/h]	1	642	96	127	694	32	45	11	0	71	12	127
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	68
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	43	43	43	15	58	58	22	22	22	22	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	39	11	54	18	18
g / C, Green / Cycle	0.49	0.14	0.68	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.22	0.07	0.21	0.05	0.14
Total Saturation Flow Adjustment	0.87	0.93	0.93	0.63	0.79
s, saturation flow rate [veh/h]	3320	1770	3523	1203	1502
c, Capacity [veh/h]	1618	243	2378	271	338
d1, Uniform Delay [s]	13.51	32.06	5.32	25.20	27.93
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.93	7.79	0.33	1.73	8.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.46	0.52	0.31	0.21	0.62
d, Delay for Lane Group [s/veh]	14.45	39.85	5.65	26.93	36.25
Lane Group LOS	B	D	A	C	D
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	6.46	3.04	4.01	1.12	4.97
50th-Percentile Queue Length [ft/ln]	161.62	75.94	100.15	28.03	124.36
95th-Percentile Queue Length [veh/ln]	12.12	6.51	8.21	2.69	9.80
95th-Percentile Queue Length [ft/ln]	302.94	162.86	205.18	67.24	244.97

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.45	14.45	14.45	39.85	5.65	5.65	26.93	26.93	26.93	36.25	36.25	36.25
Movement LOS	B	B	B	D	A	A	C	C	C	D	D	D
d_A, Approach Delay [s/veh]	14.45			10.75			26.93			36.25		
Approach LOS	B			B			C			D		
d_I, Intersection Delay [s/veh]	15.59											
Intersection LOS	B											
Intersection V/C	0.511											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Generated with PTV VISTRO
Version 7.00-05

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	12.6
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.499

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left	Left	Thru	Right	Left	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	7	1	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	106	0	0	0	0	0	0	0	0	0	54	106
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	181	9	5	72	7	1	9	9	2	5	112	180
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	3	2	22	2	0	3	3	1	2	34	54
Total Analysis Volume [veh/h]	218	11	6	87	8	1	11	11	2	6	135	217
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	659	605	722
Degree of Utilization, x	0.49	0.05	0.50

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.69	0.16	2.81
95th-Percentile Queue Length [ft]	67.33	4.04	70.23
Approach Delay [s/veh]	13.56	9.27	12.84
Approach LOS	B	A	B
Intersection Delay [s/veh]	12.61		
Intersection LOS	B		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right	Left	Thru	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	0	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	54	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	72	109	2	3	0	6	0	3
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	33	1	1	0	2	0	1
Total Analysis Volume [veh/h]	87	131	2	4	0	7	0	4
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	646	609
Degree of Utilization, x	0.35	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.55	0.06
95th-Percentile Queue Length [ft]	38.72	1.38
Approach Delay [s/veh]	11.51	9.02
Approach LOS	B	A
Intersection Delay [s/veh]	12.61	
Intersection LOS	B	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	10.3
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.470

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	10	1024	1022	126	133	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	0	0	32	32	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	20	1024	1022	0	165	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	269	269	0	43	0
Total Analysis Volume [veh/h]	21	1078	1076	0	174	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	8	78	70	70	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	74	66	66	18	18
g / C, Green / Cycle	0.04	0.74	0.66	0.66	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.01	0.30	0.30	0.00	0.10	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	71	2625	2341	1045	319	285
d1, Uniform Delay [s]	46.63	4.86	8.30	5.78	37.29	33.62
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.39	0.48	0.65	0.00	6.59	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.41	0.46	0.00	0.55	0.00
d, Delay for Lane Group [s/veh]	57.02	5.33	8.95	5.78	43.88	33.62
Lane Group LOS	E	A	A	A	D	C
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.65	6.94	8.85	0.00	5.04	0.00
50th-Percentile Queue Length [ft/ln]	16.17	173.41	221.34	0.00	125.93	0.00
95th-Percentile Queue Length [veh/ln]	1.60	12.83	15.67	0.00	9.90	0.00
95th-Percentile Queue Length [ft/ln]	40.09	320.77	391.81	0.00	247.48	0.00

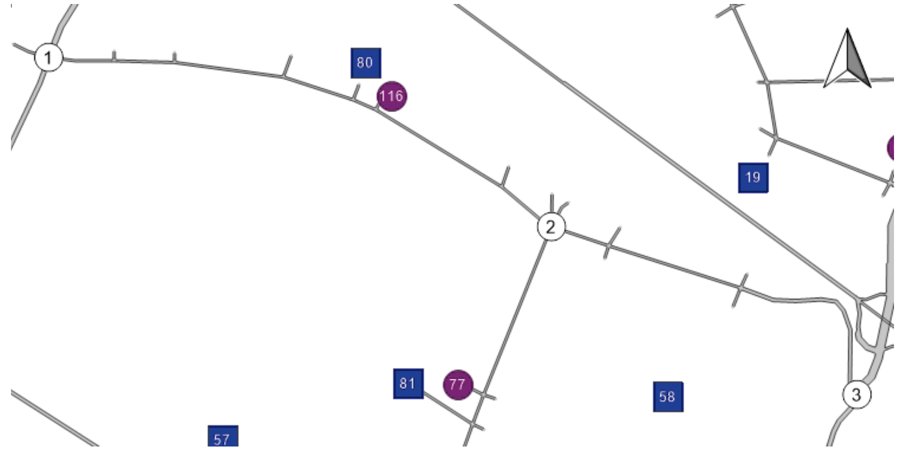
Movement, Approach, & Intersection Results

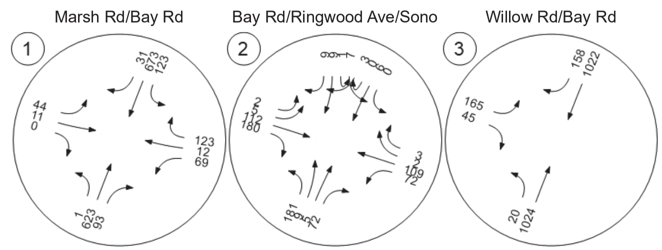
d_M, Delay for Movement [s/veh]	57.02	5.33	8.95	5.78	43.88	33.62
Movement LOS	E	A	A	A	D	C
d_A, Approach Delay [s/veh]	6.32		8.95		43.88	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	10.31					
Intersection LOS	B					
Intersection V/C	0.470					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Traffic Volume - Future Total Volume





Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro — Scenario 12 SAT Existing + Project (Mit)

Report File: N:\...\SAT Existing plus Project - Mitigation.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.498	12.2	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	12.2
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.498

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	1	7	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	106	0	0	0	0	0	0	0	0	0	54	106
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	181	9	5	72	1	7	9	9	2	5	112	180
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	3	2	22	0	2	3	3	1	2	34	54
Total Analysis Volume [veh/h]	218	11	6	87	1	8	11	11	2	6	135	217
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	545	647	549	722
Degree of Utilization, x	0.40	0.16	0.06	0.50

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.91	0.57	0.18	2.81
95th-Percentile Queue Length [ft]	47.77	14.25	4.48	70.17
Approach Delay [s/veh]	12.25		9.95	12.83
Approach LOS	B		A	B
Intersection Delay [s/veh]	12.19			
Intersection LOS	B			

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	3	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	54	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	72	109	2	3	0	6	3	0
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	33	1	1	0	2	1	0
Total Analysis Volume [veh/h]	87	131	2	4	0	7	4	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	646	553
Degree of Utilization, x	0.35	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.55	0.06
95th-Percentile Queue Length [ft]	38.68	1.52
Approach Delay [s/veh]	11.50	9.65
Approach LOS	B	A
Intersection Delay [s/veh]	12.19	
Intersection LOS	B	

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro — Scenario 3 Near Term (2021) SAT

Report File: N:\...\SAT Near Term.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.520	14.2	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NB Right	0.271	9.1	A
3	Willow Rd/Bay Rd	Signalized	HCM 2000	NB Left	0.489	9.9	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	14.2
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.520

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	1	623	62	101	673	31	44	5	0	38	6	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0400	1.0400	1.0400	1.0000	1.0000	1.0000	1.0000	1.0400	1.0000	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	184	6	0	165	0	0	0	0	3	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	832	70	105	865	31	44	5	0	43	6	105
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	214	18	27	223	8	11	1	0	11	2	27
Total Analysis Volume [veh/h]	1	858	72	108	892	32	45	5	0	44	6	108
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	68
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	43	43	43	15	58	58	22	22	22	22	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	39	11	54	18	18
g / C, Green / Cycle	0.49	0.14	0.68	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.28	0.06	0.26	0.04	0.10
Total Saturation Flow Adjustment	0.88	0.93	0.93	0.66	0.81
s, saturation flow rate [veh/h]	3346	1770	3528	1251	1541
c, Capacity [veh/h]	1631	243	2382	281	347
d1, Uniform Delay [s]	14.56	31.69	5.72	25.03	26.77
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.46	5.77	0.48	1.38	4.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.57	0.44	0.39	0.18	0.46
d, Delay for Lane Group [s/veh]	16.01	37.46	6.20	26.40	31.04
Lane Group LOS	B	D	A	C	C
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	8.94	2.51	5.52	0.99	3.44
50th-Percentile Queue Length [ft/ln]	223.45	62.78	138.05	24.76	86.11
95th-Percentile Queue Length [veh/ln]	15.80	5.54	10.67	2.40	7.24
95th-Percentile Queue Length [ft/ln]	394.91	138.44	266.63	59.92	181.01

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.01	16.01	16.01	37.46	6.20	6.20	26.40	26.40	26.40	31.04	31.04	31.04
Movement LOS	B	B	B	D	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	16.01			9.47			26.40			31.04		
Approach LOS	B			A			C			C		
d_I, Intersection Delay [s/veh]	14.24											
Intersection LOS	B											
Intersection V/C	0.520											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 2000	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.271

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	1	7	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0000	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	7	0	0	0	0	0	0	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	9	5	82	1	7	9	9	2	5	66	77
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	3	2	25	0	2	3	3	1	2	20	23
Total Analysis Volume [veh/h]	94	11	6	99	1	8	11	11	2	6	80	93
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	775	733	806
Degree of Utilization, x	0.27	0.04	0.22

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.10	0.13	0.86
95th-Percentile Queue Length [ft]	27.43	3.31	21.48
Approach Delay [s/veh]	9.36	8.13	8.75
Approach LOS	A	A	A
Intersection Delay [s/veh]	9.07		
Intersection LOS	A		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	3	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0000	1.0000	1.0000	1.0400	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	3	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	60	2	3	0	6	3	0
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	18	1	1	0	2	1	0
Total Analysis Volume [veh/h]	94	72	2	4	0	7	4	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	743	737
Degree of Utilization, x	0.23	0.01

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.89	0.05
95th-Percentile Queue Length [ft]	22.33	1.14
Approach Delay [s/veh]	9.30	7.96
Approach LOS	A	A
Intersection Delay [s/veh]	9.07	
Intersection LOS	A	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	9.9
Analysis Method:	HCM 2000	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.489

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	10	1024	1022	126	133	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	83	57	5	13	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	11	1148	1120	0	151	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	302	295	0	40	0
Total Analysis Volume [veh/h]	12	1208	1179	0	159	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	8	78	70	70	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Generated with PTV VISTRO
Version 7.00-05

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	74	66	66	18	18
g / C, Green / Cycle	0.04	0.74	0.66	0.66	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.01	0.34	0.33	0.00	0.09	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	71	2625	2341	1045	319	285
d1, Uniform Delay [s]	46.39	5.13	8.66	5.78	36.94	33.62
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.12	0.58	0.78	0.00	5.50	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.17	0.46	0.50	0.00	0.50	0.00
d, Delay for Lane Group [s/veh]	51.52	5.71	9.44	5.78	42.44	33.62
Lane Group LOS	D	A	A	A	D	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.36	8.24	10.18	0.00	4.52	0.00
50th-Percentile Queue Length [ft/ln]	9.03	206.09	254.40	0.00	112.88	0.00
95th-Percentile Queue Length [veh/ln]	0.91	14.78	17.61	0.00	9.05	0.00
95th-Percentile Queue Length [ft/ln]	22.85	369.38	440.28	0.00	226.35	0.00

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Version 7.00-05

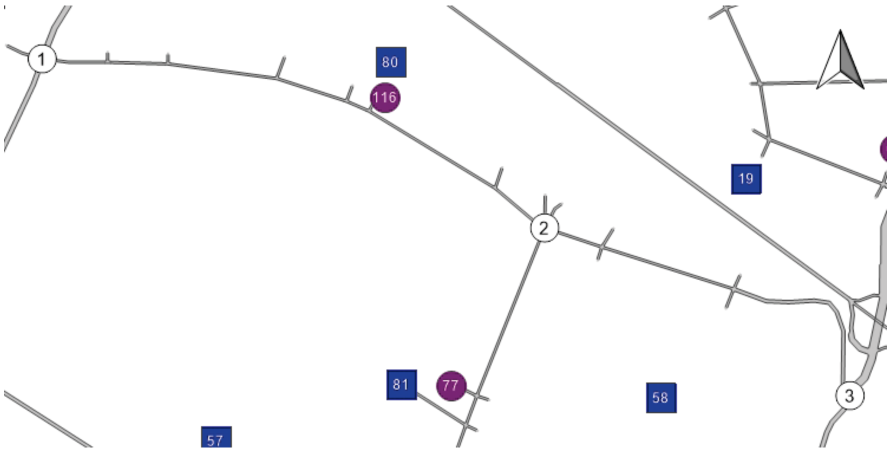
Movement, Approach, & Intersection Results

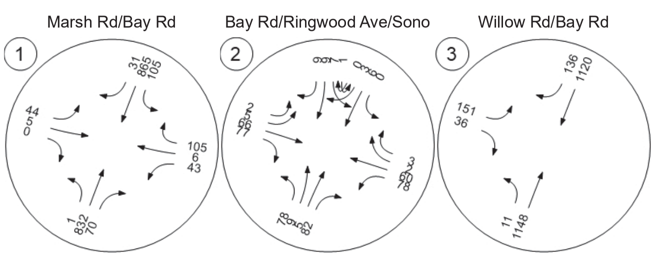
d_M, Delay for Movement [s/veh]	51.52	5.71	9.44	5.78	42.44	33.62
Movement LOS	D	A	A	A	D	C
d_A, Approach Delay [s/veh]	6.16		9.44		42.44	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	9.92					
Intersection LOS	A					
Intersection V/C	0.489					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Traffic Volume - Future Total Volume





Flood County Park Traffic Impact Study

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Report File: N:\...\SAT Near Term - Mitigation.pdf

Scenario 13 Near Term (2021) SAT (Mit)
6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.233	9.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 2000	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.233

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	1	7	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0000	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	7	0	0	0	0	0	0	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	9	5	82	1	7	9	9	2	5	66	77
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	3	2	25	0	2	3	3	1	2	20	23
Total Analysis Volume [veh/h]	94	11	6	99	1	8	11	11	2	6	80	93
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	605	736	650	801
Degree of Utilization, x	0.16	0.16	0.05	0.23

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.55	0.56	0.15	0.87
95th-Percentile Queue Length [ft]	13.67	13.94	3.75	21.65
Approach Delay [s/veh]	9.06		8.81	8.80
Approach LOS	A		A	A
Intersection Delay [s/veh]	9.04			
Intersection LOS	A			

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	3	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0000	1.0000	1.0000	1.0400	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	3	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	60	2	3	0	6	3	0
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	18	1	1	0	2	1	0
Total Analysis Volume [veh/h]	94	72	2	4	0	7	4	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	739	652
Degree of Utilization, x	0.23	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.90	0.05
95th-Percentile Queue Length [ft]	22.49	1.29
Approach Delay [s/veh]	9.35	8.61
Approach LOS	A	A
Intersection Delay [s/veh]	9.04	
Intersection LOS	A	

Flood County Park Traffic Impact Study

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Report File: N:\...\SAT Near Term plus Project.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.569	15.3	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.472	12.2	B
3	Willow Rd/Bay Rd	Signalized	HCM 2000	NB Left	0.516	10.8	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	15.3
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.569

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	1	623	62	101	673	31	44	5	0	38	6	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0400	1.0400	1.0400	1.0000	1.0000	1.0000	1.0000	1.0400	1.0000	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	184	18	22	165	0	0	0	0	15	0	22
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	832	82	127	865	31	44	5	0	55	6	127
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	214	21	33	223	8	11	1	0	14	2	33
Total Analysis Volume [veh/h]	1	858	85	131	892	32	45	5	0	57	6	131
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	68
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	43	43	43	15	58	58	22	22	22	22	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	39	11	54	18	18
g / C, Green / Cycle	0.49	0.14	0.68	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.28	0.07	0.26	0.04	0.13
Total Saturation Flow Adjustment	0.88	0.93	0.93	0.62	0.80
s, saturation flow rate [veh/h]	3340	1770	3528	1173	1524
c, Capacity [veh/h]	1628	243	2382	264	343
d1, Uniform Delay [s]	14.65	32.14	5.72	25.09	27.53
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.51	8.30	0.48	1.59	6.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.58	0.54	0.39	0.19	0.57
d, Delay for Lane Group [s/veh]	16.16	40.43	6.20	26.68	34.15
Lane Group LOS	B	D	A	C	C
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.14	3.15	5.52	1.00	4.46
50th-Percentile Queue Length [ft/ln]	228.41	78.84	138.05	24.90	111.38
95th-Percentile Queue Length [veh/ln]	16.09	6.72	10.67	2.41	8.96
95th-Percentile Queue Length [ft/ln]	402.20	168.11	266.63	60.23	223.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.16	16.16	16.16	40.43	6.20	6.20	26.68	26.68	26.68	34.15	34.15	34.15
Movement LOS	B	B	B	D	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	16.16			10.45			26.68			34.15		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	15.27											
Intersection LOS	B											
Intersection V/C	0.569											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	12.2
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.472

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left	Left	Thru	Right	Left	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	7	1	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0000	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	80	0	0	7	0	0	0	0	0	0	60	80
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	158	9	5	82	7	1	9	9	2	5	120	157
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	3	2	25	2	0	3	3	1	2	36	47
Total Analysis Volume [veh/h]	190	11	6	99	8	1	11	11	2	6	145	189
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	667	611	724
Degree of Utilization, x	0.46	0.05	0.47

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.42	0.16	2.55
95th-Percentile Queue Length [ft]	60.38	3.99	63.73
Approach Delay [s/veh]	12.90	9.20	12.34
Approach LOS	B	A	B
Intersection Delay [s/veh]	12.18		
Intersection LOS	B		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right	Left	Thru	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	0	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0000	1.0000	1.0000	1.0400	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	57	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	114	2	3	0	6	0	3
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	34	1	1	0	2	0	1
Total Analysis Volume [veh/h]	94	137	2	4	0	7	0	4
Pedestrian Volume [ped/h]	0				0			

Generated with PTV VISTRO

Version 7.00-05

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	656	615
Degree of Utilization, x	0.36	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.65	0.05
95th-Percentile Queue Length [ft]	41.13	1.36
Approach Delay [s/veh]	11.56	8.96
Approach LOS	B	A
Intersection Delay [s/veh]	12.18	
Intersection LOS	B	

Generated with PTV VISTRO

Version 7.00-05

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	10.8
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.516

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	10	1024	1022	126	133	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	83	57	37	45	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	21	1148	1120	0	183	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	302	295	0	48	0
Total Analysis Volume [veh/h]	22	1208	1179	0	193	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	8	78	70	70	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	74	66	66	18	18
g / C, Green / Cycle	0.04	0.74	0.66	0.66	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.01	0.34	0.33	0.00	0.11	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	71	2625	2341	1045	319	285
d1, Uniform Delay [s]	46.66	5.13	8.66	5.78	37.74	33.62
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.07	0.58	0.78	0.00	8.30	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.31	0.46	0.50	0.00	0.61	0.00
d, Delay for Lane Group [s/veh]	57.73	5.71	9.44	5.78	46.04	33.62
Lane Group LOS	E	A	A	A	D	C
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.68	8.24	10.18	0.00	5.74	0.00
50th-Percentile Queue Length [ft/ln]	16.99	206.09	254.40	0.00	143.54	0.00
95th-Percentile Queue Length [veh/ln]	1.68	14.78	17.61	0.00	11.01	0.00
95th-Percentile Queue Length [ft/ln]	42.02	369.38	440.28	0.00	275.19	0.00

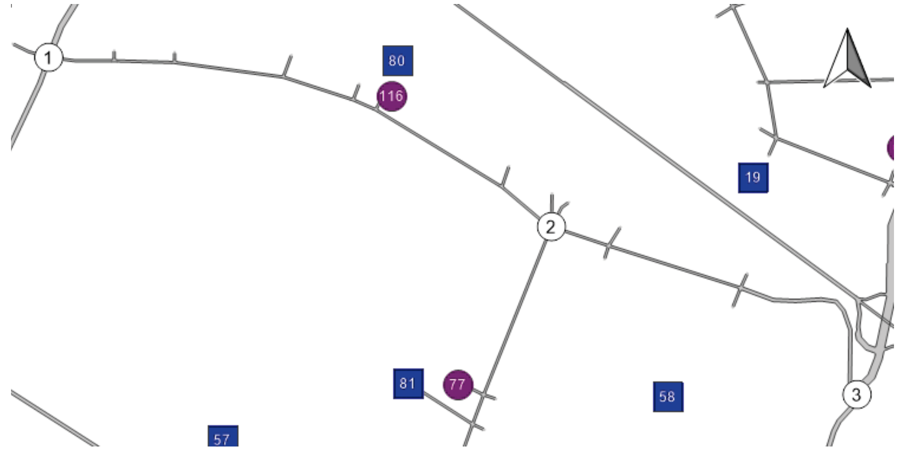
Movement, Approach, & Intersection Results

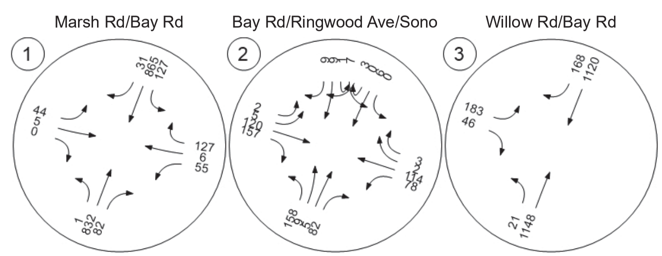
d_M, Delay for Movement [s/veh]	57.73	5.71	9.44	5.78	46.04	33.62
Movement LOS	E	A	A	A	D	C
d_A, Approach Delay [s/veh]	6.64		9.44		46.04	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	10.83					
Intersection LOS	B					
Intersection V/C	0.516					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Traffic Volume - Future Total Volume





Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro — Scenario 14 Near Term (2021) SAT + Project (Mit)

Report File: N:\...\SAT Near Term plus Project - Mitigation.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.472	11.7	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.472

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	1	7	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0000	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	80	0	0	7	0	0	0	0	0	0	60	80
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	158	9	5	82	1	7	9	9	2	5	120	157
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	3	2	25	0	2	3	3	1	2	36	47
Total Analysis Volume [veh/h]	190	11	6	99	1	8	11	11	2	6	145	189
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	547	652	555	725
Degree of Utilization, x	0.35	0.18	0.06	0.47

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.54	0.64	0.18	2.54
95th-Percentile Queue Length [ft]	38.61	16.10	4.43	63.55
Approach Delay [s/veh]	11.49		9.87	12.31
Approach LOS	B		A	B
Intersection Delay [s/veh]	11.73			
Intersection LOS	B			

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	3	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0000	1.0000	1.0000	1.0400	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	57	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	114	2	3	0	6	3	0
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	34	1	1	0	2	1	0
Total Analysis Volume [veh/h]	94	137	2	4	0	7	4	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	658	558
Degree of Utilization, x	0.36	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.64	0.06
95th-Percentile Queue Length [ft]	41.02	1.51
Approach Delay [s/veh]	11.53	9.58
Approach LOS	B	A
Intersection Delay [s/veh]	11.73	
Intersection LOS	B	

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro Scenario 10 Cumulative (2040) SAT

Report File: N:\...\SAT Cumulative.pdf 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.583	16.0	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NB Right	0.323	9.7	A
3	Willow Rd/Bay Rd	Signalized	HCM 2000	NB Left	0.572	10.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	16.0
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.583

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	1	623	62	101	673	31	44	5	0	38	6	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.2200	1.2200	1.2200	1.2200	1.0000	1.0000	1.0000	1.0000	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	188	6	0	170	0	0	0	0	3	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	948	82	123	991	31	44	5	0	49	7	123
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	244	21	32	255	8	11	1	0	13	2	32
Total Analysis Volume [veh/h]	1	977	85	127	1022	32	45	5	0	51	7	127
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	96
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	56	56	56	16	72	72	24	24	24	24	24	24
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	96	96	96	96	96
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	52	12	68	20	20
g / C, Green / Cycle	0.54	0.13	0.71	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.32	0.07	0.30	0.04	0.12
Total Saturation Flow Adjustment	0.88	0.93	0.93	0.59	0.81
s, saturation flow rate [veh/h]	3345	1770	3531	1124	1532
c, Capacity [veh/h]	1812	221	2501	234	319
d1, Uniform Delay [s]	14.78	39.59	5.82	31.48	34.22
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.40	10.41	0.52	2.07	7.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.59	0.57	0.42	0.21	0.58
d, Delay for Lane Group [s/veh]	16.18	50.00	6.34	33.56	41.70
Lane Group LOS	B	D	A	C	D
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	11.59	3.73	7.18	1.22	5.15
50th-Percentile Queue Length [ft/ln]	289.73	93.21	179.50	30.54	128.82
95th-Percentile Queue Length [veh/ln]	19.68	7.73	13.20	2.91	10.08
95th-Percentile Queue Length [ft/ln]	492.11	193.36	329.91	72.78	252.08

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.18	16.18	16.18	50.00	6.34	6.34	33.56	33.56	33.56	41.70	41.70	41.70
Movement LOS	B	B	B	D	A	A	C	C	C	D	D	D
d_A, Approach Delay [s/veh]	16.18			11.04			33.56			41.70		
Approach LOS	B			B			C			D		
d_I, Intersection Delay [s/veh]	15.99											
Intersection LOS	B											
Intersection V/C	0.583											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 2000	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.323

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	1	7	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	7	0	0	0	0	0	0	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	9	5	95	1	7	11	9	2	5	77	90
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	3	2	29	0	2	3	3	1	2	23	27
Total Analysis Volume [veh/h]	111	11	6	114	1	8	13	11	2	6	93	108
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	750	699	780
Degree of Utilization, x	0.32	0.05	0.27

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.40	0.15	1.08
95th-Percentile Queue Length [ft]	34.97	3.71	27.08
Approach Delay [s/veh]	10.07	8.40	9.31
Approach LOS	B	A	A
Intersection Delay [s/veh]	9.69		
Intersection LOS	A		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	3	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	3	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	70	2	3	0	7	3	0
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	21	1	1	0	2	1	0
Total Analysis Volume [veh/h]	110	84	2	4	0	8	4	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	719	701
Degree of Utilization, x	0.28	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.14	0.05
95th-Percentile Queue Length [ft]	28.41	1.31
Approach Delay [s/veh]	9.93	8.23
Approach LOS	A	A
Intersection Delay [s/veh]	9.69	
Intersection LOS	A	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	10.9
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.572

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	10	1024	1022	126	133	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.2200	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	95	68	5	13	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	13	1344	1315	0	175	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	354	346	0	46	0
Total Analysis Volume [veh/h]	14	1415	1384	0	184	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	8	78	70	70	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	74	66	66	18	18
g / C, Green / Cycle	0.04	0.74	0.66	0.66	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.01	0.40	0.39	0.00	0.10	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	71	2625	2341	1045	319	285
d1, Uniform Delay [s]	46.45	5.62	9.48	5.78	37.52	33.62
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.16	0.80	1.11	0.00	7.44	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.20	0.54	0.59	0.00	0.58	0.00
d, Delay for Lane Group [s/veh]	52.61	6.42	10.58	5.78	44.96	33.62
Lane Group LOS	D	A	B	A	D	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.42	10.69	13.25	0.00	5.40	0.00
50th-Percentile Queue Length [ft/ln]	10.59	267.30	331.26	0.00	135.03	0.00
95th-Percentile Queue Length [veh/ln]	1.07	18.37	22.14	0.00	10.48	0.00
95th-Percentile Queue Length [ft/ln]	26.67	459.18	553.42	0.00	261.90	0.00

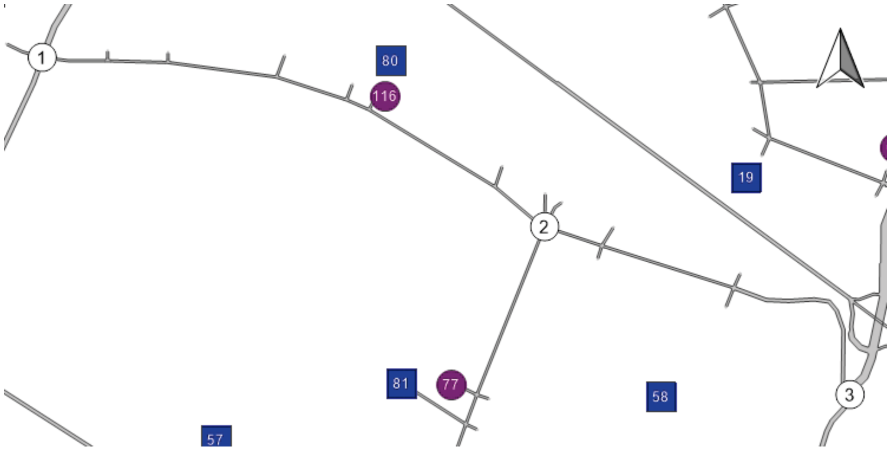
Movement, Approach, & Intersection Results

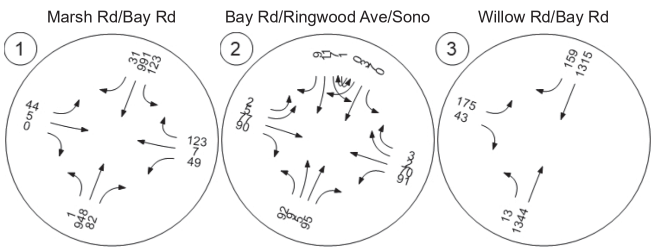
d_M, Delay for Movement [s/veh]	52.61	6.42	10.58	5.78	44.96	33.62
Movement LOS	D	A	B	A	D	C
d_A, Approach Delay [s/veh]	6.88		10.58		44.96	
Approach LOS	A		B		D	
d_I, Intersection Delay [s/veh]	10.93					
Intersection LOS	B					
Intersection V/C	0.572					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Traffic Volume - Future Total Volume





Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro — Scenario 15 Cumulative (2040) SAT (Mit - Turn Lane)

Report File: N:\...\SAT Cumulative - Mitigation Turn Lane.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.279	9.5	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 2000	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.279

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	1	7	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	7	0	0	0	0	0	0	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	9	5	95	1	7	11	9	2	5	77	90
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	3	2	29	0	2	3	3	1	2	23	27
Total Analysis Volume [veh/h]	111	11	6	114	1	8	13	11	2	6	93	108
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	590	715	624	776
Degree of Utilization, x	0.19	0.18	0.05	0.27

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.69	0.67	0.17	1.09
95th-Percentile Queue Length [ft]	17.19	16.66	4.18	27.24
Approach Delay [s/veh]	9.48		9.09	9.34
Approach LOS	A		A	A
Intersection Delay [s/veh]	9.55			
Intersection LOS	A			

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	3	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	3	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	70	2	3	0	7	3	0
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	21	1	1	0	2	1	0
Total Analysis Volume [veh/h]	110	84	2	4	0	8	4	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	717	625
Degree of Utilization, x	0.28	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.14	0.06
95th-Percentile Queue Length [ft]	28.54	1.47
Approach Delay [s/veh]	9.96	8.87
Approach LOS	A	A
Intersection Delay [s/veh]	9.55	
Intersection LOS	A	

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro — Scenario 16 Cumulative (2040) SAT (Mit - Signal)

Report File: N:\...\SAT Cumulative - Mitigation Signal.pdf — 6/4/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	Signalized	HCM 2010	SB Thru	2.731	9.3	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	Signalized	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.731

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left	Thru	Thru	Right	Left2	Left	Thru	Right	Left	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	16	72	1	8	17	13	7	2	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	7	0	0	0	0	0	0	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	9	16	95	1	8	21	13	7	2	77	90
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	3	5	29	0	2	6	4	2	1	23	27
Total Analysis Volume [veh/h]	111	11	19	114	1	10	25	16	8	2	93	108
Presence of On-Street Parking	No			No	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	7	0	4	0	0	0	8	0	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	0	5	0	0	0	5	0	0	0	5	0
Maximum Green [s]	30	0	30	0	0	0	30	0	0	0	30	0
Amber [s]	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
Split [s]	25	0	34	0	0	0	9	0	0	0	38	0
Vehicle Extension [s]	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	5	0	0	0	5	0	0	0	5	0
Pedestrian Clearance [s]	0	0	10	0	0	0	10	0	0	0	10	0
Rest In Walk			No				No				No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No		No				No				No	
Maximum Recall	No		No				No				No	
Pedestrian Recall	No		No				No				No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	29	29	29	29
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	2.00
I2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	9	2	5
g / C, Green / Cycle	0.31	0.31	0.07	0.18
(v / s)_i Volume / Saturation Flow Rate	0.07	0.08	0.99	0.13
s, saturation flow rate [veh/h]	1593	1618	51	1584
c, Capacity [veh/h]	756	497	151	411
d1, Uniform Delay [s]	7.56	7.64	14.60	11.31
k, delay calibration	0.11	0.11	0.43	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.09	0.29	5.11	0.98
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.15	0.27	0.34	0.51
d, Delay for Lane Group [s/veh]	7.65	7.92	19.71	12.29
Lane Group LOS	A	A	B	B
Critical Lane Group	Yes	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.34	0.43	0.50	1.01
50th-Percentile Queue Length [ft/ln]	8.48	10.80	12.47	25.14
95th-Percentile Queue Length [veh/ln]	0.61	0.78	0.90	1.81
95th-Percentile Queue Length [ft/ln]	15.27	19.44	22.44	45.24

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Version 7.00-05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	7.65	0.00	7.92	7.92	0.00	19.71	19.71	19.71	12.29	0.00	12.29	12.29
Movement LOS	A		A	A		B	B	B	B		B	B
d_A, Approach Delay [s/veh]	7.80				19.71				12.29			
Approach LOS	A				B				B			
d_I, Intersection Delay [s/veh]	9.32											
Intersection LOS	A											
Intersection V/C	2.731											

Generated with PTV VISTRO

Version 7.00-05

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration	┓┣							
Turning Movement	Left	Thru	Right	Right	Left	Thru	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	5	0	6	0	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	3	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	70	2	5	0	7	0	3
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	21	1	2	0	2	0	1
Total Analysis Volume [veh/h]	110	84	2	6	0	8	0	4
Presence of On-Street Parking	No			No				
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Permissive	Permissive	Protected	Permissive	Permissive
Signal Group	1	6	0	0	0	0	0	0
Auxiliary Signal Groups								
Lead / Lag	Lead	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	0	0	0	0	0
Maximum Green [s]	30	30	0	0	0	0	0	0
Amber [s]	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	28	66	0	0	0	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0
Rest In Walk		No						
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall	No	No						
Maximum Recall	No	No						
Pedestrian Recall	No	No						
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	
C, Cycle Length [s]	29	29	
L, Total Lost Time per Cycle [s]	4.00	4.00	
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	
I2, Clearance Lost Time [s]	0.00	2.00	
g_i, Effective Green Time [s]	12	12	
g / C, Green / Cycle	0.42	0.42	
(v / s)_i Volume / Saturation Flow Rate	0.08	0.05	
s, saturation flow rate [veh/h]	1422	1841	
c, Capacity [veh/h]	814	771	
d1, Uniform Delay [s]	5.52	5.18	
k, delay calibration	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	
d2, Incremental Delay [s]	0.07	0.07	
d3, Initial Queue Delay [s]	0.00	0.00	
Rp, platoon ratio	1.00	1.00	
PF, progression factor	1.00	1.00	

Lane Group Results

X, volume / capacity	0.14	0.12	
d, Delay for Lane Group [s/veh]	5.59	5.25	
Lane Group LOS	A	A	
Critical Lane Group	Yes	No	
50th-Percentile Queue Length [veh/ln]	0.23	0.19	
50th-Percentile Queue Length [ft/ln]	5.74	4.65	
95th-Percentile Queue Length [veh/ln]	0.41	0.33	
95th-Percentile Queue Length [ft/ln]	10.33	8.37	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.59	5.25	0.00	5.25	0.00	0.00	0.00	0.00
Movement LOS	A	A		A				
d_A, Approach Delay [s/veh]	5.44				0.00			
Approach LOS	A				A			
d_I, Intersection Delay [s/veh]	9.32							
Intersection LOS	A							
Intersection V/C	2.731							

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro
Scenario 11 Cumulative (2040) SAT + Project

Report File: N:\...\SAT Cumulative plus Project.v2.pdf
6/11/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	WB Right	0.708	21.1	C
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	EB Right	0.845	27.2	D
3	Willow Rd/Bay Rd	Signalized	HCM 2000	NB Left	0.617	12.7	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	21.1
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.708

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	1	623	62	101	673	31	44	5	0	38	6	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.2200	1.2200	1.2200	1.2200	1.0000	1.0000	1.0000	1.0000	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	188	58	36	170	0	0	10	0	55	10	36
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	948	134	159	991	31	44	15	0	101	17	159
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	244	35	41	255	8	11	4	0	26	4	41
Total Analysis Volume [veh/h]	1	977	138	164	1022	32	45	15	0	104	18	164
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	96
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	55	55	55	16	71	71	25	25	25	25	25	25
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	96	96	96	96	96
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	51	12	67	21	21
g / C, Green / Cycle	0.53	0.13	0.70	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.34	0.09	0.30	0.05	0.19
Total Saturation Flow Adjustment	0.87	0.93	0.93	0.59	0.79
s, saturation flow rate [veh/h]	3323	1770	3531	1119	1495
c, Capacity [veh/h]	1765	221	2464	245	327
d1, Uniform Delay [s]	15.88	40.50	6.24	30.96	36.23
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.73	19.92	0.54	2.37	26.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.63	0.74	0.43	0.25	0.87
d, Delay for Lane Group [s/veh]	17.61	60.42	6.79	33.33	62.45
Lane Group LOS	B	E	A	C	E
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	12.90	5.26	7.42	1.46	9.92
50th-Percentile Queue Length [ft/ln]	322.45	131.45	185.38	36.62	247.88
95th-Percentile Queue Length [veh/ln]	21.61	10.25	13.55	3.44	17.23
95th-Percentile Queue Length [ft/ln]	540.37	256.24	338.67	85.91	430.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	17.61	17.61	17.61	60.42	6.79	6.79	33.33	33.33	33.33	62.45	62.45	62.45
Movement LOS	B	B	B	E	A	A	C	C	C	E	E	E
d_A, Approach Delay [s/veh]	17.61			14.01			33.33			62.45		
Approach LOS	B			B			C			E		
d_I, Intersection Delay [s/veh]	21.11											
Intersection LOS	C											
Intersection V/C	0.708											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	27.2
Analysis Method:	HCM 2000	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.845

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	1	7	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	166	0	0	7	0	0	0	0	0	0	94	166
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	258	9	5	95	1	7	11	9	2	5	165	256
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	78	3	2	29	0	2	3	3	1	2	50	77
Total Analysis Volume [veh/h]	311	11	6	114	1	8	13	11	2	6	199	308
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	566	470	609
Degree of Utilization, x	0.78	0.07	0.84

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	7.28	0.23	9.19
95th-Percentile Queue Length [ft]	181.88	5.65	229.86
Approach Delay [s/veh]	28.36	11.25	32.87
Approach LOS	D	B	D
Intersection Delay [s/veh]	27.15		
Intersection LOS	D		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	3	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	91	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	158	2	3	0	7	3	0
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	48	1	1	0	2	1	0
Total Analysis Volume [veh/h]	110	190	2	4	0	8	4	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	538	473
Degree of Utilization, x	0.57	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.53	0.08
95th-Percentile Queue Length [ft]	88.21	1.95
Approach Delay [s/veh]	18.15	10.81
Approach LOS	C	B
Intersection Delay [s/veh]	27.15	
Intersection LOS	D	

Generated with PTV VISTRO
Version 7.00-05

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	12.7
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.617

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	10	1024	1022	126	133	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.2200	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	17	95	68	57	65	16
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	29	1344	1315	0	227	12
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	354	346	0	60	3
Total Analysis Volume [veh/h]	31	1415	1384	0	239	13
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Generated with PTV VISTRO
Version 7.00-05

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	8	78	70	70	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	74	66	66	18	18
g / C, Green / Cycle	0.04	0.74	0.66	0.66	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.02	0.40	0.39	0.00	0.14	0.01
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	71	2625	2341	1045	319	285
d1, Uniform Delay [s]	46.90	5.62	9.48	5.78	38.87	33.90
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	18.47	0.80	1.11	0.00	14.98	0.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.54	0.59	0.00	0.75	0.05
d, Delay for Lane Group [s/veh]	65.37	6.42	10.58	5.78	53.85	34.20
Lane Group LOS	E	A	B	A	D	C
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.99	10.69	13.25	0.00	7.74	0.32
50th-Percentile Queue Length [ft/ln]	24.68	267.30	331.26	0.00	193.55	8.07
95th-Percentile Queue Length [veh/ln]	2.39	18.37	22.14	0.00	14.03	0.82
95th-Percentile Queue Length [ft/ln]	59.75	459.18	553.42	0.00	350.83	20.49

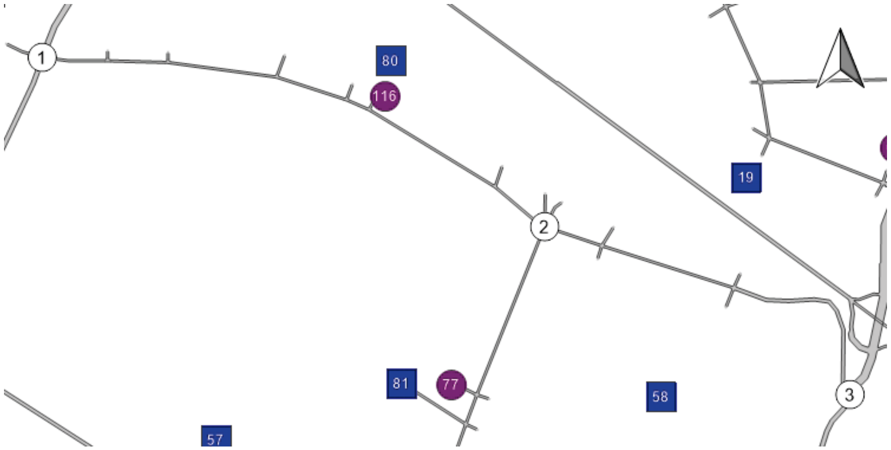
Movement, Approach, & Intersection Results

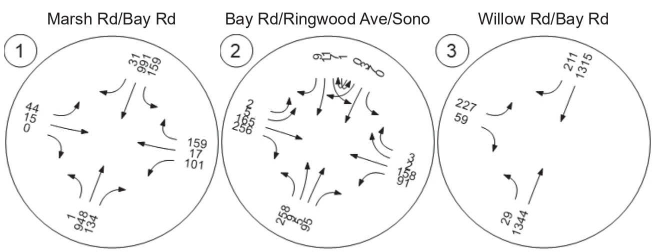
d_M, Delay for Movement [s/veh]	65.37	6.42	10.58	5.78	53.85	34.20
Movement LOS	E	A	B	A	D	C
d_A, Approach Delay [s/veh]	7.69		10.58		52.84	
Approach LOS	A		B		D	
d_I, Intersection Delay [s/veh]	12.68					
Intersection LOS	B					
Intersection V/C	0.617					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Traffic Volume - Future Total Volume





Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro | Scenario 17 Cumulative (2040) SAT + Project (Mit - Turn Lane)

Report File: N:\...\SAT Cumulative plus Project - Mitigation Turn Lane.v2.pdf | 6/11/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	EB Right	0.821	22.6	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	22.6
Analysis Method:	HCM 2000	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.821

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	1	7	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	166	0	0	7	0	0	0	0	0	0	94	166
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	258	9	5	95	1	7	11	9	2	5	165	256
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	78	3	2	29	0	2	3	3	1	2	50	77
Total Analysis Volume [veh/h]	311	11	6	114	1	8	13	11	2	6	199	308
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	483	565	445	627
Degree of Utilization, x	0.64	0.23	0.07	0.82

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.49	0.89	0.24	8.55
95th-Percentile Queue Length [ft]	112.28	22.27	5.97	213.63
Approach Delay [s/veh]	19.21		11.72	29.61
Approach LOS	C		B	D
Intersection Delay [s/veh]	22.59			
Intersection LOS	C			

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	3	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	91	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	158	2	3	0	7	3	0
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	48	1	1	0	2	1	0
Total Analysis Volume [veh/h]	110	190	2	4	0	8	4	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	553	450
Degree of Utilization, x	0.55	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.35	0.08
95th-Percentile Queue Length [ft]	83.82	2.05
Approach Delay [s/veh]	17.28	11.23
Approach LOS	C	B
Intersection Delay [s/veh]	22.59	
Intersection LOS	C	

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro — Scenario 18 Cumulative (2040) SAT + Project (Mit - Signal)

Report File: N:\...\SAT Cumulative plus Project - Mitigation Signal.v2.pdf — 6/11/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Bay Rd/Ringwood Ave/Sonoma Ave	Signalized	HCM 2010	SB Thru	1.466	14.7	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	Signalized	Delay (sec / veh):	14.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.466

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left	Thru	Thru	Right	Left2	Left	Thru	Right	Left	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	16	72	1	8	17	13	7	2	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	166	0	0	7	0	0	0	0	0	0	94	166
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	258	9	16	95	1	8	21	13	7	2	165	256
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	78	3	5	29	0	2	6	4	2	1	50	77
Total Analysis Volume [veh/h]	311	11	19	114	1	10	25	16	8	2	199	308
Presence of On-Street Parking	No			No	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	7	0	4	0	0	0	8	0	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	0	5	0	0	0	5	0	0	0	5	0
Maximum Green [s]	30	0	30	0	0	0	30	0	0	0	30	0
Amber [s]	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
Split [s]	36	0	45	0	0	0	9	0	0	0	42	0
Vehicle Extension [s]	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	5	0	0	0	5	0	0	0	5	0
Pedestrian Clearance [s]	0	0	10	0	0	0	10	0	0	0	10	0
Rest In Walk			No				No				No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No		No				No				No	
Maximum Recall	No		No				No				No	
Pedestrian Recall	No		No				No				No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	50	50	50	50
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	2.00
I2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	3	18
g / C, Green / Cycle	0.33	0.33	0.06	0.35
(v / s)_i Volume / Saturation Flow Rate	0.19	0.08	0.50	0.31
s, saturation flow rate [veh/h]	1655	1618	103	1674
c, Capacity [veh/h]	683	533	91	666
d1, Uniform Delay [s]	13.85	12.35	24.91	15.15
k, delay calibration	0.11	0.11	0.33	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.48	0.24	15.36	1.96
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.46	0.25	0.56	0.77
d, Delay for Lane Group [s/veh]	14.32	12.59	40.27	17.11
Lane Group LOS	B	B	D	B
Critical Lane Group	Yes	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	2.53	0.98	0.98	4.92
50th-Percentile Queue Length [ft/ln]	63.37	24.38	24.54	123.03
95th-Percentile Queue Length [veh/ln]	4.56	1.76	1.77	8.56
95th-Percentile Queue Length [ft/ln]	114.07	43.89	44.17	213.98

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.32	0.00	12.59	12.59	0.00	40.27	40.27	40.27	17.11	0.00	17.11	17.11
Movement LOS	B		B	B		D	D	D	B		B	B
d_A, Approach Delay [s/veh]	13.80					40.27			17.11			
Approach LOS	B					D			B			
d_I, Intersection Delay [s/veh]	14.68											
Intersection LOS	B											
Intersection V/C	1.466											

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right	Left	Thru	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	5	0	6	0	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	91	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	158	2	5	0	7	0	3
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	48	1	2	0	2	0	1
Total Analysis Volume [veh/h]	110	190	2	6	0	8	0	4
Presence of On-Street Parking	No			No				
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Permissive	Permissive	Protected	Permissive	Permissive
Signal Group	1	6	0	0	0	0	0	0
Auxiliary Signal Groups								
Lead / Lag	Lead	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	0	0	0	0	0
Maximum Green [s]	30	30	0	0	0	0	0	0
Amber [s]	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	13	55	0	0	0	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0
Rest In Walk		No						
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall	No	No						
Maximum Recall	No	No						
Pedestrian Recall	No	No						
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	
C, Cycle Length [s]	50	50	
L, Total Lost Time per Cycle [s]	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	
g_i, Effective Green Time [s]	26	26	
g / C, Green / Cycle	0.51	0.51	
(v / s)_i Volume / Saturation Flow Rate	0.10	0.11	
s, saturation flow rate [veh/h]	1093	1853	
c, Capacity [veh/h]	517	948	
d1, Uniform Delay [s]	8.77	6.72	
k, delay calibration	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	
d2, Incremental Delay [s]	0.20	0.11	
d3, Initial Queue Delay [s]	0.00	0.00	
Rp, platoon ratio	1.00	1.00	
PF, progression factor	1.00	1.00	

Lane Group Results

X, volume / capacity	0.21	0.21	
d, Delay for Lane Group [s/veh]	8.98	6.83	
Lane Group LOS	A	A	
Critical Lane Group	Yes	No	
50th-Percentile Queue Length [veh/ln]	0.49	0.89	
50th-Percentile Queue Length [ft/ln]	12.28	22.30	
95th-Percentile Queue Length [veh/ln]	0.88	1.61	
95th-Percentile Queue Length [ft/ln]	22.11	40.14	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	8.98	6.83	0.00	6.83	0.00	0.00	0.00	0.00
Movement LOS	A	A		A				
d_A, Approach Delay [s/veh]	7.60				0.00			
Approach LOS	A				A			
d_I, Intersection Delay [s/veh]	14.68							
Intersection LOS	B							
Intersection V/C	1.466							

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro
Scenario 19 Cumulative (2040) SAT + Project Alternative

Report File: N:\...\SAT Cumulative plus Project Alternative.pdf
6/11/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.658	18.6	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	NBL2	0.579	14.8	B
3	Willow Rd/Bay Rd	Signalized	HCM 2000	NB Left	0.599	11.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	18.6
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	1	623	62	101	673	31	44	5	0	38	6	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.2200	1.2200	1.2200	1.2200	1.0000	1.0000	1.0000	1.0000	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	188	37	22	170	0	0	6	0	34	6	22
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	948	113	145	991	31	44	11	0	80	13	145
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	244	29	37	255	8	11	3	0	21	3	37
Total Analysis Volume [veh/h]	1	977	116	149	1022	32	45	11	0	82	13	149
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	96
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	55	55	55	16	71	71	25	25	25	25	25	25
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

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Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	96	96	96	96	96
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	51	12	67	21	21
g / C, Green / Cycle	0.53	0.13	0.70	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.33	0.08	0.30	0.05	0.16
Total Saturation Flow Adjustment	0.88	0.93	0.93	0.59	0.79
s, saturation flow rate [veh/h]	3332	1770	3531	1124	1494
c, Capacity [veh/h]	1770	221	2464	246	327
d1, Uniform Delay [s]	15.70	40.13	6.24	30.83	35.02
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.63	15.22	0.54	2.15	14.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.62	0.67	0.43	0.23	0.75
d, Delay for Lane Group [s/veh]	17.33	55.35	6.79	32.98	49.43
Lane Group LOS	B	E	A	C	D
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	12.46	4.59	7.42	1.36	7.49
50th-Percentile Queue Length [ft/ln]	311.52	114.63	185.38	33.98	187.30
95th-Percentile Queue Length [veh/ln]	20.97	9.17	13.55	3.21	13.66
95th-Percentile Queue Length [ft/ln]	524.20	229.22	338.67	80.26	341.54

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	17.33	17.33	17.33	55.35	6.79	6.79	32.98	32.98	32.98	49.43	49.43	49.43
Movement LOS	B	B	B	E	A	A	C	C	C	D	D	D
d_A, Approach Delay [s/veh]	17.33			12.80			32.98			49.43		
Approach LOS	B			B			C			D		
d_I, Intersection Delay [s/veh]	18.59											
Intersection LOS	B											
Intersection V/C	0.658											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	14.8
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.579

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	1	7	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	100	0	0	7	0	0	0	0	0	0	60	100
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	192	9	5	95	1	7	11	9	2	5	131	190
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	3	2	29	0	2	3	3	1	2	39	57
Total Analysis Volume [veh/h]	231	11	6	114	1	8	13	11	2	6	158	229
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	633	561	682
Degree of Utilization, x	0.57	0.06	0.58

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.63	0.19	3.74
95th-Percentile Queue Length [ft]	90.64	4.67	93.54
Approach Delay [s/veh]	16.03	9.82	15.29
Approach LOS	C	A	C
Intersection Delay [s/veh]	14.80		
Intersection LOS	B		

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Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	3	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	57	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	124	2	3	0	7	3	0
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	37	1	1	0	2	1	0
Total Analysis Volume [veh/h]	110	149	2	4	0	8	4	0
Pedestrian Volume [ped/h]	0				0			

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Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	613	564
Degree of Utilization, x	0.43	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.17	0.07
95th-Percentile Queue Length [ft]	54.34	1.63
Approach Delay [s/veh]	13.26	9.53
Approach LOS	B	A
Intersection Delay [s/veh]	14.80	
Intersection LOS	B	

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Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	11.9
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.599

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	10	1024	1022	126	133	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.2200	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	95	68	37	45	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	23	1344	1315	0	207	6
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	354	346	0	54	2
Total Analysis Volume [veh/h]	24	1415	1384	0	218	6
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

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Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	8	78	70	70	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

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Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	74	66	66	18	18
g / C, Green / Cycle	0.04	0.74	0.66	0.66	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.01	0.40	0.39	0.00	0.12	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	71	2625	2341	1045	319	285
d1, Uniform Delay [s]	46.71	5.62	9.48	5.78	38.34	33.75
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.52	0.80	1.11	0.00	11.35	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.54	0.59	0.00	0.68	0.02
d, Delay for Lane Group [s/veh]	59.23	6.42	10.58	5.78	49.69	33.88
Lane Group LOS	E	A	B	A	D	C
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.75	10.69	13.25	0.00	6.76	0.15
50th-Percentile Queue Length [ft/ln]	18.65	267.30	331.26	0.00	169.10	3.70
95th-Percentile Queue Length [veh/ln]	1.84	18.37	22.14	0.00	12.57	0.38
95th-Percentile Queue Length [ft/ln]	45.91	459.18	553.42	0.00	314.27	9.52

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	59.23	6.42	10.58	5.78	49.69	33.88
Movement LOS	E	A	B	A	D	C
d_A, Approach Delay [s/veh]	7.30		10.58		49.27	
Approach LOS	A		B		D	
d_I, Intersection Delay [s/veh]	11.88					
Intersection LOS	B					
Intersection V/C	0.599					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro

Scenario 20 Cumulative (2040) SAT + Project Alternative (Mit - Turn Lane)

Report File: N:\...\SAT Cumulative plus Project Alternative - Mitigation Turn Lane.pdf

6/11/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.658	18.6	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 2000	EB Right	0.573	13.7	B
3	Willow Rd/Bay Rd	Signalized	HCM 2000	NB Left	0.599	11.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	18.6
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	1	623	62	101	673	31	44	5	0	38	6	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.2200	1.2200	1.2200	1.2200	1.0000	1.0000	1.0000	1.0000	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	188	37	22	170	0	0	6	0	34	6	22
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	948	113	145	991	31	44	11	0	80	13	145
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	244	29	37	255	8	11	3	0	21	3	37
Total Analysis Volume [veh/h]	1	977	116	149	1022	32	45	11	0	82	13	149
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	96
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	55	55	55	16	71	71	25	25	25	25	25	25
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	96	96	96	96	96
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	51	12	67	21	21
g / C, Green / Cycle	0.53	0.13	0.70	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.33	0.08	0.30	0.05	0.16
Total Saturation Flow Adjustment	0.88	0.93	0.93	0.59	0.79
s, saturation flow rate [veh/h]	3332	1770	3531	1124	1494
c, Capacity [veh/h]	1770	221	2464	246	327
d1, Uniform Delay [s]	15.70	40.13	6.24	30.83	35.02
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.63	15.22	0.54	2.15	14.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.62	0.67	0.43	0.23	0.75
d, Delay for Lane Group [s/veh]	17.33	55.35	6.79	32.98	49.43
Lane Group LOS	B	E	A	C	D
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	12.46	4.59	7.42	1.36	7.49
50th-Percentile Queue Length [ft/ln]	311.52	114.63	185.38	33.98	187.30
95th-Percentile Queue Length [veh/ln]	20.97	9.17	13.55	3.21	13.66
95th-Percentile Queue Length [ft/ln]	524.20	229.22	338.67	80.26	341.54

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	17.33	17.33	17.33	55.35	6.79	6.79	32.98	32.98	32.98	49.43	49.43	49.43
Movement LOS	B	B	B	E	A	A	C	C	C	D	D	D
d_A, Approach Delay [s/veh]	17.33			12.80			32.98			49.43		
Approach LOS	B			B			C			D		
d_I, Intersection Delay [s/veh]	18.59											
Intersection LOS	B											
Intersection V/C	0.658											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	13.7
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.573

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	5	72	1	7	9	9	2	5	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	100	0	0	7	0	0	0	0	0	0	60	100
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	192	9	5	95	1	7	11	9	2	5	131	190
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	3	2	29	0	2	3	3	1	2	39	57
Total Analysis Volume [veh/h]	231	11	6	114	1	8	13	11	2	6	158	229
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	525	622	517	689
Degree of Utilization, x	0.44	0.21	0.06	0.57

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.23	0.79	0.20	3.67
95th-Percentile Queue Length [ft]	55.63	19.74	5.10	91.63
Approach Delay [s/veh]	13.10		10.44	15.01
Approach LOS	B		B	C
Intersection Delay [s/veh]	13.68			
Intersection LOS	B			

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	3	0	6	3	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	57	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	124	2	3	0	7	3	0
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	37	1	1	0	2	1	0
Total Analysis Volume [veh/h]	110	149	2	4	0	8	4	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	620	520
Degree of Utilization, x	0.43	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.14	0.07
95th-Percentile Queue Length [ft]	53.44	1.77
Approach Delay [s/veh]	13.08	10.10
Approach LOS	B	B
Intersection Delay [s/veh]	13.68	
Intersection LOS	B	

Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	11.9
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.599

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	10	1024	1022	126	133	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.2200	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	95	68	37	45	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	23	1344	1315	0	207	6
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	354	346	0	54	2
Total Analysis Volume [veh/h]	24	1415	1384	0	218	6
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	8	78	70	70	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	74	66	66	18	18
g / C, Green / Cycle	0.04	0.74	0.66	0.66	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.01	0.40	0.39	0.00	0.12	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	71	2625	2341	1045	319	285
d1, Uniform Delay [s]	46.71	5.62	9.48	5.78	38.34	33.75
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.52	0.80	1.11	0.00	11.35	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.54	0.59	0.00	0.68	0.02
d, Delay for Lane Group [s/veh]	59.23	6.42	10.58	5.78	49.69	33.88
Lane Group LOS	E	A	B	A	D	C
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.75	10.69	13.25	0.00	6.76	0.15
50th-Percentile Queue Length [ft/ln]	18.65	267.30	331.26	0.00	169.10	3.70
95th-Percentile Queue Length [veh/ln]	1.84	18.37	22.14	0.00	12.57	0.38
95th-Percentile Queue Length [ft/ln]	45.91	459.18	553.42	0.00	314.27	9.52

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	59.23	6.42	10.58	5.78	49.69	33.88
Movement LOS	E	A	B	A	D	C
d_A, Approach Delay [s/veh]	7.30		10.58		49.27	
Approach LOS	A		B		D	
d_I, Intersection Delay [s/veh]	11.88					
Intersection LOS	B					
Intersection V/C	0.599					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Flood County Park Traffic Impact Study

Vistro File: N:\...\SMX013 SAT-SCB - 1.vistro

Scenario 21 Cumulative (2040) SAT + Project Alternative (Mit - Siganl)

Report File: N:\...\SAT Cumulative plus Project Alternative - Mitigation Signal.pdf

6/11/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Marsh Rd/Bay Rd	Signalized	HCM 2000	SB Left	0.658	18.6	B
2	Bay Rd/Ringwood Ave/Sonoma Ave	Signalized	HCM 2010	SB Thru	0.791	11.8	B
3	Willow Rd/Bay Rd	Signalized	HCM 2000	NB Left	0.599	11.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 1: Marsh Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	18.6
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	260.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Marsh Road			Marsh Road			Bay Road			Bay Road		
Base Volume Input [veh/h]	1	623	62	101	673	31	44	5	0	38	6	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.2200	1.2200	1.2200	1.2200	1.0000	1.0000	1.0000	1.0000	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	188	37	22	170	0	0	6	0	34	6	22
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	948	113	145	991	31	44	11	0	80	13	145
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	244	29	37	255	8	11	3	0	21	3	37
Total Analysis Volume [veh/h]	1	977	116	149	1022	32	45	11	0	82	13	149
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

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Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	96
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Green [s]	18	18	18	15	29	29	19	19	19	19	19	19
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	55	55	55	16	71	71	25	25	25	25	25	25
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	1	1	1	0	1	1	1	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall		No		No	No			No			No	
Maximum Recall		No		No	No			No			No	
Pedestrian Recall		No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	C
C, Cycle Length [s]	96	96	96	96	96
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	51	12	67	21	21
g / C, Green / Cycle	0.53	0.13	0.70	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.33	0.08	0.30	0.05	0.16
Total Saturation Flow Adjustment	0.88	0.93	0.93	0.59	0.79
s, saturation flow rate [veh/h]	3332	1770	3531	1124	1494
c, Capacity [veh/h]	1770	221	2464	246	327
d1, Uniform Delay [s]	15.70	40.13	6.24	30.83	35.02
k, delay calibration	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.63	15.22	0.54	2.15	14.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.62	0.67	0.43	0.23	0.75
d, Delay for Lane Group [s/veh]	17.33	55.35	6.79	32.98	49.43
Lane Group LOS	B	E	A	C	D
Critical Lane Group	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	12.46	4.59	7.42	1.36	7.49
50th-Percentile Queue Length [ft/ln]	311.52	114.63	185.38	33.98	187.30
95th-Percentile Queue Length [veh/ln]	20.97	9.17	13.55	3.21	13.66
95th-Percentile Queue Length [ft/ln]	524.20	229.22	338.67	80.26	341.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	17.33	17.33	17.33	55.35	6.79	6.79	32.98	32.98	32.98	49.43	49.43	49.43
Movement LOS	B	B	B	E	A	A	C	C	C	D	D	D
d_A, Approach Delay [s/veh]	17.33			12.80			32.98			49.43		
Approach LOS	B			B			C			D		
d_I, Intersection Delay [s/veh]	18.59											
Intersection LOS	B											
Intersection V/C	0.658											

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Intersection Level Of Service Report
Intersection 2: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	Signalized	Delay (sec / veh):	11.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.791

Intersection Setup

Name					Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left	Thru	Thru	Right	Left2	Left	Thru	Right	Left	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	No				No				No			

Volumes

Name					Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	75	9	16	72	1	8	17	13	7	2	58	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.2200	1.0000	1.0000	1.0000	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	100	0	0	7	0	0	0	0	0	0	60	100
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	192	9	16	95	1	8	21	13	7	2	131	190
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	3	5	29	0	2	6	4	2	1	39	57
Total Analysis Volume [veh/h]	231	11	19	114	1	10	25	16	8	2	158	229
Presence of On-Street Parking	No			No	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

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Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	7	0	4	0	0	0	8	0	0	0	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	0	5	0	0	0	5	0	0	0	5	0
Maximum Green [s]	30	0	30	0	0	0	30	0	0	0	30	0
Amber [s]	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
Split [s]	36	0	45	0	0	0	9	0	0	0	42	0
Vehicle Extension [s]	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	5	0	0	0	5	0	0	0	5	0
Pedestrian Clearance [s]	0	0	10	0	0	0	10	0	0	0	10	0
Rest In Walk			No				No				No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No		No				No				No	
Maximum Recall	No		No				No				No	
Pedestrian Recall	No		No				No				No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	41	41	41	41
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	13	3	12
g / C, Green / Cycle	0.33	0.33	0.08	0.29
(v / s)_i Volume / Saturation Flow Rate	0.14	0.08	0.09	0.23
s, saturation flow rate [veh/h]	1604	1618	553	1684
c, Capacity [veh/h]	671	540	153	578
d1, Uniform Delay [s]	10.81	10.05	18.16	13.64
k, delay calibration	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.30	0.24	1.27	1.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.25	0.33	0.68
d, Delay for Lane Group [s/veh]	11.11	10.29	19.42	15.07
Lane Group LOS	B	B	B	B
Critical Lane Group	Yes	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	1.32	0.73	0.46	2.89
50th-Percentile Queue Length [ft/ln]	33.12	18.18	11.62	72.15
95th-Percentile Queue Length [veh/ln]	2.38	1.31	0.84	5.19
95th-Percentile Queue Length [ft/ln]	59.62	32.73	20.92	129.87

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.11	0.00	10.29	10.29	0.00	19.42	19.42	19.42	15.07	0.00	15.07	15.07
Movement LOS	B		B	B		B	B	B	B		B	B
d_A, Approach Delay [s/veh]	10.81				19.42				15.07			
Approach LOS	B				B				B			
d_I, Intersection Delay [s/veh]	11.80											
Intersection LOS	B											
Intersection V/C	0.791											

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Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right	Left	Thru	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	No				No			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	72	55	2	5	0	6	0	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.0000	1.0000	1.0000	1.2200	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	57	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	124	2	5	0	7	0	3
Peak Hour Factor	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300	0.8300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	37	1	2	0	2	0	1
Total Analysis Volume [veh/h]	110	149	2	6	0	8	0	4
Presence of On-Street Parking	No			No				
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

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Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Permissive	Permissive	Protected	Permissive	Permissive
Signal Group	1	6	0	0	0	0	0	0
Auxiliary Signal Groups								
Lead / Lag	Lead	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	0	0	0	0	0
Maximum Green [s]	30	30	0	0	0	0	0	0
Amber [s]	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	13	55	0	0	0	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0
Rest In Walk		No						
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall	No	No						
Maximum Recall	No	No						
Pedestrian Recall	No	No						
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

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Lane Group Calculations

Lane Group	L	C	
C, Cycle Length [s]	41	41	
L, Total Lost Time per Cycle [s]	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	
g_i, Effective Green Time [s]	20	20	
g / C, Green / Cycle	0.48	0.48	
(v / s)_i Volume / Saturation Flow Rate	0.09	0.08	
s, saturation flow rate [veh/h]	1215	1850	
c, Capacity [veh/h]	611	877	
d1, Uniform Delay [s]	7.32	6.28	
k, delay calibration	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	
d2, Incremental Delay [s]	0.14	0.10	
d3, Initial Queue Delay [s]	0.00	0.00	
Rp, platoon ratio	1.00	1.00	
PF, progression factor	1.00	1.00	

Lane Group Results

X, volume / capacity	0.18	0.18	
d, Delay for Lane Group [s/veh]	7.46	6.37	
Lane Group LOS	A	A	
Critical Lane Group	Yes	No	
50th-Percentile Queue Length [veh/ln]	0.38	0.54	
50th-Percentile Queue Length [ft/ln]	9.50	13.44	
95th-Percentile Queue Length [veh/ln]	0.68	0.97	
95th-Percentile Queue Length [ft/ln]	17.11	24.18	

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Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	7.46	6.37	0.00	6.37	0.00	0.00	0.00	0.00
Movement LOS	A	A		A				
d_A, Approach Delay [s/veh]	6.82				0.00			
Approach LOS	A				A			
d_I, Intersection Delay [s/veh]	11.80							
Intersection LOS	B							
Intersection V/C	0.791							

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Intersection Level Of Service Report
Intersection 3: Willow Rd/Bay Rd

Control Type:	Signalized	Delay (sec / veh):	11.9
Analysis Method:	HCM 2000	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.599

Intersection Setup

Name	Willow Road		Willow Road		Bay Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	80.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Willow Road		Willow Road		Bay Road	
Base Volume Input [veh/h]	10	1024	1022	126	133	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.2200	1.2200	1.2200	1.2200	1.2200	1.2200
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	95	68	37	45	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	223	0	47
Total Hourly Volume [veh/h]	23	1344	1315	0	207	6
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	354	346	0	54	2
Total Analysis Volume [veh/h]	24	1415	1384	0	218	6
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

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Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	4	4	4	4	4	4
Maximum Green [s]	4	24	16	16	16	16
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	8	78	70	70	22	22
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	1	1	1	1	1
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	74	66	66	18	18
g / C, Green / Cycle	0.04	0.74	0.66	0.66	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.01	0.40	0.39	0.00	0.12	0.00
Total Saturation Flow Adjustment	0.93	0.93	0.93	0.83	0.93	0.83
s, saturation flow rate [veh/h]	1770	3547	3547	1583	1770	1583
c, Capacity [veh/h]	71	2625	2341	1045	319	285
d1, Uniform Delay [s]	46.71	5.62	9.48	5.78	38.34	33.75
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.52	0.80	1.11	0.00	11.35	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.54	0.59	0.00	0.68	0.02
d, Delay for Lane Group [s/veh]	59.23	6.42	10.58	5.78	49.69	33.88
Lane Group LOS	E	A	B	A	D	C
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.75	10.69	13.25	0.00	6.76	0.15
50th-Percentile Queue Length [ft/ln]	18.65	267.30	331.26	0.00	169.10	3.70
95th-Percentile Queue Length [veh/ln]	1.84	18.37	22.14	0.00	12.57	0.38
95th-Percentile Queue Length [ft/ln]	45.91	459.18	553.42	0.00	314.27	9.52

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	59.23	6.42	10.58	5.78	49.69	33.88
Movement LOS	E	A	B	A	D	C
d_A, Approach Delay [s/veh]	7.30		10.58		49.27	
Approach LOS	A		B		D	
d_I, Intersection Delay [s/veh]	11.88					
Intersection LOS	B					
Intersection V/C	0.599					

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix B

Menlo Park Approved/Pending Projects

List of Development Projects Based on Applications Received before or near November 2016

PROJECT ADDRESS	TYPE OF USE	SIZE	UNITS OF MEASURE	APPROVED OR PENDING	OCCUPIED AS OF NOVEMBER 2016 TRAFFIC COUNTS	STATUS AS OF NOVEMBER 2016	TRAFFIC STUDY PREPARED	TRAFFIC CONSULTANT	PLANNER	PROJECT LOCATION
Commonwealth Corp. Center (151 Commonwealth - Sobrato) 162 & 164 Jefferson Dr	Office Office Warehouse Manufacturing	259,920 -19,173 -55,627 -163,058	sf sf sf sf	Approved	No No No No	Under Construction Proposed Demolition Proposed Demolition Proposed Demolition	Yes	DKS	David Hogan	East of U.S. 101
Mermaid Inn 727 El Camino Real	Hotel Hotel Hotel	8 3,497 39	rooms sf rooms	Approved Existing	Yes Yes	Under Construction (Temporary Occupancy) Hotel sf for reference only Existing	No	n/a	Kyle Perata	West Menlo/Downtown/El Camino Real
Police/City Service Center 1283 Willow Rd	Office Retail	3,800 5,096	sf sf	Approved	No No	Under Construction (Expired building permit) Under Construction (Expired building permit)	No	n/a	Justin Murphy	East of U.S. 101
Anton Menlo 3639 Haven Ave	Residential Manufacturing Warehousing	394 -36,471 -40,837	du sf sf	Approved	No No No	Under Construction Demolished Demolished	Housing Element	TJKM	Deanna Chow	East of U.S. 101
Greanheart 777 Hamilton Ave	Residential Manufacturing	195 -47,999	du sf	Approved	No No	Under Construction Demolished	Housing Element	TJKM	Deanna Chow	East of U.S. 101
Greystar 3645 Haven Ave	Residential Warehouse	146 -15,000	du sf	Approved	No No	Under Construction Demolished	Housing Element	TJKM	Deanna Chow	East of U.S. 101
Sequoia Belle Haven - MidPen 1221 Willow Rd	Residential Residential	90 -48	du du	Approved	No No	Under Construction Demolished	Housing Element	TJKM	Deanna Chow	East of U.S. 101
Facebook Building 23 300 Constitution Dr	Office Warehouse	180,108 -184,438	sf sf	Approved	No No	Under Construction Demolished	No	n/a	Kyle Perata	East of U.S. 101
Laurel Upper School (former O'Connor/GAIS) 275 Elliott Dr	School School	360 -280	students students	Approved	Yes No	Completed Demolished	Yes	Arch Beach Consulting	Menlo Park City School District	West of U.S. 101
Menlo Gateway 100-190 Independence Dr	Office/R&D Health Club Hotel Hotel Office	200,000 41,000 250 197,000 -63,360	sf sf rooms sf sf	Approved	No No No No No	Under Construction Under Construction Under Construction Hotel sf for reference only Demolished	Yes	DKS	Tom Smith	East of U.S. 101
Menlo Gateway 100-155 Constitution Drive	Office Restaurant Office	487,244 7,420 -133,690	sf sf sf	Approved	No No Yes	Approved New Construction Approved New Construction Proposed Demolition	Yes	DKS	Tom Smith	East of U.S. 101

1283-1295 El Camino Real	Residential Office/Retail/Service Office/Retail/Service	15 1,997 -6,471	du sf sf	Approved	No No No	Approved New Construction Approved New Construction Demolished	No	n/a	Thomas Rogers	West Menlo/Downtown/El Camino Real
Roger Reynolds 133 Encinal Ave	Residential Retail	24 -6,166	du sf	Approved	No No	Approved New Construction Proposed Demolition	No	n/a	Jean Lin	West Menlo/Downtown/El Camino Real
1010-1026 Alma St	Office Retail Retail	25,156 324 -10,272	sf sf sf	Approved	No No No	Approved New Construction Approved New Construction Demolished	No	n/a	Jean Lin	West Menlo/Downtown/El Camino Real
1315 O'Brien Dr	R&D Warehouse Manufacturing Office Warehouse Warehouse	113,382 61,338 45,796 -56,002 -162,839 -32,197	sf sf sf sf sf sf	Approved	No No No No No No	Under Construction Under Construction Under Construction Proposed Demolition (Conversion) Proposed Demolition (Conversion) Proposed Demolition	No (TDM Plan)	n/a	Kyle Perata Tom Smith	East of U.S. 101
Pollock Group 1400 El Camino Real	Hotel Hotel Gas Station	61 33,657 -1,932	rooms sf sf	Approved	No No No	Approved New Construction Hotel sf for reference only Demolished	No	n/a	Jean Lin	West Menlo/Downtown/El Camino Real
Minkoff Group 650-660 Live Oak Ave	Office Residential Residential Office	16,854 17 -2 -5,996	sf du du sf	Approved	No No Yes Yes	Approved New Construction Approved New Construction Proposed Demolition Proposed Demolition	No	n/a	Thomas Rogers	West Menlo/Downtown/El Camino Real
1275 El Camino Real	Residential Office Retail	3 9,334 589	du sf sf	Approved	No No No	Approved New Construction Approved New Construction Approved New Construction	No	n/a	Corinna Sandmeier	West Menlo/Downtown/El Camino Real
Facebook Expansion Project 301-309 Constitution Dr	Office Hotel Hotel Manufacturing R&D Office	962,400 200 174,800 -308,142 -76,533 -127,012	sf rooms sf sf sf sf	Approved	No No No No No No	Proposed Construction Proposed Construction Hotel sf for reference only Demolished Demolished Demolished	In progress	TJKM	Kyle Perata	East of U.S. 101
Facebook TE Campus 307-309 Constitution Drive Bldgs 307-309 Demolition	Office R&D Manufacturing	-123,556 -9,588 -191,007	sf sf sf	Approved	No No No	Demolished Demolished Demolished	No	n/a	Kyle Perata	East of U.S. 101
Stanford 500 El Camino Real	Residential Office Retail Temporary Art Gallery Auto Dealer (Vacant)	215 143,900 10,000 -35,275 -35,270	du sf sf sf sf	Pending	No No No Yes No	Proposed Construction Proposed Construction Proposed Construction Proposed Demolition Proposed Demolition	In progress	W-Trans	Jean Lin	West Menlo/Downtown/El Camino Real
SRI 333 Ravenswood Ave	R&D Campus R&D Campus	3,000 1,780	employees employees	Pending Existing	No Yes	Proposed Construction Existing (1500+280)	In progress	W-Trans	Kyle Perata	West Menlo/Downtown/El Camino Real

New Magnet High School 150 Jefferson Dr	School School Light Industrial	40,000 400 -43,986	sf students sf	Pending?	No No ?	Proposed Construction Proposed Construction Proposed Demolition	In progress	Hexagon	Sequoia Union High School District	East of U.S. 101
Greenheart 1300 El Camino Real	Residential Office Retail Dance Studio Fast Food Restaurant Hardware Storage	202 210,000 7,000 -3,800 -1,200 -5,000	du sf sf sf sf sf	Pending	No No No Yes No Yes	Proposed Construction Proposed Construction Proposed Construction Proposed Demolition Proposed Demolition Proposed Demolition	Yes	W-Trans	Thomas Rogers	West Menlo/Downtown/El Camino Real
840 Menlo Ave	Residential Office	3 6,662	du sf	Pending	No No	Proposed Construction Proposed Construction	No	n/a	Yesenia Jimenez	West Menlo/Downtown/El Camino Real
Stanford 2111-2121 Sand Hill Road	Office Office Residence	39,010 48,024 1	sf sf du	Pending Existing Existing	No Yes Yes	Proposed Construction Existing Existing	In progress	Hexagon	Tom Smith	Sharon Heights/Sand Hill
1080 O'Brien Dr	R&D/Office Office	29,040 -20,454	sf sf	Pending	No Yes	Proposed Construction Proposed Demolition	No (TDM Plan)	n/a	Tom Smith	East of U.S. 101
1704 El Camino Real Hampton Inn	Hotel Hotel Hotel Hotel	70 40,060 -10,776 -28	rooms sf sf rooms	Pending	No No Yes Yes	Proposed Construction Hotel sf for reference only Proposed Demolition Proposed Demolition	No	n/a	Corinna Sandmeier	West Menlo/Downtown/El Camino Real
706-716 Santa Cruz Avenue	Residential Office Retail Retail/Restaurant/Bank	4 19,111 13,018 -12,758	du sf sf sf	Pending	No No No Yes	Proposed Construction Proposed Construction Proposed Construction Proposed Demolition	No	n/a	Kaitie Meador	West Menlo/Downtown/El Camino Real

Notes:

Table includes all projects in City of Menlo Park that have filed a complete development application for 5 or more NET NEW residential units or 5,000 sf or more of NET NEW commercial.
Table includes pending and approved projects that were not occupied when traffic counts were performed.
For residential projects, occupancy is based on date of final building inspection.
For commercial projects, occupancy is based on date of final building inspection of applicable tenant improvements.
Some projects involve the demolition of existing structures. Demolished buildings are only listed for projects that receive credit for traffic purposes.
Project location corresponds to the four categories in the CSA as follows from west to east: Sharon Heights/Sand Hill; West Menlo/Downtown/El Camino; West of US 101; and East of US 101.
n/a = not applicable

Appendix C

Trip Generation Assumptions

Flood County Park Trip Generation Assumptions

Travel assumptions are included below.

Note: One cycle is defined as a group of users arriving, utilizing, and departing the park.

Phase 1 – Projected Use

- Synthetic Ballfield/Concession/Press Box
  - 30 players, 45 spectators per game on weekends, 3 cycles per day
  - 30 players, 30 parents on weekdays, 1 cycle per day
  - 2.0 persons per vehicle
  - Assume one cycle occurs during the weekday peak hour
  - Assume two cycles occur during the weekend peak hour
  - Weekend peak hour trip rate: 150 total trips, 75 in/75 out
  - Weekday peak hour trip rate: 60 total trips, 30 in/30 out
- Synthetic Soccer/Lacrosse
  - 30 players, 45 spectators per game on weekends, 3 cycles per day
  - 30 players, 30 parents on weekdays, 1 cycle per day
  - 2.0 persons per vehicle
  - Assume one cycle occurs during the weekday peak hour
  - Assume two cycles occur during the weekend peak hour
  - Weekend peak hour trip rate: 150 total trips, 75 in/75 out
  - Weekday peak hour trip rate: 60 total trips, 30 in/30 out
- Tennis Courts (set of 2)
  - 8 players, 8 people waiting on weekends, 4 cycles per day
  - 8 players, 8 people waiting on weekdays, 2 cycles per day
  - 2.0 persons per vehicle
  - Assume two cycles occur during the weekday peak hour
  - Assume two cycles occur during the weekend peak hour
  - Weekend peak hour trip rate: 32 total trips, 16 in/16 out
  - Weekday peak hour trip rate: 32 total trips, 16 in/16 out
- Sand Volleyball (set of 2)
  - 12 players on weekends, 1 cycle per day
  - No weekday activity
  - 1.2 persons per vehicle
  - Assume one cycle occurs during the weekend peak hour
  - Weekend peak hour trip rate: 20 total trips, 10 in/10 out
- Basketball
  - 10 players, 10 people waiting on weekends, 3 cycles per day
  - 10 players, 10 people waiting on weekdays, 1 cycle per day
  - 1.2 persons per vehicle
  - Assume one cycle occurs during the weekday peak hour
  - Assume two cycles occur during the weekend peak hour
  - Weekend peak hour trip rate: 66 total trips, 33 in/33 out

- Weekday peak hour trip rate: 16 total trips, 8 in/8 out
- Pump Track
  - 30 person maximum capacity on weekends
  - 20 person peak use on weekdays
  - 2.5 persons per vehicle
  - Assume two cycles occur during the weekday peak hour
  - Assume two cycles occur during the weekend peak hour
  - Weekend peak hour trip rate: 48 total trips, 24 in/24 out
  - Weekday peak hour trip rate: 32 total trips, 16 in/16 out

Phase 2 – Projected Use

- Demonstration Garden/Other Passive Uses
  - 15 person maximum capacity on weekends
  - 10 person peak use on weekdays
  - 1.2 persons per vehicle
  - Assume one cycle occurs during the weekday peak hour
  - Assume two cycles occur during the weekend peak hour
  - Weekend peak hour trip rate: 50 total trips per game, 25 in/25 out
  - Weekday peak hour trip rate: 16 total trips per game, 8 in/8 out
- Play Area Universal (2-5)
  - 20 person maximum capacity on weekends
  - 15 person peak use on weekdays
  - 2.0 persons per vehicle
  - Assume two cycles occur during the weekday peak hour
  - Assume two cycles occur during the weekend peak hour
  - Weekend peak hour trip rate: 40 total trips per game, 20 in/20 out
  - Weekday peak hour trip rate: 30 total trips per game, 15 in/15 out
- Play Area Universal (5-12)
  - 40 person maximum capacity on weekends
  - 30 person peak use on weekdays
  - 2.5 persons per vehicle
  - Assume two cycles occur during the weekday peak hour
  - Assume two cycles occur during the weekend peak hour
  - Weekend peak hour trip rate: 64 total trips per game, 32 in/32 out
  - Weekday peak hour trip rate: 32 total trips per game, 16 in/16 out
- Adventure Play
  - 35 person maximum capacity on weekends
  - 20 person peak use on weekdays
  - 2.0 persons per vehicle
  - Assume two cycles occur during the weekday peak hour
  - Assume two cycles occur during the weekend peak hour
  - Weekend peak hour trip rate: 70 total trips per game, 35 in/35 out
  - Weekday peak hour trip rate: 40 total trips per game, 20 in/20 out
- Small Group Picnic
  - 8 areas, 15 people per site on weekends
  - No weekday activity
  - 2.5 persons per vehicle
  - Assume one-quarter of sites are utilized during the weekend peak hour
  - Weekend peak hour trip rate: 96 total trips per game, 48 in/48 out

Phase 3 – Projected Use

- Shade/Market Structure
  - 75 person maximum capacity on weekends
  - No weekday activity
  - 2.5 persons per vehicle
  - Assume one-half of the structure is utilized during the weekend peak hour
  - Weekend peak hour trip rate: 120 total trips per game, 60 in/60 out
- Event/Group Picnic Area
  - 200 person maximum capacity on weekends
  - No weekday activity
  - 2.5 persons per vehicle
  - Assume one-quarter of sites are utilized during the weekend peak hour
  - Weekend peak hour trip rate: 160 total trips per game, 80 in/80 ou

Appendix D

Turn-Lane Warrants

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: Flood County Park Driveway at Bay Road
Study Scenario: PM Near-Term 2021 plus Project

Direction of Analysis Street: East/West

Cross Street Intersects: From the North

Bay Road
Westbound Volumes (veh/hr)
Through Volume = 408
Right Turn Volume = 78

Bay Road
Eastbound Volumes (veh/hr)
272 = Through Volume
28 = Left Turn Volume

Westbound Speed Limit: 30 mph
Westbound Configuration: 2 Lanes - Undivided

Flood County Park

Eastbound Speed Limit: 30 mph
Eastbound Configuration: 2 Lanes - Undivided

Westbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	465
Advancing Volume	Va =	486
If AV<Va then warrant is met		Yes

Right Turn Lane Warranted: **YES**

Westbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

N/A

2. Check advance volume threshold criteria for taper

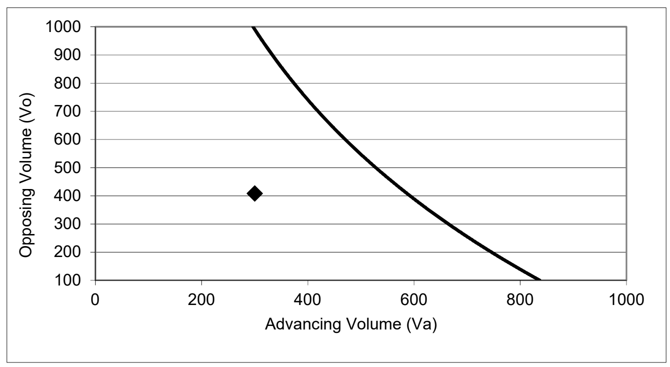
Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	-
If AV<Va then warrant is met		-

Right Turn Taper Warranted: **N/A**

Eastbound Left Turn Lane Warrants

Percentage Left Turns	%lt	9.3 %
Advancing Volume Threshold	AV	587 veh/hr

If AV<Va then warrant is met



◆ Study Intersection
Two lane roadway warrant threshold for: 30 mph
Turn lane warranted if point falls to right of warrant threshold line

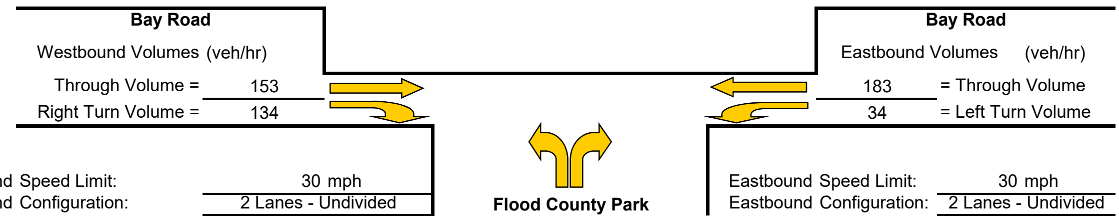
Left Turn Lane Warranted: **NO**

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements*, January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: Flood County Park Driveway at Bay Road
Study Scenario: SAT Near-Term 2021 plus Project

Direction of Analysis Street: East/West
Cross Street Intersects: From the North



Westbound Speed Limit: 30 mph
Westbound Configuration: 2 Lanes - Undivided

Eastbound Speed Limit: 30 mph
Eastbound Configuration: 2 Lanes - Undivided

Westbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	44.9
Advancing Volume	Va =	287
If AV<Va then warrant is met		Yes

Right Turn Lane Warranted: **YES**

Westbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

N/A

2. Check advance volume threshold criteria for taper

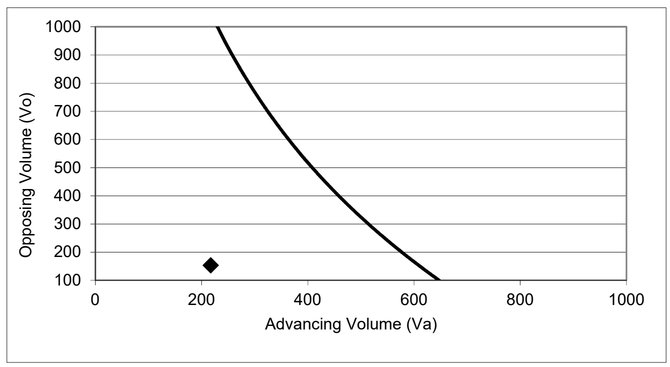
Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	-
If AV<Va then warrant is met		-

Right Turn Taper Warranted: **N/A**

Eastbound Left Turn Lane Warrants

Percentage Left Turns	%lt	15.7 %
Advancing Volume Threshold	AV	609 veh/hr

If AV<Va then warrant is met



◆ Study Intersection
—— Two lane roadway warrant threshold for: 30 mph
Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: **NO**

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements*, January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.

Appendix E

Traffic Signal Warrants

Warrant 3: Peak-Hour Volumes and Delay

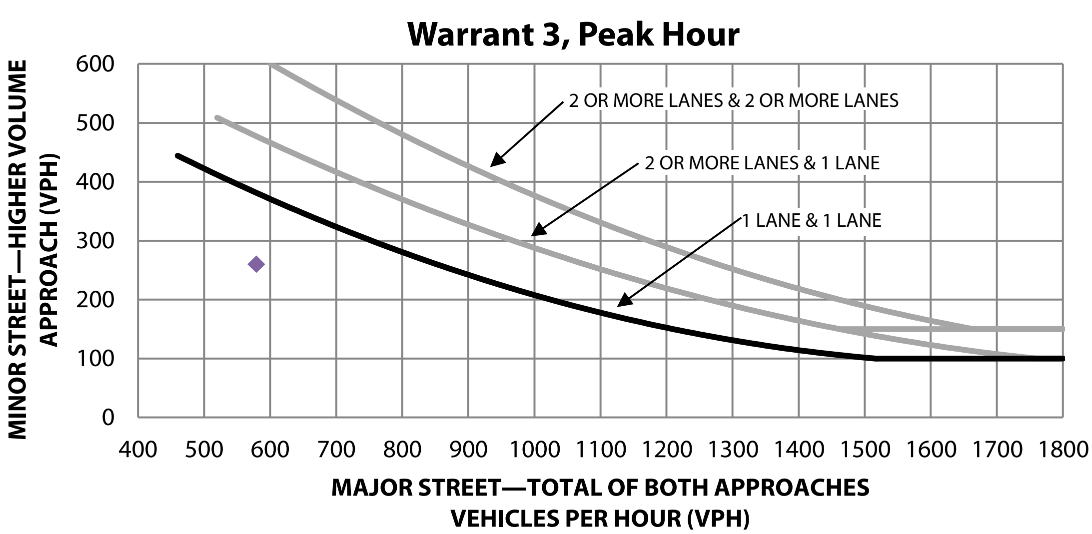
City of Menlo Park
Ringwood Avenue & Bay Road

Flood County Park TIS

	Major Street	Minor Street
Street Name	Ringwood Avenue	Bay Road
Direction	N-S	E-W
Number of Lanes	1	1
Approach Speed	25	30

Population less than 10,000? No
Date of Count: Thursday, November 17, 2016
Scenario: PM Existing

Warrant 3 Met?: Met when either Condition A or B is met	**No**
Condition A: Met when conditions A1, A2, and A3 are met	Not Met
Condition A1	Not Met
The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach	
Minor Approach Delay: 1.03 vehicle-hours	
Condition A2	Met
The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes	
Minor Approach Volume: 260 vph	
Condition A3	Met
The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more appraches or 650 vph for intersections with three approaches	
Total Entering Volume: 1082 vph	
Condition B	Not Met
The plotted point falls above the curve	



Warrant 3: Peak-Hour Volumes and Delay

City of Menlo Park
Ringwood Avenue & Bay Road

Flood County Park TIS

	Major Street	Minor Street
Street Name	Ringwood Avenue	Bay Road
Direction	N-S	E-W
Number of Lanes	1	1
Approach Speed	25	30

Population less than 10,000? No
Date of Count: Thursday, November 17, 2016
Scenario: PM Existing + Project

Warrant 3 Met?: Met when either Condition A or B is met — **No**

Condition A: Met when conditions A1, A2, and A3 are met — Not Met

Condition A1 — Not Met

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 1.11 vehicle-hours

Condition A2 — Met

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 275 vph

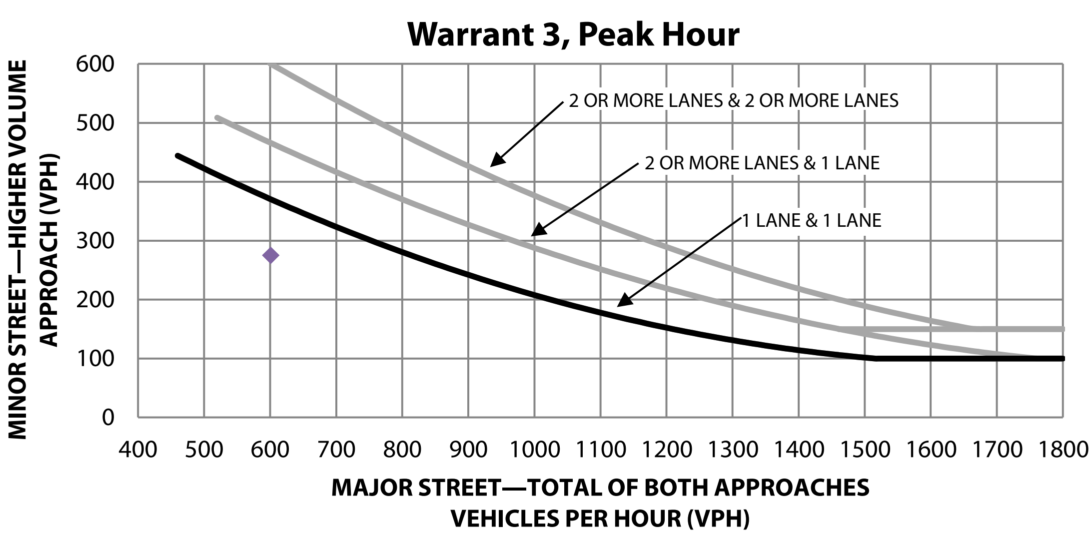
Condition A3 — Met

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more appraches or 650 vph for intersections with three approaches

Total Entering Volume: 1136 vph

Condition B — Not Met

The plotted point falls above the curve



Warrant 3: Peak-Hour Volumes and Delay

City of Menlo Park
Ringwood Avenue & Bay Road

Flood County Park TIS

	Major Street	Minor Street
Street Name	Ringwood Avenue	Bay Road
Direction	N-S	E-W
Number of Lanes	1	1
Approach Speed	25	30

Population less than 10,000? No
Date of Count: Thursday, November 17, 2016
Scenario: PM Near Term

Warrant 3 Met?: Met when either Condition A or B is met — **No**

Condition A: Met when conditions A1, A2, and A3 are met — Not Met

Condition A1 — Not Met

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 1.4 vehicle-hours

Condition A2 — Met

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 284 vph

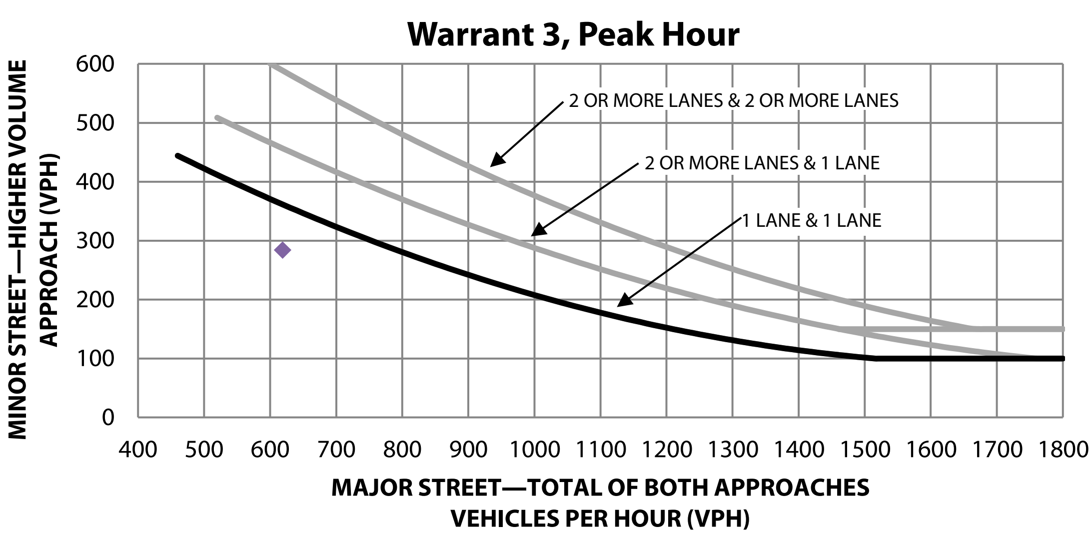
Condition A3 — Met

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more appraches or 650 vph for intersections with three approaches

Total Entering Volume: 1163 vph

Condition B — Not Met

The plotted point falls above the curve



Warrant 3: Peak-Hour Volumes and Delay

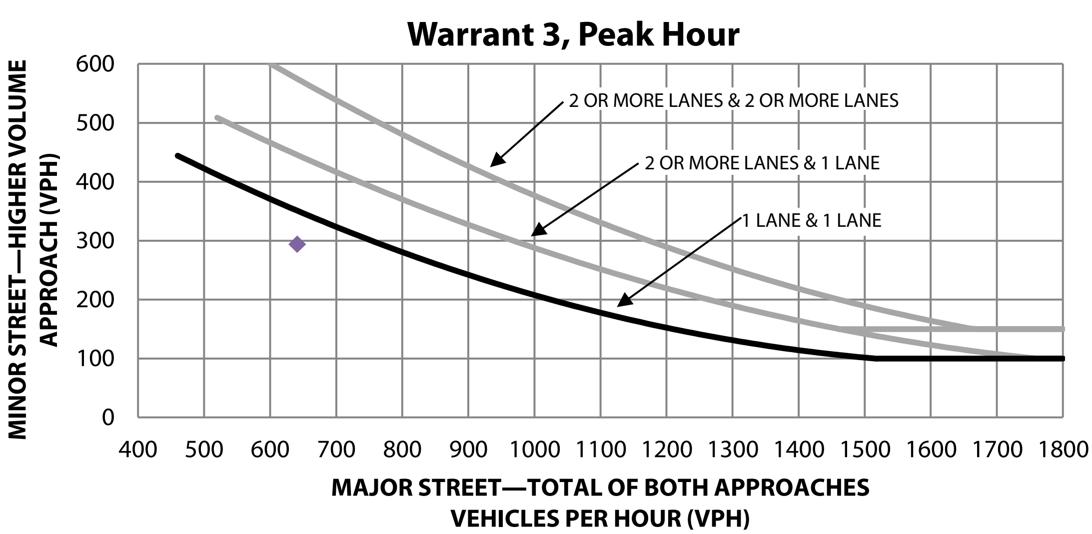
City of Menlo Park
Ringwood Avenue & Bay Road

Flood County Park TIS

	Major Street	Minor Street
Street Name	Ringwood Avenue	Bay Road
Direction	N-S	E-W
Number of Lanes	1	1
Approach Speed	25	30

Population less than 10,000? No
Date of Count: Thursday, November 17, 2016
Scenario: PM Near Term + Project

Warrant 3 Met?: Met when either Condition A or B is met	**No**
Condition A: Met when conditions A1, A2, and A3 are met	Not Met
Condition A1	Not Met
The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach	
Minor Approach Delay: 1.5 vehicle-hours	
Condition A2	Met
The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes	
Minor Approach Volume: 294 vph	
Condition A3	Met
The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more appraches or 650 vph for intersections with three approaches	
Total Entering Volume: 1227 vph	
Condition B	Not Met
The plotted point falls above the curve	



Warrant 3: Peak-Hour Volumes and Delay

City of Menlo Park
Ringwood Avenue & Bay Road

Flood County Park TIS

	Major Street	Minor Street
Street Name	Ringwood Avenue	Bay Road
Direction	N-S	E-W
Number of Lanes	1	1
Approach Speed	25	30

Population less than 10,000? No
Date of Count: Thursday, November 17, 2016
Scenario: PM Cumulative

Warrant 3 Met?: Met when either Condition A or B is met	**Yes**
Condition A: Met when conditions A1, A2, and A3 are met	Not Met
Condition A1	Not Met

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 2.01 vehicle-hours

Condition A2 — Met

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 331 vph

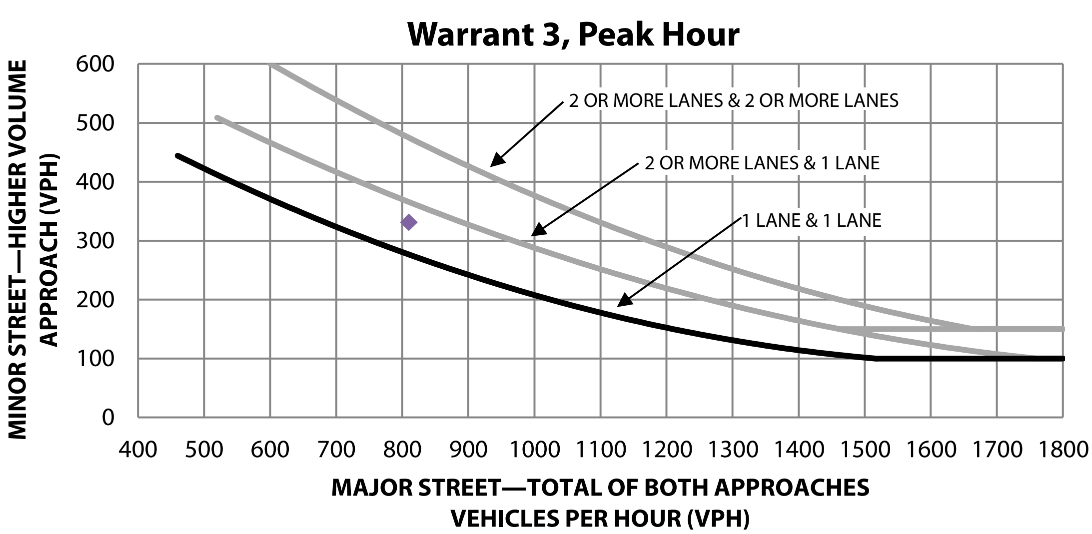
Condition A3 — Met

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more appraches or 650 vph for intersections with three approaches

Total Entering Volume: 1449 vph

Condition B — Met

The plotted point falls above the curve



Warrant 3: Peak-Hour Volumes and Delay

City of Menlo Park
Ringwood Avenue & Bay Road

Flood County Park TIS

	Major Street	Minor Street
Street Name	Ringwood Avenue	Bay Road
Direction	N-S	E-W
Number of Lanes	1	1
Approach Speed	25	30

Population less than 10,000? No
Date of Count: Thursday, November 17, 2016
Scenario: PM Cumulative + Project

Warrant 3 Met?: Met when either Condition A or B is met	**Yes**
Condition A: Met when conditions A1, A2, and A3 are met	Not Met
Condition A1	Not Met

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 2.11 vehicle-hours

Condition A2 — Met

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 341 vph

Condition A3 — Met

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more appraches or 650 vph for intersections with three approaches

Total Entering Volume: 1513 vph

Condition B — Met

The plotted point falls above the curve

Warrant 3, Peak Hour