ADDENDUM

to the
2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects
Final Environment Impact Report

Stony Oaks Affordable Housing Project
2542 Old Stony Point Road
City of Santa Rosa, California

Assessor's Parcel No. 125-551-016
May 2021

Lead Agency:

City of Santa Rosa
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SECTION 1.0 INTRODUCTION

A. CEQA FRAMEWORK FOR ADDENDUMS

This document is an Addendum to the 2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects Final Environment Impact Report (2016 FEIR) (State Clearinghouse Number 2016012030). The City of Santa Rosa (City) is the California Environmental Quality Act (CEQA) lead agency for the Stony Oaks Affordable Housing Project (proposed Project). Revised CEQA Guidelines went into effect in 2019, this Addendum reviews the proposed Project in light of these revised Guidelines and includes updated analysis as required by the revised Guidelines. Since the proposed Project application requires additional discretionary entitlements, it is subject to subsequent review standards under Public Resources Code Section 21166. Under CEQA, Public Resources Code Sections 21000, et seq. and implementing State CEQA Guidelines, Title 14, Chapter 3 of the California Code of Regulations, as amended (collectively, "CEQA"), when a project that was studied and approved under a certified Environmental Impact Report (EIR) is proposed to be modified, an Addendum to the EIR may satisfy CEQA regulations. Both Public Resources Code Section 21166 and CEQA Guidelines Section 15162 provide that when an EIR has been certified or a negative declaration has been adopted for that project, no subsequent EIR shall be prepared for the project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

- Substantial changes are proposed in the project which will require major revisions to the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
- Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions to the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
- New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time of EIR adoption, shows any of the following:

    i) The project will have one or more significant effects not discussed in the EIR;
    ii) the project will result in impacts substantially more severe than those disclosed in the EIR;
    iii) mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponent declines to adopt the mitigation measure or alternative; or
    iv) mitigation measures or alternatives that are considerably different from those analyzed in the EIR would substantially reduce one or more significant effects on the environment, but the project proponent declines to adopt the mitigation measure or alternative.

Per CEQA Guidelines Section 15164(a), the lead agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in CEQA Guidelines Section 15162 calling for the preparation of a subsequent EIR have occurred. Furthermore, Section 15164(b) states that an addendum to an approved EIR is appropriate when only minor technical changes or additions are made but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR or negative declaration have occurred.

As discussed herein, none of the elements requiring the preparation of a subsequent EIR exists, and the City of Santa Rosa has determined that it is not necessary to prepare a subsequent EIR or negative declaration. Rather, this Addendum has been determined to be the appropriate CEQA document for the proposed Project.

This Addendum reflects the independent analysis and judgment of the City as the lead agency. Further, it

demonstrates that the environmental analysis, impacts, and mitigation requirements[1] identified in the 2016 Final EIR, remain substantively unchanged by the changes described herein, and support the finding that the proposed Project does not raise any new issues that result in any new significant impacts which cannot be mitigated to a level of less than significant, and do not exceed the level of impacts identified in the 2016 FEIR.

Per CEQA Guidelines Section 15164(c), an addendum need not be circulated for public review, but can be included in or attached to the final EIR or adopted mitigated negative declaration. Per CEQA Guidelines Section 15164(d), the decision-making body shall consider an addendum with the final EIR or adopted mitigated negative declaration prior to making a decision on the project.

Accordingly, this Addendum will be considered by the City prior to making a decision on the proposed Project. This Addendum, along with the previous environmental analyses, is on file with and may be obtained from the City of Santa Rosa, Planning and Economic Development Department, Planning Division, 100 Santa Rosa Avenue, Room 3, Santa Rosa, California, 95404, or online at: https://srcity.org/425/Plans-Studies-EIRs.

SECTION 2.0 PROJECT INFORMATION

A. SUMMARY OF THE ROSELAND AREA/SEBASTOPOL ROAD SPECIFIC PLAN AND ROSELAND AREA ANNEXATION PROJECTS

The Santa Rosa City Council and Sonoma County Board of Supervisors identified the Roseland area annexation as a priority in 2013 because of the need to unify the areas in southwest Santa Rosa, which are completely surrounded by the City. As part of Santa Rosa, these areas of the community would be provided services by one jurisdiction, rather than multiple jurisdictions.

In 2014, the City of Santa Rosa was awarded a grant from the Sonoma County Transportation Authority (SCTA) for development of a specific plan for the southwestern portion of the City, which is commonly known as Roseland, and the area to its south. The Specific Plan area includes the Roseland Priority Development Area (PDA) and part of the Sebastopol Road PDA. PDAs are locally identified areas that can accommodate residential growth near transit and jobs. The planning process for the Roseland Area/Sebastopol Road Specific Plan and Roseland Annexation Projects commenced in December 2014.

In accordance with CEQA, the City prepared an EIR for the Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects (Specific Plan and Annexation) (State Clearing House Number 2016012030). The project site in the EIR includes the Roseland Area/Sebastopol Road Specific Plan area (Plan Area). The Specific Plan area encompasses approximately 1,860 acres (1,220 acres of incorporated City land and 640 acres of unincorporated county land) located in southwestern Santa Rosa. The Plan Area is generally bounded by State Route (SR) 12 to the north, Bellevue Avenue to the south, US Highway 101 (US 101) to the east, and Stony Point Road to the west.

The Specific Plan and Annexation provides an overall vision for future development within the Plan Area. The Specific Plan provides a land use diagram, circulation plan, and infrastructure improvement plan as well as goals and policies to guide development and redevelopment. The Specific Plan and Annexation projects include annexation of five unincorporated County islands in southwest Santa Rosa. An unincorporated island is defined as an area of unincorporated land that is substantially surrounded by City land. Two of the five islands are located within the Specific Plan and Annexation areas and three located outside the Specific Plan and Annexation areas.

The principle objectives identified for the Specific Plan and Annexation in the 2016 FEIR are identified as follows:

- Comply with Sonoma Local Agency Formation Commission (LAFCO) policy to create a more logical

[1] *Not all of the Mitigation Measures included in the 2016 Final EIR are applicable to the proposed Project.*

City boundary and provide more effective delivery of City services by annexing all existing unincorporated islands in southwest Santa Rosa.
- New residents will receive the same level of service as current residents.
- Existing service levels to current City residents will not be reduced in order to provide services to the Roseland Area.
- Make life and the physical environment better for plan area residents and employees.
- Establish a land use and policy framework to guide future development in the area toward transit supportive land uses.
- Balance the preservation of the existing uses and the development of new uses while maintaining the cultural diversity that makes this area special and unique in Santa Rosa.
- Improve connections, particularly for bicycling and walking, to the Southside Bus Transfer Center, to the downtown SMART station, and to Sebastopol Road, the main commercial area (within the plan area and beyond).
- Enhance livability by promoting community health and equity.
- Establish the Plan Area as a place where people want to live, work, shop, and visit.
- Promote economic vitality by maintaining and expanding small businesses and local services for residents.

B. SUMMARY OF THE PROPOSED STONY OAKS AFFORDABLE HOUSING PROJECT

The proposed Project site is located on a 4.39-acre vacant, grassy lot at 2542 Old Stony Point Road at Assessor's Parcel Number (APN) 125-551-016 in the City of Santa Rosa, Sonoma County, California. The Project site is located in the southwest portion of Santa Rosa, adjacent to Hearn Avenue and Old Stony Point Road, and is a part of the Roseland Specific Plan Area. The Project site is located just under two miles from downtown Santa Rosa and is surrounded by residential properties. The Project site is bordered to the north by a multi-family development, to the east by single-family residences, to the south by Hearn Avenue and single-family residences, and the west by Old Stony Point Road. See Attachment 1 (Regional Location Map) and Attachment 2 (Project Site Aerial).

As analyzed in the 2016 FEIR, the General Plan Land Use Designation for the Project site is Medium High Density Residential which permits a total of 132 multi-family dwelling units on-site based on the size of the site. This proposed 100 percent affordable housing Project qualifies for a 35 percent state density bonus. With the 35 percent density bonus the permitted number of multi-family dwelling units on-site is 179 units.

The proposed Stony Oaks Affordable Housing Project includes the construction of a four-story, 142-unit, multi-family apartment building, with 33 units on the first floor, 39 units on the second floor, 38 units on the third floor, and 32 units on the fourth floor. The proposed Project includes 56 one-bedroom units, 48 two-bedroom units, and 38 three-bedroom units. The total square footage of the proposed Project is 149,810 square feet with a maximum building height of 45 feet. See Attachment 3 (Site Plans).

Proposed Project Summary

Stony Oaks Affordable Housing Project Development Summary		
Total Site Area:	4.39 Acres	
Gross Building Square Footage:	149,810 Square Feet	
Building Height:	45 Feet (Four Stories)	
Dwelling Units:	142 Total Units:	56 One-Bedroom Units
		48 Two-Bedroom Units
		38 Three-Bedroom Units
Proposed Parking Spaces:	185 Parking Spaces	

The proposed affordable housing units would be built in the center of the Project site, set back from Old Stony Point Road, and surrounded by surface parking on the north, south, and east sides of the multi-family dwelling units. Other proposed Project improvements include landscaped areas, courtyards, open spaces, recreational areas and a scenic pedestrian pathway at the western side of the Project site. The proposed Project footprint, driveway, and pedestrian pathway off of Old Stony Point Road have been designed to preserve the maximum number of trees located in the western portion of the Project site.

Primary ingress and egress for the proposed Project would be via Old Stony Point Road with an emergency access location off of Hearn Avenue. An additional 0.10 acres will be developed in the public ROW. Improvements within Old Stony Point Road include a new curb, gutter, a 6-foot wide planting strip, and sidewalk. Improvements in the ROW on Hearn Avenue include widening the apron of the drive aisle for the vehicular entrance on Hearn Avenue and public utility connections.

Construction of the proposed Project would take approximately 19 months (depending upon weather), including minor on-site tree removal, grading and building construction. External construction work would be limited to the hours of 7:00 AM to 7:00 PM, Monday-Friday, and 8:00 AM to 6:00 PM on Saturdays, or as allowed by the City's standard Conditions of Approval.

Grading is expected to occur over two months: one month for demolition and site clearing, and one month for earthwork (pad preparation and rough grading). Site utilities improvements are anticipated to require over two months, depending on weather conditions. Approximately 3,500 cubic yards of soil would be imported to the Project site, with an estimated 195 concrete truck trips and 100 asphalt truck trips anticipated to occur.

The proposed Project includes the construction of low impact development (LID) stormwater management systems, including proposed bio-retention treatment areas, which would allow stormwater runoff from the Project site to infiltrate the ground surface resulting in a net reduction of runoff from the site. Since the Project includes the removal and replacement of greater than one acre of impervious surface area, the Project requires hydromodification control measures which would capture and treat 100 percent of the one-inch storm event (2-year, 24-hour event) in accordance with the City of Santa Rosa's LID Technical Design Manual. All drainage areas on-site are conveyed to vegetated areas and bioretention prior to out-falling to existing vegetated features satisfying the 100 percent trash capture design requirement.

Drainage from the proposed buildings, parking and concrete walkways is designed to sheet flow across the parking area where it would infiltrate the storage medium in accordance with Priority 1 (Roadside Bioretention with No Curb or Curb Openings) objectives of the City's LID Technical Design Manual. Once the treatment medium is fully saturated the drainage would flow into inlets and utilize the City's storm drain system. These BMP measures are in place to offset the net increase in runoff due to increased impervious surface on the site. Storm water for larger events would utilize the proposed storm drain.

Required Permits and Approvals

- Minor Design Concept Review (City of Santa Rosa)
- Density Bonus Approval (City of Santa Rosa)
- Grading Permit (City of Santa Rosa)
- Building Permit (City of Santa Rosa)
- Well Removal Permit (Sonoma County)
- Clean Water Act Section 404 (U.S. Army Corps of Engineers)
- Clean Water Act Section 401 Water Quality Certification (Regional Water Quality Control Board)
- Any other discretionary or ministerial permits that are required to undertake the Project

SECTION 3.0 ANALYSIS OF POTENTIAL ENVIRONMENTAL EFFECTS

The following discussion confirms that the proposed Project, as described in Section 2B (Summary of the proposed Project) above, would not result in any new or substantially more significant effects, or the need for new mitigation measures as compared to those required in the Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects Final Environment Impact Report (2016 FEIR).

3.1 AESTHETICS

A. Description and Impacts

The 2016 FEIR indicates that the Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects (Specific Plan and Annexation) would result in development on previously undeveloped parcels that could block views of scenic vistas from surrounding properties, concluding that impacts would be less than significant. The 2016 FEIR indicates that the Specific Plan and Annexation would not substantially damage scenic resources within a state scenic highway, and no impacts would occur. The Specific Plan and Annexation could change the existing visual character of the Specific Plan and Annexation areas by allowing new development on currently vacant and underutilized parcels, however, impacts would be less than significant. The Specific Plan and Annexation would introduce new sources of light or glare, but impacts associated would be less than significant. Overall, the Specific Plan and Annexation, in combination with other planned and recently approved projects in the Specific Plan and Annexation areas, would result in a less than cumulatively considerable impact on the visual character of the City.

Development of the Project site was included in the 2016 FEIR analysis and the proposed Project represents a negligible increase of 10 additional dwelling units compared to the maximum density analyzed in the 2016 FEIR. Similar to the Specific Plan and Annexation, the proposed Project would not significantly damage scenic resources, including rock outcroppings or historic buildings. Further, the Project site is not located within a scenic highway nor located on a street that is designated as a Scenic Road in the Santa Rosa General Plan 2035. Impacts to scenic vistas would be less than significant.

Additionally, the proposed Project will be subject to other Municipal Code development and design standards, which are designed to lessen the potential degradation of the existing visual character or quality of the site and its surroundings. The proposed Project would not have any new significant aesthetics impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

Sources

- 2016 FEIR
- City of Santa Rosa Zoning Code, 2006
- Project Site Plans (Attachment 3)

3.2 AGRICULTURE AND FORESTRY RESOURCES

A. Discussion and Impacts

The 2016 FEIR analyzed the potential impacts to agricultural and forestry resources and determined that the Specific Plan and Annexation would neither convert nor impact farmland to a non-agriculture use or

result in the conversion of other farmland to non-agricultural uses, nor would the Specific Plan and Annexation conflict with existing zoning for agricultural use or a Williamson Act contract. The 2016 FEIR indicates that the Specific Plan area and the Annexation areas do not contain any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, and therefore would not convert any important farmland and no impacts would occur. The 2016 FEIR indicates that the Specific Plan and Annexation would not contribute to cumulative impacts on agricultural resources. The 2016 FEIR also indicates that the Specific Plan and Annexation areas do not contain forestlands as defined in Public Resources Code Section 12220(g) or timberland as defined in the Public Resources Code Section 4526, nor are they currently designated or zoned for timberland production or other forestry-related uses nor are they in a designated Timberland Production Zone.

There are no active agricultural uses at the Project site, and therefore no new potential to convert farmland to non-agricultural uses exists.

The Project site is in an urban area, is not zoned for forestry resources, and does not contain any forestry resources. Therefore, no conflict with forestry resources, no loss of forest land nor conversion of forestry land to non-forestry use would occur with the proposed Project.

Similarly, the proposed Project is completely within the boundary of the Specific Plan and Annexation, and circumstances related to agriculture and forestry resources have not changed. The proposed Project would not have any new agricultural or forestry significant impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

Sources

- 2016 FEIR

3.3 AIR QUALITY

A. Description and Impacts

As described in the 2016 FEIR, subsequent land use activities associated with implementation of the Specific Plan and Annexation would not conflict with the Bay Area 2010 Clean Air Plan released by the Bay Area Air Quality Management District (BAAQMD) or result in vehicle miles traveled increases greater than the projected population increases over the Specific Plan and Annexation's planning period. The Specific Plan and Annexation could result in short-term construction emissions that could violate or substantially contribute to a violation of federal and state standards. The Specific Plan and Annexation would not contribute to localized concentrations of mobile-source carbon monoxide (CO) that would exceed applicable ambient air quality standards. The Specific Plan and Annexation could result in increased exposure of existing or planned sensitive land uses to construction-source toxic air contaminant (TAC) emissions. The Specific Plan and Annexation could result in the development of housing units (sensitive land uses) near stationary or mobile-source TACs. Future development within the Specific Plan and Annexation areas would not result in exposure of sensitive receptors to substantial odorous emissions. The Specific Plan and Annexation could result in a significantly cumulative increase of criteria air pollutants for which the air basin is designated nonattainment. The Specific Plan and Annexation would not expose sensitive receptors to substantial pollutant concentrations or create objectionable odors.

The proposed Project would be located within the boundaries of the Specific Plan and Annexation. Development of the Project site was included in the 2016 FEIR analysis and the proposed Project

represents a minor increase of 10 dwelling units compared to the maximum density analyzed in the 2016 FEIR. The proposed Project would not have any new significant impacts, nor would it create a substantial increase in the severity of the previously disclosed air quality impacts analyzed in the 2016 FEIR. The proposed Project would be required to implement Mitigation Measure (MM) 3.3.3 below; however, the remaining air quality mitigation measures from the 2016 FEIR are not applicable to the proposed Project. Specifically, MM 3.3.5 is not required to be implemented by the proposed Project because the Project site is less than five acres. MM 3.3.6 from the 2016 FEIR is not applicable because the Project site is not located within 1,000 feet of significant emissions sources.

B. Mitigation Measures

The following mitigation measure from the 2016 FEIR is required and would reduce construction related pollutants to less-than-significant levels.

MM 3.3.3: Where projects in the project area are subject to subsequent CEQA review, the City of Santa Rosa must ensure that in addition to the BAAQMD basic construction mitigation measures from Table 8-1 of the BAAQMD CEQA Air Quality Guidelines (or subsequent updates), BAAQMD additional mitigation measures from Table 8-2 of the BAAQMD CEQA Air Quality Guidelines (or subsequent updates) are noted on the construction documents and implemented. These measures include the following:

1. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.
2. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
3. Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
4. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
5. The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
6. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
7. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12-inch compacted layer of wood chips, mulch, or gravel.
8. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.
9. Minimizing the idling time of diesel-powered construction equipment to two minutes.
10. 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 NOx reduction and 45 percent PM reduction compared to the most recent CARB fleet average.
11. Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings).
12. Requiring that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NOx and PM.
13. Requiring all contractors use equipment that meets CARB's most recent certification standard for off-road heavy-duty diesel engines.

Sources

- Bay Area Air Quality Management District. CEQA Guidelines, Page 3-2 through 3-4, May, 2010.
- 2016 FEIR

3.4 BIOLOGICAL RESOURCES

A. Description and Impacts

The 2016 FEIR indicates that implementation of the Specific Plan and Annexation could result in adverse effects, either directly or indirectly, on species listed as endangered, threatened, rare, proposed, and candidate plant and wildlife species as well as plant species identified by the California Native Plant Society (CNPS) with a rating of List 1A or 1B, which would result in potentially significant impacts. However, these potentially significant impacts could be reduced to less-than-significant levels with implementation of MM 3.4.1a and MM 3.4.1b listed below. Implementation of the Specific Plan and Annexation could result in direct and indirect loss of habitat and individuals of animal and plant species of concern and other non-listed special-status species, resulting in potentially significant impacts which would be reduced to less-than-significant levels with implementation of MM 3.4.1a and MM 3.4.1b discussed below.

The 2016 FEIR indicates that implementation of the Specific Plan and Annexation could result in disturbance and degradation of riparian habitat or other sensitive natural communities identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (CDFW) or the United States Fish and Wildlife Service (USFWS), resulting in less-than-significant impacts. Implementation of the proposed Project would result in the loss or degradation of protected wetlands or vernal pools, resulting in potentially significant impacts, which could be reduced to less-than-significant levels with implementation of MM 3.4.2a and MM 3.4.2b listed below.

Implementation of the Specific Plan and Annexation could interfere with movement of native resident or migratory fish or wildlife species or establish migratory corridor; however, implementation of the goals and policies of the General Plan and the Citywide Creek Master Plan would enhance wildlife corridors in the project area and resulting impacts would be less than significant. Implementation of the Specific Plan and Annexation would not result in a conflict with a local policy or ordinance protecting biological resources, and no impact would occur. Development in the Specific Plan and Annexation rea would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved Conservation Plan, and no impacts would occur. Development in the Specific Plan and Annexation areas, when considered together with other past, existing, planned future projects, would not result in a significant cumulative impact to biological resources in the region, and impacts would be less than cumulatively considerable.

Development of the Project site was included in the 2016 FEIR analysis and the proposed Project represents a minor increase of 10 dwelling units compared to the maximum density analyzed in the 2016 FEIR. The proposed Project would not have any new significant impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR. The proposed Project will be required to implement all of the 2016 FEIR biological resources mitigation measures, as listed below.

B. Mitigation Measures

The following mitigation measures are required from the 2016 FEIR and would reduce impacts to less-than-significant levels.

MM 3.4.1a: Implement General Plan Mitigation Measure 4.F-5: The City of Santa Rosa shall incorporate the avoidance and mitigation measures described in the Santa Rosa Plain Conservation Strategy and the USFWS Programmatic Biological Opinion, as conditions of approval for development in or near areas with suitable habitat for California tiger salamander, Burke's goldfields, Sonoma sunshine, Sebastopol meadowfoam, and many flowered navarretia. However, in accordance with the USFWS Programmatic Biological Opinion, projects within the Southwest Santa Rosa Preserve System will be evaluated individually and mitigation may not necessarily adhere to the ratios described in the Conservation Strategy.

MM 3.4.1b: If there is the potential for destruction of a nest or substantial disturbance to nesting birds or bats due to construction activities, a plan to monitor nesting birds or bats during construction shall be prepared and submitted to the USFWS and CDFG for review and approval. The City shall comply with all USFWS or CDFG guidance for protection of nesting birds. If vegetation, buildings, or bridges that potentially provide nesting sites must be removed, a qualified wildlife biologist shall conduct pre-construction surveys. If an active bird nest is found, the bird shall be identified as to species and the approximate distance from the closest work site to the nest estimated. No additional measures need be implemented if active nests are more than the following distances from the nearest work site: (a) 300 feet for raptors; or (b) 75 feet for other nonspecial-status bird species. Disturbance of active nests shall be avoided to the extent possible until it is determined that nesting is complete and the young have fledged. Bats shall be absent or flushed from roost locations prior to demolition of buildings. If flushing of bats from buildings is necessary, it shall be done by a qualified biologist during the non-breeding season from October 1 to March 31. When flushing bats, structures shall be moved carefully to avoid harming individuals, and torpid bats given time to completely arouse and fly away. During the maternity season from April 1 to September 30, prior to building demolition or construction, a qualified biologist shall determine if a bat nursery is present at any sites identified as potentially housing bats. If an active nursery is present, disturbance of bats shall be avoided until the biologist determines that breeding is complete and young are reared.

MM 3.4.2a: Implement Mitigation Measure 3.4.1a.

MM 3.4.2b: A formal wetland delineation shall be conducted for areas that will be permanently or temporarily impacted by the project. If jurisdictional waters cannot be avoided, the City shall apply for a CWA Section 404 permit from the USACE and a Section 401 permit from the RWQCB. These permits shall be obtained prior to issuance of grading permits and implementation of the proposed project. The City shall ensure that the project will result in no net loss of waters of the U.S. by providing mitigation through impact avoidance, impact minimization, and/or compensatory mitigation for the impact, as determined in the CWA Section 404/401 permits. Compensatory mitigation may consist of (a) obtaining credits from a mitigation bank; (b) making a payment to an in-lieu fee program that will conduct wetland, stream, or other aquatic resource restoration, creation, enhancement, or preservation activities (these programs are generally administered by government agencies or nonprofit organizations that have established an agreement with the regulatory agencies to use in-lieu fee payments collected from permit applicants); and/or (c) providing compensatory mitigation through an aquatic resource restoration, establishment, enhancement, and/or preservation activity. This last type of compensatory mitigation may be provided at or adjacent to the impact site (i.e., on-site mitigation) or at another location, usually within the same watershed as the permitted impact (i.e., off-site mitigation). The project proponent/permit applicant retains responsibility for the implementation and success of the mitigation project. Evidence of compliance with this mitigation measure shall be provided prior to construction and grading activities for the proposed project.

Sources

- 2016 FEIR
- Santa Rosa Citywide Creek Master Plan, Revised 2013

3.5 CULTURAL RESOURCES

A. Description and Impacts

The 2016 FEIR analyzed the potential impacts to cultural resources that could occur as a result of the Specific Plan and Annexation projects. The 2016 FEIR determined that the Specific Plan and Annexation would have less-than-significant impacts on cultural after mitigation.

The 2016 FEIR indicates that redevelopment within the Specific Plan and Annexation areas could affect historic properties through modification of historic character and through construction activities; however, the 2016 FEIR concluded that impacts would be less than significant and no mitigation would be required. The 2016 FEIR found that future projects constructed in the Specific Plan and Annexations area involving

ground disturbance could result in the disturbance of known and undiscovered archaeological resources, resulting in potentially significant impacts. The 2016 FEIR reduced this potentially significant impact to less-than-significant levels with implementation of MM 3.5.2a and MM 3.5.2b listed below. The 2016 FEIR also noted that if future projects constructed under the Specific Plan involve ground disturbance, implementation could result in the disturbance of human remains, then potentially significant impacts could occur. However, these potentially significant impacts would be reduced to less-than-significant levels by implementing MM 3.5.3a and MM 3.5.3b listed below. The General Plan 2035 EIR concluded that the impacts related to the potential for development under the General Plan would be reduced to less than cumulatively significant levels with the implementation of applicable policies included in the General Plan. These policies include HP-A-1 through HP-A-5 and HP-B-1 through HP-B-9. The entire Specific Plan and Annexation areas are subject to these General Plan policies.

Consequently, the impacts related to cultural that could occur as a result of the proposed Project would be less-than-significant after implementation of the 2016 FEIR mitigation measures referenced above and identified below. As a result, the proposed Project, similar to the Specific Plan and Annexation projects, would have less-than-significant impacts after mitigation on cultural resources. The proposed Project would not have any new significant cultural resources impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

A Cultural Resources Study for the proposed Project was prepared by Tom Origer & Associates on December 29, 2020 (Attachment 5). The Cultural Resources Study was conducted in compliance with the requirements of Section 106 of the National Historic Preservation Act and with CEQA. An intensive field survey of the Project's area of potential effects (APE) was conducted on December 18, 2020, and is referenced in the Cultural Resources Study. The field survey found two obsidian flakes and deemed them isolated specimens. Isolated finds can contribute some information about prehistoric land use and hunting patterns. However, once their presence is documented no further work is warranted as they do not rise to a level of significance that would qualify them for listing on the National Register nor the California Register. The isolated finds were documented and no further investigation or protection was recommended.

No historic properties were found during the course of the Cultural Resources Study; therefore, no recommendations were warranted. The Cultural Resources Study provided the following recommendations regarding "Accidental Discovery."

If buried materials are encountered, all soil disturbing work should be halted at the location of any discovery until a qualified archaeologist completes a significance evaluation of the find(s) pursuant to Section 106 of the National Historic Preservation Act (36CFR60.4). Prehistoric archaeological site indicators expected within the general area include: chipped chert and obsidian tools and tool manufacture waste flakes; grinding and hammering implements that look like fist-size, river-tumbled stones; and for some rare sites, locally darkened soil that generally contains abundant archaeological specimens. Historical remains expected in the general area commonly include items of ceramic, glass, and metal. Features that might be present include structure remains (e.g., cabins or their foundations) and pits containing historical artifacts.

The following actions are promulgated under 43 CFR 10 Subpart B Section 10.4 of the Native American Graves and Repatriation Act (NAGPRA) and relate to the inadvertent discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony. If such items are discovered on Federal or tribal lands, the discovery must be reported immediately via telephone, with written confirmation, to the responsible Federal agency official (with respect to Federal lands), or to the responsible Indian tribe official (with respect to tribal lands). The requirements of these regulations regarding inadvertent discoveries apply whether or not an inadvertent discovery is duly reported. If written confirmation is provided by certified mail, the return receipt constitutes evidence of the receipt of the written notification by the Federal agency official or Indian tribe official. All activity in the area of the discovery shall cease and the find shall be protected from further disturbance until the agency or tribal official arranges for appropriate disposition of the material.

Per the requirements of the California Code of Regulations, Title 14, Chapter 3, Section 15064.5(e) if human remains are encountered during the course of the project, excavation or disturbance of the location must be halted in the vicinity of the find, and the county coroner contacted. If the coroner determines the remains are Native American, the coroner will contact the NAHC. The NAHC will identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent makes recommendations regarding the treatment of the remains with appropriate dignity.

B. Mitigation Measures

The following mitigation measures are required from the 2016 FEIR and would reduce cultural and tribal cultural resources impacts to less-than-significant levels.

MM 3.5.2a: Phase 1 Archaeological Resource Study. When specific projects are proposed within the project area that involve ground-disturbing activity, a site-specific Phase I archaeological resource study shall be performed by a qualified archaeologist or equivalent cultural resources professional that will include an updated records search, pedestrian survey of the project area, development of a historic context, sensitivity assessment for buried prehistoric deposits, and preparation of a technical report that meets federal and state requirements. If significant or unique resources are identified and cannot be avoided, treatment plans will be developed in consultation with the City and appropriate Native American representatives to mitigate potential impacts to less than significant based on the provisions of Public Resources Code Section 21083.2.

MM 3.5.2b: Should any archaeological artifacts be discovered during construction of any project allowed under the Specific Plan, all construction activities shall be halted immediately within 50 feet of the discovery, the City shall be notified, and a professional archaeologist that meets the Secretary of the Interior's Standards and Guidelines for Professional Qualifications in archaeology and/or history shall be retained to determine the significance of the discovery. The professional archaeologist shall prepare a plan to identify, record, report, evaluate, and recover the resources as necessary, which shall be implemented by the developer. Construction within the area of the discovery shall not recommence until impacts on the archaeological resource are mitigated as described in Mitigation Measure MM 3.5.2a. Additionally, Public Resources Code Section 5097.993 stipulates that a project sponsor must inform project personnel that collection of any Native American artifacts is prohibited by law.

MM 3.5.3a: Implement Mitigation Measure MM 3.5.2a (Phase 1 Archaeological Resource Study).

MM 3.5.3b: Should human remains be discovered during construction of any project allowed under the Specific Plan, all construction activities shall be halted immediately within 50 feet of the discovery, the City shall be notified, and the Sonoma County Coroner shall be notified, according to Section 5097.98 of the State Public Resources Code and Section 7050.5 of California's Health and Safety Code. If the remains are determined to be Native American, the coroner will notify the Native American Heritage Commission, and the procedures outlined in CEQA Section 15064.5(d) and (e) shall be followed.

Sources

- 2016 FEIR
- 2020 Cultural Resources Study, prepared by Eileen Barrow, MA/RPA, of Tom Origer & Associates

3.6 ENERGY

A. Description and Impacts

Section 5.4 of the 2016 FEIR states that development in the Specific Plan and Annexation areas would be required to comply with all General Plan 2035 objectives and policies assumed for energy reduction in the General Plan 2035 EIR. Because the level of development in the Specific Plan and Annexation is similar

to that assumed in the General Plan 2035 EIR and the Specific Plan and Annexation would be subject to the energy conserving policies identified in the General Plan 2035 EIR, the Specific Plan and Annexation would not result in inefficient, wasteful, and unnecessary consumption of energy or substantially increase energy consumption compared to that assumed in the General Plan 2035 EIR.

The proposed Project is a residential project proposed on land designated and zoned for multi-family residential uses. There will be increases in both short- and long-term energy demands consistent with a residential project. Short-term energy demand would result from construction activities occurring as a result of construction, including energy needed to power worker and vendor vehicle trips as well as construction equipment. Long-term energy demand would result from operation of the Project, which would include activities such as lighting, heating, and cooling of structures. Although implementation of the proposed Project would result in an increase in energy usage compared to current conditions due to the new structures on the Project site, the increase in energy use would not be wasteful or inefficient because of measures incorporated into Project design, including energy-efficient building design meeting CALGreen requirements. Moreover, given the small increase in the number of units, it would be consistent with the applicable long-range projections for energy use.

The proposed Project would be required to comply with Title 24, Part 6 of the California Code of Regulations, Building Energy Efficiency Standards. Additionally, the proposed Project is not located in an identified area designated for renewable energy production nor would the project interfere with the installation of any renewable energy systems. Therefore, the proposed Project would not conflict with or obstruct with applicable State and local plans for promoting use of renewable energy and energy efficiency and have not significant impact on energy resources. Overall, the proposed Project would not have any new significant energy impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of impacts were found. Therefore, no measures are required.

Sources

- City of Santa Rosa 2035 General Plan/Final EIR, 2009.
- 2016 FEIR

3.7 GEOLOGY AND SOILS

A. Description and Impacts

The 2016 FEIR indicates that subsequent projects developed as result of implementation of the Specific Plan and Annexation could be at risk from seismic hazards. Construction of subsequent projects could result in temporary erosion impacts. Subsequent projects developed as a result of implementation of the Specific Plan and Annexation could be constructed on soils that are expansive or have other physical characteristics that could result in unstable conditions. Subsequent projects developed as a result of implementation of the Specific Plan and Annexation in addition to other proposed and approved projects in the vicinity, would not cumulatively create any new or exacerbate any identified geological or soils impacts. The 2016 FEIR found all of these impacts to be less than significant.

Similar to the Specific Plan and Annexation projects, the proposed Project would be constructed in compliance with applicable construction codes and requirements intended to mitigate any adverse impacts resulting from any potential ground shaking, ground failure, liquefaction, and expansive soils. Proposed improvements to the Project site would be designed in strict adherence to current standards for earthquake resistant construction, including the latest California Building Code (CBC), for seismic safety. Conformance with the CBC would reduce the effects of ground shaking and mitigate potential adverse seismic impacts to less than a significant level.

The proposed Project would comply with the most current CBC requirements and the recommendations of the Project Geotechnical Report (Rockridge Geotechnical, September 19, 2020) submitted with the building permit, ensuring all potential impacts are less-than-significant. As a result, the proposed Project, similar to the Specific Plan and Annexation projects would not cause, directly or indirectly, impacts on geologic resources. The proposed Project would not have any new significant geology and soils impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

Sources

- 2016 FEIR

3.8 GREENHOUSE GAS EMISSIONS

A. Description and Impacts

Principal greenhouse gases (GHGs) contributing to global warming are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds. Unlike emissions of criteria and toxic air pollutants, which have local or regional impacts, emissions of greenhouse gases contribute to global warming or climate change. GHG emissions can be reduced to some degree by improved coordination of land use and transportation planning at the city, county, and sub regional levels, as well as by other measures to reduce automobile use. Energy conservation measures also can contribute to reductions in GHG emissions. In response to increases in GHG's, California adopted AB32 and recommended local governments reduce emissions. The Bay Area Air Quality Management District (BAAQMD) recommended local governments prepare Climate Action Plans (CAPs). The City of Santa Rosa prepared and adopted a CAP in June of 2012. The City's CAP is considered a qualified greenhouse gas reduction strategy. Projects that are in compliance with the City's General Plan and CAP are considered compliant with respect to cumulative contributions to GHGs for CEQA purposes. The Specific Plan and Annexation is proposing to implement the City's CAP, as noted in the 2016 FEIR Project Description.

The BAAQMD's 2017 Clean Air Plan is the regional air quality plan (AQP) for the San Francisco Bay Area Air Basin and it identifies strategies to bring regional emissions into compliance with federal and state air quality standards. The 2017 Clean Air Plan contains 85 control measures aimed at reducing air pollution in the Bay Area. Along with the traditional stationary, area, mobile source, and transportation control measures, the 2017 Clean Air Plan contains a number of new control measures designed to protect the climate and promote high-density, compact development to reduce vehicle emissions and exposure to pollutants from stationary and mobile sources.

The City's Community-wide Climate Action Plan (CAP) also includes strategies for reducing mobile source GHG emissions such as increasing jobs and housing density, and including affordable housing near transit centers. These strategies would also reduce mobile source criteria pollutant emissions. The CAP includes a New Development Checklist to ensure that new development projects comply with the CAP. The City also passed an all-electric Reach Code in November 2019. The Reach Code would require all new residential construction of three stories or less to be all electric. This would reduce emissions from the combustion of fossil fuels, mainly natural gas, in new developments. However, the proposed Project is over three stories and therefore not subject to the all-electric Reach Code. The proposed Project would be subject to the CAP and the 2017 Clean Air Plan.

Relative to the energy and climate measures contained in the 2017 Clean Air Plan, the proposed Project

would be required to conform to the energy efficiency requirements of the California Building Standards Code, also known as Title 24. The Building Efficiency Standards were adopted, in part, to meet an Executive Order in the Green Building Initiative to improve the energy efficiency of residential buildings through aggressive standards. Title 24 has been recently updated, including certain revisions to the energy usage components of the CALGreen Code. The Title 24 standards are updated on an approximately 3-year cycle to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy-efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The 2019 Standards are 7 percent more efficient than 2016 Standards for residential construction. The proposed Project would be required to comply with the current version of the CALGreen Code.

The New Development Checklist is represented in Appendix E of the Santa Rosa CAP. The purpose of the New Development Checklist is "[t]o ensure new development projects are compliant with the City's Climate Action Plan, the following checklist has been developed. This checklist should be filled out for each new project, subject to discretionary review, to allow new development to find a less than significant impact for greenhouse gas emissions in the environmental review process."

The City's CAP Goal 1 – Action 1.1.3 of the CAP was adopted to coincide with California Energy Codes. Since the CAP adoption, the California Energy Commission (CEC) has determined that it is not possible to achieve net zero on a wholesale basis and "net zero" has been removed from the California Energy Codes. Appendix E of the Santa Rosa CAP states "[t]o be in compliance with the CAP, all measures denoted with an asterisk are required in all new development projects unless otherwise specified. If a project cannot meet one or more of the mandatory requirements, substitutions may be made from other measures listed at the discretion of the Community Development Director." CAP Goal 1.1 requires projects to comply with Tier 1 CALGreen requirements, as amended, for new non-residential and residential development. Tier 1 CALGreen does not include "net zero" GHG assumptions for development. In addition, current California Green Building Code Standards apply to all projects. Compliance with current California Green Building Code Standards has been determined by the Director to be an acceptable substitution for CAP Goal 1 – 1.1.3. Therefore, strict compliance with CAP Goal 1 – 1.1.3 is not achievable and not required for the proposed Project.

The 2016 FEIR concluded that the Specific Plan and Annexation projects would not conflict with an applicable plan adopted for the purpose of reducing GHG emissions. As a result, the proposed Project, similar to Specific Plan and Annexation projects would not cause, directly or indirectly, significant GHG impacts. Development of the Project site was included in the 2016 FEIR analysis and the proposed Project represents a minor increase of 10 dwelling units compared to the maximum density analyzed in the 2016 FEIR. Any increase in emissions would be negligible and compliance with applicable regulations would remain unchanged. The proposed Project would not have any new significant impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

Sources

- BAAQMD CEQA Air Quality Guidelines, 2010
- City of Santa Rosa Climate Action Plan, 2012
- 2016 FEIR
- BAAQMD 2017 Clean Air Plan

3.9 HAZARDS AND HAZARDOUS MATERIALS

A. Description and Impacts

The 2016 FEIR analyzed the potential impacts to hazards and hazardous materials that could occur as a result of Specific Plan and Annexation projects. The 2016 FEIR determined that the Specific Plan and Annexation would have less than significant impacts related to the use, storage, and transport of hazardous materials, the risk of accidental release of hazardous materials, and the use of hazardous materials near schools. The 2016 FEIR also indicates that Specific Plan and Annexation areas are neither in an area near an airport or within an area subject to a wildland fire and thus no impacts would occur in relationship to airports or wildland fire.

However, the 2016 FEIR concluded that the Specific Plan and Annexation could result in potentially significant impacts related to sites with hazardous materials. This impact can be mitigated to less-than-significant levels with the implementation of 2016 FEIR MM 3.8.4 listed below.

For the proposed Project, all potential impacts related to such hazards, either during construction or operation, will be similar to those assessed in the 2016 FEIR. The proposed Project would not have any new significant hazardous materials impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

The following mitigation measures from the 2016 FEIR are required and would reduce hazardous materials impacts to less-than-significant levels.

MM 3.8.4: Phase I Environmental Site Assessment. Developers shall be required to complete a Phase I environmental site assessment for each property to be developed or redeveloped. If a Recognized Environmental Condition (REC) is identified in a Phase I environmental site assessment, a Phase II environmental site assessment shall be prepared to determine whether conditions are present that require remediation or other controls to minimize the potential for hazardous materials contamination to adversely affect public health and the environment. If remediation is required, developers shall complete site remediation in accordance with OSHA standards and Santa Rosa Fire Department, Sonoma County Environmental Health Department, and State Water Resources Control Board guidelines. The Department of Toxic Substances Control (DTSC) may become involved wherever toxic levels of contaminants are found that pose an immediate hazard. Remediation shall reduce human exposure risk and environmental hazards, both during and after construction. The remediation plan shall be prepared in accordance with the environmental consultant's recommendations and established procedures for safe remediation. Specific mitigation measures designed to protect human health and the environment will be provided in the plan. Requirements shall include but not be limited to the following:

- Documentation of the extent of previous environmental investigation and remediation at the site, including closure reports for underground storage tanks (USTs) and contaminant concentrations.
- A site-specific health and safety plan to be prepared by all contractors at the project site, where applicable. This includes a plan for all demolition, grading, and excavation on the site, as well as for future subsurface maintenance work. The plan shall include appropriate training, any required personal protective equipment, and monitoring of contaminants to determine exposure. The Health and Safety Plan shall be reviewed and approved by a certified industrial hygienist.
- Description of protocols for the investigation and evaluation of previously unidentified hazardous materials that could be encountered during project development, including engineering controls that may be required to reduce exposure to construction workers and future users of the site.
- Requirements for site-specific construction techniques that would minimize exposure to any

subsurface contamination, where applicable, which shall include treatment and disposal measures for any contaminated groundwater removed from excavations, trenches, and dewatering systems in accordance with local and Regional Water Quality Control Board guidelines.

- Sampling and testing plan for excavated soils to determine suitability for reuse or acceptability for disposal at a state-licensed landfill facility.
- Restrictions limiting future excavation or development of the subsurface by residents and visitors to the proposed development, and prohibition of groundwater development should it be determined from test results that contamination is present. The restrictions would be developed based on site-specific conditions and would reflect the requirements of the RWQCB and/or DTSC, depending on which agency is responsible for oversight of the particular site. Restrictions, which are sometimes also referred to as land use covenants, shall be recorded with the parcel(s), shall run with the land. The developer or land owner successor(s)-in-interest shall be responsible for ensuring development complies with the restrictions. Compliance with the restrictions must be demonstrated to the satisfaction of the City before a grading permit is issued.
- Completion of an approved remediation plan should land use restrictions be insufficient to allow development to proceed safely. Remediation measures may include excavation and replacement of contaminated soil with clean fill, pumping and treatment of groundwater, thermal treatment, etc.

MM 3.8.4b: In the event previously unknown contaminated soil, groundwater, or subsurface features are encountered or have the potential be present during ground-disturbing activities at any site, work shall cease immediately, and the developer's contractor shall notify the City of Santa Rosa Fire Department for further instruction. The City shall ensure any grading or improvement plan or building permit includes a statement specifying that if hazardous materials contamination is discovered or suspected during construction activities, all work shall stop immediately until the City of Santa Rosa Fire Department has determined an appropriate course of action. Such actions may include, but would not be limited to, site investigation, human health and environmental risk assessment, implementation of a health and safety plan, and remediation and/or site management controls. The City of Santa Rosa Fire Department shall be responsible for notifying the appropriate regulatory agencies and providing evidence to the City Planning and Economic Development Department that potential risks have been mitigated to the extent required by regulatory agencies. Work shall not recommence on an impacted site until the applicable regulatory agency has determined further work would not pose an unacceptable human health or environmental risk. Deed restrictions may be required as provided under mitigation measure MM 3.8.4a.

Sources

- 2016 FEIR

3.10 HYDROLOGY AND WATER QUALITY

A. Description and Impacts

The 2016 FEIR analyzed effects to hydrology and water quality associated with implementation of the Specific Plan and Annexation projects. Construction and operation of subsequent projects in the Specific Plan and Annexation areas could generate stormwater runoff containing pollutants from construction sites and new impervious surfaces, which could affect water quality. Future development in the Specific Plan and Annexation areas would not significantly deplete groundwater supplies or alter the area available for recharge of the groundwater aquifer. Future development in the Specific Plan and Annexation areas could increase impervious surfaces and, as a result, alter drainage patterns and increase drainage rates over existing conditions. Future development may result in increased runoff and flows to the municipal storm drain system. Future development may also occur in areas subject to flooding hazards. However, the 2016 FEIR determined that no significant impacts would occur and therefore no mitigation measures are required.

Development of the Project site was included in the 2016 FEIR analysis and implementation of the proposed Project would result in 10 multi-family dwelling units developed at the site in addition to the maximum of 132 multi-family units analyzed in the 2016 FEIR. The amount of impervious surface of the Project would be almost identical, if not the same, as that analyzed in the 2016 FEIR and the Project would be subject to the same municipal regulations. The proposed Project would not have any new significant hydrology or water quality impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

Sources

- 2016 FEIR

3.11 LAND USE AND PLANNING

A. Description and Impacts

The 2016 FEIR concluded that the Specific Plan and Annexation would not divide an established community nor would it conflict with applicable land use plans. Implementation of the Specific Plan and Annexation would not significantly contribute to adverse cumulative impacts related to land use including conflicts with applicable land use plans. All land use and planning impacts were found to be less than significant in the 2016 FEIR.

Development of the Project site was included in the 2016 FEIR analysis and the proposed Project represents a minor increase of 10 dwelling units compared to the maximum density analyzed in the 2016 FEIR. The development footprint of the Project would be largely the same, if not identical, to the number of units analyzed for the Project site in the 2016 FEIR. The proposed Project would not have any new significant land use impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

Sources

- 2016 FEIR

3.12 MINERAL RESOURCES

A. Description and Impacts

The 2016 FEIR evaluated the Specific Plan and Annexation areas and concluded that there would be no impacts to mineral resources and required no mitigation measures related to mineral resources for the Specific Plan and Annexation.

Neither the City of Santa Rosa's General Plan, nor the Surface Mining and Reclamation Act (SMARA) of

1975, identifies specific areas of mineral resources in the North San Francisco Bay Region including Santa Rosa. The Specific Plan and Annexation does not lie within one of the listed aggregate deposits in the SMARA report as shown on Santa Rosa Quadrangle.

Development of the Project site was included in the 2016 FEIR analysis and circumstances related to mineral resources under which the proposed Project would be undertaken have not changed. As a result, the proposed Project, similar to the Specific Plan and Annexation, would have no impacts on mineral resources. The proposed Project would not have any new significant mineral resources impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

Sources

- 2016 FEIR

3.13 NOISE

A. Description and Impacts

The 2016 FEIR evaluated potential noise impacts related to the Specific Plan and Annexation projects. Specifically, the Specific Plan and Annexation would not expose residents to traffic noise or stationary sources of noise in excess of established standards. Project operation would generate increased local traffic volumes that could cause a substantial permanent increase in ambient noise levels in the Specific Plan and Annexation vicinity. Planned development under the proposed project would be required to comply with City noise standards set forth in the City Code. Construction activities could cause a substantial temporary increase in ambient noise levels at nearby noise-sensitive land uses, which may result in increased levels of annoyance, activity interference, and sleep disruption. The 2016 FEIR found all of these noise impacts to be less than significant.

Development of the Project site was included in the 2016 FEIR analysis and the proposed Project represents a minor increase of 10 dwelling units compared to the maximum density analyzed in the 2016 FEIR. Given the small increase in the number of units, additional noise, if any, would be unlikely to change the level of significance. Moreover, the Project would comply with all City Code standards. The proposed Project would not have any new significant noise impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

Sources

- 2016 FEIR

3.14 POPULATION AND HOUSING

A. Description and Impacts

The 2016 FEIR found that the Specific Plan and Annexation would result in population growth in the Specific

Plan and Annexation projects area that is consistent with growth projections for the City. The Specific Plan and Annexation could involve redevelopment activities on currently occupied residential parcels, but there would be no net displacement of people or housing overall. The Specific Plan and Annexation, along with other approved, proposed, and reasonably foreseeable development, could induce population and housing growth in the City's Urban Growth Boundary. The Specific Plan and Annexation, along with other approved, proposed, and reasonably foreseeable development, would not result in cumulative loss of housing or displacement of people. The 2016 FEIR concluded that the Specific Plan and Annexation would result in less-than-significant population and housing impacts overall.

As analyzed in the 2016 FEIR, the General Plan Land Use Designation for the Project site is Medium High Density Residential which permits a total of 132 multi-family dwelling units on the Project site based on the size of the Project site. This proposed 100 percent affordable housing project qualifies for a 35 percent state density bonus, which would allow for an additional 47 units, with a total of 179 multi-family dwelling units permitted on-site. Development of the Project site was included in the 2016 FEIR analysis and the proposed Project represents a minor increase of 10 dwelling units compared to the maximum density analyzed in the 2016 FEIR. The proposed Project would not have any new significant impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

Sources

- 2016 FEIR

3.15 PUBLIC SERVICES

A. Description and Impacts

The 2016 FEIR analyzed effects to public services associated with the Specific Plan and Annexation projects. Development resulting from implementation of the Specific Plan and Annexation could increase demand for fire protection, fire prevention, emergency medical, and law enforcement services, resulting in the need for new facilities, the construction of which could result in physical environmental effects. The Specific Plan and Annexation, in combination with other reasonably foreseeable development, would increase the City's population and could contribute to the need for expanded fire protection, fire prevention, and emergency medical services that could cause significant physical impacts to the environment. The Specific Plan and Annexation would result in the development of new residential and non-residential uses in the Specific Plan and Annexation projects area which would increase enrollment at local schools. The Specific Plan and Annexation, in combination with other reasonably foreseeable development in the City, would generate new student enrollments at local area schools. Implementation of the Specific Plan and Annexation would increase demand for parks and recreational facilities. Implementation of the Specific Plan and Annexation, in combination with other reasonably foreseeable development in the City, would also increase demand for parks and recreational facilities. The 2016 FEIR determined that the Specific Plan and Annexation would have less-than-significant impacts on public services, and no mitigation measures were required.

Development of the Project site was included in the 2016 FEIR analysis. As described in Section 2.0.B above, the General Plan Land Use Designation for the Project site is Medium High Density Residential which permits a total of 132 multi-family dwelling units on-site based on the size of the site. This proposed 100 percent affordable housing Project qualifies for a 35 percent state density bonus. With the 35 percent density bonus the permitted number of multi-family dwelling units on-site is 179 units. The proposed Project includes the construction of a four-story, 142-unit, multi-family apartment building, which is only 10 more dwelling

units than the baseline permitted by the General Plan Land Use Designation and zoning for the site. Thus, the increase to public service demand would be negligible. The proposed Project would not have any new significant public services impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

Sources

- 2016 FEIR

3.16 RECREATION

A. Description and Impacts

The 2016 FEIR analyzed the potential impacts on recreational facilities and the Specific Plan and Annexation would have minimal effects on existing neighborhood and regional parks. Impacts were found to be less than significant and no mitigation measures were required.

Development of the Project site was included in the 2016 FEIR analysis and the proposed Project represents a minor increase of 10 dwelling units compared to the maximum density analyzed in the 2016 FEIR. The proposed Project would not have any new significant recreation impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

Sources

- 2016 FEIR

3.17 TRANSPORTATION AND TRAFFIC

A. Description and Impacts

The 2016 FEIR concluded that Specific Plan and Annexation traffic would not degrade corridor operations to unacceptable levels of service under "Existing plus Project" conditions. Specific Plan and Annexation traffic would have the potential to degrade mainline freeway operations to unacceptable levels of service under Existing plus Project conditions. Traffic would have the potential to degrade freeway ramp operations to an unacceptable level of service at the southbound US 101 freeway off-ramp at Hearn Avenue under Existing plus Project conditions. The Specific Plan and Annexation includes various roadway improvements that would be designed and constructed according to City-approved design standards to ensure safety. Implementation of the proposed Project would not interfere with emergency access within the Specific Plan and Annexation areas. Implementation of the Specific Plan and Annexation would not conflict with any alternative transportation policies or plans. Implementation of the Specific Plan and Annexation would result in improvements to pedestrian and bicycle circulation in the Specific Plan and Annexation areas that would enhance connectivity and safety. Implementation of the Specific Plan and Annexation would have a beneficial impact on bus transit by concentrating uses in a transit-oriented development pattern and by increasing connectivity to transit facilities. Construction activities associated with implementation may temporarily affect vehicular, pedestrian, bicycle, and transit circulation. Specific Plan and Annexation traffic, when considered together with other past, present, and future development, would have the potential to degrade corridor operations to unacceptable levels of service (Future plus Project or cumulative condition). Specific Plan and Annexation traffic, when considered together with other past, present, and future development, would have the potential to degrade mainline freeway operations to unacceptable levels of service (Future plus Project or "cumulative" conditions).

Development of the Project site was included in the 2016 FEIR analysis and the proposed Project represents a minor increase of 10 dwelling units compared to the maximum density analyzed in the 2016 FEIR. The proposed Project would not have any new significant transportation impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

A Traffic Impact Study (TIS) for the proposed Project was prepared by W-Trans in April of 2021 (Attachment 6). According to the TIS, the proposed Project is expected to generate an average of 772 trips per day, including 51 trips during the weekday a.m. peak hour and 62 trips during the weekday p.m. peak hour. A summary of the TIS impacts analysis for the proposed Project is provided below.

Vehicle Miles Travelled (VMT) Analysis

Based on data from the version of the Sonoma County Transportation Authority (SCTA) travel demand model released in October 2020, the County of Sonoma has a baseline average residential VMT of 16.53 miles per capita. A residential project generating a VMT that is 15 percent or more below this value, or 14.05 miles per capita or less, would have a less-than-significant VMT impact. The SCTA model includes traffic analysis zones (TAZ) covering geographic areas throughout Sonoma County. The Project site is located within TAZ 500, which has a baseline VMT per capita of 13.01 miles. Because this per capita VMT ratio is below the significance threshold of 14.05 miles, the Project would be considered to have a less-than-significant VMT impact.

The City's VMT guidelines and OPR Technical Advisory also include screening criteria which identify certain types of projects that may be presumed to have a less than significant VMT impact, including developments comprised of 100 percent affordable housing. As a 100 percent affordable housing project, the proposed Stony Oaks Project would qualify for this screening criteria in addition to falling below the VMT per capita significance threshold.

Also, according to the Association of Bay Area Governments' report on Transit Oriented Development and Affordable Housing, lower-income households have lower car ownership rates than moderate-income

households. Although each development is unique and will be individually analyzed, very high-density affordable housing developments tend to generate lower VMT than market-rate housing at comparable densities. The City of Santa Rosa's Draft VMT guidelines provides screening criteria for transportation review under CEQA for 100% affordable housing constructed near a major transit stop or high-quality transit corridor in PDAs.

Overall, the TIS found that the Project would have a less-than-significant impact on vehicle miles traveled.

Pedestrian Facilities

The site would include an on-site network of pedestrian sidewalks and paths. Given that the site is an infill location within existing neighborhoods and near school, recreation, and employment uses, it is reasonable to assume that some Project residents would walk and/or use transit to reach destinations beyond the site. As proposed, the Project would include a sidewalk along its entire frontage of Old Stony Point Road, replacing the current asphalt path and dike and connecting to the existing pedestrian network to the north and south. From this pedestrian connection on Old Stony Point Road, residents would be able to access nearby bus stops on Stony Point Road, Hearn Avenue, and at Southwest Community Park. Enhanced pedestrian crossings including Rectangular Rapid Flashing Beacon (RRFB) warning devices are already in place near the transit stops on both Stony Point Road and Hearn Avenue.

The Project would also provide a short segment of sidewalk on its limited Hearn Avenue frontage. Currently, the north side of Hearn avenue to the east and west has sidewalk gaps that are anticipated to be filled over time as adjacent properties develop or redevelop. Until such time as those sidewalks are constructed in the future, residents of the proposed Project would still have continuous access to the surrounding pedestrian network and transit facilities via existing sidewalks on Old Stony Point Road and the south side of Hearn Avenue. The City has indicated that pedestrian access at the site's Hearn Avenue driveway will need to be restricted until sidewalk gaps are filled or a means to access the sidewalk on the south side of Hearn is provided. The TIS found that pedestrian facilities serving the Project site would be adequate upon the completion of the proposed frontage improvements.

Bicycle Facilities

The existing Class II bike lanes on Hearn Avenue along with planned future bicycle facilities in the vicinity would provide adequate access for bicyclists. Residents of the proposed development would be able to use the existing bike lanes on Hearn Avenue to connect to many of the primary bicycle facilities in the City. The TIS found that the bicycle facilities serving the Project site are adequate.

Transit

Existing transit routes are adequate to accommodate Project-generated transit trips. Bus stops serving two City Bus routes are within convenient walking distance of the site and accessible by the existing pedestrian network. Thus, according to the TIS, transit facilities serving the Project site are adequate.

Site Access

The Project would include two driveways providing primary access to the proposed apartments, one on Old Stony Point Road at the site's western property boundary and one on Hearn Avenue near the site's eastern property boundary. Old Stony Point Road is a low-volume local street that terminates 300 feet north of the Project site; given the nature of the street no potential conflicts would be created by the proposed driveway. The Project driveway on Hearn Avenue would be located on a segment of the corridor that has existing two-way left-turn lanes, and the south side of Hearn Avenue near the Project site includes single-family homes that generate very low volumes of turning traffic. The two-way left-turn lane will provide space for eastbound drivers to turn left into the site, and for outbound drivers to make left-turns in two separate movements during busier periods. The driveway is anticipated to function acceptably.

Sight Distance

Sight distances along Old Stony Point Road and Hearn Avenue at the Project driveways were evaluated based on sight distance criteria contained in the Highway Design Manual published by Caltrans. The recommended sight distance for the driveway approaches is based on stopping sight distance and uses the approach travel speed as the basis for determining the recommended sight distance.

For Old Stony Point Road, which has a speed of 25 mph, the minimum stopping sight distance is 150 feet. The minimum stopping sight distance for Hearn Avenue, which has a posted speed limit of 30 mph, is 200 feet. The available sight lines were field measured and exceed 200 feet at both driveways, which meets the sight distance requirements.

The TIS found that based on field observations and review of the Project site plan, the Project's proposed driveways are anticipated to operate acceptably, with adequate sight distances along Old Stony Point Road and Hearn Avenue.

Based on the finding above, the TIS identified the following recommendation: To maintain clear lines if sight from the Project driveways it is recommended that any landscaping be low-profile and that trees be set back outside the vision triangle.

Emergency Access

Emergency response vehicles could access the site via the main access point on Old Stony Point Road as well as the Hearn Avenue driveway. The AutoTURN application of AutoCad was used to evaluate the adequacy of access for emergency vehicles based on the Project site plan. As designed, there would be no anticipated issues with fire truck access. An exhibit showing the expected travel paths on the site plan is provided in Appendix C of the Traffic Impact Study. The TIS found that emergency access is expected to function acceptably.

On-site Circulation

The site consists of a group of apartment buildings surrounded by drive aisles that loop around the building and include perpendicular parking spaces. All drive aisles connect internally, allowing access to both Old Stony Point Road and Hearn Avenue. The TIS found that on-site circulation is anticipated to function acceptably.

Parking

Parking was evaluated to determine if the proposed parking supply would be adequate to satisfy City and State requirements. Per the Project site plan, a total of 185 parking spaces will be provided on-site, including 13 ADA-accessible spaces. Section 20-36.040 of the Santa Rosa City Code requires multifamily affordable housing projects to provide one parking space per one-bedroom unit and two parking spaces per unit with two or more bedrooms. Based on these rates, the Project would need to provide a total of 228 parking spaces and would fall short of this by 30 spaces.

The Project would qualify for State density bonus provisions as outlined in Government Code Section 65915, which requires one parking space for one-bedroom units and one and one-half parking spaces for two- and three-bedroom units. Based on the unit mix for this Project, 185 parking spaces are required, which equals the proposed supply. The proposed supply of 185 parking spaces is compliant with applicable State and local density bonus provisions.

It should be noted that the site is located within one-quarter mile of transit stops for Santa Rosa CityBus and would be connected to surrounding pedestrian and bicycle facilities, supporting travel by non-auto modes

and reducing reliance on vehicle ownership, which thereby helps to reduce demand for parking.

Bicycle Parking

The required bicycle parking supply was calculated to ensure adequacy under City requirements. Santa Rosa City Code Section 20-36.040 requires multifamily dwellings to provide bicycle parking at the rate of one space per four units if the units do not have a private garage or private storage space. The proposed Project provide 41 long-term and 18 short-term bike spaces and would meet bike parking requirements. According to the TIS, the Project's proposed bicycle parking would be adequate.

Traffic Signal Warrants

The TIS found that the Peak Hour Volume warrant would be met at the intersection of Hearn Avenue/Burbank Avenue under both Baseline and Baseline plus Project Conditions. The need for signalization was identified in the Specific Plan and the Project has been added to the City's Capital Improvement Program.

Based on the finding above, the TIS identified the following recommendation: As directed by the City, the applicant should contribute a proportional share of funds for the signalization of the intersection of Hearn Avenue/Burbank Avenue. The Project would be responsible for 9.3 percent of the cost, or $29,760.

B. Mitigation Measures

The following mitigation measure from the 2016 FEIR is required and would reduce construction-related traffic impacts to less-than-significant levels.

MM 3.14.9: Prior to construction activities, applicants seeking to construct projects in the project area shall submit a construction traffic control plan to the City of Santa Rosa for review and approval. The plan shall identify the timing and routing of all major construction-related traffic to avoid potential congestion and delays on the local street network. Any temporary road or sidewalk closures shall be identified along with detour plans for rerouting pedestrian and bicycle traffic for rerouting pedestrian and bicycle traffic. The plan shall also identify locations where transit service would be temporarily rerouted or transit stops moved, and these changes must be approved by the Santa Rosa City Bus and Sonoma County Transit before the plan is finalized. If necessary, movement of major construction equipment and materials shall be limited to off-peak hours to avoid conflicts with local traffic circulation.

Sources

- 2016 FEIR
- 2020 Draft Vehicle Miles Traveled (VMT) Guidelines Final Draft, City of Santa Rosa Transportation and Public Works Department
- 2021 Draft Traffic Impact Study for Stony Oaks Apartments, prepared by W-Trans

3.18 TRIBAL CULTURAL RESOURCES

A. Description and Impacts

The 2016 FEIR analyzed the potential impacts to tribal cultural resources that could occur as a result of the Specific Plan and Annexation projects. The 2016 FEIR determined that the Specific Plan and Annexation would have less-than-significant impacts on tribal cultural resources after mitigation.

The 2016 FEIR found that future projects constructed in the Specific Plan and Annexations area involving ground disturbance could result in the disturbance of known and undiscovered archaeological resources or cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074, resulting in potentially significant impacts. The 2016 FEIR reduced this potentially significant impact to less-than-significant levels with implementation of MM 3.5.2a and MM 3.5.2b listed below. The 2016 FEIR also noted that if future projects constructed under the Specific Plan involve ground disturbance, implementation could result in the disturbance of human remains, then potentially significant impacts could occur. However, these potentially significant impacts could be reduced to less-than-significant levels by implementing MM 3.5.3a and MM 3.5.3b listed below. Implementation of the Specific Plan and Annexation, along with any foreseeable development in the Specific Plan and Annexation vicinity, could contribute to cumulative impacts to cultural resources; however, these impacts were found to be less than cumulatively considerable.

Consequently, the impacts related to tribal resources that could occur as a result of the proposed Project would be less-than-significant after implementation of the 2016 FEIR mitigation measures referenced above and identified below. As a result, the proposed Project, similar to the Specific Plan and Annexation projects, would have less-than-significant impacts after mitigation on tribal cultural resources. The proposed Project would not have any new significant tribal cultural resources impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

The City consulted with Federated Indians of Graton Rancheria (FIGR), and the Tribal Response to the application is summarized as follows: “Federated Indians of Graton Rancheria (FIGR) has received your project notification, and has reviewed your project and concluded that the project may impact Tribal Cultural Resources. The project should have a notification provision to contact the FIGR Tribal Heritage Preservation Officer (THPO) if cultural resources are encountered during any ground disturbing activities.”

B. Mitigation Measures

The following mitigation measures are required from the 2016 FEIR and would reduce cultural and tribal cultural resources impacts to less-than-significant levels.

MM 3.5.2a: Phase 1 Archaeological Resource Study. When specific projects are proposed within the project area that involve ground-disturbing activity, a site-specific Phase I archaeological resource study shall be performed by a qualified archaeologist or equivalent cultural resources professional that will include an updated records search, pedestrian survey of the project area, development of a historic context, sensitivity assessment for buried prehistoric deposits, and preparation of a technical report that meets federal and state requirements. If significant or unique resources are identified and cannot be avoided, treatment plans will be developed in consultation with the City and appropriate Native American representatives to mitigate potential impacts to less than significant based on the provisions of Public Resources Code Section 21083.2.

MM 3.5.2b: Should any archaeological artifacts be discovered during construction of any project allowed under the Specific Plan, all construction activities shall be halted immediately within 50 feet of the discovery, the City shall be notified, and a professional archaeologist that meets the Secretary of the Interior’s Standards and Guidelines for Professional Qualifications in archaeology and/or history shall be retained to determine the significance of the discovery. The professional archaeologist shall prepare a plan to identify, record, report, evaluate, and recover the resources as necessary, which shall be

implemented by the developer. Construction within the area of the discovery shall not recommence until impacts on the archaeological resource are mitigated as described in Mitigation Measure MM 3.5.2a. Additionally, Public Resources Code Section 5097.993 stipulates that a project sponsor must inform project personnel that collection of any Native American artifacts is prohibited by law.

MM 3.5.3a: Implement Mitigation Measure MM 3.5.2a (Phase 1 Archaeological Resource Study).

MM 3.5.3b: Should human remains be discovered during construction of any project allowed under the Specific Plan, all construction activities shall be halted immediately within 50 feet of the discovery, the City shall be notified, and the Sonoma County Coroner shall be notified, according to Section 5097.98 of the State Public Resources Code and Section 7050.5 of California's Health and Safety Code. If the remains are determined to be Native American, the coroner will notify the Native American Heritage Commission, and the procedures outlined in CEQA Section 15064.5(d) and (e) shall be followed.

Sources

- 2016 FEIR

3.19 UTILITIES AND SERVICE SYSTEMS

A. Description and Impacts

The 2016 FEIR determined that implementation of the Specific Plan and Annexation did not require any new or expanded water treatment facilities, resulting in no impact. The Specific Plan and Annexation in combination with other reasonably foreseeable development in the Sonoma County Water Agency service area, would result in less than cumulatively considerable water supply impacts. Wastewater flows generated as a result of the Specific Plan and Annexation would not exceed existing capacity at the Laguna Wastewater Treatment Plant or in existing conveyance facilities, and impacts were deemed less than significant. Implementation of the Specific Plan and Annexation required the extension of existing stormwater drainage facilities to serve new development; however, impacts were considered less than significant. Cumulative growth in the City would increase the volume of stormwater entering the City's drainage system; however, impacts would be less than cumulatively considerable.

The 2016 FEIR indicated that future development resulting from implementation of the Specific Plan and Annexation would increase demand for solid waste collection, recycling, and disposal services; however, impacts would be less than significant. Implementation of the Specific Plan and Annexation would not be expected to result in conflicts with any federal, state, or local solid waste regulations, and impacts would less than significant. The Specific Plan and Annexation, when considered in combination with other existing and planned development in the SCWMA service area, would increase cumulative demand for solid waste disposal services, however, impacts would be less than cumulatively considerable.

Development of the Project site was included in the 2016 FEIR analysis and the proposed Project represents a minor increase of 10 dwelling units compared to the maximum density analyzed in the 2016 FEIR. The proposed Project would not have any new significant utilities and service systems impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

B. Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

Sources

- 2016 FEIR

3.20 WILDFIRE

A. Description and Impacts

The 2016 FEIR concluded that the Specific Plan and Annexation would result in no impacts related to wildfire as the Specific Plan and Annexation areas are not within a State designated area of high fire hazard severity. The Specific Plan and Annexation areas are in an urbanized area surrounded by mostly industrial uses. The proposed Project site is located within an urbanized portion of the City of Santa Rosa that was not threatened by the 2017 wildfires. The 2017 Tubbs Fire limit was located approximately 4.6 miles to the north of the Project site. While wildfires have entered urban areas, the risk is not considered significant for the Specific Plan and Annexation areas as they are far removed from areas of high wildfire risk.

The City of Santa Rosa General Plan 2035 identifies Wildland Urban Interface (WUI) zones, which are defined as areas where homes are built near or among lands prone to wildland fire. According to the General Plan, WUI zones include four types of fire hazard zones: moderate, high, very high, and mutual threat. According to the General Plan, approximately 30 percent of the City is located in a WUI zone. The Project site is not located within, or near, a WUI zone as identified in the General Plan and therefore is not designated one of the four WUI fire hazard zones.

The Specific Plan and Annexation would not impair implementation of, or physically interfere with the community's adopted emergency operations plan. The Specific Plan and Annexation would not change existing circulation patterns and therefore would have no effect on emergency response routes.

The proposed Project would be required to comply with all applicable building and safety codes, including the California Building Code and California Fire Code, and all applicable fire safety standards set forth by the City regarding fire protection to protect the proposed structures and future occupants from possible wildfires. The Project would be constructed with fire-resistant materials and any exterior exposed wood would be fire treated. The new buildings would also be equipped with standard safety features such as certified alarm systems, fire extinguishers, and fire sprinklers (as required by General Plan policy NS-G-2) to better alert occupants of potential wildfires. The fire sprinklers installed for the proposed project would comply with the California Building Code and the National Fire Protection Association and the Santa Rosa Fire Department (SRFD) would review the fire sprinkler system prior to installation.

The proposed Project will require a building permit and be built in compliance with the California Building Code in affect at the time of Building Permit submittal and will not exacerbate the fire risk. In accordance with City requirements, the Project includes construction of two access points to provide additional access for fire apparatus and to allow emergency ingress and egress to the Project site. The Project includes two ingress and egress locations to support evacuation plans and emergency access. In compliance with the Santa Rosa City Code and the California Fire Code, all Project roadways would be a minimum of 20 feet wide. Therefore, in the event of a wildfire, the proposed Project is not expected to substantially impair an adopted emergency response plan or emergency evacuation plan, and impacts would be less than significant.

Development of the Project site was included in the 2016 FEIR analysis. The proposed Project would not have any new significant wildfire impacts, nor would it create a substantial increase in the severity of the previously disclosed impacts analyzed in the 2016 FEIR.

Mitigation Measures

None required. No new significant environmental effects and no substantial increase in the severity of previously identified significant effects were found. Therefore, no additional or modified mitigation measures are required.

B. Sources

- 2016 FEIR
- City of Santa Rosa. 2009. City of Santa Rosa General Plan 2035

3.21 MANDATORY FINDINGS OF SIGNIFICANCE

The 2016 FEIR addressed mandatory findings of significance associated with the Specific Plan and Annexation. The 2016 FEIR concluded that the Specific Plan and Annexation would result in various levels of environmental impact significance (after mitigation, where applicable), including: No Impact, Less than Significant Impact, Significant and Unavoidable Impact, Less than Cumulatively Considerable Impact, and Cumulatively Considerable Impact. Refer to Table ES-1 (Executive Summary) of the 2016 FEIR for a summary of the environmental impacts associated with implementation of the Specific Plan and Annexation.

The 2016 FEIR concluded that the following impacts associated with the Specific Plan and Annexation would be ***less than significant after mitigation***:

Air Quality
- Impact 3.3.3 (short-term construction emissions)
- Impact 3.3.5 (increased exposure of existing or planned sensitive land uses to construction-source toxic air contaminant [TAC] emissions)
- Impact 3.3.6 (development of housing units [sensitive land uses] near stationary or mobile-source TACs

Biological Resources
- Impact 3.4.1 (adverse effects, either directly or indirectly, on species listed as endangered, threatened, rare, proposed, and candidate plant and wildlife species)
- Impact 3.4.2 (direct and indirect loss of habitat and individuals of animal and plant species of concern)
- Impact 3.4.4 (result in the loss or degradation of protected wetlands or vernal pools)

Cultural Resources
- Impact 3.5.2 (disturbance of known and undiscovered archaeological resources or cause a substantial adverse change in the significance of a tribal cultural resource)
- Impact 3.5.3 (disturbance of human remains)

Hazards and Hazardous Materials
- Impact 3.8.4 (hazardous materials sites in the project area)

Traffic and Transportation
- Impact 3.14.9 (temporarily affect vehicular, pedestrian, bicycle, and transit circulation)
- Impact 3.14.12 (degradation of freeway ramp operations to an unacceptable level of service)

The 2016 FEIR concluded that the following impacts associated with the Specific Plan and Annexation would be ***significant and unavoidable***:

Traffic and Transportation
- Impact 3.14.2 (degradation of mainline freeway operations)
- Impact 3.14.3 (degradation freeway ramp operations)

The 2016 FEIR concluded that the following impacts associated with the Specific Plan and Annexation would be ***cumulatively considerable and significant and unavoidable***:

Air Quality
- Impact 3.3.8 (cumulative increase of criteria air pollutants)

Traffic and Transportation

- 3.14.11 (degradation of mainline freeway operations)

Based on the 2016 FEIR, implementation of the Specific Plan and Annexation, with applicable Mitigation Measures required by the 2016 FEIR, would not: have the potential to substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of a rare or endangered plant or animal; or eliminate important examples of the major periods of California history or prehistory.

The 2016 FEIR concluded that the Specific Plan and Annexation would not result in cumulatively considerable impacts with the exception of Impact 3.3.8 (cumulative increase of criteria air pollutants) and Impact 3.14.11 (degradation of mainline freeway operations).

The 2016 FEIR concluded that the Specific Plan and Annexation would not result in environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly.

Development of the proposed Project site was included in the 2016 FEIR analysis and the proposed Project represents a minor increase of 10 dwelling units compared to the maximum density analyzed for the Project site in the 2016 FEIR. This Addendum finds that actions required for the proposed Project, as identified herein, would not result in any new significant environmental effects, or result in the substantial increase of any impacts previously identified in the 2016 Final EIR.

SECTION 4.0 REPORT AUTHORS, PROJECT APPLICANT AND CONSULTANTS

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MITIGATION MONITORING AND REPORTING PROGRAM

This Mitigation Monitoring and Reporting Program (MMRP) has been prepared pursuant to CEQA Guidelines (California Code of Regulations, Title 14), which state the following:

> *In order to ensure that the mitigation measures and project revisions identified in the EIR or negative declaration are implemented, the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects. A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program.*
>
> *The public agency may choose whether its program will monitor mitigation, report on mitigation, or both. "Reporting" generally consists of a written compliance review that is presented to the decision-making body or authorized staff person. A report may be required at various stages during project implementation or upon completion of the mitigation measure. "Monitoring" is generally an ongoing or periodic process of project oversight. There is often no clear distinction between monitoring and reporting and the program best suited to ensuring compliance in any given instance will usually involve elements of both.*

Table 1 lists the potentially significant impacts and proposed mitigation measures identified in the Stony Oaks Affordable Housing Project CEQA Addendum. Table 1 describes the timing of implementation of the mitigation measures (i.e., when the measure will be implemented) and the City of Santa Rosa (City) staff or individual responsible for ensuring implementation of the measures. Finally, Table 1 describes the City staff or individual responsibility for monitoring the mitigation measures.

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Table 1
Mitigation Monitoring and Reporting Program

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
AIR QUALITY				
Impact 3.3.3: The proposed Project could result in short-term construction emissions that could violate or substantially contribute to a violation of federal and state standards. ***Significance of Impact before Mitigation:*** Potentially Significant ***Significance of Impact After Mitigation:*** Less Than Significant	**MM 3.3.3:** Where projects in the project area are subject to subsequent CEQA review, the City of Santa Rosa must ensure that in addition to the BAAQMD basic construction mitigation measures from Table 8-1 of the BAAQMD CEQA Air Quality Guidelines (or subsequent updates), BAAQMD additional mitigation measures from Table 8-2 of the BAAQMD CEQA Air Quality Guidelines (or subsequent updates) are noted on the construction documents and implemented. These measures include the following: 1. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe. 2. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. 3. Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity. 4. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. 5. The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time. 6. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.	City of Santa Rosa Planning and Economic Development Department	Implemented during construction activities for the proposed Project within the Project area	***Initials*** _____ ***Date*** _____

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
	7. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12-inch compacted layer of wood chips, mulch, or gravel. 8. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent. 9. Minimizing the idling time of diesel-powered construction equipment to two minutes. 10. 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 NOx reduction and 45 percent PM reduction compared to the most recent CARB fleet average. 11. Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings). 12. Requiring that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NOx and PM. 13. Requiring all contractors use equipment that meets CARB's most recent certification standard for off-road heavy-duty diesel engines.			

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
BIOLOGICAL RESOURCES				
Impact 3.4.1: Implementation of the proposed Project could result in adverse effects, either directly or indirectly, on species listed as endangered, threatened, rare, proposed, and candidate plant and wildlife species as well as plant species identified by the CNPS with a rating of List 1A or 1B. ***Significance of Impact Before Mitigation:*** Potentially Significant ***Significance of Impact After Mitigation:*** Less Than Significant	**MM 3.4.1a:** Implement General Plan Mitigation Measure 4.F-5: The City of Santa Rosa shall incorporate the avoidance and mitigation measures described in the Santa Rosa Plain Conservation Strategy and the USFWS Programmatic Biological Opinion, as conditions of approval for development in or near areas with suitable habitat for California tiger salamander, Burke's goldfields, Sonoma sunshine, Sebastopol meadowfoam, and many flowered navarretia. However, in accordance with the USFWS Programmatic Biological Opinion, projects within the Southwest Santa Rosa Preserve System will be evaluated individually and mitigation may not necessarily adhere to the ratios described in the Conservation Strategy.	City of Santa Rosa Planning and Economic Development Department	Prior to construction of the proposed Project that could result in disturbance to bird or bat nests	***Initials*** _____ ***Date*** _____

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
Impact 3.4.1: Implementation of the proposed Project could result in adverse effects, either directly or indirectly, on species listed as endangered, threatened, rare, proposed, and candidate plant and wildlife species as well as plant species identified by the CNPS with a rating of List 1A or 1B. ***Significance of Impact Before Mitigation:*** Potentially Significant ***Significance of Impact After Mitigation:*** Less Than Significant	**MM 3.4.1b:** If there is the potential for destruction of a nest or substantial disturbance to nesting birds or bats due to construction activities, a plan to monitor nesting birds or bats during construction shall be prepared and submitted to the USFWS and CDFG for review and approval. The City shall comply with all USFWS or CDFG guidance for protection of nesting birds. If vegetation, buildings, or bridges that potentially provide nesting sites must be removed, a qualified wildlife biologist shall conduct pre-construction surveys. If an active bird nest is found, the bird shall be identified as to species and the approximate distance from the closest work site to the nest estimated. No additional measures need be implemented if active nests are more than the following distances from the nearest work site: (a) 300 feet for raptors; or (b) 75 feet for other nonspecial-status bird species. Disturbance of active nests shall be avoided to the extent possible until it is determined that nesting is complete and the young have fledged. Bats shall be absent or flushed from roost locations prior to demolition of buildings. If flushing of bats from buildings is necessary, it shall be done by a qualified biologist during the non-breeding season from October 1 to March 31. When flushing bats, structures shall be moved carefully to avoid harming individuals, and torpid bats given time to completely arouse and fly away. During the maternity season from April 1 to September 30, prior to building demolition or construction, a qualified biologist shall determine if a bat nursery is present at any sites identified as potentially housing bats. If an active nursery is present, disturbance of bats shall be avoided until the biologist determines that breeding is complete and young are reared.	City of Santa Rosa Planning and Economic Development Department	Prior to construction of the proposed Project that could result in disturbance to bird nests or bat roosts	***Initials*** _____ ***Date*** _____

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
Impact 3.4.2: Implementation of the proposed Project could result in direct and indirect loss of habitat and individuals of animal and plant species of concern and other non-listed special-status species. ***Significance of Impact Before Mitigation:*** Potentially Significant ***Significance of Impact After Mitigation:*** Less Than Significant	**MM 3.4.2a:** Implement Mitigation Measure 3.4.1a and 3.4.1b.	City of Santa Rosa Planning and Economic Development Department	Prior to any vegetation removal or ground disturbing activities	***Initials*** _____ ***Date*** _____

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
Impact 3.4.4: Implementation of the project could result in the loss or degradation of protected wetlands or vernal pools. ***Significance of Impact Before Mitigation:*** Potentially Significant ***Significance of Impact After Mitigation:*** Less Than Significant	**MM 3.4.2b:** A formal wetland delineation shall be conducted for areas that will be permanently or temporarily impacted by the project. If jurisdictional waters cannot be avoided, the City shall apply for a CWA Section 404 permit from the USACE and a Section 401 permit from the RWQCB. These permits shall be obtained prior to issuance of grading permits and implementation of the proposed Project. The City shall ensure that the project will result in no net loss of waters of the U.S. by providing mitigation through impact avoidance, impact minimization, and/or compensatory mitigation for the impact, as determined in the CWA Section 404/401 permits. Compensatory mitigation may consist of (a) obtaining credits from a mitigation bank; (b) making a payment to an in-lieu fee program that will conduct wetland, stream, or other aquatic resource restoration, creation, enhancement, or preservation activities (these programs are generally administered by government agencies or nonprofit organizations that have established an agreement with the regulatory agencies to use in-lieu fee payments collected from permit applicants); and/or (c) providing compensatory mitigation through an aquatic resource restoration, establishment, enhancement, and/or preservation activity. This last type of compensatory mitigation may be provided at or adjacent to the impact site (i.e., on-site mitigation) or at another location, usually within the same watershed as the permitted impact (i.e., off-site mitigation). The project proponent/permit applicant retains responsibility for the implementation and success of the mitigation project. Evidence of compliance with this mitigation measure shall be provided prior to construction and grading activities for the proposed Project.	City of Santa Rosa Planning and Economic Development Department	Prior to any vegetation removal or ground disturbing activities	***Initials*** _____ ***Date*** _____
CULTURAL RESOURCES				
Impact 3.5.2: If future projects constructed in the project area involve ground disturbance, implementation of the proposed	**MM 3.5.2a:** Phase 1 Archaeological Resource Study. When specific projects are proposed within the project area that involve ground-disturbing activity, a site-specific Phase I archaeological resource study shall be performed by a qualified archaeologist or	City of Santa Rosa Planning and Economic Development	Prior to subsequent projects that would result in	***Initials*** _____

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
Project could result in the disturbance of known and undiscovered archaeological resources or cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074. ***Significance of Impact Before Mitigation:*** Potentially Significant ***Significance of Impact After Mitigation:*** Less Than Significant	equivalent cultural resources professional that will include an updated records search, pedestrian survey of the project area, development of a historic context, sensitivity assessment for buried prehistoric deposits, and preparation of a technical report that meets federal and state requirements. If significant or unique resources are identified and cannot be avoided, treatment plans will be developed in consultation with the City and appropriate Native American representatives to mitigate potential impacts to less than significant based on the provisions of Public Resources Code Section 21083.2.	Department	ground-disturbing activity	***Date*** _____
Impact 3.5.2: If future projects constructed in the project area involve ground disturbance, implementation of the proposed Project could result in the disturbance of known and undiscovered archaeological resources or cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074. ***Significance of Impact Before Mitigation:*** Potentially Significant	**MM 3.5.2b:** Should any archaeological artifacts be discovered during construction of any project allowed under the Specific Plan, all construction activities shall be halted immediately within 50 feet of the discovery, the City shall be notified, and a professional archaeologist that meets the Secretary of the Interior's Standards and Guidelines for Professional Qualifications in archaeology and/or history shall be retained to determine the significance of the discovery. The professional archaeologist shall prepare a plan to identify, record, report, evaluate, and recover the resources as necessary, which shall be implemented by the developer. Construction within the area of the discovery shall not recommence until impacts on the archaeological resource are mitigated as described in Mitigation Measure MM 3.5.2a. Additionally, Public Resources Code Section 5097.993 stipulates that a project sponsor must inform project personnel that collection of any Native American artifacts is prohibited by law.	City of Santa Rosa Planning and Economic Development Department	As a condition of Project approval, and during construction of the proposed Project	***Initials*** _____ ***Date*** _____

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
Significance of Impact After Mitigation: Less Than Significant				
Impact 3.5.3: If future projects constructed in the project area involve ground disturbance, implementation of the proposed Project could result in the disturbance of human remains. ***Significance of Impact Before Mitigation:*** Potentially Significant ***Significance of Impact After Mitigation:*** Less Than Significant	**MM 3.5.3a:** Implement Mitigation Measure MM 3.5.2a (Phase 1 Archaeological Resource Study).	City of Santa Rosa Planning and Economic Development Department	Prior to subsequent projects that would result in ground-disturbing activity	***Initials*** _____ ***Date*** _____
Impact 3.5.3: If future projects constructed in the project area involve ground disturbance, implementation of the proposed Project could result in the disturbance of human remains. ***Significance of Impact Before Mitigation:*** Potentially Significant ***Significance of Impact After***	**MM 3.5.3b:** Should human remains be discovered during construction of any project allowed under the Specific Plan, all construction activities shall be halted immediately within 50 feet of the discovery, the City shall be notified, and the Sonoma County Coroner shall be notified, according to Section 5097.98 of the State Public Resources Code and Section 7050.5 of California's Health and Safety Code. If the remains are determined to be Native American, the coroner will notify the Native American Heritage Commission, and the procedures outlined in CEQA Section 15064.5(d) and (e) shall be followed.	City of Santa Rosa Planning and Economic Development Department	As a condition of Project approval, and during construction of the proposed Project	***Initials*** _____ ***Date*** _____

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
Mitigation: Less Than Significant				
HAZARDS AND HAZARDOUS MATERIALS				
Impact 3.8.4: Review of environmental hazards databases conducted in association with the proposed Project identified hazardous materials sites in the project area, including sites on the Cortese List. ***Significance of Impact Before Mitigation:*** Potentially Significant ***Significance of Impact After Mitigation:*** Less Than Significant	**MM 3.8.4:** Phase I Environmental Site Assessment. Developers shall be required to complete a Phase I environmental site assessment for each property to be developed or redeveloped. If a Recognized Environmental Condition (REC) is identified in a Phase I environmental site assessment, a Phase II environmental site assessment shall be prepared to determine whether conditions are present that require remediation or other controls to minimize the potential for hazardous materials contamination to adversely affect public health and the environment. If remediation is required, developers shall complete site remediation in accordance with OSHA standards and Santa Rosa Fire Department, Sonoma County Environmental Health Department, and State Water Resources Control Board guidelines. The Department of Toxic Substances Control (DTSC) may become involved wherever toxic levels of contaminants are found that pose an immediate hazard. Remediation shall reduce human exposure risk and environmental hazards, both during and after construction. The remediation plan shall be prepared in accordance with the environmental consultant's recommendations and established procedures for safe remediation. Specific mitigation measures designed to protect human health and the environment will be provided in the plan. Requirements shall include but not be limited to the following: • Documentation of the extent of previous environmental investigation and remediation at the site, including closure reports for underground storage tanks (USTs) and contaminant concentrations. • A site-specific health and safety plan to be prepared by all contractors at the project site, where applicable. This	City of Santa Rosa Fire Department; City of Santa Rosa Planning and Economic Development Department	As a condition of Project approval, and during construction of the proposed Project	***Initials*** _____ ***Date*** _____

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
	includes a plan for all demolition, grading, and excavation on the site, as well as for future subsurface maintenance work. The plan shall include appropriate training, any required personal protective equipment, and monitoring of contaminants to determine exposure. The Health and Safety Plan shall be reviewed and approved by a certified industrial hygienist. • Description of protocols for the investigation and evaluation of previously unidentified hazardous materials that could be encountered during project development, including engineering controls that may be required to reduce exposure to construction workers and future users of the site. • Requirements for site-specific construction techniques that would minimize exposure to any subsurface contamination, where applicable, which shall include treatment and disposal measures for any contaminated groundwater removed from excavations, trenches, and dewatering systems in accordance with local and Regional Water Quality Control Board guidelines. • Sampling and testing plan for excavated soils to determine suitability for reuse or acceptability for disposal at a state-licensed landfill facility. • Restrictions limiting future excavation or development of the subsurface by residents and visitors to the proposed development, and prohibition of groundwater development should it be determined from test results that contamination is present. The restrictions would be developed based on site-specific conditions and would reflect the requirements of the RWQCB and/or DTSC, depending on which agency is responsible for oversight of the particular site. Restrictions, which are sometimes also referred to as land			

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
	use covenants, shall be recorded with the parcel(s), shall run with the land. The developer or land owner successor(s)-in-interest shall be responsible for ensuring development complies with the restrictions. Compliance with the restrictions must be demonstrated to the satisfaction of the City before a grading permit is issued. • Completion of an approved remediation plan should land use restrictions be insufficient to allow development to proceed safely. Remediation measures may include excavation and replacement of contaminated soil with clean fill, pumping and treatment of groundwater, thermal treatment, etc.			
Impact 3.8.4: Review of environmental hazards databases conducted in association with the proposed Project identified hazardous materials sites in the project area, including sites on the Cortese List. ***Significance of Impact Before Mitigation:*** Potentially Significant ***Significance of Impact After Mitigation:*** Less Than Significant	**MM 3.8.4b:** In the event previously unknown contaminated soil, groundwater, or subsurface features are encountered or have the potential be present during ground-disturbing activities at any site, work shall cease immediately, and the developer's contractor shall notify the City of Santa Rosa Fire Department for further instruction. The City shall ensure any grading or improvement plan or building permit includes a statement specifying that if hazardous materials contamination is discovered or suspected during construction activities, all work shall stop immediately until the City of Santa Rosa Fire Department has determined an appropriate course of action. Such actions may include, but would not be limited to, site investigation, human health and environmental risk assessment, implementation of a health and safety plan, and remediation and/or site management controls. The City of Santa Rosa Fire Department shall be responsible for notifying the appropriate regulatory agencies and providing evidence to the City Planning and Economic Development Department that potential risks have been mitigated to the extent required by regulatory agencies. Work shall not recommence on an impacted site until the applicable regulatory agency has determined further work would not pose an	City of Santa Rosa Fire Department; City of Santa Rosa Planning and Economic Development Department	As a condition of Project approval, and during construction of the proposed Project	***Initials*** _____ ***Date*** _____

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
	unacceptable human health or environmental risk. Deed restrictions may be required as provided under mitigation measure MM 3.8.4a.			
TRANSPORTATION				
Impact 3.14.9: Construction activities associated with project implementation may temporarily affect vehicular, pedestrian, bicycle, and transit circulation. ***Significance of Impact Before Mitigation:*** Significant ***Significance of Impact After Mitigation:*** Less Than Significant	**MM 3.14.9:** Prior to construction activities, applicants seeking to construct projects in the project area shall submit a construction traffic control plan to the City of Santa Rosa for review and approval. The plan shall identify the timing and routing of all major construction-related traffic to avoid potential congestion and delays on the local street network. Any temporary road or sidewalk closures shall be identified along with detour plans for rerouting pedestrian and bicycle traffic for rerouting pedestrian and bicycle traffic. The plan shall also identify locations where transit service would be temporarily rerouted or transit stops moved, and these changes must be approved by the Santa Rosa City Bus and Sonoma County Transit before the plan is finalized. If necessary, movement of major construction equipment and materials shall be limited to off-peak hours to avoid conflicts with local traffic circulation.	City of Santa Rosa Transportation and Public Works Department and Planning and Economic Development Department	Prior to construction activities	***Initials*** _____ ***Date*** _____
TRIBAL CULTURAL RESOURCES				
Impact: Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of size and scope of the landscape, sacred place, or object with cultural value to a	See **MM 3.5.2a** and **MM 3.5.2b** above	City of Santa Rosa Planning and Economic Development Department	Prior to subsequent projects that would result in ground-disturbing activity; As a condition of Project approval, and during construction of	***Initials*** _____ ***Date*** _____

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
California Native American tribe, and that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k) ***Significance of Impact Before Mitigation:*** Potentially Significant ***Significance of Impact After Mitigation:*** Less Than Significant			the proposed Project	
Impact: Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set	See **MM 3.5.3a** and **MM 3.5.3b** above	City of Santa Rosa Planning and Economic Development Department	Prior to subsequent projects that would result in ground-disturbing activity; As a condition of Project approval, and during construction of the proposed Project	***Initials*** _____ ***Date*** _____

Environmental Impact	Mitigation Measures	Monitoring Responsibility	Timing	Performance Objective
forth in subdivision (c) of Public Resources Code section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe ***Significance of Impact Before Mitigation:*** Potentially Significant ***Significance of Impact After Mitigation:*** Less Than Significant				

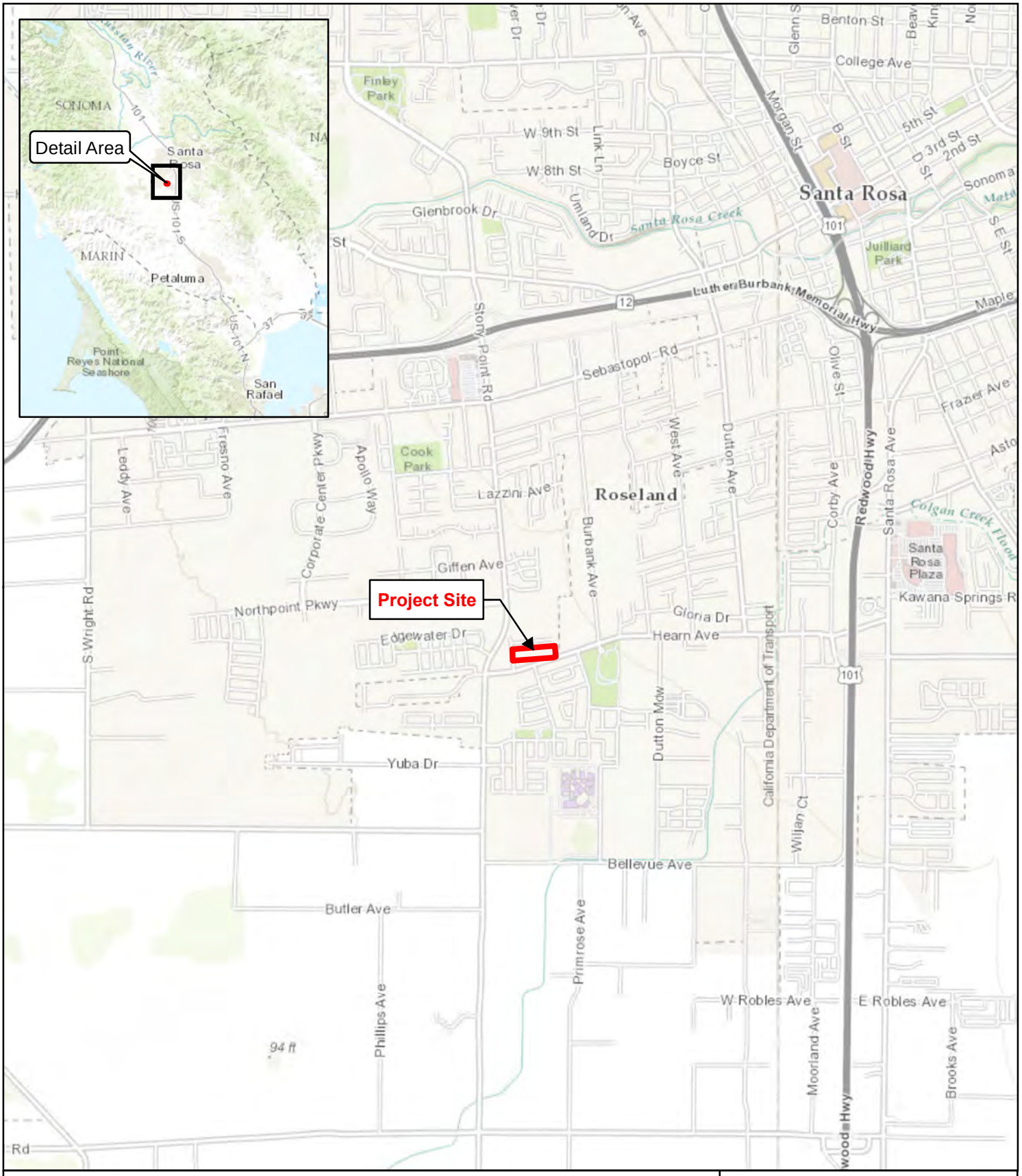


Figure 1. Regional Location Map

Stony Oaks Affordable Housing Project
City of Santa Rosa, California

0 0.25 0.5 1 Miles

ENVIRONMENTAL CONSULTANTS

Map Prepared By: SGillespie
Base Source: Esri World Topo
Data Source(s): WRA

Path: L:\Acad 2000 Files\25000\25350\GIS\ArcMap\Fig1_LocMap.mxd

wra
ENVIRONMENTAL CONSULTANTS

Stony Oaks Affordable Housing Project
City of Santa, California

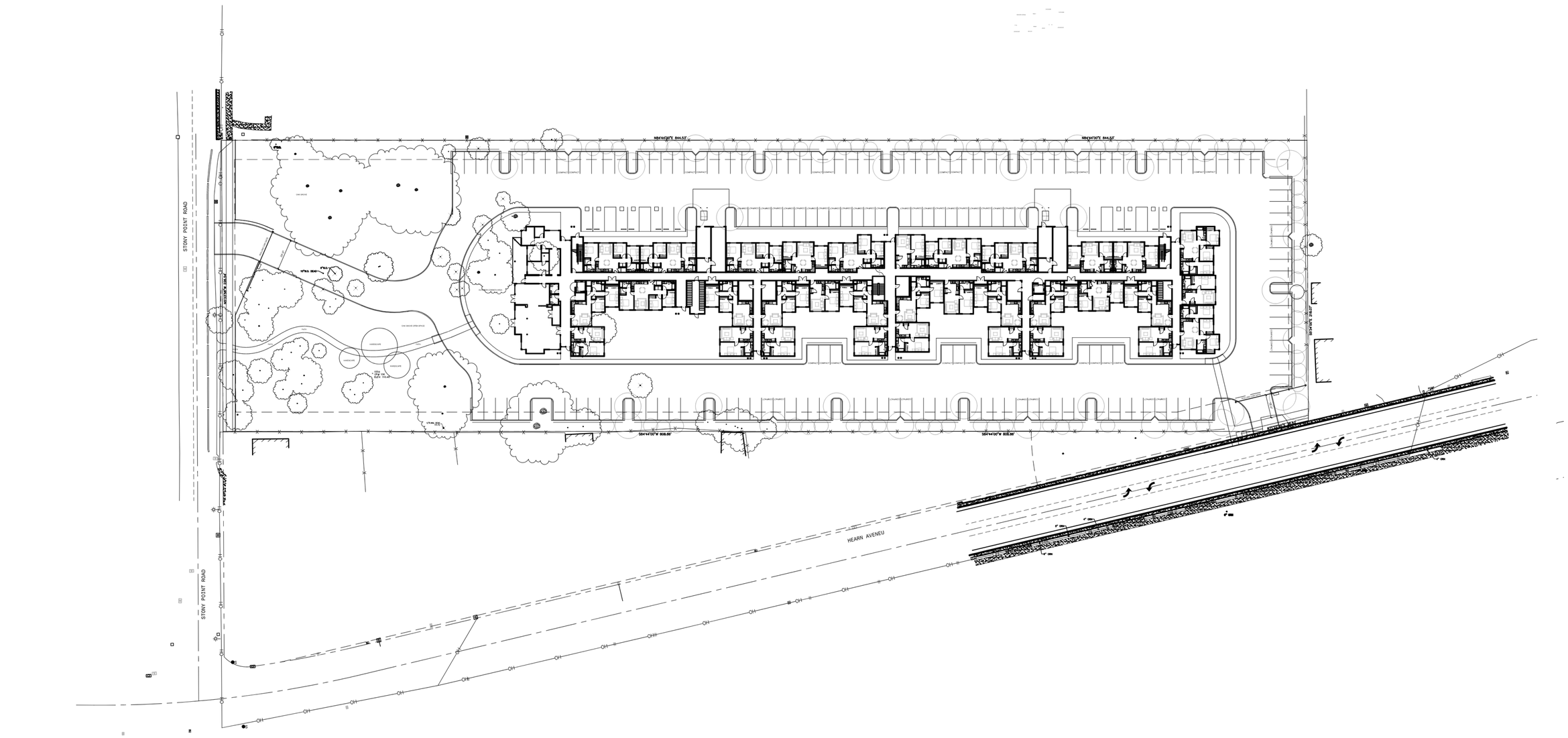
Figure 2.
Project Site Aerial

N
W E
S

0 37.5 75 150
Feet

Map Prepared By: fhourigan
Base Source: USGS
Data Source(s): WRA

Path: L:\Acad 2000 Files\25000\25350\GIS\ArcMap\ProjectSiteAerial.mxd



Stony Oaks Affordable Housing Project Development Summary		
Total Site Area:	4.39 Acres	
Gross Building Square Footage:	149,810 Square Feet	
Building Height:	45 Feet (Four Stories)	
Dwelling Units:	142 Total Units:	56 One-Bedroom Units
		48 Two-Bedroom Units
		38 Three-Bedroom Units
Proposed Parking Spaces:	185 Parking Spaces	

ARCHITECTURAL SITE PLAN

SCALE: 1/32"=1'-0"

0 32 64 128

STONY OAKS APARTMENTS | SANTA ROSA, CA

META HOUSING CORPORATION

Meta Housing Corporation

DAHLIN

JOB NO. 1318.014
DATE 01.11.2021

5865 Owens Drive
Pleasanton, CA 94588
925-251-7200

N

A1.7

FIRST FLOOR UNIT MIX:	
1-BEDROOM UNITS:	12
2-BEDROOM UNITS:	12
3-BEDROOM UNITS:	9
TOTAL:	33

FIRST FLOOR PLAN

SCALE: 1/16"=1'-0"

0 16 32 64

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Meta Housing Corporation

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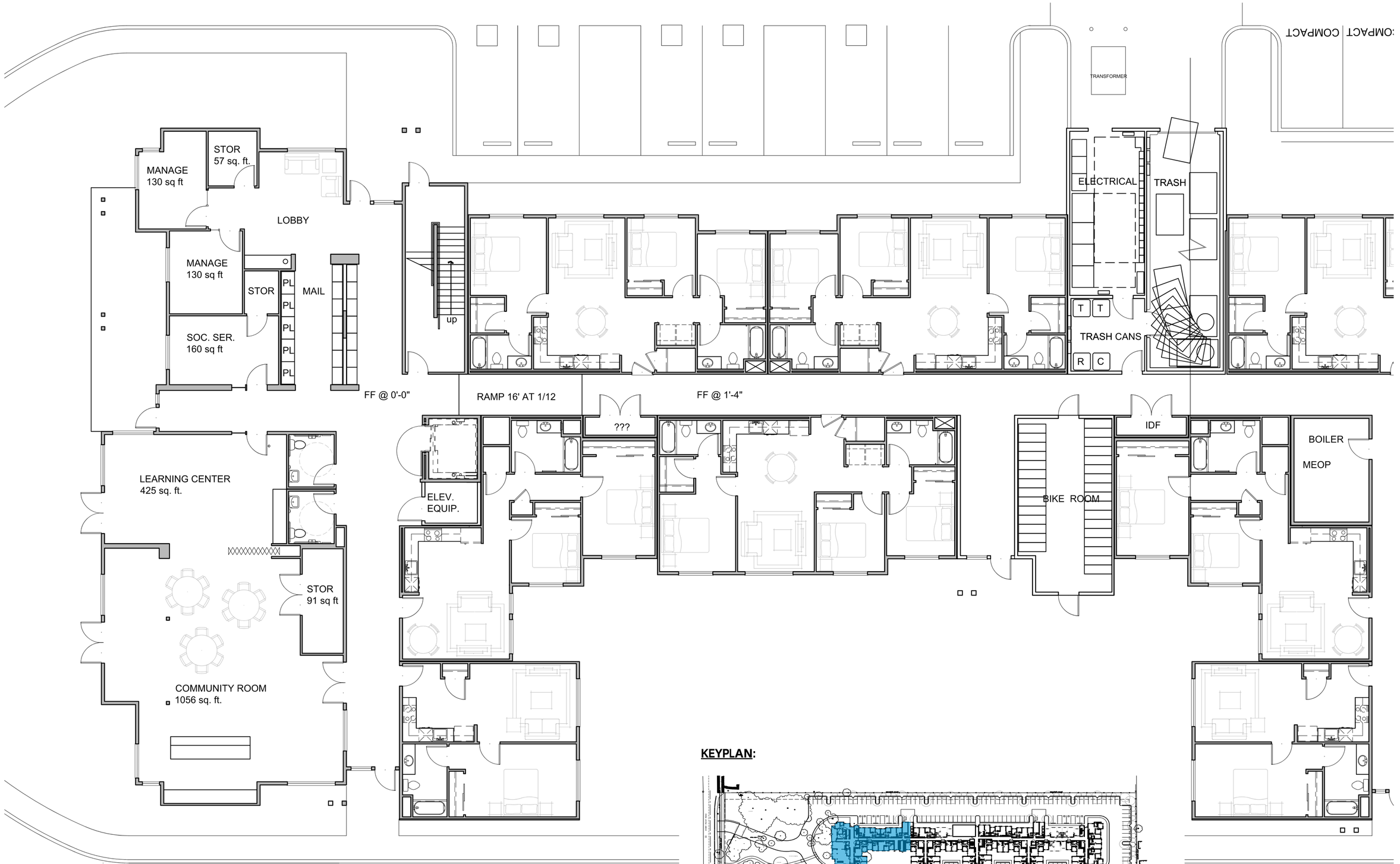
A3.1



KEYPLAN:

ENLARGED GROUND FLOOR PLAN

SCALE: 3/16"=1'-0"

0 4 8 16 32

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SECOND FLOOR UNIT MIX:	
1-BEDROOM UNITS:	16
2-BEDROOM UNITS:	12
3-BEDROOM UNITS:	11
TOTAL:	39

SECOND FLOOR PLAN

SCALE: 1/16"=1'-0"

0 16 32 64

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N

A3.2

THIRD FLOOR UNIT MIX:	
1-BEDROOM UNITS:	17
2-BEDROOM UNITS:	12
3-BEDROOM UNITS:	9
TOTAL:	38

THIRD FLOOR PLAN

SCALE: 1/16"=1'-0"

0 8 16 32

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N

A3.3

FOURTH FLOOR UNIT MIX:	
1-BEDROOM UNITS	11
2-BEDROOM UNITS	12
3-BEDROOM UNITS	9
TOTAL:	32

FOURTH FLOOR PLAN

SCALE: 1/16"=1'-0"

0 16 32 64

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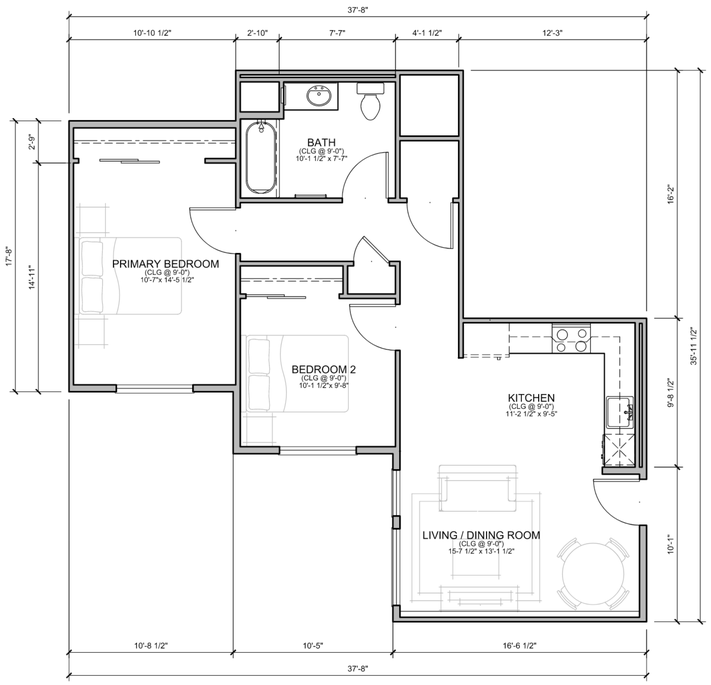


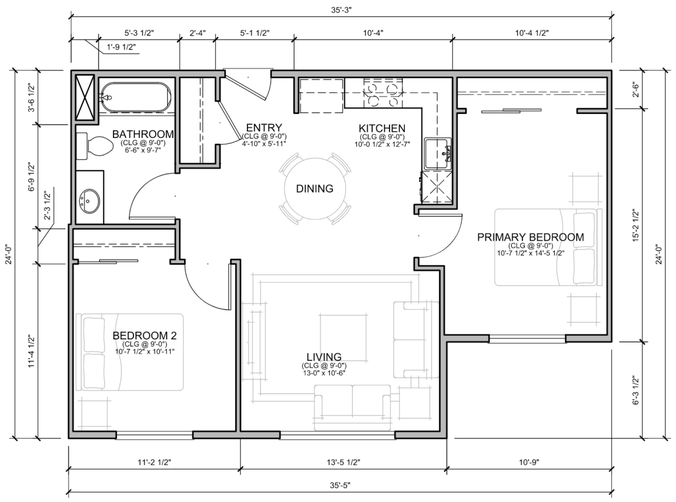
UNIT 2A - 2BED/1 BATH
GROSS SF: 851 SQ. FT.
NET SF: 772 SQ. FT.

SQUARE FOOTAGE CALCULATIONS:

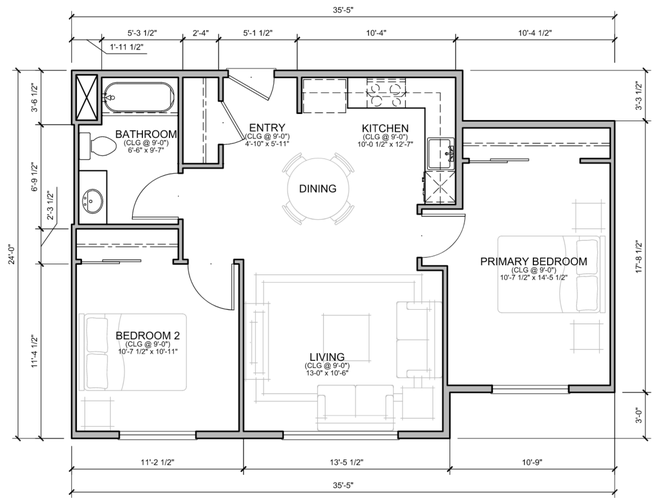
UNIT GROSS SQFT - MEASURED TO THE OUTSIDE FACE OF PERIMETER STUDS.

UNIT NET SQFT - MEASURED TO THE INSIDE FACE OF STUDS. CHASES EXCLUDED.

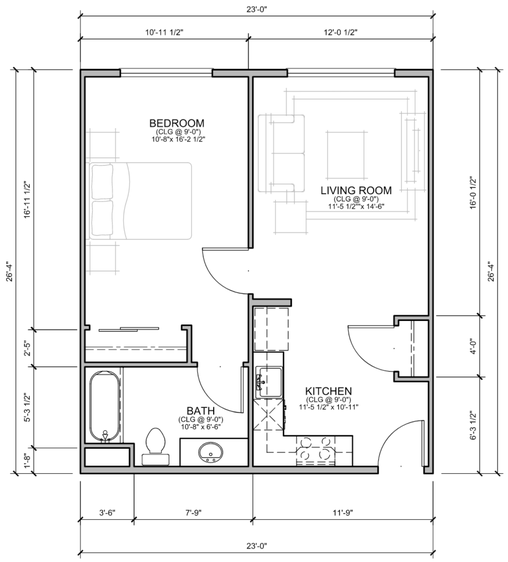
**NOTE: OPENINGS MAY VARY. REFER TO BUILDING PLANS FOR MORE INFORMATION.*



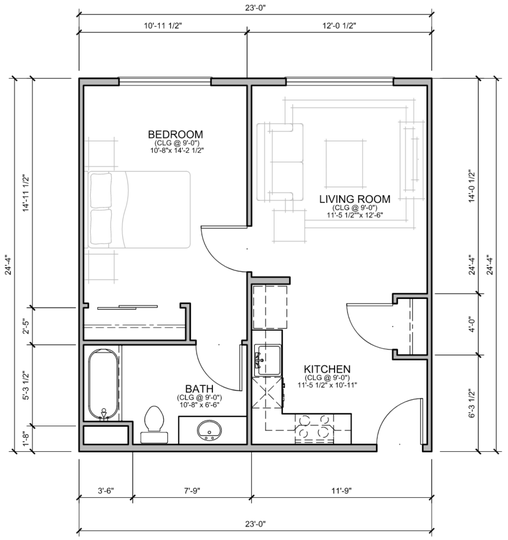
UNIT 2B - 2BED/1 BATH
GROSS SF: 781 SQ. FT.
NET SF: 729 SQ. FT.



UNIT 2C - 2BED/1 BATH
GROSS SF: 783 SQ. FT.
NET SF: 732 SQ. FT.



UNIT 1A - 1BED/1 BATH
GROSS SF: 606 SQ. FT.
NET SF: 565 SQ. FT.



UNIT 1B - 1BED/1 BATH
GROSS SF: 560 SQ. FT.
NET SF: 520 SQ. FT.

UNIT PLANS

SCALE: 1/4"=1'-0"
0 4 8 16

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META HOUSING CORPORATION

Meta Housing Corporation

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JOB NO. 1318.014
DATE 01.11.2021

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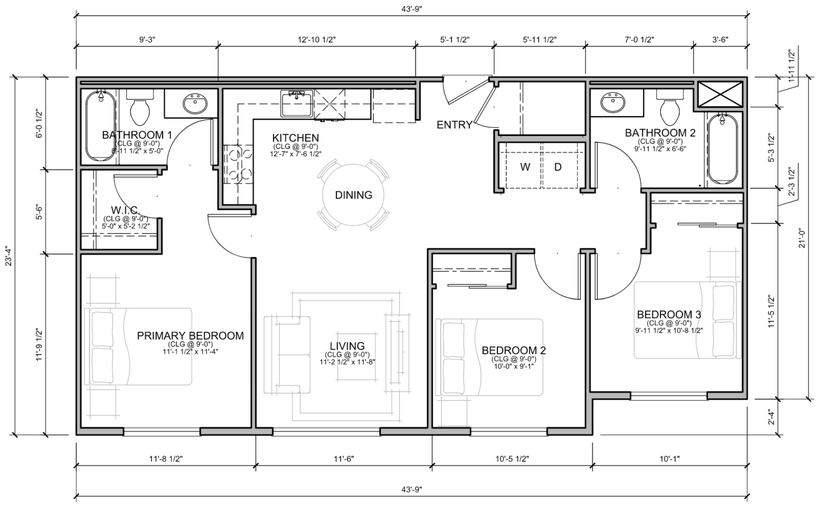
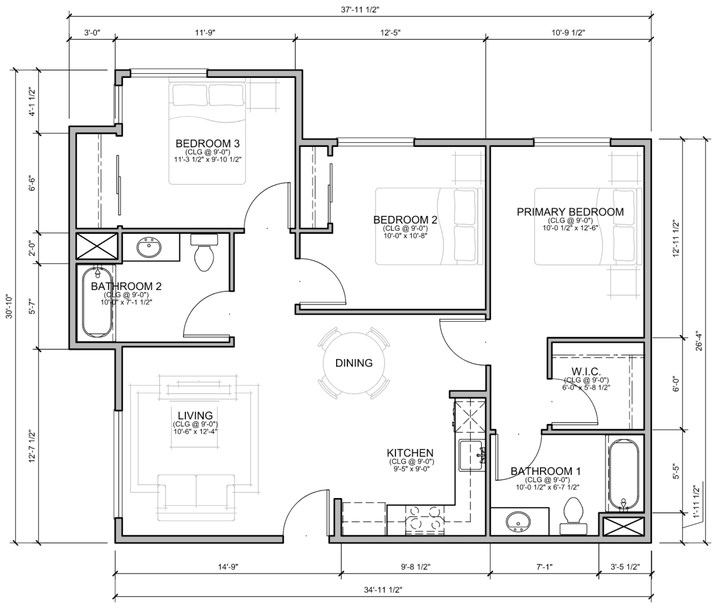


UNIT 3A - 2BED/1 BATH
GROSS SF: 997 SF
NET SF: 931 SF



UNIT 3B - 3BED/2 BATH
GROSS SF: 1019 SQ. FT.
NET SF: 948 SQ. FT.

SQUARE FOOTAGE CALCULATIONS:

UNIT GROSS SQFT - MEASURED TO THE OUTSIDE FACE OF PERIMETER STUDS.

UNIT NET SQFT - MEASURED TO THE INSIDE FACE OF STUDS. CHASES EXCLUDED.

**NOTE: OPENINGS MAY VARY. REFER TO BUILDING PLANS FOR MORE INFORMATION.*

UNIT PLANS

SCALE: 1/4"=1'-0"
0 16 32 64

STONY OAKS APARTMENTS | SANTA ROSA, CA

META HOUSING CORPORATION

Meta Housing Corporation

DAHLIN

5865 Owens Drive
Pleasanton, CA 94588
925-251-7200

JOB NO. 1318.014
DATE 01.11.2021

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CITY OF SANTA ROSA

ROSELAND AREA/SEBASTOPOL ROAD SPECIFIC PLAN AND ROSELAND AREA ANNEXATION

MITIGATION MONITORING AND REPORTING PROGRAM

SCH No. 2016012030

Prepared for:

CITY OF SANTA ROSA
PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT
100 SANTA ROSA AVENUE, ROOM 3
SANTA ROSA, CA 95404

Prepared by:

Michael Baker INTERNATIONAL

2729 PROSPECT PARK DRIVE, SUITE 220
RANCHO CORDOVA, CA 95670

AUGUST 2016

INTRODUCTION

This document is the Mitigation Monitoring and Reporting Program (MMRP) for the Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation project. CEQA Section 21081.6(a) requires lead agencies to adopt a mitigation monitoring and reporting program (MMRP) to describe measures that have been adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment. An MMRP is required for the proposed project because the EIR has identified significant adverse impacts, and measures have been identified to mitigate those impacts.

The numbering of the individual mitigation measures follows the numbering sequence as found in the EIR.

MITIGATION MONITORING AND REPORTING PROGRAM

The MMRP, as outlined in the following table describes mitigation timing, monitoring responsibilities, and compliance verification responsibility for all mitigation measures identified in this Final EIR.

The City of Santa Rosa will be the primary agency, but not the only agency responsible for implementing the mitigation measures. In some cases, the City or other public agencies will implement measures. In other cases, the project applicant will be responsible for implementation of measures and the City's role is exclusively to monitor the implementation of the measures. In those cases, the project applicant may choose to delegate to the construction contractor the responsibility to implement specific mitigation measures prior to and/or during construction. The City will continue to monitor mitigation measures prior to and during construction as well as during the operation of the project.

The MMRP is presented in tabular form on the following pages. The components of the MMRP are described briefly below:

- **Mitigation Measures:** Mitigation measures contained in the MMRP are taken from the Draft EIR in the same order that they appear in the Draft EIR. No revisions to these mitigation measures were required in the Final EIR.

- **Mitigation Timing:** Identifies when the mitigation must be completed.

- **Monitoring Responsibility:** Identifies the department within the City, project applicant, or other entity responsible for mitigation monitoring.

- **Compliance Verification Responsibility:** Identifies the department of the City or other entity responsible for verifying compliance with the mitigation. In some cases, verification will include contact with responsible state and federal agencies.

MITIGATION MONITORING AND REPORTING PROGRAM FOR THE ROSELAND AREA/SEBASTOPOL ROAD SPECIFIC PLAN AND ROSELAND AREA ANNEXATION PROJECTS

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
Air Quality				
MM 3.3.3	Where projects in the project area are subject to subsequent CEQA review, the City of Santa Rosa must ensure that in addition to the BAAQMD basic construction mitigation measures from Table 8-1 of the BAAQMD CEQA Air Quality Guidelines (or subsequent updates), BAAQMD additional mitigation measures from Table 8-2 of the BAAQMD CEQA Air Quality Guidelines (or subsequent updates) are noted on the construction documents and implemented. These measures include the following: 1. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe. 2. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. 3. Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity. 4. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. 5. The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time. 6. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.	City of Santa Rosa Planning and Economic Development Department	Implemented during construction activities for subsequent projects within the project area	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	7. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel. 8. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent. 9. Minimizing the idling time of diesel powered construction equipment to two minutes. 10. 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 CARB fleet average. 11. Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings). 12. Requiring that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NOx and PM. 13. Requiring all contractors use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines.			
MM 3.3.5	Projects within the project area that have a construction area greater than 5 acres and which are scheduled to last more than two years shall be required to prepare a site-specific construction pollutant mitigation plan in consultation with Bay Area Air Quality Management District (BAAQMD) staff prior to the issuance of grading permits. A project-specific construction-related dispersion model acceptable to the BAAQMD shall be used to identify potential toxic air contaminant impacts, including diesel particulate matter. If BAAQMD risk thresholds (i.e., probability of contracting cancer is greater than 10 in one	City of Santa Rosa Planning and Economic Development Department	Modeling shall be completed prior to grading permit issuance, and measures implemented during construction activities for subsequent projects with a construction area	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	million) would be exceeded, mitigation measures shall be identified in the construction pollutant mitigation plan to address potential impacts and shall be based on site-specific information, such as the distance to the nearest sensitive receptors, project site plan details, and construction schedule. The City shall ensure construction contracts include all identified measures. Construction pollutant mitigation plan measures shall include but not be limited to limiting the amount of acreage to be graded in a single day, requiring the use of advanced particulate filters on construction equipment, and requiring the use of alternative fuels, such as biodiesel, to power construction equipment.		greater than 5 acres and construction lasting more than two years	
MM 3.3.6	The following measures shall be utilized in site planning and building designs to reduce TAC and PM2.5 exposure where new receptors are located within 1,000 feet of emissions sources: • Future development in the project area that includes sensitive receptors (such as residences, schools, hospitals, daycare centers, or retirement homes) located within 1,000 feet of US 101 and/or stationary sources shall require site-specific analysis to determine the level of health risk. This analysis shall be conducted following procedures outlined by the BAAQMD. If the site-specific analysis reveals significant exposures from all sources (i.e., health risk in terms of excess cancer risk greater than 100 in one million, acute or chronic hazards with a hazard Index greater than 10, or annual PM2.5 exposures greater than 0.8 μg/m3), measures shall be employed to reduce the risk to below the threshold (e.g., electrostatic filtering systems or equivalent systems and location of vents away from TAC sources). • Future nonresidential developments projected to generate more than 100 heavy-duty truck trips daily and/or include the need for a BAAQMD permit to operate a stationary source shall include measures to protect public health to ensure they do not cause a significant health risk in terms of excess cancer	City of Santa Rosa Planning and Economic Development Department	Prior to issuance of building permits	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	risk greater than 10 in one million, acute or chronic hazards with a Hazard Index greater than 1.0, or annual PM2.5 exposures greater than 0.3 μg/m3.			
Biological Resources				
MM 3.4.1a	Implement General Plan Mitigation Measure4.F-5: The City of Santa Rosa shall incorporate the avoidance and mitigation measures described in the Santa Rosa Plain Conservation Strategy and the USFWS Programmatic Biological Opinion, as conditions of approval for development in or near areas with suitable habitat for California tiger salamander, Burke's goldfields, Sonoma sunshine, Sebastopol meadowfoam, and manyflowered navarretia. However, in accordance with the USFWS Programmatic Biological Opinion, projects within the Southwest Santa Rosa Preserve System will be evaluated individually and mitigation may not necessarily adhere to the ratios described in the Conservation Strategy.	City of Santa Rosa Planning and Economic Development Department	Prior to construction of any subsequent project that could result in disturbance to bird or bat nests	
MM 3.4.1b	If there is the potential for destruction of a nest or substantial disturbance to nesting birds or bats due to construction activities, a plan to monitor nesting birds or bats during construction shall be prepared and submitted to the USFWS and CDFG for review and approval. The City shall comply with all USFWS or CDFG guidance for protection of nesting birds. If vegetation, buildings, or bridges that potentially provide nesting sites must be removed, a qualified wildlife biologist shall conduct pre-construction surveys. If an active bird nest is found, the bird shall be identified as to species and the approximate distance from the closest work site to the nest estimated. No additional measures need be implemented if active nests are more than the following distances from the nearest work site: (a) 300 feet for raptors; or (b) 75 feet for other non-special-status bird species. Disturbance of active nests shall be avoided to the extent possible until it is determined that nesting is complete and the	City of Santa Rosa Planning and Economic Development Department	Prior to construction of any subsequent project that could result in disturbance to bird nests or bat roosts	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	young have fledged. Bats shall be absent or flushed from roost locations prior to demolition of buildings. If flushing of bats from buildings is necessary, it shall be done by a qualified biologist during the non-breeding season from October 1 to March 31. When flushing bats, structures shall be moved carefully to avoid harming individuals, and torpid bats given time to completely arouse and fly away. During the maternity season from April 1 to September 30, prior to building demolition or construction, a qualified biologist shall determine if a bat nursery is present at any sites identified as potentially housing bats. If an active nursery is present, disturbance of bats shall be avoided until the biologist determines that breeding is complete and young are reared.			
MM 3.4.2a	Implement Mitigation Measure 3.4.1a and 3.4.1b	City of Santa Rosa Planning and Economic Development Department	Prior to any vegetation removal or ground disturbing activities	
MM 3.4.2b	A formal wetland delineation shall be conducted for areas that will be permanently or temporarily impacted by the project. If jurisdictional waters cannot be avoided, the City shall apply for a CWA Section 404 permit from the USACE and a Section 401 permit from the RWQCB. These permits shall be obtained prior to issuance of grading permits and implementation of the proposed project. The City shall ensure that the project will result in no net loss of waters of the U.S. by providing mitigation through impact avoidance, impact minimization, and/or compensatory mitigation for the impact, as determined in the CWA Section 404/401 permits. Compensatory mitigation may consist of (a) obtaining credits from a mitigation bank; (b) making a payment to an in-lieu fee program that will conduct wetland, stream, or other aquatic resource restoration, creation, enhancement, or preservation	City of Santa Rosa Planning and Economic Development Department	Prior to any vegetation removal or ground disturbing activities	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	activities (these programs are generally administered by government agencies or nonprofit organizations that have established an agreement with the regulatory agencies to use in-lieu fee payments collected from permit applicants); and/or (c) providing compensatory mitigation through an aquatic resource restoration, establishment, enhancement, and/or preservation activity. This last type of compensatory mitigation may be provided at or adjacent to the impact site (i.e., on-site mitigation) or at another location, usually within the same watershed as the permitted impact (i.e., off-site mitigation). The project proponent/permit applicant retains responsibility for the implementation and success of the mitigation project. Evidence of compliance with this mitigation measure shall be provided prior to construction and grading activities for the proposed project.			
Cultural Resources				
MM 3.5.2a	Phase 1 Archaeological Resource Study. When specific projects are proposed within the project area that involve ground-disturbing activity, a site-specific Phase I archaeological resource study shall be performed by a qualified archaeologist or equivalent cultural resources professional that will include an updated records search, pedestrian survey of the project area, development of a historic context, sensitivity assessment for buried prehistoric deposits, and preparation of a technical report that meets federal and state requirements. If significant or unique resources are identified and cannot be avoided, treatment plans will be developed in consultation with the City and appropriate Native American representatives to mitigate potential impacts to less than significant based on the provisions of Public Resources Code Section 21083.2.	City of Santa Rosa Planning and Economic Development Department	Prior to subsequent projects that would result in ground-disturbing activity	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
MM 3.5.2b	Should any archaeological artifacts be discovered during construction of any project allowed under the Specific Plan, all construction activities shall be halted immediately within 50 feet of the discovery, the City shall be notified, and a professional archaeologist that meets the Secretary of the Interior's Standards and Guidelines for Professional Qualifications in archaeology and/or history shall be retained to determine the significance of the discovery. The professional archaeologist shall prepare a plan to identify, record, report, evaluate, and recover the resources as necessary, which shall be implemented by the developer. Construction within the area of the discovery shall not recommence until impacts on the archaeological resource are mitigated as described in Mitigation Measure MM 3.5.2a. Additionally, Public Resources Code Section 5097.993 stipulates that a project sponsor must inform project personnel that collection of any Native American artifacts is prohibited by law.	City of Santa Rosa Planning and Economic Development Department	As a condition of subsequent project approval, and during construction of any subsequent project	
MM 3.5.3a	Implement Mitigation Measure MM 3.5.2a (Phase 1 Archaeological Resource Study).	See MM 3.5.2a	See MM 3.5.2a	
MM 3.5.3b	Should human remains be discovered during construction of any project allowed under the Specific Plan, all construction activities shall be halted immediately within 50 feet of the discovery, the City shall be notified, and the Sonoma County Coroner shall be notified, according to Section 5097.98 of the State Public Resources Code and Section 7050.5 of California's Health and Safety Code. If the remains are determined to be Native American, the coroner will notify the Native American Heritage Commission, and the procedures outlined in CEQA Section 15064.5(d) and (e) shall be followed.	City of Santa Rosa Planning and Economic Development Department	As a condition of subsequent project approval, and during construction of any subsequent project	
Hazards and Hazardous Materials				
MM 3.8.4a	Phase I Environmental Site Assessment. Developers shall be required to complete a Phase I environmental site assessment for	City of Santa Rosa Fire Department; City of Santa	As a condition of subsequent project	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	each property to be developed or redeveloped. If a Recognized Environmental Condition (REC) is identified in a Phase I environmental site assessment, a Phase II environmental site assessment shall be prepared to determine whether conditions are present that require remediation or other controls to minimize the potential for hazardous materials contamination to adversely affect public health and the environment. If remediation is required, developers shall complete site remediation in accordance with OSHA standards and Santa Rosa Fire Department, Sonoma County Environmental Health Department, and State Water Resources Control Board guidelines. The Department of Toxic Substances Control (DTSC) may become involved wherever toxic levels of contaminants are found that pose an immediate hazard. Remediation shall reduce human exposure risk and environmental hazards, both during and after construction. The remediation plan shall be prepared in accordance with the environmental consultant's recommendations and established procedures for safe remediation. Specific mitigation measures designed to protect human health and the environment will be provided in the plan. Requirements shall include but not be limited to the following: • Documentation of the extent of previous environmental investigation and remediation at the site, including closure reports for underground storage tanks (USTs) and contaminant concentrations. • A site-specific health and safety plan to be prepared by all contractors at the project site, where applicable. This includes a plan for all demolition, grading, and excavation on the site, as well as for future subsurface maintenance work. The plan shall include appropriate training, any required personal protective equipment, and monitoring of contaminants to determine exposure. The Health and Safety	Rosa Planning and Economic Development Department	approval, and implemented during construction activities	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	Plan shall be reviewed and approved by a certified industrial hygienist. • Description of protocols for the investigation and evaluation of previously unidentified hazardous materials that could be encountered during project development, including engineering controls that may be required to reduce exposure to construction workers and future users of the site. • Requirements for site-specific construction techniques that would minimize exposure to any subsurface contamination, where applicable, which shall include treatment and disposal measures for any contaminated groundwater removed from excavations, trenches, and dewatering systems in accordance with local and Regional Water Quality Control Board guidelines. • Sampling and testing plan for excavated soils to determine suitability for reuse or acceptability for disposal at a state-licensed landfill facility. • Restrictions limiting future excavation or development of the subsurface by residents and visitors to the proposed development, and prohibition of groundwater development should it be determined from test results that contamination is present. The restrictions would be developed based on site-specific conditions and would reflect the requirements of the RWQCB and/or DTSC, depending on which agency is responsible for oversight of the particular site. Restrictions, which are sometimes also referred to as land use covenants, shall be recorded with the parcel(s), shall run with the land. The developer or land owner successor(s)-in-interest shall be responsible for ensuring development complies with the restrictions. Compliance with the restrictions must be demonstrated to the satisfaction of the City before a grading permit is issued.			

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	• Completion of an approved remediation plan should land use restrictions be insufficient to allow development to proceed safely. Remediation measures may include excavation and replacement of contaminated soil with clean fill, pumping and treatment of groundwater, thermal treatment, etc.			
MM 3.8.4b	In the event previously unknown contaminated soil, groundwater, or subsurface features are encountered or have the potential be present during ground-disturbing activities at any site, work shall cease immediately, and the developer's contractor shall notify the City of Santa Rosa Fire Department for further instruction. The City shall ensure any grading or improvement plan or building permit includes a statement specifying that if hazardous materials contamination is discovered or suspected during construction activities, all work shall stop immediately until the City of Santa Rosa Fire Department has determined an appropriate course of action. Such actions may include, but would not be limited to, site investigation, human health and environmental risk assessment, implementation of a health and safety plan, and remediation and/or site management controls. The City of Santa Rosa Fire Department shall be responsible for notifying the appropriate regulatory agencies and providing evidence to the City Planning and Economic Development Department that potential risks have been mitigated to the extent required by regulatory agencies. Work shall not recommence on an impacted site until the applicable regulatory agency has determined further work would not pose an unacceptable human health or environmental risk. Deed restrictions may be required as provided under mitigation measure MM 3.8.4a.	City of Santa Rosa Fire Department; City of Santa Rosa Planning and Economic Development Department	As a condition of subsequent project approval, and implemented during construction activities	
Traffic and Transportation				
MM 3.14.9	Prior to construction activities, applicants seeking to construct projects in the project area shall submit a construction traffic control plan to the City of Santa Rosa for review and approval.	City of Santa Rosa Transportation and Public Works Department and	Prior to construction activities	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	The plan shall identify the timing and routing of all major construction-related traffic to avoid potential congestion and delays on the local street network. Any temporary road or sidewalk closures shall be identified along with detour plans for rerouting pedestrian and bicycle traffic for rerouting pedestrian and bicycle traffic. The plan shall also identify locations where transit service would be temporarily rerouted or transit stops moved, and these changes must be approved by the Santa Rosa CityBus and Sonoma County Transit before the plan is finalized. If necessary, movement of major construction equipment and materials shall be limited to off-peak hours to avoid conflicts with local traffic circulation.	Planning and Economic Development Department		
MM 3.14.12	The City shall widen the Dutton Avenue westbound off-ramp to extend the right turn pocket to a minimum length of 550 feet to alleviate the adverse queuing onto the mainline freeway. The City shall monitor queuing conditions on the ramp through field observations and review of development traffic impact studies and add the widening project to the Capital Improvement Program once it is determined that queues are likely to exceed storage within a five-year time frame. The City shall collaborate with Caltrans in obtaining approvals to complete the widening project.	City of Santa Rosa Transportation and Public Works Department	Prior to adverse queuing onto the mainline freeway	

Cultural Resources Study for the Stony Oaks Project at 2542 Old Stony Point Road Santa Rosa, Sonoma County, California

Eileen Barrow, MA

December 29, 2020

Cultural Resources Study for the Stony Oaks Project at 2542 Old Stony Point Road Santa Rosa, Sonoma County, California

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December 29, 2020

ABSTRACT

Tom Origer & Associates conducted a cultural resources study for the Stony Oaks Project at 2542 Old Stony Point Road, Santa Rosa, Sonoma County, California. The study was requested and authorized by Geoff Reilly of WRA, Inc. This study was conducted to meet the requirements of Section 106 of the National Historic Preservation Act and those of the California Environmental Quality Act. The purpose of this report is to identify resources that could be eligible for inclusion on the National Register of Historic Places, as outlined in 36 CFR 800, and to identify potential historical resources other than Tribal Cultural Resources, as defined in Public Resources Code [PRC] 21074 (a)(1)(A)-(B) and discussed in the Regulatory Context section). Tribal Cultural Resources are defined in Public Resources Code [PRC] 21074 (a)(1)(A)-(B).

The proposed project includes the construction of multi-unit low-income, residential housing and related infrastructure on the parcel at 2542 Old Stony Point Road.

This study included archival research at the Northwest Information Center, Sonoma State University, examination of the library and files of Tom Origer & Associates, Native American contact, and field inspection of the Area of Potential Effects. Two isolated obsidian flakes were found within the APE. Isolated finds do not meet eligibility criteria for the National Register of Historic Places nor the California Register of Historic Resources; therefore, no historic properties were found within the Area of Potential Effects.

Appendix D of this report contains information about the locations of archaeological sites. For the protection of these resources, this report, and such location information, should not be publicly circulated.

Synopsis

Project:	Stony Oaks Project
Location:	2542 Old Stony Point Road, Santa Rosa, Sonoma County
APN:	125-551-016
Quadrangles:	Santa Rosa 7.5’ series
Study Type:	Intensive
Scope:	4.39 acres
Field Hours:	one person-hour
NWIC #:	20-0959
TOA #:	2020-058
Finds:	Two isolated obsidian flakes. No historic properties were found.

Key Personnel

Eileen Barrow provided project oversight and authored the report for this project. Mrs. Barrow has been with Tom Origer & Associates since 2005. She holds a Master of Arts in cultural resources management from Sonoma State University. Mrs. Barrow's experience includes work that has been completed in compliance with local ordinances, CEQA, NEPA, and Section 106 (NHPA) requirements. Her professional affiliations include the Society for American Archaeology, the Society for California Archaeology, the Cotati Historical Society, the Sonoma County Historical Society, the Western Obsidian Focus Group, and the Register of Professional Archaeologists (#989269).

Taylor Alshuth participated in the field phase for this project. Mr. Alshuth obtained a Bachelor of Arts degree in Anthropology from Humboldt State University in 2014, after obtaining an Associate of Arts degree in Anthropology at Santa Rosa Junior College in 2012. He has been affiliated with the Society for California Archaeology, the Archaeological Institute of America, and the Archaeological Conservancy. Mr. Alshuth has been a part of northern California archaeology since 2014.

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INTRODUCTION

This report describes a cultural resources study for the Stony Oaks Project located at 2542 Old Stony Point Road, Santa Rosa, Sonoma County, California (Figure 1). The study was requested and authorized by Geoff Reilly of WRA, Inc. This study was conducted in compliance with the requirements of Section 106 of the National Historic Preservation Act (Section 106) and those of the California Environmental Quality Act (CEQA). Documentation pertaining to this study is on file at Tom Origer & Associates (File No. 2020-58).

The proposed project includes the construction of multi-unit low-income, residential housing and related infrastructure on the parcel at 2542 Old Stony Point Road.

REGULATORY CONTEXT

Under Section 106, when a federal agency is involved in an undertaking, it must take into account the effects of the undertaking on historic properties (36CFR Part 800). Compliance with Section 106 requires that agencies make an effort to identify historic properties that might be affected by a project.

The State of California requires that cultural resources be considered during the environmental review process. This process is outlined in CEQA and accomplished by an inventory of resources within a study area and by assessing the potential that historical resources could be affected by development.

The term "Historical Resources" encompasses all forms of cultural resources including prehistoric and historical archaeological sites and built environment resources (e.g., buildings, bridges, canals), that would be eligible for inclusion on the California Register of Historical Resources (California Register).

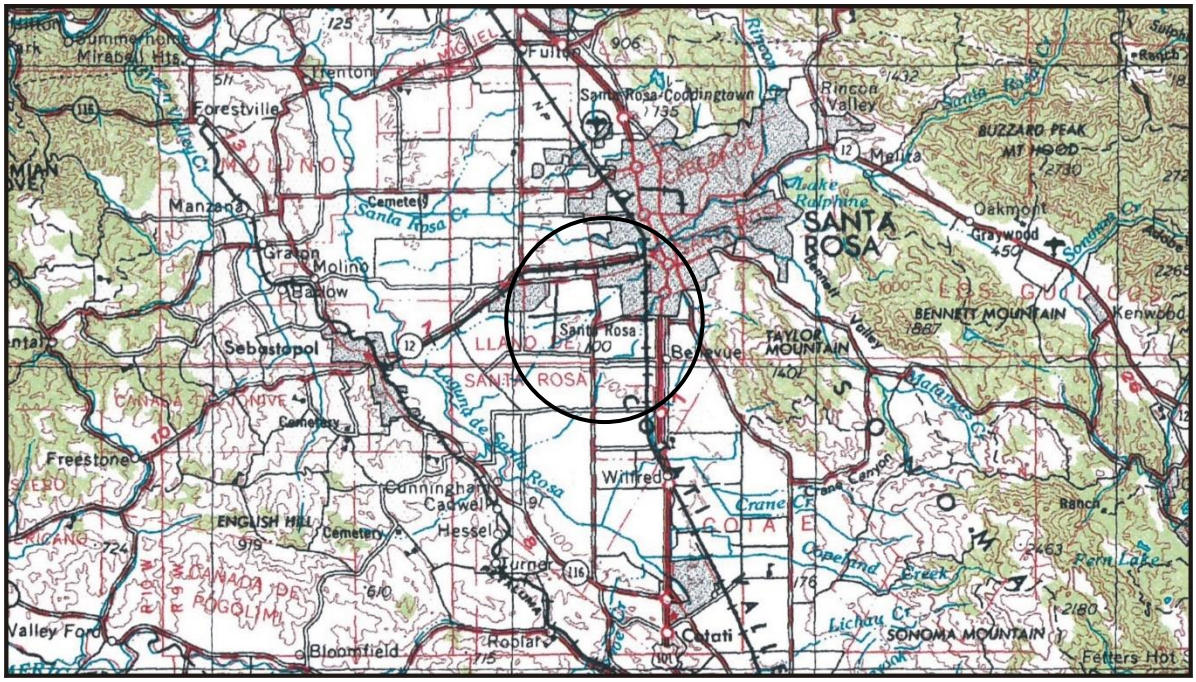

Figure 1. Project vicinity (adapted from the 1980 Santa Rosa 1:250,000-scale USGS map).

An additional category of resources is defined in CEQA under the term “Tribal Cultural Resources” (Public Resources Code Section 21074). They are not addressed in this report because Tribal Cultural Resources are resources that are of specific concern to California Native American tribes, and knowledge of such resources is limited to tribal people. Pursuant to CEQA, as revised in July 2015, such resources are to be identified by tribal people in direct, confidential consultation with the lead agency (PRC §21080.3.1).

The term, cultural resources, will be used in this report to describe historical resources under CEQA and cultural resources under Section 106.

Pursuant to Section 106 and the CEQA Guidelines, the goals of this study were to 1) identify cultural resources within the project’s area of potential effects (APE); 2) provide an evaluation of the significance of identified resources; 3) determine resource vulnerability to adverse impacts that could arise from project activities; and 4) offer recommendations designed to protect cultural resource values, as warranted.

Resource Definitions

The National Register of Historic Places (National Register) defines a historic property as a district, site, building, structure, or object significant in American history, architecture, engineering, archaeology, and culture, and that may be of value to the nation as a whole or important only to the community in which it is located. The National Park Service (NPS) describes these resources as follows (NPS 1995:4-5).

> **Site.** A site is the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archaeological value regardless of the value of any existing structure.
>
> **Building.** A building, such as a house, barn, church, hotel, or similar construction, is created principally to shelter any form of human activity. "Building" may also be used to refer to a historically and functionally related unit, such as a courthouse and jail, or a house and barn.
>
> **Structure.** The term "structure" is used to distinguish from buildings those functional constructions made usually for purposes other than creating human shelter.
>
> **Object.** The term "object" is used to distinguish from buildings and structures those constructions that are primarily artistic in nature or are relatively small in scale and simply constructed. Although it may be, by nature or design, movable, an object is associated with a specific setting or environment.
>
> **District.** A district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.

Significance Criteria

When a project might affect a cultural resource, the project proponent is required to conduct an assessment to determine whether the effect may be one that is significant. Consequently, it is necessary to determine the importance of resources that could be affected. For purposes of the National Register,

the importance of a resource is evaluated in terms of criteria put forth in 36CFR60 (see below). Eligibility criteria for the California Register (Title 14 CCR, §4852) are very similar and will not be presented here.

> The quality of significance is present in properties that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> B. That are associated with the lives of persons significant in our past; or
>
> C. That embody the distinct characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> D. That have yielded or may be likely to yield, information important in prehistory or history.

In addition to meeting one or more of the above criteria, eligibility for both the California Register and the National Register requires that a resource retains sufficient integrity to convey a sense of its significance or importance. Seven elements are considered key in considering a property's integrity: location, design, setting, materials, workmanship, feeling, and association.

The OHP advocates that all resources over 45 years old be recorded for inclusion in the OHP filing system (OHP 1995:2), although the use of professional judgment is urged in determining whether a resource warrants documentation.

PROJECT SETTING

Area of Potential Effects Location and Description

The APE is within the Santa Rosa Plain, a northwest-trending valley at the southern end of the Northern Coast Ranges. Twenty-two miles long and nine miles wide at its widest point, the Santa Rosa Plain was once a broad savannah cross-cut by seasonal streams that drained toward the area now known as the Laguna de Santa Rosa. Santa Rosa Creek and Mark West Creek, year-round tributaries to the Laguna, are the main westerly flowing streams on the plain. In addition to vast grasslands, plant communities include oak woodlands and vernal pools (Honton and Sears 2006).

The APE is located at 2542 Old Stony Point Road in the southwest portion of the city of Santa Rosa and is comprised of 4.39 acres of vacant land as shown on the Santa Rosa 7.5' USGS topographic map (Figure 2). Figure 3 provides a current overview of the APE. The parcel is located just under two miles from downtown Santa Rosa and is surrounded by vacant parcels and residential properties.

Soils mapped for the study area are Wright loam and Zamora clay loam (Miller 1972: Sheet 81). Zamora soils are well-draining clay loams found on alluvial fans. Wright soils are moderately well-draining to somewhat poorly draining loams that are underlain by old valley plain alluvium of mixed origin. Wright soils are primarily found on low terraces. In a natural state, both of these soils support the growth of annual and perennial grasses, forbs, and scattered oaks. Historically, these soils were used for growing dryland and irrigated pasture, vineyards, orchards, and row and truck crops, (Miller 1972:86, 90-91).

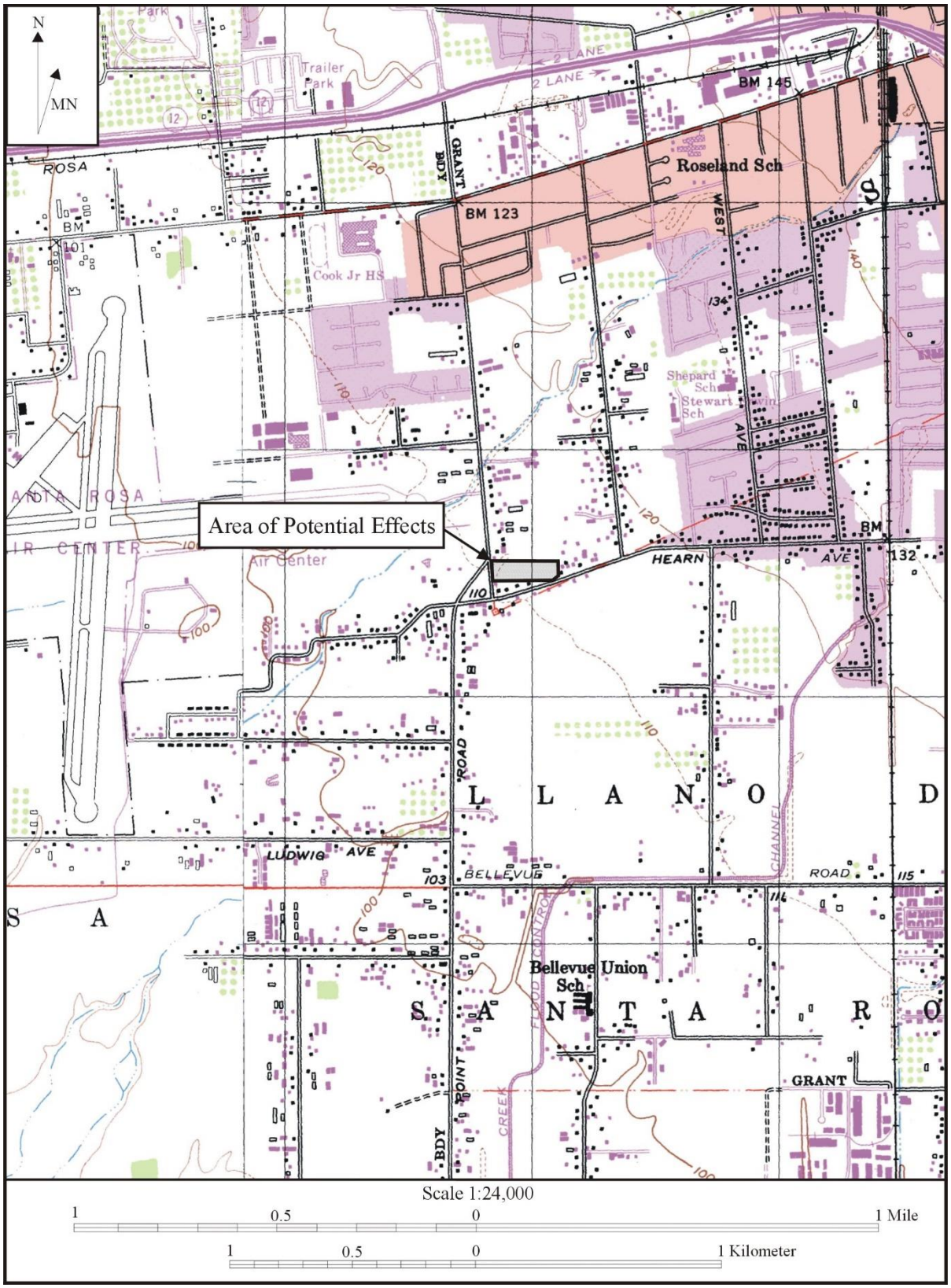

Figure 2. Area of Potential Effects location (adapted from the 1993Santa Rosa 7.5' USGS topographic maps).

Figure 3. Overview photo of the Area of Potential Effects, facing west-northwest.

Geologic maps show inconsistent information for the APE (Graymer *et al.* 2006; McLaughlin *et al.* 2008). One map shows that the geology for the APE consists of alluvial fan and fluvial terrace deposits that date to the Holocene Epoch (11,700 to present) (McLaughlin *et al.* 2008). However, a second map shows that the geology of the APE consists of alluvium that dates to the early Pleistocene (78,000 to 2.58 million years ago) (Graymer *et al.* 2006).

The APE is situated on level land with a percent slope of 1% or less. Roseland Creek is the closest source of fresh water. It has been channelized and currently lies 150 meters north of the APE. However, prior to when it was channelized, it flowed 325 meters northwest of the northwestern corner of the APE.

Cultural Setting

Prehistory

The concept of prehistory refers to the period of time before events were recorded in writing and vary worldwide. Because there is no written record, our understanding of California prehistory relies on archaeological materials and oral histories passed down through generations. Early archaeological research in this area began with the work of Max Uhle and Nels Nelson. Uhle is credited with the first scientific excavation in California with his work at the Emeryville Shellmound in 1902, and Nelson spent several years (1906 to 1908) surveying the San Francisco Bay margins and California coast for

archaeological sites (Nelson 1909). In the 1930s, archaeologists from Sacramento Junior College and the University of California began piecing together a sequence of cultures primarily based on burial patterns and ornamental artifacts from sites in the lower Sacramento Valley (Lillard *et al*. 1939; Heizer and Fenenga 1939). Their cultural sequence became known as the Central California Taxonomic System (CCTS), which identified three culture periods termed the Early, Middle, and Late Horizons, but without offering date ranges. Refinement of the CCTS became a chief concern of archaeologists as the century progressed with publications by Richard Beardsley (1948, 1954) and Clement Meighan (1955) based on materials excavated by the University of California archaeological survey.

In 1973, David Fredrickson synthesized prior work, and in combination with his own research, he developed a regional chronology that is used to this day, albeit modified for locality-specific circumstances. Fredrickson's scheme shows that native peoples have occupied the region for over 11,000 years (which is supported by Erlandson *et al.* 2007), and during that time, shifts took place in their social, political, and ideological regimes (Fredrickson 1973). While Fredrickson's chronology was adopted by many archaeologists, Beardsley's cultural sequence was adopted by others creating a roughly North Bay-South Bay division in usage.

In 1960, the first study of obsidian hydration as a dating tool for archaeologists was published (Friedman and Smith 1960). This study showed that the chemical composition of the obsidian and temperature affect the hydration process. It was not until the 1980s that research into this dating method was conducted for the North Bay Area which has four major obsidian sources. In 1987, Thomas Origer devised a hydration chronology for the North Bay Area (Origer 1987). This chronology was developed by pairing micron readings taken from obsidian specimens and pairing them with radiocarbon-dated artifacts and features. Origer was able to develop a hydration rate for Annadel and Napa Valley obsidian sources as a result of his study. Later, Tremaine (1989, 1993) was able to develop comparison constants among the four primary obsidian sources in the North Bay Area. The concept of comparison constants allows for the calculation of dates from hydration band measurements taken from obsidian specimens from sources with unknown hydration rates.

The development of obsidian hydration rates for the four, primary north Bay Area obsidian sources have provided archaeologists the ability to obtain dates from sites that could not previously be dated due to lack of diagnostic artifacts or organic material suitable for radiocarbon dating. Origer was able to support and refine Fredrickson's chronology dating tools diagnostic of certain periods (Origer 1987).

In an effort to bridge the differences between chronologies, Milliken *et al.* (2007: Figure 8.4) presented a concordance for comparing time periods, cultural patterns, and local variations for the San Francisco Bay Area. Milliken included Dating Scheme D, as presented by Groza in 2002, which is a refinement of previous radiocarbon-based temporal sequences for the San Francisco Bay Area. More recently, Byrd, Whitaker, Mikkelsen, and Rosenthal (2017) called upon archaeologists to abandon previous temporal sequences in favor of Scheme D, further refined in Groza *et al.* 2011. Table 1 assimilates Scheme D, Fredrickson's (1973) chronology, and the obsidian hydration dating scheme from Origer (1987). Note that the Early, Middle, Late Horizon scheme is still evident though refinements have been made within those categories.

Early occupants appear to have had an economy based largely on hunting, with limited exchange, and social structures based on the extended family unit. Later, milling technology and an inferred acorn economy were introduced. This diversification of economy appears to be coeval with the development of sedentism and population growth and expansion. Sociopolitical complexity and status distinctions based on wealth are also observable in the archaeological record, as evidenced by an increased range and distribution of trade goods (e.g., shell beads, obsidian tool stone), which are possible indicators of both status and increasingly complex exchange systems.

Table 1. North Bay/San Francisco Bay Area Chronology

Temporal Period[1]	Approximate Time Range[1]	~ Hydration Interval (μ) [2]	Scheme D Periods[3]	Approximate Time Range[3]	~ Hydration Interval (μ) [2]
Historical	< AD 1800	<1.20	Historic Mission	AD 1835 to AD 1770	1.10 - 1.27
Upper Emergent	AD 1800 to AD 1500	1.21 - 1.84	Late 2	AD 1770 to AD 1520	1.28 - 1.80
Lower Emergent	AD 1500 to AD 1000	1.85 - 2.58	Late 1b	AD 1520 to AD 1390	1.81 - 2.02
			Late 1a	AD 1390 to AD 1265	2.03 - 2.22
			Middle/Late Transition	AD 1265 to AD 1020	2.23 - 2.55
Upper Archaic	AD 1000 to 500 BC	2.59 - 4.05	Middle 4	AD 1020 to AD 750	2.56 - 2.88
			Middle 3	AD 750 to AD 585	2.89 - 3.06
			Middle 2	AD 585 to AD 420	3.07 - 3.23
			Middle 1	AD 420 to 200 BC	3.24 - 3.80
			Early/Middle Transition	200 BC to 600 BC	3.81 - 4.13
Middle Archaic	500 BC to 3000 BC	4.06 - 5.72	Early	600 BC to 2100 BC	4.14 - 5.18
Lower Archaic	3000 BC to 6000 BC	5.73 - 7.23			
Paleo-Indian	6000 BC to 8000 BC	7.24 - 8.08+			

μ = microns
[1] based on Fredrickson (1994)
[2] based on Napa Glass Mountain rate by Origer (1987) and Effective Hydration Temperature value from the vicinity of Santa Rosa, Sonoma County
[3] based on Groza *et al.* (2011)

These horizons or periods are marked by a transition from large projectile points and milling slabs, indicating a focus on hunting and gathering during the Early Period, to a marine focus during the Middle Period evidenced by the number of shellmounds in the Bay Area. The Middle Period also saw more reliance on acorns and the use of bowl-shaped mortars and pestles. Acorn exploitation increased during the Late Period and the bow and arrow were introduced.

Prehistoric archaeological site indicators expected to be found in the region include but are not limited to: obsidian and chert flakes and chipped stone tools; grinding and mashing implements such as slabs and hand-stones, and mortars and pestles; and locally darkened midden soils containing some of the previously listed items plus fragments of bone, shellfish, and fire-affected stones.

Ethnography

Linguists and ethnographers tracing the evolution of languages have found that most of the indigenous languages of the California region belong to one of five widespread North American language groups (the Hokan and Penutian phyla, and the Uto-Aztecan, Algic, and Athabaskan language families). The distribution and internal diversity of four of these groups suggest that their original centers of dispersal were outside, or peripheral to, the core territory of California, that is, the Central Valley, the Sierra Nevada, the Coast Range from Cape Mendocino to Point Conception, and the Southern California coast and islands. Only languages of the Hokan phylum can plausibly be traced back to populations inhabiting parts of this core region during the Archaic period, and there are hints of connections between certain branches of Hokan, such as that between Salinan and Seri, that suggest that at least some of the Hokan languages could have been brought into California by later immigrants, primarily from the Southwest and northwestern Mexico (Golla 2011).

At the time of European settlement, people inhabiting this area spoke Southern Pomo, one of seven mutually unintelligible Pomoan languages belonging to the Hokan language stock. The Southern Pomo's aboriginal territory falls within present-day Sonoma County. To the north, it reaches the divide between Rock Pile Creek and the Gualala River, and to the south, it extends to near the town of Cotati. The eastern boundary primarily runs along the western flanks of Sonoma Mountain until it reaches Healdsburg, where it crosses to the west side of the Russian River. Within the larger area that constitutes the Southern Pomo homelands, were bands or tribelets that occupied distinct areas. Primary village sites of the Southern Pomo were occupied continually, while temporary sites were visited to procure resources that were especially abundant or available only during certain seasons. Sites often were situated near freshwater sources and in ecotones where plant life and animal life were diverse and abundant.

The Southern Pomo population was decimated early in the historic period, especially in the southern part of their territory. Ethnic identity was severely impacted in the region of Santa Rosa and Sebastopol; McLendon and Oswalt (1978: 279) reported that the few Southern Pomo speakers remaining in 1976 were from north of Healdsburg. For more information about the Pomo, see Bean and Theodoratus (1978), Kniffen (1939), and Stewart (1943).

History

Historically, the APE is within the Rancho Cabeza de Santa Rosa, an 8,885-acre grant made to María Ignacia López de Carrillo, the mother-in-law of General Mariano Vallejo. Traveling from San Diego in 1837, she brought seven of her children to settle on the rancho and built the first European dwelling in the Santa Rosa area (Hoover *et al.* 1990:479-480). After Señora Carrillo's death in 1849, the rancho was divided amongst seven claimants. The APE lies within the part of the rancho confirmed to James Eldridge (GLO 1859).

As originally platted, the town of Santa Rosa included the blocks between 1st and 5th streets and between present-day Morgan Street on the west and just beyond E Street to the east (Brewster 1854). Green's Addition was the first expansion of the town, moving the limits northward toward present-day Cherry Street. Outlying parcels varied in size, tending to increase in acreage as they got further from the town center. The APE is outside of what was originally plotted as Santa Rosa. By 1867, land containing the APE is under the ownership of one named Thayer (Bowers 1867).

With the end of World War II, Santa Rosa experienced a population boom, much like the rest of the nation. Census data show that the city had 12,605 people enumerated in 1940, and over the next ten years, the number rose to 17,902 (State of California Department of Finance 2011). By 1960, Santa Rosa boasted a population of just over 31,000 people, nearly tripling in size in just 20 years. To accommodate this growth, entire neighborhoods were erected in short order and the outward movement of families to the suburbs, begun during the late nineteenth century, recommenced with due speed. Much of this growth was bolstered by benefits extended to returning service members and their families. The Servicemen's Readjustment Act of 1944 (also known as the G.I. Bill of Rights) included several programs to ease World War II veterans back into the local economy while avoiding a return to the pre-war depression. Among those benefits was a military loan guarantee program to help purchase homes. In 1950, homeownership in California had risen 11 percent over the proceeding decade and was at an all-time high of 58 percent by 1960.

The years following World War II brought unprecedented well-being to Americans, and commerce flourished as people grew more comfortable with spending. Immediately after World War II, new commercial buildings generally were in downtown areas and other existing commercial centers. Bolstered by post-war consumer confidence, new housing developments appeared, and with them the need for more schools, new churches, and new commercial enterprises. By the end of the 1950s, new commercial construction was usually located in the new suburbs at the edge of town. In Santa Rosa, Hugh Codding led the way with several housing and commercial developments, including Brookwood Terrace, Town & Country Village, and Montgomery Village. These subdivisions tended to have their own commercial areas, and often social features as well.

Although the APE is within the limits of the City of Santa Rosa, it remained a relatively rural part of the City until recent times when several residential subdivisions were constructed. Like the APE, there are still several parcels in the area that are undeveloped or may only contain a single-family home and associated outbuildings.

Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps).

STUDY PROCEDURES AND FINDINGS

Native American Contact

A request was sent to the State of California's Native American Heritage Commission seeking information from the Sacred Lands File and the names of Native American individuals and groups that would be appropriate to contact regarding this project. It is our understanding that Native American consultation under AB52 and under Section 106 is being conducted by the appropriate lead agencies.

Native American Contact Results

The NAHC responded on November 24, 2020, stating that a review of the Sacred Lands File showed that there are no resources in the vicinity of the project area. A list of additional contacts was provided (see Appendix A).

Archival Research Procedures

Archival research included examination of the library and project files at Tom Origer & Associates. This research is meant to assess the potential to encounter archaeological sites and built environment within the study area. Research was also completed to determine the potential for buried archaeological deposits.

A review (NWIC File No. 20-0900) was completed of the archaeological site base maps and records, survey reports, and other materials on file at the Northwest Information Center (NWIC), Sonoma State University, Rohnert Park. Sources of information included but were not limited to the current listings of properties on the National Register of Historic Places, California Historical Landmarks, California Register of Historical Resources, and California Points of Historical Interest as listed in the OHP's *Historic Property Directory* (2012) and the *Built Environment Resources Directory* (2020).

The OHP has determined that structures in excess of 45 years of age could be important historical resources, and former building and structure locations could be important archaeological sites. Archival research included an examination of 19th and 20th-century maps and aerial photographs to gain insight into the nature and extent of historical development in the general vicinity, and especially within the study area.

Ethnographic literature that describes appropriate Native American groups, county histories, and other primary and secondary sources were reviewed. Sources reviewed are listed in the "Materials Consulted" section of this report.

A model for predicting a location's sensitivity for buried archaeological sites was formulated by Byrd *et al.* (2017) based on the age of the landform, slope, and proximity to water. A location is considered to have the highest sensitivity if the landform dates to the Holocene, has a slope of five percent or less, is within 150 meters of freshwater, and 150 meters of a confluence. Note, the Holocene Epoch is the current period of geologic time, which began about 11,700 years ago, and coincides with the emergence of human occupation of the area. A basic premise of the model is that archaeological deposits will not be buried within landforms that predate human colonization of the area. Calculating these factors using the buried site model (Byrd *et al.* 2017:Tables 11 and 12), a location's sensitivity is scored on a scale of 1 to 10 and classed as follows: lowest (<1); low (1-3); moderate (3-5.5); high (5.5-7.5); highest (>7.5). Incorporating King's (2004) analysis of buried site potential, the probability of encountering buried archaeological deposits for each class is as follows:

Sensitivity Score[1]	Classification[1]	Probability[2]
<1	Lowest	<1 %
1-3	Low	1-2 %
3-5.5	Moderate	2-3%
5.5-7.5	High	3-5%
>7.5	Highest	5-20%

[1] Byrd *et al.* 2017
[2] King 2004

Archival Research Findings

Archival research found that the APE was subjected to a prior cultural resources study and no historic properties were found (Beard 2003). At that time, there was a house present on the property; it was not recommended eligible for inclusion on the National Register. No archaeological site indicators were found during that survey.

Forty-seven studies have been conducted either adjacent or within a half-mile of the APE (see Appendix B for list of studies). There are thirty-two resources within a half-mile of the APE (see Appendix C for list and Figure 4 for a map of resources).

There are no ethnographic villages reported within one mile of the study area (Barrett 1908).

Review of late 19th and early 20th century maps found no evidence of buildings or structures within the APE until 1954 when two houses are shown (Bowers 1867; GLO 1859; Reynolds and Proctor 1898; Thompson 1877; USGS 1916, 1944, 1954a, 1954b). Review of aerial photos show the buildings were there as early as 1953 (UCSB 1953).

Based on landform age, our analysis of the environmental setting, and incorporating the Byrd *et al.* (2017) analysis of sensitivity for buried sites, there is, at most, a moderate sensitivity (3.9) for buried archaeological site indicators within the APE if one considers that the age of the geologic landform dates to the Holocene epoch. If the landform dates to the early Pleistocene epoch there is a very low (<1) potential for buried sites and this predates the generally accepted dates for human occupation of California.

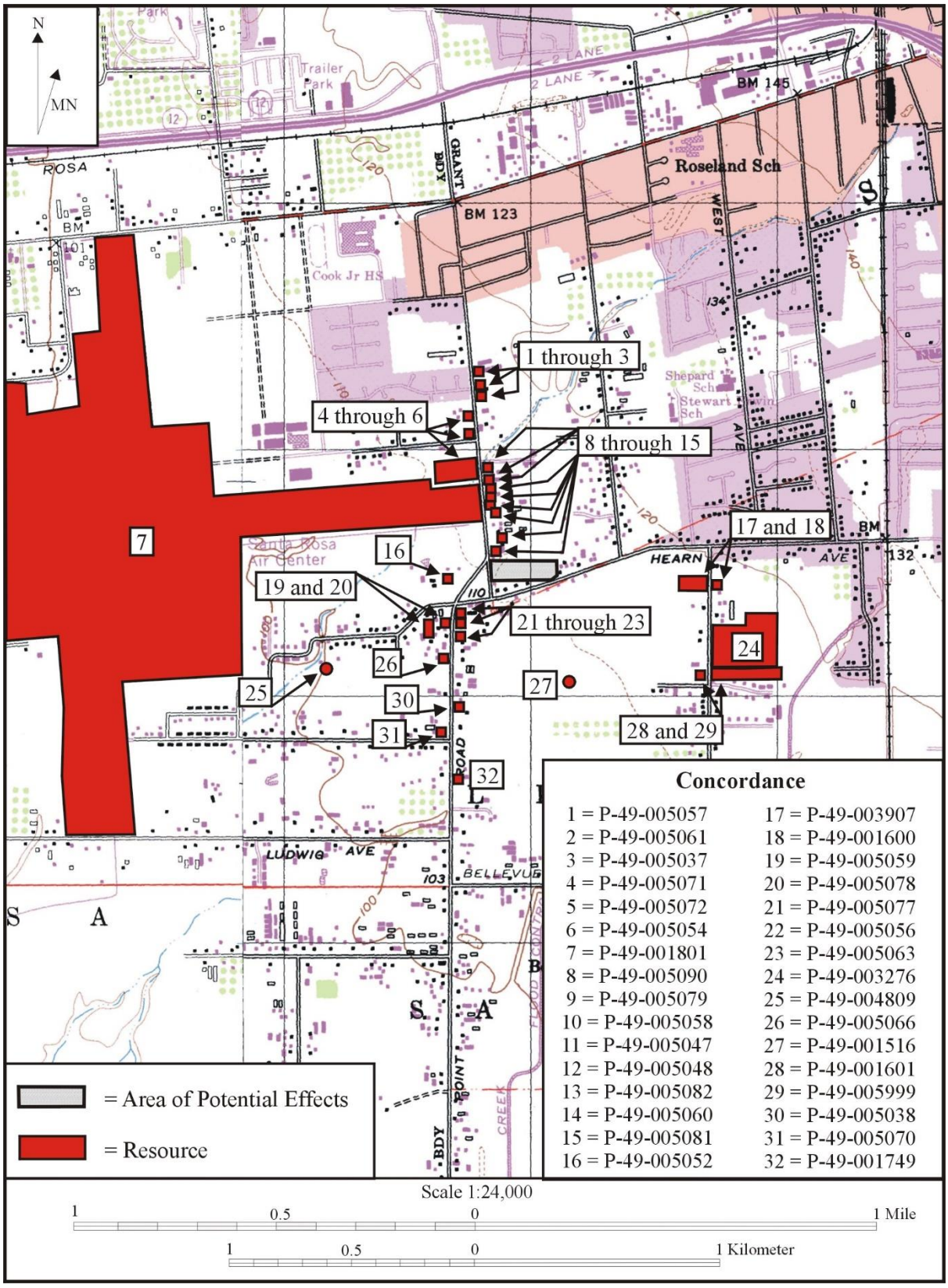

Figure 4. Resources documented within a half-mile of the Area of Potential Effects.

Field Survey Procedures

An intensive field survey of the APE was conducted by Taylor Alshuth on December 18, 2020. One person-hour was spent in the field and field conditions were cool but sunny. Surface examination consisted of walking in 15-meter transects. Ground visibility ranged was primarily poor with vegetation such as grasses and forbs being the primary hindrance. A hoe was used, as needed, to clear patches of vegetation to expose the ground surface.

Field Survey Findings

Archaeology

Two obsidian flakes were found within the APE. See Appendix D for resource documentation.

Modern garbage was found dumped near the western end of the APE.

Built Environment

There are no buildings within the APE.

DISCUSSION AND RECOMMENDATIONS

Field survey found two obsidian flakes. These flakes are isolated specimens. Isolated finds can contribute some information about prehistoric land use and hunting patterns. However, once their presence is documented no further work is warranted as they do not rise to a level of significance that would qualify them for listing on the National Register nor the California Register. The isolated finds have been documented and no further investigation or protection is recommended.

Application of buried sites model indicates that there is only a moderate potential at most for buried sites within the APE.

Prior to our survey the buildings were demolished and removed from the property.

Archaeological Recommendations

No recommendations are warranted

Built Environment Recommendations

No recommendations are warranted

Accidental Discovery

If buried materials are encountered, all soil disturbing work should be halted at the location of any discovery until a qualified archaeologist completes a significance evaluation of the find(s) pursuant to Section 106 of the National Historic Preservation Act (36CFR60.4). Prehistoric archaeological site

indicators expected within the general area include: chipped chert and obsidian tools and tool manufacture waste flakes; grinding and hammering implements that look like fist-size, river-tumbled stones; and for some rare sites, locally darkened soil that generally contains abundant archaeological specimens. Historical remains expected in the general area commonly include items of ceramic, glass, and metal. Features that might be present include structure remains (e.g., cabins or their foundations) and pits containing historical artifacts.

The following actions are promulgated under 43 CFR 10 Subpart B Section 10.4 of the Native American Graves and Repatriation Act (NAGPRA) and relate to the inadvertent discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony. If such items are discovered on Federal or tribal lands, the discovery must be reported immediately via telephone, with written confirmation, to the responsible Federal agency official (with respect to Federal lands), or to the responsible Indian tribe official (with respect to tribal lands). The requirements of these regulations regarding inadvertent discoveries apply whether or not an inadvertent discovery is duly reported. If written confirmation is provided by certified mail, the return receipt constitutes evidence of the receipt of the written notification by the Federal agency official or Indian tribe official. All activity in the area of the discovery shall cease and the find shall be protected from further disturbance until the agency or tribal official arranges for appropriate disposition of the material.

Per the requirements of the California Code of Regulations, Title 14, Chapter 3, Section 15064.5(e) if human remains are encountered during the course of the project, excavation or disturbance of the location must be halted in the vicinity of the find, and the county coroner contacted. If the coroner determines the remains are Native American, the coroner will contact the NAHC. The NAHC will identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent makes recommendations regarding the treatment of the remains with appropriate dignity.

SUMMARY

Tom Origer & Associates completed a cultural resources study for the Stony Oaks Project located at 2542 Old Stony Point Road, Santa Rosa, Sonoma County, California (Figure 1). The study was requested and authorized by Geoff Reilly of WRA, Inc. This study was conducted in compliance with the requirements of Section 106 and with CEQA. No historic properties were found during the course of this study; therefore, no recommendations are warranted. Documentation pertaining to this study is on file at Tom Origer & Associates (File No. 2020-58).

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APPENDIX A

Native American Contact

Copies of Correspondence

Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: 2542 Old Stony Point Road
County: Sonoma

USGS Quadrangles
Name: Santa Rosa
Township T7N Range R8W Section(s) MDBM (within the Cabeza de Santa Rosa land grant)

Date: November 17, 2020
Company/Firm/Agency: Tom Origer & Associates
Contact Person: Eileen Barrow

Address: P.O. Box 1531
City: Rohnert Park Zip: 94927
Phone: (707) 584-8200 Fax: (707) 584-8300
Email: eileen@origer.com

Project Description: The project proponent is obtaining permits to develop the property into multi-unit residential housing.

Native American Heritage Commission
Native American Contact List
Sonoma County
11/24/2020

Cloverdale Rancheria of Pomo Indians
Patricia Hermosillo, Chairperson
555 S. Cloverdale Blvd., Suite A — Pomo
Cloverdale, CA, 95425
Phone: (707) 894 - 5775
Fax: (707) 894-5727
info@cloverdalerancheria.com

Dry Creek Rancheria of Pomo Indians
Chris Wright, Chairperson
P.O. Box 607 — Pomo
Geyserville, CA, 95441
Phone: (707) 814 - 4150
lynnl@drycreekrancheria.com

Federated Indians of Graton Rancheria
Greg Sarris, Chairperson
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Rohnert Park, CA, 94928 — Pomo
Phone: (707) 566 - 2288
Fax: (707) 566-2291
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Guidiville Indian Rancheria
Donald Duncan, Chairperson
P.O. Box 339 — Pomo
Talmage, CA, 95481
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Fax: (707) 462-9183
admin@guidiville.net

Lytton Rancheria
Marjorie Mejia, Chairperson
437 Aviation Boulevard — Pomo
Santa Rosa, CA, 95403
Phone: (707) 575 - 5917
Fax: (707) 575-6974
margiemejia@aol.com

Middletown Rancheria of Pomo Indians
Jose Simon, Chairperson
P.O. Box 1035 — Lake Miwok
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Phone: (707) 987 - 3670
Fax: (707) 987-9091
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Middletown Rancheria
Sally Peterson, THPO
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Mishewal-Wappo Tribe of Alexander Valley
Scott Gabaldon, Chairperson
2275 Silk Road — Wappo
Windsor, CA, 95492
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scottg@mishewalwappotribe.com

Pinoleville Pomo Nation
Erica Carson, Tribal Historic Preservation Officer
500 B Pinoleville Drive — Pomo
Ukiah, CA, 95482
Phone: (707) 463 - 1454
Fax: (707) 463-6601

Pinoleville Pomo Nation
Leona Willams, Chairperson
500 B Pinoleville Drive — Pomo
Ukiah, CA, 95482
Phone: (707) 463 - 1454
Fax: (707) 463-6601

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed 2542 Old Stony Point Road Project, Sonoma County.

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

November 24, 2020

Elieen Barrow, Senior Associate
Tom Origer & Associates

Via Email to: Eileen@origer.com

Re: 2542 Old Stony Point Road Project, Sonoma County

Dear Ms. Barrow:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Sarah.Fonseca@nahc.ca.gov.

Sincerely,

Sarah Fonseca
Cultural Resources Analyst

Attachment

APPENDIX B

List of Studies Conducted within a Half-Mile of the Area of Potential Effects

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
S-000032		1973	Harrison E. Hoes	Archaeological Impact Evaluation, Roseland Creek Flood Control Project, Between Stony Point Road and Llano Road, Sonoma County, California		49-000670
S-000289		1973	Thomas F. King	An archaeological field reconnaissance of the property at the end of Gloria Street (letter report)		
S-002613		1981	William Cole	An Archaeological Survey of a Proposed Underground Storm Drain near Santa Rosa, Sonoma County, California	Anthropology Department, Sonoma State University	
S-007923	Submitter - File No.: 5501/21-86	1986	David G. Bieling and Leigh Jordan	An Archaeological Investigation of the South Wright Road Area (Sewerage System Master Plan Job #6462), Santa Rosa, Sonoma County, California.	Cultural Resources Facility, Sonoma State University	49-001415, 49-001416, 49-001417, 49-001418, 49-001419, 49-001420
S-008260	Submitter - 5501-73/86	1986	Ray Wilbur	An archaeological investigation of the proposed subdivisions (Parcel No. 35-135-2, 3, 4) located at 2595 Griffen Avenue, Santa Rosa, California (letter report)	Cultural Resources Facility, Sonoma State University	
S-010089	Submitter - 5501/84-88	1988	Kim J. Tremaine	An Archaeological Study for a Parcel at 1545 Stony Point Road, Sonoma County, California	The Cultural Resources Facility, Sonoma State University	49-002215

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
S-011710	Agency Nbr - DEA-041 (801); OHP PRN - FHWA871022A; Voided - S-11709; Voided - S-11957	1989	Mary Praetzellis, Adrian Praetzellis, Suzanne B. Stewart, Dennis Harris, and David A. Fredrickson	Historic Architectural Survey Report, Stony Point Road Reconstruction Project, Located Between Petaluma and Santa Rosa, Sonoma County, California, FWHA No: DEA-041 (801)	Anthropological Studies Center, Sonoma State University	49-000018, 49-000135, 49-000483, 49-001514, 49-001515, 49-001516, 49-001518, 49-001519, 49-001749, 49-002114, 49-002288, 49-002290, 49-002295, 49-002769, 49-002773, 49-002774, 49-002775, 49-002776, 49-002777, 49-002778, 49-002779, 49-002780, 49-002781, 49-002782, 49-003751, 49-004232, 49-004244, 49-005035, 49-005036, 49-005037, 49-005038, 49-005039, 49-005040, 49-005041, 49-005042, 49-005043, 49-005044, 49-005045, 49-005046, 49-005047, 49-005048, 49-005049, 49-005050, 49-005051, 49-005052, 49-005053, 49-005054, 49-005055, 49-005056, 49-005057, 49-005058, 49-005059, 49-005060, 49-005061, 49-005063, 49-005064, 49-005065, 49-005066, 49-005067, 49-005068, 49-005069, 49-005070, 49-005071, 49-005072, 49-005073, 49-005074, 49-005075, 49-005076, 49-005077, 49-005078, 49-005079, 49-005080, 49-005081, 49-005082, 49-005083, 49-005084, 49-005085, 49-005086, 49-005087, 49-005088, 49-005089, 49-005090, 49-005091, 49-005092, 49-005093, 49-005094, 49-005095, 49-005096, 49-005097, 49-005098, 49-005099, 49-005101, 49-005102, 49-005103, 49-005104, 49-005105, 49-005106, 49-005107, 49-005108, 49-005109, 49-005110, 49-005111, 49-005112, 49-005113, 49-005114, 49-005115, 49-005116, 49-005117, 49-005118, 49-005119, 49-005120, 49-005121, 49-005122, 49-005123, 49-005124, 49-005125, 49-005126, 49-005127, 49-005128, 49-005129, 49-005130, 49-005131, 49-005133, 49-005134, 49-005135, 49-005136, 49-005137, 49-005138, 49-005139, 49-005140, 49-005141, 49-005142, 49-005143, 49-005144, 49-005145, 49-005146, 49-005147, 49-005148,

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
						49-005149, 49-005150, 49-005151, 49-005153
S-011710a		1989	Mary Praetzellis, Suzanne B. Stewart, Adrian Praetzellis, and David A. Frederickson	Historic Property Survey Report, Stony Point Road Reconstruction Project, Located Between Petaluma and Santa Rosa, Sonoma County, California, FHWA No: DEA-041 (801)	Anthropological Studies Center, Sonoma State University	
S-011710b		1990	Katheryn Gualtieri and Bruce E. Cannon	FHWA871022A; Reconstruction, Widening, and Realignment of Stony Point Road from State Route 12 in Santa Rosa to Petaluma Boulevard in Petaluma, Sonoma County	Office of Historic Preservation, Federal Highway Administration	
S-011710c		1989	Christian Gerike, Suzanne B. Stewart, and David A. Fredrickson	Archaeological Survey Report, Stony Point Road Reconstruction Project, Sonoma County, California, FHWA No. DEA-041 (801)	Anthropological Studies Center	
S-011710d		1989	Suzanne B. Stewart and David A. Fredrickson	Test Excavations and Evaluations of CA-SON-1794 and CA-SON-1795, Stony Point Road Reconstruction Project, Sonoma County, California	Anthropological Studies Center, Sonoma State University	
S-014423		1992	Marianne Babal and Beth Padon	Historical Assessment for the Southwest Santa Rosa High School Project, Santa Rosa, California	LSA Associates, Inc.	49-002290
S-014423a		1992	Christopher Powell	Results of Archaeological Pedestrian Survey of Parcels 134-042-25, 134-042-28, and 134-042-32 at 599 Bellevue Avenue, Near Santa Rosa, CA (letter report)	Holman and Associates	
S-014652	Submitter - A.R.S. Project 92-55	1992	Stephen Bryne	A Cultural Resources Evaluation of the California Stony Point Road Development, 2701 Stony Point Road, Santa Rosa, Sonoma County, California	Archaeological Resource Service	49-004809
S-016080		1993	Jan M. Hupman and David Chavez	Cultural Resources Investigations for the Southwest Santa Rosa Area Plan Environmental Impact Report, Sonoma County, California	David Chavez and Associates	49-001415, 49-001416, 49-001418, 49-001419, 49-001420, 49-001514, 49-001515, 49-001516, 49-001801, 49-002215, 49-002290
S-016556		1992	Janine M. Loyd	An Archaeological Survey for the Hearn/Colgan Conduit Project, Sonoma County Water Agency, Santa Rosa, California	Tom Origer & Associates	49-001516
S-016610		1994	Janine M. Loyd and Thomas M. Origer	A Cultural Resources Survey for the City of Santa Rosa Housing and Redevelopment Agency, Sonoma County, California	Tom Origer & Associates	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
S-016837		1994	Vicki R. Beard	Historic Property Report, 2773 and 2750 South Dutton Avenue, Santa Rosa, Sonoma County, California	Tom Origer & Associates	49-001600, 49-001601
S-017810		1996	Bright Eastman	APN 134-042-21, North 2830 Stony Point Road, Santa Rosa, Sonoma County, California (letter report)	Anthropological Studies Center, Sonoma State University	49-001749
S-017987		1996	Thomas M. Origer	Potential historic resources on the Levine and Scovell properties (letter report)	Tom Origer & Associates	
S-022884	Submitter - A.R.S. Project 00-27	2000	Cassandra Chattan	A Cultural Resources Evaluation of the Carinalli Property at 2727 Dutton Meadows, Santa Rosa, APN 043-072-004	Archaeological Resource Service	
S-023420	Submitter - A.R.S. Project #00-88	2000	Katherine Flynn	A Cultural Resources Evaluation of the Bellevue Ranch Phase 9 (aka Derho Property), 2732 Stony Point Road, Santa Rosa, APN 134-042-060, Sonoma County, CA	Archaeological Resource Service	
S-024132	IC Record Search Nbr - 60800-00-597	2000	Robert Cartier	Cultural Resource Evaluation of the Property for the Proposed Dutton Meadows Project in the City of Santa Rosa	Archaeological Resource Management	
S-024169	IC Record Search Nbr - 60800-00-597	2001	Robert Cartier	Cultural Resources Evaluation of the Property for the Proposed 12.1 Acre Dutton Meadows Project in the City of Santa Rosa	Archaeological Resource Management	08-000245
S-025355		2002	Janine Loyd and Vicki Beard	A Cultural Resources Survey for the Proposed Burbank Avenue Annexation and Development Project, Santa Rosa, Sonoma County, California	Tom Origer & Associates	
S-026122		2002	Robert Cartier	Historical Evaluation of the Structures at 2650 Dutton Meadow Road in the City of Santa Rosa	Archaeological Resource Management	49-001601
S-026367		2002	Sue-Ann Schroder and Thomas M. Origer	An Archaeological Survey of the Properties at 2384 and 2410 Old Stony Point Road, Santa Rosa, Sonoma County, California	Tom Origer & Associates	
S-028147	Submitter - ARS #04-007	2004	Cassandra Chattan	Historical architectural evaluation of the structure located at 1320 Trombetta Street in the City of Santa Rosa (letter report)	Archaeological Resource Service	
S-028871	Submitter - A.R.S. Project 04-059	2004	Cassandra Chattan	A Cultural Resources Evaluation of the Parcel at 2733 Stony Point Road, Santa Rosa, Sonoma County	Archaeological Resource Service	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
S-028872	Submitter - A.R.S. Project 04-060	2004	Cassandra Chattan	A Cultural Resources Evaluation of the Parcel at 2786 Dutton Meadows, Santa Rosa, Sonoma County (APN 043-171-010)	Archaeological Resource Service	49-005999
S-028924		2004	Sandra Massey	A Cultural Resources Study of APNs 134-022-007 and 134-022-014, Santa Rosa, Sonoma County, California	Anthropological Studies Center, Sonoma State University	
S-029151		2003	Vicki R. Beard	A Cultural Resources Survey for Proposed Housing Projects at 2542 Old Stony Point Road and 1828 Hearn Ave, Santa Rosa, Sonoma County, California	Tom Origer & Associates	
S-029823	Submitter - File No. 04-91S	2004	Nelson R. Thompson, Vicki R. Beard, and Thomas M. Origer	A Cultural Resources Survey for the Roseland Creek Restoration Project, Santa Rosa, Sonoma County, California.	Tom Origer & Associates	
S-030956	Submitter - File No. 05-80S	2005	Vicki R. Beard	A Cultural Resources Survey of Two Parcels at 2853 and 2875 Dutton Meadows Avenue, Santa Rosa, Sonoma County, California.	Tom Origer & Associates	
S-031618	Submitter - A.R.S. Project 05-098	2005	Sally R. Evans	A Cultural Resources Evaluation of the Proposed "Park Village" Subdivision, 1550 & 1590 Hearn Avenue, Santa Rosa, Sonoma County, California	Archaeological Resource Service	
S-034126	Submitter - A.R.S. Project 07-047	2007	Cassandra Chattan	A Cultural Resources Evaluation of the Property at 2616 Giffen Avenue, Santa Rosa, Sonoma County, California	Archaeological Resource Service	
S-034325	Submitter - File No. 07-92S	2007	Sandra A. Ledebuhr and Vicki R. Beard	A Cultural Resources Survey for Stony Point Terrace, 2615 Stony Point Road and 2022 West Hearn Avenue, Santa Rosa, Sonoma County, California	Tom Origer & Associates	
S-034339		2007	Eileen Steen and Thomas M. Origer	A Cultural Resources Survey of the Property at 1466 Hearn Avenue, Santa Rosa, Sonoma County, California	Tom Origer & Associates	
S-034765	Submitter - A.R.S. Project 08-003	2008	Cassandra Chattan	A Cultural Resources Evaluation of the Lone Star Subdivision at 2803 Dutton Meadow, Santa Rosa, APN 043-111-001	Archaeological Resource Service	
S-035151		2008	Vicki Beard	A Cultural Resources Survey of the Parcel at 2641 Dutton Meadow, Santa Rosa, Sonoma County, California	Tom Origer and Associates	49-003907
S-035153		2008	Vicki Beard	Historical Evaluation of the Property at 2641 Dutton Meadow, Santa Rosa, Sonoma County, California	Tom Origer and Associates	49-003907

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
S-037424	Submitter - A.R.S. Project 09-054	2010	Cassandra Chattan	A Cultural Resources Evaluation of the Property at 2149 West Hearn Avenue, Santa Rosa, Sonoma County, California	Archaeological Resource Service	
S-038322	Submitter - File # 11-69S	2011	Eileen Barrow	A Cultural Resources Survey for the Burbank Avenue Pathway Project Santa Rosa, Sonoma County, California	Tom Origer & Associates	
S-038346	Submitter - File #10-103S	2010	Lauren Del Bondio and Thomas M. Origer	A Cultural Resources Survey for the West Santa Rosa Baptist Church, Sonoma County, California	Tom Origer & Associates	
S-040586		2012	Amy Foutch	PG&E Stony Point Road R20A Overhead to Underground Project, Santa Rosa, California (letter report)	Far Western Anthropological Research Group, Inc.	49-001801
S-040587		2012	Amy E. Foutch	PG&E ET WRO Stony Point Road Relocation, Santa Rosa, California (letter report)	Far Western Anthropological Research Group, Inc.	
S-042843		2012	Amy E. Foutch	PG&E External Corrosion Direct Assessment (ECDA) on Line 21D, Santa Rosa, California (letter report)	Far Western Anthropological Research Group, Inc.	49-001801
S-045451	OTIS Report Number - COE_2017_0417_001; Submitter - 2015-00136N	2014	Dawna Meeks, Virginia Ton, and Janine M. Origer	A Cultural Resources Study of APN 134-022-049 for the Stony Point North Project, Santa Rosa, Sonoma County, California	Tom Origer & Associates	
S-045451a		2017	Rick M. Bottoms and Julianne Polanco	COE_2017_0417_001, Section 106 Consultation for the Stony Point North Project, Santa Rosa, Sonoma County, California (2015-00136N)	U.S. Army Corps of Engineers; California Office of Historic Preservation	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
S-048798		1989	Anne Bloomfield	Cultural Heritage Survey of the City of Santa Rosa, California	Anne Bloomfield Architectural History	49-002834, 49-003050, 49-003698, 49-003725, 49-004075, 49-004239, 49-004841, 49-005166, 49-005167, 49-005188, 49-005197, 49-005198, 49-005200, 49-005201, 49-005202, 49-005203, 49-005204, 49-005205, 49-005206, 49-005207, 49-005208, 49-005209, 49-005210, 49-005211, 49-005212, 49-005213, 49-005215, 49-005216, 49-005217, 49-005218, 49-005219, 49-005220, 49-005221, 49-005222, 49-005223, 49-005224, 49-005225, 49-005226, 49-005227, 49-005228, 49-005229, 49-005230, 49-005231, 49-005232, 49-005233, 49-005234, 49-005236, 49-005237, 49-005238, 49-005239, 49-005240, 49-005241, 49-005242, 49-005243, 49-005244, 49-005245, 49-005246, 49-005247, 49-005248, 49-005249, 49-005250, 49-005251, 49-005252, 49-005253, 49-005254, 49-005255, 49-005256, 49-005257, 49-005258, 49-005259, 49-005260, 49-005261, 49-005262, 49-005263, 49-005264, 49-005265, 49-005266, 49-005267, 49-005268, 49-005269, 49-005270, 49-005271, 49-005272, 49-005273, 49-005274, 49-005275, 49-005276, 49-005277, 49-005278, 49-005279, 49-005280, 49-005281, 49-005282, 49-005283, 49-005284, 49-005285, 49-005286, 49-005287, 49-005288, 49-005289, 49-005290, 49-005291, 49-005292, 49-005293, 49-005294, 49-005295, 49-005296, 49-005297, 49-005298, 49-005299, 49-005300, 49-005301, 49-005302, 49-005303, 49-005304, 49-005305, 49-005306, 49-005307, 49-005308, 49-005309, 49-005310, 49-005311, 49-005312, 49-005313, 49-005314, 49-005315, 49-005316, 49-005317, 49-005318, 49-005319, 49-005320, 49-005321, 49-005322, 49-005323, 49-005324, 49-005329, 49-005426, 49-005427,

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
						49-005428, 49-005429, 49-005430, 49-005451, 49-005452, 49-005453, 49-005454, 49-005455, 49-005456, 49-005457, 49-005458, 49-005459, 49-005460, 49-005461, 49-005462, 49-005463, 49-005464, 49-005465, 49-005466, 49-005467, 49-005468, 49-005469, 49-005470, 49-005471, 49-005472, 49-005473, 49-005474, 49-005475, 49-005476, 49-005477, 49-005478, 49-005479, 49-005480, 49-005481, 49-005482, 49-005483, 49-005484, 49-005485, 49-005486, 49-005487, 49-005488, 49-005489, 49-005490, 49-005491, 49-005492, 49-005493, 49-005494, 49-005495, 49-005496, 49-005497, 49-005498, 49-005499, 49-005500, 49-005501, 49-005502, 49-005503, 49-005504, 49-005505, 49-005506, 49-005507, 49-005508, 49-005509, 49-005510, 49-005511, 49-005512, 49-005513, 49-005514, 49-005522, 49-005528, 49-005577, 49-005578, 49-005579, 49-005580, 49-005581, 49-005582, 49-005586, 49-005618, 49-005619, 49-005620, 49-005621, 49-005629, 49-005630, 49-005631, 49-005632, 49-005633, 49-005634, 49-005635, 49-005636, 49-005637, 49-005638, 49-005639, 49-005640, 49-005641, 49-005642, 49-005643, 49-005644, 49-005645, 49-005646, 49-005647, 49-005648, 49-005649, 49-005650, 49-005651, 49-005652, 49-005653, 49-005654, 49-005655, 49-005656, 49-005657, 49-005658, 49-005659, 49-005661, 49-005672, 49-005673, 49-005674, 49-005675, 49-005676, 49-005677, 49-005678, 49-005679, 49-005680, 49-005681, 49-005682, 49-005683, 49-005684, 49-005685, 49-005686, 49-005687, 49-005688, 49-005689, 49-005690, 49-005691, 49-005692, 49-005693, 49-005694, 49-005695, 49-005696, 49-005697,

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
						49-005699, 49-005700, 49-005701, 49-005702, 49-005703, 49-005704, 49-005705, 49-005706, 49-005707, 49-005708, 49-005709, 49-005710, 49-005711, 49-005712, 49-005713, 49-005718, 49-005719, 49-005720, 49-005721, 49-005722, 49-005723, 49-005724, 49-005725, 49-005726, 49-005727, 49-005728, 49-005729, 49-005730, 49-005731, 49-005732, 49-005733, 49-005734, 49-005735, 49-005736, 49-005737, 49-005738, 49-005739, 49-005740, 49-005741, 49-005742, 49-005743, 49-005744, 49-005745, 49-005746, 49-005747, 49-005748, 49-005749, 49-005750, 49-005751, 49-005752, 49-005753, 49-005754, 49-005755, 49-005756, 49-005757, 49-005758, 49-005759, 49-005760, 49-005761, 49-005762, 49-005763, 49-005764, 49-005765, 49-005766, 49-005767, 49-005768, 49-005769, 49-005770, 49-005771, 49-005772, 49-005773, 49-005774, 49-005775, 49-005776, 49-005777, 49-005778, 49-005779, 49-005780, 49-005781, 49-005782, 49-005783, 49-005784, 49-005785, 49-005786, 49-005787, 49-005788, 49-005789, 49-005790, 49-005791, 49-005792, 49-005793, 49-005794, 49-005795, 49-005798, 49-005799, 49-005800, 49-005801, 49-005802, 49-005803, 49-005804, 49-005805, 49-005806, 49-005807, 49-005808, 49-005809, 49-005810, 49-005811, 49-005812, 49-005813, 49-005814, 49-005815, 49-005816, 49-005817, 49-005818, 49-005819, 49-005820, 49-005821, 49-005822, 49-005823, 49-005824, 49-005825, 49-005826, 49-005827, 49-005828, 49-005829, 49-005830, 49-005831, 49-005832, 49-005833, 49-005834, 49-005835

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
S-048798a		1990	Dan Peterson, Anne Bloomfield, Dennis Harris, Adrian Praetzellis, Jack Bookwalter, and Paula Cook	City of Santa Rosa Cultural Heritage Survey; Historic Properties Inventory	Department of Community Development	
S-049112	Agency Nbr - FA#STPLZ-5030(056); Other - 04-SON-0-SRO, HSIPL 5028 (073)	2016	Thomas Origer	Historic Property Survey Report for Crosswalk Enhancement Throughout Santa Rosa Project in the City of Santa Rosa in Sonoma County, 04-SON-O-SRO, HSIPL 5028 (073)	Tom Origer & Associates	49-000076, 49-000956, 49-001983
S-049112a		2016	Thomas Origer	Archaeological Survey Report for Crosswalk Enhancements Throughout Santa Rosa Project Santa Rosa, Sonoma County, California, 04-SON-O-SRO, HSIPL 5028 (073)	Tom Origer & Associates	
S-049112b		2016	Thomas M. Origer	A Proposal to Conduct Extended Phase I Investigations for the Crosswalk Enhancements Throughout Santa Rosa Project Santa Rosa, Sonoma County, California, 04-SON-O-SRO, HSIPL 5028 (073)	Tom Origer & Associates	
S-049112c		2016	Thomas M. Origer	Extended Phase I Report: Crosswalk Enhancements Throughout Santa Rosa Project, Santa Rosa, Sonoma County, California 04-SON-O-SRO, HSIPL 5028 (073)	Tom Origer & Associates	
S-049129		2017	William Burns, Kara R. Dotter, and Adam Giacinto	Cultural Resources Inventory Report for the Bellevue 7 Ranch Project, City of Santa Rosa, California	Dudek	49-005714, 49-005715, 49-005716, 49-005717, 49-005853
S-052375	OTIS Report Number - COE_2018_0618_002; Submitter - Corps File #2005-299820; Submitter - J-2017-11-AC12-0227	2018	Sally Evans	A Cultural Resources Study for the Proposed "Somerset Place" Residential Subdivision Project at 2786 Dutton Meadows, Santa Rosa, Sonoma County, California	Evans & De Shazo, Inc.	49-005999
S-052375a		2018	Stacey De Shazo	A Historic Resource Evaluation for the Proposed "Somerset Place" Residential Subdivision Project at 2786 Dutton Meadow, Santa Rosa, Sonoma County, California	Evans & De Shazo Archaeology & Historic Preservation	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
S-052375b		2018	Julianne Polanco and Rick M. Bottoms	[COE_2018_0618_002] Section 106 Consultation for the proposed Somerset Place Residential Housing Project at 2786 Dutton Meadow, Santa Rosa, Sonoma County, California (Corps File #2005-299820)	Office of Historic Preservation, U.S. Army Corps of Engineers	

APPENDIX C

List of Resources Documented within a Half-Mile of the Area of Potential Effects

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-49-001516	CA-SON-001785H	OHP PRN - ADOE 49-90-003-00; Resource Name - [none]	Site	Historic	AH04	1989 (L. Jordan, J. Caputo, B. Terhorst, E. Allison, Anthropological Studies Center, SSU)	S-011709, S-011710, S-016080, S-016556
P-49-001600		Resource Name - Bellevue Ranch 7; Other - BR7	Building	Historic	HP02	1994 (Vicki Beard, Tom Origer & Associates)	S-016837
P-49-001601		Other - BR10; Resource Name - Bellvue Ranch 10	Building, Site	Historic	HP02; HP04	1994 (Vicki R. Beard, Tom Origer & Associates)	S-016837, S-026122
P-49-001749		Resource Name - Fitzgerald Farmstead; Voided - P-49-005062; OHP Property Number - 067973; OHP PRN - DOE-49-90-0049-0000; OHP PRN - FHWA871022A	Building, Structure	Historic	HP02; HP04; HP33	1988 (Purser, Praetzellis, Anthropological Studies Center, SSU); 1996 (B. Eastman, Anthropological Studies Center, SSU)	S-011710, S-017810
P-49-001801		Resource Name - U.S. Naval Air Station; OHP Property Number - 105172 & 105173; OHP PRN - DOE-49-96-0014-0000; OHP PRN - COE941013E; Voided - P-49-002542; Other - Sewage Treatment Facility for Santa Rosa Naval Air Station	Building, Structure, Object, Site	Historic	AH07; HP04; HP10; HP14; HP34; HP39	1996 (Sunshine Psota, ASC/SSU); 1996 (Sunshine Psota, ASC/SSU); 1999 (Sunshine Psota, ASC/SSU)	S-016080, S-018522, S-019702, S-021449, S-023000, S-036180, S-040586, S-042843, S-051518
P-49-003276		Resource Name - Baptiste Bossa Bungalow	Building, Structure	Historic	HP02; HP32; HP33	2004 (Susan M. Clark, Holly L. Hoods, Clark Historic Resource Consutants, Inc)	
P-49-003907		Resource Name - 2641 Dutton Meadow; Other - 2641 South Dutton Avenue	Building, Structure	Historic	HP33	2008 (V. Beard, S. Ledebuhr, Tom Origer & Associates); 2008 (V. Beard, Tom Origer & Associates)	S-035151, S-035153
P-49-004809		Resource Name - ARS 92-55; Voided - CA-SON-ISO-68	Other	Prehistoric	AP02	1992 (Stephen Bryne, ARS)	S-014652

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-49-005037		Resource Name - 1760 North Stony Point Road; OHP Property Number - 067951; OHP PRN - DOE-49-90-0027-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005038		Resource Name - 2740 North Stony Point Road; OHP Property Number - 067970; OHP PRN - DOE-49-90-0046-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1989 (Terhorst, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005047		Resource Name - Annett house; OHP Property Number - 067958; OHP PRN - DOE-49-90-0034-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005048		Resource Name - Annett rental; OHP Property Number - 067957; OHP PRN - DOE-49-90-0033-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005052		Resource Name - Boorman Dairy; OHP Property Number - 067963; OHP PRN - DOE-49-90-0039-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1989 (Purser, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005054		Resource Name - Buss farmstead; OHP Property Number - 067954; OHP PRN - DOE-49-90-0030-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Purser, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005056		Resource Name - Cox Residence; OHP Property Number - 067965; OHP PRN - DOE-49-90-0041-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1989 (Terhorst, Praetzellis, Anthropological Studies Center, SSU)	S-011710

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-49-005057		Resource Name - Dinelli farmstead; OHP Property Number - 067949; OHP PRN - DOE-49-90-0025-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Terhorst, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005058		Resource Name - Elmer Stevens Residence; OHP Property Number - 067959; OHP PRN - DOE-49-90-0035-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Purser, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005059		Resource Name - Enquist chicken house; OHP Property Number - 067967; OHP PRN - DOE-49-90-0043-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Terhorst, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005060		Resource Name - Ernest Canneaux house; OHP Property Number - 067961; OHP PRN - DOE-49-90-0037-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Purser, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005061		Resource Name - Fear residence; OHP Property Number - 067950; OHP PRN - DOE-49-90-00-0000; OHP PRN - FHWA871022A	Building	Historic	HP02; HP04	1988 (Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005063		Resource Name - Glantz residence; OHP Property Number - 067966; OHP PRN - DOE-49-90-0042-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Terhorst, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005066		Resource Name - Irma Enquist Kirk Residence; OHP Property Number - 067969; OHP PRN - DOE-49-90-0045-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1989 (Terhorst, Praetzellis, Anthropological Studies Center, SSU)	S-011710

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-49-005070		Resource Name - Joy farmstead; OHP Property Number - 067971; OHP PRN - DOE-49-90-0047-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Terhorst, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005071		Resource Name - King farmstead; OHP Property Number - 067952; OHP PRN - DOE-49-90-0028-0000; OHP PRN - FHWA871022A	Building	Historic	HP02; HP04	1988 (Terhorst, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005072		Resource Name - King house; OHP Property Number - 067953; OHP PRN - DOE-49-90-0029-0000; OHP PRN - FHWA871022A	Building	Historic	HP02; HP04	1988 (Purser, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005077		Resource Name - Nelson farmstead; OHP Property Number - 067964; OHP PRN - DOE-49-90-0040-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Terhorst, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005078		Resource Name - Nickels residence; OHP Property Number - 067968; OHP PRN - DOE-49-90-0044-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1989 (Terhorst, Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005079		Resource Name - Niles Stevens Farmstead; OHP Property Number - 067956; OHP PRN - DOE-49-90-0032-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Purser, Praetzelis, Anthropological Studies Center, SSU)	S-011710
P-49-005081		Resource Name - Peter farmstead; OHP Property Number - 067962; OHP PRN - DOE-49-90-0038-0000; OHP PRN - FHWA871022A	Building	Historic	HP02	1988 (Praetzellis, Anthropological Studies Center, SSU)	S-011710

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-49-005082		Resource Name - Poisson farmstead; OHP Property Number - 067960; OHP PRN - DOE-49-90-0036-0000; OHP PRN - FHWA871022A	Building	Historic	HP02; HP04	1988 (Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005090		Resource Name - William Stevans residence; OHP Property Number - 067955; OHP PRN - DOE-49-90-0031-0000; OHP PRN - FHWA871022A	Building	Historic	HP02; HP04	1988 (Praetzellis, Anthropological Studies Center, SSU)	S-011710
P-49-005999		Resource Name - 2786 Dutton Meadow	Building	Historic	HP02; HP04; HP33	2018 (Stacey De Shazo, Evans & De Shazo, Inc)	S-028872, S-052375

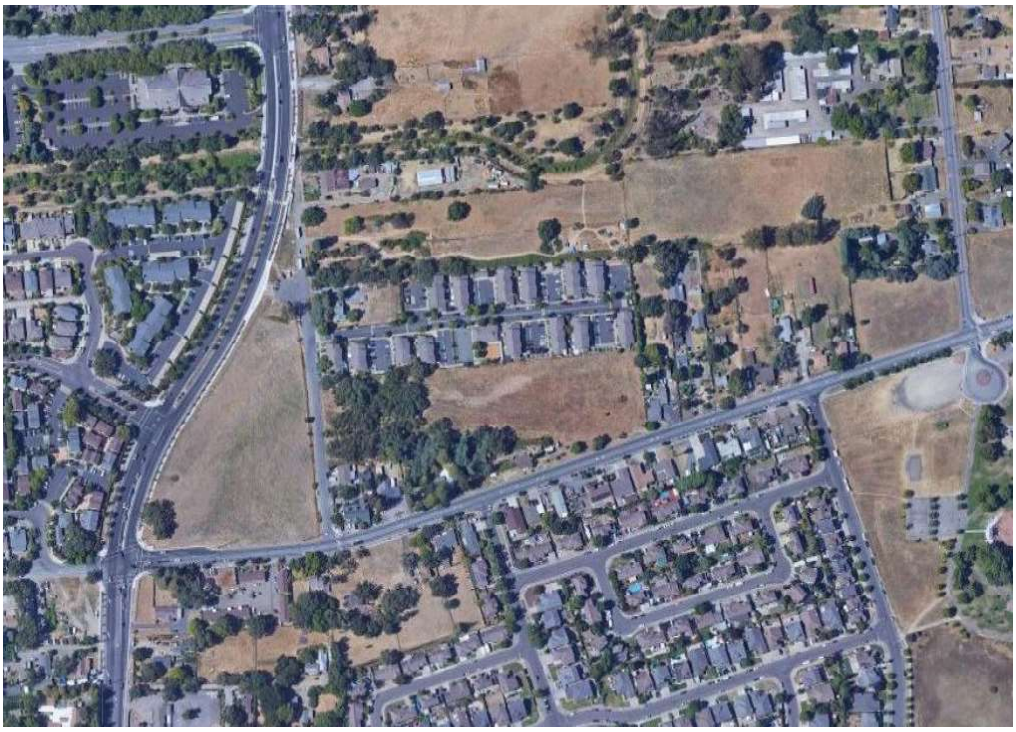
APPENDIX D

Available To Qualified Individuals Only

DPR 523 Forms
Resource Documentation

Archaeological site location information should be kept confidential to protect sites from damage by vandals and collectors

Final Traffic Impact Study for Stony Oaks Apartments



Prepared for the City of Santa Rosa

Submitted by
W-Trans

May 18, 2021

TRAFFIC ENGINEERING
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Executive Summary

The proposed Stony Oaks project consists of a 142-unit affordable apartments complex to be located on a currently vacant site at 2542 Old Stony Point Road in the City of Santa Rosa. The project would take access from a driveway on Old Stony Point Road as well as a driveway on Hearn Avenue. The project would be expected to generate 772 trips per day, including 51 trips during the weekday a.m. peak hour and 62 trips during the weekday p.m. peak hour.

Analysis indicates that four of the five study intersections operate acceptably per the applicable City standards under Existing and Baseline Conditions and would continue to do so with the addition of project traffic. The intersection at Hearn Avenue/Burbank Avenue would operate acceptably overall under Existing and Existing plus Project conditions, though would encounter LOS E or F operation on the stop-controlled southbound leg; the peak hour signal warrant would remain unmet. Under Baseline and Baseline plus Project conditions, delays at the intersection would increase, and the peak hour signal warrant would be met both without and with the proposed project. The proposed project would be expected to increase overall delays at the intersection by 1.7 to 2.2 seconds under Baseline conditions, which falls below the City's significance criteria of five seconds. The City of Santa Rosa plans to signalize the intersection as detailed in the 2016 *Roseland Area/Sebastopol Road Specific Plan*. Installation of a signal would be expected improve LOS to acceptable levels under both near-term and long-range conditions. As indicated by the City, the project should contribute its proportionate share of $29,760 toward signalization of the intersection.

The project site is in an area of Santa Rosa that has a baseline residential VMT per capita that is more than 15 percent below the Countywide average, falling below the City's significance thresholds contained in the *Vehicle Miles Traveled (VMT) Guidelines Final Draft*. As a 100 percent affordable residential development, the project also qualifies for VMT screening criteria established by the City of Santa Rosa. Given these conditions, the project may be presumed to have a less than significant VMT impact.

Existing pedestrian and bicycle facilities in the project vicinity, including sidewalks and Class II bike lanes on Hearn Avenue and Stony Point Road, will adequately serve these modes upon completion of the sidewalk frontage improvements to be installed as part of the project. Santa Rosa CityBus transit routes also operate within a walkable distance of the project site and would be accessible via the sidewalk system. Project residents would be able to walk to surrounding areas and transit stops via the project's connection to Old Stony Point Road and existing sidewalk facilities including those on the south side of Hearn Avenue. Additional pedestrian connectivity options would exist in the future once continuous sidewalks are constructed on adjacent properties along the north side of Hearn Avenue.

Sight lines are currently adequate at the project driveways to accommodate all turns into and out of the site. To maintain existing sight lines, it is recommended that any new signage and taller landscaping to be installed along the project frontage be placed outside of the vision triangle of a driver waiting on each driveway. The site would provide effective access and circulation for emergency response vehicles.

The project would qualify for State density bonus provisions that require a minimum of 185 parking spaces, which equals the proposed supply. The project would provide both long-term and short-term bicycle parking in excess of that required by the City's zoning code.

Introduction

This report presents an analysis of the potential traffic impacts that would be associated with development of the proposed Stony Oaks Apartments project to be located at 2542 Old Stony Point Road in the City of Santa Rosa. The traffic study was completed in accordance with the criteria established by the City of Santa Rosa, reflects a scope of work and study area reviewed and approved by City staff, and is consistent with standard traffic engineering techniques.

Prelude

The purpose of a traffic impact study is to provide City staff and policy makers with data they can use to make an informed decision regarding the potential traffic impacts of a proposed project, and any associated improvements that would be required to mitigate these impacts to a level of insignificance and reduce adverse effects to an acceptable level as defined by the City's General Plan or other policies. Vehicular traffic operational effects are typically evaluated by determining the number of new trips that the proposed use 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 effect the new traffic would be expected to have on critical intersections or roadway segments. While the traffic operational analysis is required by the City and used to confirm consistency with General Plan policies, it is not used for CEQA purposes, consistent with updates to the CEQA guidelines adopted by the State of California. CEQA transportation impacts are assessed through analysis of vehicle miles traveled (VMT), with evaluation of non-auto modes including access for pedestrians, bicyclists, and to transit, and circulation safety.

Project Profile

The proposed project includes the development of 142 affordable apartments on a site that is currently vacant, as shown in Figure 1. The project would include a driveway onto Old Stony Point Road as well as a driveway onto Hearn Avenue near the eastern project boundary.

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Traffic Impact Study for Stony Oaks Apartments

Figure 1 – Study Area and Existing Lane Configurations

W-Trans

Transportation Setting

Operational Analysis

Study Area and Periods

The study area consists of the sections of Hearn Avenue and Old Stony Point Road fronting the project site as well as the following intersections.

1. Stony Point Road/Northpoint Parkway
2. Stony Point Road/Hearn Avenue
3. Hearn Avenue/Old Stony Point Road
4. Hearn Avenue/Burbank Avenue
5. Hearn Avenue/Dutton Meadow

Operating conditions during the a.m. and p.m. peak periods were evaluated to capture the highest potential impacts for the proposed project as well as the highest volumes on the local transportation network. The morning peak hour occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute, while the p.m. peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion during the homeward bound commute.

Study Intersections

Stony Point Road/Northpoint Parkway is a signalized tee intersection with protected-permitted left-turn phasing including flashing yellow arrow (FYA) signal heads on the northbound approach. There are crosswalks on the north and west legs of the intersection.

Stony Point Road/Hearn Avenue is a signalized intersection with protected left-turn phasing on all approaches, and a right-turn overlap phase on the westbound approach. Crosswalks are provided on all legs.

Stony Point Road/Old Stony Point Road is a three-legged unsignalized intersection that is stop-controlled on the southbound Old Stony Point Road approach. A left-turn lane is provided on the eastbound Hearn Avenue approach, and the east leg has a two-way left-turn lane. A marked crosswalk with rapid rectangular flashing beacon (RRFB) pedestrian crossing lights is located on the east intersection leg.

Hearn Avenue/Burbank Avenue is an unsignalized intersection that is stop-controlled on the northbound Southwest Community Park access and the southbound Burbank Avenue approach. Left-turn lanes are provided on the eastbound and westbound Hearn Avenue approaches and the east leg has a marked crosswalk.

Hearn Avenue/Dutton Meadow is a three-legged signalized intersection. The westbound left-turn has protected phasing, along with overlap phasing for the northbound right-turn movement. The west leg has a crosswalk and curb ramps.

The locations of the study intersections and the existing lane configurations and controls are shown in Figure 1.

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published

in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is November 1, 2014 through October 31, 2019.

As presented in Table 1, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in *2016 Collision Data on California State Highways*, California Department of Transportation (Caltrans). These average rates statewide are for intersections in the same environment (urban), with the same number of approaches (three or four), and the same controls (two-way stop or signalized). Collision rates for three of the five study intersections were above the statewide average so were further reviewed. The collision rate calculations are provided in Appendix A.

Table 1 – Collision Rates for the Study Intersections

Study Intersection	Number of Collisions (2014-2019)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. Stony Point Rd/Northpoint Pkwy	15	**0.35**	0.28
2. Stony Point Rd/Hearn Ave	15	0.38	0.43
3. Hearn Ave/Old Stony Point Rd	2	0.12	0.14
4. Hearn Ave/Burbank Ave	6	**0.25**	0.23
5. Hearn Ave/Dutton Meadow	9	**0.33**	0.28

Note: c/mve = collisions per million vehicles entering; **Bold** text = higher collision rate than statewide average

The collision rate at Stony Point Road/Northpoint Parkway is higher than the statewide average, with 13 of the 15 reported collisions being either rear-end, hit object or right-angle collisions. Rear-end crashes are common at signalized intersections during congested conditions. Right-angle collisions can result from right-of-way violations. It is noted that this intersection was within a construction zone for a long period during the Stony Point Road widening project; 11 of the 15 crashes occurred prior to completion of the Stony Point Road widening, and collision frequency has decreased since that time.

The predominant crash type at Hearn Avenue/Burbank Avenue was right-angle collisions. Three of the five right-angle crashes involved vehicles entering Hearn Avenue from either Burbank Avenue or the Southwest Community Park and two involved vehicles turning into Burbank Avenue or the Park from Hearn Avenue. It is understood that the City has added signalization of this intersection to the Capital Improvement Program (CIP), and such an installation would reduce the frequency of these types of crashes.

Review of the collisions reported at Hearn Avenue/Dutton Meadow indicates that 7 of the 10 collisions were rear-end collisions, which occurred on the westbound and eastbound approaches to the intersection. The most common primary collision factor cited was unsafe speed. An increased enforcement presence may help to reduce the frequency of these types of collisions.

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, pedestrian signals, and curb ramps provide access for pedestrians in the vicinity of the proposed project site where property has been developed; however, sidewalk gaps can be found along streets near the project site.

- **Hearn Avenue** – Several sections of sidewalk are provided from Stony Point Road to Dutton Meadow, but there are large gaps in sidewalk coverage on both sides of Hearn Avenue. In these areas with no sidewalk, pedestrians walk on paved shoulders or cross Hearn Avenue to access the segments of Hearn Avenue that include a sidewalk. Lighting is provided by overhead lights, mainly on the north side of the street.

- **Old Stony Point Road** – The east side of this minor street currently has a combination of sidewalks and asphalt paths separated from vehicle lanes by an asphalt berm. The sidewalks and paths connect to existing facilities on Hearn Avenue and Stony Point Road.

Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2017, classifies bikeways into four 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.
- **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 Hearn Avenue between Stony Point Road and Dutton Meadow, extending eastward to the SMART multi-use pathway. Continuous bicycle lanes also exist on Stony Point Road within the study area, extending northward over four miles through much of western Santa Rosa. 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 *City of Santa Rosa Bicycle & Pedestrian Master Plan Update 2018.*

Table 2 - Bicycle Facility Summary

Status Facility	Class	Length (miles)	Begin Point	End Point
Existing				
Hearn Ave	II	1.15	Stony Point Rd	Whitewood Dr
Stony Point Rd-Marlow Rd	II	4.80	Piner Rd	Bellevue Ave
Planned				
Burbank Ave	II	1.00	Roundelay Ln	Hearn Ave
Dutton Meadow	II	0.86	Hearn Ave	Bellevue Ave
Northpoint Pkwy	IV	0.33	Stony Point Rd	Burbank Ave

Source: *City of Santa Rosa Bicycle & Pedestrian Master Plan Update 2018*, City of Santa Rosa, 2018

Transit Facilities

Santa Rosa CityBus provides fixed route bus service in Santa Rosa. Routes 12 and 15 serve the study area seven days a week. Route 15 stops on Stony Point Road just north of Pearblossom Drive near the northern terminus of Old Stony Point Road; the northbound bus stop is approximately 450 feet from the proposed project's driveway on Old Stony Point Road, and the southbound bus stop is approximately 800 feet from the project driveway. Route 15 also stops at the intersection of Hearn Avenue/Arrowhead Drive, approximately 650 feet southeast of the

project's Old Stony Point Road driveway. Routes 12 and 15 stop at Southwest Community Park, which is approximately 120 feet south of the intersection of Hearn Avenue/ Burbank Avenue, and roughly one-half mile east of the project site. The bus stops on Hearn Avenue and Southwest Community Park are accessible from the project site via Old Stony Point Road and existing sidewalks on the south side of Hearn Avenue.

Route 12 operates Monday through Friday with approximately one-hour headways between 6:15 a.m. and 7:15 p.m. Weekend service operates with approximately one-hour headways between 10:15 a.m. and 4:15 p.m. Route 15 operates Monday through Friday with approximately one-hour headways between 6:20 a.m. and 7:20 p.m. Weekend service operates with approximately one-hour headways between 10:20 a.m. and 4:20 p.m. These schedules are indicative of pre COVID-19 conditions but are anticipated to resume in the future.

Two to three bicycles can be carried on most CityBus buses. Bike rack space is on a first-come, first-served basis.

Paratransit, also known as dial-a-ride, 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. CityBus paratransit is contracted out to MV Transportation and is designed to serve the needs of individuals with disabilities within three-quarters (3/4) of a mile from existing CityBus routes. Paratransit service is available seven days a week, but rides must be scheduled one day in advance.

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, 6th Edition, 2018. 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 Levels of Service for the intersections with side street stop controls, or those which are unsignalized and have one or two approaches stop controlled, were analyzed using the "Two-Way Stop-Controlled" intersection capacity method from the HCM. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection.

The study intersections that are controlled by a traffic signal 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 the signals are coordinated or not, 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 signal timing obtained from City of Santa Rosa.

The ranges of delay associated with the various levels of service are indicated in Table 3.

Table 3 – Intersection Level of Service Criteria

LOS	Two-Way Stop-Controlled	Signalized
A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.	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. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.	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. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street.	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. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.	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. Few acceptable gaps in traffic are available, and longer queues may form on the side street.	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 may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues.	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, 6th Edition, 2018

Traffic Operation Standards

The City of Santa Rosa establishes measures of effectiveness for traffic operational analyses in *Guidance for the Preparation of Traffic Operational Analysis*, July 2019. This document refers to and builds upon the following policies included in section 5.8 (Transportation Goals & Policy) of the City of Santa Rosa General Plan.

T-D-1 *Maintain a Level of Service (LOS) D or better along all major corridors. Exceptions to meeting the standard include:*

- *Within downtown;*
- *Where attainment would result in significant degradation;*
- *Where topography or impacts makes the improvement impossible; or*
- *Where attainment would ensure loss of an area's unique character.*

The LOS is to be calculated using the average traffic demand over the highest 60-minute period.

Traffic Engineering Division will require a level of service evaluation of arterial and collector corridors if deemed necessary.

T-D-2 *Monitor level of service at intersections to assure that improvements or alterations to improve corridor level of service do not cause severe impacts at any single intersection.*

General interpretation of Policy T-D-2. The impact to an intersection is considered adverse if the project related and/or future trips result in:

1. The level of service (LOS) at an intersection degrading from LOS D or better to LOS E or F, OR
2. An increase in average vehicle delay of greater than 5 seconds at a signalized intersection where the current LOS is either LOS E or F.
3. Queuing impacts based on a comparative analysis between the design queue length and the available queue storage capacity. Impacts include, but are not limited to, spillback queue at project access locations (both ingress and egress), turn lanes at intersections, lane drops, spill back that impacts upstream intersections or interchange ramps.
4. Exceptions may be granted under the following conditions:
   a. Within downtown,
   b. Where attainment would result in significant degradation,
   c. Where topography or impacts makes the improvement impossible; or
   d. Where attainment would ensure loss of an area's unique character.

T-C-3 *Implement traffic calming techniques on streets subject to high speed and/or cut-through traffic, in order to improve neighborhood livability, Techniques Include:*

- *Narrow Streets*
- *On-street parking*
- *Choker or diverters*
- *Decorative crosswalks*
- *Planted islands*

General interpretation of Policy T-C-3. An impact is considered adverse if the project has the potential to alter community character by significantly increasing cut-through traffic, unexpected vehicle maneuvers or commercial vehicle trips in a residential area.

T-H-3 *Require new development to provide transit improvements, where a rough proportionality to demand from the project is established. Transit improvements may include:*

- *Direct and paved pedestrian access to transit stops*
- *Bus turnouts and shelters*
- *Lane width to accommodate buses.*

General interpretation of Policy T-H-3. An impact is considered adverse if the project has the potential to disrupt existing transit operations or establishes transit facilities and equipment such that it creates a sight distance deficiency or vehicle conflict point.

T-J *Provide attractive and safe streets for pedestrian and bicyclists.*

General interpretation of Policy T-J. An impact is considered adverse if the project generates 20 pedestrians in any single hour at an unsignalized intersection, mid-block crossing or where no crossing has been established.

An impact is further considered significant if the project interrupts existing or proposed pedestrian, bicycle and transit facilities, path or travel, direct access resulting in excessive rerouting or creates a vehicle conflict condition which affects the safety of other roadway users.

Use of LOS E or F at Unsignalized Intersections

On sections of certain arterial streets, it is typical to have all side streets operating at LOS E or F with long traffic delays, even where side street volumes are very low. In fact, it may be operationally, physically, and/or financially infeasible to provide mitigation which would allow LOS D or better operation from all side streets during peak hours. The most typical mitigation measure used to improve operation for the side street is a traffic signal, and it is both operationally and financially undesirable to provide a traffic signal at every intersection along most street segments. For these reasons, mitigation measures were considered when only when LOS F conditions were projected for minor movements at unsignalized intersections.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the a.m. and p.m. peak periods. This condition does not include project-generated traffic volumes.

Because the COVID-19 pandemic has had a substantial effect on traffic patterns, the existing volumes applied in this analysis have been adjusted to reflect non-pandemic conditions using a combination of new and previously obtained counts. Traffic counts at the intersections of Stony Point Road/Northpoint Parkway, Stony Point Road/Hearn Avenue, and Hearn Avenue/Dutton Meadow from 2017 and 2018 were factored by a growth rate of one percent per year to reflect current conditions. Counts obtained in September 2019 at Hearn Avenue/Burbank Avenue were directly applied. New counts were obtained at the Hearn Avenue/Old Stony Point Road intersection in December 2020. Growth factors were applied to these volumes based on a comparison of COVID versus non-COVID volumes on the segment of Hearn Avenue between Stony Point Road and Old Stony Point Road, and in consideration of the traffic volumes that would typically be expected on Old Stony Point Road based on the approximately 70 apartments and five single-family homes that currently rely on the street for access. This approach was discussed with and approved by the City's Traffic Engineer.

Under existing conditions, all study intersections are operating acceptably overall. Although the intersection of Hearn Avenue/Burbank Avenue is operating acceptably at LOS A overall, the City is aware of the high delays experienced on the southbound approach and has plans to signalize the intersection, as detailed in the 2016

Roseland Area/Sebastopol Road Specific Plan. The installation of a signal would be expected to reduce the delays on the southbound approach to an acceptable Level of Service.

The existing traffic volumes are shown in Figure 2. A summary of the intersection Level of Service calculations is contained in Table 4, and copies of the calculations are provided in Appendix B.

Table 4 - Existing Peak Hour Intersection Levels of Service

Study Intersection ***Approach***	AM Peak		PM Peak	
	Delay	**LOS**	**Delay**	**LOS**
1. Stony Point Rd/Northpoint Pkwy	8.4	A	18.9	B
2. Stony Point Rd/Hearn Ave	39.7	D	29.1	C
3. Hearn Ave/Old Stony Point Rd	0.4	A	0.9	A
Southbound (Old Stony Point Rd) Approach	*11.6*	*B*	*12.8*	*B*
4. Hearn Ave/Burbank Ave	8.6	A	6.9	A
Southbound (Burbank Ave) Approach	*62.4*	*F*	*49.8*	*E*
5. Hearn Ave/Dutton Meadow	15.8	B	9.1	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

Baseline Conditions

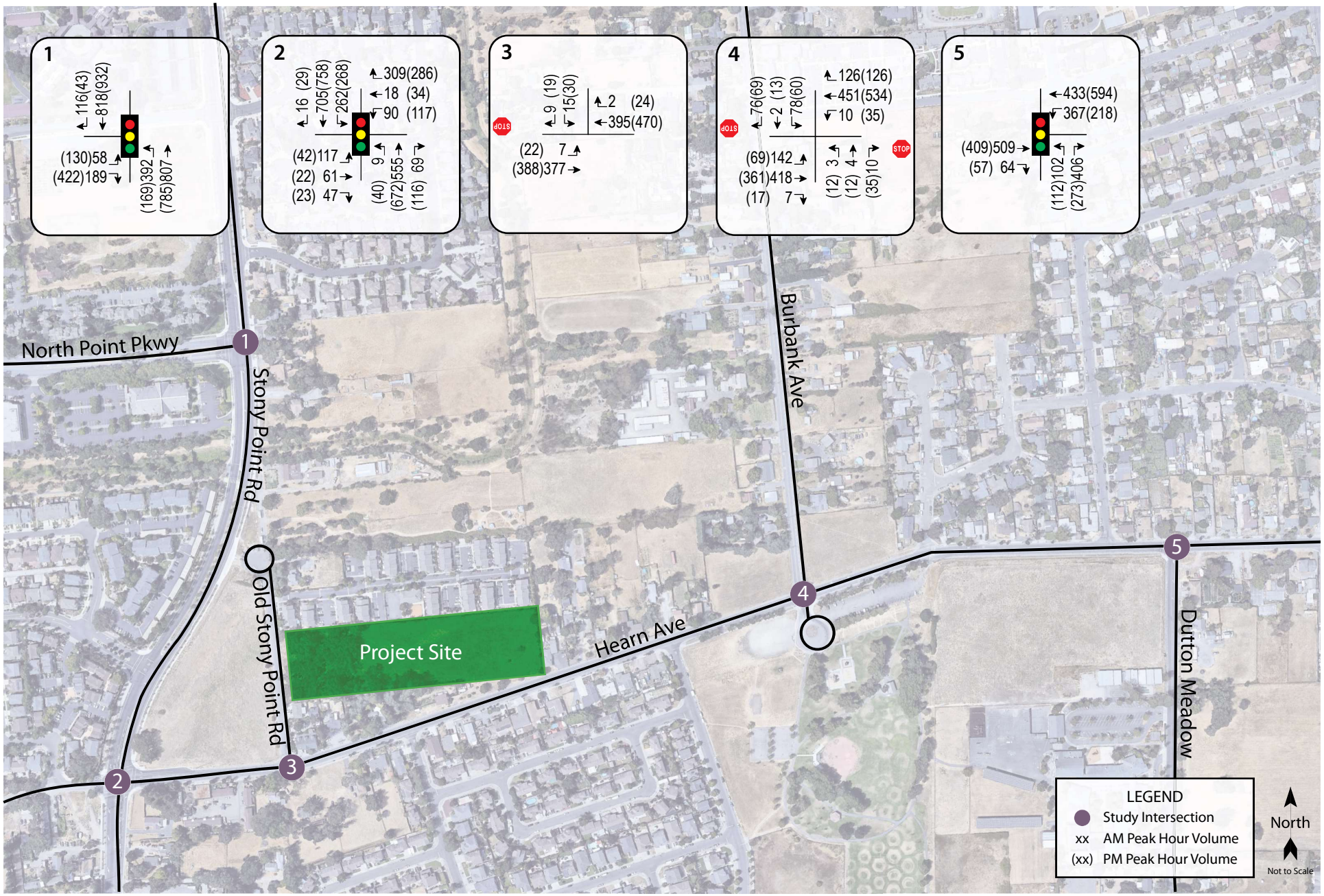
Baseline (Existing plus Approved) operating conditions were assessed with traffic from approved projects in and near the study area added to the Existing volumes. As directed by staff, the following ten projects contained in the *Citywide Summary of Pending Development* report published by the City in May 2020 were included in the evaluation of Baseline Conditions. Unless stated otherwise, the same trip generation and distribution assumptions used in the traffic studies for the various projects, where available, were used in this analysis.

Southwest Estates is an approved 60 single-family residence development at 533 Bellevue Avenue. As contained in the *Traffic Impact Study for the Southwest Estates*, W-Trans, August 2008, the project is expected to generate a total of 566 trips per day, including 44 trips during the a.m. peak hour and 59 trips during the p.m. peak hour.

Burbank Avenue Subdivision includes an approved 64 apartments and 74 single-family dwellings at 1400 Burbank Avenue. As contained in the *Traffic Impact Study for the Burbank Avenue Subdivision*, W-Trans, December 2019, the project is expected to generate a total of 1,158 trips per day, including 83 trips during the a.m. peak hour and 108 trips during the p.m. peak hour.

Somerset Place has been approved with 32 single-family dwelling units at 2786 Dutton Meadow. The trip generation for this project (as well as others with no available traffic studies) was calculated using standard rates published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual*, 10th Edition. The project is expected to generate 302 daily trips on average, with 24 trips during the morning peak period and 32 trips during the evening peak period.

Meadowood Ranch is an approved single-family residential development with 78 units at 2853 Dutton Meadow. The project is expected to generate 736 daily trips on average, with 58 trips during the morning peak period and 77 trips during the evening peak period.



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Traffic Impact Study for Stony Oaks Apartments

Figure 2 – Existing Traffic Volumes

Bellevue Ranch 7 is an approved 30-unit development of single-family dwellings at 2903 Dutton Meadow. The project is expected to generate 283 daily trips on average, with 22 trips during the morning peak period and 30 trips during the evening peak period.

Lantana Place is an approved 48 single-family dwelling development at 2979 Dutton Meadow. The project is expected to generate 453 daily trips on average, with 36 trips during the morning peak period and 48 trips during the evening peak period.

Air Center East Phase 2 includes 133 single-family dwellings approved for 1301 Ludwig Avenue. The project is expected to generate 1,256 daily trips on average, with 98 trips during the morning peak period and 132 trips during the evening peak period.

Stony Village North has been approved with 47 single-family dwellings at 2729 Stony Point Road. As contained in the *Traffic Impact Study for the Stony Village North Project*, W-Trans, January 2016, the project is expected to generate a total of 436 trips per day, including 34 trips during the a.m. peak hour and 45 trips during the p.m. peak hour.

Grove Village is an approved 157 single-family dwelling project at 2880 Stony Point Road. The project is expected to generate 1,482 daily trips on average, with 116 trips during the morning peak period and 155 trips during the evening peak period.

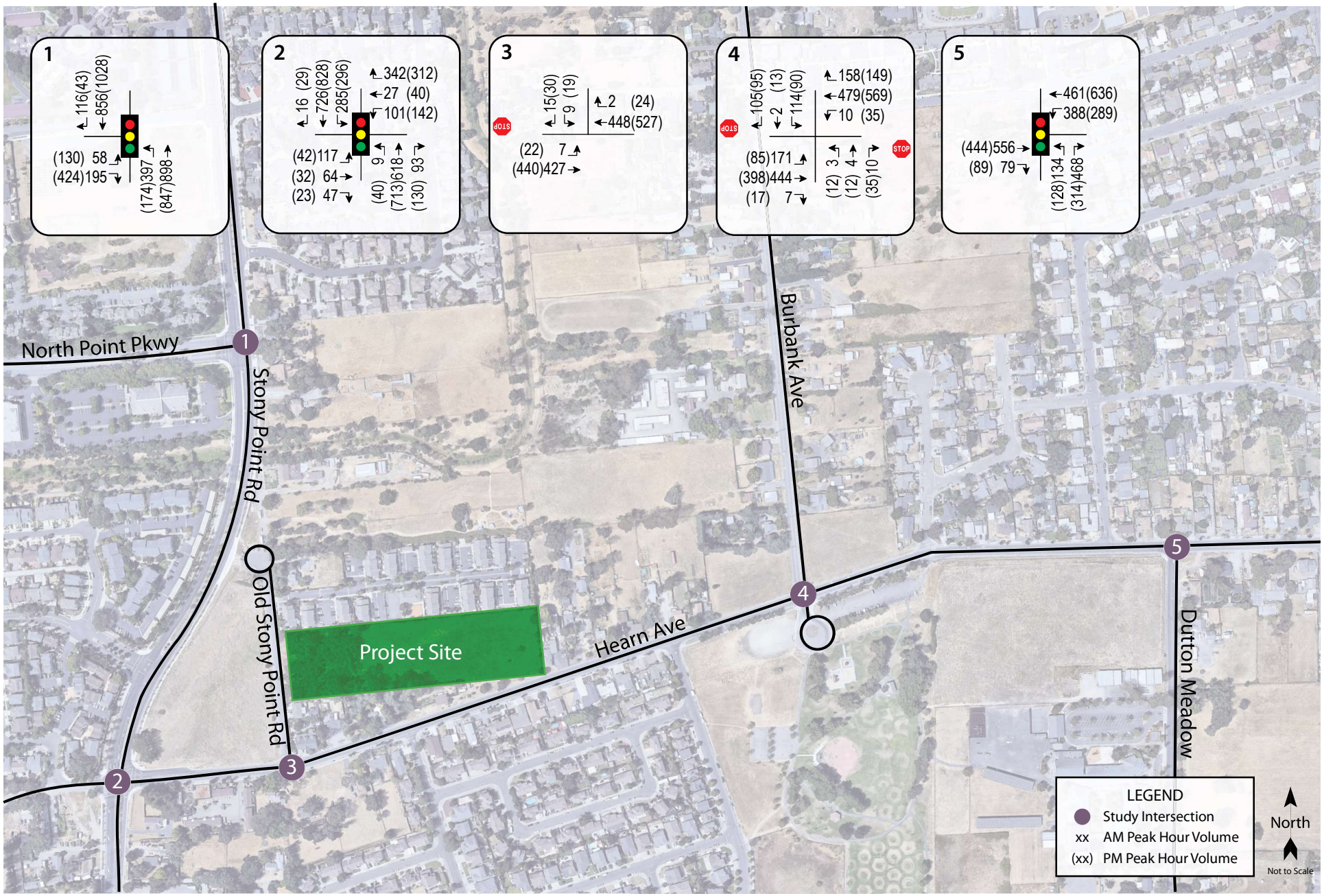
Roseland Accelerated Middle School as proposed would relocate an existing 300-student middle school campus to the Roseland Creek Elementary School site on Burbank Avenue. The project is expected to generate 567 trips per day, including 189 trips during the morning peak hour and 105 trips during the evening peak hour.

Upon adding trips from the approved projects to Existing volumes, the study intersections are expected to continue operating at acceptable service levels overall. The southbound approach at Hearn Avenue/Burbank Avenue would experience increased delays and LOS F operation, and the "peak hour" signal warrant would be met (see additional signal warrant discussion under Access and Circulation). These results are summarized in Table 5 and Baseline volumes are shown in Figure 3.

Table 5 - Baseline Peak Hour Intersection Levels of Service

Study Intersection *Approach*	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. Stony Point Rd/Northpoint Pkwy	8.4	A	19.7	B
2. Stony Point Rd/Hearn Ave	42.2	D	35.5	D
3. Hearn Ave/Old Stony Point Rd	0.4	A	0.8	A
Southbound (Old Stony Point Rd) Approach	*12.1*	*B*	*13.5*	*B*
4. Hearn Ave/Burbank Ave	37.3	D	23.1	C
Southbound (Burbank Ave) Approach	*244.5*	*F*	*161.7*	*F*
5. Hearn Ave/Dutton Meadow	20.7	C	10.7	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*



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Traffic Impact Study for Stony Oaks Apartments

Figure 3 – Baseline Traffic Volumes

Project Description

The proposed project includes the development of 142 affordable apartments on a site that is currently vacant. The project would include driveways onto Old Stony Point Road as well as Hearn Avenue near the eastern project boundary. The proposed project site plan is shown in Figure 4.

Trip Generation

The anticipated trip generation for the proposed project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 10th Edition, 2017 for "Multi-Family Housing (Mid-Rise)" (Land Use #221). Based on application of these rates, the proposed project is expected to generate an average of 772 trips per day, including 51 a.m. peak hour trips and 62 trips during the p.m. peak hour. These results are summarized in Table 6.

Table 6 - Trip Generation Summary

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Multi-Family Housing (Mid-Rise)	142 du	5.44	772	0.36	51	13	38	0.44	62	38	24

Note: du = dwelling unit

Trip Distribution

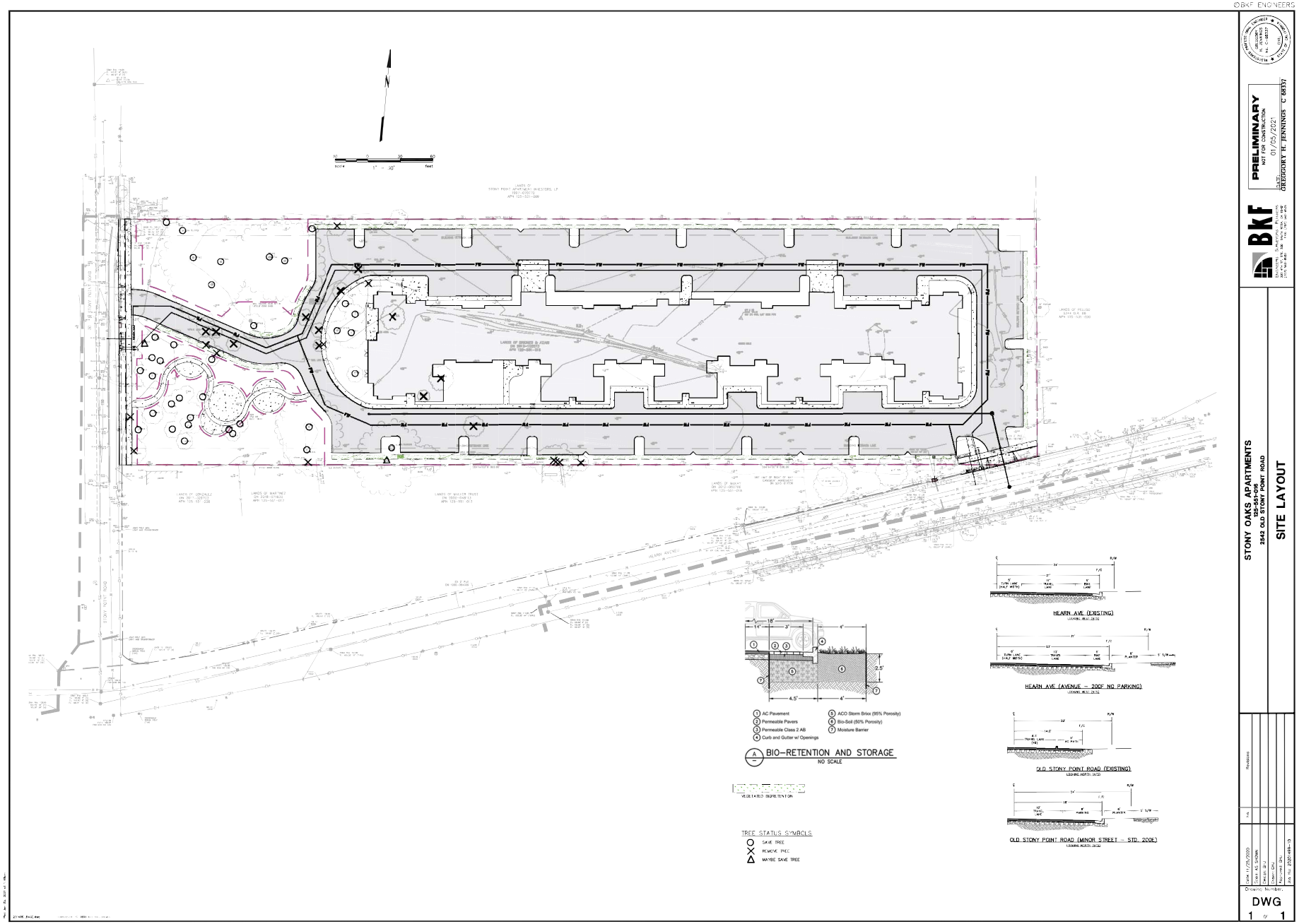
The pattern used to allocate new project trips to the street network was determined by reviewing existing turning movements at the study intersections. Trips routed from and to the west were assumed to be equally split between the project's driveways on Old Stony Point Road and Hearn Avenue. All trips routed from and to the east were assigned to the project's Hearn Avenue driveway. The applied distribution assumptions and resulting trips are shown in Table 7.

Table 7 – Trip Distribution Assumptions

Route	Percent	AM Trips	PM Trips
From/to the north via Stony Point Rd	45%	23	28
From/to the east via Hearn Ave	40%	20	25
From/to the south via Stony Point Rd	15%	8	9
TOTAL	**100%**	**51**	**62**

Existing plus Project Conditions

Upon the addition of project-related traffic to the Existing volumes, the study intersections are expected to continue operating acceptably overall. Operation on the southbound approach to Hearn Avenue/Burbank Avenue would deteriorate from LOS E to LOS F, though the increase due to the project would be less than five seconds. The project is anticipated to increase overall average delay at the Hearn Avenue/Burbank Avenue intersection by 0.4 to 0.5 seconds, though the "peak hour" warrant for signalization would be unmet (see additional signal warrant discussion in Access and Circulation). Project traffic volumes are shown in Figure 5. These results are summarized in Table 8.



Source: BKF Engineers/Surveyors/Planners 2/10

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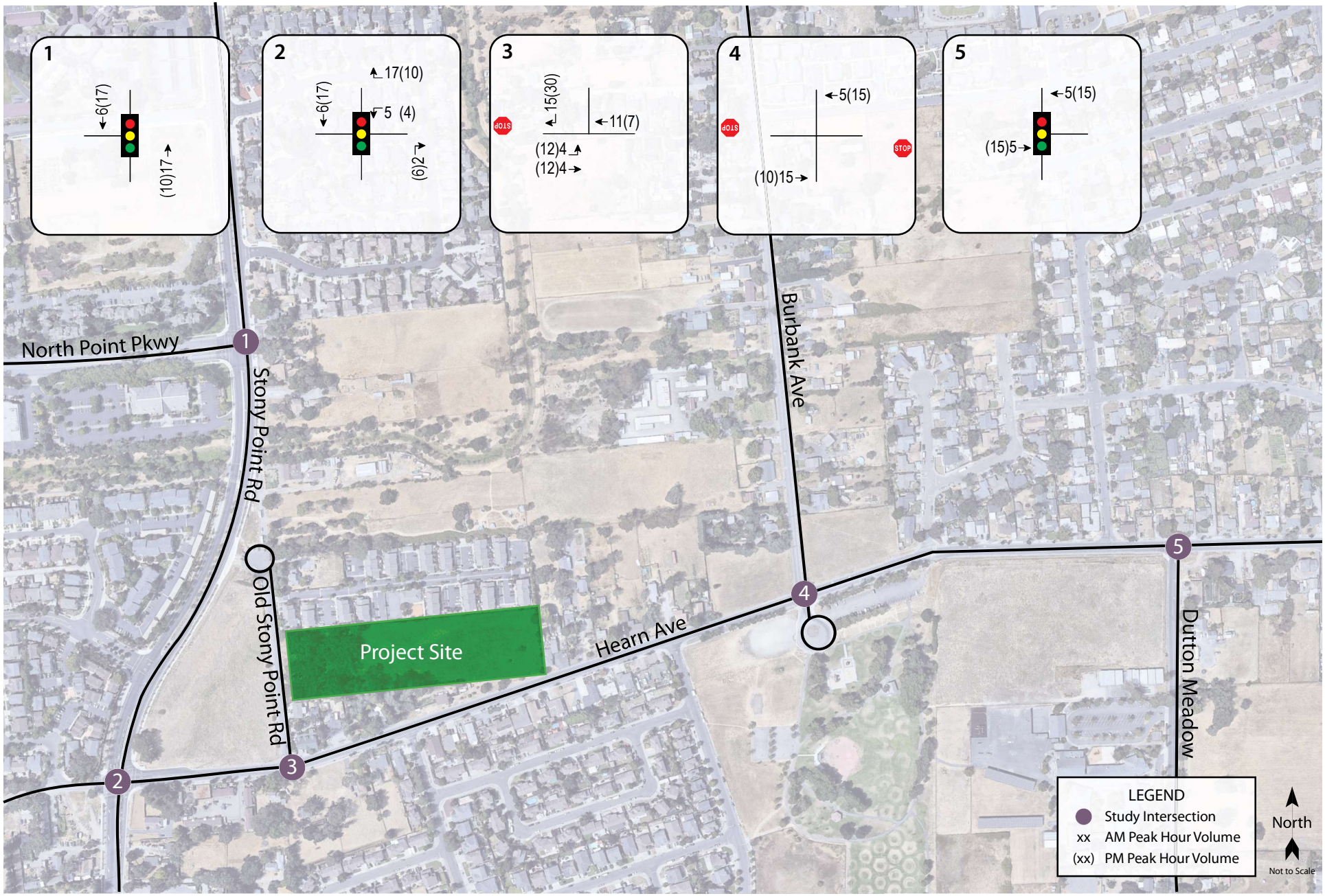
Traffic Impact Study for Stony Oaks Apartments

Figure 4 – Site Plan



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Traffic Impact Study for Stony Oaks Apartments

Figure 5 – Project Traffic Volumes

W-Trans

Table 8 – Existing and Existing plus Project Peak Hour Intersection Levels of Service								
Study Intersection ***Approach***	**Existing Conditions**				**Existing plus Project**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Stony Point Rd/Northpoint Pkwy	8.4	A	18.9	B	8.4	A	19.0	B
2. Stony Point Rd/Hearn Ave	39.7	D	29.1	C	39.8	D	29.3	C
3. Hearn Ave/Old Stony Point Rd	0.4	A	0.9	A	0.6	A	1.0	A
SB (Old Stony Point Rd) Approach	11.6	B	12.8	B	*11.5*	*B*	*13.0*	*B*
4. Hearn Ave/Burbank Ave	8.6	A	6.9	A	*9.1*	*B*	*7.3*	*A*
SB (Burbank Ave) Approach	*62.4*	*F*	*49.8*	*E*	*67.1*	*F*	*54.1*	*F*
5. Hearn Ave/Dutton Meadow	15.8	B	9.1	A	16.2	B	9.2	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; SB = Southbound

Finding – The study intersections are expected to continue operating acceptably overall at the same levels of service upon the addition of project-generated traffic. Although the southbound approach to Hearn Avenue/Burbank Avenue is expected to operate at LOS F, the project's impact would be considered less-than-significant as the intersection would be expected to continue operating acceptably overall and the peak hour signalization warrant would be unmet.

Baseline plus Project Conditions

With project-related traffic added to Baseline volumes, the study intersections are expected to continue operating acceptably and the southbound approach at Hearn Avenue/Burbank Avenue would continue to operate at LOS F until the planned traffic signal is installed. Under Baseline plus Project conditions, the project is anticipated to increase overall delay at the Hearn Avenue/Burbank Avenue intersection by 1.7 to 2.2 seconds as compared to Baseline conditions without the project. Under both Baseline and Baseline plus Project conditions, the "peak hour" signal warrant would be met. These results are summarized in Table 9.

Table 9 – Baseline and Baseline plus Project Peak Hour Intersection Levels of Service								
Study Intersection ***Approach***	**Baseline Conditions**				**Baseline plus Project**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Stony Point Rd/Northpoint Pkwy	8.4	A	19.7	B	8.4	A	19.9	B
2. Stony Point Rd/Hearn Ave	42.2	D	35.5	D	42.4	D	35.8	D
3. Hearn Ave/Old Stony Point Rd	0.4	A	0.8	A	0.6	A	1.0	A
SB (Old Stony Point Rd) Approach	*12.1*	*B*	*13.5*	*B*	*12.1*	*B*	*13.8*	*B*
4. Hearn Ave/Burbank Ave	37.3	D	23.1	C	*39.5*	*D*	*24.8*	*C*
SB (Burbank Ave) Approach	*244.5*	*F*	*161.7*	*F*	*263.2*	*F*	*177.7*	*F*
5. Hearn Ave/Dutton Meadow	20.7	C	10.7	B	21.5	C	10.8	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; SB = Southbound

Finding – The study intersections are expected to continue operating acceptably overall at the same Levels of Service upon the addition of project-generated traffic to Baseline conditions as without it. Although the southbound approach to Hearn Avenue/Burbank Avenue is expected to operate at LOS F, the project's impact would be considered acceptable as the intersection would be expected to continue operating acceptably overall, the peak hour signal warrant would be met both without and with the project, and the project would be expected to increase overall delays by less than five seconds.

Vehicle Miles Traveled

Background and Applied Thresholds

Senate Bill (SB) 743 established a change in the metric to be applied for determining traffic impacts associated with development projects. Rather than the delay-based criteria associated with a Level of Service analysis, the increase in Vehicle Miles Traveled (VMT) as a result of a project is now the basis for determining transportation impacts. The City of Santa Rosa has established parameters for VMT analyses in the *Vehicles Miles Traveled Guidelines Final Draft*, June 2020. The City's parameters are consistent with guidance provided in the publication *Transportation Impacts (SB 743) CEQA Guidelines Update and Technical Advisory*, California Governor's Office of Planning and Research (OPR), 2018. Both documents indicate that a residential project generating vehicle travel that is 15 or more percent below the existing countywide residential VMT per capita may indicate a less than significant VMT impact.

VMT Analysis

Based on data from the version of the Sonoma County Transportation Authority (SCTA) travel demand model released in October 2020, the County of Sonoma has a baseline average residential VMT of 16.53 miles per capita. A residential project generating a VMT that is 15 percent or more below this value, or 14.05 miles per capita or less, would have a less-than-significant VMT impact. The SCTA model includes traffic analysis zones (TAZ) covering geographic areas throughout Sonoma County. The project site is located within TAZ 500, which has a baseline VMT per capita of 13.01 miles. Because this per capita VMT ratio is below the significance threshold of 14.05 miles, the project would be considered to have a less-than-significant VMT impact. A map excerpt from the SCTA travel demand model showing the residential VMT per capita for TAZs in the project vicinity is included in Appendix C.

The City's VMT guidelines and OPR Technical Advisory also include screening criteria which identify certain types of projects that may be presumed to have a less than significant VMT impact, including developments comprised of 100 percent affordable housing. The proposed Stony Oaks project would qualify for this screening criteria in addition to falling below the VMT per capita significance threshold.

Finding – The project would have a less-than-significant impact on vehicle miles traveled.

Alternative Modes

Pedestrian Facilities

The site would include an onsite network of pedestrian sidewalks and paths. Given that the site is an infill location within existing neighborhoods and near school, recreation, and employment uses, it is reasonable to assume that some project residents would want to walk and/or use transit to reach destinations beyond the site. As proposed, the project would include a sidewalk along its entire frontage of Old Stony Point Road, replacing the current asphalt path and dike and connecting to the existing pedestrian network to the north and south. From this pedestrian connection on Old Stony Point Road, residents would be able to access nearby bus stops on Stony Point Road, Hearn Avenue, and at Southwest Community Park. Enhanced pedestrian crossings including RRFB warning devices are already in place near the transit stops on both Stony Point Road and Hearn Avenue.

The project would also provide a short segment of sidewalk on its limited Hearn Avenue frontage. Currently, the north side of Hearn Avenue to the east and west has sidewalk gaps that are anticipated to be filled over time as adjacent properties develop or redevelop. Until such time as those sidewalks are constructed in the future, residents of the proposed project would still have continuous access to the surrounding pedestrian network and transit facilities via existing sidewalks on Old Stony Point Road and the south side of Hearn Avenue. The City has indicated that pedestrian access at the site's Hearn Avenue driveway will need to be restricted until sidewalk gaps are filled or a means to access the sidewalk on the south side of Hearn is provided.

Finding – Pedestrian facilities serving the project site would be adequate upon the completion of the proposed frontage improvements.

Bicycle Facilities

The existing Class II bike lanes on Hearn Avenue along with planned future bicycle facilities in the vicinity would provide adequate access for bicyclists. Residents of the proposed development would be able to use the existing bike lanes on Hearn Avenue to connect to many of the primary bicycle facilities in the City.

Finding – Bicycle facilities serving the project site are adequate.

Transit

Existing transit routes are adequate to accommodate project-generated transit trips. Bus stops serving two CityBus routes are within a convenient walking distance of the site and accessible by the existing pedestrian network.

Finding – Transit facilities serving the project site are adequate.

Access and Circulation

Site Access

The project would include two driveways providing primary access to the proposed apartments, one on Old Stony Point Road at the site's western property boundary and one on Hearn Avenue near the site's eastern property boundary. Old Stony Point Road is a low-volume local street that terminates 300 feet north of the project site; given the nature of the street no potential conflicts would be created by the proposed driveway. The project driveway on Hearn Avenue would be located on a segment of the corridor that has existing two-way left-turn lanes, and the south side of Hearn Avenue near the project site includes single-family homes that generate very low volumes of turning traffic. The two-way left-turn lane will provide space for eastbound drivers to turn left into the site, and for outbound drivers to make left-turns in two separate movements during busier periods. The driveway is anticipated to function acceptably.

Sight Distance

Sight distances along Old Stony Point Road and Hearn Avenue at the project driveways were evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance for driveway approaches is based on stopping sight distance and uses the approach travel speed as the basis for determining the recommended sight distance.

For Old Stony Point Road, which has a speed of 25 mph, the minimum stopping sight distance is 150 feet. The minimum stopping sight distance for Hearn Avenue, which has a posted speed limit of 30 mph, is 200 feet. Available sight lines were field measured and exceed 200 feet at both driveways, which meets the sight distance requirements.

Finding – Based on field observations and review of the project site plan, the project's proposed driveways are anticipated to operate acceptably, with adequate sight distances along Old Stony Point Road and Hearn Avenue.

Recommendation – To maintain clear lines of sight from the project driveways it is recommended that any landscaping be low-profile and that trees be set back outside the vision triangle.

Emergency Access

Emergency response vehicles could access the site via the main access point on Old Stony Point Road as well as the Hearn Avenue driveway. The AutoTURN application of AutoCAD was used to evaluate the adequacy of access for emergency vehicles based on the project site plan. As designed, there would be no anticipated issues with fire truck access. An exhibit showing the expected travel paths on the site plan is provided in Appendix D.

Finding – Emergency access is expected to function acceptably.

Onsite Circulation

The site consists of a group of apartment buildings surrounded by drive aisles that loop around the buildings and include perpendicular parking spaces. All drive aisles connect internally, allowing access to both Old Stony Point Road and Hearn Avenue.

Finding – Onsite circulation is anticipated to function acceptably.

Traffic Signal Warrants

Because the intersection of Hearn Avenue/Burbank Avenue has LOS F operation on the minor stop-controlled approach in all project scenarios, a signal warrants analysis was performed. 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, but for the purposes of this study, Warrant 3 (the peak hour warrant) was evaluated. Warrant 3 determines the need for traffic control based on the highest volume hour of the day and was used as an initial indication of traffic control needs. The use of this signal warrant is common practice for planning studies.

Warrant 3: 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.

Despite LOS F operation on the southbound approach of Hearn Avenue/Burbank Avenue, the signal warrant would be unmet under both Existing and Existing plus Project conditions. Under Baseline volumes both without and with the project, the signal warrant would be met. Copies of the Signal Warrant Spreadsheets are provided in Appendix E.

As noted in the operational analysis, signalization of the Hearn Avenue/Burbank Avenue intersection was identified as a planned future improvement in the *Roseland Area/Sebastopol Road Specific Plan* and its EIR and has since been added to the City's Capital Improvement Program. The signal is to be funded by development projects in the area. Because the project would contribute to the need for these improvements, the City has indicated that the project should pay a proportional share fee toward the cost of construction, with the share determined by the project's contribution to added delays on the critical southbound approach during the worst-case a.m. peak hour.

Based on the operational analysis, the project would be responsible for 9.3 percent of the projected increases in delay occurring between Existing and Baseline plus Project conditions. As contained in the *Infrastructure Report for Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation*, Michael Baker International, 2016, signalization of the Hearn Avenue/Burbank Avenue intersection is estimated to have a total cost of $320,000 ($200,000 for construction and $120,000 for soft costs). The applicant's proportionate share of this fee would therefore be $29,760. A summary of the proportionate share calculation is provided in Appendix F.

Finding – The Peak Hour Volume warrant would be met at the intersection of Hearn Avenue/Burbank Avenue under both Baseline and Baseline plus Project Conditions. The need for signalization was identified in the *Roseland Area/Sebastopol Road Specific Plan* and the project has been added to the City's Capital Improvement Program.

Recommendation – As directed by the City, the applicant should contribute a proportional share of funds for the signalization of the intersection of Hearn Avenue/Burbank Avenue. The project would be responsible for 9.3 percent of the cost, or $29,760.

Parking

Parking was evaluated to determine if the proposed parking supply would be adequate to satisfy City and State requirements. Per the project site plan, a total of 185 parking spaces will be provided on-site, including 13 ADA-accessible spaces. Section 20-36.040 of the *Santa Rosa City Code* requires multifamily affordable housing projects to provide one parking space per one-bedroom unit and two parking spaces per unit with two or more bedrooms. Based on these rates, the project would need to provide a total of 228 parking spaces and would fall short of this by 30 spaces.

The project would qualify for State density bonus provisions as outlined in Government Code Section 65915, which requires one parking space for one-bedroom units and one and one-half parking spaces for two- and three-bedroom units. Based on the unit mix for this project, 185 parking spaces are required, which equals the proposed supply. The proposed supply of 185 parking spaces is compliant with applicable State and local density bonus provisions.

The proposed parking supply's consistency with State density bonus provisions is shown in Table 10.

Table 10 – Parking Supply Consistency with State Density Bonus Provisions

Land Use	Units	Rate	Parking Spaces
Multifamily Affordable Housing	142 du		
1 bedroom	56 du	1.0 space/du	56
2+ bedrooms	86 du	1.5 spaces/du	129
State Required Parking Total			*185*
Proposed Parking Supply			**185**

Notes: du=dwelling unit

It should be noted that the site is located within one-quarter mile of transit stops for Santa Rosa CityBus and would be connected to surrounding pedestrian and bicycle facilities, supporting travel by non-auto modes and reducing reliance on vehicle ownership, which thereby helps to reduce demand for parking.

Finding – The proposed project would satisfy applicable parking requirements established in State Density Bonus provisions.

Bicycle Parking

The required bicycle parking supply was calculated to ensure adequacy under City requirements. Santa Rosa City Code Section 20-36.040 requires multifamily dwellings to provide bicycle parking at the rate of one space per four units if the units do not have a private garage or private storage space. The proposed project provides 41 long-term and 18 short-term bike spaces and would meet bike parking requirements.

Finding – The project's proposed bicycle parking would be adequate.

Conclusions and Recommendations

Conclusions

- The proposed project is expected to generate an average of 772 trips per day, including 51 a.m. peak hour trips and 62 trips during the p.m. peak hour.
- The study intersections are expected to continue operating acceptably at the same levels of service upon the addition of project-generated traffic. Although the southbound approach to Hearn Avenue/ Burbank Avenue is expected to operate at LOS F, the project's effect would be considered acceptable as the intersection would be expected to continue operating acceptably overall and the peak hour signalization warrant would be unmet.
- Under Baseline plus Project conditions the study intersections are expected to continue operating acceptably overall. Although the southbound approach at Hearn Avenue/Burbank Avenue is expected to operate at LOS F, the project's effect would be considered acceptable as the intersection would be expected to continue operating acceptably overall, the peak hour signal warrant would be met both without and with the project, and the project would be expected to increase overall delays by less than five seconds.
- The project would have a less-than-significant impact on vehicle miles traveled.
- Pedestrian facilities serving the project site would be adequate upon the completion of the proposed frontage improvements.
- Bicycle facilities serving the project site are adequate.
- Transit facilities serving the project site are adequate.
- Based on field observations and review of the project site plan, the project's proposed driveways are anticipated to operate acceptably, with adequate sight distances existing along Old Stony Point Road and Hearn Avenue.
- Emergency access is expected to function acceptably.
- Onsite circulation is anticipated to function acceptably.
- The Peak Hour Volume warrant would be met at the intersection of Hearn Avenue/Burbank Avenue under Baseline and Baseline plus Project volumes. The need for signalization was identified in the *Roseland Area/Sebastopol Road Specific Plan*, and the project has been added to the City's Capital Improvement Program.
- The proposed project would satisfy applicable parking requirements established in State Density Bonus provisions.
- The project's proposed bicycle parking would be adequate.

Recommendations

- To maintain a clear line of sight from the project driveways, it is recommended that any landscaping be low-profile, and that trees be set back outside the vision triangle.

- As directed by the City, the applicant should contribute a proportional share of funds for the signalization of the intersection of Hearn Avenue/Burbank Avenue. The project would be responsible for 9.3 percent of the cost, or $29,760.

Study Participants and References

Study Participants

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Appendix A

Collision Rate Calculations

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Intersection Collision Rate Worksheet

Stony Oaks TIS

Intersection # 1: Stony Point Rd & Northpoint Pkwy
Date of Count: Tuesday, September 25, 2018

Number of Collisions: 15
Number of Injuries: 6
Number of Fatalities: 0
Average Daily Traffic (ADT): 23700
Start Date: November 1, 2014
End Date: October 31, 2019
Number of Years: 5

Intersection Type: Tee
Control Type: Signals
Area: Suburban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{15 \times 1{,}000{,}000}{23{,}700 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.35 c/mve**	**0.0%**	**40.0%**
Statewide Average*	**0.28 c/mve**	**0.4%**	**37.2%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2016 Collision Data on California State Highways, Caltrans

Intersection # 2: Stony Point Rd & Hearn Ave
Date of Count: Wednesday, March 1, 2017

Number of Collisions: 15
Number of Injuries: 8
Number of Fatalities: 0
Average Daily Traffic (ADT): 21900
Start Date: November 1, 2014
End Date: October 31, 2019
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Suburban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{15 \times 1{,}000{,}000}{21{,}900 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.38 c/mve**	**0.0%**	**53.3%**
Statewide Average*	**0.43 c/mve**	**0.4%**	**36.1%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2016 Collision Data on California State Highways, Caltrans

Intersection Collision Rate Worksheet

Stony Oaks TIS

Intersection # 3: Hearn Ave & Old Stony Point Rd
Date of Count: Saturday, January 0, 1900

Number of Collisions: 2
Number of Injuries: 1
Number of Fatalities: 0
Average Daily Traffic (ADT): 9000
Start Date: November 1, 2014
End Date: October 31, 2019
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls
Area: Suburban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{2 \times 1{,}000{,}000}{9{,}000 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.12 c/mve**	**0.0%**	**50.0%**
Statewide Average*	**0.14 c/mve**	**1.2%**	**38.2%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2016 Collision Data on California State Highways, Caltrans

Intersection # 4: Hearn Ave & Burbank Ave
Date of Count: Saturday, January 0, 1900

Number of Collisions: 6
Number of Injuries: 5
Number of Fatalities: 0
Average Daily Traffic (ADT): 13400
Start Date: November 1, 2014
End Date: October 31, 2019
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Stop & Yield Controls
Area: Suburban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{6 \times 1{,}000{,}000}{13{,}400 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.25 c/mve**	**0.0%**	**83.3%**
Statewide Average*	**0.23 c/mve**	**1.9%**	**39.0%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2016 Collision Data on California State Highways, Caltrans

Intersection Collision Rate Worksheet

Stony Oaks TIS

Intersection # 5: Hearn Ave & Dutton Meadow
Date of Count: Saturday, January 0, 1900

Number of Collisions: 9
Number of Injuries: 6
Number of Fatalities: 0
Average Daily Traffic (ADT): 15100
Start Date: November 1, 2014
End Date: October 31, 2019
Number of Years: 5

Intersection Type: Tee
Control Type: Signals
Area: Suburban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{9 \times 1{,}000{,}000}{15{,}100 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.33 c/mve**	**0.0%**	**66.7%**
Statewide Average*	**0.28 c/mve**	**0.4%**	**37.2%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2016 Collision Data on California State Highways, Caltrans

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Appendix B

Intersection Level of Service Calculations

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HCM 6th Signalized Intersection Summary
1: Stony Point Rd & Northpoint Pkwy

02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	0	189	0	0	0	392	807	0	0	818	116
Future Volume (veh/h)	58	0	189	0	0	0	392	807	0	0	818	116
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870				1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	58	0	189				392	807	0	0	818	116
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	2				2	2	2	2	2	2
Cap, veh/h	228	0	341				563	2830	0	67	2128	302
Arrive On Green	0.13	0.00	0.13				0.12	1.00	0.00	0.00	0.68	0.68
Sat Flow, veh/h	1781	0	1585				1781	3647	0	675	3124	443
Grp Volume(v), veh/h	58	0	189				392	807	0	0	465	469
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1781	1777	0	675	1777	1791
Q Serve(g_s), s	3.2	0.0	11.5				6.9	0.0	0.0	0.0	12.2	12.2
Cycle Q Clear(g_c), s	3.2	0.0	11.5				6.9	0.0	0.0	0.0	12.2	12.2
Prop In Lane	1.00		1.00				1.00		0.00	1.00		0.25
Lane Grp Cap(c), veh/h	228	0	341				563	2830	0	67	1210	1219
V/C Ratio(X)	0.25	0.00	0.55				0.70	0.29	0.00	0.00	0.38	0.38
Avail Cap(c_a), veh/h	463	0	551				885	2830	0	67	1210	1219
HCM Platoon Ratio	1.00	1.00	1.00				1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.79	0.79	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	0.0	37.7				5.6	0.0	0.0	0.0	7.4	7.4
Incr Delay (d2), s/veh	0.2	0.0	0.5				0.5	0.2	0.0	0.0	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	10.2				1.5	0.1	0.0	0.0	4.2	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	0.0	38.3				6.0	0.2	0.0	0.0	8.4	8.4
LnGrp LOS	D	A	D				A	A	A	A	A	A
Approach Vol, veh/h		247						1199			934	
Approach Delay, s/veh		39.3						2.1			8.4	
Approach LOS		D						A			A	

Timer - Assigned Phs	2	4	5	6
Phs Duration (G+Y+Rc), s	89.9	18.1	12.5	77.4
Change Period (Y+Rc), s	3.9	4.3	3.0	3.9
Max Green Setting (Gmax), s	71.7	28.1	29.0	39.7
Max Q Clear Time (g_c+I1), s	2.0	13.5	8.9	14.2
Green Ext Time (p_c), s	6.3	0.3	0.5	6.1

Intersection Summary	
HCM 6th Ctrl Delay	8.4
HCM 6th LOS	A

HCM 6th Signalized Intersection Summary
2: Stony Point Rd & Hearn Ave

02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	61	47	90	18	309	9	555	69	262	705	16
Future Volume (veh/h)	117	61	47	90	18	309	9	555	69	262	705	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1945	1945	1870	1870	1870
Adj Flow Rate, veh/h	117	61	47	90	18	309	9	555	69	262	705	16
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	158	121	114	284	501	329	905	767	293	1526	35
Arrive On Green	0.07	0.16	0.16	0.06	0.15	0.15	0.18	0.47	0.47	0.05	0.14	0.14
Sat Flow, veh/h	1781	980	755	1781	1870	1585	1781	1945	1648	1781	3552	81
Grp Volume(v), veh/h	117	0	108	90	18	309	9	555	69	262	353	368
Grp Sat Flow(s),veh/h/ln	1781	0	1734	1781	1870	1585	1781	1945	1648	1781	1777	1856
Q Serve(g_s), s	7.0	0.0	6.0	5.4	0.9	13.3	0.4	23.1	2.5	15.8	19.7	19.7
Cycle Q Clear(g_c), s	7.0	0.0	6.0	5.4	0.9	13.3	0.4	23.1	2.5	15.8	19.7	19.7
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	132	0	279	114	284	501	329	905	767	293	763	797
V/C Ratio(X)	0.89	0.00	0.39	0.79	0.06	0.62	0.03	0.61	0.09	0.89	0.46	0.46
Avail Cap(c_a), veh/h	132	0	514	148	571	745	329	905	767	297	763	797
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.92	0.92
Uniform Delay (d), s/veh	49.6	0.0	40.6	49.8	39.2	18.2	36.1	21.6	16.1	50.1	34.9	34.9
Incr Delay (d2), s/veh	46.1	0.0	0.9	18.9	0.1	1.2	0.0	3.1	0.2	24.5	1.8	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	2.6	3.0	0.4	4.9	0.2	10.6	1.0	9.5	9.7	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.7	0.0	41.4	68.8	39.3	19.4	36.1	24.7	16.4	74.6	36.7	36.7
LnGrp LOS	F	A	D	E	D	B	D	C	B	E	D	D
Approach Vol, veh/h		225			417			633			983	
Approach Delay, s/veh		69.6			30.9			24.0			46.8	
Approach LOS		E			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.8	54.9	10.9	21.4	24.6	51.1	12.0	20.3
Change Period (Y+Rc), s	3.0	4.7	4.0	* 4	4.7	* 4.7	4.0	3.9
Max Green Setting (Gmax), s	13.3	33.4	9.0	* 32	5.0	* 46	8.0	33.0
Max Q Clear Time (g_c+I1), s	17.3	25.1	7.4	8.0	2.4	21.7	9.0	15.3
Green Ext Time (p_c), s	0.0	2.3	0.0	0.5	0.0	4.3	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	39.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	377	0	0	395	2	0	0	0	9	0	15
Future Vol, veh/h	7	377	0	0	395	2	0	0	0	9	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	1082339328		-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	377	0	0	395	2	0	0	0	9	0	15

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	397	0	-	-	-	0			787	787	396
Stage 1	-	-	-	-	-	-			396	396	-
Stage 2	-	-	-	-	-	-			391	391	-
Critical Hdwy	4.12	-	-	-	-	-			6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-			5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-			5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-			3.518	4.018	3.318
Pot Cap-1 Maneuver	1162	-	0	0	-	-			360	324	653
Stage 1	-	-	0	0	-	-			680	604	-
Stage 2	-	-	0	0	-	-			683	607	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	1162	-	-	-	-	-			358	0	653
Mov Cap-2 Maneuver	-	-	-	-	-	-			473	0	-
Stage 1	-	-	-	-	-	-			676	0	-
Stage 2	-	-	-	-	-	-			683	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1162	-	-	-	571
HCM Lane V/C Ratio	0.006	-	-	-	0.042
HCM Control Delay (s)	8.1	-	-	-	11.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	142	418	7	10	451	126	3	4	10	78	2	76
Future Vol, veh/h	142	418	7	10	451	126	3	4	10	78	2	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	142	418	7	10	451	126	3	4	10	78	2	76

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	577	0	0	425	0	0	1279	1303	422	1247	1243	514
Stage 1	-	-	-	-	-	-	706	706	-	534	534	-
Stage 2	-	-	-	-	-	-	573	597	-	713	709	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	996	-	-	1134	-	-	143	161	632	150	174	560
Stage 1	-	-	-	-	-	-	427	439	-	530	524	-
Stage 2	-	-	-	-	-	-	505	491	-	423	437	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	996	-	-	1134	-	-	108	137	632	128	148	560
Mov Cap-2 Maneuver	-	-	-	-	-	-	108	137	-	128	148	-
Stage 1	-	-	-	-	-	-	366	376	-	454	519	-
Stage 2	-	-	-	-	-	-	431	487	-	353	375	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0.1	21.6	62.4
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	234	996	-	-	1134	-	-	206
HCM Lane V/C Ratio	0.073	0.143	-	-	0.009	-	-	0.757
HCM Control Delay (s)	21.6	9.2	-	-	8.2	-	-	62.4
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.2	0.5	-	-	0	-	-	5.1

HCM 6th Signalized Intersection Summary
5: Hearn Ave & Dutton Meadow 02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	509	64	367	433	0	102	0	406	0	0	0
Future Volume (veh/h)	0	509	64	367	433	0	102	0	406	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0	1870	1870	1870			
Adj Flow Rate, veh/h	0	509	64	367	433	0	102	0	406			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2			
Cap, veh/h	0	612	77	427	1302	0	279	0	628			
Arrive On Green	0.00	0.38	0.38	0.24	0.70	0.00	0.16	0.00	0.16			
Sat Flow, veh/h	0	1629	205	1781	1870	0	1781	0	1585			
Grp Volume(v), veh/h	0	0	573	367	433	0	102	0	406			
Grp Sat Flow(s),veh/h/ln	0	0	1833	1781	1870	0	1781	0	1585			
Q Serve(g_s), s	0.0	0.0	12.7	8.8	4.1	0.0	2.3	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	0.0	12.7	8.8	4.1	0.0	2.3	0.0	0.0			
Prop In Lane	0.00		0.11	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	0	688	427	1302	0	279	0	628			
V/C Ratio(X)	0.00	0.00	0.83	0.86	0.33	0.00	0.37	0.00	0.65			
Avail Cap(c_a), veh/h	0	0	878	439	1482	0	718	0	1019			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	12.7	16.3	2.7	0.0	16.9	0.0	10.9			
Incr Delay (d2), s/veh	0.0	0.0	5.5	14.6	0.1	0.0	0.8	0.0	1.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	5.1	4.8	0.5	0.0	0.9	0.0	2.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	18.2	30.9	2.8	0.0	17.7	0.0	12.1			
LnGrp LOS	A	A	B	C	A	A	B	A	B			
Approach Vol, veh/h		573			800			508				
Approach Delay, s/veh		18.2			15.7			13.2				
Approach LOS		B			B			B				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.3	20.4				34.7		10.0				
Change Period (Y+Rc), s	3.6	* 3.6				3.6		3.0				
Max Green Setting (Gmax), s	11.0	* 21				35.4		18.0				
Max Q Clear Time (g_c+I1), s	10.8	14.7				6.1		4.3				
Green Ext Time (p_c), s	0.0	2.1				2.9		1.7				

Intersection Summary			
HCM 6th Ctrl Delay		15.8	
HCM 6th LOS		B	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Stony Point Rd & Northpoint Pkwy

02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	0	422	0	0	0	169	785	0	0	932	43
Future Volume (veh/h)	130	0	422	0	0	0	169	785	0	0	932	43
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870				1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	130	0	422				169	785	0	0	932	43
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	2				2	2	2	2	2	2
Cap, veh/h	171	0	736				837	2966	0	61	1498	69
Arrive On Green	0.10	0.00	0.10				0.74	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h	1781	0	1585				1781	3647	0	689	3459	160
Grp Volume(v), veh/h	130	0	422				169	785	0	0	479	496
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1781	1777	0	689	1777	1842
Q Serve(g_s), s	8.4	0.0	0.0				0.0	0.0	0.0	0.0	24.7	24.7
Cycle Q Clear(g_c), s	8.4	0.0	0.0				0.0	0.0	0.0	0.0	24.7	24.7
Prop In Lane	1.00		1.00				1.00		0.00	1.00		0.09
Lane Grp Cap(c), veh/h	171	0	736				837	2966	0	61	769	798
V/C Ratio(X)	0.76	0.00	0.57				0.20	0.26	0.00	0.00	0.62	0.62
Avail Cap(c_a), veh/h	433	0	970				837	2966	0	61	769	798
HCM Platoon Ratio	1.00	1.00	1.00				2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.79	0.79	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	0.0	23.1				5.0	0.0	0.0	0.0	26.0	26.0
Incr Delay (d2), s/veh	2.6	0.0	0.3				0.0	0.2	0.0	0.0	3.8	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	13.9				0.9	0.1	0.0	0.0	10.8	11.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	0.0	23.3				5.1	0.2	0.0	0.0	29.7	29.6
LnGrp LOS	D	A	C				A	A	A	A	C	C
Approach Vol, veh/h		552						954			975	
Approach Delay, s/veh		30.7						1.0			29.7	
Approach LOS		C						A			C	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		102.4		15.6	47.4	55.0						
Change Period (Y+Rc), s		3.9		4.3	3.9	* 3.9						
Max Green Setting (Gmax), s		81.1		28.7	27.0	* 51						
Max Q Clear Time (g_c+I1), s		2.0		10.4	2.0	26.7						
Green Ext Time (p_c), s		6.1		0.9	0.2	6.3						

Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Stony Point Rd & Hearn Ave

02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	22	23	117	34	286	40	672	116	268	758	29
Future Volume (veh/h)	42	22	23	117	34	286	40	672	116	268	758	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1945	1945	1870	1870	1870
Adj Flow Rate, veh/h	42	22	23	117	34	286	40	672	116	268	758	29
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	54	37	39	136	167	720	55	715	606	650	2500	96
Arrive On Green	0.03	0.04	0.04	0.08	0.09	0.09	0.03	0.37	0.37	0.73	1.00	1.00
Sat Flow, veh/h	1781	837	875	1781	1870	1585	1781	1945	1648	1781	3490	133
Grp Volume(v), veh/h	42	0	45	117	34	286	40	672	116	268	386	401
Grp Sat Flow(s),veh/h/ln	1781	0	1713	1781	1870	1585	1781	1945	1648	1781	1777	1846
Q Serve(g_s), s	2.8	0.0	3.0	7.7	2.0	1.7	2.6	39.4	5.6	6.9	0.0	0.0
Cycle Q Clear(g_c), s	2.8	0.0	3.0	7.7	2.0	1.7	2.6	39.4	5.6	6.9	0.0	0.0
Prop In Lane	1.00		0.51	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	54	0	76	136	167	720	55	715	606	650	1273	1323
V/C Ratio(X)	0.78	0.00	0.59	0.86	0.20	0.40	0.73	0.94	0.19	0.41	0.30	0.30
Avail Cap(c_a), veh/h	106	0	450	136	523	1022	106	715	606	650	1273	1323
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	56.8	0.0	55.4	53.9	49.8	12.3	56.7	36.0	25.4	11.0	0.0	0.0
Incr Delay (d2), s/veh	21.1	0.0	7.2	39.4	0.6	0.4	6.6	21.7	0.7	0.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	1.5	4.9	1.0	3.7	1.3	22.2	2.3	2.1	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.9	0.0	62.6	93.3	50.4	12.6	63.3	57.7	26.1	11.2	0.5	0.5
LnGrp LOS	E	A	E	F	D	B	E	E	C	B	A	A
Approach Vol, veh/h		87			437			828			1055	
Approach Delay, s/veh		70.0			37.2			53.6			3.2	
Approach LOS		E			D			D			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.8	48.1	13.0	9.1	6.7	89.2	7.6	14.6				
Change Period (Y+Rc), s	4.7	* 4.7	4.0	3.9	3.0	4.7	4.0	* 4				
Max Green Setting (Gmax), s	3.3	* 43	9.0	31.0	7.0	55.4	7.0	* 33				
Max Q Clear Time (g_c+I1), s	3.8	41.4	9.7	5.0	4.6	2.0	4.8	4.0				
Green Ext Time (p_c), s	0.3	1.0	0.0	0.2	0.0	5.3	0.0	1.2				

Intersection Summary	
HCM 6th Ctrl Delay	29.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	388	0	0	470	24	0	0	0	19	0	30
Future Vol, veh/h	22	388	0	0	470	24	0	0	0	19	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	1082494976		-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	388	0	0	470	24	0	0	0	19	0	30

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	494	0	-	-	-	0			914	914	482
Stage 1	-	-	-	-	-	-			482	482	-
Stage 2	-	-	-	-	-	-			432	432	-
Critical Hdwy	4.12	-	-	-	-	-			6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-			5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-			5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-			3.518	4.018	3.318
Pot Cap-1 Maneuver	1070	-	0	0	-	-			303	273	584
Stage 1	-	-	0	0	-	-			621	553	-
Stage 2	-	-	0	0	-	-			655	582	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	1070	-	-	-	-	-			297	0	584
Mov Cap-2 Maneuver	-	-	-	-	-	-			423	0	-
Stage 1	-	-	-	-	-	-			608	0	-
Stage 2	-	-	-	-	-	-			655	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1070	-	-	-	509
HCM Lane V/C Ratio	0.021	-	-	-	0.096
HCM Control Delay (s)	8.4	-	-	-	12.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	361	17	35	534	126	12	12	35	60	13	69
Future Vol, veh/h	69	361	17	35	534	126	12	12	35	60	13	69
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	69	361	17	35	534	126	12	12	35	60	13	69

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	660	0	0	378	0	0	1216	1238	370	1198	1183	597
Stage 1	-	-	-	-	-	-	508	508	-	667	667	-
Stage 2	-	-	-	-	-	-	708	730	-	531	516	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	928	-	-	1180	-	-	158	176	676	162	189	503
Stage 1	-	-	-	-	-	-	547	539	-	448	457	-
Stage 2	-	-	-	-	-	-	426	428	-	532	534	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	928	-	-	1180	-	-	119	158	676	133	170	503
Mov Cap-2 Maneuver	-	-	-	-	-	-	119	158	-	133	170	-
Stage 1	-	-	-	-	-	-	507	499	-	415	443	-
Stage 2	-	-	-	-	-	-	346	415	-	456	494	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.4	23	49.8
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	258	928	-	-	1180	-	-	214
HCM Lane V/C Ratio	0.229	0.074	-	-	0.03	-	-	0.664
HCM Control Delay (s)	23	9.2	-	-	8.1	-	-	49.8
HCM Lane LOS	C	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	0.9	0.2	-	-	0.1	-	-	4.1

HCM 6th Signalized Intersection Summary
5: Hearn Ave & Dutton Meadow 02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	409	57	218	594	0	112	0	273	0	0	0
Future Volume (veh/h)	0	409	57	218	594	0	112	0	273	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0	1870	1870	1870			
Adj Flow Rate, veh/h	0	409	57	218	594	0	112	0	273			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2			
Cap, veh/h	0	560	78	309	1165	0	342	0	579			
Arrive On Green	0.00	0.35	0.35	0.17	0.62	0.00	0.19	0.00	0.19			
Sat Flow, veh/h	0	1606	224	1781	1870	0	1781	0	1585			
Grp Volume(v), veh/h	0	0	466	218	594	0	112	0	273			
Grp Sat Flow(s),veh/h/ln	0	0	1830	1781	1870	0	1781	0	1585			
Q Serve(g_s), s	0.0	0.0	7.9	4.1	6.3	0.0	1.9	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	0.0	7.9	4.1	6.3	0.0	1.9	0.0	0.0			
Prop In Lane	0.00		0.12	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	0	638	309	1165	0	342	0	579			
V/C Ratio(X)	0.00	0.00	0.73	0.70	0.51	0.00	0.33	0.00	0.47			
Avail Cap(c_a), veh/h	0	0	1201	599	2014	0	899	0	1075			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	10.2	13.9	3.7	0.0	12.4	0.0	8.7			
Incr Delay (d2), s/veh	0.0	0.0	1.6	1.1	0.3	0.0	0.6	0.0	0.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	2.5	1.4	0.9	0.0	0.6	0.0	1.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	11.8	15.0	4.1	0.0	13.0	0.0	9.3			
LnGrp LOS	A	A	B	B	A	A	B	A	A			
Approach Vol, veh/h		466			812			385				
Approach Delay, s/veh		11.8			7.0			10.3				
Approach LOS		B			A			B				
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	9.8	16.0				25.8		9.8				
Change Period (Y+Rc), s	3.6	* 3.6				3.6		3.0				
Max Green Setting (Gmax), s	12.0	* 23				38.4		18.0				
Max Q Clear Time (g_c+I1), s	6.1	9.9				8.3		3.9				
Green Ext Time (p_c), s	0.2	2.5				4.4		1.3				

Intersection Summary	
HCM 6th Ctrl Delay	9.1
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Stony Point Rd & Northpoint Pkwy

02/11/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	0	195	0	0	0	397	898	0	0	856	116
Future Volume (veh/h)	58	0	195	0	0	0	397	898	0	0	856	116
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870				1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	58	0	195				397	898	0	0	856	116
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	2				2	2	2	2	2	2
Cap, veh/h	233	0	350				547	2818	0	67	2124	288
Arrive On Green	0.13	0.00	0.13				0.12	1.00	0.00	0.00	0.68	0.68
Sat Flow, veh/h	1781	0	1585				1781	3647	0	620	3144	426
Grp Volume(v), veh/h	58	0	195				397	898	0	0	484	488
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1781	1777	0	620	1777	1794
Q Serve(g_s), s	3.2	0.0	11.8				7.2	0.0	0.0	0.0	13.1	13.1
Cycle Q Clear(g_c), s	3.2	0.0	11.8				7.2	0.0	0.0	0.0	13.1	13.1
Prop In Lane	1.00		1.00				1.00		0.00	1.00		0.24
Lane Grp Cap(c), veh/h	233	0	350				547	2818	0	67	1200	1212
V/C Ratio(X)	0.25	0.00	0.56				0.73	0.32	0.00	0.00	0.40	0.40
Avail Cap(c_a), veh/h	463	0	555				866	2818	0	67	1200	1212
HCM Platoon Ratio	1.00	1.00	1.00				1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.72	0.72	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	0.0	37.4				6.2	0.0	0.0	0.0	7.8	7.8
Incr Delay (d2), s/veh	0.2	0.0	0.5				0.5	0.2	0.0	0.0	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	10.5				1.6	0.1	0.0	0.0	4.6	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.4	0.0	37.9				6.7	0.2	0.0	0.0	8.8	8.8
LnGrp LOS	D	A	D				A	A	A	A	A	A
Approach Vol, veh/h		253						1295			972	
Approach Delay, s/veh		38.9						2.2			8.8	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		89.6		18.4	12.7	76.9						
Change Period (Y+Rc), s		3.9		4.3	3.0	3.9						
Max Green Setting (Gmax), s		71.7		28.1	29.0	39.7						
Max Q Clear Time (g_c+I1), s		2.0		13.8	9.2	15.1						
Green Ext Time (p_c), s		7.3		0.3	0.5	6.4						

Intersection Summary	
HCM 6th Ctrl Delay	8.4
HCM 6th LOS	A

HCM 6th Signalized Intersection Summary
2: Stony Point Rd & Hearn Ave

02/11/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	64	47	101	27	342	9	618	93	285	726	16
Future Volume (veh/h)	117	64	47	101	27	342	9	618	93	285	726	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1945	1945	1870	1870	1870
Adj Flow Rate, veh/h	117	64	47	101	27	342	9	618	93	285	726	16
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	168	123	126	309	526	304	874	741	297	1527	34
Arrive On Green	0.07	0.17	0.17	0.07	0.17	0.17	0.17	0.45	0.45	0.06	0.14	0.14
Sat Flow, veh/h	1781	1002	736	1781	1870	1585	1781	1945	1648	1781	3555	78
Grp Volume(v), veh/h	117	0	111	101	27	342	9	618	93	285	363	379
Grp Sat Flow(s),veh/h/ln	1781	0	1738	1781	1870	1585	1781	1945	1648	1781	1777	1856
Q Serve(g_s), s	7.0	0.0	6.1	6.0	1.3	14.6	0.5	27.7	3.6	17.2	20.3	20.3
Cycle Q Clear(g_c), s	7.0	0.0	6.1	6.0	1.3	14.6	0.5	27.7	3.6	17.2	20.3	20.3
Prop In Lane	1.00		0.42	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	132	0	291	126	309	526	304	874	741	297	763	798
V/C Ratio(X)	0.89	0.00	0.38	0.80	0.09	0.65	0.03	0.71	0.13	0.96	0.48	0.48
Avail Cap(c_a), veh/h	132	0	515	148	571	748	304	874	741	297	763	798
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.90	0.90
Uniform Delay (d), s/veh	49.6	0.0	40.0	49.4	38.2	17.6	37.3	24.0	17.4	50.7	35.1	35.1
Incr Delay (d2), s/veh	46.1	0.0	0.8	22.6	0.1	1.4	0.0	4.8	0.3	38.6	1.9	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	2.7	3.5	0.6	5.4	0.2	13.1	1.4	11.4	10.0	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.7	0.0	40.8	72.0	38.3	18.9	37.3	28.8	17.7	89.3	37.0	37.0
LnGrp LOS	F	A	D	E	D	B	D	C	B	F	D	D
Approach Vol, veh/h		228			470			720			1027	
Approach Delay, s/veh		68.9			31.5			27.5			51.5	
Approach LOS		E			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	53.2	11.7	22.1	23.1	51.1	12.0	21.8				
Change Period (Y+Rc), s	3.0	4.7	4.0	* 4	4.7	* 4.7	4.0	3.9				
Max Green Setting (Gmax), s	18.0	33.4	9.0	* 32	5.0	* 46	8.0	33.0				
Max Q Clear Time (g_c+I1), s	9.2	29.7	8.0	8.1	2.5	22.3	9.0	16.6				
Green Ext Time (p_c), s	0.0	1.5	0.0	0.6	0.0	4.4	0.0	1.2				

Intersection Summary	
HCM 6th Ctrl Delay	42.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	427	0	0	448	2	0	0	0	9	0	15
Future Vol, veh/h	7	427	0	0	448	2	0	0	0	9	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	1082339328		-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	427	0	0	448	2	0	0	0	9	0	15

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	450	0	-	-	-	0			890	890	449
Stage 1	-	-	-	-	-	-			449	449	-
Stage 2	-	-	-	-	-	-			441	441	-
Critical Hdwy	4.12	-	-	-	-	-			6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-			5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-			5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-			3.518	4.018	3.318
Pot Cap-1 Maneuver	1110	-	0	0	-	-			313	282	610
Stage 1	-	-	0	0	-	-			643	572	-
Stage 2	-	-	0	0	-	-			648	577	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	1110	-	-	-	-	-			311	0	610
Mov Cap-2 Maneuver	-	-	-	-	-	-			436	0	-
Stage 1	-	-	-	-	-	-			639	0	-
Stage 2	-	-	-	-	-	-			648	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1110	-	-	-	531
HCM Lane V/C Ratio	0.006	-	-	-	0.045
HCM Control Delay (s)	8.3	-	-	-	12.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	37.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	171	444	7	10	479	158	3	4	10	114	2	105
Future Vol, veh/h	171	444	7	10	479	158	3	4	10	114	2	105
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	171	444	7	10	479	158	3	4	10	114	2	105

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	637	0	0	451	0	0	1422	1447	448	1375	1371	558
Stage 1	-	-	-	-	-	-	790	790	-	578	578	-
Stage 2	-	-	-	-	-	-	632	657	-	797	793	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	947	-	-	1109	-	-	114	131	611	123	146	529
Stage 1	-	-	-	-	-	-	383	402	-	501	501	-
Stage 2	-	-	-	-	-	-	468	462	-	380	400	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	947	-	-	1109	-	-	77	106	611	~ 101	119	529
Mov Cap-2 Maneuver	-	-	-	-	-	-	77	106	-	~ 101	119	-
Stage 1	-	-	-	-	-	-	314	329	-	410	496	-
Stage 2	-	-	-	-	-	-	370	458	-	303	328	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.6	0.1	26.7	244.5
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	183	947	-	-	1109	-	-	164
HCM Lane V/C Ratio	0.093	0.181	-	-	0.009	-	-	1.348
HCM Control Delay (s)	26.7	9.6	-	-	8.3	-	-	244.5
HCM Lane LOS	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.3	0.7	-	-	0	-	-	13.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th Signalized Intersection Summary
5: Hearn Ave & Dutton Meadow 02/11/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	556	79	388	461	0	134	0	468	0	0	0
Future Volume (veh/h)	0	556	79	388	461	0	134	0	468	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0	1870	1870	1870			
Adj Flow Rate, veh/h	0	556	79	388	461	0	134	0	468			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2			
Cap, veh/h	0	637	90	414	1320	0	276	0	614			
Arrive On Green	0.00	0.40	0.40	0.23	0.71	0.00	0.16	0.00	0.16			
Sat Flow, veh/h	0	1602	228	1781	1870	0	1781	0	1585			
Grp Volume(v), veh/h	0	0	635	388	461	0	134	0	468			
Grp Sat Flow(s),veh/h/ln	0	0	1829	1781	1870	0	1781	0	1585			
Q Serve(g_s), s	0.0	0.0	15.2	10.1	4.6	0.0	3.3	0.0	1.2			
Cycle Q Clear(g_c), s	0.0	0.0	15.2	10.1	4.6	0.0	3.3	0.0	1.2			
Prop In Lane	0.00		0.12	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	0	727	414	1320	0	276	0	614			
V/C Ratio(X)	0.00	0.00	0.87	0.94	0.35	0.00	0.49	0.00	0.76			
Avail Cap(c_a), veh/h	0	0	826	414	1398	0	677	0	970			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	13.2	17.8	2.7	0.0	18.3	0.0	12.6			
Incr Delay (d2), s/veh	0.0	0.0	9.3	28.7	0.2	0.0	1.3	0.0	2.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	6.8	6.9	0.7	0.0	1.3	0.0	3.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	22.5	46.6	2.9	0.0	19.6	0.0	14.6			
LnGrp LOS	A	A	C	D	A	A	B	A	B			
Approach Vol, veh/h		635			849			602				
Approach Delay, s/veh		22.5			22.9			15.7				
Approach LOS		C			C			B				
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.6	22.4				37.0		10.3				
Change Period (Y+Rc), s	3.6	* 3.6				3.6		3.0				
Max Green Setting (Gmax), s	11.0	* 21				35.4		18.0				
Max Q Clear Time (g_c+I1), s	12.1	17.2				6.6		5.3				
Green Ext Time (p_c), s	0.0	1.6				3.1		2.1				

Intersection Summary	
HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Stony Point Rd & Northpoint Pkwy

02/11/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	0	424	0	0	0	174	847	0	0	1028	43
Future Volume (veh/h)	130	0	424	0	0	0	174	847	0	0	1028	43
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870				1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	130	0	424				174	847	0	0	1028	43
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	2				2	2	2	2	2	2
Cap, veh/h	171	0	736				811	2966	0	61	1505	63
Arrive On Green	0.10	0.00	0.10				0.74	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h	1781	0	1585				1781	3647	0	650	3476	145
Grp Volume(v), veh/h	130	0	424				174	847	0	0	526	545
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1781	1777	0	650	1777	1844
Q Serve(g_s), s	8.4	0.0	0.0				0.0	0.0	0.0	0.0	28.1	28.1
Cycle Q Clear(g_c), s	8.4	0.0	0.0				0.0	0.0	0.0	0.0	28.1	28.1
Prop In Lane	1.00		1.00				1.00		0.00	1.00		0.08
Lane Grp Cap(c), veh/h	171	0	736				811	2966	0	61	769	799
V/C Ratio(X)	0.76	0.00	0.58				0.21	0.29	0.00	0.00	0.68	0.68
Avail Cap(c_a), veh/h	433	0	970				811	2966	0	61	769	799
HCM Platoon Ratio	1.00	1.00	1.00				2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.76	0.76	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	0.0	23.1				5.9	0.0	0.0	0.0	26.9	26.9
Incr Delay (d2), s/veh	2.6	0.0	0.3				0.0	0.2	0.0	0.0	4.9	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	13.9				1.0	0.1	0.0	0.0	12.4	12.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	0.0	23.4				5.9	0.2	0.0	0.0	31.8	31.6
LnGrp LOS	D	A	C				A	A	A	A	C	C
Approach Vol, veh/h		554						1021			1071	
Approach Delay, s/veh		30.7						1.2			31.7	
Approach LOS		C						A			C	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		102.4		15.6	47.4	55.0						
Change Period (Y+Rc), s		3.9		4.3	3.9	* 3.9						
Max Green Setting (Gmax), s		81.1		28.7	27.0	* 51						
Max Q Clear Time (g_c+I1), s		2.0		10.4	2.0	30.1						
Green Ext Time (p_c), s		6.8		0.9	0.2	6.8						

Intersection Summary	
HCM 6th Ctrl Delay	19.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Stony Point Rd & Hearn Ave

02/11/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	32	23	142	40	312	40	713	130	296	828	29
Future Volume (veh/h)	42	32	23	142	40	312	40	713	130	296	828	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1945	1945	1870	1870	1870
Adj Flow Rate, veh/h	42	32	23	142	40	312	40	713	130	296	828	29
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	54	51	36	136	178	720	55	715	606	640	2489	87
Arrive On Green	0.03	0.05	0.05	0.08	0.10	0.10	0.03	0.37	0.37	0.72	1.00	1.00
Sat Flow, veh/h	1781	1012	727	1781	1870	1585	1781	1945	1648	1781	3502	123
Grp Volume(v), veh/h	42	0	55	142	40	312	40	713	130	296	420	437
Grp Sat Flow(s),veh/h/ln	1781	0	1739	1781	1870	1585	1781	1945	1648	1781	1777	1848
Q Serve(g_s), s	2.8	0.0	3.7	9.0	2.3	1.9	2.6	43.2	6.4	8.3	0.0	0.0
Cycle Q Clear(g_c), s	2.8	0.0	3.7	9.0	2.3	1.9	2.6	43.2	6.4	8.3	0.0	0.0
Prop In Lane	1.00		0.42	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	54	0	87	136	178	720	55	715	606	640	1263	1314
V/C Ratio(X)	0.78	0.00	0.63	1.05	0.22	0.43	0.73	1.00	0.21	0.46	0.33	0.33
Avail Cap(c_a), veh/h	106	0	457	136	523	1013	106	715	606	640	1263	1314
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.79	0.79	0.79
Uniform Delay (d), s/veh	56.8	0.0	55.0	54.5	49.4	12.5	56.7	37.2	25.6	11.8	0.0	0.0
Incr Delay (d2), s/veh	21.1	0.0	7.4	89.8	0.6	0.4	6.6	32.8	0.8	0.2	0.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	1.8	7.4	1.1	4.1	1.3	26.1	2.6	2.5	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.9	0.0	62.4	144.3	50.0	12.9	63.3	70.1	26.4	11.9	0.6	0.5
LnGrp LOS	E	A	E	F	D	B	E	E	C	B	A	A
Approach Vol, veh/h		97			494			883			1153	
Approach Delay, s/veh		69.1			53.7			63.3			3.5	
Approach LOS		E			D			E			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	48.1	13.0	9.8	6.7	88.6	7.6	15.2				
Change Period (Y+Rc), s	4.7	* 4.7	4.0	3.9	3.0	4.7	4.0	* 4				
Max Green Setting (Gmax), s	9.3	* 43	9.0	31.0	7.0	55.4	7.0	* 33				
Max Q Clear Time (g_c+I1), s	10.3	45.2	11.0	5.7	4.6	2.0	4.8	4.3				
Green Ext Time (p_c), s	0.3	0.0	0.0	0.2	0.0	5.9	0.0	1.3				

Intersection Summary	
HCM 6th Ctrl Delay	35.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	440	0	0	527	24	0	0	0	19	0	30
Future Vol, veh/h	22	440	0	0	527	24	0	0	0	19	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	1082494976		-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	440	0	0	527	24	0	0	0	19	0	30

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	551	0	-	-	-	0			1023	1023	539
Stage 1	-	-	-	-	-	-			539	539	-
Stage 2	-	-	-	-	-	-			484	484	-
Critical Hdwy	4.12	-	-	-	-	-			6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-			5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-			5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-			3.518	4.018	3.318
Pot Cap-1 Maneuver	1019	-	0	0	-	-			261	236	542
Stage 1	-	-	0	0	-	-			585	522	-
Stage 2	-	-	0	0	-	-			620	552	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	1019	-	-	-	-	-			255	0	542
Mov Cap-2 Maneuver	-	-	-	-	-	-			388	0	-
Stage 1	-	-	-	-	-	-			572	0	-
Stage 2	-	-	-	-	-	-			620	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1019	-	-	-	470
HCM Lane V/C Ratio	0.022	-	-	-	0.104
HCM Control Delay (s)	8.6	-	-	-	13.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	23.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	398	17	35	569	149	12	12	35	90	13	95
Future Vol, veh/h	85	398	17	35	569	149	12	12	35	90	13	95
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	85	398	17	35	569	149	12	12	35	90	13	95

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	718	0	0	415	0	0	1345	1365	407	1314	1299	644
Stage 1	-	-	-	-	-	-	577	577	-	714	714	-
Stage 2	-	-	-	-	-	-	768	788	-	600	585	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	883	-	-	1144	-	-	129	147	644	135	161	473
Stage 1	-	-	-	-	-	-	502	502	-	422	435	-
Stage 2	-	-	-	-	-	-	394	402	-	488	498	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	883	-	-	1144	-	-	87	129	644	107	141	473
Mov Cap-2 Maneuver	-	-	-	-	-	-	87	129	-	107	141	-
Stage 1	-	-	-	-	-	-	454	454	-	381	422	-
Stage 2	-	-	-	-	-	-	296	390	-	406	450	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0.4	29.2	161.7
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	207	883	-	-	1144	-	-	175
HCM Lane V/C Ratio	0.285	0.096	-	-	0.031	-	-	1.131
HCM Control Delay (s)	29.2	9.5	-	-	8.2	-	-	161.7
HCM Lane LOS	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.1	0.3	-	-	0.1	-	-	10.2

HCM 6th Signalized Intersection Summary
5: Hearn Ave & Dutton Meadow 02/11/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	444	89	289	636	0	128	0	314	0	0	0
Future Volume (veh/h)	0	444	89	289	636	0	128	0	314	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0	1870	1870	1870			
Adj Flow Rate, veh/h	0	444	89	289	636	0	128	0	314			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2			
Cap, veh/h	0	567	114	357	1243	0	307	0	591			
Arrive On Green	0.00	0.37	0.37	0.20	0.66	0.00	0.17	0.00	0.17			
Sat Flow, veh/h	0	1513	303	1781	1870	0	1781	0	1585			
Grp Volume(v), veh/h	0	0	533	289	636	0	128	0	314			
Grp Sat Flow(s),veh/h/ln	0	0	1816	1781	1870	0	1781	0	1585			
Q Serve(g_s), s	0.0	0.0	10.5	6.3	7.0	0.0	2.6	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	0.0	10.5	6.3	7.0	0.0	2.6	0.0	0.0			
Prop In Lane	0.00		0.17	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	0	681	357	1243	0	307	0	591			
V/C Ratio(X)	0.00	0.00	0.78	0.81	0.51	0.00	0.42	0.00	0.53			
Avail Cap(c_a), veh/h	0	0	1052	529	1779	0	794	0	1024			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	11.2	15.4	3.4	0.0	14.9	0.0	9.9			
Incr Delay (d2), s/veh	0.0	0.0	2.1	3.4	0.3	0.0	0.9	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	3.5	2.4	1.0	0.0	0.9	0.0	1.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	13.3	18.8	3.8	0.0	15.8	0.0	10.7			
LnGrp LOS	A	A	B	B	A	A	B	A	B			
Approach Vol, veh/h		533			925			442				
Approach Delay, s/veh		13.3			8.5			12.1				
Approach LOS		B			A			B				
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	11.7	18.7				30.4		10.0				
Change Period (Y+Rc), s	3.6	* 3.6				3.6		3.0				
Max Green Setting (Gmax), s	12.0	* 23				38.4		18.0				
Max Q Clear Time (g_c+I1), s	8.3	12.5				9.0		4.6				
Green Ext Time (p_c), s	0.2	2.6				4.8		1.5				

Intersection Summary	
HCM 6th Ctrl Delay	10.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Stony Point Rd & Northpoint Pkwy

02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	0	189	0	0	0	392	824	0	0	824	116
Future Volume (veh/h)	58	0	189	0	0	0	392	824	0	0	824	116
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870				1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	58	0	189				392	824	0	0	824	116
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	2				2	2	2	2	2	2
Cap, veh/h	228	0	341				561	2830	0	67	2130	300
Arrive On Green	0.13	0.00	0.13				0.12	1.00	0.00	0.00	0.68	0.68
Sat Flow, veh/h	1781	0	1585				1781	3647	0	665	3128	440
Grp Volume(v), veh/h	58	0	189				392	824	0	0	468	472
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1781	1777	0	665	1777	1791
Q Serve(g_s), s	3.2	0.0	11.5				6.9	0.0	0.0	0.0	12.3	12.3
Cycle Q Clear(g_c), s	3.2	0.0	11.5				6.9	0.0	0.0	0.0	12.3	12.3
Prop In Lane	1.00		1.00				1.00		0.00	1.00		0.25
Lane Grp Cap(c), veh/h	228	0	341				561	2830	0	67	1210	1220
V/C Ratio(X)	0.25	0.00	0.55				0.70	0.29	0.00	0.00	0.39	0.39
Avail Cap(c_a), veh/h	463	0	551				883	2830	0	67	1210	1220
HCM Platoon Ratio	1.00	1.00	1.00				1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.77	0.77	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	0.0	37.7				5.6	0.0	0.0	0.0	7.5	7.5
Incr Delay (d2), s/veh	0.2	0.0	0.5				0.5	0.2	0.0	0.0	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	10.2				1.5	0.1	0.0	0.0	4.3	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	0.0	38.3				6.1	0.2	0.0	0.0	8.4	8.4
LnGrp LOS	D	A	D				A	A	A	A	A	A
Approach Vol, veh/h		247						1216			940	
Approach Delay, s/veh		39.3						2.1			8.4	
Approach LOS		D						A			A	

Timer - Assigned Phs	2		4	5	6
Phs Duration (G+Y+Rc), s	89.9		18.1	12.5	77.4
Change Period (Y+Rc), s	3.9		4.3	3.0	3.9
Max Green Setting (Gmax), s	71.7		28.1	29.0	39.7
Max Q Clear Time (g_c+I1), s	2.0		13.5	8.9	14.3
Green Ext Time (p_c), s	6.5		0.3	0.5	6.2

Intersection Summary	
HCM 6th Ctrl Delay	8.4
HCM 6th LOS	A

HCM 6th Signalized Intersection Summary
2: Stony Point Rd & Hearn Ave

02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	61	47	95	18	326	9	555	71	262	711	16
Future Volume (veh/h)	117	61	47	95	18	326	9	555	71	262	711	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1945	1945	1870	1870	1870
Adj Flow Rate, veh/h	117	61	47	95	18	326	9	555	71	262	711	16
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	161	124	120	297	513	316	891	755	293	1526	34
Arrive On Green	0.07	0.16	0.16	0.07	0.16	0.16	0.18	0.46	0.46	0.05	0.14	0.14
Sat Flow, veh/h	1781	980	755	1781	1870	1585	1781	1945	1648	1781	3553	80
Grp Volume(v), veh/h	117	0	108	95	18	326	9	555	71	262	355	372
Grp Sat Flow(s),veh/h/ln	1781	0	1734	1781	1870	1585	1781	1945	1648	1781	1777	1856
Q Serve(g_s), s	7.0	0.0	6.0	5.7	0.9	14.0	0.5	23.4	2.6	15.8	19.9	19.9
Cycle Q Clear(g_c), s	7.0	0.0	6.0	5.7	0.9	14.0	0.5	23.4	2.6	15.8	19.9	19.9
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	132	0	286	120	297	513	316	891	755	293	763	797
V/C Ratio(X)	0.89	0.00	0.38	0.79	0.06	0.64	0.03	0.62	0.09	0.89	0.47	0.47
Avail Cap(c_a), veh/h	132	0	514	148	571	745	316	891	755	297	763	797
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Uniform Delay (d), s/veh	49.6	0.0	40.2	49.6	38.6	17.9	36.7	22.2	16.6	50.1	35.0	35.0
Incr Delay (d2), s/veh	46.1	0.0	0.8	20.7	0.1	1.3	0.0	3.3	0.2	24.3	1.9	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	2.6	3.2	0.4	5.2	0.2	10.9	1.0	9.5	9.8	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.7	0.0	41.0	70.3	38.7	19.2	36.7	25.5	16.8	74.4	36.8	36.7
LnGrp LOS	F	A	D	E	D	B	D	C	B	E	D	D
Approach Vol, veh/h		225			439			635			989	
Approach Delay, s/veh		69.4			31.1			24.7			46.7	
Approach LOS		E			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.8	54.2	11.3	21.8	23.9	51.1	12.0	21.0
Change Period (Y+Rc), s	3.0	4.7	4.0	* 4	4.7	* 4.7	4.0	3.9
Max Green Setting (Gmax), s	13.3	33.4	9.0	* 32	5.0	* 46	8.0	33.0
Max Q Clear Time (g_c+I1), s	11.7	25.4	7.7	8.0	2.5	21.9	9.0	16.0
Green Ext Time (p_c), s	0.0	2.3	0.0	0.5	0.0	4.3	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	39.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	381	0	0	406	2	0	0	0	9	0	27
Future Vol, veh/h	11	381	0	0	406	2	0	0	0	9	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	1082339328		-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	381	0	0	406	2	0	0	0	9	0	27

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	408	0	-	-	-	0			810	810	407
Stage 1	-	-	-	-	-	-			407	407	-
Stage 2	-	-	-	-	-	-			403	403	-
Critical Hdwy	4.12	-	-	-	-	-			6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-			5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-			5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-			3.518	4.018	3.318
Pot Cap-1 Maneuver	1151	-	0	0	-	-			349	314	644
Stage 1	-	-	0	0	-	-			672	597	-
Stage 2	-	-	0	0	-	-			675	600	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	1151	-	-	-	-	-			346	0	644
Mov Cap-2 Maneuver	-	-	-	-	-	-			464	0	-
Stage 1	-	-	-	-	-	-			665	0	-
Stage 2	-	-	-	-	-	-			675	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1151	-	-	-	587
HCM Lane V/C Ratio	0.01	-	-	-	0.061
HCM Control Delay (s)	8.2	-	-	-	11.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	9.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	142	433	7	10	456	126	3	4	10	78	2	76
Future Vol, veh/h	142	433	7	10	456	126	3	4	10	78	2	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	142	433	7	10	456	126	3	4	10	78	2	76

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	582	0	0	440	0	0	1299	1323	437	1267	1263	519
Stage 1	-	-	-	-	-	-	721	721	-	539	539	-
Stage 2	-	-	-	-	-	-	578	602	-	728	724	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	992	-	-	1120	-	-	138	156	620	146	170	557
Stage 1	-	-	-	-	-	-	419	432	-	527	522	-
Stage 2	-	-	-	-	-	-	501	489	-	415	430	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	992	-	-	1120	-	-	104	132	620	124	144	557
Mov Cap-2 Maneuver	-	-	-	-	-	-	104	132	-	124	144	-
Stage 1	-	-	-	-	-	-	359	370	-	452	517	-
Stage 2	-	-	-	-	-	-	427	485	-	346	369	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0.1	22.2	67.1
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	226	992	-	-	1120	-	-	200
HCM Lane V/C Ratio	0.075	0.143	-	-	0.009	-	-	0.78
HCM Control Delay (s)	22.2	9.2	-	-	8.2	-	-	67.1
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.2	0.5	-	-	0	-	-	5.4

HCM 6th Signalized Intersection Summary
5: Hearn Ave & Dutton Meadow 02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	524	64	367	438	0	102	0	406	0	0	0
Future Volume (veh/h)	0	524	64	367	438	0	102	0	406	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0	1870	1870	1870			
Adj Flow Rate, veh/h	0	524	64	367	438	0	102	0	406			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2			
Cap, veh/h	0	623	76	426	1309	0	275	0	624			
Arrive On Green	0.00	0.38	0.38	0.24	0.70	0.00	0.15	0.00	0.15			
Sat Flow, veh/h	0	1635	200	1781	1870	0	1781	0	1585			
Grp Volume(v), veh/h	0	0	588	367	438	0	102	0	406			
Grp Sat Flow(s),veh/h/ln	0	0	1834	1781	1870	0	1781	0	1585			
Q Serve(g_s), s	0.0	0.0	13.2	8.9	4.2	0.0	2.3	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	0.0	13.2	8.9	4.2	0.0	2.3	0.0	0.0			
Prop In Lane	0.00		0.11	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	0	699	426	1309	0	275	0	624			
V/C Ratio(X)	0.00	0.00	0.84	0.86	0.33	0.00	0.37	0.00	0.65			
Avail Cap(c_a), veh/h	0	0	867	433	1463	0	708	0	1010			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	12.8	16.5	2.7	0.0	17.2	0.0	11.2			
Incr Delay (d2), s/veh	0.0	0.0	6.2	15.2	0.1	0.0	0.8	0.0	1.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	5.5	4.9	0.6	0.0	0.9	0.0	2.7			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	19.0	31.7	2.8	0.0	18.0	0.0	12.3			
LnGrp LOS	A	A	B	C	A	A	B	A	B			
Approach Vol, veh/h		588			805			508				
Approach Delay, s/veh		19.0			16.0			13.5				
Approach LOS		B			B			B				
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.4	20.8				35.3		10.0				
Change Period (Y+Rc), s	3.6	* 3.6				3.6		3.0				
Max Green Setting (Gmax), s	11.0	* 21				35.4		18.0				
Max Q Clear Time (g_c+I1), s	10.9	15.2				6.2		4.3				
Green Ext Time (p_c), s	0.0	2.0				2.9		1.7				

Intersection Summary	
HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Stony Point Rd & Northpoint Pkwy

02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	0	422	0	0	0	169	795	0	0	949	43
Future Volume (veh/h)	130	0	422	0	0	0	169	795	0	0	949	43
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870				1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	130	0	422				169	795	0	0	949	43
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	2				2	2	2	2	2	2
Cap, veh/h	171	0	736				832	2966	0	61	1499	68
Arrive On Green	0.10	0.00	0.10				0.74	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h	1781	0	1585				1781	3647	0	683	3462	157
Grp Volume(v), veh/h	130	0	422				169	795	0	0	487	505
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1781	1777	0	683	1777	1842
Q Serve(g_s), s	8.4	0.0	0.0				0.0	0.0	0.0	0.0	25.3	25.3
Cycle Q Clear(g_c), s	8.4	0.0	0.0				0.0	0.0	0.0	0.0	25.3	25.3
Prop In Lane	1.00		1.00				1.00		0.00	1.00		0.09
Lane Grp Cap(c), veh/h	171	0	736				832	2966	0	61	769	798
V/C Ratio(X)	0.76	0.00	0.57				0.20	0.27	0.00	0.00	0.63	0.63
Avail Cap(c_a), veh/h	433	0	970				832	2966	0	61	769	798
HCM Platoon Ratio	1.00	1.00	1.00				2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.79	0.79	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	0.0	23.1				5.2	0.0	0.0	0.0	26.1	26.1
Incr Delay (d2), s/veh	2.6	0.0	0.3				0.0	0.2	0.0	0.0	3.9	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	13.9				0.9	0.1	0.0	0.0	11.1	11.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	0.0	23.3				5.2	0.2	0.0	0.0	30.1	29.9
LnGrp LOS	D	A	C				A	A	A	A	C	C
Approach Vol, veh/h		552						964			992	
Approach Delay, s/veh		30.7						1.1			30.0	
Approach LOS		C						A			C	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		102.4		15.6	47.4	55.0						
Change Period (Y+Rc), s		3.9		4.3	3.9	* 3.9						
Max Green Setting (Gmax), s		81.1		28.7	27.0	* 51						
Max Q Clear Time (g_c+I1), s		2.0		10.4	2.0	27.3						
Green Ext Time (p_c), s		6.2		0.9	0.2	6.4						

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Stony Point Rd & Hearn Ave

02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	22	23	121	34	296	40	672	122	268	775	29
Future Volume (veh/h)	42	22	23	121	34	296	40	672	122	268	775	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1945	1945	1870	1870	1870
Adj Flow Rate, veh/h	42	22	23	121	34	296	40	672	122	268	775	29
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	54	37	39	136	167	720	55	715	606	650	2502	94
Arrive On Green	0.03	0.04	0.04	0.08	0.09	0.09	0.03	0.37	0.37	0.73	1.00	1.00
Sat Flow, veh/h	1781	837	875	1781	1870	1585	1781	1945	1648	1781	3493	131
Grp Volume(v), veh/h	42	0	45	121	34	296	40	672	122	268	394	410
Grp Sat Flow(s),veh/h/ln	1781	0	1713	1781	1870	1585	1781	1945	1648	1781	1777	1847
Q Serve(g_s), s	2.8	0.0	3.0	7.9	2.0	1.7	2.6	39.4	6.0	6.9	0.0	0.0
Cycle Q Clear(g_c), s	2.8	0.0	3.0	7.9	2.0	1.7	2.6	39.4	6.0	6.9	0.0	0.0
Prop In Lane	1.00		0.51	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	54	0	76	136	167	720	55	715	606	650	1273	1323
V/C Ratio(X)	0.78	0.00	0.59	0.89	0.20	0.41	0.73	0.94	0.20	0.41	0.31	0.31
Avail Cap(c_a), veh/h	106	0	450	136	523	1022	106	715	606	650	1273	1323
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.81	0.81	0.81
Uniform Delay (d), s/veh	56.8	0.0	55.4	54.0	49.8	12.4	56.7	36.0	25.5	11.0	0.0	0.0
Incr Delay (d2), s/veh	21.1	0.0	7.2	46.1	0.6	0.4	6.6	21.7	0.7	0.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	1.5	5.3	1.0	3.9	1.3	22.2	2.5	2.1	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.9	0.0	62.6	100.1	50.4	12.7	63.3	57.7	26.2	11.2	0.5	0.5
LnGrp LOS	E	A	E	F	D	B	E	E	C	B	A	A
Approach Vol, veh/h		87			451			834			1072	
Approach Delay, s/veh		70.0			39.0			53.4			3.2	
Approach LOS		E			D			D			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.8	48.1	13.0	9.1	6.7	89.2	7.6	14.6				
Change Period (Y+Rc), s	4.7	* 4.7	4.0	3.9	3.0	4.7	4.0	* 4				
Max Green Setting (Gmax), s	3.3	* 43	9.0	31.0	7.0	55.4	7.0	* 33				
Max Q Clear Time (g_c+I1), s	3.9	41.4	9.9	5.0	4.6	2.0	4.8	4.0				
Green Ext Time (p_c), s	0.3	1.0	0.0	0.2	0.0	5.4	0.0	1.2				

Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	34	400	0	0	477	24	0	0	0	19	0	37
Future Vol, veh/h	34	400	0	0	477	24	0	0	0	19	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	1082494976		-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	34	400	0	0	477	24	0	0	0	19	0	37

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	501	0	-	-	-	0			957	957	489
Stage 1	-	-	-	-	-	-			489	489	-
Stage 2	-	-	-	-	-	-			468	468	-
Critical Hdwy	4.12	-	-	-	-	-			6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-			5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-			5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-			3.518	4.018	3.318
Pot Cap-1 Maneuver	1063	-	0	0	-	-			286	258	579
Stage 1	-	-	0	0	-	-			616	549	-
Stage 2	-	-	0	0	-	-			630	561	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	1063	-	-	-	-	-			277	0	579
Mov Cap-2 Maneuver	-	-	-	-	-	-			406	0	-
Stage 1	-	-	-	-	-	-			596	0	-
Stage 2	-	-	-	-	-	-			630	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1063	-	-	-	506
HCM Lane V/C Ratio	0.032	-	-	-	0.111
HCM Control Delay (s)	8.5	-	-	-	13
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	371	17	35	549	126	12	12	35	60	13	69
Future Vol, veh/h	69	371	17	35	549	126	12	12	35	60	13	69
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	69	371	17	35	549	126	12	12	35	60	13	69

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	675	0	0	388	0	0	1241	1263	380	1223	1208	612
Stage 1	-	-	-	-	-	-	518	518	-	682	682	-
Stage 2	-	-	-	-	-	-	723	745	-	541	526	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	916	-	-	1170	-	-	152	170	667	156	183	493
Stage 1	-	-	-	-	-	-	541	533	-	440	450	-
Stage 2	-	-	-	-	-	-	417	421	-	525	529	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	916	-	-	1170	-	-	113	152	667	128	164	493
Mov Cap-2 Maneuver	-	-	-	-	-	-	113	152	-	128	164	-
Stage 1	-	-	-	-	-	-	500	493	-	407	437	-
Stage 2	-	-	-	-	-	-	338	408	-	449	489	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.4	24	54.1
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	248	916	-	-	1170	-	-	206
HCM Lane V/C Ratio	0.238	0.075	-	-	0.03	-	-	0.689
HCM Control Delay (s)	24	9.2	-	-	8.2	-	-	54.1
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.9	0.2	-	-	0.1	-	-	4.3

HCM 6th Signalized Intersection Summary
5: Hearn Ave & Dutton Meadow 02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	419	57	218	609	0	112	0	273	0	0	0
Future Volume (veh/h)	0	419	57	218	609	0	112	0	273	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0	1870	1870	1870			
Adj Flow Rate, veh/h	0	419	57	218	609	0	112	0	273			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2			
Cap, veh/h	0	569	77	307	1171	0	339	0	576			
Arrive On Green	0.00	0.35	0.35	0.17	0.63	0.00	0.19	0.00	0.19			
Sat Flow, veh/h	0	1612	219	1781	1870	0	1781	0	1585			
Grp Volume(v), veh/h	0	0	476	218	609	0	112	0	273			
Grp Sat Flow(s),veh/h/ln	0	0	1831	1781	1870	0	1781	0	1585			
Q Serve(g_s), s	0.0	0.0	8.2	4.1	6.5	0.0	2.0	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	0.0	8.2	4.1	6.5	0.0	2.0	0.0	0.0			
Prop In Lane	0.00		0.12	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	0	647	307	1171	0	339	0	576			
V/C Ratio(X)	0.00	0.00	0.74	0.71	0.52	0.00	0.33	0.00	0.47			
Avail Cap(c_a), veh/h	0	0	1191	594	1997	0	892	0	1067			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	10.2	14.0	3.7	0.0	12.6	0.0	8.8			
Incr Delay (d2), s/veh	0.0	0.0	1.7	1.1	0.4	0.0	0.6	0.0	0.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	2.6	1.4	0.9	0.0	0.7	0.0	1.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	11.8	15.2	4.1	0.0	13.1	0.0	9.4			
LnGrp LOS	A	A	B	B	A	A	B	A	A			
Approach Vol, veh/h		476			827			385				
Approach Delay, s/veh		11.8			7.0			10.5				
Approach LOS		B			A			B				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	9.8	16.3				26.1		9.9				
Change Period (Y+Rc), s	3.6	* 3.6				3.6		3.0				
Max Green Setting (Gmax), s	12.0	* 23				38.4		18.0				
Max Q Clear Time (g_c+I1), s	6.1	10.2				8.5		4.0				
Green Ext Time (p_c), s	0.2	2.5				4.6		1.3				

Intersection Summary			
HCM 6th Ctrl Delay		9.2	
HCM 6th LOS		A	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Stony Point Rd & Northpoint Pkwy

02/11/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	0	195	0	0	0	397	915	0	0	862	116
Future Volume (veh/h)	58	0	195	0	0	0	397	915	0	0	862	116
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870				1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	58	0	195				397	915	0	0	862	116
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	2				2	2	2	2	2	2
Cap, veh/h	233	0	350				545	2818	0	67	2126	286
Arrive On Green	0.13	0.00	0.13				0.12	1.00	0.00	0.00	0.68	0.68
Sat Flow, veh/h	1781	0	1585				1781	3647	0	610	3147	424
Grp Volume(v), veh/h	58	0	195				397	915	0	0	487	491
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1781	1777	0	610	1777	1794
Q Serve(g_s), s	3.2	0.0	11.8				7.2	0.0	0.0	0.0	13.2	13.2
Cycle Q Clear(g_c), s	3.2	0.0	11.8				7.2	0.0	0.0	0.0	13.2	13.2
Prop In Lane	1.00		1.00				1.00		0.00	1.00		0.24
Lane Grp Cap(c), veh/h	233	0	350				545	2818	0	67	1200	1212
V/C Ratio(X)	0.25	0.00	0.56				0.73	0.32	0.00	0.00	0.41	0.41
Avail Cap(c_a), veh/h	463	0	555				863	2818	0	67	1200	1212
HCM Platoon Ratio	1.00	1.00	1.00				1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.70	0.70	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	0.0	37.4				6.3	0.0	0.0	0.0	7.8	7.8
Incr Delay (d2), s/veh	0.2	0.0	0.5				0.5	0.2	0.0	0.0	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	10.5				1.6	0.1	0.0	0.0	4.6	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.4	0.0	37.9				6.8	0.2	0.0	0.0	8.8	8.8
LnGrp LOS	D	A	D				A	A	A	A	A	A
Approach Vol, veh/h		253						1312			978	
Approach Delay, s/veh		38.9						2.2			8.8	
Approach LOS		D						A			A	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		89.6		18.4	12.7	76.9						
Change Period (Y+Rc), s		3.9		4.3	3.0	3.9						
Max Green Setting (Gmax), s		71.7		28.1	29.0	39.7						
Max Q Clear Time (g_c+I1), s		2.0		13.8	9.2	15.2						
Green Ext Time (p_c), s		7.5		0.3	0.5	6.4						

Intersection Summary												
HCM 6th Ctrl Delay			8.4									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary
2: Stony Point Rd & Hearn Ave

02/11/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	64	47	106	27	359	9	618	95	285	732	16
Future Volume (veh/h)	117	64	47	106	27	359	9	618	95	285	732	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1945	1945	1870	1870	1870
Adj Flow Rate, veh/h	117	64	47	106	27	359	9	618	95	285	732	16
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	172	126	132	323	538	291	860	729	297	1528	33
Arrive On Green	0.07	0.17	0.17	0.07	0.17	0.17	0.16	0.44	0.44	0.06	0.14	0.14
Sat Flow, veh/h	1781	1002	736	1781	1870	1585	1781	1945	1648	1781	3556	78
Grp Volume(v), veh/h	117	0	111	106	27	359	9	618	95	285	366	382
Grp Sat Flow(s),veh/h/ln	1781	0	1738	1781	1870	1585	1781	1945	1648	1781	1777	1856
Q Serve(g_s), s	7.0	0.0	6.1	6.3	1.3	15.4	0.5	28.0	3.7	17.2	20.5	20.5
Cycle Q Clear(g_c), s	7.0	0.0	6.1	6.3	1.3	15.4	0.5	28.0	3.7	17.2	20.5	20.5
Prop In Lane	1.00		0.42	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	132	0	298	132	323	538	291	860	729	297	763	798
V/C Ratio(X)	0.89	0.00	0.37	0.80	0.08	0.67	0.03	0.72	0.13	0.96	0.48	0.48
Avail Cap(c_a), veh/h	132	0	515	148	571	748	291	860	729	297	763	798
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.90	0.90
Uniform Delay (d), s/veh	49.6	0.0	39.6	49.2	37.5	17.3	38.0	24.6	17.8	50.7	35.2	35.2
Incr Delay (d2), s/veh	46.1	0.0	0.8	24.2	0.1	1.4	0.0	5.1	0.4	38.6	1.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	2.7	3.7	0.6	5.6	0.2	13.4	1.5	11.4	10.1	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.7	0.0	40.4	73.4	37.6	18.8	38.0	29.7	18.2	89.3	37.2	37.1
LnGrp LOS	F	A	D	E	D	B	D	C	B	F	D	D
Approach Vol, veh/h		228			492			722			1033	
Approach Delay, s/veh		68.7			31.6			28.3			51.5	
Approach LOS		E			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	52.5	12.0	22.5	22.4	51.1	12.0	22.5				
Change Period (Y+Rc), s	3.0	4.7	4.0	* 4	4.7	* 4.7	4.0	3.9				
Max Green Setting (Gmax), s	18.0	33.4	9.0	* 32	5.0	* 46	8.0	33.0				
Max Q Clear Time (g_c+I1), s	9.2	30.0	8.3	8.1	2.5	22.5	9.0	17.4				
Green Ext Time (p_c), s	0.0	1.3	0.0	0.6	0.0	4.5	0.0	1.3				

Intersection Summary												
HCM 6th Ctrl Delay			42.4									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	431	0	0	459	2	0	0	0	9	0	27
Future Vol, veh/h	11	431	0	0	459	2	0	0	0	9	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	1082339328		-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	431	0	0	459	2	0	0	0	9	0	27

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	461	0	-	-	-	0			913	913	460
Stage 1	-	-	-	-	-	-			460	460	-
Stage 2	-	-	-	-	-	-			453	453	-
Critical Hdwy	4.12	-	-	-	-	-			6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-			5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-			5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-			3.518	4.018	3.318
Pot Cap-1 Maneuver	1100	-	0	0	-	-			304	273	601
Stage 1	-	-	0	0	-	-			636	566	-
Stage 2	-	-	0	0	-	-			640	570	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	1100	-	-	-	-	-			301	0	601
Mov Cap-2 Maneuver	-	-	-	-	-	-			427	0	-
Stage 1	-	-	-	-	-	-			630	0	-
Stage 2	-	-	-	-	-	-			640	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1100	-	-	-	545
HCM Lane V/C Ratio	0.01	-	-	-	0.066
HCM Control Delay (s)	8.3	-	-	-	12.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	39.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	171	459	7	10	484	158	3	4	10	114	2	105
Future Vol, veh/h	171	459	7	10	484	158	3	4	10	114	2	105
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	171	459	7	10	484	158	3	4	10	114	2	105

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	642	0	0	466	0	0	1442	1467	463	1395	1391	563
Stage 1	-	-	-	-	-	-	805	805	-	583	583	-
Stage 2	-	-	-	-	-	-	637	662	-	812	808	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	943	-	-	1095	-	-	110	128	599	119	142	526
Stage 1	-	-	-	-	-	-	376	395	-	498	499	-
Stage 2	-	-	-	-	-	-	465	459	-	373	394	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	943	-	-	1095	-	-	74	104	599	~ 97	115	526
Mov Cap-2 Maneuver	-	-	-	-	-	-	74	104	-	~ 97	115	-
Stage 1	-	-	-	-	-	-	308	324	-	408	495	-
Stage 2	-	-	-	-	-	-	367	455	-	297	323	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.6	0.1	27.3	263.2
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	178	943	-	-	1095	-	-	159
HCM Lane V/C Ratio	0.096	0.181	-	-	0.009	-	-	1.39
HCM Control Delay (s)	27.3	9.7	-	-	8.3	-	-	263.2
HCM Lane LOS	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.3	0.7	-	-	0	-	-	13.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th Signalized Intersection Summary
5: Hearn Ave & Dutton Meadow 02/11/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	571	79	388	466	0	134	0	468	0	0	0
Future Volume (veh/h)	0	571	79	388	466	0	134	0	468	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0	1870	1870	1870			
Adj Flow Rate, veh/h	0	571	79	388	466	0	134	0	468			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2			
Cap, veh/h	0	647	90	410	1324	0	275	0	609			
Arrive On Green	0.00	0.40	0.40	0.23	0.71	0.00	0.15	0.00	0.15			
Sat Flow, veh/h	0	1608	222	1781	1870	0	1781	0	1585			
Grp Volume(v), veh/h	0	0	650	388	466	0	134	0	468			
Grp Sat Flow(s),veh/h/ln	0	0	1830	1781	1870	0	1781	0	1585			
Q Serve(g_s), s	0.0	0.0	15.7	10.3	4.6	0.0	3.3	0.0	1.3			
Cycle Q Clear(g_c), s	0.0	0.0	15.7	10.3	4.6	0.0	3.3	0.0	1.3			
Prop In Lane	0.00		0.12	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	0	736	410	1324	0	275	0	609			
V/C Ratio(X)	0.00	0.00	0.88	0.95	0.35	0.00	0.49	0.00	0.77			
Avail Cap(c_a), veh/h	0	0	819	410	1385	0	671	0	961			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	13.2	18.1	2.7	0.0	18.5	0.0	12.9			
Incr Delay (d2), s/veh	0.0	0.0	10.4	30.8	0.2	0.0	1.3	0.0	2.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	7.2	7.2	0.7	0.0	1.3	0.0	3.7			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	23.6	49.0	2.9	0.0	19.8	0.0	14.9			
LnGrp LOS	A	A	C	D	A	A	B	A	B			
Approach Vol, veh/h		650			854			602				
Approach Delay, s/veh		23.6			23.8			16.0				
Approach LOS		C			C			B				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	14.6	22.8				37.4		10.4				
Change Period (Y+Rc), s	3.6	* 3.6				3.6		3.0				
Max Green Setting (Gmax), s	11.0	* 21				35.4		18.0				
Max Q Clear Time (g_c+I1), s	12.3	17.7				6.6		5.3				
Green Ext Time (p_c), s	0.0	1.5				3.2		2.1				

Intersection Summary			
HCM 6th Ctrl Delay		21.5	
HCM 6th LOS		C	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Stony Point Rd & Northpoint Pkwy

02/11/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	0	424	0	0	0	174	857	0	0	1045	43
Future Volume (veh/h)	130	0	424	0	0	0	174	857	0	0	1045	43
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870				1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	130	0	424				174	857	0	0	1045	43
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	2				2	2	2	2	2	2
Cap, veh/h	171	0	736				807	2966	0	61	1506	62
Arrive On Green	0.10	0.00	0.10				0.74	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h	1781	0	1585				1781	3647	0	644	3478	143
Grp Volume(v), veh/h	130	0	424				174	857	0	0	534	554
Grp Sat Flow(s),veh/h/ln	1781	0	1585				1781	1777	0	644	1777	1845
Q Serve(g_s), s	8.4	0.0	0.0				0.0	0.0	0.0	0.0	28.7	28.7
Cycle Q Clear(g_c), s	8.4	0.0	0.0				0.0	0.0	0.0	0.0	28.7	28.7
Prop In Lane	1.00		1.00				1.00		0.00	1.00		0.08
Lane Grp Cap(c), veh/h	171	0	736				807	2966	0	61	769	799
V/C Ratio(X)	0.76	0.00	0.58				0.22	0.29	0.00	0.00	0.69	0.69
Avail Cap(c_a), veh/h	433	0	970				807	2966	0	61	769	799
HCM Platoon Ratio	1.00	1.00	1.00				2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.75	0.75	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	0.0	23.1				6.0	0.0	0.0	0.0	27.1	27.1
Incr Delay (d2), s/veh	2.6	0.0	0.3				0.0	0.2	0.0	0.0	5.1	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	13.9				1.0	0.1	0.0	0.0	12.7	13.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	0.0	23.4				6.1	0.2	0.0	0.0	32.2	32.0
LnGrp LOS	D	A	C				A	A	A	A	C	C
Approach Vol, veh/h		554						1031			1088	
Approach Delay, s/veh		30.7						1.2			32.1	
Approach LOS		C						A			C	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		102.4		15.6	47.4	55.0						
Change Period (Y+Rc), s		3.9		4.3	3.9	* 3.9						
Max Green Setting (Gmax), s		81.1		28.7	27.0	* 51						
Max Q Clear Time (g_c+I1), s		2.0		10.4	2.0	30.7						
Green Ext Time (p_c), s		6.9		0.9	0.2	6.8						

Intersection Summary	
HCM 6th Ctrl Delay	19.9
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Stony Point Rd & Hearn Ave

02/11/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	32	23	146	40	322	40	713	136	296	845	29
Future Volume (veh/h)	42	32	23	146	40	322	40	713	136	296	845	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1945	1945	1870	1870	1870
Adj Flow Rate, veh/h	42	32	23	146	40	322	40	713	136	296	845	29
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	54	51	36	136	178	720	55	715	606	640	2491	85
Arrive On Green	0.03	0.05	0.05	0.08	0.10	0.10	0.03	0.37	0.37	0.72	1.00	1.00
Sat Flow, veh/h	1781	1012	727	1781	1870	1585	1781	1945	1648	1781	3505	120
Grp Volume(v), veh/h	42	0	55	146	40	322	40	713	136	296	428	446
Grp Sat Flow(s),veh/h/ln	1781	0	1739	1781	1870	1585	1781	1945	1648	1781	1777	1849
Q Serve(g_s), s	2.8	0.0	3.7	9.0	2.3	1.9	2.6	43.2	6.7	8.3	0.0	0.0
Cycle Q Clear(g_c), s	2.8	0.0	3.7	9.0	2.3	1.9	2.6	43.2	6.7	8.3	0.0	0.0
Prop In Lane	1.00		0.42	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	54	0	87	136	178	720	55	715	606	640	1263	1314
V/C Ratio(X)	0.78	0.00	0.63	1.07	0.22	0.45	0.73	1.00	0.22	0.46	0.34	0.34
Avail Cap(c_a), veh/h	106	0	457	136	523	1013	106	715	606	640	1263	1314
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.78	0.78	0.78
Uniform Delay (d), s/veh	56.8	0.0	55.0	54.5	49.4	12.6	56.7	37.2	25.7	11.8	0.0	0.0
Incr Delay (d2), s/veh	21.1	0.0	7.4	98.6	0.6	0.4	6.6	32.8	0.9	0.2	0.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	1.8	7.7	1.1	4.3	1.3	26.1	2.8	2.5	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.9	0.0	62.4	153.1	50.0	13.0	63.3	70.1	26.6	11.9	0.6	0.5
LnGrp LOS	E	A	E	F	D	B	E	E	C	B	A	A
Approach Vol, veh/h		97			508			889			1170	
Approach Delay, s/veh		69.1			56.2			63.1			3.4	
Approach LOS		E			E			E			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	48.1	13.0	9.8	6.7	88.6	7.6	15.2				
Change Period (Y+Rc), s	4.7	* 4.7	4.0	3.9	3.0	4.7	4.0	* 4				
Max Green Setting (Gmax), s	9.3	* 43	9.0	31.0	7.0	55.4	7.0	* 33				
Max Q Clear Time (g_c+I1), s	10.3	45.2	11.0	5.7	4.6	2.0	4.8	4.3				
Green Ext Time (p_c), s	0.3	0.0	0.0	0.2	0.0	6.1	0.0	1.4				

Intersection Summary	
HCM 6th Ctrl Delay	35.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	34	452	0	0	534	24	0	0	0	19	0	37
Future Vol, veh/h	34	452	0	0	534	24	0	0	0	19	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	1082494976		-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	34	452	0	0	534	24	0	0	0	19	0	37

Major/Minor	Major1			Major2					Minor2		
Conflicting Flow All	558	0	-	-	-	0			1066	1066	546
Stage 1	-	-	-	-	-	-			546	546	-
Stage 2	-	-	-	-	-	-			520	520	-
Critical Hdwy	4.12	-	-	-	-	-			6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-			5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-			5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-			3.518	4.018	3.318
Pot Cap-1 Maneuver	1013	-	0	0	-	-			246	222	538
Stage 1	-	-	0	0	-	-			580	518	-
Stage 2	-	-	0	0	-	-			597	532	-
Platoon blocked, %		-			-	-					
Mov Cap-1 Maneuver	1013	-	-	-	-	-			238	0	538
Mov Cap-2 Maneuver	-	-	-	-	-	-			372	0	-
Stage 1	-	-	-	-	-	-			560	0	-
Stage 2	-	-	-	-	-	-			597	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1013	-	-	-	467
HCM Lane V/C Ratio	0.034	-	-	-	0.12
HCM Control Delay (s)	8.7	-	-	-	13.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	24.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	408	17	35	584	149	12	12	35	90	13	95
Future Vol, veh/h	85	408	17	35	584	149	12	12	35	90	13	95
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	65	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	85	408	17	35	584	149	12	12	35	90	13	95

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	733	0	0	425	0	0	1370	1390	417	1339	1324	659
Stage 1	-	-	-	-	-	-	587	587	-	729	729	-
Stage 2	-	-	-	-	-	-	783	803	-	610	595	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	872	-	-	1134	-	-	124	142	636	130	156	464
Stage 1	-	-	-	-	-	-	496	497	-	414	428	-
Stage 2	-	-	-	-	-	-	387	396	-	482	492	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	872	-	-	1134	-	-	83	124	636	103	137	464
Mov Cap-2 Maneuver	-	-	-	-	-	-	83	124	-	103	137	-
Stage 1	-	-	-	-	-	-	448	449	-	374	415	-
Stage 2	-	-	-	-	-	-	289	384	-	400	444	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0.4	30.5	177.7
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	199	872	-	-	1134	-	-	169
HCM Lane V/C Ratio	0.296	0.097	-	-	0.031	-	-	1.172
HCM Control Delay (s)	30.5	9.6	-	-	8.3	-	-	177.7
HCM Lane LOS	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.2	0.3	-	-	0.1	-	-	10.6

HCM 6th Signalized Intersection Summary
5: Hearn Ave & Dutton Meadow 02/11/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	454	89	289	651	0	128	0	314	0	0	0
Future Volume (veh/h)	0	454	89	289	651	0	128	0	314	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0	1870	1870	1870			
Adj Flow Rate, veh/h	0	454	89	289	651	0	128	0	314			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2			
Cap, veh/h	0	576	113	357	1249	0	304	0	588			
Arrive On Green	0.00	0.38	0.38	0.20	0.67	0.00	0.17	0.00	0.17			
Sat Flow, veh/h	0	1519	298	1781	1870	0	1781	0	1585			
Grp Volume(v), veh/h	0	0	543	289	651	0	128	0	314			
Grp Sat Flow(s),veh/h/ln	0	0	1817	1781	1870	0	1781	0	1585			
Q Serve(g_s), s	0.0	0.0	10.8	6.3	7.2	0.0	2.6	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	0.0	10.8	6.3	7.2	0.0	2.6	0.0	0.0			
Prop In Lane	0.00		0.16	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	0	689	357	1249	0	304	0	588			
V/C Ratio(X)	0.00	0.00	0.79	0.81	0.52	0.00	0.42	0.00	0.53			
Avail Cap(c_a), veh/h	0	0	1043	524	1762	0	786	0	1017			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	11.2	15.6	3.5	0.0	15.1	0.0	10.1			
Incr Delay (d2), s/veh	0.0	0.0	2.4	3.6	0.3	0.0	0.9	0.0	0.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.0	3.7	2.5	1.0	0.0	0.9	0.0	1.7			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	13.6	19.2	3.8	0.0	16.0	0.0	10.8			
LnGrp LOS	A	A	B	B	A	A	B	A	B			
Approach Vol, veh/h		543			940			442				
Approach Delay, s/veh		13.6			8.5			12.3				
Approach LOS		B			A			B				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	11.8	19.1				30.8		10.0				
Change Period (Y+Rc), s	3.6	* 3.6				3.6		3.0				
Max Green Setting (Gmax), s	12.0	* 23				38.4		18.0				
Max Q Clear Time (g_c+I1), s	8.3	12.8				9.2		4.6				
Green Ext Time (p_c), s	0.2	2.7				5.0		1.5				

Intersection Summary												
HCM 6th Ctrl Delay			10.8									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix C

SCTA Model VMT per Capita Map

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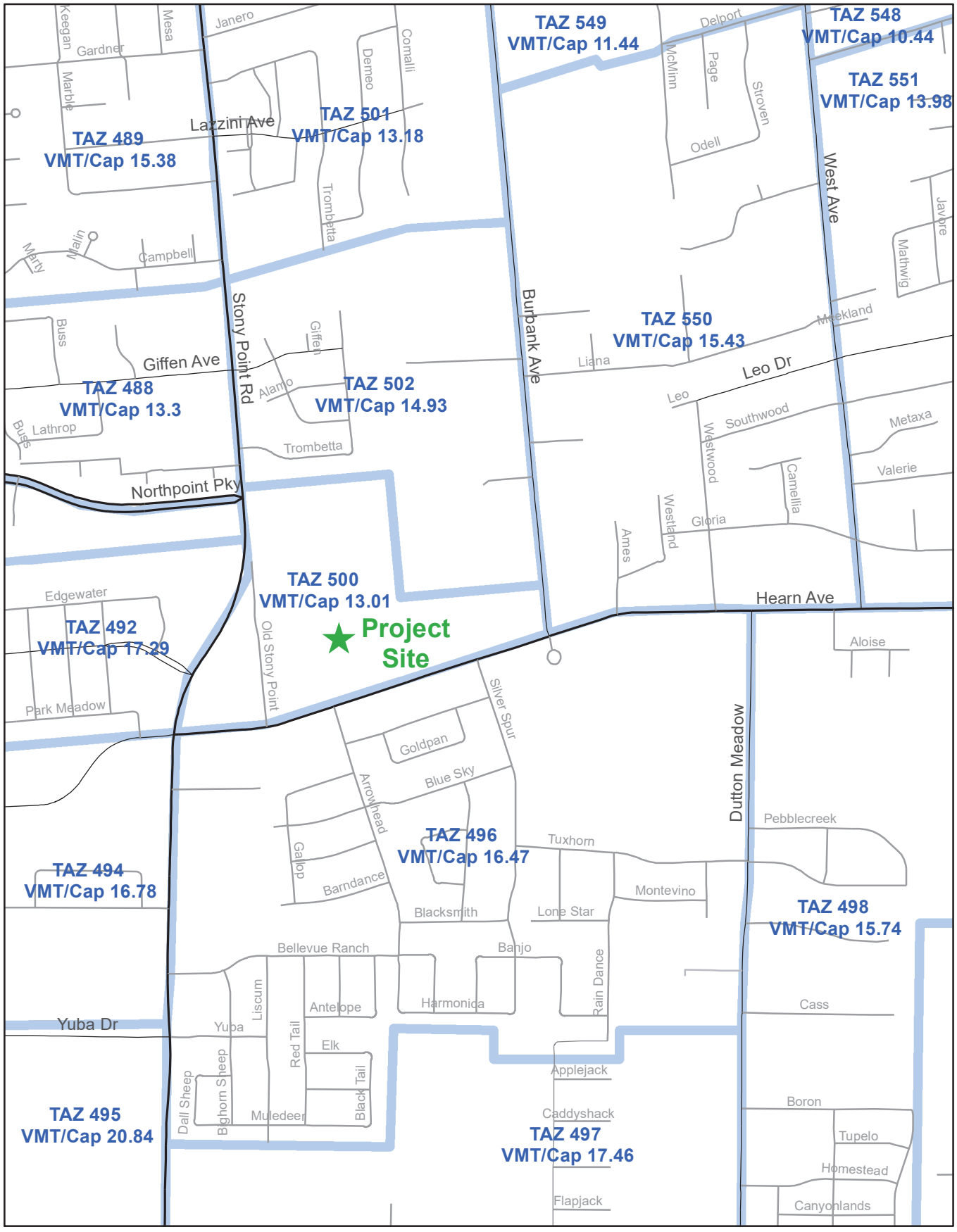
SCTA Regional Model (Fall 2020)
VMT per Capita by Traffic Analysis Zone



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Appendix D

Emergency Vehicle Access Exhibits

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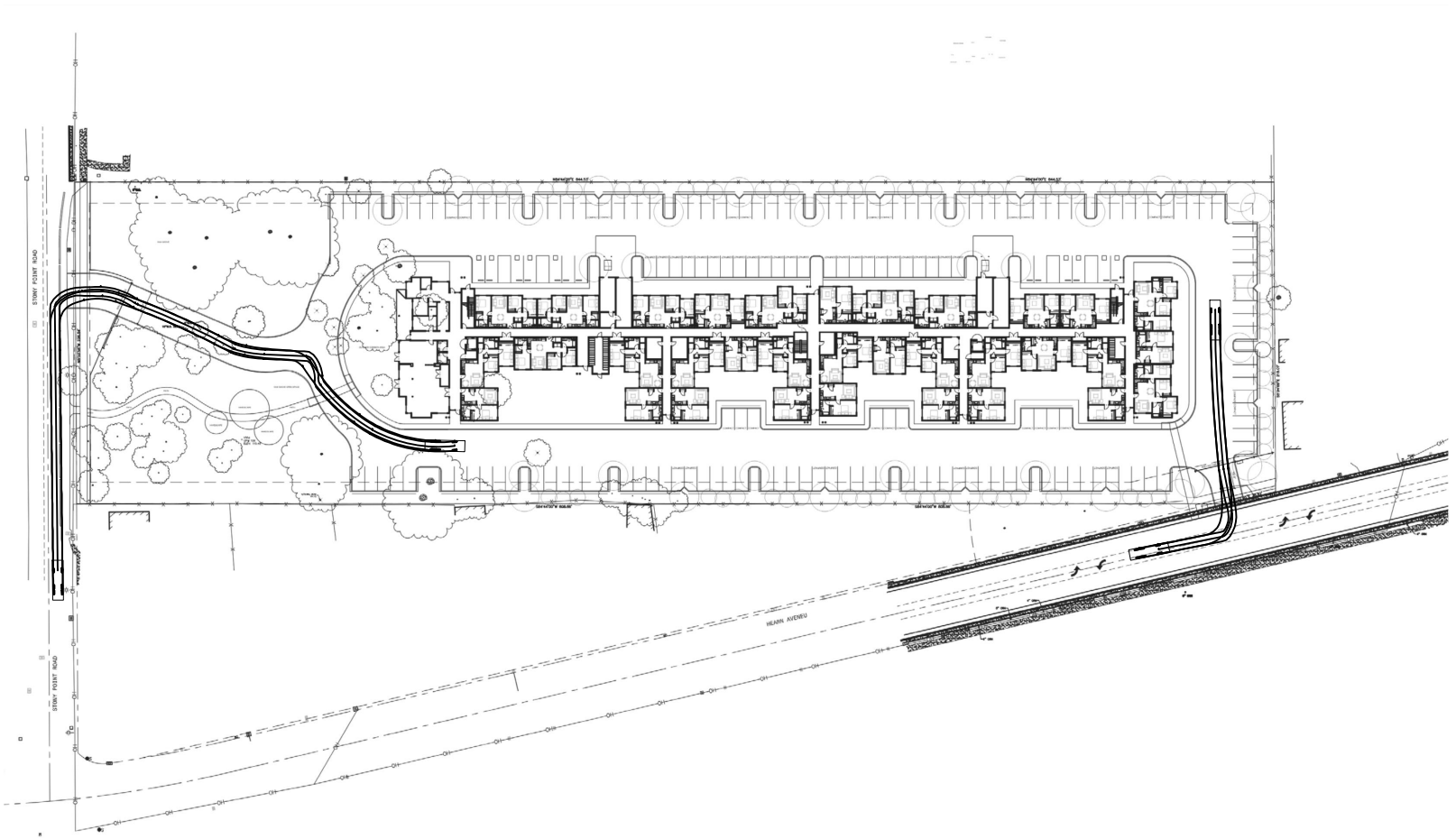

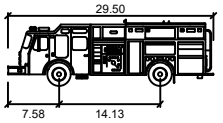

Sonoma County Fire Truck Feet

Width	: 8.00
Track	: 6.91
Lock to Lock Time	: 6.0
Steering Angle	: 38.8

2542 Old Stony Point Road

Fire Truck Access

SRO411

January 2021

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Appendix E

Signal Warrant Spreadsheets

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Warrant 3: Peak-Hour Volumes and Delay

Hearn Avenue & Burbank Avenue
Santa Rosa

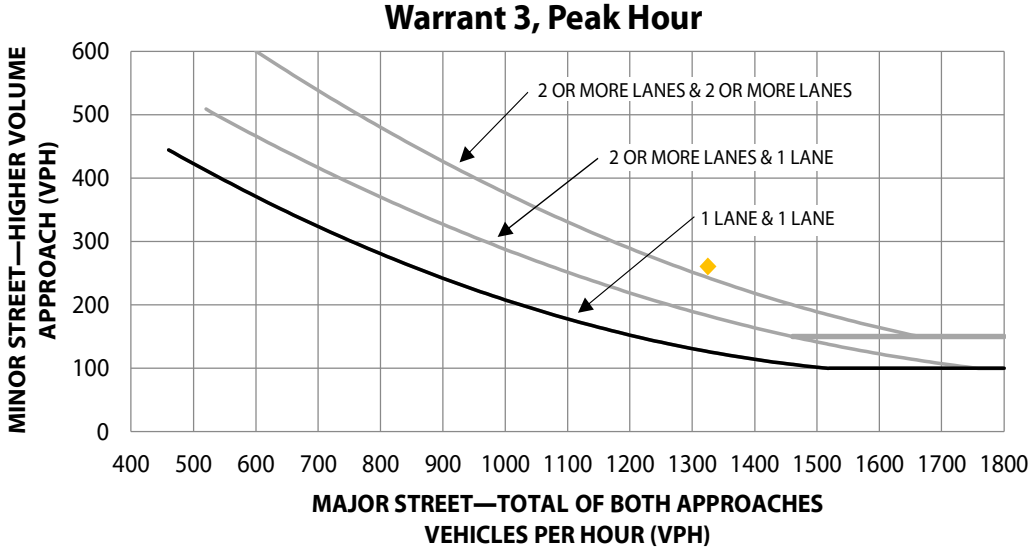
Project Name: Stony Oaks TIS

Intersection: 4

	Major Street	Minor Street
Street Name	Hearn Avenue	Burbank Avenue
Direction	E-W	N-S
Number of Lanes	1	1
Approach Speed	30	25

Population less than 10,000? No
Date of Count: Wednesday, September 11, 2019
Scenario: AM Baseline

Warrant 3 Met?: Met when either Condition A or B is met	**Yes**
Condition A: Met when conditions A1, A2, and A3 are met	Met
Condition A1	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: 29.81 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: 261 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: 1603 vph	
Condition B	Met
The plotted point falls above the curve	



Warrant 3: Peak-Hour Volumes and Delay

Hearn Avenue & Burbank Avenue
Santa Rosa

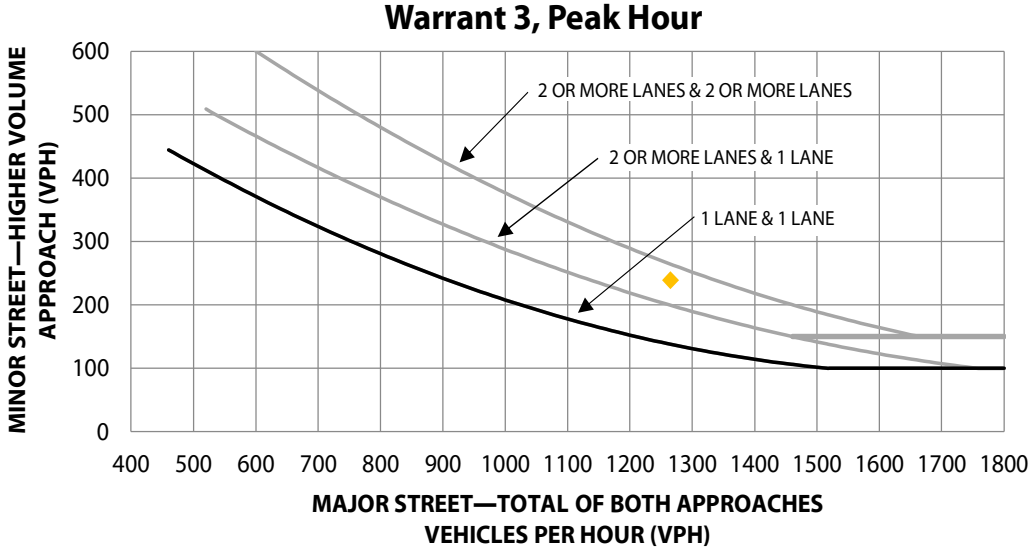
Project Name: Stony Oaks TIS

Intersection: 4

	Major Street	Minor Street
Street Name	Hearn Avenue	Burbank Avenue
Direction	E-W	N-S
Number of Lanes	1	1
Approach Speed	30	25

Population less than 10,000? No
Date of Count: Wednesday, September 11, 2019
Scenario: PM Baseline

Warrant 3 Met?: Met when either Condition A or B is met	**Yes**
Condition A: Met when conditions A1, A2, and A3 are met	Met
Condition A1	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: 13.51 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: 239 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: 1563 vph	
Condition B	Met
The plotted point falls above the curve	



Warrant 3: Peak-Hour Volumes and Delay

Hearn Avenue & Burbank Avenue
Santa Rosa

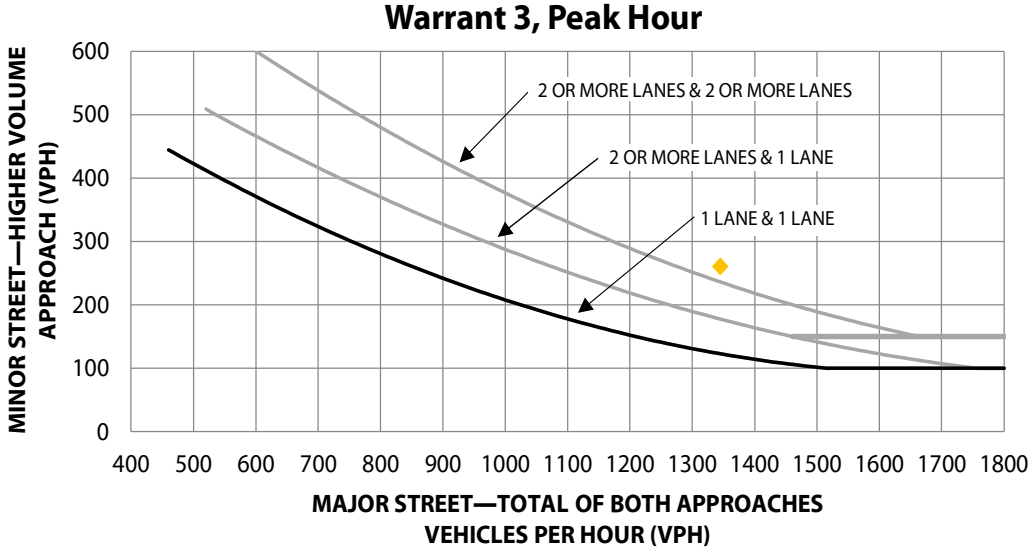
Project Name: Stony Oaks TIS

Intersection: 4

	Major Street	Minor Street
Street Name	Hearn Avenue	Burbank Avenue
Direction	E-W	N-S
Number of Lanes	1	1
Approach Speed	30	25

Population less than 10,000? No
Date of Count: Wednesday, September 11, 2019
Scenario: AM Baseline Plus 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	Met
Condition A1	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: 31.83 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: 261 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: 1623 vph	
Condition B	Met
The plotted point falls above the curve	



Warrant 3: Peak-Hour Volumes and Delay

Hearn Avenue & Burbank Avenue
Santa Rosa

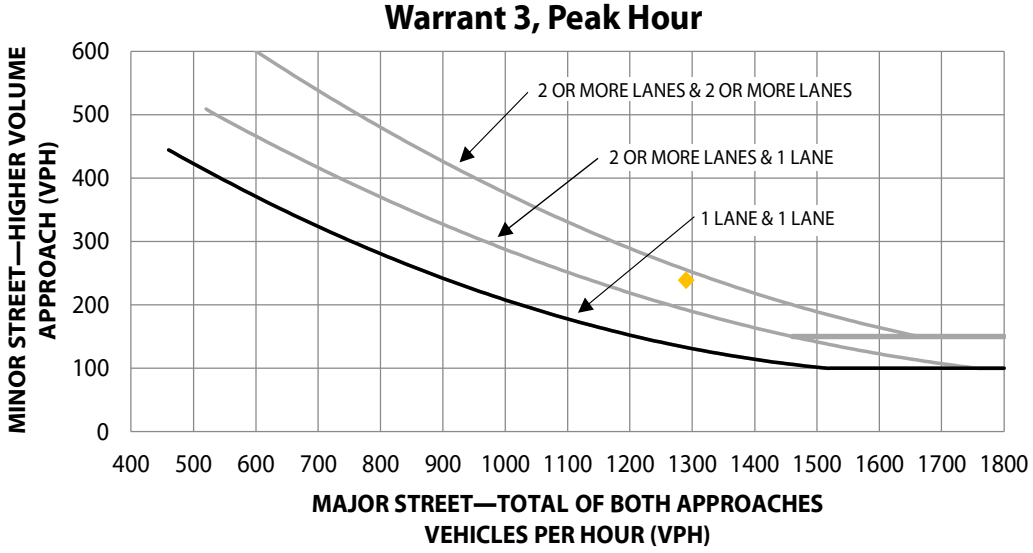
Project Name: Stony Oaks TIS

Intersection: 4

	Major Street	Minor Street
Street Name	Hearn Avenue	Burbank Avenue
Direction	E-W	N-S
Number of Lanes	1	1
Approach Speed	30	25

Population less than 10,000? No
Date of Count: Wednesday, September 11, 2019
Scenario: PM Baseline Plus 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	Met
Condition A1	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: 14.89 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: 239 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: 1588 vph	
Condition B	Met
The plotted point falls above the curve	



Appendix F

Proportionate Share Calculations

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Equitable Share Calculations
Hearn Avenue/Burbank Avenue

AM Peak Hour Southbound Approach Delay (seconds)

Existing	62.4
Baseline (no project)	244.5
Baseline + Project	263.2
Project Delay (D)	18.7

Description of Project Improvement:

Install traffic signal

Calculation of Project Share

P = D / (DB - DE)
where:
P = Equitable Share
D = Project added delay during the affected peak hour
DB = Baseline plus Project Delay
DE = Existing Delay

D	18.7
DB	263.2
DE	62.4
P	**9.3%**

Total Estimated Cost of Improvements	$320,000
Equitable Share Contribution	**$29,760**

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