PROPOSED

# MITIGATED NEGATIVE DECLARATION AND INITIAL STUDY

FOR THE

# FULLERTON RANCH PLANNED DEVELOPMENT PROJECT

AUGUST 2017

*Prepared for:*

City of Lincoln
Community Development Department
600 Sixth Street
Lincoln, CA 95648

*Prepared by:*

De Novo Planning Group
1020 Suncast Lane, Suite 106
El Dorado Hills, CA 95762
(916) 580-9818

De Novo Planning Group

A Land Use Planning, Design, and Environmental Firm

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# Proposed Mitigated Negative Declaration for the Fullerton Ranch Planned Development Project

**Lead Agency:** City of Lincoln
600 Sixth Street
Lincoln, CA 95648

**Project Title:** Fullerton Ranch Planned Development

**Project Location:** The project site is located west of Joiner Parkway and south of Nicolaus Road in a predominately residential area of Lincoln, California. The project site totals approximately 19.7 acres and is currently undeveloped. The Assessor's Parcel Numbers (APNs) for the project site are 021-310-094, -095, and -096.

**Project Description:** The project includes a Rezone and a Vesting Tentative Subdivision Map that would facilitate the development of 81 single family residential units on approximately 19.7 acres located southwest of the Nicolaus Road and Joiner Parkway intersection. The project applicant has submitted a vesting tentative subdivision map which contains a lot layout plan, preliminary utility layout plan, preliminary grading and drainage plan, existing easements plan, and a preliminary tree removal plan. The proposed project would require a rezone from RE to Planned Development-Low Density Residential (PD-LDR).

The proposed project contemplates lot sizes that range from 6,000 square feet (sf) to over 24,000 sf with an average lot size exceeding 8,000 sf. The overall site density is 4.11 dwelling units per acre. Lots would be served by interior streets conforming to the City's 50-foot and 44-foot public right-of-way standards. Roadway connections would be made to existing streets at Nicolaus Road (north), Abbeyhill Road (west), Savannah Drive (east), and Milan Way (south). At the southern access point, Sydney Terrace, a right-of-way extension would link the proposed Amelia Way/Amelia Court roadway to the existing Milan Way/Montaro Court roadway to the south of the project site. Unimpeded emergency vehicle access would be provided along this southern connection. The right-of-way extension from Sydney Terrace would include a raised rolled curb on both sides of the road, signage and striping to indicate 'No Parking', stamped and colored concrete, and landscaping on both sides, totaling 47 feet in right-of-way width.

As part of the PD zoning designation, development standards, setbacks, plotting, parking, and other project characteristics have been developed for the project.

The proposed project would connect to existing City infrastructure to provide water, sewer, and storm drainage utilities. A water quality basin would be located in the northeastern portion of the project site. Police protection service would be provided by the Lincoln Police Department. The Lincoln Fire Department would provide fire protection service. School services would be provided by the Western Placer Unified School District. Gas and electricity will be provided by Pacific Gas & Electric.

**Findings:**

In accordance with the California Environmental Quality Act, the City of Lincoln has prepared an Initial Study to determine whether the proposed Project may have a significant adverse effect on the environment. The Initial Study and Proposed Mitigated Negative Declaration reflect the independent judgment of City of Lincoln staff. On the basis of the Initial Study, the City of Lincoln hereby finds:

> *Although the proposed project could have a significant adverse effect on the environment, there will not be a significant adverse effect in this case because the project has incorporated specific provisions to reduce impacts to a less than significant level and/or the mitigation measures described herein have been added to the project. A Mitigated Negative Declaration has thus been prepared.*

The Initial Study, which provides the basis and reasons for this determination, is attached and/or referenced herein and is hereby made a part of this document.

________________________________________ ____________________
Signature Date

**Proposed Mitigation Measures:**

The following Mitigation Measures are extracted from the Initial Study. These measures are designed to avoid or minimize potentially significant impacts, and thereby reduce them to an insignificant level. A Mitigation Monitoring and Reporting Program (MMRP) is an integral part of project implementation to ensure that mitigation is properly implemented by the City of Lincoln and the implementing agencies. The MMRP will describe actions required to implement the appropriate mitigation for each CEQA category including identifying the responsible agency, program timing, and program monitoring requirements. Based on the analysis and conclusions of the Initial Study, the impacts of proposed project would be mitigated to less-than-significant levels with the implementation of the mitigation measures presented below.

***Mitigation Measure Air-1:*** *Prior to approval of grading or improvement plans for the project, the applicant shall submit a Construction Emission/Dust Control Plan to PCAPCD. Construction contractors shall not break ground prior to receiving PCAPCD approval of the Construction Emission/Dust Control Plan, and delivering that approval to the City.*

***Mitigation Measure Air-2:*** *To reduce criteria pollutant emissions and energy consumption, the project applicant shall institute measures to reduce wasteful, inefficient, and unnecessary consumption of energy during construction, operation, and maintenance/landscaping. The measures to reduce wasteful, inefficient, and unnecessary consumption of energy during construction, operation, and maintenance/landscaping include the following:*

- *Ensure that the pedestrian/bicycle network within the project area connects to offsite pedestrian networks.*
- *Provide traffic calming measures on proposed street segments within the project site, where feasible. Traffic calming features may include: marked crosswalks, textured pavement, curb extensions, median islands, or on-street parking.*
- *Exceed Title 24 energy efficiency requirements from the 2013 California Building Energy Efficiency Standards by 15 percent.*
- *Install high efficiency lighting and appliance within all buildings (i.e., EnergyStar qualified appliances).*
- *Install low-flow faucets, toilets, and showers as applicable.*
- *Use water-efficient irrigation systems throughout the project area.*
- *Prohibit wood burning fireplaces.*

***Mitigation Measure Bio-1:*** *If project construction activities, including vegetation clearing, are to occur during the nesting season for birds protected under the California Fish and Game Code and/or Migratory Bird Treaty Act (approximately March 1-August 31), the project applicant shall retain a qualified biologist to perform preconstruction surveys for protected birds, including nesting raptors, on the project site and in the immediate vicinity. At least two surveys shall be conducted no more than 15 days prior to the initiation of construction activities, including vegetation clearing. In the event that protected birds, including nesting raptors, are found on the project site, offsite improvement corridors, or the immediate vicinity, the project applicant shall:*

- *Locate and map the location of the nest site. Within 2 working days of the surveys prepare a report and submit to the City and CDFW;*
- *A no-disturbance buffer of 250 feet shall be established;*
- *On-going weekly surveys shall be conducted to ensure that the no disturbance buffer is maintained. Construction can resume when a qualified biologist has confirmed that the birds have fledged.*

*In the event of destruction of a nest with eggs, or if a juvenile or adult raptor should become stranded from the nest, injured or killed, the qualified biologist shall immediately notify the CDFW. The qualified biologist shall coordinate with the CDFW to have the injured raptor either transferred to a raptor recovery center or, in the case of mortality, transfer it to the CDFW within 48 hours of notification. If directed/authorized by the CDFW during the notification, the qualified biologist may transfer the injured raptors to a raptor recovery center.*

***Mitigation Measure Bio-2****: Prior to any construction activities that would disturb protected wetlands and/or jurisdictional areas on the project site, the appropriate state and federal authorizations (Streambed Alteration Agreement, Section 404 permit, Section 401 water quality certification) shall be obtained. All requirements of these authorizations shall be adhered to throughout the construction phase.*

***Mitigation Measure Bio-3****: The project proponent shall compensate for any authorized disturbance to protected wetlands and/or jurisdictional areas to ensure no net loss of habitat functions and values. Compensation ratios shall be based on site-specific information and determined through coordination with state, federal, and local agencies as part of the permitting process for the project. Unless determined otherwise by the regulatory/permitting agency, the compensation shall be at a minimum ratio of 1 acre restored, created, and/or preserved for every 1 acre of protected wetlands and/or jurisdictional areas disturbed. Compensation may comprise onsite restoration/creation, off-site restoration, preservation, or mitigation credits (or a combination of these elements).*

***Mitigation Measure Bio-4****: Prior to removal of any trees, the project applicant shall obtain a tree removal permit from the City of Lincoln in accordance with the City's Oak Tree Preservation Ordinance (Chapter 18.69). For native oak trees that must be removed, the applicant shall implement the following:*

- *Replacement of oak tree(s) removed or irrevocably harmed by planting replacement specimen trees of no less than 15 gallons in size, having a total combined diameter at the time of planting equal to the diameter of the removed tree(s). In order to ensure survival of the replacement tree(s), the project applicant shall be responsible for inspection of the replacement tree(s) during the early plant establishment period for sprouting success and survival for three years. Sprouting success may be documented using monitoring data. Monitoring data may include plant density (average number of individuals/unit area), cover of the area covered by a given species, and species composition. Success criteria will be based on the survival rates. Percent survival for years one, two and three are 90, 80 and 70, respectively. Species not meeting the success criteria shall be replanted, providing the mortality causes can be identified and corrected prior to replanting. If the causes cannot be identified, another native species with high survival rates shall be used for replacement. Photographs shall be taken in the same month each year to assist in evaluation of mitigation success.*
- *If the project site is not capable of supporting all the required replacement trees, a fee shall be paid to the City equal to the retail costs at the time of the replacement trees.*
- *To reduce the loss of protected native oak trees (those not requiring removal), the applicant shall comply with all conditions of project approval and any City guidelines for protected native oak trees. This includes implementation of the Tree Management Recommendations and Protection Measures as outlined in the Arborist Report (2016) for pre-construction, during construction, and post-construction.*

***Mitigation Measure Cul-1:** If cultural resources (i.e., prehistoric sites, historic sites, isolated artifacts/features, and paleontological sites) are discovered, work shall be halted immediately within 50 meters (165 feet) of the discovery, the City of Lincoln and tribal representatives from the United Auburn Indian Community (UAIC) of the Auburn Rancheria and the Shingle Springs Band of Miwok Indians shall be notified, and a qualified archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology (or a qualified paleontologist in the event paleontological resources are found) shall be retained to determine the significance of the discovery. The City of Lincoln shall consider recommendations presented by the professional for any unanticipated discoveries and shall carry out the measures deemed feasible and appropriate. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures. Specific measures are developed based on the significance of the find.*

***Mitigation Measure Cul-2:** If any human remains are found during grading and construction activities, all work shall be halted immediately within 50 meters (165 feet) of the discovery and the County Coroner must 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 shall notify the Native American Heritage Commission, and the procedures outlined in CEQA Section 15064.5(d) and (e) shall be followed. Additionally, if the Native American resources are identified, a Native American monitor, following the Guidelines for Monitors/Consultants of Native American Cultural, Religious, and Burial Sites established by the Native American Heritage Commission, may also be required and, if required, shall be retained at the applicant's expense.*

***Mitigation Measure Geo-1:** Prior to the development of the Project site, further subsurface geotechnical investigation shall be performed to identify onsite soil conditions and identify any site-specific engineering measures to be implemented during the construction of building foundations, surface improvements, and subsurface improvements. The results of the subsurface geotechnical investigation shall be reflected on the Improvements Plans, subject to review and approval by the City's Building Division.*

***Mitigation Measure Geo-2:*** *Expansive materials and potentially weak and compressible fills at the site shall be evaluated by a Geotechnical Engineer during the grading plan stage of development. If highly expansive or compressible materials are encountered, special foundation designs and reinforcement, removal and replacement with soil with low to non-expansive characteristics, compaction strategies, or soil treatment options to lower the expansion potential shall be incorporated through requirements imposed by the City's Building Division. Additionally, the recommendations of the Preliminary Geotechnical Engineering Report (Wallace-Kuhl & Associates, 2004) shall be reflected on the Improvements Plans, subject to review and approval by the City's Building Division.*

***Mitigation Measure Geo-3:*** *The project applicant shall submit a Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) to the RWQCB in accordance with the NPDES General Construction Permit requirements. The SWPPP shall be designed to control pollutant discharges utilizing Best Management Practices (BMPs) and technology to reduce erosion and sediments. BMPs may consist of a wide variety of measures taken to reduce pollutants in stormwater runoff from the project site. Measures shall include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) that will be employed to control erosion from disturbed areas. Final selection of BMPs will be subject to approval by the City of Lincoln and the RWQCB. The SWPPP will be kept on site during construction activity and will be made available upon request to representatives of the RWQCB.*

***Mitigation Measure Haz-1:*** *An overflight notification shall be recorded for residential land uses within Compatibility Zone C2 and an airport proximity disclosure shall be provided for residential land uses within Compatibility Zone D.*

***Mitigation Measure Haz-2:*** *Ensure that the proposed on-site detention uses are implemented in a manner consistent with ALUCP Policy 3.5.3 (a)(6) and Federal Aviation Administration regulation (FAA Advisory Circular 150.5200-33B, "Hazardous Wildlife Attractants On or Near Airports"). This requirement shall be noted on the project improvement plans.*

***Mitigation Measure Hydro-1:*** *The storm drainage plan shall be designed and engineered to ensure that post-project runoff is equal to or less than pre-project runoff in accordance with the West Placer Storm Water Quality Design Manual. The applicant shall provide the City Engineer with all stormwater runoff calculations with the improvement plan submittal.*

***Mitigation Measure Noise-1:*** *A 6-foot tall sound wall shall be constructed along Nicolaus Road, in accordance with the Noise Barrier Location Map (JC Brennan 2017). The sound wall shall be reflected on the Improvements Plans, subject to review and approval by the City's Building Division.*

***Mitigation Measure Noise-2:*** *All project construction activities shall comply with the following:*

- *Construction hours shall be limited to 7 a.m. to 7 p.m., Monday through Friday (unless extended by a special permit).*
- *All heavy construction equipment and all stationary noise sources (such as diesel generators) shall have manufacturer-installed mufflers.*
- *Equipment warm up areas, water tanks, and equipment storage areas shall be located in an area as far away from existing residences as is feasible.*

*The above requirements shall be reflected on the Improvements Plans, subject to review and approval by the City's Building Division.*

***Mitigation Measure Public-1:*** *The applicant shall pay applicable park in-lieu fees or dedicate 1.455 acres of parkland in accordance with the City of Lincoln Municipal Code standards outlined in Chapter 17.32. Proof of payment of the in-lieu fees shall be submitted to the City Engineer.*

***Mitigation Measure Trans-1:*** *Prior to approval of improvements plans, the improvement plans shall reflect the following bicycle facility improvements on and adjacent to the project site:*

- *Construct the segment of the Class II bike lane along the project frontage on the south side of Nicolaus Road. Alternatively, the project shall dedicate the right-of-way and pay the project's fair share towards the Class II bike lane on the south side of Nicolaus Road between Waverly Drive and Joiner Parkway.*

- *Construct the Class III bike lane connecting Nicolaus Road, through the Glenmoor Subdivision via Abbeyhill Road, through the project site, to Savannah Drive.*

***Mitigation Measure Tribal-1:*** *If cultural resources are discovered during project-related construction activities, all ground disturbances within a minimum of 50 feet of the find shall be halted until a qualified professional archaeologist can evaluate the discovery, and tribal representatives from the United Auburn Indian Community (UAIC) of the Auburn Rancheria and the Shingle Springs Band of Miwok Indians shall be contacted. The archaeologist, in coordination with the UAIC and Shingle Springs Band of Miwok Indians representatives, shall examine the resources, assess their significance, and recommend appropriate procedures to the lead agency to either further investigate or mitigate adverse impacts. If the find is determined by the lead agency in consultation with the Native American tribe traditionally and culturally affiliated with the geographic area of the project site to be a tribal cultural resource and the discovered archaeological resource cannot be avoided, then applicable mitigation measures for the resource shall be discussed with the geographically affiliated tribe. Applicable mitigation measures that also take into account the cultural values and meaning of the discovered tribal cultural resource, including confidentiality if requested by the tribe, shall be completed (e.g., preservation in place, data recovery program pursuant to PRC §21083.2[i]). During evaluation or mitigative treatment, ground disturbance and construction work could continue on other parts of the project site.*

***Mitigation Measure Utilities-1:*** *Prior to the issuance of a building or grading permit, the project applicant shall submit a drainage plan to the City of Lincoln for review and approval. The plan shall include an engineered storm drainage plan that demonstrates attainment of pre-project runoff requirements in accordance with the West Placer Storm Water Quality Design Manual prior to release and describes the volume reduction measures and treatment controls used to reach attainment consistent with the Lincoln Stormwater Post-Construction Ordinance.*

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# INITIAL STUDY CHECKLIST

## PROJECT TITLE

Fullerton Ranch Planned Development Project

## LEAD AGENCY NAME AND ADDRESS

City of Lincoln
600 6th Street
Lincoln, CA 95648

## CONTACT PERSON AND PHONE NUMBER

Robert Poetsch, Associate Planner
Community Development Department
City of Lincoln
600 Sixth Street
Lincoln, CA 95648
Robert.poetsch@lincolnca.gov
(916) 434-2470

## PROJECT SPONSOR'S NAME AND ADDRESS

Mr. Chris Tyler
Terravest Capital Partners, LP
3208 Wycliffe Drive
Modesto, California 95355

## PROJECT LOCATION AND SETTING

The project site is located west of Joiner Parkway and south of Nicolaus Road in a predominately residential area of Lincoln, California (Figure 1 and 2). The project site totals approximately 19.7 acres and is currently undeveloped. The Assessor's Parcel Numbers (APNs) for the project site are 021-310-094, -095, and -096. The site is nearly level at an elevation of approximately 133 to 135 feet above mean sea level (MSL). The project site contains 189 individual trees scattered throughout the project site, including 99 blue oaks, 85 valley oaks, and 6 interior live oaks (Figure 3). At the southwestern corner of the project site, the property abuts the City's former Wastewater Treatment Plant, which is a proposed master-planned residential community development by Lewis Communities that would include low- and medium-density residential land uses, open space, and public facilities to serve the development.

## GENERAL PLAN AND ZONING

The project site has a Low Density Residential (LDR) General Plan Land Use Designation (Figure 4) and Residential Estate (R-E) Zoning Designation (Figure 5).

## PROJECT DESCRIPTION

The proposed project includes a Rezone and a Vesting Tentative Subdivision Map that would facilitate the development of 81 single family residential units on approximately 19.7 acres located southwest of the Nicolaus Road and Joiner Parkway intersection (Figure 6). The project applicant has submitted a vesting tentative subdivision map which contains a lot layout plan, preliminary utility layout plan, preliminary grading and drainage plan, existing easements plan, and a preliminary tree removal plan. These detailed preliminary plans are contained in Appendix A. The proposed project would require a rezone from RE to Planned Development-Low Density Residential (PD-LDR).

The proposed project contemplates lot sizes that range from 6,000 square feet (sf) to over 24,000 sf with an average lot size exceeding 8,000 sf. The overall site density is 4.11 dwelling units per acre.

Lots would be served by interior streets conforming to the City's 50-foot and 44-foot public right-of-way standards. Roadway connections would be made to existing streets at Nicolaus Road (north), Abbeyhill Road (west), Savannah Drive (east), and Milan Way (south). At the southern access point, Sydney Terrace, a right-of-way extension would link the proposed Amelia Way/Amelia Court roadway to the existing Milan Way/Montaro Court roadway to the south of the project site. Unimpeded emergency vehicle access would be provided along this southern connection. The right-of-way extension from Sydney Terrace would include a raised rolled curb on both sides of the road, signage and striping to indicate 'No Parking', stamped and colored concrete, and landscaping on both sides, totaling 47 feet in right-of-way width.

As part of the PD zoning designation, development standards, setbacks, plotting, parking, and other project characteristics have been developed for the project. Table 1 shows the proposed development standard. The standards and regulations set forth in Table 1 are proposed to supersede those of the Lincoln Municipal Code, unless otherwise stated. In instances of conflicting regulations or standards, the regulations and standards contained in Table 1 are proposed to take precedence over the Municipal Code. If Table 1 is silent on an issue, then the standards in the Municipal Code or other applicable City, state, or federal codes will apply, as appropriate.

***Table 1: Development Standards***

| ***Lot Size and Building Intensity*** | ***Proposed PD Zoning Standard*** | ***Existing R-E Zoning Standard*** |
|---|---|---|
| *Lot Configuration (Minimums)* | | |
| Lot Area | 6,000 sf | 108,900 sf |
| Width, Interior Lot | 60' | 100' |
| Width, Corner Lot | 65' | 100' |
| Width, Knuckle or Cul-De-Sac (at street right-of-way) | 35 | N/A |
| Depth | 80' | 200' |
| *Lot Configuration (Maximums)* | | |
| Lot Coverage | 60% | 30% |
| Lot Depth to Width Ratio | 5:1 | N/A |

Table 2 shows the proposed setbacks. When not specified, setbacks will conform with Chapter 18.12, R-1 Zone, of Title 18 of the City Municipal Code.

A minimum of two parking spaces will be provided per unit in an enclosed garage. Three car front facing garages are allowed on houses that are a minimum of 45-feet wide and must be configured in one of the following ways: side-by-side with the third space offset from the remaining two spaces a minimum of two feet or separated by living space; the third space in a tandem configuration; a combination of side entry and front entry spaces. For houses that are less than 45-feet wide, a third car garage is permitted in tandem configuration only.

***Table 2: Setbacks***

| ***Setbacks*** | ***Proposed PD Zoning Standard*** | ***Existing R-E Zoning Standard*** |
|---|---|---|
| *Front Setbacks (Minimums)* | | |
| Living Space | 15’ | 25’ |
| Porch, Balcony, Deck | 10’ | N/A |
| Front Facing Garage | 18’ | N/A |
| Side Entry Garage | 12’ | N/A |
| *Rear Setbacks (Minimums)* | | |
| Balcony, Deck, Living Space | 10’ | 20’ |
| 2nd Story Living Space Adjacent to Nicolaus Road | 15’ | N/A |
| Patio Cover | 5’ | N/A |
| *Side Setbacks (Minimums)* | | |
| Living Space – Interior Side | 5’ | 10’ |
| Living Space – Street Side | 10’ | 10’ |
| Porches – Street Side | 10’ | N/A |
| *Building Height (Maximum)* | | |
| Height – Residence and Accessory Structures | Residence: 35’<br>Accessory: 16’ | Residence: 35’<br>Accessory: 16’ |

A variety of building forms, materials, colors, and roof forms and materials would be provided.

The proposed project would connect to existing City infrastructure to provide water, sewer, and storm drainage utilities. A water quality basin would be located in the northeastern portion of the project site. Police protection service would be provided by the Lincoln Police Department. The Lincoln Fire Department would provide fire protection service. School services would be provided by the Western Placer Unified School District. Gas and electricity will be provided by Pacific Gas & Electric.

## REQUESTED ENTITLEMENTS AND OTHER APPROVALS

The City of Lincoln is the Lead Agency for the proposed project, pursuant to the State Guidelines for Implementation of CEQA, Section 15050.

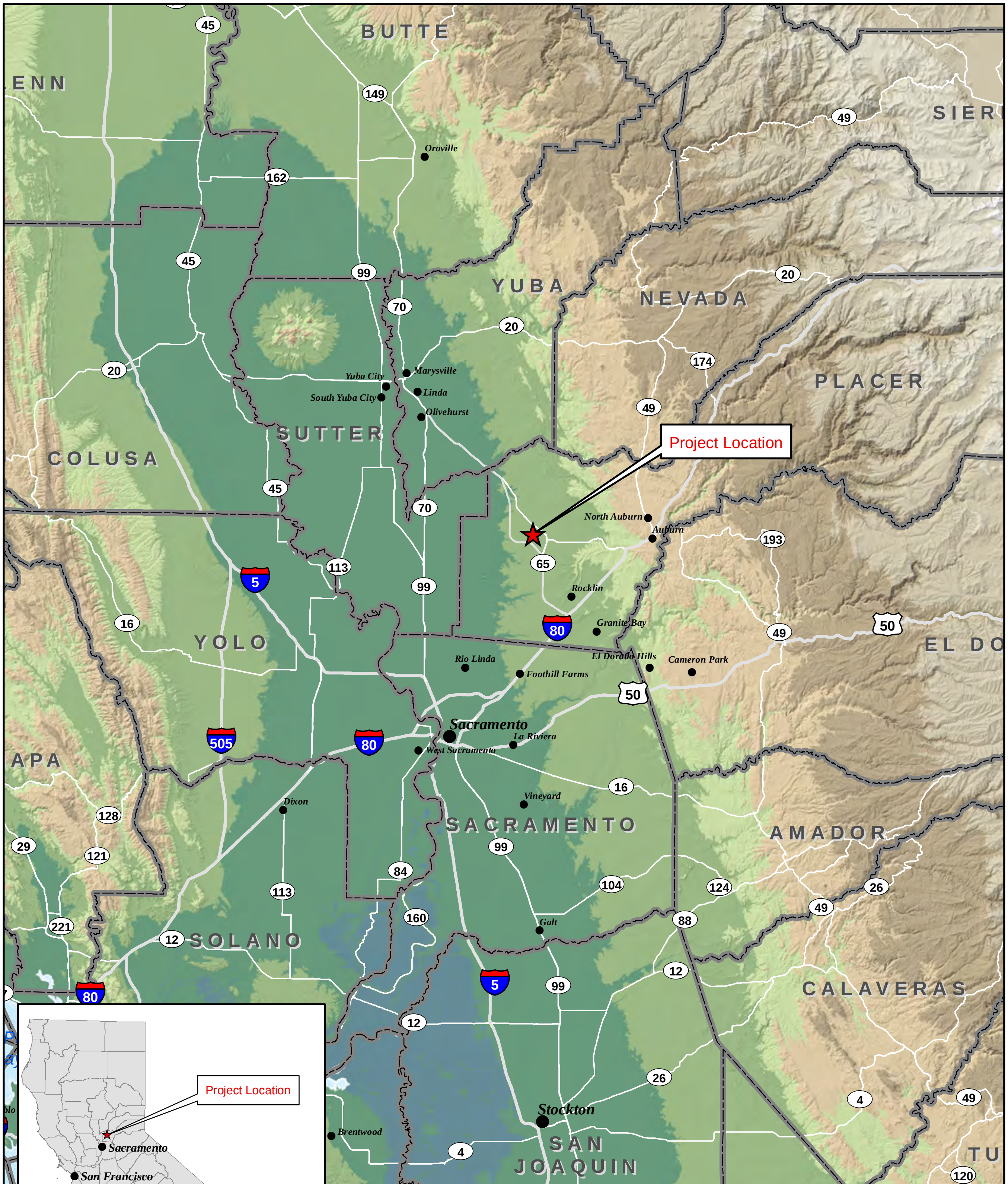
This document will be used by the City of Lincoln to take the following actions:

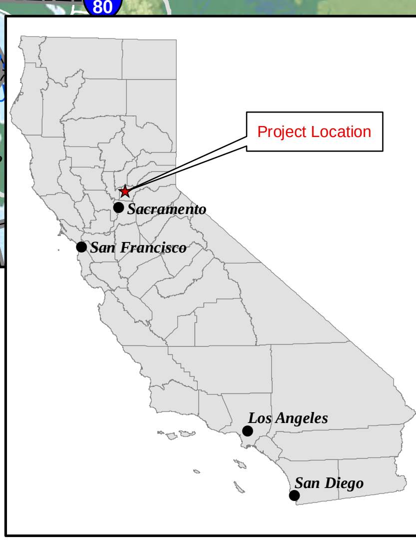
- Adoption of the MND;
- Adoption of the Mitigation Monitoring and Reporting Program (MMRP);
- Approval of a rezone from R-E to PD-LDR;
- Vesting Tentative Subdivision Map Approval; and
- Approval of the Fullerton Ranch General Development Plan.

The following agencies may be required to issue permits or approve certain aspects of the proposed project:

- California Department of Fish and Wildlife (CDFW) – Streambed Alteration Agreement pursuant to Section 1602 of the California Fish and Game Code;
- Placer County Airport Land Use Commission – Review of the proposed rezoning for consistency with the Placer County Airport Land Use Plan (ALUP).

- Regional Water Quality Control Board (RWQCB) – Construction activities would be required to be covered under the National Pollution Discharge Elimination System (NPDES);
- Regional Water Quality Control Board (RWQCB) – Water quality certification pursuant to Section 401 of the Clean Water Act;
- Regional Water Quality Control Board (RWQCB) – Permitting of State jurisdictional areas, including isolated wetlands pursuant to the Porter-Cologne Water Quality Act;
- Regional Water Quality Control Board (RWQCB) - Storm Water Pollution Prevention Plan (SWPPP) approval prior to construction activities pursuant to the Clean Water Act; and
- United States Army Corps Of Engineers (USACE) – Permitting of federal jurisdictional areas pursuant to Section 404 of the Clean Water Act.




**CITY OF LINCOLN - FULLERTON RANCH**

Figure 1: Regional Location Map

0 5 10
Miles
1:1,000,000

Sources: CalAtlas. Map date: December 6, 2016. Revised March 17, 2017

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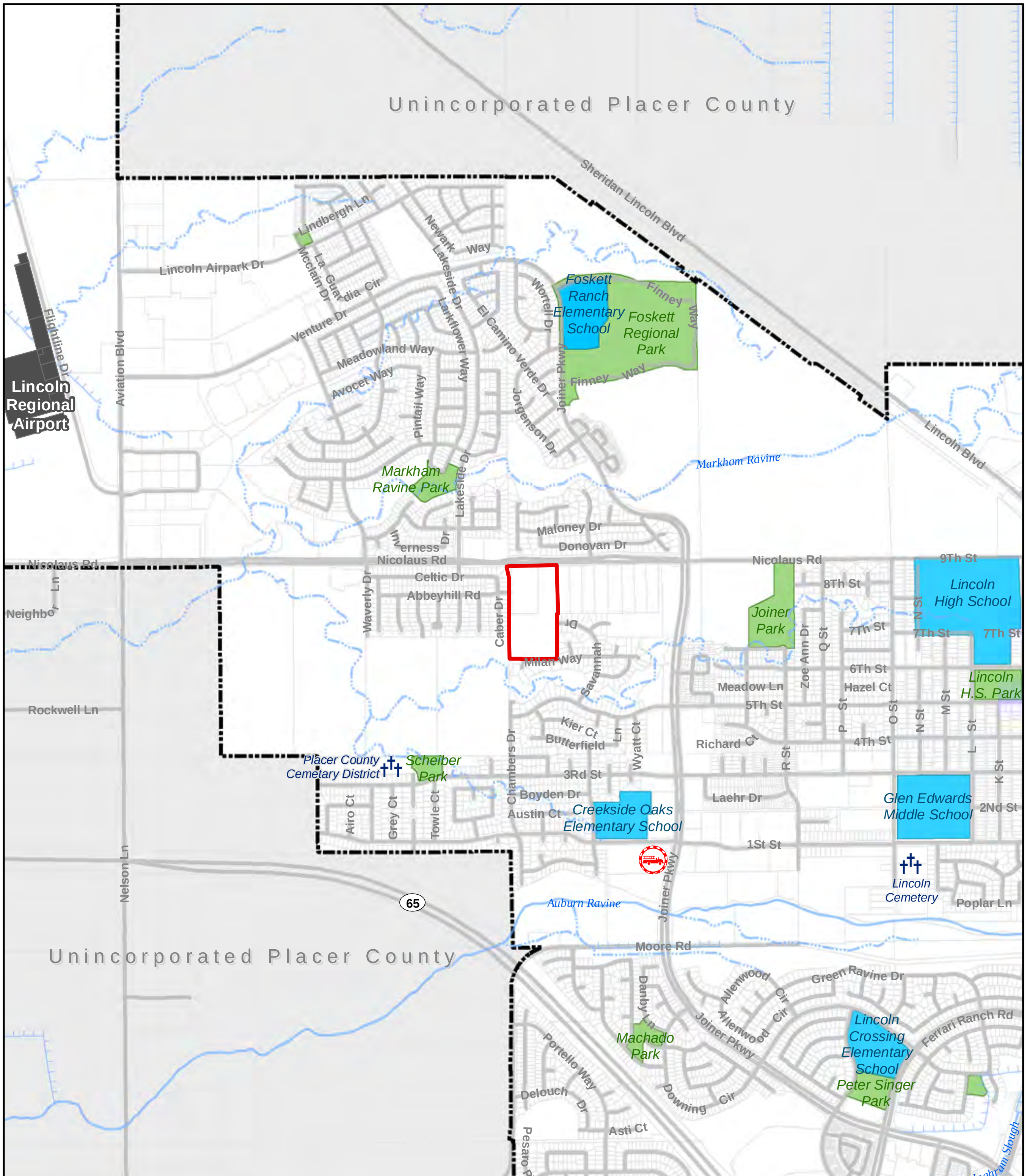


**CITY OF LINCOLN - FULLERTON RANCH**

Figure 2. Vicinity Map

**Legend**

- Project Boundary
- Lincoln City Boundary
- Perennial Stream
- Intermittent Stream
- Canal
- Park
- School
- Fire Station
- Cemetery

N

0 500 1,000
Feet
1:24,000

*Sources: Placer County GIS; Google Maps.*
*Map date: December 9, 2016. Revised March 17, 2017.*

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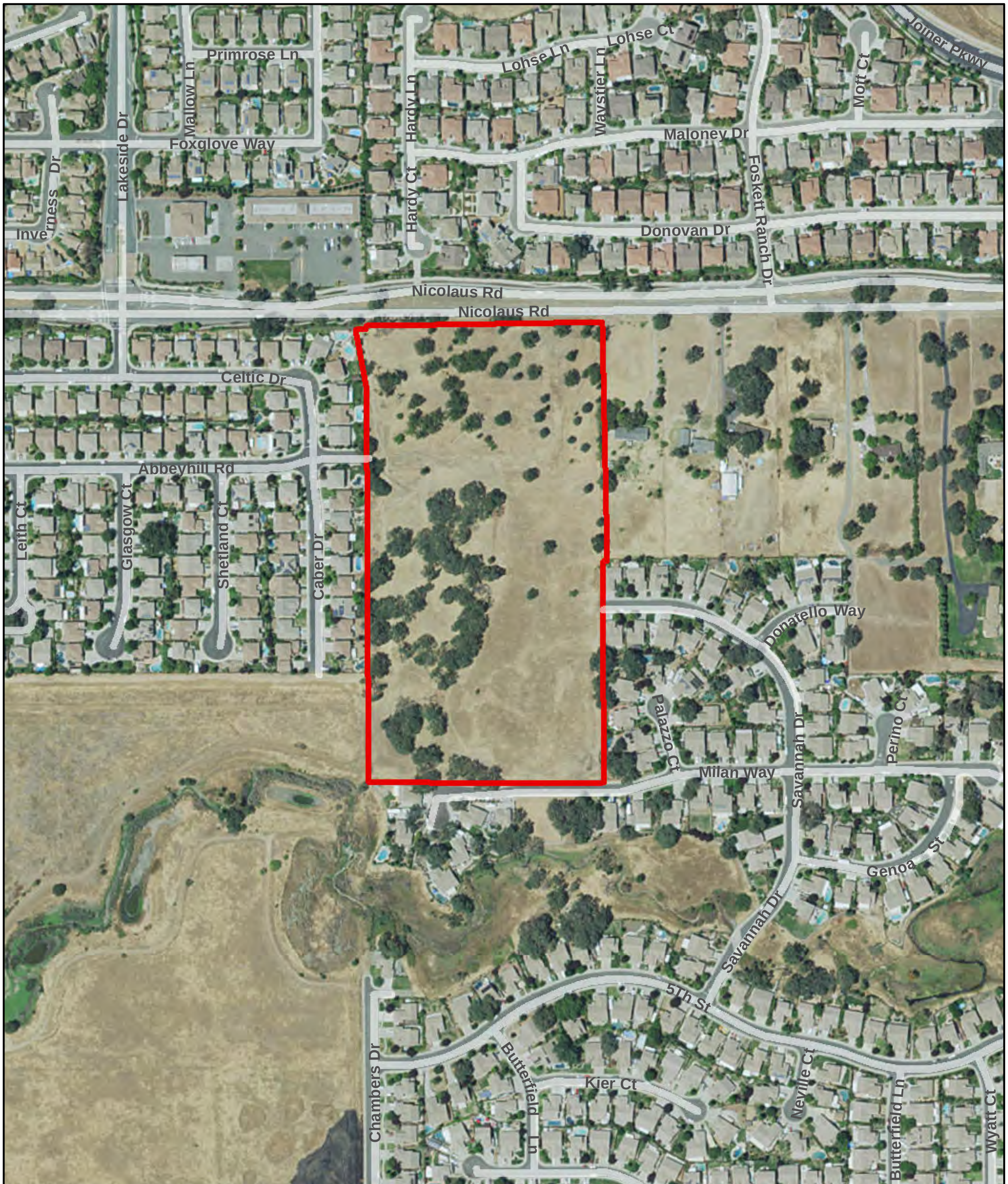


**CITY OF LINCOLN - FULLERTON RANCH**

Figure 3. Aerial View of Project Site

**Legend**

Project Boundary

N

0 150 300

Feet

1:4,800

*Sources: Placer County GIS; ArcGIS Online Worl Imagery Service. Map date: December 6, 2016.*

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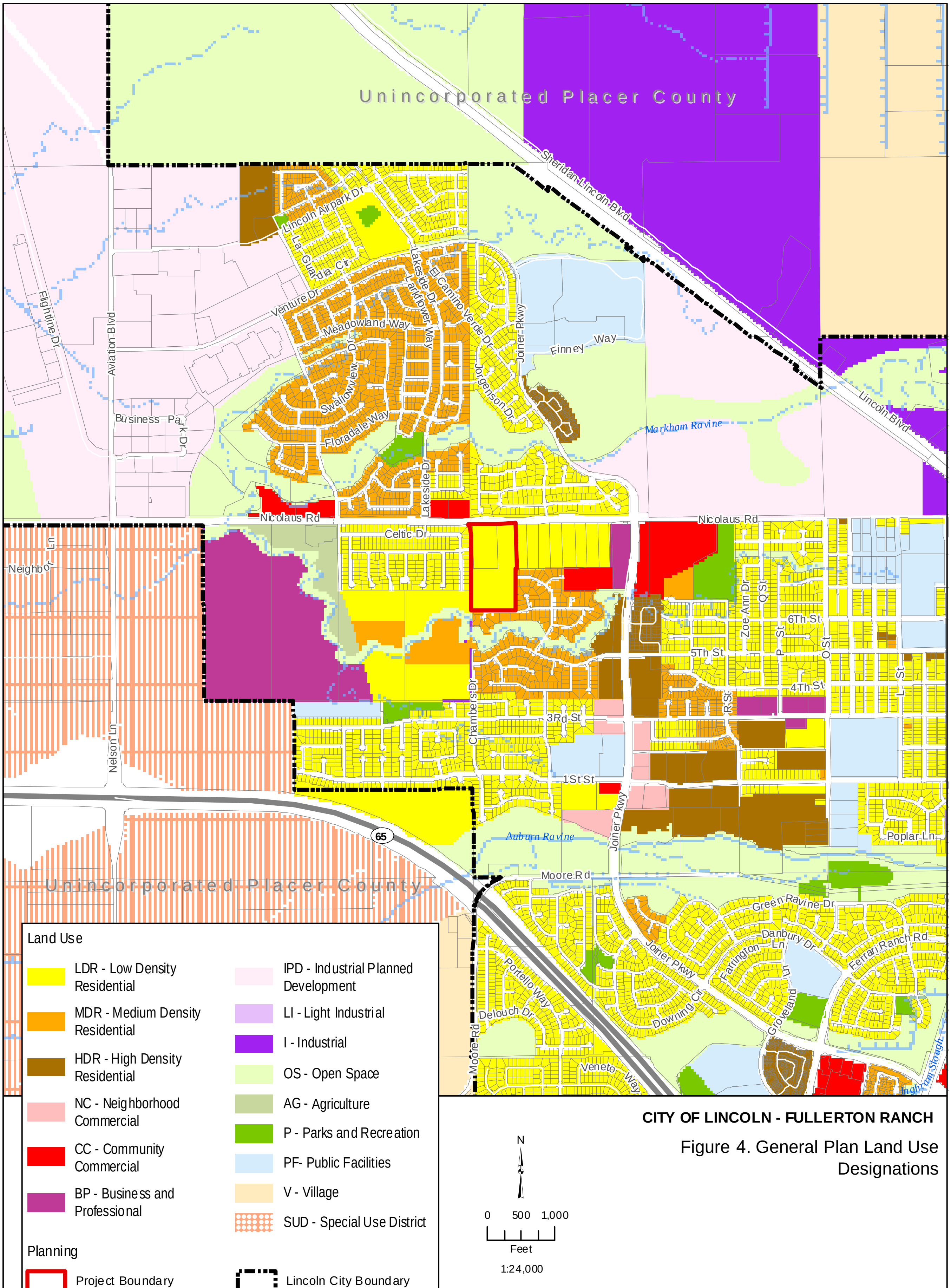


**CITY OF LINCOLN - FULLERTON RANCH**

Figure 4. General Plan Land Use Designations

*Sources: City of Lincoln General Plan, Land Use and Circulation Diagram, June 2014; Placer County GIS. Map date: December 15, 2016.*

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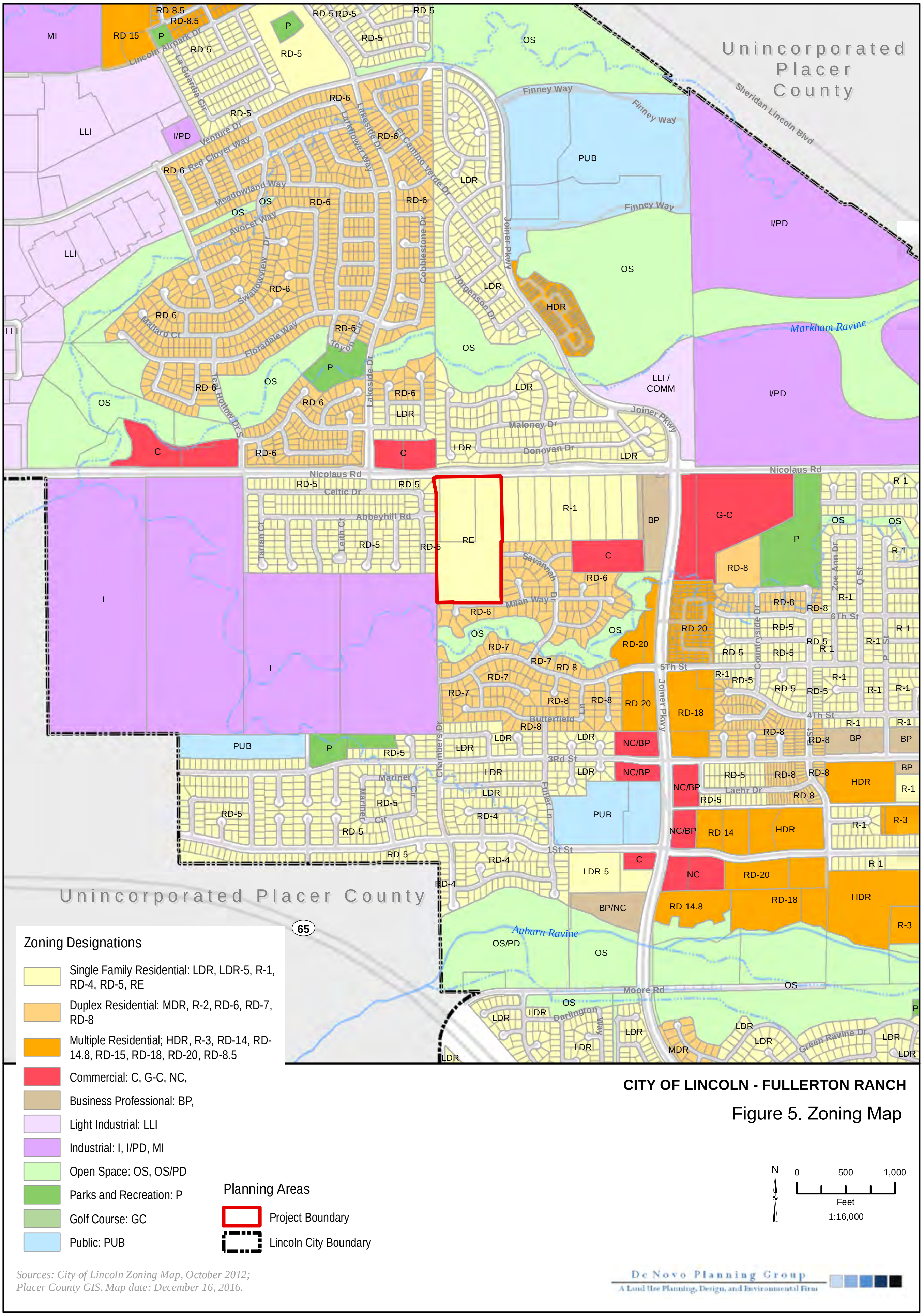
Unincorporated Placer County
Unincorporated Placer County
Sheridan Lincoln Blvd
Finney Way
Markham Ravine
Auburn Ravine
Nicolaus Rd
Joiner Pkwy
Lakeside Dr
Cobblestone Dr
El Camino Verde Dr
Jorgenson Dr
Maloney Dr
Donovan Dr
Celtic Dr
Abbeyhill Rd
Tartan Ct
Leith Ct
Savannah Dr
Milan Way
Butterfield
Chambers Dr
Mariner Cir
Fuller Ln
Countryside Dr
Zoe Ann Dr
5Th St
6Th St
4Th St
3Rd St
1St St
Laehr Dr
Moore Rd
Darlington Way
Green Ravine Dr
Lincoln Airpark Dr
La Guardia Cir
Venture Dr
Red Clover Way
Meadowland Way
Avocet Way
Swallowview Dr
Mallard Ct
Floradale Way
Toyon
Larkflower Way
65
Zoning Designations
Single Family Residential: LDR, LDR-5, R-1, RD-4, RD-5, RE
Duplex Residential: MDR, R-2, RD-6, RD-7, RD-8
Multiple Residential; HDR, R-3, RD-14, RD-14.8, RD-15, RD-18, RD-20, RD-8.5
Commercial: C, G-C, NC,
Business Professional: BP,
Light Industrial: LLI
Industrial: I, I/PD, MI
Open Space: OS, OS/PD
Parks and Recreation: P
Golf Course: GC
Public: PUB
Planning Areas
Project Boundary
Lincoln City Boundary
CITY OF LINCOLN - FULLERTON RANCH
Figure 5. Zoning Map
N
0 500 1,000
Feet
1:16,000
Sources: City of Lincoln Zoning Map, October 2012; Placer County GIS. Map date: December 16, 2016.
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**CITY OF LINCOLN - FULLERTON RANCH**

Figure 6. Site Plan

Source: VVII Consulting Engineer.

Map date: July 13, 2017.

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# ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

None of the environmental factors listed below would be significantly impacted by implementation of this project and the associated recommended mitigation measures, as described on the following pages.

| | | | | | |
|---|---|---|---|---|---|
| | Aesthetics | | Agriculture and Forest Resources | | Air Quality |
| | Biological Resources | | Cultural Resources | | Geology and Soils |
| | Greenhouse Gasses | | Hazards and Hazardous Materials | | Hydrology and Water Quality |
| | Land Use and Planning | | Mineral Resources | | Noise |
| | Population and Housing | | Public Services | | Recreation |
| | Transportation and Traffic | | Tribal Cultural Resources | | Utilities and Service Systems |
| | Mandatory Findings of Significance | | | | |

# DETERMINATION

On the basis of this initial evaluation:

| | |
|---|---|
| | I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared. |
| X | I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared. |
| | I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required. |
| | I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed. |
| | I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required. |

Signature

Date

# EVALUATION INSTRUCTIONS

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).
5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
    a) Earlier Analysis Used. Identify and state where they are available for review.
    b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
    c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances).

Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:
   a) The significance criteria or threshold, if any, used to evaluate each question; and
   b) The mitigation measure identified, if any, to reduce the impact to less than significant.

# EVALUATION OF ENVIRONMENTAL IMPACTS

In each area of potential impact listed in this section, there are one or more questions which assess the degree of potential environmental effect. A response is provided to each question using one of the four impact evaluation criteria described below. A discussion of the response is also included.

- Potentially Significant Impact. This response is appropriate when there is substantial evidence that an effect is significant. If there are one or more "Potentially Significant Impact" entries, upon completion of the Initial Study, an EIR is required.
- Less than Significant With Mitigation Incorporated. This response applies when the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact". The Lead Agency must describe the mitigation measures and briefly explain how they reduce the effect to a less than significant level.
- Less than Significant Impact. A less than significant impact is one which is deemed to have little or no adverse effect on the environment. Mitigation measures are, therefore, not necessary, although they may be recommended to further reduce a minor impact.
- No Impact. These issues were either identified as having no impact on the environment, or they are not relevant to the Project.

# ENVIRONMENTAL CHECKLIST

This section of the Initial Study incorporates the most current Appendix "G" Environmental Checklist Form, contained in the CEQA Guidelines. Impact questions and responses are included in both tabular and narrative formats for each of the 18 environmental topic areas.

## *I. AESTHETICS*

| *Would the project:* | *Potentially Significant Impact* | *Less Than Significant with Mitigation Incorporation* | *Less Than Significant Impact* | *No Impact* |
|---|---|---|---|---|
| a) Have a substantial adverse effect on a scenic vista? | | | *X* | |
| b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | | | | *X* |
| c) Substantially degrade the existing visual character or quality of the site and its surroundings? | | | *X* | |
| d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | | | *X* | |

### *Responses to Checklist Questions*

**Responses a, c):** The General Plan does not contain any policies that specifically address scenic vistas, nor does it define or identify any scenic vistas. In general, a scenic vista would include areas with views of scenic resources, scenic water resources, and other scenic resources from, or to a project site.

For analysis purposes, a scenic vista can be discussed in terms of a foreground, middleground, and background viewshed. The middleground and background viewshed is often referred to as the broad viewshed. Examples of scenic vistas can include mountain ranges, valleys, ridgelines, or water bodies from a focal point of the forefront of the broad viewshed, such as visually important trees, rocks, or historic buildings. An impact would generally occur if a project would change the view to the middle ground or background elements of the broad viewshed, or remove the visually important trees, rocks, or historic buildings in the foreground.

The proposed project will not significantly disrupt middleground or background views from public viewpoints. The proposed project would result in changes to the foreground views from the public viewpoint by adding residential homes to a site that is undeveloped.

Upon build-out, the project would be of similar visual character to adjacent developments. For motorists travelling along nearby roadways, such as Nicolaus Road, the project would appear to be a continuation of adjacent land uses and would not present unexpected or otherwise unpleasant aesthetic values within the general project vicinity. A sound wall currently exists along the Glenmoor Subdivision frontage on Nicolaus Road, west of the project site. As noted in Section XII, Noise, a 6-foot tall sound wall would be constructed along Nicolaus Road as required by Mitigation Measure Noise-1. The design and height of this required sound wall would be consistent with the existing sound walls currently located along Nicolaus Road.

The greatest visual change would apply to neighbors that abut the project site with a direct view of the area. Generally though, views of the project site are not visible from many nearby residences due to the existing fencing, mature trees, and vegetation that obscure views. The change in character of the project site, once developed, is anticipated by the General Plan and would be visually compatible with surrounding existing residential neighborhoods to the north, south, east, and west. Therefore, the project would not substantially degrade the existing visual character or quality of the site and its surroundings and this impact would be ***less than significant***.

**Response b):** The project site is not located within view of a state scenic highway. The nearest highway subject to this program is State Route 49, an Eligible Designated State Scenic Highways, located approximately 13 miles east of the project site. Although the project would require removal of 95 of the 189 existing trees on the project site, because the site is not visible from a state scenic highway, the proposed project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. Implementation of the proposed project would have ***no impact*** relative to this topic. Physical impacts associated with tree removal are discussed in the Biological Resources section.

**Response d):** There is a potential for the proposed project to create new sources of light and glare. Examples would include construction lighting, street lighting, security lighting along sidewalks, exterior building lighting, interior building lighting, automobile lighting, and reflective building materials. Residential development and streets to the north, south, east, and west currently produce a moderate amount of nighttime lighting from street lighting, residential interiors, and exterior building lighting. Because light sources from the project would be consistent with the type and intensity of existing lighting sources, the existing, ambient condition would not substantially change. The project site is currently undeveloped and does not contain existing lighting. With development of the project, sources of nighttime lighting would be added and would increase nighttime lighting in the area with a type and intensity of lighting consistent with residential neighborhoods located north, south, east, and west of the project site. When viewed from more distant areas, the lighting associated with the residential development could appear to increase skyglow in the area because the existing project site is currently dark.

City of Lincoln General Plan Policy LU-11.3 requires that all outdoor light fixtures, including street lighting, externally illuminated signs, advertising displays, and billboards, use low-energy, shielded light fixtures that direct light downward (i.e., lighting shall not emit higher than a horizontal level). Additionally, where public safety would not be compromised, the City shall encourage the use of low intensity lighting for all outdoor light fixtures. Outdoor lighting would be installed in conformance with City codes and ordinances, applicable safety and illumination requirements, and California Title 24 requirements. Lighting would be installed at pedestrian crossings, as appropriate for public safety, and where lighting is needed for public safety. Limited safety and security lighting and indirect shielded lighting would also be provided. Further, proposed lighting would also be placed to ensure it illuminates only the intended areas and does not penetrate into residential communities. These lighting plans would be consistent with General Plan Policy LU-11.3 as described above.

Development on the project site could also increase daytime glare because of an increase in the number of windows and use of certain types of building materials. However, use of non-reflective building materials is proposed as part of the project and the project would be required to undergo design review with the City to confirm it complies with the City's design requirements. Therefore, impacts associated with the creation of light or glare, such that it adversely affects daytime or nighttime views in the area, would be ***less than significant***.

## *II. AGRICULTURE AND FOREST RESOURCES*

| ***Would the project:*** | ***Potentially Significant Impact*** | ***Less Than Significant with Mitigation Incorporation*** | ***Less Than Significant Impact*** | ***No Impact*** |
|---|---|---|---|---|
| a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | | | | X |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? | | | | X |
| c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 1222(g)) or timberland (as defined in Public Resources Code section 4526)? | | | | X |
| d) Result in the loss of forest land or conversion of forest land to non-forest use? | | | | X |
| e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? | | | | X |

*Responses to Checklist Questions*

**Response a):** As shown in Figure 7, the project site does not contain prime farmland, unique farmland, or farmland of statewide importance as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency. The proposed project would not result in the conversion of agricultural land to non-agricultural use. Implementation of the proposed project would have ***no impact*** relative to this issue.

**Response b):** The project site is not zoned for agricultural use nor is it under a Williamson Act contract. The proposed project would not conflict with existing zoning for agricultural use, or a Williamson Act contract. Implementation of the proposed project would have ***no impact*** relative to this issue.

**Response c):** The Project site is not forest land (as defined in Public Resources Code section 1222(g)) or timberland (as defined in Public Resources Code section 4526). The proposed project would not conflict with existing zoning for, or cause rezoning of, forest land or timberland. Implementation of the proposed project would have ***no impact*** relative to this issue.

**Response d):** The project site is not forest land. The proposed project would not result in the loss of forest land or conversion of forest land to non-forest use. Implementation of the proposed project would have ***no impact*** relative to this issue.

**Response e):** The project site does not contain agricultural land or forest land. The proposed project does not involve changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use, or conversion of forest land to non-forest use. Implementation of the proposed project would have ***no impact*** relative to this issue.

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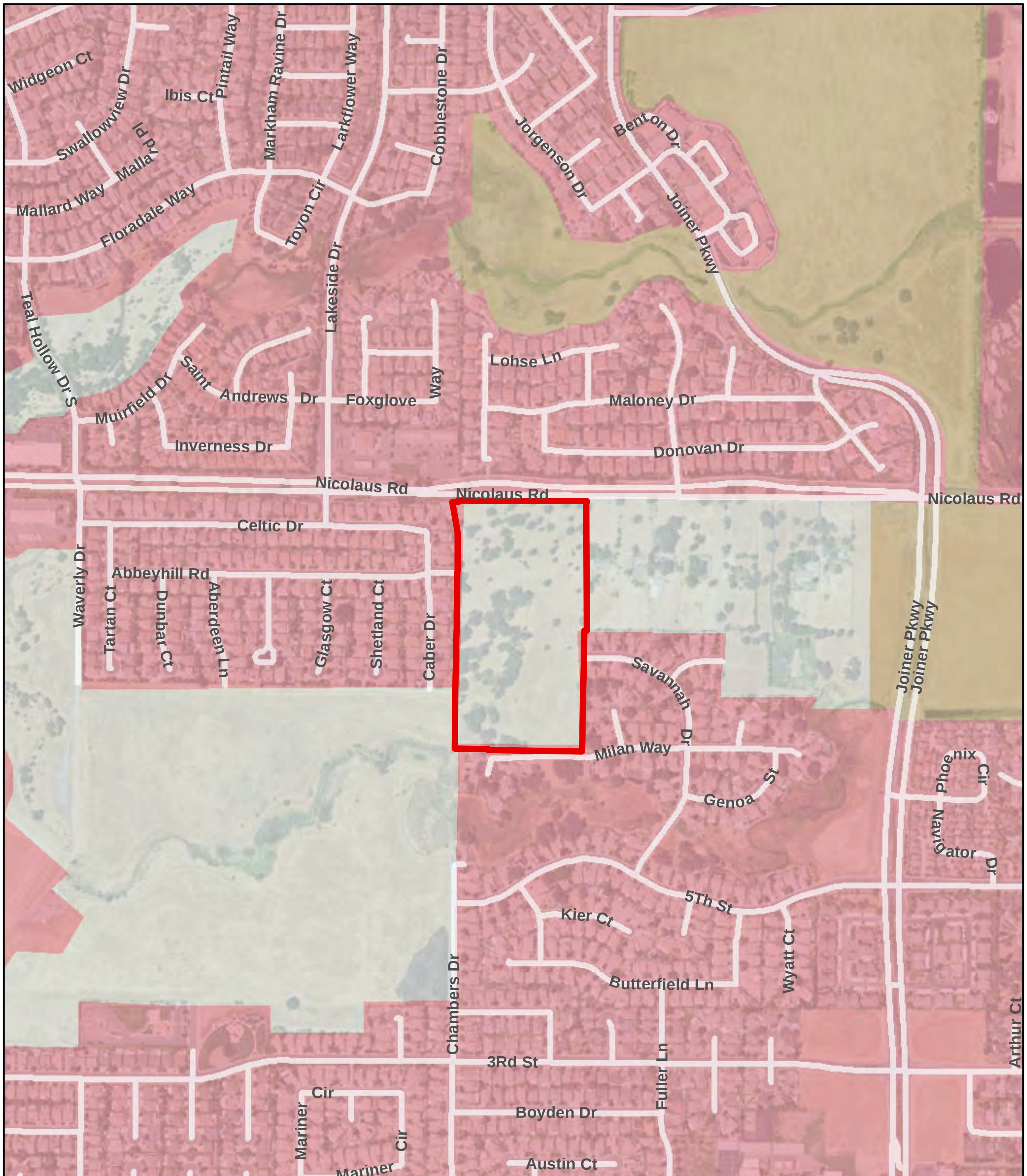


## Legend

Project Boundary

**Farmland Classification**

Urban and Built-Up Land

Grazing Land

Other Land

N

0 250 500

Feet

1:9,000

**CITY OF LINCOLN - FULLERTON RANCH**

Figure 7. Important Farmlands

*Sources: Farmland Mapping and Monitoring Program, Placer County 2014; Placer County GIS; ArcGIS Online World Imagery Service. Map date: December 8, 2016.*

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## III. AIR QUALITY

| *Would the project:* | *Potentially Significant Impact* | *Less Than Significant with Mitigation Incorporation* | *Less Than Significant Impact* | *No Impact* |
|---|---|---|---|---|
| a) Conflict with or obstruct implementation of the applicable air quality plan? | | X | | |
| b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation? | | X | | |
| c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? | | X | | |
| d) Expose sensitive receptors to substantial pollutant concentrations? | | | X | |
| e) Create objectionable odors affecting a substantial number of people? | | | X | |

### *Existing Setting*

The project site is located within the boundaries of the Placer County Air Pollution Control District (PCAPCD). This agency is responsible for monitoring air pollution levels and ensuring compliance with federal and state air quality regulations within the Sacramento Valley Air Basin (SVAB) and has jurisdiction over most air quality matters within its borders.

### *Responses to Checklist Questions*

**Responses a-c):** Air quality emissions would be generated during construction of the proposed project and during operation of the proposed project. Construction-related air quality impacts and operational air quality impacts are addressed separately below.

*Construction-Related Emissions*

***Construction Activities/Schedule***: Construction activities will consist of multiple phases over several months. These construction activities can be described as site improvements (grading, underground infrastructure, and topside improvements) and vertical construction (building construction and architectural coatings). For purposes of this analysis, it is assumed that the entire project is built-out from May 2018 to May 2020. Actual construction emissions will likely be spread out over an extended period of time, so this construction schedule is considered worst case. The assumptions made for the air quality and greenhouse gas emissions analysis are included as Appendix B.

*Site Improvements*: The exact construction schedule of the entire project is largely dependent on market demands. For purposes of this analysis it is assumed that site improvements are installed in one phase. This approach will present a more conservative and worst-case scenario.

The site improvement phase of construction will begin with site preparation. The site preparation step will include the use of dozers, backhoes, and loaders to strip (clear and grub) all organic materials and the upper half-inch to inch of soil from the project site. This task will generally take approximately four days to complete and will include vehicle trips from construction workers. This step will likely be less than the assumed four days.

After the site is stripped of organic materials grading will begin. This activity will involve the use of excavators, graders, dozers, scrappers, loaders, and backhoes to move soil around the project site to create specific engineered grade elevations and soil compaction levels. After grading and compaction all underground infrastructure would be installed. This includes the excavation of trenches to install storm water, wastewater, potable water, and dry utilities, and then backfilling and compacting the soil over the infrastructure. Grading and infrastructure for the project site would take approximately sixty days and will include vehicle trips from construction workers. *(Note: It would be possible to grade the site under a more compacted schedule with extra equipment operating or under a longer timeframe with less equipment.).*

The last task is to install the topside improvements, which includes pouring concrete curbs, gutters, sidewalks, and access aprons and then paving of all streets and parking lots. This task will involve the use of pavers, paving equipment, and rollers and will take approximately 10 days and will include vehicle trips from construction workers. *(Note: It would be possible to install the topside improvements under a more compacted schedule with extra equipment operating or under a longer timeframe with less equipment).*

*Building Construction/Architectural Coatings:* Building construction involves the vertical construction of structures and landscaping around the structures. This task will involve the use of forklifts, generator sets, and small tractors/loaders/backhoes. The exact construction schedule of the entire project is largely dependent on market demands. For purposes of this analysis it is assumed that the entire project is constructed in approximately fourteen months. The actual building construction phase may vary based on market conditions. Architectural coatings involve the interior and exterior painting associated with the structures. This task will generally begin two months after construction begins on the structure and will generally be completed with the completion of the individual buildings.

***Construction Emissions:*** A quantification of the emissions of ROG, $NO_X$, and $PM_{10}$ that will be emitted by project construction has been performed. CalEEMod™ (v.2016.3.1) was used to estimate construction emissions for the proposed project. Below is a list of model assumptions used in the construction screens of CalEEMod. Table 3 presents the estimated construction phase schedule, which shows the duration of each construction phase. Table 4 shows the off-road construction equipment used during construction for each phase. Following these tables are a list of default factors that were used in the model.

### *Model Assumptions (Construction)*

***Table 3: Construction Phase***

| *Phase #* | *Phase Name* | *Start Date* | *End Date* | *# Days/Week* | *# Days* |
|---|---|---|---|---|---|
| 1 | Site Preparation | 5/1/2018 | 5/4/2018 | 5 | 4 |
| 2 | Grading | 5/4/2018 | 7/26/2018 | 5 | 60 |
| 3 | Building Construction | 8/8/2018 | 3/6/2020 | 5 | 413 |
| 4 | Paving | 7/26/2018 | 8/8/2018 | 5 | 10 |
| 5 | Architectural Coating | 10/12/2018 | 5/12/2020 | 5 | 413 |

*SOURCE: CALEEMOD (V.2016.3.1)*

***Table 4: Off-Road Equipment***

| Equipment Type | Unit Amount | Hours/Day | Horsepower | Load Factor |
|---|---|---|---|---|
| SITE PREPARATION | | | | |
| Rubber Tired Dozers | 1 | 8.00 | 255 | 0.40 |
| Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| GRADING | | | | |
| Excavators | 2 | 8.00 | 162 | 0.38 |
| Graders | 1 | 8.00 | 174 | 0.41 |
| Rubber Tired Dozers | 1 | 8.00 | 255 | 0.40 |
| Scrapers | 1 | 8.00 | 361 | 0.48 |
| Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| BUILDING CONSTRUCTION | | | | |
| Cranes | 1 | 3.00 | 226 | 0.29 |
| Forklifts | 1 | 8.00 | 89 | 0.20 |
| Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Tractors/Loaders/Backhoes | 1 | 4.00 | 97 | 0.37 |
| Welders | 0 | N/A | N/A | N/A |
| PAVING | | | | |
| Pavers | 1 | 8.00 | 125 | 0.42 |
| Paving Equipment | 1 | 8.00 | 130 | 0.36 |
| Rollers | 1 | 8.00 | 80 | 0.38 |
| ARCHITECTURAL COATINGS | | | | |
| Air Compressors | 1 | 6.00 | 78 | 0.48 |

*SOURCE: CALEEMOD (V.2016.3.1)*

Table 5 shows the construction emissions for the construction years 2018 through 2020.

***Table 5: Construction Emissions (Unmitigated)***

| Thresholds | ROG | $NO_X$ | $PM_{10}$ |
|---|---|---|---|
| | ≤ 82 lbs/day | ≤ 82 lbs/day | ≤ 82 lbs/day |
| 2018 | 6.0549 | 60.6242 | 20.8009 |
| 2019 | 5.8684 | 12.5636 | 1.0546 |
| 2020 | 5.7248 | 11.4530 | 0.9586 |
| **Maximum** | **6.0549** | **60.6242** | **20.8009** |
| **Threshold Exceeded in any Year?** | **No** | **No** | **No** |

*NOTES: LBS/DAY = POUNDS PER DAY.*

*SOURCE: CALEEMOD (V.2016.3.1)*

The PCAPCD has established construction related emissions thresholds of significance as follows: 82 pounds per day (lbs/day) of ROG, $NO_x$, or $PM_{10}$. If the proposed project's emissions will exceed the PCAPCD's threshold of significance for construction-generated emissions, the proposed project will have a significant impact on air quality and all feasible mitigation are required to be implemented to reduce emissions. As shown in Table 5 above, annual construction emissions of ROG, $NO_x$, and $PM_{10}$ will not exceed the PCAPCD thresholds of significance in any given year. Nevertheless, regardless of emission quantities, the PCAPCD requires construction related mitigation in accordance with their rules and regulations. Implementation of the following mitigation measure will ensure that the proposed project would reduce construction related emissions to the extent possible. With implementation of the following mitigation measure, the proposed project would have a ***less than significant*** impact related to construction emissions.

***Mitigation Measure Air-1:*** *Prior to approval of grading or improvement plans for the project, the applicant shall submit a Construction Emission/Dust Control Plan to PCAPCD. Construction contractors shall not break ground prior to receiving PCAPCD approval of the Construction Emission/Dust Control Plan, and delivering that approval to the City.*

*Operational Emissions*

The PCAPCD is tasked with implementing programs and regulations required by the Federal Clean Air Act and the California Clean Air Act. In that capacity, the PCAPCD has prepared plans to attain Federal and State ambient air quality standards. To achieve attainment with the standards, the PCAPCD has established thresholds of significance for criteria pollutant emissions in their *Review of Land Use Projects Under CEQA* (2016) document. Projects with emissions below the thresholds of significance for criteria pollutants would be determined to "Not conflict or obstruct implementation of the District's air quality plan".

The proposed project would be a direct and indirect source of air pollution, in that it would generate and attract vehicle trips in the region (mobile source emissions) and it would increase area source emissions and energy consumption. The mobile source emissions would be entirely from vehicles, while the area source emissions would be primarily from the use of natural gas fuel combustion, landscape fuel combustion, consumer products, and architectural coatings.

CalEEMod™ (v.2016.3.1) was used to estimate emissions for buildout of the proposed project. Table 6 shows the emissions, which include mobile, area source, and energy emissions of criteria pollutants that would result from operations of the proposed project.

***Table 6: Operational Buildout Generated Emissions***

| | ***ROG*** | | ***$NO_X$*** | | ***$PM_{10}$*** | |
|---|---|---|---|---|---|---|
| ***Thresholds*** | ***55 lbs/day*** | | ***55 lbs/day*** | | ***82 lbs/day*** | |
| ***Category*** | ***UM*** | ***M*** | ***UM*** | ***M*** | ***UM*** | ***M*** |
| Area | 127.7862 | 3.9657 | 2.4984 | 1.2868 | 21.4914 | 0.1346 |
| Energy | 0.0766 | 0.0660 | 0.6542 | 0.5643 | 0.0529 | 0.0456 |
| Mobile | 1.5841 | 1.5580 | 8.3027 | 8.0835 | 2.9030 | 2.7032 |
| **Total** | **129.4469** | **5.5898** | **11.4553** | **9.9347** | **24.4473** | **2.8834** |
| **Threshold Exceeded?** | **Yes** | **No** | **No** | **No** | **No** | **No** |
| **Percent Reduction** | **95.68** | | **13.27** | | **88.21** | |

*NOTES: UM = UNMITIGATED, M = MITIGATED.*

*SOURCE: CALEEMOD (V.2016.3.1).*

The long-term operational emissions estimate for buildout of the proposed project, incorporates the potential area source and vehicle emissions, and emissions associated with utility and water usage, and wastewater and solid waste generation. The modeling included mitigation inputs including the following:

<u>Traffic Modeling Assumptions</u>

- Increase transit accessibility in the project site (minimum distance to transit stops is 0.6 miles)
- Increase accessibility to downtown/job center (minimum distance to downtown/job center is 1.45 miles)

- Improve pedestrian network so that the project site connects to offsite pedestrian networks
- Provide traffic calming measures on street segments and intersections

Energy Modeling Assumptions

- Exceed Title 24 by 15%
- Install high efficiency lighting
- Install high efficiency appliances within residences

Area Modeling Assumptions

- Use low VOC paint
- Use only natural gas hearths

Water Modeling Assumptions

- Install low flow bathroom faucet
- Install low-flow kitchen faucet
- Install low-flow toilet
- Install low-flow shower
- Use water-efficient irrigation systems

The PCAPCD has established their thresholds of significance by which the project emissions are compared against to determine the level of significance. The PCAPCD has established operations related emissions thresholds of significance as follows: 55 lbs/day of $NO_x$, 55 lbs/day of ROG, and 82 lbs/day of $PM_{10}$. If the proposed project's emissions will exceed the PCAPCD's threshold of significance for operational-generated emissions, the proposed project will have a significant impact on air quality and all feasible mitigation are required to be implemented to reduce emissions to the extent feasible. As shown in Table 6 above, annual emissions of NOx and $PM_{10}$ would not exceed the PCAPCD thresholds of significance. Although the annual emissions of ROG would exceed the PCAPCD thresholds of significance, the mitigation inputs would reduce the emissions to below the threshold. As such, with implementation of the following mitigation measure, operation of the proposed project would have a ***less than significant*** impact relative to operational air emissions.

***Mitigation Measure Air-2:*** *To reduce criteria pollutant emissions and energy consumption, the project applicant shall institute measures to reduce wasteful, inefficient, and unnecessary consumption of energy during construction, operation, and maintenance/landscaping. The measures to reduce wasteful, inefficient, and unnecessary consumption of energy during construction, operation, and maintenance/landscaping include the following:*

- *Ensure that the pedestrian/bicycle network within the project area connects to offsite pedestrian networks.*
- *Provide traffic calming measures on proposed street segments within the project site, where feasible. Traffic calming features may include: marked crosswalks, textured pavement, curb extensions, median islands, or on-street parking.*
- *Exceed Title 24 energy efficiency requirements from the 2013 California Building Energy Efficiency Standards by 15 percent.*
- *Install high efficiency lighting and appliance within all buildings (i.e., EnergyStar qualified appliances).*

- *Install low-flow faucets, toilets, and showers as applicable.*
- *Use water-efficient irrigation systems throughout the project area.*
- *Prohibit wood burning fireplaces.*

**Response d):** *Construction-Related Impacts on Sensitive Receptors:* Sensitive receptors are those parts of the population that can be severely impacted by air pollution. Sensitive receptors include children, the elderly, and the infirm. The residents located to the east and west of the project site are considered sensitive receptors. The proposed project would place additional sensitive receptors in the area. The operations of the proposed project would not contribute substantial concentrations of pollutants to sensitive receptors. The construction phase of the proposed project has the potential to increase pollution concentrations that would impact sensitive receptors.

The construction phase of the Project would be temporary and short-term, and the implementation of Mitigation Measure Air-1 would greatly reduce pollution concentrations generated during construction activities. Operation of the proposed Project would result in emissions primarily from vehicle trips, area sources, and energy sources. As described under Response a) – c) above, the proposed project would not generate significant concentrations of air emissions. Impacts to sensitive receptors during construction would be negligible and this is a ***less than significant*** impact.

*Toxic Air Contaminant Impacts on Sensitive Receptors:* A toxic air contaminant (TAC) is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air. However, their high toxicity or health risk may pose a threat to public health even at very low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

The California Air Resources Board (CARB) published the *Air Quality and Land Use Handbook: A Community Health Perspective* (2007) to provide information to local planners and decision-makers about land use compatibility issues associated with emissions from industrial, commercial and mobile sources of air pollution. The CARB Handbook indicates that mobile sources continue to be the largest overall contributors to the State's air pollution problems, representing the greatest air pollution health risk to most Californians. The most serious pollutants on a statewide basis include diesel exhaust particulate matter (diesel PM), benzene, and 1,3-butadiene, all of which are emitted by motor vehicles. These mobile source air toxics are largely associated with freeways and high traffic roads. Non-mobile source air toxics are largely associated with industrial and commercial uses. Table 7 provides the CARB minimum separation recommendations on siting sensitive land uses.

In addition to the airplane engines, aircrafts can also emit PM and TACs from other on-board sources. These other aircraft sources include auxiliary power units and aircraft brake and tire emissions during touchdown. There is currently no data on PM number, size, and mass for brake and tire emissions from landing aircraft. LIDAR data collected in the UK suggest that these brake and tire emissions could be a significant PM source at aircrafts. Due to various data limitations, a means to estimate the relative contributions from aircraft and other PM sources to airport PM inventories that reflect actual, source-specific PM data and source operational procedures is lacking. It is noted that CARB does not provide minimum separation recommendations on siting sensitive land uses from airport land uses.

The project includes residential uses which are considered sensitive land uses. There are no source categories listed above that are proposed. Additionally, there are no source categories listed above that are within screening distances or minimum separation distances suggested for sensitive uses. State Route 65 is the closest freeway and is located over 3,500 feet from the project site. The project is consistent with the *CARB Minimum Separation Recommendations on Siting Sensitive Land Uses* (2005). A health risk assessment is not warranted for any further assessment. Implementation of the proposed project would not result in an increased exposure of sensitive receptors to localized concentrations of TACs. This Project would have a ***less than significant*** impact relative to this topic.

***Table 7: CARB Minimum Separation Recommendations on Siting Sensitive Land Uses***

| ***Source Category*** | ***Advisory Recommendations*** |
|---|---|
| Freeways and High-Traffic Roads | • Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.1 |
| Distribution Centers | • Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week).<br>• Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points. |
| Rail Yards | • Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard.<br>• Within one mile of a rail yard, consider possible siting limitations and mitigation approaches. |
| Ports | • Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the CARB on the status of pending analyses of health risks. |
| Refineries | • Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation. |
| Chrome Platers | • Avoid siting new sensitive land uses within 1,000 feet of a chrome plater. |
| Dry Cleaners Using Perchloro-ethylene | • Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district.<br>• Do not site new sensitive land uses in the same building with perc dry cleaning operations. |
| Gasoline Dispensing Facilities | • Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50 foot separation is recommended for typical gas dispensing facilities. |

*SOURCE: AIR QUALITY AND LAND USE HANDBOOK: A COMMUNITY HEALTH PERSPECTIVE" (CARB 2005).*

**Response e):** The proposed project would not generate objectionable odors. People in the immediate vicinity of construction activities may be subject to temporary odors typically associated with construction activities (diesel exhaust, hot asphalt, etc.). However, any odors generated by construction activities would be minor and would be short and temporary in duration. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

## *IV. BIOLOGICAL RESOURCES*

| ***Would the project:*** | ***Potentially Significant Impact*** | ***Less Than Significant with Mitigation Incorporation*** | ***Less Than Significant Impact*** | ***No Impact*** |
|---|---|---|---|---|
| a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? | | X | | |
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service? | | | | X |
| c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | | X | | |
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | | | X | |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | | X | | |
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | | | | X |

### *Background*

A *Special-Status Plant Survey* (Foothill Associates, 2016) was prepared for the proposed project. De Novo Planning Group peer reviewed the report for use in the Initial Study. The full report is contained in Appendix C. This report contains the findings of a focused botanical survey for six special-status plant species that was conducted for the project site. The plant species include: Ahart's dwarf rush (*Juncus leiospermus* var. *aharti*), big-scale balsam-root (*Balsamorhiza macrolepis* var. *macrolepis*), Bogg's Lake hedge-hyssop (*Gratiola heterosepala*), dwarf downingia (*Downingia pusilla*), legenere (*Legenere limosa*), and pincushion navarretia (*Navarretia myersii* ssp. *myersii*). The purpose of the plant survey was to determine whether the potentially occurring special-status plants exist within the project site. In addition, a comprehensive botanical inventory was conducted within the project site, in accordance with the California Department of Fish and Wildlife's (CDFW) (2009) protocol plant surveys by Foothill. Plants observed within the project site are provided in Appendix C.

A *Dry-Season Sampling for Federally Listed Large Branchiopods at the Premier Oak Estates* (November 2004) and a *Wet-Season Sampling for Federally Listed Large Branchiopods at the*

*Premier Oak Estates, Placer County* (June 2005) were prepared by Helm Biological Consulting. A Section 7 consultation was initiated with the USFWS in February 2007 for vernal pool branchiopods and valley elderberry longhorn beetle. The USFWS issued a not likely to adversely affect determination in June 13, 2007. Due to the time lapse since the USFWS's determination additional surveys were performed to reverify conditions. A *Dry Season Sampling for Federally Listed Large Branchiopods at the Fullerton Ranch Project* (Helm Biological Consulting, 2016) was performed (see Appendix D). No evidence of federally listed large branchiopods (cysts belonging to the genus *Branchinecta* or *Lepidurus* or carapaces of *Lepidurus*) were observed in the soils collected.

Additionally, a *90-Day Report 2016-2017 Wet-Season Survey for Listed Vernal Pool Branchiopods* (Foothill Associates, 2017) was performed (see Appendix E). Because more than 10 years have passed since the previous wet-season invertebrate sampling surveys, and in due diligence of potential special-status species that may be present on the project site, protocol-level wet-season surveys for branchiopods were conducted as part of the *90-Day Report 2016-2017 Wet-Season Survey for Listed Vernal Pool Branchiopods* (Foothill Associates, 2017). As part of this survey, the project site was surveyed on December 27, 2016, January 11 and 24, 2017, February 10 and 28, 2017, March 31, 2017, April 14 and 28, 2017, and May 12, 2017. A total of 13 features were sampled. No listed or non-listed branchiopod species were found in any of the sampled pools. This is consistent with the 2004 dry-season sampling results discussed above.

Other technical studies that have been prepare for the project site include a *Biological Resources Assessment Update for the Whispering Oaks Site, Lincoln, Placer County* (April 2006) and an *Arborist Report for the Fullerton Ranch Project Site* (Dudek 2016).

The project site is located west of Joiner Parkway and south of Nicolaus Road in a predominately residential area of Lincoln. The project site totals approximately 19.7 acres and is currently undeveloped. The project site is comprised of annual grassland and oak woodland with seasonal wetland features interspersed in the southern half of the project site. The western half of the project site is comprised of oak woodland with an annual grassland understory. The topography within the project site is generally level with elevations ranging from 133 to 135 feet above MSL.

### *Responses to Checklist Questions*

**Response a):** A records search reveals that there are eight known special status species (federal or state listed, of CNPS List 1B or 2) within a 10-mile radius search of the project site (see Table 8). As noted previously, botanical surveys within blooming period have been performed, including focused surveys. The plants found on the project site are listed in Appendix C. Although the project site provides habitat for the special-status species within the vernal pools, these species were not observed. These species are not present within the project site. Therefore, the proposed project would have ***no impact*** on special-status plants.

***Table 8: Special-Status Plants***

| *Species* | *Status (Fed/State/CNPS)* | *Habitat* | *Potential for Occurrence* |
|---|---|---|---|
| Ahart's dwarf rush *Juncus leiospermus var. aharti* | SC/--/1B | Vernal pools | Not observed during previous site visits. |
| Big-scale balsam-root *Balsamorhiza macroleps var. macrolepis* | SC/--/1B | Open woodlands and grasslands | Not observed during previous site visits. |
| Bogg's Lake hedge-hyssop *Gratiola heterosepala* | --/CE/1B | Moist margins of vernal pools and marshes | Not observed during previous site visits. |
| Dwarf downingia *Downingia pusilla* | --/--/2 | Vernal pools | Not observed during previous site visits. |
| hispid salty bird's-beak *Chloropyron molle ssp. hispidum* | --/--/1B | Alkali Sink, Valley Grassland, wetland-riparian | Not observed during previous site visits. |
| Legenere *Legenere limosa* | SC/--/1B | Vernal pools | Not observed during previous site visits. |
| Pincushion navarretia *Navarretia myersii* ssp. *myersii* | --/--/1B | Vernal pools | Not observed during previous site visits. |
| Red Bluff dwarf rush *Juncus leiospermus var. leiospermus* | --/--/1B | Vernal pools | Not observed during previous site visits. |

*Notes: (--) = None; Federal: SC = Species of Concern; State: CE = California Endangered; California Native Plant Society (CNPS): List 1B = Rare or Endangered in California; List 2 = Rare and Endangered in California, more common elsewhere.*

*SOURCE: CNDDB. 2016.*

Table 9 shows the twenty-one special-status wildlife species which are known to occur within a ten-mile radius of the project site. The table shows the species name, protection status, geographic distribution, and habitat requirements. The property was surveyed for these special status species, and none were found. This included surveys for vernal pool branchiopods in 2007 (which resulted in a USFWS "not likely to adversely affect" determination) and in 2016.

***Table 9: Special-Status Wildlife***

| *Species* | *Status (Fed/State)* | *Geographic Distribution* | *Habitat Requirements* |
|---|---|---|---|
| ***Amphibians/Reptiles*** | | | |
| Western pond turtle *Clemmys marmorata* | --/SSC | Occurs from the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada | Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests |
| Western spadefoot *Scaphiopus hammondii* | --/SSC | Sierra Nevada foothills, Central Valley, Coast Ranges, coastal counties in southern California | Shallow streams with riffles and seasonal wetlands, such as vernal pools in annual grasslands and oak woodlands. |
| ***Birds*** | | | |
| Bank swallow *Riparia riparia* | --/T | Occurs along the Sacramento River from Tehama County to Sacramento County, along the Feather and lower American Rivers, in the Owens Valley; and in the plains east of the Cascade Range in Modoc, Lassen, and northern Siskiyou Counties. Small populations near the coast from San Francisco County to Monterey County | Nests in bluffs or banks, usually adjacent to water, where the soil consists of sand or sandy loam |
| burrowing owl *Athene cunicularia* | --/SSC | Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. Rare along south coast | Level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows |
| California black rail *Laterallus jamaicensis coturniculus* | --/T | Permanent resident in the San Francisco Bay and east-ward through the Delta into Sacramento and San Joaquin Counties; small populations in Marin, Santa Cruz, San Luis Obispo, Orange, Riverside, and Imperial Counties | Tidal salt marshes associated with heavy growth of pickleweed; also occurs in brackish marshes or freshwater marshes at low elevations |

| *Species* | *Status (Fed/State)* | *Geographic Distribution* | *Habitat Requirements* |
|---|---|---|---|
| grasshopper sparrow *Ammodramus savannarum* | --/SSC | Dense grasslands on rolling hills, lowland plains, in valleys & on hillsides on lower mountain slopes. | Favors native grasslands with a mix of grasses, forbs & scattered shrubs. Loosely colonial when nesting. Valley & foothill grassland |
| Great blue heron *Ardea herodias* (rookery) | --/-- | Found throughout much of North America and into Central and South America. Common throughout California. | Rookeries occur in tall trees near a variety of wetland habitat types. Isolated areas that discourage predation and human disturbance are preferred. |
| Osprey *Pandion haliaetus* | --/SSC | Nests along the north coast from Marin County to Del Norte County, east through the Klamath and Cascade Ranges, and in the upper Sacramento Valley. Important inland breeding populations at Shasta Lake, Eagle Lake, and Lake Almanor and small numbers elsewhere south through the Sierra Nevada. Winters along the coast from San Mateo County to San Diego County | Nests in snags, trees, or utility poles near the ocean, large lakes, or rivers with abundant fish populations |
| song sparrow ("Modesto" population) *Melospiza melodi* | --/SSC | Occurs primarily below 200 ft (61 m) elevation in the Central Valley from Colusa County in the Sacramento Valley south through the Sacramento–San Joaquin River Delta (exclusive of Suisun Marsh) to the northern San Joaquin Valley of Stanislaus County. | Emergent freshwater marshes dominated by tules and cattails as well as riparian willow thickets. Also nest in riparian forests of Valley Oak with a sufficient understory of blackberry along vegetated irrigation canals and levees, and in recently planted Valley Oak restoration sites |
| Swainson's hawk *Buteo swainsoni* | --/CT | Range from the Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley. Highest nesting densities occur near Davis and Woodland, Yolo County. | Nests in oaks or cottonwoods in or near riparian habitats. Forages in grasslands, irrigated pastures, and grain fields |
| Tricolored blackbird *Agelaius tricolor* | / SSC (CC) | Permanent resident in the Central Valley from Butte County to Kern County. Breeds at scattered coastal locations from Marin County south to San Diego County; and at scattered locations in Lake, Sonoma, and Solano Counties. Rare nester in Siskiyou, Modoc, and Lassen Counties. | Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grainfields. Habitat must be large enough to support 50 pairs. Probably requires water at or near the nesting colony |
| White-tailed kite *Elanus leucurus* | --/FP | Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border | Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging |
| ***Fish*** | | | |
| Steelhead – Central Valley DPS *Oncorhynchus mykiss irideus* | FT/-- | This distinct population segment, or DPS, includes all naturally spawned populations of steelhead (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco Bay and San Pablo Bays and their tributaries. | Free of heavy sedimentation with adequate flow and cool, clear water. Gravel that is between 0.5 to 6.0 inches in diameter, dominated by 2 to 3 inch gravel. Escape cover such as logs, undercut banks, and deep pools for spawning adults. |
| ***Invertebrates*** | | | |
| California linderiella *Linderiella occidentalis* | --/-- | Range from Redding in the north to Fresno County in the south, mainly east of the Sacramento and San Joaquin rivers. | Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity, conductivity, and TDS. |
| Conservancy fairy shrimp *Branchinecta conservatio* | E/-- | The historical distribution of the Conservancy fairy shrimp is not known. The species is currently known from several disjunct populations: the Vina Plains in Tehama County, south of Chico in Butte County, the Jepson Prairie Preserve and surrounding area in Solano County, Sacramento National Wildlife Refuge in Glenn County, Mapes Ranch west of Modesto, San Luis National Wildlife | Inhabit rather large, cool-water vernal pools with moderately turbid water. |

| Species | Status (Fed/State) | Geographic Distribution | Habitat Requirements |
|---|---|---|---|
| | | Refuge and the Haystack Mountain/Yosemite Lake area in Merced County, and two locations on the Los Padres National Forest in Ventura County. | |
| Valley elderberry longhorn beetle *Desmocerus californicus dimorphus* | FT/-- | Stream side habitats below 3,000 feet throughout the Central Valley | Riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant. |
| Vernal pool fairy shrimp *Branchinecta lynchi* | FT/-- | Range from Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. Isolated populations also in Riverside County. | Common in vernal pools; they are also found in sandstone rock outcrop pools. |
| Vernal pool tadpole shrimp Lepidurus packardi | E/-- | Shasta County south to Merced County | Vernal pools and ephemeral stock ponds. |
| ***Mammals*** | | | |
| Pallid bat *Antrozous pallidus* | --/SSC | Occurs throughout California except the high Sierra from Shasta to Kern County and the northwest coast, primarily at lower and mid elevations | Occurs in a variety of habitats from desert to coniferous forest. Most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California and oak woodland, grassland, and desert scrub in southern California. Relies heavily on trees for roosts |
| purple martin *Progne subis* | --/SSC | Inhabits woodlands, low elevation coniferous forest of Douglas-fir, ponderosa pine, & Monterey pine. | Nests in old woodpecker cavities mostly, also in human-made structures. Nest often located in tall, isolated tree/snag. |
| Townsend's big-eared bat *Corynorhinus townsendii* | --/SSC | Coastal regions from Del Norte County south to Santa Barbara County | Roosts in caves, tunnels, mines, and dark attics of abandoned buildings. Very sensitive to disturbances and may abandon a roost after one onsite visit |

*FEDERAL: FE = ENDANGERED, FT = THREATENED, PFE = PROPOSED FOR ENDANGERED, PFT = PROPOSED FOR THREATENED; FC = CANDIDATE SPECIES FOR LISTING; D = DELISTED FROM FEDERAL LISTING STATUS.*

*STATE: CE = ENDANGERED, CT = THREATENED, CC = CANDIDATE SPECIES FOR LISTING; FP = FULLY PROTECTED UNDER THE CALIFORNIA FISH AND GAME CODE; SSC = SPECIES OF SPECIAL CONCERN IN CALIFORNIA.*

*SOURCE: CNDDB. 2016.*

Historical and continuing site disturbance makes the presence of many special-status animals on the project site unlikely. However, nesting birds can utilize the trees and open areas afforded by the existing vegetation. There are a variety of raptors and/or birds protected by the MBTA that could utilize this habitat for nesting or foraging. The project would eliminate foraging habitat on the project site and would require the removal of some on-site trees. The proposed project would retain 94 on-site trees (53 blue oaks, 37 valley oaks, and 4 interior live oaks), which could be used for future nesting habitat, although the presence of the residents would make it a less desirable location for nesting in the retained trees by many species. Construction activities that occur during the nesting season (generally March 1-August 31) could disturb nesting sites if they were present during construction.

Surveys that were performed over the past decade, including surveys performed in the past several months, did not reveal the presence of active or remnant nests on the project site. The project site is designated for urban development by the City's General Plan, and potential impacts associated with the loss of foraging and nesting habitat located on the project site were previously analyzed in the City's General Plan EIR. The City subsequently approved the current residential land use designation for the project site under the General Plan and General Plan EIR. The following mitigation measure is consistent with the City of Lincoln General Plan and standard industry practices to avoid and/or minimize potential impacts to protected birds.

Implementation of the following mitigation measure would reduce this potential impact to a ***less than significant*** level.

> ***Mitigation Measure Bio-1:*** *If project construction activities, including vegetation clearing, are to occur during the nesting season for birds protected under the California Fish and Game Code and/or Migratory Bird Treaty Act (approximately March 1-August 31), the project applicant shall retain a qualified biologist to perform preconstruction surveys for protected birds, including nesting raptors, on the project site and in the immediate vicinity. At least two surveys shall be conducted no more than 15 days prior to the initiation of construction activities, including vegetation clearing. In the event that protected birds, including nesting raptors, are found on the project site, offsite improvement corridors, or the immediate vicinity, the project applicant shall:*
>
> - *Locate and map the location of the nest site. Within 2 working days of the surveys prepare a report and submit to the City and CDFW;*
> - *A no-disturbance buffer of 250 feet shall be established;*
> - *On-going weekly surveys shall be conducted to ensure that the no disturbance buffer is maintained. Construction can resume when a qualified biologist has confirmed that the birds have fledged.*
>
> *In the event of destruction of a nest with eggs, or if a juvenile or adult raptor should become stranded from the nest, injured or killed, the qualified biologist shall immediately notify the CDFW. The qualified biologist shall coordinate with the CDFW to have the injured raptor either transferred to a raptor recovery center or, in the case of mortality, transfer it to the CDFW within 48 hours of notification. If directed/authorized by the CDFW during the notification, the qualified biologist may transfer the injured raptors to a raptor recovery center.*

**Responses b-c):** Riparian habitat is found in the interface between land and a river or stream. This habitat is significant in ecology, environmental management, and civil engineering because of its role in soil conservation, its habitat biodiversity, and the influence it has on fauna and aquatic ecosystems, including grassland, woodland, wetland or even non-vegetative.

Sensitive natural communities are those that are considered rare in the region, support special-status plant or wildlife species, or receive regulatory protection (i.e., §404 and 401 of the Clean Water Act, the CDFG §1600 et seq. of the California Fish and Game Code, and/or the Porter-Cologne Act). In addition, the California Natural Diversity Data Base (CNDDB) has designated a number of communities as rare; these communities are given the highest inventory priority (Holland 1986, CDFG 2003e).

The project site does not support any riparian habitat or sensitive natural communities. Four sensitive natural communities are known to occur within a 10-mile radius of the project site. This includes the Alkali Meadow, Alkali Seep, Northern Hardpan Vernal Pool, and Northern Volcanic Mud Flow Vernal Pool. These sensitive natural communities are not located on the project site. While not specifically mapped or designated as a sensitive natural community, the vernal pools located on the project site are unique because of the wetland characteristics. Additionally, the vernal pools/wetlands are protected under federal and state laws. The potential impacts to vernal pools/wetlands is discussed below.

The project site has been studied numerous times dating back to 2004. A *Wetland Delineation* was completed by North Fork Associates in May 2004. A second *Delineation of Water of the United States* was subsequently completed by Foothill Associates in July 2006. The USACE provided a verification letter in February 2007. Because the USACE verification had expired at the time applications were submitted for the proposed project, it was necessary to perform a reverification. As such, Foothill Associates reevaluated the project site and submitted a reverification request to the USACE in July 2016. The USACE subsequently provided a verification for the Wetland Delineation in July 2016. The reverification request and the USACE verified Wetland Delineation are contained in Appendix F. The following discussion is based on the USACE verified Wetland Delineation.

Potential jurisdictional wetland types mapped within the site are depressional seasonal wetland and vernal pool. As shown in Figure 9 and Table 10, there are approximately 0.083 acres of depressional seasonal wetlands, 0.271 acres of vernal pools, and 0.035 acres of riverine seasonal wetland located on the project site.

***Table 10: Summary of USACE Delineated Features***

| ***Feature*** | ***Area (Acres)*** | ***Length (Feet)*** |
|---|---|---|
| *Depressional Wetlands* | | |
| Depressional Seasonal Wetland | 0.083 | N/A |
| Vernal Pool | 0.271 | N/A |
| *Other Waters of the U.S.* | | |
| Riverine Seasonal Wetland | 0.035 | 636 |
| *TOTAL* | *0.39* | *636* |

*SOURCE: FOOTHILLS ASSOCIATES, 2006 AND 2016.*

The development of the project will include the fill of 0.39 acres of wetland habitat. The proposed wetland fill would require authorization from several agencies, including the USACE, CDFW, and the Regional Water Quality Control Board.

Without the proper authorizations/permits, the fill activities would be a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.), Section 401 of the Clean Water Act, the Section 1600 et seq. of the California Fish and Game Code, and/or the Porter-Cologne Act, through direct removal, filling, hydrological interruption, or other means. Implementation of the following mitigation measures would ensure that the regulatory agencies are consulted, permits are obtained, compensatory mitigation is purchased, and the impact to jurisdictional wetlands/water is reduced to a ***less than significant*** level.

> ***Mitigation Measure Bio-2****: Prior to any construction activities that would disturb protected wetlands and/or jurisdictional areas on the project site, the appropriate state and federal authorizations (Streambed Alteration Agreement, Section 404 permit, Section 401 water quality certification) shall be obtained. All requirements of these authorizations shall be adhered to throughout the construction phase.*

> ***Mitigation Measure Bio-3****: The project proponent shall compensate for any authorized disturbance to protected wetlands and/or jurisdictional areas to ensure no net loss of habitat functions and values. Compensation ratios shall be based on site-specific information and determined through coordination with state, federal, and local agencies as part of the permitting process for the project. Unless determined otherwise by the regulatory/permitting agency, the compensation shall be at a minimum ratio of 1 acre restored, created, and/or preserved for every 1 acre of protected wetlands and/or jurisdictional areas disturbed. Compensation may comprise onsite restoration/creation, off-site restoration, preservation, or mitigation credits (or a combination of these elements).*

**Response d):** The project site is currently undeveloped and does not serve as a wildlife corridor, or nursery site. Although an open space area is located to the southwest of the project site, movement of wildlife through the project site is currently limited by existing development and roadways. For example, Nicolaus Road is located to the north of the project site, an existing residential area is located to the west of the project site, Milan Way is located to the south of the project site, and existing single family residential development and other ranchettes are located to the west of the project site. The proposed project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Implementation of the proposed project would result in a ***less than significant*** impact relative to this topic.

**Response e):** The removal of native oak trees is regulated by the City of Lincoln Oak Tree Preservation Ordinance. Chapter 18.69 of the City's Municipal Code encourages the preservation of native oak trees to promote aesthetic values, soil stability, healthy air, ground water absorption, and a host of other natural and human benefits. The ordinance establishes policies for the preservation of all native oak trees within City limits where possible when activities that require approval by the City. If a protected oak tree is removed or irrevocably harmed in violation of conditions of project approval, the City may require one or more of the following: planting of replacement trees; fee payment to the City; additional recourse or penalties.

An *Arborist Report for the Fullerton Ranch Project Site* (Dudek 2016) was prepared to inventory and assess all on-site trees. De Novo Planning Group peer reviewed the report for use in the Initial Study. The full report is contained in Appendix G. Trees were identified to species and measured 4.5 feet above grade in the field. They were tagged with a unique tree identification number and the location of each individual tree was hand mapped on a site aerial photograph.

The largest tree measured 44.1 inches in diameter and the smallest measured 6.0 inches. Tree condition ranged from very poor to good. Species included *Quercus douglasii, Q. lobata,* and *Q. wislizenii*. As shown in Figure 10, the proposed project development footprint may require removal of up to 95 of the site's oak trees.

Mitigation for removal of oak trees from the project site is addressed through the requirements of the Oak Tree Preservation Ordinance, and may include on- or off-site tree planting, payment of an in-lieu fee, or a combination thereof, or other measures approved by the City. The in-lieu fee is used to offset the loss of the native oak tree habitat and the fund is used to plant new trees in the city, to maintain existing trees owned by the city, and to maintain trees located within the city's right-of-way.

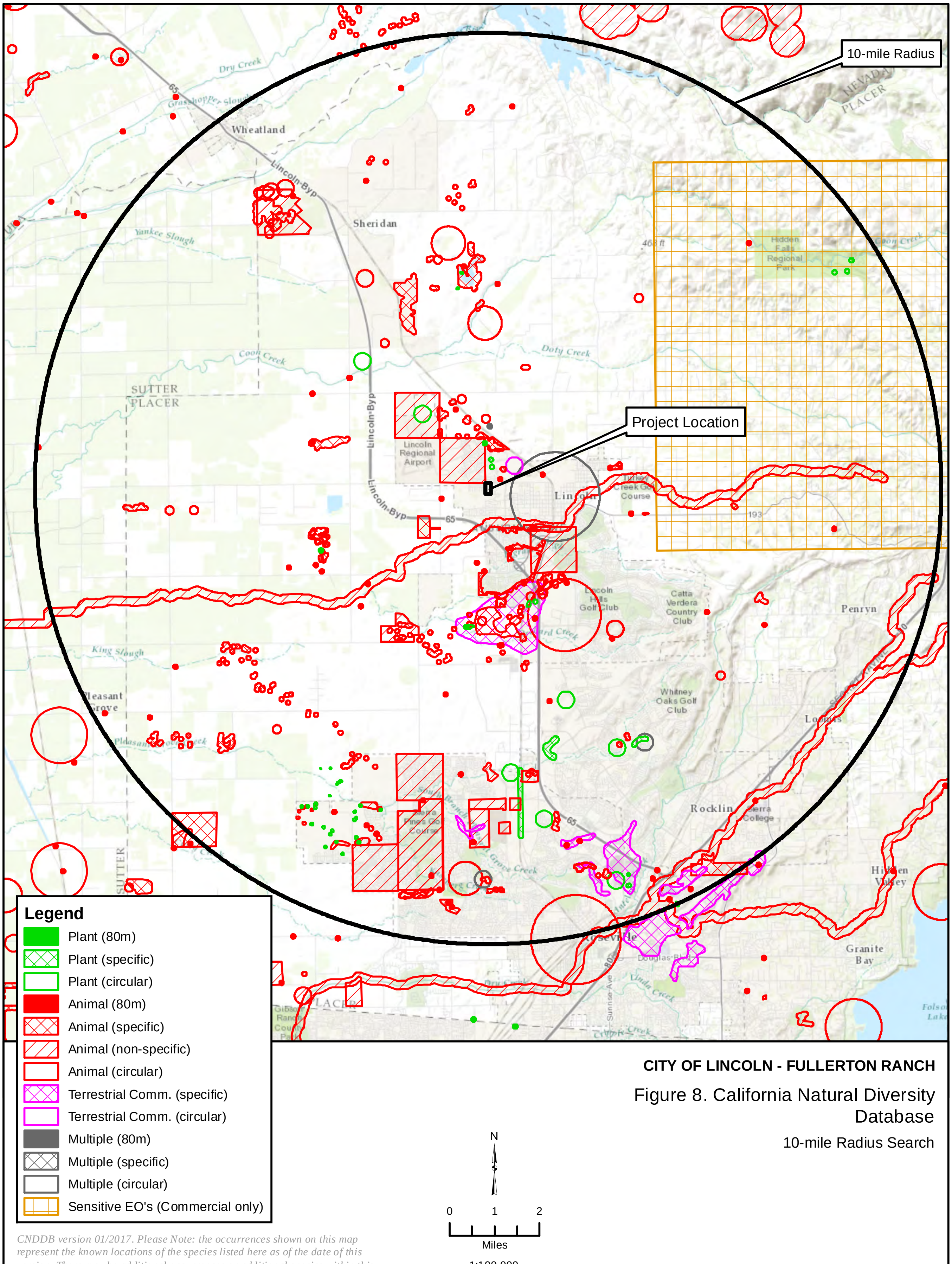
The project applicant is requesting a tree removal permit as part of the application package to ensure compliance with the City of Lincoln Oak Tree Preservation Ordinance. The City will make a determination for approval or denial with their consideration of the overall application package. Implementation of the following mitigation measure would ensure that the potential impact is reduced to a ***less than significant*** level.

***Mitigation Measure Bio-4****: Prior to removal of any trees, the project applicant shall obtain a tree removal permit from the City of Lincoln in accordance with the City's Oak Tree Preservation Ordinance (Chapter 18.69). For native oak trees that must be removed, the applicant shall implement the following:*

- *Replacement of oak tree(s) removed or irrevocably harmed by planting replacement specimen trees of no less than 15 gallons in size, having a total combined diameter at the time of planting equal to the diameter of the removed tree(s). In order to ensure survival of the replacement tree(s), the project applicant shall be responsible for inspection of the replacement tree(s) during the early plant establishment period for sprouting success and survival for three years. Sprouting success may be documented using monitoring data. Monitoring data may include* *plant density (average number of individuals/unit area), cover of the area covered by a given species, and species composition. Success criteria will be based on the survival rates. Percent survival for years one, two and three are 90, 80 and 70, respectively. Species not meeting the success criteria shall be replanted, providing the mortality causes can be identified and corrected prior to replanting. If the causes cannot be identified, another native species with high survival rates shall be used for replacement. Photographs shall be taken in the same month each year to assist in evaluation of mitigation success.*

- *If the project site is not capable of supporting all the required replacement trees, a fee shall be paid to the City equal to the retail costs at the time of the replacement trees.*
- *To reduce the loss of protected native oak trees (those not requiring removal), the applicant shall comply with all conditions of project approval and any City guidelines for protected native oak trees. This includes implementation of the Tree Management Recommendations and Protection Measures as outlined in the Arborist Report (2016) for pre-construction, during construction, and post-construction.*

**Response f):** The Placer County Conservation Plan (PCCP) is a county-proposed solution to coordinate and streamline the permitting process by allowing local entities to issue state and federal permits. The proposed PCCP is a habitat conservation plan (HCP) under the ESA and a natural community conservation plan (NCCP) under the California Natural Community Conservation Planning Act. As proposed, the PCCP would include the County Aquatic Resources Program to issue permits related to the Federal Clean Water Act and the California Fish and Game Code. The City of Lincoln is currently involved in the development of the PCCP. Although the PCCP has not been finalized or approved, the project is within the potential future growth area and would not conflict with the draft proposed reserve system for the PCCP (Placer County 2015). There are no other HCP/NCCPs applicable to the project site. Implementation of the proposed project would have ***no impact*** relative to this issue.




**CITY OF LINCOLN - FULLERTON RANCH**

Figure 8. California Natural Diversity Database

10-mile Radius Search

*CNDDB version 01/2017. Please Note: the occurrences shown on this map represent the known locations of the species listed here as of the date of this version. There may be additional occurrences or additional species within this area which have not been surveyed and/or mapped. Lack of information in the CNDDB abouta species or an area can never be used as proof that no special status species occur in an area.*

*Other map sources: Placer County GIS; ArcGIS Online World Topographic Map Service. Map date: January 27, 2017.*

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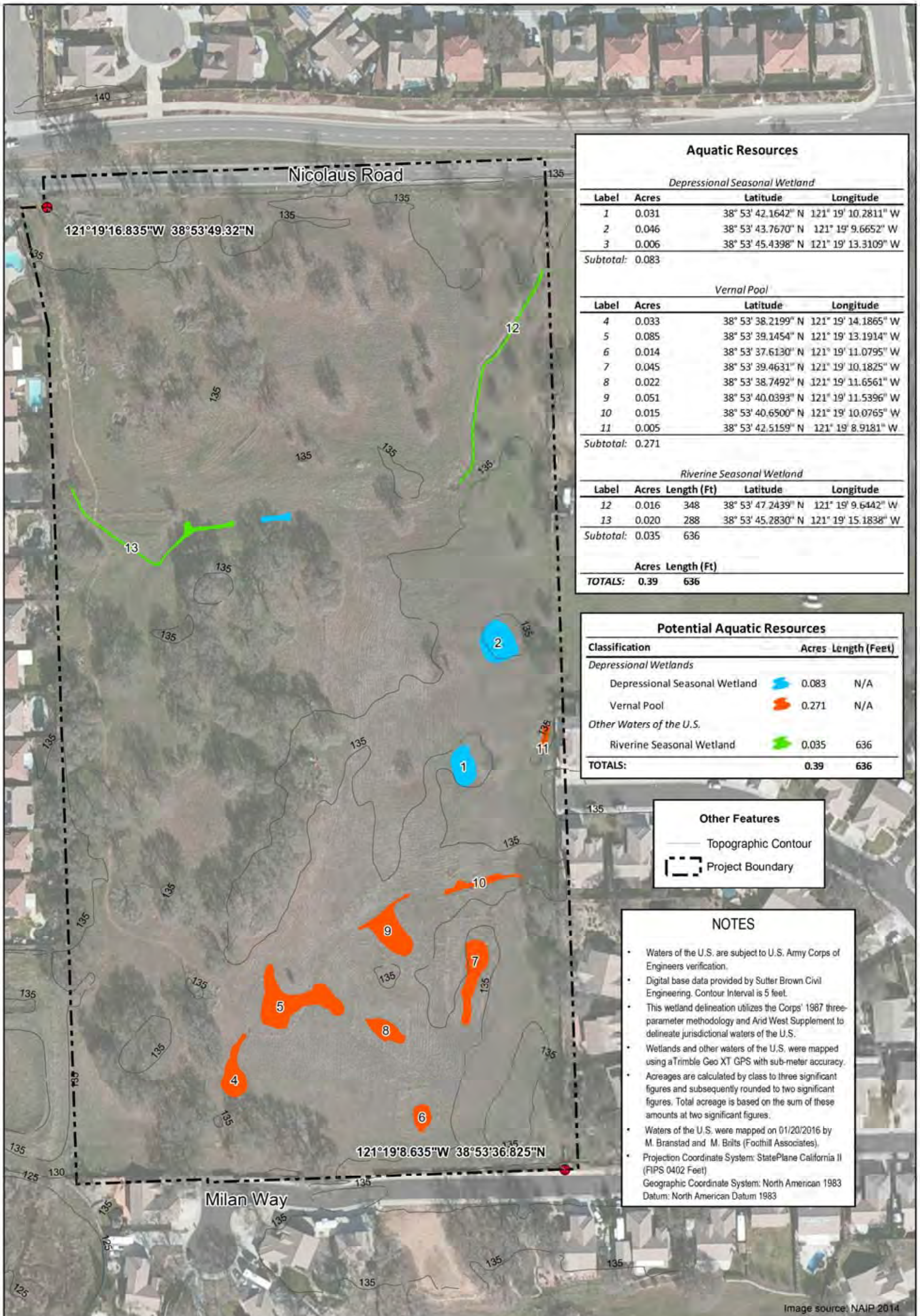


## Aquatic Resources

*Depressional Seasonal Wetland*

| Label | Acres | Latitude | Longitude |
|---|---|---|---|
| *1* | 0.031 | 38° 53' 42.1642" N | 121° 19' 10.2811" W |
| *2* | 0.046 | 38° 53' 43.7670" N | 121° 19' 9.6652" W |
| *3* | 0.006 | 38° 53' 45.4398" N | 121° 19' 13.3109" W |
| *Subtotal:* | 0.083 | | |

*Vernal Pool*

| Label | Acres | Latitude | Longitude |
|---|---|---|---|
| *4* | 0.033 | 38° 53' 38.2199" N | 121° 19' 14.1865" W |
| *5* | 0.085 | 38° 53' 39.1454" N | 121° 19' 13.1914" W |
| *6* | 0.014 | 38° 53' 37.6130" N | 121° 19' 11.0795" W |
| *7* | 0.045 | 38° 53' 39.4631" N | 121° 19' 10.1825" W |
| *8* | 0.022 | 38° 53' 38.7492" N | 121° 19' 11.6561" W |
| *9* | 0.051 | 38° 53' 40.0393" N | 121° 19' 11.5396" W |
| *10* | 0.015 | 38° 53' 40.6500" N | 121° 19' 10.0765" W |
| *11* | 0.005 | 38° 53' 42.5159" N | 121° 19' 8.9181" W |
| *Subtotal:* | 0.271 | | |

*Riverine Seasonal Wetland*

| Label | Acres | Length (Ft) | Latitude | Longitude |
|---|---|---|---|---|
| *12* | 0.016 | 348 | 38° 53' 47.2439" N | 121° 19' 9.6442" W |
| *13* | 0.020 | 288 | 38° 53' 45.2830" N | 121° 19' 15.1838" W |
| *Subtotal:* | 0.035 | 636 | | |

| | Acres | Length (Ft) |
|---|---|---|
| ***TOTALS:*** | **0.39** | **636** |

## Potential Aquatic Resources

| Classification | Acres | Length (Feet) |
|---|---|---|
| *Depressional Wetlands* | | |
| Depressional Seasonal Wetland | 0.083 | N/A |
| Vernal Pool | 0.271 | N/A |
| *Other Waters of the U.S.* | | |
| Riverine Seasonal Wetland | 0.035 | 636 |
| **TOTALS:** | **0.39** | **636** |

## NOTES

- Waters of the U.S. are subject to U.S. Army Corps of Engineers verification.
- Digital base data provided by Sutter Brown Civil Engineering. Contour Interval is 5 feet.
- This wetland delineation utilizes the Corps' 1987 three-parameter methodology and Arid West Supplement to delineate jurisdictional waters of the U.S.
- Wetlands and other waters of the U.S. were mapped using aTrimble Geo XT GPS with sub-meter accuracy.
- Acreages are calculated by class to three significant figures and subsequently rounded to two significant figures. Total acreage is based on the sum of these amounts at two significant figures.
- Waters of the U.S. were mapped on 01/20/2016 by M. Branstad and M. Brits (Foothill Associates).
- Projection Coordinate System: StatePlane California II (FIPS 0402 Feet)
  Geographic Coordinate System: North American 1983
  Datum: North American Datum 1983

**CITY OF LINCOLN - FULLERTON RANCH**

Figure 9. Aquatic Resources Delineation Map

*Source: Foothill & Associates, 7/7/2016.*
*Map date: January 19, 2016.*

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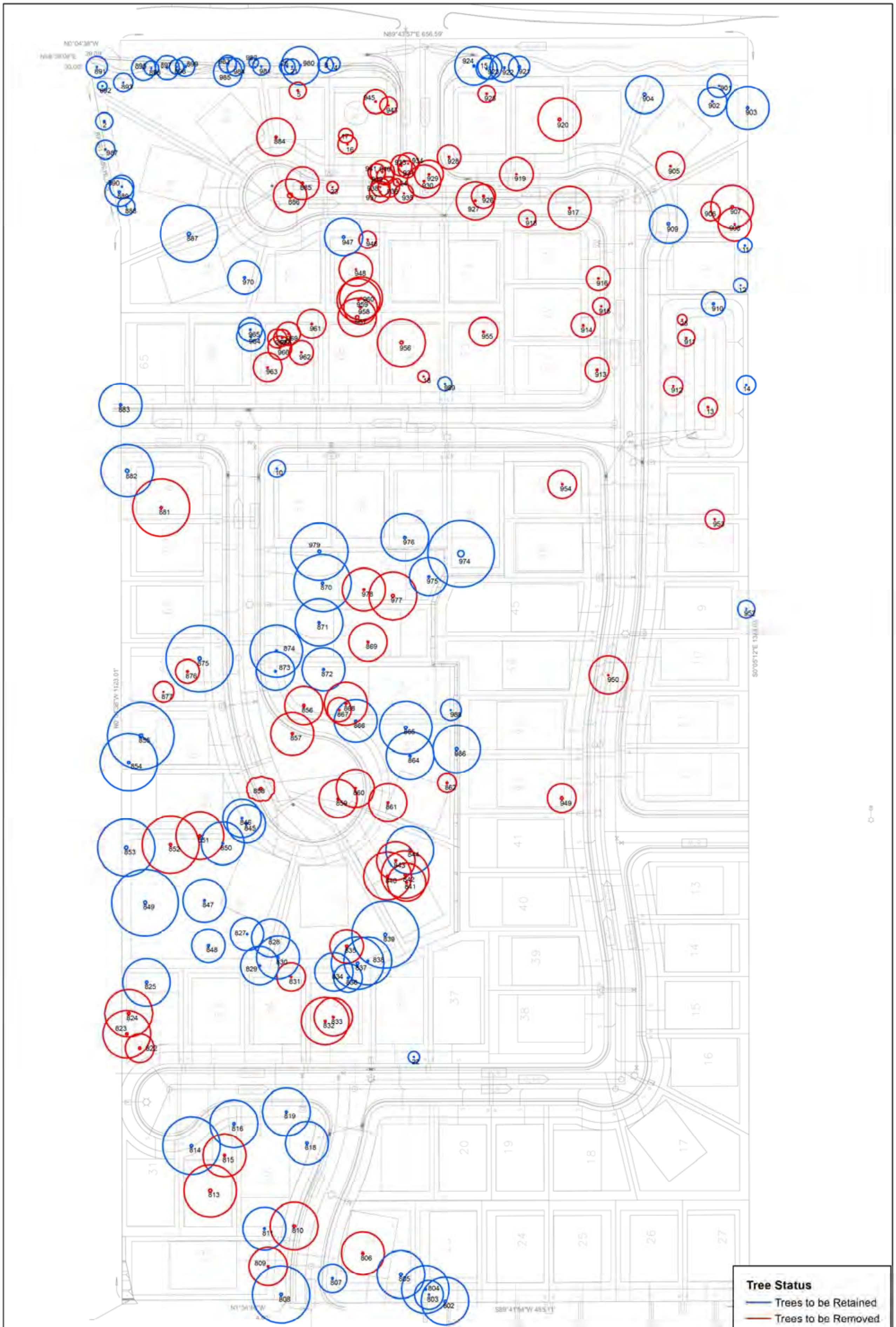


CITY OF LINCOLN - FULLERTON RANCH

Figure 10. Tree Location Exhibit

*Source: DUDEK, Arborist Report for the Fullerton Ranch Project Site (APNs 021-310-094, 021-310-095, and 021-310-096), 8/16/2016; VVH Consulting Engineers, 2016. Map date: January 19, 2017.*

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## V. CULTURAL RESOURCES

| Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5? | | X | | |
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5? | | X | | |
| c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | | X | | |
| d) Disturb any human remains, including those interred outside of formal cemeteries? | | X | | |

### *Background*

A *Determination of Eligibility and Effect for the Fullerton Ranch Project Area, City of Lincoln, Placer County, California* (Peak and Associates, 2017) was prepared for the proposed project (Appendix H). The following is based on that study.

The study included a review of literature maintained by the North Central Information Center (NCIC) of the California Historical Resources Information System at California State University, Sacramento. This indicated that the project area had been previously surveyed by Peak and Associates in 2004 (Peak and Associates, 2004). No resources were located on the property during the survey, but a residence, built in 1963, was noted on the project site. The building was not old enough to record at that time of the 2004 survey. The building's location was present by 1981, as shown on the Lincoln 1981 USGS topographic quadrangle, which is a photo revision of the 1953 quadrangle.

A complete, intensive pedestrian field survey of the project site was completed on December 28, 2016, with transects no wider than 10 meters. The ground visibility was fair and where necessary, weeds were cleared and small holes were dug by hand to check the sediments. The 1963 residence has been removed from the property.

The project site does not appear to have agricultural modification such as land leveling. There are several lines of barbed wire held by steel T-posts or older wooden split wooden posts extending from the boundary fencing on the north and south. A modern steel grate covers a concrete drain in the northeast section of the site, with a modern ditch leading away to near Nicolaus Road. Several small piles of debris can be found through the site including dirt, chunks of asphalt, concrete, wire, brush, and modern litter. Household litter can be found near the fence along the fence line bordering a housing tract on the east side.

The project site has a few groups of trees including native interior live oaks, valley oaks, black walnut, as well as almond. These trees are mostly mature and cover the west side of the site. Soil type and coloration varies, but mostly appears in the orange range, sandy, and with high proportion of coarse degraded granite. In the north end of site, the soil is slightly darker and contains more loam. The soil visibility is moderate to good depending on rodent disturbance, human trails, and areas of heavy or lacking grass. Occasional stones of varying sizes are scattered and piled throughout the site, consisting of local granite and andesite. All these stones appear to have been moved, evidenced by mechanical scrapes and marks.

No prehistoric or historic resources were observed during the pedestrian field survey.

The Native American Heritage Commission (NAHC) was contacted by Peak & Associates for a check of the Sacred Lands file and a list of Native Americans who may have information or concerns relative to the project site. A reply was received from the NAHC on December 21, 2016, indicating there were no resources listed in the Sacred Lands files. A list of contacts that may have concerns or more information was provided in the response. The individuals and organizations identified by the NAHC were contacted by letter on January 6, 2017 (see Appendix I). Correspondence requesting information and/or comment and a topographic map showing the project were sent to the United Auburn Indian Community of the Auburn Rancheria (Gene Whitehouse), Shingle Springs Band of Miwok Indians (Nicholas Fonseca), Tsi-Akim Maidu (Grayson Coney), and Tsi-Akim Maidu (Don Ryburg). To date, two replies have been received: United Auburn Indian Community of the Auburn Rancheria (Gene Whitehouse), and Shingle Springs Band of Miwok Indians (Nicholas Fonseca). According to the response letters, neither group is aware of any known cultural resources on the project site.

### *Responses to Checklist Questions*

**Responses a-b):** As a result of the identification and evaluation efforts, there are no historic properties or archaeological resources present. As with any surface inspection, there is some possibility that a buried site may exist in the area and be obscured by vegetation, fill, or other historic activities, leaving no surface evidence. Should artifacts or unusual amounts of stone, bone, or shell be uncovered during construction activities, an archeologist should be consulted for an evaluation. Implementation of the following mitigation measure would require investigations and avoidance methods in the event that a previously undiscovered cultural resource is encountered during construction activities. This mitigation measure would reduce this potential impact to a ***less than significant*** level.

> ***Mitigation Measure Cul-1:*** *If cultural resources (i.e., prehistoric sites, historic sites, isolated artifacts/features, and paleontological sites) are discovered, work shall be halted immediately within 50 meters (165 feet) of the discovery, the City of Lincoln and tribal representatives from the United Auburn Indian Community (UAIC) of the Auburn Rancheria and the Shingle Springs Band of Miwok Indians shall be notified, and a qualified archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology (or a qualified paleontologist in the event paleontological resources are found) shall be retained to determine the significance of the discovery. The City of Lincoln shall consider recommendations presented by the professional for any unanticipated discoveries and shall carry out the measures deemed feasible and appropriate. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures. Specific measures are developed based on the significance of the find.*

**Response c):** The project site is located in an area that is currently undeveloped. The project site is located away from any permanent water sources, although a small intermittent drainage is located to the south of the project site. Markham Ravine is the closest permanent water source, located about 0.125 miles north of the northern edge of the project site. Exposed granitic outcrops are absent. Prehistoric period activity in the immediate project area focused on habitation adjacent to Markham and nearby Auburn Ravine and utilization of granitic outcrops for food processing. There is little chance of any buried prehistoric period deposits being present as the soil was generally formed in situ without contributions from alluvial sources. However, ground-disturbing activities have the potential to damage or destroy undiscovered paleontological resources, especially during deeper excavations.

Implementation of Mitigation Measure Cul-1 above would require investigations and avoidance methods in the event that a previously undiscovered paleontological resource is encountered during construction activities. This mitigation measure would reduce this impact to a ***less than significant*** level.

**Response d):** Indications are that humans have occupied the Central Valley for at least 10,000 years and it is not always possible to predict where human remains may occur outside of formal burials. Therefore, excavation and construction activities, regardless of depth, may yield human remains that may not be interred in marked, formal burials. Under CEQA, human remains are protected under the definition of archaeological materials as being "any evidence of human activity." Additionally, Public Resources Code Section 5097 has specific stop-work and notification procedures to follow in the event that human remains are inadvertently discovered during construction. Implementation of the following mitigation measure would reduce this potential impact to a ***less than significant*** level.

> ***Mitigation Measure Cul-2:*** *If any human remains are found during grading and construction activities, all work shall be halted immediately within 50 meters (165 feet) of the discovery and the County Coroner must 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 shall notify the Native American Heritage Commission, and the procedures outlined in CEQA Section 15064.5(d) and (e) shall be followed. Additionally, if the Native American resources are identified, a Native American monitor, following the Guidelines for Monitors/Consultants of Native American Cultural, Religious, and Burial Sites established by the Native American Heritage Commission, may also be required and, if required, shall be retained at the applicant's expense.*

## *VI. GEOLOGY AND SOILS*

| *Would the project:* | *Potentially Significant Impact* | *Less Than Significant with Mitigation* | *Less Than Significant Impact* | *No Impact* |
|---|---|---|---|---|
| a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: | | | | |
| i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | | | X | |
| ii) Strong seismic ground shaking? | | | X | |
| iii) Seismic-related ground failure, including liquefaction? | | X | | |
| iv) Landslides? | | X | | |
| b) Result in substantial soil erosion or the loss of topsoil? | | X | | |
| c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? | | X | | |
| d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? | | X | | |
| e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? | | | | X |

### *Background*

A *Preliminary Geotechnical Engineering Report* (Wallace-Kuhl & Associates, 2004) was prepared for the proposed project. De Novo Planning Group peer reviewed the report for use in the Initial Study. The scope of the report included site reconnaissance, review of historical aerial photographs and available groundwater information, excavation and sampling of soil test pits across the project site, review of Department of Agricultural Soils Conservation Service (SCS) Soil Survey for Placer County, limited laboratory testing, and preparation of the preliminary report.

### *Responses to Checklist Questions*

**Responses a.i), a.ii):** The project site is within the City of Lincoln, Placer County on the eastern edge of the Sacramento Valley floor at the base of the Sierra Nevada foothills. The City of Lincoln is 90 miles east of the Bay Area and lies within Seismic Risk Zone 3, a risk zone that poses a lesser risk for earthquakes than those experienced in Zone 4 (e.g., San Francisco Bay

Area). As a result, the City could be affected by regionally occurring earthquakes; however, impacts resulting from such an event would be less in nature than those experienced in the Bay Area. Implementation of the proposed project would not affect the likelihood of an earthquake in the region. As shown in Figure 11, the City is not located within and does not cross a delineated Alquist-Priolo Earthquake Fault Zone. Additionally, mapped earthquake faults do not exist within the City or the project site.

Because of the City's substantial distance from the active Hayward, Cleveland Hills, and Concord Fault zones and the type of ground shaking expected from those faults, the probability of soil liquefaction within the City is considered low.

In order to minimize potential damage to the buildings and site improvements, all construction in California is required to be designed in accordance with the latest seismic design standards of the California Building Code. The California Building Code, Title 24, Part 2, Chapter 16 addresses structural design and Chapter 18 addresses soils and foundations. Collectively, these state requirements, which have been adopted by the City of Lincoln, include design standards and requirements that are intended to minimize impacts to structures in seismically active areas of California. Section 1613 specifically provides structural design standards for earthquake loads. Section 1803.5.11 and 1803.5.12 provide requirements for geotechnical investigations for structures assigned varying Seismic Design Categories in accordance with Section 1613. Design in accordance with these standards and policies would reduce any potential impact to a less than significant level. Because development of the proposed project must be designed in conformance with these state and local standards and policies, any potential impact would be ***less than significant***.

**Responses a.iii), c), d):** Liquefaction normally occurs when sites underlain by saturated, loose to medium dense, granular soils are subjected to relatively high ground shaking. During an earthquake, ground shaking may cause certain types of soil deposits to lose shear strength, resulting in ground settlement, oscillation, loss of bearing capacity, landsliding, and the buoyant rise of buried structures. The majority of liquefaction hazards are associated with sandy soils, silty soils of low plasticity, and some gravelly soils. Cohesive soils are generally not considered to be susceptible to liquefaction. In general, liquefaction hazards are most severe within the upper 50 feet of the surface, except where slope faces or deep foundations are present.

Expansive soils are those that undergo volume changes as moisture content fluctuates; swelling substantially when wet or shrinking when dry. Soil expansion can damage structures by cracking foundations, causing settlement and distorting structural elements. Expansion is a typical characteristic of clay-type soils. Expansive soils shrink and swell in volume during changes in moisture content, such as a result of seasonal rain events, and can cause damage to foundations, concrete slabs, roadway improvements, and pavement sections.

Soil expansion is dependent on many factors. The more clayey, critically expansive surface soil and fill materials will be subjected to volume changes during seasonal fluctuations in moisture content. Figure 12 shows the soils within the Project site, and Figure 13 shows the shrink-swell potential of the soils within the site. The soils encountered at the site consist of mainly San Joaquin-Cometa sandy loams, with some Cometa-Ramona sandy loams along the eastern project boundary and Ramona sandy loam in the northwestern corner of the project site. The San Joaquin series consists of moderately deep, well and moderately well drained soils that formed in alluvium derived soils from mixed but dominantly granitic rock sources. The Ramona series consists of well drained soils that are typically sandy loam and fine sandy loam. The Cometa series consists of moderately deep, well and moderately well drained soils that formed in alluvium from granitic rock sources. According to the *Preliminary Geotechnical Engineering Report*, the site surface soils very from non-expansive and low plasticity silty sands to moderately to highly expansive clay soils. Overall, the potential for soil expansion to occur at the Project site is considered low, but there will be soil inclusions encountered with moderate to high expansion potential.

Based on the results of the *Preliminary Geotechnical Engineering Report*, the on-site clays would not be suitable for use as fill within the upper portions of the building pads, and if exposed at final grade, should be removed and replaced with on-site low plasticity soils. Otherwise, special foundation and floor slab recommendations will be needed. Future studies should include additional laboratory testing to further define the geotechnical engineering requirements for the individual lots and structures. With implementation of the following mitigation measures, this potential impact would be ***less than significant***.

> ***Mitigation Measure Geo-1:*** *Prior to the development of the Project site, further subsurface geotechnical investigation shall be performed to identify onsite soil conditions and identify any site-specific engineering measures to be implemented during the construction of building foundations, surface improvements, and subsurface improvements. The results of the subsurface geotechnical investigation shall be reflected on the Improvements Plans, subject to review and approval by the City's Building Division.*

> ***Mitigation Measure Geo-2:*** *Expansive materials and potentially weak and compressible fills at the site shall be evaluated by a Geotechnical Engineer during the grading plan stage of development. If highly expansive or compressible materials are encountered, special foundation designs and reinforcement, removal and replacement with soil with low to non-expansive characteristics, compaction strategies, or soil treatment options to lower the expansion potential shall be incorporated through requirements imposed by the City's Building Division. Additionally, the recommendations of the Preliminary Geotechnical Engineering Report (Wallace-Kuhl & Associates, 2004) shall be reflected on the Improvements Plans, subject to review and approval by the City's Building Division.*

**Response a.iv):** There are several categories of landslides including: rockfalls, deep slope failure, and shallow slope failure. Factors such as the geological conditions, drainage, slope, vegetation, and others directly affect the potential for landslides. One of the most common causes of landslides is construction activity that is associated with road building (i.e. cut and fill).

The project site is relatively flat and there are no major slopes in the vicinity of the project site. Slope instability at the project site, as a result of seismic events, has very low potential because of the lack of relief across the area and its distance from active and potentially active faults. The project site is not located in the foothills, mountain terrain, or along a river bank. As such, the Project site is exposed to little or no risk associated with landslides.

The City's General Plan includes several policies and implementation measures designed to address a variety of environmental impacts associated with geology and soil conditions. For example, the draft Health and Safety Element provides a number of policies that have been developed to ensure a safe environment for its residents, visitors, and businesses. These policies and implementation measures include continued compliance with all applicable development requirements including the Uniform Building Code (see Policies HS-2.1 and HS-2.4) and the restriction of development within a variety of hazardous areas (see Policies HS-2.2 and HS-2.3). Policy HS-1.1 requires the preparation of engineering studies for all new development proposals within areas of potential soil instability. Additionally, Health and Safety Implementation Measure #1 requires the City to amend the Zoning Ordinance to prohibit development of areas with slopes greater than 30%. The project site is not located in an area with slopes greater than 30%.

Implementation Measure #2 requires the City to adopt guidelines for both the evaluation and mitigation of all applicable geologic hazards common to the study area as part of the approval for both public and private projects. According to the City's General Plan EIR, with adherence to these codes and regulations and implementation of the policies and implementation measures contained in the Health and Safety Element, geologic hazard impacts associated with on-or off-site landslide, subsidence, liquefaction, or collapse would be minimized. The proposed project would be required to comply with all applicable development requirements included in the Uniform Building Code. This is a ***less than significant*** impact and no mitigation is required.

**Response b):** The project site is currently undeveloped and is not at significant risk of erosion under the existing conditions. Construction activities including grading could temporarily increase soil erosion rates during and shortly after project construction. Construction-related erosion could result in the loss of a substantial amount of nonrenewable topsoil and could adversely affect water quality in nearby surface waters. The RWQCB requires a project specific Storm Water Pollution Prevention Plan (SWPPP) to be prepared for each project that disturbs an area one acre or larger. The SWPPP will include project specific best management measures that are designed to control drainage and erosion. Furthermore, proposed project will include detailed project specific drainage plan that control storm water runoff and erosion, both during and after construction. The SWPPP and the project specific drainage plan would reduce the potential for erosion. Implementation of the following mitigation measure would ensure that the proposed project would result in a ***less-than-significant*** impact relative to this topic.

> ***Mitigation Measure Geo-3:*** *The project applicant shall submit a Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) to the RWQCB in accordance with the NPDES General Construction Permit requirements. The SWPPP shall be designed to control pollutant discharges utilizing Best Management Practices (BMPs) and technology to reduce erosion and sediments. BMPs may consist of a wide variety of measures taken to reduce pollutants in stormwater runoff from the project site. Measures shall include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) that will be employed to control erosion from disturbed areas. Final selection of BMPs will be subject to approval by the City of Lincoln and the RWQCB. The SWPPP will be kept on site during construction activity and will be made available upon request to representatives of the RWQCB.*

**Response e):** The proposed project would not require the use of septic tanks or alternative waste water disposal systems for the disposal of waste water. Implementation of the proposed project would result in ***no impact*** relative to this topic.

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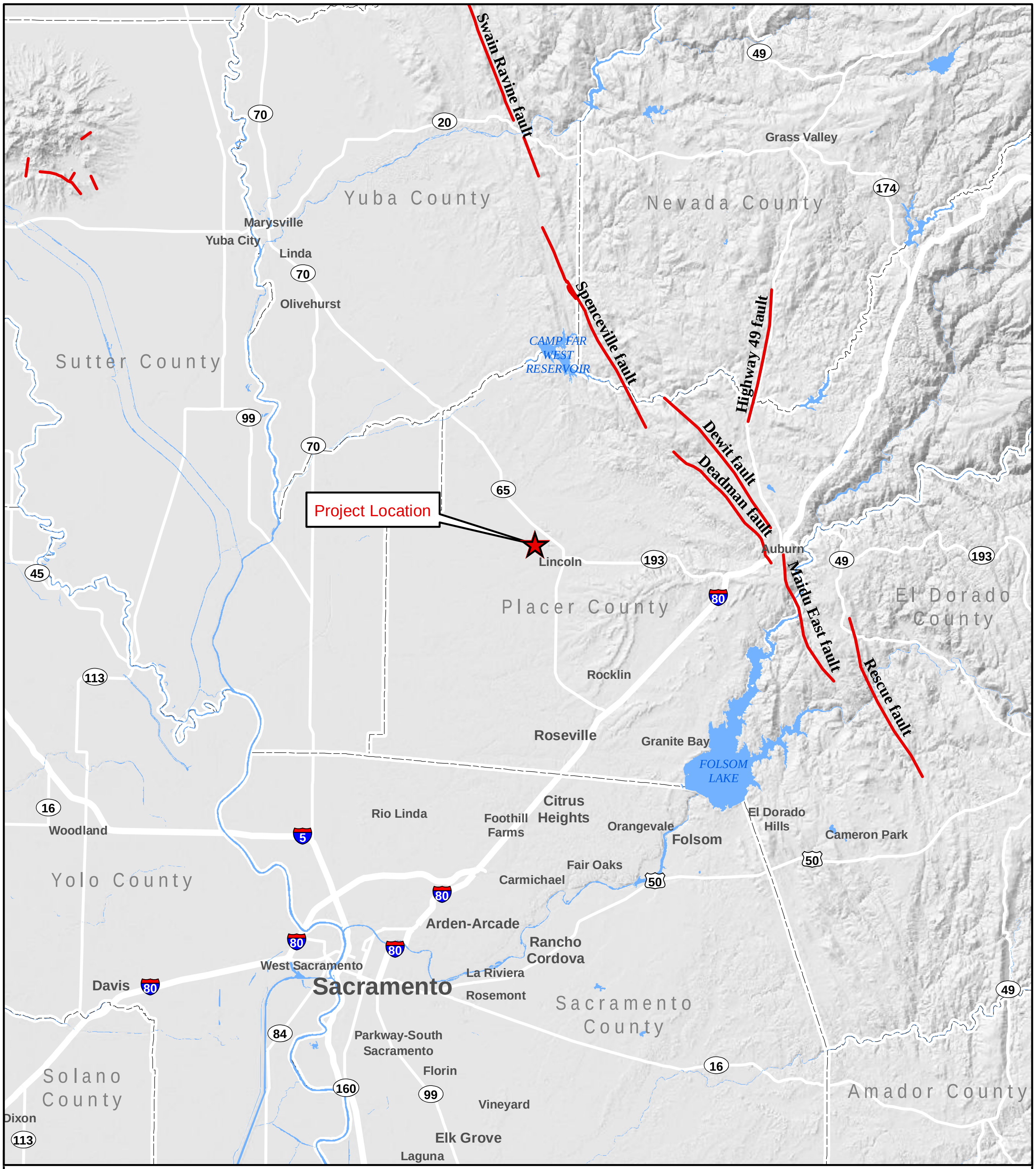


**CITY OF LINCOLN - FULLERTON RANCH**

Figure 11. Earthquake Faults and Alquist-Priolo Zones

**Quaternary Faults**

- Well-constrained
- Moderately-constrained
- Inferred
- Alquist-Priolo Fault Zones*

*There are no A-P Zones within the mapped extent

N

0 2½ 5

Miles

1:500,000

*Data sources: US Geologic Survey; CalAtlas. Map date: December 8, 2016.*

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## Legend

Project Boundary

**NRCS Soil Description**

- 142 - Cometa-Ramona Sandy Loams (0.75 ac)
- 175 - Ramona Sandy Loam (0.19 ac)
- 182 - San Joaquin-Cometa sandy loams (18.76 ac)

N

0 50 100

Feet

1:2,400

*Sources: NRCS Web Soil Survey, Placer County California, Western Part, Version 8; Placer County GIS; ArcGIS Online World Imagery Service. Map date: December 7, 2016.*

**CITY OF LINCOLN - FULLERTON RANCH**

Figure 12. Project Site Soils

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**Legend**

Project Boundary

**Shrink-Swell Potential of Soil***

Low Potential

*Shrink-Swell Potential is determined by linear extensibility. Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Soils are considered to have low potential when the linear extensibility is less than 3%, moderate if 3-6%, and high if 6-9%. Map labels can be cross-referenced to Figure 10. Project Site Soils.

*Sources: NRCS Web Soil Survey, Placer County California, Western Part, Version 8; Placer County GIS; ArcGIS Online World Imagery Service. Map date: December 7, 2016.*

N

0 50 100

Feet

1:2,400

**CITY OF LINCOLN - FULLERTON RANCH**

Figure 13. Shrink-Swell Potential of Soils

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## *VII. GREENHOUSE GAS EMISSIONS*

| ***Would the project:*** | ***Potentially Significant Impact*** | ***Less Than Significant with Mitigation Incorporation*** | ***Less Than Significant Impact*** | ***No Impact*** |
|---|---|---|---|---|
| a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | | | X | |
| b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses? | | | X | |

### *Background*

Various gases in the Earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation.

Naturally occurring greenhouse gases include water vapor ($H_2O$), carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), and ozone ($O_3$). Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also greenhouse gases, but they are, for the most part, solely a product of industrial activities. Although the direct greenhouse gases $CO_2$, $CH_4$, and $N_2O$ occur naturally in the atmosphere, human activities have changed their atmospheric concentrations. From the pre-industrial era (i.e., ending about 1750) to 2005, concentrations of these three greenhouse gases have increased globally by 36, 148, and 18 percent, respectively (IPCC 2007)[1].

Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide ($CO_2$), methane ($CH_4$), ozone ($O_3$), water vapor, nitrous oxide ($N_2O$), and chlorofluorocarbons (CFCs).

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission 2006a)[2]. In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (California Energy Commission 2006a).

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California produced 492 million gross metric tons of carbon dioxide

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1 Intergovernmental Panel on Climate Change. 2007. "Climate Change 2007: The Physical Science Basis, Summary for Policymakers." Available at: http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg1_report_the_physical_science_basis.htm.

2 California Energy Commission. 2006a. Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004. Available at: http://www.arb.ca.gov/cc/inventory/archive/archive.htm.

equivalents ($MMTCO_2e$) in 2004 (California Energy Commission 2006a). By 2020, California is projected to produce 507 $MMTCO_2e$ per year.[3]

Carbon dioxide equivalents are a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only $CO_2$ were being emitted.

Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions. In 2012, transportation sector emissions accounted for approximately 37 percent of the total GHG emissions in the state (California Greenhouse Gas Emission Inventory: 2000-2012).[4] This category was followed by the industrial sector contributing 21.9 percent of GHG emissions. The electric power generation sector (including both in-state and out of-state sources) has seen the greatest decline in GHG emissions down 14 percent from 2000, and currently contributing 11.2 percent of all state GHG emissions.

### *EFFECTS OF GLOBAL CLIMATE CHANGE*

The effects of increasing global temperature are far-reaching and extremely difficult to quantify. The scientific community continues to study the effects of global climate change. In general, increases in the ambient global temperature as a result of increased GHGs are anticipated to result in rising sea levels, which could threaten coastal areas through accelerated coastal erosion, threats to levees and inland water systems and disruption to coastal wetlands and habitat.

If the temperature of the ocean warms, it is anticipated that the winter snow season would be shortened. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state. The snowpack portion of the supply could potentially decline by 70 to 90 percent by the end of the 21st century (Cal EPA 2006).[5] This phenomenon could lead to significant challenges securing an adequate water supply for a growing state population. Further, the increased ocean temperature could result in increased moisture flux into the state; however, since this would likely increasingly come in the form of rain rather than snow in the high elevations, increased precipitation could lead to increased potential and severity of flood events, placing more pressure on California's levee/flood control system.

Sea level has risen approximately seven inches during the last century and it is predicted to rise an additional 22 to 35 inches by 2100, depending on the future GHG emissions levels (Cal EPA 2006). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion and disruption of wetlands (Cal EPA 2006). As the existing climate throughout California changes over time, mass migration of species, or failure of species to migrate in time

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3 California Air Resources Board. 2010. "Functional Equivalent Document prepared for the California Cap on GHG Emissions and Market-Based Compliance Mechanisms."

4 EPA. Available at: http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-12_report.pdf.

5 California Environmental Protection Agency, Climate Action Team. 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature. Available at: http://www.climatechange.ca.gov/climate_action_team/reports/.

to adapt to the perturbations in climate, could also result. Under the emissions scenarios of the Climate Scenarios report (Cal EPA 2006), the impacts of global warming in California are anticipated to include, but are not limited to, the following.

*Public Health*

Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation are projected to increase from 25 to 35 percent under the lower warming range and to 75 to 85 percent under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55 percent more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures will increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

*Water Resources*

A vast network of man-made reservoirs and aqueducts capture and transport water throughout the State from Northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snow pack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snow pack, increasing the risk of summer water shortages.

The state's water supplies are also at risk from rising sea levels. An influx of saltwater would degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta, a major state fresh water supply. Global warming is also projected to seriously affect agricultural areas, with California farmers projected to lose as much as 25 percent of the water supply they need; decrease the potential for hydropower production within the state (although the effects on hydropower are uncertain); and seriously harm winter tourism. Under the lower warming range, the snow dependent winter recreational season at lower elevations could be reduced by as much as one month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing, snowboarding, and other snow dependent recreational activities.

If GHG emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snow pack by as much as 70 to 90 percent. Under the lower warming scenario, snow pack losses are expected to be only half as large as those expected if temperatures were to rise to the higher warming range. How much snow pack will be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snow pack would pose challenges to water managers, hamper hydropower generation, and nearly eliminate all skiing and other snow-related recreational activities.

### *Agriculture*

Increased GHG emissions are expected to cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. Although higher carbon dioxide levels can stimulate plant production and increase plant water-use efficiency, California's farmers will face greater water demand for crops and a less reliable water supply as temperatures rise.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising temperatures are likely to worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts, and milk.

Crop growth and development will be affected, as will the intensity and frequency of pest and disease outbreaks. Rising temperatures will likely aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

In addition, continued global warming will likely shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant populations already established. Should range contractions occur, it is likely that new or different weed species will fill the emerging gaps. Continued global warming is also likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

### *Forests and Landscapes*

Global warming is expected to alter the distribution and character of natural vegetation thereby resulting in a possible increased risk of large of wildfires. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. For example, if precipitation increases as temperatures rise, wildfires in Southern California are expected to increase by approximately 30 percent toward the end of the century. In contrast, precipitation decreases could increase wildfires in Northern California by up to 90 percent.

Moreover, continued global warming will alter natural ecosystems and biological diversity within the state. For example, alpine and sub-alpine ecosystems are expected to decline by as much as 60 to 80 percent by the end of the century as a result of increasing temperatures. The productivity of the state's forests is also expected to decrease as a result of global warming.

### *Rising Sea Levels*

Rising sea levels, more intense coastal storms, and warmer water temperatures will increasingly threaten the state's coastal regions. Under the higher warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate coastal areas with saltwater, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

### *SIGNIFICANCE THRESHOLDS*

PCAPCD recently developed recommendations for thresholds of significance for evaluating construction-and operation-related GHG emissions for proposed land use development projects within its jurisdiction. These thresholds were developed in collaboration with the Sacramento Metropolitan Air Quality Management District, the Yolo Solano Air Quality Management District, and the Feather River Air Quality Management District. PCAPCD recommends a two-tiered approach for assessing a project's operational emissions. The first tier consists of comparing a project's annual operational emissions to PCAPCD's recommended mass emission threshold. This threshold gives lead agencies the ability to conclude that smaller developments would not necessarily make a considerable contribution to the cumulative impact of climate change.

The second tier consists of evaluating a project's consistency with California's GHG reduction targets. Prior to the Newhall Ranch decision, the second-tier involved comparison of the project emissions to a "no action taken" (NAT) scenario. In the Newhall Ranch decision, the court found that, although comparison of a project to NAT (or "business as usual") may be appropriate in concept, the comparison of a specific local project against a statewide business as usual scenario is not an analogous comparison. The Court stated that the BAU approach would need to be based on a substantial evidence-supported link between data in the Scoping Plan and the project, at its proposed location, to demonstrate consistency of a project's reductions with statewide goals.

Based on current data available it is not possible, within the structure of the Scoping Plan sectors, to develop the evidence to reliably relate a specific land use development project's reductions to the Scoping Plan's statewide goal, as envisioned by the Court. Based on the court's finding, the NAT approach is now considered problematic and is no longer recommended by PCAPCD. Therefore, consistent with direction from the PCAPCD, the following analysis replaces the second tier with a threshold that is consistent with the Newhall Ranch decision. This new second-tier consists of evaluating the consistency of a project's GHG efficiency with California's GHG reduction targets. In light of the Newhall Ranch decision, efficiency metrics were developed in coordination with PCAPCD to assess the project's consistency with California's adopted GHG reduction target for 2020 under AB 32.

PCAPCD's recommended methodology for assessing a project's consistency with GHG targets established in AB 32 is the use of GHG efficiency metrics to assess the GHG efficiency of a project on a "service population (SP)" basis (the sum of the number of jobs and the number of residents supported by a project). This metric represents the GHG efficiency needed to achieve a fair share of the state's emissions mandate embodied in AB 32. The use of "fair share" in this instance refers to the GHG efficiency that, if applied statewide, would meet the AB 32 emissions target and support efforts to reduce emissions beyond 2020. The intent of AB 32 is to accommodate population and economic growth in California, but do so in a way that results in less GHG emissions. With a reduced rate of emissions per service population, California can accommodate expected population growth and achieve economic development objectives, while also abiding by AB 32's emissions target and supporting efforts to reduce statewide GHG levels beyond 2020.

The per service population efficiency target is based on the AB 32 GHG reduction target and GHG emissions inventory prepared for the ARB 2008 Scoping Plan. The efficiency approach allows lead agencies to assess whether any given project or plan would accommodate population and employment growth in a way that is consistent with the emissions limit established under AB 32. The resultant GHG efficiency metric applicable to the project would be 4.5 MT $CO_2e$/SP/year.

The project is anticipated to be built out and fully operational by mid 2020. Therefore, the City bases its significance determination for this project on the 2020 target. Analysis of project emissions at buildout is consistent with current CEQA practice and available guidance from air districts on analyzing emissions from the first fully operational year (SMAQMD 2015:6-5). Operational emissions would be highest during the first year and would decline due to fleet turnover and implementation of additional regulations at the State level. Furthermore, if the project's estimated GHG emissions per service population in 2020 are less than these metrics, the impact would be considered less than significant for the AB 32 target year.

Based on the discussion above, the following thresholds are applied to this analysis:

- For the evaluation of construction-related emissions, the PCAPCD-recommended threshold of 1,100 metric tons of carbon dioxide-equivalent per year (MT $CO_2e$/year) is used. If the project's construction-related emissions are above this threshold, a significant impact would result.
- For the evaluation of operational emissions, the PCAPCD-recommended De Minimis Level threshold of 1,100 MT $CO_2e$/year is used. If the project's operational emissions are above 1,100 MT $CO_2e$/year and below the PCAPCD-recommended Bright-Line threshold of 10,000 MT $CO_2e$/year, the PCAPCD-recommended Efficiency Matrix threshold is used. For urban residential uses, the Efficiency Matrix threshold is 4.5 MT $CO_2e$/year/capita. For rural residential uses, the Efficiency Matrix threshold is 5.5 MT $CO_2e$/year/capita. The project site is located in a suburban residential area, which does not specifically have an Efficiency Matrix threshold. For purposes of this analysis the stricter urban Efficiency Matrix threshold of 4.5 MT $CO_2e$/year/capita will be used. If the project's operational-related emissions are above the De Minimis Level threshold of 1,100 MT $CO_2e$/year and above the 4.5 MT $CO_2e$/year/capita Efficiency Matric threshold, a significant impact would result. Further, if the project's operational-related emissions are above the Bright-Line threshold, a significant impact would result.

*Responses to Checklist Questions*

**Responses a), b):** The proposed project's short-term construction-related and long-term operational GHG emissions for buildout of the proposed Project, were estimated using the California Emission Estimator Model (CalEEMod)™ (v.2016.3.1). CalEEMod is a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify GHG emissions from land use projects. The model quantifies direct GHG emissions from construction and operation (including vehicle use), as well as indirect GHG emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. Emissions are expressed in annual metric tons of $CO_2$ equivalent units of measure (i.e., $MTCO_2e$), based on the global warming potential of the individual pollutants.

*Short-Term Construction GHG Emissions*

Estimated increases in GHG emissions associated with construction of the proposed project (all phases collectively) are summarized in Table 11. The modeling included mitigation inputs for construction operations including the following:

- Reduce vehicle speed on unpaved roads to 5 miles per hour (mph); and
- Water exposed area 3 times daily.

***Table 11: Construction GHG Emissions***

| | *Bio-$CO_2$* | *NBio-$CO_2$* | *Total $CO_2$* | *$CH_4$* | *$N_2O$* | *$CO_2e$* |
|---|---|---|---|---|---|---|
| ***Year*** | ***MT/yr*** | | | | | |
| 2018 | 0.0000 | 225.8618 | 225.8618 | 0.0533 | 0.0000 | 227.1953 |
| 2019 | 0.0000 | 246.8680 | 246.8680 | 0.0339 | 0.0000 | 247.7144 |
| 2020 | 0.0000 | 51.8196 | 51.8196 | 6.5300e-003 | 0.0000 | 51.9829 |
| **Maximum** | **0.0000** | **246.8680** | **246.8680** | **0.0533** | **0.0000** | **247.7144** |

*SOURCE: CALEEMOD (V.2016.3.1).*

As presented in the table, the maximum short-term construction emissions of GHG associated with development of the project are estimated to be 247.7144 $MTCO_2e$. This value is well below the PCAPCD-recommended threshold of 1,100 $MTCO_2e$ for construction-related emissions. These construction GHG emissions are a one-time release and are comparatively much lower than overall emissions associated with operational phases of a project. Construction GHG emissions from the proposed project do not impede local GHG reduction efforts, or violate GHG reduction goals set by AB 32, as required by the Public Resources Code, Section 21082.2. Therefore, cumulatively these construction emissions would not generate a significant contribution to global climate change.

### *Long-Term Operational GHG Emissions*

The long-term operational GHG emissions estimate for buildout of the proposed project incorporates the potential area source and vehicle emissions, and emissions associated with utility and water usage, and wastewater and solid waste generation. The modeling included mitigation inputs including the following:

<u>Traffic Modeling Assumptions</u>

- Increase transit accessibility in the project site (minimum distance to transit stops is 0.6 miles)
- Increase accessibility to downtown/job center (minimum distance to downtown/job center is 1.45 miles)
- Improve pedestrian network so that the project site connects to offsite pedestrian networks
- Provide traffic calming measures on street segments and intersections

<u>Energy Modeling Assumptions</u>

- Exceed Title 24 by 15%
- Install high efficiency lighting
- Install high efficiency appliances within residences

<u>Area Modeling Assumptions</u>

- Use low VOC paint

- Use only natural gas hearths

Water Modeling Assumptions

- Install low flow bathroom faucet
- Install low-flow kitchen faucet
- Install low-flow toilet
- Install low-flow shower
- Use water-efficient irrigation systems

Estimated GHG emissions associated with buildout of the proposed project with and without the above mitigation incorporated are summarized in Tables 12 and 13. As shown in Tables 12 and 13, the annual operational GHG emissions associated with buildout of the proposed project would be 1,059.9021 $MTCO_2e$ without mitigation, which is slightly below the De Minimis level threshold, and well below the bright line threshold. The GHG emissions would be reduced to 930.2354 $MTCO_2e$ with the above referenced mitigation incorporated. The mitigation results in a total decrease of 129.6667 $MTCO_2e$, representing a decrease of 12.23 percent. With and without these basic mitigation measures, the total emissions would be below the De Minimis level threshold.

***Table 12: Operational GHG Emissions (Unmitigated)***

| | ***Bio-$CO_2$*** | ***NBio-$CO_2$*** | ***Total $CO_2$*** | ***$CH_4$*** | ***$N_2O$*** | ***$CO_2e$*** |
|---|---|---|---|---|---|---|
| ***Category*** | ***MT/yr*** | | | | | |
| Area | 83.6696 | 36.0722 | 119.7418 | 0.0782 | 6.5800e-003 | 123.6573 |
| Energy | 0.0000 | 234.7804 | 234.7804 | 0.0123 | 4.5300e-003 | 236.4384 |
| Mobile | 0.0000 | 648.6329 | 648.6329 | 0.0327 | 0.0000 | 649.4506 |
| Waste | 15.2730 | 0.0000 | 15.2730 | 0.9026 | 0.0000 | 37.8383 |
| Water | 1.6743 | 5.2882 | 6.9625 | 0.1725 | 4.1700e-003 | 12.5175 |
| **Total** | **100.6169** | **924.7737** | **1,025.3906** | **1.1983** | **0.0153** | **1,059.9021** |

*SOURCE: CALEEMOD (V.2016.3.1).*

***Table 13: Operational GHG Emissions (Mitigated)***

| | ***Bio-$CO_2$*** | ***NBio-$CO_2$*** | ***Total $CO_2$*** | ***$CH_4$*** | ***$N_2O$*** | ***$CO_2e$*** |
|---|---|---|---|---|---|---|
| ***Category*** | ***MT/yr*** | | | | | |
| Area | 0.0000 | 58.4021 | 58.4021 | 2.0633e-003 | 1.0500e-003 | 58.7673 |
| Energy | 0.0000 | 210.0198 | 210.0198 | 0.0114 | 4.0600e-003 | 211.5149 |
| Mobile | 0.0000 | 611.0924 | 611.0924 | 0.0318 | 0.0000 | 611.8862 |
| Waste | 15.2730 | 0.0000 | 15.2730 | 0.9026 | 0.0000 | 37.8383 |
| Water | 1.3394 | 4.4434 | 5.7829 | 0.1380 | 3.3400e-003 | 10.2287 |
| **Total** | **16.6125** | **883.9577** | **900.5702** | **1.0858** | **8.4500e-003** | **930.2354** |

*SOURCE: CALEEMOD (V.2016.3.1).*

This project's operational-related GHG emissions (930.2354 $MTCO_2e$) are well below the PCAPCD-recommended mass emission threshold of 1,100 $MTCO_2e$ for operational-related emissions. Additionally, although the project would not exceed the PCAPCD operational threshold, the project was evaluated to demonstrate consistency with a GHG Efficiency Matrix of 4.5 MT $CO_2e$/SP/year.

Trip generation and associated mobile source emissions were estimated using information provided by Fehr & Peers for the project traffic study. Taking into account an average household size of 2.59, the project would provide housing for an estimated 209 individuals, and no land uses that harbor employment. Therefore, GHG emissions per service population for the project would be 4.45 MT $CO_2e$/SP/year in 2020, which would be lower than the target efficiency of 4.5 MT $CO_2e$/SP/year. Thus, the project would be consistent with the GHG Efficiency Matrix threshold. The project would be fully operational by 2020 and would meet the State's 2020 GHG reduction targets under AB 32. Additionally, certain regulations that are relevant to the land use development and that are being implemented as part of the AB 32 Scoping Plan will continue to be phased in after 2020 (e.g., Advanced Clean Cars, Renewables Portfolio Standard [RPS], SB 375) and result in additional GHG reductions. Therefore, project emissions are expected to decline in the future as additional regulations are implemented at the State level.

Another consideration in addressing the project's GHG emissions is whether the SACOG MTP/SCS, which addresses GHG emissions goals for automobiles and light duty trucks for 2020 and 2036 in the Sacramento Metropolitan Region, would address the project's emissions (SACOG 2016). SACOG was tasked by ARB to achieve a seven percent reduction in per capita GHGs from passenger cars and light trucks by 2020 and a 16 percent reduction by 2035, relative to emission levels in 2005. Based on the development outlined in the MTP/SCS, the region would achieve both reduction targets by implementing its SCS (SACOG 2016:173). This target cannot be directly translated to an overall threshold, given it is geared toward GHG emissions from transportation only. However, mobile source emissions from passenger vehicles represent a large proportion of GHG emissions associated with land use development projects, especially residential development, resulting from vehicle trips to and from the development. The project is included in the SCS planning period (through 2036) and the rest of the project site is consistent with the "Established Community" designation in the SCS (SACOG 2016: 28). While the MTP/SCS acknowledges it cannot predict land use on a parcel-by-parcel basis throughout the SACOG region, SACOG does account for some growth in areas designated as "Established Communities" through 2036. This growth assumes that many of the newer subdivisions, including the City of Lincoln, will likely continue to build at a steadier pace than traditional infill in the near term (through 2020) (SACOG 2016: 31). If development follows the trends and predictions for growth in the SCS for the SACOG region over the next 20 years, development at the project site would be consistent with SCS assumptions.

SACOG states that for the purposes of determining SCS consistency, the policies of the MTP/SCS are embedded in the metrics and growth forecast assumptions of the MTP/SCS. Projects consistent with the growth forecast assumptions of the MTP/SCS, are consistent with the MTP/SCS and its policies (SACOG 2016). The MTP/SCS forecasts 3,280 new units per year through 2036 in Established Communities (SACOG 2016: 31). The 81 units of the project are, therefore, within the growth anticipated in the MTP/SCS and development from the project when added to other entitled projects is not expected to exceed the MTP/SCS buildout assumptions for the area within this Community Type. The project would be located in an Established Community and is in line with the MTP/SCS which addresses GHG emissions goals for automobiles and light duty trucks for 2020 and 2036.

As described above, the project's GHG emissions per service population would be below the derived efficiency metric for 2020. As such, the project will be consistent with the 2020 GHG reduction target that applies through the construction of the project. The project would not result in operational GHG emissions that exceed PCAPCD's recommended efficiency threshold for 2020. Therefore, this impact would be ***less than significant***.

## *VIII. HAZARDS AND HAZARDOUS MATERIALS*

| *Would the project:* | *Potentially Significant Impact* | *Less Than Significant with Mitigation Incorporation* | *Less Than Significant Impact* | *No Impact* |
|---|---|---|---|---|
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | | | X | |
| b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | | | X | |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | | | X | |
| d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? | | | X | |
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? | | X | | |
| f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? | | X | | |
| g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | | | | X |
| h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? | | | X | |

### *Responses to Checklist Questions*

**Responses a), b):** The proposed project would place residential uses in an area of the City that currently contains residential uses. The proposed residential land uses do not routinely transport, use, or dispose of hazardous materials, or present a reasonably foreseeable release of hazardous materials, with the exception of common hazardous materials such as household cleaners, paint, etc. The operational phase of the proposed project does not pose a significant hazard to the public or the environment.

Onsite reconnaissance and historical records indicate that there are no known underground storage tanks or pipelines located on the project site that contain hazardous materials. Therefore, the disturbance of such items during construction activities is unlikely. Construction equipment and materials would likely require the use of petroleum based products (oil, gasoline, diesel fuel), and a variety of common chemicals including paints, cleaners, and solvents. Transportation, storage, use, and disposal of hazardous materials during construction activities would be required to comply with applicable federal, state, and local statutes and regulations. Compliance would ensure that human health and the environment are not exposed to hazardous materials. Therefore, the proposed project would have a ***less than significant*** impact relative to this issue.

**Response c):** The project site is outside a ¼ mile radius of the nearest school. The closest school is Foskett Ranch Elementary located approximately 0.62 miles to the north of the project site. The operations of a residential subdivision would not emit hazardous emissions or result in the storage or handling of hazardous or acutely hazardous materials, substances or waste above the level of existing conditions. Implementation of the proposed project would result in a ***less than significant*** impact relative to this topic.

**Response d):** According the California Department of Toxic Substances Control (DTSC) there are no Federal Superfund Sites, State Response Sites, or Voluntary Cleanup Sites on, or in the near vicinity of the project site. The project site is not included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5. The nearest investigation sites include:

- Lincoln Auxiliary Field (site #80000580): This site is a State Response Site which has a current status of No Further Action. The government acquired the 627.87-acre site between 1942 and 1944 for use as an auxiliary field to Mather Air Force Base (AFB). The site was declared surplus in 1944. On January 2, 1947, the property was quitclaimed to the City of Lincoln. The site was investigated for lead contamination as a result of the previous airfield operations located on the site. No potential hazards related to Department of Defense activities have been identified with this site.

- Foskett Ranch Elementary School (site #31020003): This site is a School Investigation which has a current status of No Action Required. For the past 130 years, the site was used for livestock grazing. The site was evaluated for potential contaminants associated with the previous agricultural uses. No contaminants of concern were found on the site.

Implementation of the proposed project would result in a ***less than significant*** impact relative to this environmental topic.

**Responses e), f):** The Federal Aviation Administration (FAA) establishes distances of ground clearance for take-off and landing safety based on such items as the type of aircraft using the airport. The project site is not located within the vicinity of a private airstrip. The closest airstrip is the Lincoln Regional Airport approximately 1.49 miles west of the project site. According to the Placer County Airport Land Use Compatibility Plan (Placer County ALUP), project site is located within Compatibility Zones C2 and D for the Lincoln Regional Airport (see Figure 16 in Section XII, Noise). Each compatibility zone is discussed below.

**Compatibility Zone C2:** Within Compatibility Zone C2, aircraft typically overfly these areas at an altitude of 1,000 to 1,500 feet above ground level on visual approaches. Safety is a concern only with regard to uses involving high concentrations of people and particularly risk-sensitive uses such as schools and hospitals (PCTPA 2014: 6-3 and 6-4). For Lincoln Regional Airport, the Placer County ALUP's intensity criteria for single-family residential home land uses within Compatibility Zone C2 is a maximum site-wide average intensity of 300 people per acre and maximum single-acre intensity of 1,200 people per acre. The proposed project would result in the construction of residential housing that would generate an estimated 209 people based on an average of 2.59 people per household. After development of the 19.7-acre site with residential uses, the density of development would be approximately 14.2 people per acre, which is well below the lowest site-wide intensity standard in the Placer County ALUP. Therefore, the project would be consistent with the Placer County ALUP's land use compatibility and safety standards. No schools or hospitals are proposed as part of the project.

**Compatibility Zone D:** Within Compatibility Zone D, areas are sometimes overflown by aircraft arriving and departing the Airport. Hazards to flight are the only compatibility concern. Height limits are no less than 150 feet within Compatibility Zone D. Single-family residential home land uses within Compatibility Zone D do not have intensity limits. Therefore, the project would be consistent with the Placer County ALUP's land use compatibility and safety standards. No schools or hospitals are proposed as part of the project.

One of the required project approvals includes Airport Land Use Commission (Commission) review of the proposed rezoning for consistency with the Placer County ALUP. The Commission noted, "Single-family residential is considered a compatible use in Zones C2 and D. As such, there are no airport noise and safety concerns, or airspace protection issues associated with the proposed rezone. The subdivision is located where about 80 percent of aircraft overflights occur." The Commission reviewed the project and determined that the proposed project is consistent with the Placer County Airport Land Use Compatibility Plan Zones C2 and D and recommended the following mitigation in order to ensure compatibility.

Implementation of the following mitigation measures would ensure that the proposed project would result in a ***less-than-significant*** impact relative to the Lincoln Regional Airport Compatibility Zones C2 and D.

> ***Mitigation Measure Haz-1:*** *An overflight notification shall be recorded for residential land uses within Compatibility Zone C2 and an airport proximity disclosure shall be provided for residential land uses within Compatibility Zone D.*
>
> ***Mitigation Measure Haz-2:*** *Ensure that the proposed on-site detention uses are implemented in a manner consistent with ALUCP Policy 3.5.3 (a)(6) and Federal Aviation Administration regulation (FAA Advisory Circular 150.5200-33B, "Hazardous Wildlife Attractants On or Near Airports"). This requirement shall be noted on the project improvement plans.*

**Response g):** The General Plan provides a number of policies that address conformance with local emergency response programs and continued cooperation with emergency response service providers. For example, policies in the Health and Safety Element have been developed to ensure that all applicable disaster plans are updated regularly (see Policy HS-7.2) and a coordinated emergency response system is maintained with other agencies (see Policies HS-7.1 and HS-7.5). The proposed project does not include any actions that would impair or physically interfere with an adopted emergency response plan or emergency evacuation plan. The project involves the development of residential uses near similar residential uses, and would not interfere with any emergency response or evacuation plans. Implementation of the proposed project would result in ***no impact*** on this environmental topic.

**Response h):** The risk of wildfire is related to a variety of parameters, including fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents), and topography (degree of slope). Steep slopes contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Fuels such as grass are highly flammable because they have a high surface area to mass ratio and require less heat to reach the ignition point, while fuels such as trees have a lower surface area to mass ratio and require more heat to reach the ignition point.

The City has areas with an abundance of flashy fuels (i.e., grassland) in the outlying residential parcels and open lands that, when combined with warm and dry summers with temperatures often exceeding 100 degrees Fahrenheit, create a situation that results in higher risk of wildland fires. Most wildland fires are human caused, so areas with easy human access to land with the appropriate fire parameters generally result in an increased risk of fire.

The California Department of Forestry has designated the northeastern edge of the City as having a moderate wildland fire potential; however, moderate rating does not extend to the project site. Because the project site is not located within a designated wildfire hazard area, this is a ***less than significant*** impact and no mitigation is required.

## IX. HYDROLOGY AND WATER QUALITY

| *Would the project:* | *Potentially Significant Impact* | *Less Than Significant with Mitigation Incorporation* | *Less Than Significant Impact* | *No Impact* |
|---|---|---|---|---|
| a) Violate any water quality standards or waste discharge requirements? | | | X | |
| b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? | | | X | |
| c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site? | | X | | |
| d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site? | | X | | |
| e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? | | X | | |
| f) Otherwise substantially degrade water quality? | | | X | |
| g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? | | | | X |
| h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows? | | | | X |
| i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? | | | | X |
| j) Inundation by seiche, tsunami, or mudflow? | | | | X |

### *Responses to Checklist Questions*

**Response a):** Implementation of proposed project would not violate any water quality or waste discharge requirements. Construction activities including grading could temporarily increase soil erosion rates during and shortly after project construction. Construction-related erosion could result in the loss of soil and could adversely affect water quality in nearby surface waters. The RWQCB requires a project specific SWPPP to be prepared for each project that disturbs an area one acre or larger. The SWPPP is required to include project specific best management measures that are designed to control drainage and erosion. Mitigation Measure Geo-3 would require the preparation of a SWPPP to ensure that the proposed project prepares and implements a SWPPP throughout the construction phase of the project. Furthermore, the proposed project includes a preliminary grading and drainage plan that has a specific drainage plan designed to control storm water runoff and erosion, both during and after construction. The SWPPP (Mitigation Measure Geo-3) and the project specific drainage plan would reduce the potential for the proposed project to violate water quality standards during construction. Implementation of the proposed project would result in a ***less-than-significant*** impact relative to this topic.

**Response b):** The proposed project would connect to the City of Lincoln water system. The City's municipal water supply is primarily surface water, and groundwater wells within the City are typically only used as a backup water supply source. The City provides potable water to all residents and commercial customers within the City limits. The potable water is provided by the Placer County Water Agency (PCWA) (17 million gallons per day [MGD]) and four City-owned municipal wells (7 MGD). Water supplied by PCWA comprises the City's base water supply and is derived from PCWA and Nevada Irrigation District (NID) entitlement to surface water fed by the Sierra snowpack. Water from PCWA is treated at PCWA's Foothill Water Treatment Plant and is then delivered to the City. The City's wells are used as back-up water supply.

The proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted). According to the *Preliminary Geotechnical Engineering Report* prepared for the project by Wallace-Kuhl & Associates (July 2004), a permanent groundwater table was not encountered within the test pits for the project site. The Report concluded that the permanent groundwater table is not within 160 of the existing site grades. The project site is not a recharge site.

Project construction would add additional impervious surfaces to the project site; however, the front and back yard spaces would remain largely pervious, which would allow infiltration to underlying groundwater. In addition, Markham Ravine lower tributary would not be disturbed as part of the project, and one detention basin would be constructed onsite. The water quality basin would continue to contribute to groundwater recharge following construction of the project. Furthermore, the project is not anticipated to significantly affect groundwater quality because sufficient stormwater infrastructure would be constructed as part of project to detain and filter stormwater runoff and prevent long-term water quality degradation. Therefore, project construction and operation would not substantially deplete or interfere with groundwater supply or quality. This impact would be ***less than significant***.

**Responses c-e):** When land is in a natural or undeveloped condition, precipitation will infiltrate/percolate the soils and mulch. Much of the rainwater that falls on natural or undeveloped land slowly infiltrates the soil and is stored either temporarily or permanently in underground layers of soil. When the soil becomes completely soaked or saturated with water or the rate of rainfall exceeds the infiltration capacity of the soil, the rainwater begins to flow on the surface of land to low lying areas, ditches, channels, streams, and rivers. Rainwater that flows off of a site is defined as storm water runoff. When a site is in a natural condition or is undeveloped, a larger percentage of rainwater infiltrates into the soil and a smaller percentage flows off the site as storm water runoff.

The infiltration and runoff process is altered when a site is developed with urban uses. Houses, buildings, roads, and parking lots introduce asphalt, concrete, and roofing materials to the landscape. These materials are relatively impervious, which means that they absorb less rainwater. As impervious surfaces are added to the ground conditions, the natural infiltration process is reduced. As a result, the volume and rate of storm water runoff increases. The increased volumes and rates of storm water runoff can result in flooding in some areas if adequate storm drainage facilities are not provided.

There are no rivers, streams, or water courses located on or immediately adjacent to the project site. As such, there is no potential for the project to alter a water course, which could lead to on or offsite flooding. Drainage improvements associated with the project site would be located on the project site, and the project would not alter or adversely impact offsite drainage facilities.

The proposed project would increase impervious surfaces throughout the project site. The proposed project would require the installation of storm drainage infrastructure to ensure that storm waters properly drain from the project site. The proposed storm drainage plan includes an engineered network of storm drain lines, manholes, inlets, and a water quality basin. The storm drainage plan was designed and engineered to ensure proper construction of storm drainage infrastructure to control runoff and prevent flooding, erosion, and sedimentation. The City Engineer reviews all storm drainage plans as part of the improvement plan submittal to ensure that all facilities are designed to the City's standards and specifications. The City Engineer also reviews all storm drainage plans to ensure that post-project runoff does not exceed pre-project runoff. The City Engineer's review of pre- and post-project runoff is intended to ensure that the capacity of the existing storm drainage system is not exceeded. This determination is ultimately made by the City Engineer during the improvement plan review and approval. Mitigation Measure Hydro-1 will require the post-project runoff to be equal to or less than pre-project runoff, which would ensure that the proposed project would not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site. The storm drainage plan will require the construction of new storm water drainage facilities on the project site; however, the construction of these facilities would not substantially alter the existing drainage pattern of the area, or alter the course of a stream or river. Implementation of the proposed project with the following mitigation measure would have a ***less-than-significant*** impact relative to this environmental topic.

> ***Mitigation Measure Hydro-1:*** *The storm drainage plan shall be designed and engineered to ensure that post-project runoff is equal to or less than pre-project runoff in accordance with the West Placer Storm Water Quality Design Manual. The applicant shall provide the City Engineer with all stormwater runoff calculations with the improvement plan submittal.*

**Response f):** Construction activities including grading could temporarily increase soil erosion rates during and shortly after project construction. Construction-related erosion could result in the loss of soil and could adversely affect water quality in nearby surface waters. The RWQCB requires a project specific SWPPP to be prepared for each project that disturbs an area one acre or larger. The SWPPP is required to include project specific best management measures that are designed to control drainage and erosion. Mitigation Measure Geo-3 would require the preparation of a SWPPP to ensure that the proposed project prepares and implements a SWPPP throughout the construction phase of the project. Furthermore, the proposed project includes a detailed project specific drainage plan that controls storm water runoff and erosion after construction. The SWPPP (Mitigation Measure Geo-3) and the project specific drainage plan would reduce the potential for polluted runoff and/or degradation of water quality.

Implementation of the proposed project would result in a ***less-than-significant*** impact relative to this topic.

**Responses g-h):** As shown in Figure 14, the project site is located within Flood Zone X, which is not within the 100-year flood zone as shown on the Flood Insurance Rate Map (FIRM). The closest 100-year flood zone is located to the south, outside of the project site. While the Markham Ravine Lower Tributary is located near the southwestern corner of the project site, the entire project site is outside of this regulatory floodway.

Further, in 2007, the State of California passed a series of laws referred to as Senate Bill (SB) 5 directing the Department of Water Resources (DWR) to prepare flood maps for the Central Valley flood system and the State Plan of Flood Control, which includes a system of levees and flood control facilities located in the Central Valley. This legislation also set specific locations within the area affected by the 200-year flood event as the urban level of flood protection (ULOP) for the Central Valley.

SB5 "requires all cities and counties within the Sacramento-San Joaquin Valley, as defined in California Government Code Sections 65007(h) and (j), to make findings related to an ULOP or national Federal Emergency Management Agency (FEMA) standard of flood protection before: (1) entering into a development agreement for any property that is located within a flood hazard zone; (2) approving a discretionary permit or other discretionary entitlement, or ministerial permit that would result in the construction of a new residence, for a project that is located within a flood hazard zone; or (3) approving a tentative map, or a parcel map for which a tentative map was not required, for any subdivision that is located within a flood hazard zone." The City of Lincoln completed its General Plan updated in June 2016 to meet the requirements of SB 5.

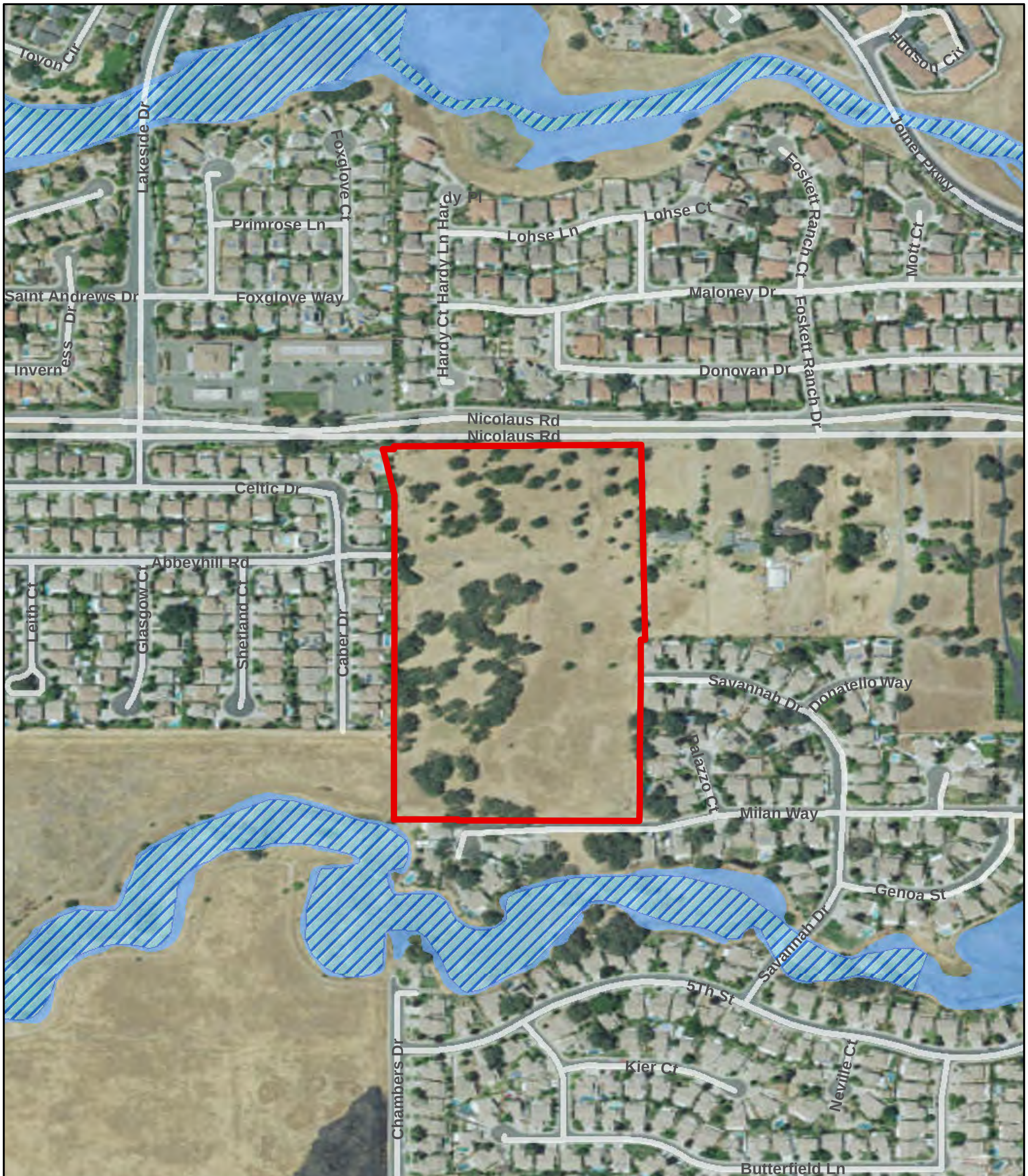
Implementation of the proposed project would have ***no impact*** relative to this environmental topic.

**Response i):** The project site is not located within an area with a control levee or dam. As shown in Figure 15, the project site is not located within a dam inundation area. The proposed project would not expose people or structures to a significant risk of loss, injury or death involving flooding as a result of the failure of a levee or dam. Implementation of the proposed project would have ***no impact*** relative to this environmental topic.

**Response j):** The project site is not anticipated to be inundated by a tsunami because it is located at an elevation of 130 feet above sea level and is approximately 100 miles away from the Pacific Ocean which is the closest ocean waterbody. Implementation of the proposed project would have ***no impact*** relative to this environmental topic.

The project site is not anticipated to be inundated by a seiche because it is not located in close proximity to a water body capable of creating a seiche. Implementation of the proposed project would have ***no impact*** relative to this environmental topic.

A mudflow is a category of landslide that is associated with heavy saturation of soils and sometimes is associated with seismicity. Factors such as the geological conditions, drainage, slope, vegetation, and others directly affect the potential for mudflow. The City's General Plan EIR does not identify mudslides as a topic of concern. Additionally, the project site is essentially flat and would be graded as part of the project. No steep areas that would have the potential to generate mudflows during operations would be created. Therefore, implementation of the proposed project would have ***no impact*** relative to this environmental topic.




**CITY OF LINCOLN - FULLERTON RANCH**

Figure 14. FEMA Flood Zone Map

## Legend

Project Boundary

**FEMA Designation**

1% Annual Chance Flood Hazards (100-yr Flood Zone)

Regulatory Floodway

N

0 250 500

Feet

1:6,000

*Sources: FEMA Preliminary FIRM Panel 06061C_PRELIMDB issued 12/28/2015. Placer County GIS; ArcGIS Online World Imagery Service. Map date: December 12, 2016.*

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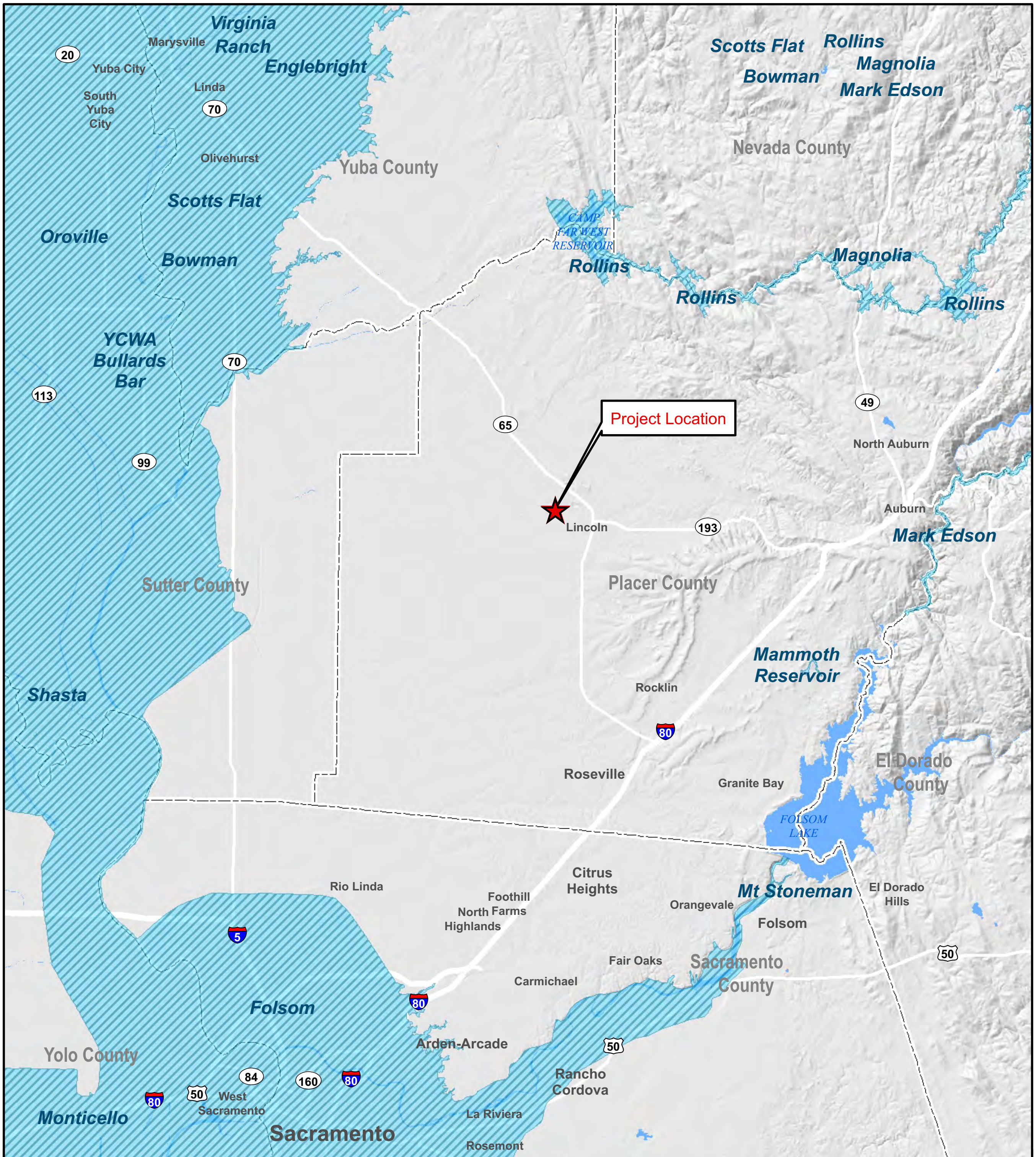


**CITY OF LINCOLN - FULLERTON RANCH**

Figure 15. Dam Inundation Areas

**Legend**

Dam Inundation Areas

N

0 2 4

Miles

1:350,000

*Data sources: California Emergency Management Agency; CalAtlas. Map date: January 26, 2017.*

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## *X. LAND USE AND PLANNING*

| ***Would the project:*** | ***Potentially Significant Impact*** | ***Less Than Significant with Mitigation Incorporation*** | ***Less Than Significant Impact*** | ***No Impact*** |
|---|---|---|---|---|
| a) Physically divide an established community? | | | X | |
| b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? | | | X | |
| c) Conflict with any applicable habitat conservation plan or natural community conservation plan? | | | | X |

### *Responses to Checklist Questions*

**Response a):** The proposed project is a residential subdivision on an undeveloped site that is surrounded by residential subdivisions. The proposed residential subdivision is consistent with the surrounding uses and would not physically divide an established community. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

**Response b):** The key planning documents that are directly related to, or that establish a framework within which the proposed project must be consistent, include:

- City of Lincoln General Plan
- City of Lincoln Zoning Ordinance

The proposed project is a residential development in an area surrounded by existing and planned residential developments. Development of the project site would alter the existing landscape from undeveloped land to a residential neighborhood. The 19.7-acre project site currently has a Low Density Residential (LDR) General Plan Land Use Designation and a Residential Estate (R-E) Zoning Designation. The LDR General Plan designation allows for 3 to 5.9 dwelling units to the acre. The current R-E zoning, however, is not consistent with the General Plan Land Use designation and it warrants a rezone to a zone that conforms to the General Plan Land Use Designation. The applicant has proposed to rezone from R-E to PD-LDR, which would bring the zoning into consistency with the General Plan Land Use Designation. In addition, the rezoning would establish specific development standards, setbacks, plotting, parking, and other project characteristics that have been developed specifically for this proposed neighborhood. Approval of the rezone would create consistency between the General Plan and Zoning Ordinance for the project site.

According to Chapter 18.32 of the Lincoln Municipal Code, the City's PD zone is established to encourage and provide for a creative and more flexible approach to the use of land; to maximize choices for living environments available to the people of the City; and to encourage more efficient allocation and maintenance of privately controlled common open space through the redistribution of overall densities where such a rearrangement is desirable and feasible.

The proposed standards and regulations (Table 1) are proposed for this project in-lieu of the existing standards provided in the Lincoln Municipal Code, except where otherwise stated. Where the proposed PD standards are silent on an issue, then the standards in the Municipal

Code or other applicable city, state, or federal codes will apply, as appropriate. If the project is approved by the City of Lincoln, the proposed PD zone change would ensure that the project does not conflict with the City's Zoning Ordinance. The proposed PD zone change does not cause a significant physical environmental impact.

The proposed project would result in 81 units on 19.7 acres, which would result in approximately 4.11 dwelling units per acre. This density falls within the allowed density for the LDR General Plan designation. The proposed uses and density are generally consistent with the LDR General Plan Land Use Designation.

The above analysis indicates that the proposed project is consistent with the General Plan. The project applicant has proposed a zone change to ensure that the proposed development standards that were designed for this proposed neighborhood is not in conflict with the Zoning Ordinance. The project as proposed would not conflict with any applicable land use plan, policy, or regulation of the City of Lincoln. Implementation of the proposed project would have a ***less than significant*** impact relative to this issue.

**Response c):** The adopted Placer County Conservation Plan (PCCP) was drafted with the intention to protect oak woodlands, vernal pool grasslands, non-vernal pool grasslands, riparian, freshwater wetlands and streams in portions of western Placer County. The City of Lincoln is a partner in the PCCP. The project site is identified as an area for Potential Future Growth in the Draft PCCP Reserve Map and no areas proposed for preservation are located within the project site (Placer 2015). Because the project would not conflict with the development guidelines in the PCCP, implementation of the proposed project would have ***no impact*** relative to this issue.

## *XI. MINERAL RESOURCES*

| ***Would the project:*** | ***Potentially Significant Impact*** | ***Less Than Significant with Mitigation Incorporation*** | ***Less Than Significant Impact*** | ***No Impact*** |
|---|---|---|---|---|
| a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | | | | X |
| b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? | | | | X |

### *Responses to Checklist Questions*

**Response a):** The California Geological Survey (CGS) has mapped mineral and mineral aggregate resources in Placer County. The MZ-4 designation covers the site and the surrounding area, a designation defined as "areas of no known mineral occurrences where geologic information does not rule out either the presence or absence of significant mineral resources" (CDMG, 1995). No mineral extraction operations exist at the property. Additionally, there are no oil and gas extraction wells within or in the vicinity of the property. Implementation of the proposed project would have ***no impact*** relative to this issue.

**Response b):** The project site does not contain a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. The proposed project would not result in loss of a mineral resource. Implementation of the proposed project would have ***no impact*** relative to this issue.

## *XII. NOISE*

| *Would the project result in:* | *Potentially Significant Impact* | *Less Than Significant with Mitigation Incorporation* | *Less Than Significant Impact* | *No Impact* |
|---|---|---|---|---|
| a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | | X | | |
| b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? | | | X | |
| c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? | | X | | |
| d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? | | X | | |
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? | | | | X |
| f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? | | | | X |

### *Background*

An *Environmental Noise Assessment* (2017) was prepared by j.c. brennan & associates for the proposed project. The following is a summary of the report, which is contained in Appendix J.

*Regulatory Framework*

**City of Lincoln General Plan Health and Safety Element:** The General Plan Noise Element provides the following goals and policies:

- *Goal HS-8*: To protect residents from health hazards and annoyance associated with excessive noise levels.
- *Policy HS 8.1*: Sensitive Receptors: The City will allow the development of new noise-sensitive land uses (which include but are not limited to residential, health care facilities and schools) only in areas exposed to existing or projected levels of noise which satisfy the levels specified in Table 8.1 (Table 16 of this section). Noise mitigation measures spaces to levels specified in Table 8.1 (Table 16 of this section).
- *Policy HS 8.2*: Protect Residential Areas: The City will strive to achieve exterior noise levels for existing and future dwellings in residential areas that do not exceed exterior noise levels of 60 dBA CNEL and interior noise levels of 45 dBA CNEL.

- Policy HS 8.3: Railroad Noise: The City will work with railroad operators to assess the feasibility of noise mitigation measures, where sensitive noise receptors are impacted by rail operations.
- *Policy HS 8.4*: Controlling Truck Traffic: The City shall control noise sources in residential areas and other noise-sensitive areas by restricting truck traffic to designated truck routes.
- *Policy HS 8.5*: Noise Monitoring: The City shall establish an ongoing noise monitoring program for the purpose of enforcing noise standards established by the City.
- *Policy HS 8.6*: Development Around Airports: The City shall require that development around Lincoln Airport be consistent with the noise standards contained in the approved Airport Land Use Commission Plan, and where deemed appropriate, require aviation easements from new development.
- *Policy HS 8.7*: Update Airport Master Plan: The City shall pursue the update of the Airport Master Plan noise contours through the year 2030, consistent with the anticipated use of the airport by larger aircraft, and to revise the General Plan as necessary to reflect new noise contours.
- *Policy HS 8.8*: Construction Noise: The City will provide guidelines to developers for reducing potential construction noise impacts on surrounding land uses.
- *Policy HS 8.9*: Noise Compatibility Guidelines: The City shall use adopted noise compatibility guidelines to evaluate compatibility of proposed new development and ensure compatibility between residential, commercial and other surrounding land uses (Table 16 of this section).
- *Policy HS 8.10*: Sound Attenuation Features: The City shall require sound attenuation features such as walls, berming, and heavy landscaping between commercial and industrial uses and residential uses to reduce noise and vibration. Setback distances may also be used to reduce noise.
- *Policy HS 8.11*: Noise Buffering: The City shall require a variety of sound attenuation features (including noise buffering or insulation) in new development along major streets and highways, and along railroad tracks.
- *Policy HS 8.15*: Limiting Construction Activities: The City shall establish restrictions regarding the hours and days of construction activities throughout the City.

**Placer County Airport Land Use Compatibility Plan:** According to the Placer County ALUP, the project site is located within Compatibility Zones D and C2 for the Lincoln Regional Airport. The Land Use Compatibility Plan states that single-family residential uses are considered "Normally Compatible" within this zone. Figure 16 shows the Compatibility Zones and noise contours for the Lincoln Regional Airport.

Annoyance associated with aircraft overflights is the major concern within Compatibility Zone C2. While these areas do not fall within the take-off or landing overflight zone, they are close enough to the airport to expect that there will be some planes flying over at times. The exact flight path of a plane is largely up to the discretion of the pilot. The elevation of the plane during a flyover is largely going to affect the noise levels. The higher the plane, the lower the noise level at ground elevation, while the lower the plane the higher the noise level at ground elevation. Additionally, the type of plane largely influences the noise level generated by the plane, Small personal aircraft generate the least amount of noise compared to large jets. During an over overflight of a plane at low elevation, it is expected that there would be a spike in the noise level, and the level of spike will depend on the type of plane. This spike would be short-lived and would amount to 10 to 20 seconds of elevated noise.

*Existing Noise Levels*

Traffic noise was the dominant noise sources discerned on the project site during field noise monitoring. There are other major sources of noise within the City of Lincoln, such as the Sierra Pacific Lumber Mill or the Union Pacific Railroad. Noise monitoring did not indicate that these other regional noise sources were noise sources that were substantial at the project site. This is likely due to distance, combined with the shielding and various attenuating structures that separate the project site from these regional noise sources. The following discussion focuses on existing traffic noise levels, as traffic noise was determined to be the dominant noise source at the project site.

The FHWA Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop $L_{dn}$ (24-hour average) noise contours for the primary project-area roadways. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model predicts hourly $L_{eq}$ values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict $L_{dn}$ values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour period.

Existing traffic volumes were obtained from the traffic consultant (Fehr & Peers, August 2017). Day/night traffic distributions were based upon file data for similar roadways and field-measured values where available. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing conditions. Table 14 shows the results of this analysis. The complete inputs and results for the FHWA traffic noise modeling are contained within the Environmental Noise Assessment (Appendix J).

***Table 14: Existing Traffic Noise Levels***

| ***Roadway*** | ***Segment*** | ***Noise Level at Closest Receptors ($L_{dn}$)*** | ***Distances to Traffic Noise Contours $L_{dn}$, feet*** | | |
|---|---|---|---|---|---|
| | | | ***70 dB*** | ***65 dB*** | ***60 dB*** |
| Nicolaus Rd. | West of Lakeside Dr. | 57.0 | 11 | 23 | 50 |
| Nicolaus Rd. | Lakeside Dr. to Fullerton Ranch | 57.7 | 11 | 25 | 53 |
| Nicolaus Rd. | Fullerton Ranch to Joiner Pkwy. | 56.9 | 11 | 25 | 53 |
| Nicolaus Rd. | East of Joiner | 60.9 | 15 | 32 | 68 |
| Joiner Pkwy. | Nicolaus Rd. to 1st St. | 55.8 | 10 | 21 | 45 |
| Joiner Pkwy. | South of 1st St. | 56.9 | 13 | 29 | 63 |

*NOTES: DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS.*
*SOURCE: FHWA-RD-77-108 WITH INPUTS FROM FEHR & PEERS AND J.C. BRENNAN & ASSOCIATES, INC. 2017.*

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segments. In some locations, sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the project-area roadway segments analyzed in this report. Where sound walls occur, a -5 dB offset was applied to account for typical acoustic shielding provided by a 6-foot tall sound wall.

The actual distances to noise level contours may vary from the distances calculated by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. The distances reported in Table 14 are generally considered to be conservative worst-case calculations of noise exposure along the project-area roadways.

*Community Noise Survey*

A community noise survey was conducted to document existing ambient noise levels at the project site. The data collected included the hourly average ($L_{eq}$), median ($L_{50}$), and the maximum level ($L_{max}$) during the measurement period. Noise monitoring sites and the measured noise levels at each site are summarized in Table 15. Figure 17 shows the locations of the noise monitoring site.

Community noise monitoring equipment included a Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter equipped with an LDL ½" microphone. The measurement system was calibrated using a LDL Model CAL200 acoustical calibrator before and after testing. The measurement equipment meets all pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

***Table 15: Existing Ambient Noise Monitoring Results***

| Noise Measurement Site | CNEL / $L_{DN}$ (DBA) | Measured Hourly Noise Levels (dBA) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Daytime (7 a.m. – 10 p.m.) | | | Nightime (10 p.m. – 7 a.m.) | | |
| | | $L_{EQ}$ | $L_{50}$ | $L_{MAX}$ | $L_{EQ}$ | $L_{50}$ | $L_{MAX}$ |
| ***Continuous (24-hour) Noise Level Measurements*** | | | | | | | |
| A: North border of project site. | 65 | 63 | 58 | 81 | 57 | 45 | 76 |
| ***Short-Term Noise Level Measurements*** | | | | | | | |
| 1: Abbeyhill Rd. @ W. border of project site | N/A | 51 | 46 | 63 | 1/12/17, 2:26 pm. – Roadway traffic, birds, rain | | |
| 2: Milan Way @ S. border of project site. | N/A | 53 | 53 | 55 | 1/12/17, 2:51 pm. – Birds/wildlife/rain | | |
| 3: Savannah Dr. @ E. border of project site. | N/A | 58 | 58 | 60 | 1/12/17, 3:10 pm. – Birds/wildlife/rain | | |

*SOURCE: J.C. BRENNAN & ASSOCIATES, INC. - 2017.*

*Noise Standards*

The noise standards applicable to the project include the relevant portions of the City of Lincoln General Plan as described in the Regulatory Framework section above. The City of Lincoln has established acceptable standards for noise levels as follows:

- Policy HS 8.1: Sensitive Receptors: The City will allow the development of new noise-sensitive land uses (which include but are not limited to residential, health care facilities and schools) only in areas exposed to existing or projected levels of noise which satisfy the levels specified in Table 8.1 (Table 16 of this section). Noise mitigation measures spaces to levels specified in Table 8.1 (Table 16 of this section).

***Table 16: Maximum Allowable Noise Exposure by Land Use***

| | Noise Level (CNEL) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0-55 | 56-60 | 61-65 | 66-70 | 71-75 | 75-80 | >80 |
| Residential - Low Density Single Family, Duplex, Mobile Homes | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Unacceptable | Unacceptable |
| Residential - Multiple Family, Group Homes | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Unacceptable | Unacceptable |
| Motels / Hotels | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Normally Unacceptable | Unacceptable |
| Schools, Libraries, Churches, Hospitals, Extended Care Facilities | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Normally Unacceptable | Unacceptable |
| Auditoriums, Concert Halls, Amphitheaters | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Unacceptable | Unacceptable | Unacceptable | Unacceptable |
| Sports Arenas, Outdoor Spectator Sports | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Unacceptable | Unacceptable | Unacceptable |
| Playgrounds, Neighborhood Parks | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Acceptable | Unacceptable | Unacceptable | Unacceptable |
| Golf Courses, Riding Stables, Water Recreation, Cemeteries | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Unacceptable | Normally Unacceptable | Unacceptable |
| Office Buildings, Business Commercial and Professional | Normally Acceptable | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Normally Unacceptable |
| Industrial, Manufacturing, Utilities, Agriculture | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable |

| | |
|---|---|
| (blank) | **Normally Acceptable.** Specified land use is satisfactory, based on the assumption that any buildings involved are of normal, conventional construction, without any special noise insulation requirements. |
| (hatched) | **Conditionally Acceptable.** New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed insulation features have been included in the design. |
| (cross-hatched) | **Normally Unacceptable.** New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor areas must be shielded. |
| (solid) | **Unacceptable.** New construction or development should not be undertaken. |

*Vibration Standards*

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities. The City of Lincoln does not have specific policies pertaining to vibration levels. However, vibration levels associated with construction activities are addressed as potential noise impacts associated with project implementation.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. The threshold for damage to structures ranges from 0.2 to 0.6 peak particle velocity in inches per second (in/sec p.p.v). The general threshold at which human annoyance could occur is notes as 0.1 in/sec p.p.v.

*Responses to Checklist Questions*

**Responses a, c):**

*Traffic Noise at Existing Receptors*

To describe future noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. Inputs to the model included traffic volumes provided by Fehr & Peers. The FHWA model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly $L_{eq}$ values for free-flowing traffic conditions. To predict $L_{dn}$/CNEL values, it is necessary to determine the day/night distribution of traffic and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Table 17 shows the noise levels associated with traffic on the local roadway network under the existing and existing plus project traffic conditions. As indicated by Table 17, the related noise level increases under development of the proposed project are predicted to be no more than 0.2 dB. A 3.0 dBA change is considered to be a just-perceivable difference. Therefore, the impact of a 0.2 dB traffic noise increase on existing receptors would be considered ***less than significant***.

***Table 17: Existing Traffic Noise Levels vs. Existing Plus Project Traffic Noise Levels***

| *Roadway* | *Segment* | *Noise Levels (CNEL / $L_{dn}$, dB)* | | | *Distance to Existing + Project Traffic Noise Contours, feet[1]* | | |
|---|---|---|---|---|---|---|---|
| | | *Existing* | *Existing + Project* | *Change (dB)* | *70 dB $L_{dn}$* | *65 dB $L_{dn}$* | *60 dB $L_{dn}$* |
| Nicolaus Rd. | West of Lakeside Dr. | 57.0 | 57.1 | 0.1 | 11 | 24 | 51 |
| Nicolaus Rd. | Lakeside Dr. to Fullerton Ranch | 57.7 | 57.8 | 0.1 | 12 | 25 | 54 |
| Nicolaus Rd. | Fullerton Ranch to Joiner Pkwy. | 56.9 | 57.0 | 0.1 | 12 | 25 | 54 |
| Nicolaus Rd. | East of Joiner Pkwy. | 60.9 | 60.9 | 0.0 | 15 | 32 | 69 |
| Joiner Pkwy. | Nicolaus Rd. to 1st St. | 55.8 | 55.9 | 0.1 | 10 | 21 | 45 |
| Joiner Pkwy. | South of 1st St. | 56.9 | 57.1 | 0.2 | 14 | 30 | 64 |

[1] *DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS. ACTUAL DISTANCES MAY VARY DUE TO SHIELDING FROM EXISTING NOISE BARRIERS OR INTERVENING STRUCTURES. TRAFFIC NOISE LEVELS MAY VARY DEPENDING ON ACTUAL SETBACK DISTANCES AND LOCALIZED SHIELDING.*

*SOURCE: FHWA-RD-77-108 WITH INPUTS FROM FEHR & PEERS AND J.C. BRENNAN & ASSOCIATES, INC. 2017.*

Table 18 shows the noise levels associated with traffic on the local roadway network under the cumulative and cumulative plus project traffic conditions. The traffic noise levels shown in Table 18 are based upon the existing land uses and, in some cases, include shielding from existing sound walls. The predicted traffic noise levels for Nicolaus Road between Fullerton Ranch and Joiner Parkway assume shielding from the current sound walls adjacent to the existing residential uses.

***Table 18: Cumulative Traffic Noise Levels vs. Cumulative Plus Project Traffic Noise Levels***

| Roadway | Segment | Noise Levels (CNEL / $L_{dn}$, dB) | | | Distance to Existing + Project Traffic Noise Contours, feet[1] | | |
|---|---|---|---|---|---|---|---|
| | | Cumulative | Cumulative + Project | Change (dB) | 70 dB $L_{dn}$ | 65 dB $L_{dn}$ | 60 dB $L_{dn}$ |
| Nicolaus Rd. | West of Lakeside Dr. | 61.0 | 61.0 | 0.0 | 20 | 43 | 94 |
| Nicolaus Rd. | Lakeside Dr. to Fullerton Ranch | 61.4 | 61.5 | 0.1 | 20 | 44 | 94 |
| Nicolaus Rd. | Fullerton Ranch to Joiner Pkwy. | 60.6 | 60.7 | 0.1 | 20 | 44 | 94 |
| Nicolaus Rd. | East of Joiner Pkwy. | 64.5 | 64.5 | 0.0 | 26 | 56 | 120 |
| Joiner Pkwy. | Nicolaus Rd. to 1st St. | 58.8 | 58.8 | 0.0 | 15 | 33 | 71 |
| Joiner Pkwy. | South of 1st St. | 59.7 | 59.7 | 0.0 | 21 | 45 | 96 |

[1] DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS. ACTUAL DISTANCES MAY VARY DUE TO SHIELDING FROM EXISTING NOISE BARRIERS OR INTERVENING STRUCTURES. TRAFFIC NOISE LEVELS MAY VARY DEPENDING ON ACTUAL SETBACK DISTANCES AND LOCALIZED SHIELDING.

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM FEHR & PEERS AND J.C. BRENNAN & ASSOCIATES, INC. 2017.

Under cumulative plus project conditions, there would not be significant increases in noise levels compared to the cumulative no project conditions. However, the 60, 65 and 70 dB $L_{dn}$ contours would extend farther under cumulative conditions and potentially impact additional sensitive receptors. As shown in the table, the proposed project would contribute no more than 0.1 dB $L_{dn}$ to noise levels on roadways fronting residential uses along the study area roadways. As described earlier, a 3-dBA change is considered to be a just-perceivable difference. Additionally, the project would not cause new exceedances of the City of Lincoln 60 dB CNEL exterior noise level standard. Therefore, the impact of a 0.1 dB traffic noise increase on existing receptors would be considered ***less than significant***.

*Traffic Noise at New Receptors*

The existing vs existing plus project scenario is not performed for "New" receptors because these receptors are not present under the existing conditions. As such, there is no impact to new receptors under these scenarios. The focus of this discussion is the cumulative plus project condition on new receptors.

The cumulative context for noise impacts associated with the proposed project consists of the existing and future noise sources that could affect the project or surrounding uses. Noise generated by construction would be temporary, and would not add to the permanent noise environment or be considered as part of the cumulative context. The total noise impact of the proposed project would be fairly small and would not be a substantial increase to the existing future noise environment.

Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to the proposed project and other projects within the area.

The FHWA traffic noise prediction model was used to predict Cumulative + Project traffic noise levels at the proposed residential uses associated with the project. Table 19 shows the predicted traffic noise levels at the proposed residential uses adjacent to the major project-area roadways. The Noise Report (Appendix J) provides the complete inputs and results to the FHWA traffic noise prediction model.

***Table 19: Cumulative + Project Transportation Noise Levels at Proposed Residential Uses***

| ***Roadway*** | ***Receptor Description*** | ***Approximate Residential Setback, feet[1]*** | ***ADT*** | ***Predicted Traffic Noise Levels, $L_{dn}$*** | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | ***No Wall*** | ***6' Wall*** | ***7' Wall*** | ***8' Wall*** | ***9' Wall*** |
| Nicolaus Road | Nearest Backyards | 70' | 25,710 | 67 dB | 61 dB | 59 dB | 58 dB | 57 dB |

[1] SETBACK DISTANCES ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS TO THE CENTER OF RESIDENTIAL BACKYARDS.
-- MEETS THE CITY OF EXTERIOR NOISE STANDARD WITHOUT MITIGATION.
SOURCE: FHWA-RD-77-108 WITH INPUTS FROM ABRAMS ASSOCIATES, AND J.C. BRENNAN & ASSOCIATES, INC. 2017.

The Table 19 data indicate that a 7-foot tall sound wall would achieve the City of Lincoln 60 dB CNEL exterior noise level standard. However, a 6-foot tall would achieve 61 dB CNEL which meets the City's conditionally acceptable noise level standard of up to 65 dB CNEL. Based upon discussions with City staff and review of existing sound wall heights around the project site, a 6-foot tall wall would be consistent with surrounding wall heights while also ensuring that future residents are not exposed to excessive noise levels. Therefore, a 6-foot tall sound wall should be constructed. Figure 18 shows the recommended wall location.

*Interior Noise Impacts*

Modern construction typically provides a 25 dB exterior-to-interior noise level reduction with windows closed. Therefore, sensitive receptors exposed to exterior noise of 70 dB CNEL/$L_{dn}$, or less, will typically comply with the City of Lincoln 45 dB CNEL interior noise level standard. Additional noise reduction measures, such as acoustically rated windows are generally required for exterior noise levels exceeding 70 dB CNEL/$L_{dn}$.

It should be noted that exterior noise levels are typically 2 to 3 dB higher at second floor locations. The proposed residential uses are predicted to be exposed to unmitigated first floor exterior transportation noise levels of 67 dB CNEL/$L_{dn}$. Therefore, second floor facades are predicted to be exposed to exterior noise levels of up to 70 dB CNEL/$L_{dn}$. Based upon a 25 dB exterior-to-interior noise level reduction, interior noise levels are predicted to be 45 dB CNEL. These interior noise levels would meet the City of Lincoln 45 dB CNEL interior noise level standard and no interior noise mitigation would be required.

The following mitigation measure will minimize noise impacts resulting from transportation noise on the proposed project site. Implementation of this mitigation measure would ensure consistency with the City's noise standards and would reduce this potentially significant impact to a ***less than significant*** level.

> ***Mitigation Measure Noise-1:*** *A 6-foot tall sound wall shall be constructed along Nicolaus Road, in accordance with the Noise Barrier Location Map (JC Brennan 2017). The sound wall shall be reflected on the Improvements Plans, subject to review and approval by the City's Building Division.*

**Response b):** The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and roadway construction occur. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located approximately 25 feet or further from the project site. At this distance construction vibrations are not predicted to exceed acceptable levels. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours. Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural. Table 20 shows the typical vibration levels produced by construction equipment.

***Table 20: Vibration Levels for Varying Construction Equipment***

| *Type of Equipment* | *Peak Particle Velocity @ 25 Feet (Inches/Second)* | *Peak Particle Velocity @ 50 Feet (Inches/Second)* | *Peak Particle Velocity @ 100 Feet (Inches/Second)* |
|---|---|---|---|
| Large Bulldozer | 0.089 | 0.031 | 0.011 |
| Loaded Trucks | 0.076 | 0.027 | 0.010 |
| Small Bulldozer | 0.003 | 0.001 | 0.000 |
| Auger/drill Rigs | 0.089 | 0.031 | 0.011 |
| Jackhammer | 0.035 | 0.012 | 0.004 |
| Vibratory Hammer | 0.070 | 0.025 | 0.009 |
| Vibratory Compactor | 0.210 (<0.200 @ 26’) | 0.074 | 0.026 |

*SOURCE: FEDERAL TRANSIT ADMINISTRATION, TRANSIT NOISE AND VIBRATION IMPACT ASSESSMENT GUIDELINES, MAY 2006*

The Table 20 data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec p.p.v. threshold of damage to buildings and less than the 0.1 in/sec threshold of annoyance criteria at distances over 25 feet. Therefore, construction vibrations are not predicted to cause damage to existing buildings or cause annoyance to sensitive receptors. Therefore, this impact would be considered ***less than significant***.

**Response d):** The proposed project could result in temporary or periodic increases in ambient noise levels in the project vicinity above levels existing without the project. These temporary or periodic increases in noise would be associated with the construction phase of the project. The new development, maintenance of roadways, installation of public utilities, and infrastructure improvements associated with the project will require construction activities. These activities include the use of heavy equipment and impact tools. Table 21 provides a list of the types of equipment which may be associated with construction activities and the associated noise levels.

Activities involved in project construction would typically generate maximum noise levels ranging from 85 to 90 dB at a distance of 50 feet. The nearest residential receptors would be located 25 to 50 feet or more from the majority of project construction activities.

***Table 21: Construction Equipment Noise***

| *Type of Equipment* | *Predicted Noise Levels, $L_{max}$ dB* | | | | *Distances to Noise Contours, feet* | |
|---|---|---|---|---|---|---|
| | *Noise Level at 50'* | *Noise Level at 100'* | *Noise Level at 200'* | *Noise Level at 400'* | *70 dB $L_{max}$ contour* | *65 dB $L_{max}$ contour* |
| Backhoe | 78 | 72 | 66 | 60 | 126 | 223 |
| Compactor | 83 | 77 | 71 | 65 | 223 | 397 |
| Compressor (air) | 78 | 72 | 66 | 60 | 126 | 223 |
| Concrete Saw | 90 | 84 | 78 | 72 | 500 | 889 |
| Dozer | 82 | 76 | 70 | 64 | 199 | 354 |
| Dump Truck | 76 | 70 | 64 | 58 | 100 | 177 |
| Excavator | 81 | 75 | 69 | 63 | 177 | 315 |
| Generator | 81 | 75 | 69 | 63 | 177 | 315 |
| Jackhammer | 89 | 83 | 77 | 71 | 446 | 792 |
| Pneumatic Tools | 85 | 79 | 73 | 67 | 281 | 500 |

*SOURCE: ROADWAY CONSTRUCTION NOISE MODEL USER'S GUIDE. FEDERAL HIGHWAY ADMINISTRATION. FHWA-HEP-05-054. JANUARY 2006. J.C. BRENNAN & ASSOCIATES, INC. 2017.*

There is generally an increase in ambient noise between the hours of 7 a.m. and 7 p.m. By limiting the hours of construction to these hours, the potential for nuisance noise is reduced because project construction-related noise increases would be less noticeable. The use of mufflers on construction equipment would decrease the overall noise generated during construction. Because sound diminishes with distance, locating noise-generating equipment away from noise sensitive uses would reduce overall noise impacts associated with project construction. Implementation of the following mitigation measure would reduce impacts to a ***less-than-significant*** level.

***Mitigation Measure Noise-2:*** *All project construction activities shall comply with the following:*

- *Construction hours shall be limited to 7 a.m. to 7 p.m., Monday through Friday (unless extended by a special permit).*
- *All heavy construction equipment and all stationary noise sources (such as diesel generators) shall have manufacturer-installed mufflers.*
- *Equipment warm up areas, water tanks, and equipment storage areas shall be located in an area as far away from existing residences as is feasible.*

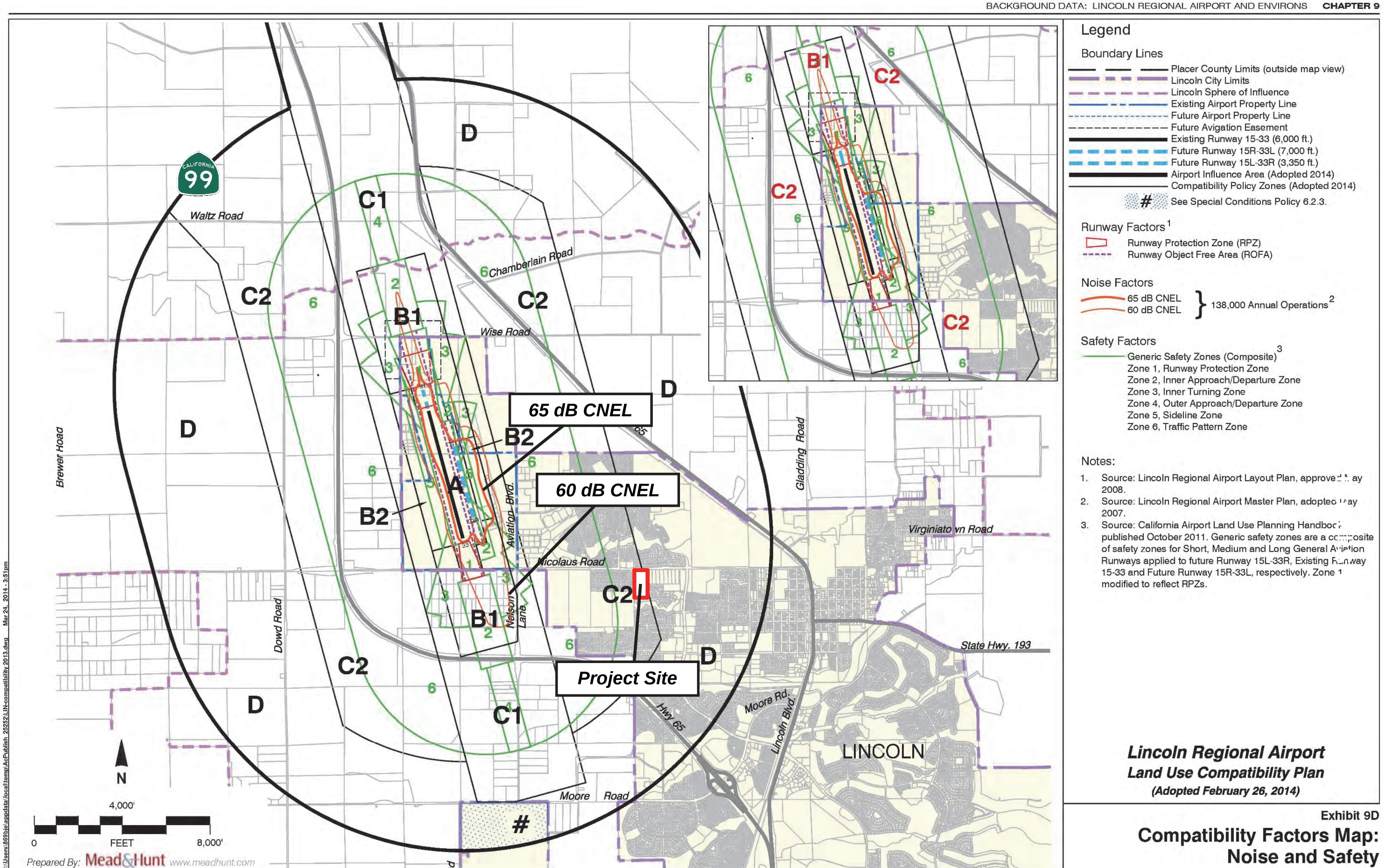
*The above requirements shall be reflected on the Improvements Plans, subject to review and approval by the City's Building Division.*

**Response e):** The project site is located within an airport land use plan and, within two miles of a public airport or public use airport. The closest airstrip is the Lincoln Regional Airport approximately 1.49 miles northwest of the project site. According to the Lincoln Regional Airport-Specific Compatibility Policies and Maps (Placer County ALUCP, 2014), the majority of the project site is located in Compatibility Zone C2, and the northeastern corner of the project site is in Zone D (see Figure 16). As shown in Figure 16, the project site is located approximately one-mile outside of the 60 dB CNEL noise contour for the Lincoln Regional Airport. Therefore, no new sensitive receptors (future residents) would be exposed to aircraft noise exceeding the City of Lincoln 60 dB CNEL exterior and 45 dB CNEL interior noise level standard.

During the field visit, the noise engineer did not observe aircraft overflights directly over the project site. The project site does not fall within the take-off or landing overflight zone, however, given the proximity to the airport it can be expected that there will be some planes flying over the project site at times. The exact flight path of a plane is largely up to the discretion of the pilot with guidance from air traffic controllers. The elevation of the plane during a flyover is largely going to affect the noise levels. The higher the plane, the lower the noise level at ground elevation, while the lower the plane the higher the noise level at ground elevation. Additionally, the type of plane largely influences the noise level generated by the plane, Small personal aircraft generate the least amount of noise compared to large jets. During an over overflight of a plane at low elevation, it would be expected that there would be a spike in the noise level. This spike would be short-lived and would amount to 10-20 seconds of elevated noise. This would be similar to a spike in noise along a roadway where a loud motorcycle (i.e. Harley Davidson) drives by. Because these elevated noise levels are not continuous (i.e. they are just spikes), they do not significantly influence the CNEL dB levels at the noise sensitive uses. While occasional overflights could occur and result in a 10 to 20 second spike in noise, they are not predicted to cause any exceedance of the City of Lincoln exterior or interior noise level standards as discussed above.  Implementation of the proposed project would result in ***no impact*** relative to this topic.

**Response f):** The project site is not located within the vicinity of a private airstrip. The closest airstrip is the Lincoln Regional Airport approximately 1.49 miles northwest of the project site. The project site is located within Compatibility Zones C2 and D. As noted previously, the Land Use Compatibility Plan states that single-family residential uses are considered "Normally Compatible" within this zone.

Additionally, as defined in this plan, annoyance associated with aircraft overflights is the major concern within Compatibility Zone C2. Although the zone lies outside the CNEL 55 dB contour, noise from individual aircraft overflights may adversely affect certain land uses. Safety is a concern only with regard to uses involving high concentrations of people and particularly risk-sensitive uses such as schools and hospitals. The proposed project would not result in a high concentration of people, and does not include school or hospital uses. Therefore, implementation of the proposed project would result in ***no impact*** relative to this topic.




# Fullerton Ranch

**Figure: 16**

**Lincoln Airport Noise Contours**

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consultants in acoustics

*Figure Prepared: 3/28/2017*

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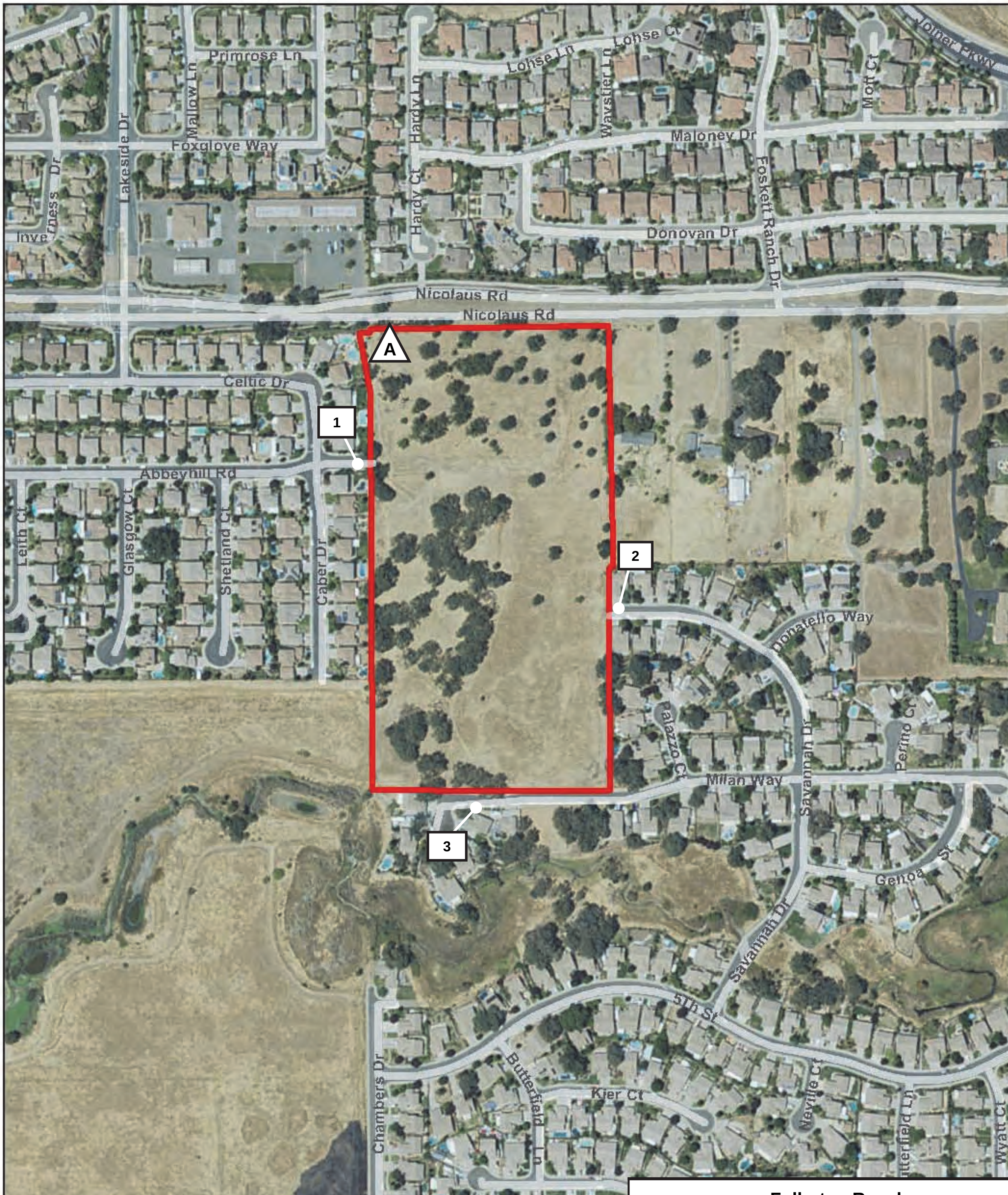


**Fullerton Ranch**

**Figure 17: Noise Measurement Locations**

N

**Legend**

X : Continuous (24-hr) Noise Measurement Site

# : Short-Term Noise Measurement Site

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*Figure Prepared: January 2017*

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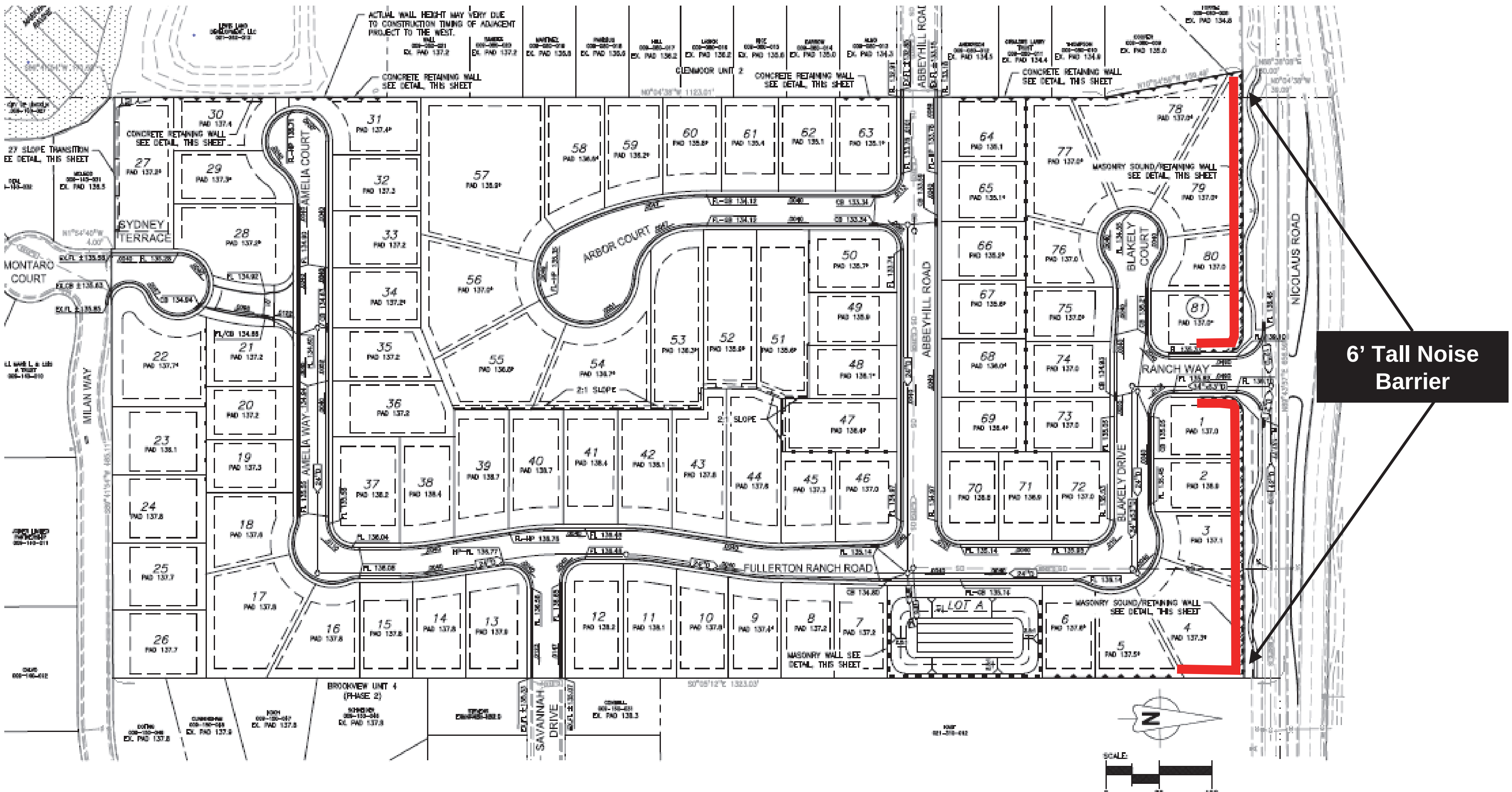


**Fullerton Ranch**

**Figure 18: Recommended Noise Barrier Location**

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*Rev. 3/28/2017*

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## *XIII. POPULATION AND HOUSING*

| ***Would the project:*** | ***Potentially Significant Impact*** | ***Less Than Significant with Mitigation Incorporation*** | ***Less Than Significant Impact*** | ***No Impact*** |
|---|---|---|---|---|
| a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | | | X | |
| b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? | | | | X |
| c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? | | | | X |

### *Responses to Checklist Questions*

**Response a):** According to the 2015 US Census population estimates, the population in Lincoln is 46,474 people. According to the City of Lincoln 2013-2021 Housing Element, the average persons per household is 2.59. The proposed project would result in the construction of residential housing that would generate an estimated 209 people. This is an estimated 0.45 percent growth in Lincoln. An estimated 0.45 percent growth in Lincoln is not considered substantial growth in Lincoln or the region and it is consistent with the assumed growth in the General Plan. The 209 people may come from Lincoln or surrounding communities. The proposed project would not include upsizing of offsite infrastructure or roadways. The installation of new infrastructure would be limited to the internal subdivision. The sizing of the infrastructure would be specific to the number of units proposed within the project site. Implementation of the proposed project would not induce substantial population growth in an area, either directly or indirectly. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

**Responses b), c):** The project site currently undeveloped and does not contain housing. The proposed project would not displace housing or people. Implementation of the proposed project would have ***no impact*** relative to this topic.

## *XIV. PUBLIC SERVICES*

| | ***Potentially Significant Impact*** | ***Less Than Significant with Mitigation Incorporation*** | ***Less Than Significant Impact*** | ***No Impact*** |
|---|---|---|---|---|
| a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: | | | | |
| Fire protection? | | | X | |
| Police protection? | | | X | |
| Schools? | | | X | |
| Parks? | | X | | |
| Other public facilities? | | | | X |

### *Responses to Checklist Questions*

**Response a):**

*Fire Protection*

Fire protection is provided by the City of Lincoln Fire Department (Fire Department). The Fire Department covers roughly 20 square miles with a population of approximately 45,000 residents from its three stations located throughout the City. Fire Station #34, which is located at 126 Joiner Parkway and serves as the Fire Department's Headquarters, is the nearest fire station to the project site (0.5 miles south).

In 2014, the Fire Department received 3,977 calls for service (City of Lincoln, 2016). The Fire Department's independent Insurance Services Office (ISO) rating (a rating which can be used to assess the effectiveness of fire protection services) was most recently evaluated in September 2014, with a Public Protection Class 5 (ratings are made on a scale of 1 to 10, with 1 being the highest). Average response time in the City is 7.5 minutes.

The City expands fire protection services as growth and development occurs to meet the adopted fire response time of five minutes or less as a general guideline. (General Plan Policies PFS-8.2, PFS-8.4, and PFS-8.5). Funding for fire operations and services is derived from a combination of development impact fees and the City's General Fund. Development impact fees are paid prior to construction and are typically used to fund new facilities and equipment, while the General Fund (revenues from property tax and sales tax) is typically used to fund ongoing fire operations.

In terms of generating funding for the construction of needed facilities and equipment, the City has an existing Public Facilities Element which is a capital facilities fee program. Based on the requirements of this program, all new development must participate in the funding of needed facilities and equipment based on adopted program standards. The project would be subject to this funding mechanism. In determining the capital facility needs, these standards call for 1.26 firefighters per 1,000 residents, 500 square feet of fire station facilities per firefighter, each station to contain approximately 11,000 square feet and requiring two fire trucks per station with one out of six trucks being a ladder truck. These costs are spread over new development based on an equivalent dwelling unit factor such that capital facilities costs are equally borne by both residential and non-residential development.

The proposed project would add 81 residential units, which is anticipated to add 209 people to the City of Lincoln. Using the 1.26 firefighters per 1,000 residents standard, the addition of 209 person to the proposed project site would require 0.26 firefighters.

The proposed project would not result in a need to construct a new fire station or physically alter an existing fire station. As previously stated, the Lincoln Fire Department would receive development impact fees and property tax revenues from each parcel on the project site. The combination of those funds is intended to pay for project impacts on fire protection service.

Additionally, the project site is currently designated LDR by the City's land use map, which allows for three to 5.9 units per acre. The proposed project includes 81 units on 19.7 acres, for a density of 4.11 units per acre. The project would reduce the potential number of units allowed by the current City land use designation. Development of the project site for residential uses was analyzed in the City's General Plan EIR. The City's General Plan EIR concluded that, with adoption of the policies and implementation measures included in the General Plan. Impacts to fire protection would be less than significant. Consistent with this conclusion, the proposed project's impact to fire service is considered ***less than significant***.

*Police Protection*

Law enforcement is provided by City of Lincoln Police Department (Police Department). The Police Department is divided into three divisions: The Administrative Division, the Operations Division, and the Support Division. The Office of the Chief of Police makes up the Administrative Division and is responsible for overseeing the entire operation of the Police Department. The Operations division consists of two units: Patrol and Investigations. These units are directly responsible for the enforcement of local and state laws, investigation of criminal activity, and ensuring the safety of the citizens of the City of Lincoln. The Support Services division is composed of Communications, Records, Citizen Volunteers, Animal Control, and Property and Evidence. The goal of the Support Services Division is to maintain the day-to-day functions of the Police Department, manage the business aspect of the agency, data and record retention, and continually assess the needs of the department and City while implementing programs to enhance the experience of the Police Department for customers and employees alike. The Police Department has 20.5 sworn police officers based at the department's headquarters on 7$^{th}$ Street (approximately 1.4 miles from the project site) (City of Lincoln Police Department 2015).

The proposed project would add 81 residential units, which is anticipated to add 209 people to the City of Lincoln. The additional of 209 people in the City of Lincoln would place additional demands for police service on the City of Lincoln Police Department.

The City would expand police protection service consistent with community needs and provide an adequate level of service (General Plan Policy PFS-8.8), including striving to maintain an average response time of five minutes or less for high priority calls (General Plan Policy PFS-8.14). Per General Plan Policy PFS-8.11, the project would result in an increase in demand on police services equal to less than 0.5 officers. The on-going operations of the Police Department is funded primarily from the City's General Fund, which receives revenue from property taxes, transit taxes, fees, and other sources. The owner of each residence would pay taxes and fees that would increase the General Fund. Typically, the City would use a part of this additional revenue to increase police staffing, as needed.

In addition to the operational funding for police services, the City requires each development to pay development impact fees for police services prior to construction. These fees are used to fund the direct impact on increased demand for police facilities and equipment. The City's Master Fee Schedule is a compilation of the fees charged for services and development with the City of Lincoln. All fees are reviewed from time to time in order to ensure that the fees charged do not exceed the estimated costs required to produce the services and that all fees are in compliance with the California Government Code Sections 66016 and 66018.

In terms of generating funding for the construction of needed facilities and equipment, the City has implemented a Public Facilities Element capital facilities fee program. Based on the requirements of this program all new development must participate in the funding of needed facilities and equipment based on adopted program standards. The project would be subject to this funding mechanism. In determining the capital facility needs, these standards call for 1.87 sworn and 0.4 non-sworn per 1,000 residents, 350 square feet of police station facilities per employee, and requiring 1 additional police vehicle per 1,000 new residents. These costs are spread over new development based on an equivalent dwelling unit factor such that capital facilities costs are equally borne by both residential and non-residential development.

The proposed project would add 81 residential units, which is anticipated to add 209 people to the City of Lincoln. Using the 1.87 sworn and 0.4 non-sworn per 1,000 residents standard, the addition of 209 person to the proposed project site would require 0.39 sworn officers and 0.08 non-sworn officers. Additionally, using the 1 additional police vehicle per 1,000 new residents standard, the addition of 209 person to the proposed project site would require 0.21 additional police vehicles.

The payment of the fees by the project proponent would serve as adequate compensation for impacts the police service impacts. Additionally, the City of Lincoln receives ongoing revenues that would come from property taxes, sales taxes, and other revenues generated by new development to fund ongoing police service. The taxes and fees would provide the City with the means to offset the increased demand for law enforcement services created by the project. The proposed project would not result in a need to construct a new police station or physically alter an existing police station. As previously stated, the Lincoln Police Department would receive development impact fees and property tax revenues from each parcel on the project site. The combination of those funds are intended to pay for project impacts on police protection service.

Development of the project site for residential uses was analyzed in the City's General Plan EIR. The City's General Plan EIR concluded that, with adoption of the policies and implementation measures included in the General Plan. Impacts to law enforcement would be less than significant. Consistent with this conclusion, the proposed project's impact to police service is considered ***less than significant***.

*Schools*

The project site is within the area served by the Western Placer Unified School District (WPUSD). WPUSD has a total of 11 schools, three of which currently serve the project area (i.e., Creekside Oaks Elementary, Glen Edwards Middle School, and Lincoln High School). Based on enrollment for the 2013-2014 school year, Creekside Oaks had remaining capacity for approximately 270 students, Glen Edwards Middle School had remaining capacity for approximately 420 students, and Lincoln High School had remaining capacity for approximately 225 students (WPUSD 2014: 30). However, according to WPUSD staff in 2015, Creekside Oaks

Elementary has limited capacity to serve additional students, while Glen Edwards Middle School and Lincoln High School are at capacity.[6]

Funding for new school construction is provided through State and local revenue sources. The project applicant would be required to contribute funding to school facilities. The specific requirements would be set forth in the Development Agreement for the project.

The Leroy F. Greene School Facilities Act allows the School District to collect impact fees up to approximately 50 percent of the estimated cost of new school facilities. The collection of the impact fees is based on the assumption that the State School Facility funding program remains intact and that state funds are available for partial funding of new school facilities. Although school impact fees might not be sufficient to fund 100 percent of new school facility construction and operation, the California State Legislature has declared the school impact fee to be full and adequate mitigation under CEQA.

Pursuant to Section 65995.5–7 of the California Government Code, the WPUSD has imposed Level 1 residential developer impact fees at the current rate of $3.48 per square-foot of new residential construction (WPUSD 2016). In addition to collecting Level I fees at the time of building permits, the City would certify that school facilities meeting adopted School District standards are available for the development (General Plan Policy PFS-9.1) and would coordinate with the School District to make sure that adequate developer fees are collected in accordance with State law (General Plan Policy PFS-9.7). The City would also work with WPUSD and the applicant to evaluate alternatives to funding/providing adequate school facilities, pursuant to General Plan Policy PFS-9.9. The WPUSD 2016 School Facility Fee Justification report indicated that residential development creates a school facility cost of $7.28 per square foot. Therefore, there would be a gap between what is collected and costs that are generated from residential development for the project.

As discussed above, the provisions of State law are considered full and complete mitigation for the purposes of analysis under CEQA for school construction needed to serve new development. In fact, State law expressly precludes the City from reaching a conclusion under CEQA that payment of the Leroy F. Greene School Facilities Act school impact fees would not completely mitigate new development impacts on school facilities. Consequently, the City of Lincoln is without the legal authority under CEQA to impose any fee, condition, or other exaction on the project for the funding of new school construction other than the fees allowed by the Leroy F. Greene School Facilities Act. Although WPUSD may collect higher fees than those imposed by the Leroy F. Greene School Facilities Act, no such fees are required to mitigate the impact under CEQA. Because the project would pay fees as required by The Leroy F. Greene School Facilities Act, this impact would be ***less than significant***.

*Parks*

City parks and facilities are maintained by the Recreation Division of the City's Public Services Department Parks and Recreation. Currently, there are approximately 160 acres of City park lands and 1,838 acres of open space and trails within the City of Lincoln. The City park dedication in-lieu fee (Chapter 17.32 of the City Municipal Code) requires dedication of land, payment of in-lieu fees, or a combination of both. The City of Lincoln has an adopted standard of five acres of park land per 1,000 residents for newly incorporated areas. This requirement can

[6] City of Lincoln. Draft Environmental Impact Report – Independence at Lincoln Development Project (page 4.9-3). September 30, 2016.

be met through the provision of park credit for a variety of traditional and non-traditional park lands that are constructed. The amount of credit granted against the five acres per 1,000 population standard may vary based upon the recreational value of the land to City residents (City of Lincoln 2008: 4-8). When park land is not constructed within the project site the City requires the payment of in-lieu park fees.

The project would result in the construction of 81 single-family residential homes. According to the 2015 US Census population estimates, the population in Lincoln is 46,474 people. Lincoln Municipal Code Section 17.32.040 provides the parkland formula for dedication of park land. According to the Municipal Code, the average density per single-family dwelling unit is 3.6. Based on the City's ratio, the addition of 81 single-family units at the site would increase population by up to 291 individuals. This would require the project to create 1.455 acres of parks or pay an in-lieu fee for 1.455 acres of park land. The project does not propose to construct any park land within the project site. As such, the proposed project is subject to the City park dedication in-lieu fees.

The payment of the City park dedication in-lieu fees would serve as an adequate offset for the park demand. With the implementation of the following mitigation measure, the proposed project's impact to park and recreational facilities is considered ***less than significant***.

> ***Mitigation Measure Public-1:*** *The applicant shall pay applicable park in-lieu fees or dedicate 1.455 acres of parkland in accordance with the City of Lincoln Municipal Code standards outlined in Chapter 17.32. Proof of payment of the in-lieu fees shall be submitted to the City Engineer.*

*Other Public Facilities*

The proposed project would not result in a need for other public facilities that are not addressed above, or in Section XVIII, Utilities and Service Systems. Implementation of the proposed project would have ***no impact*** relative to this issue.

## *XV. RECREATION*

| | ***Potentially Significant Impact*** | ***Less Than Significant with Mitigation Incorporation*** | ***Less Than Significant Impact*** | ***No Impact*** |
|---|---|---|---|---|
| a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | | | X | |
| b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? | | | | X |

*Responses to Checklist Questions*

**Responses a**): Currently, there are approximately 160 acres of City park lands and 1,838 acres of open space and trails within the City of Lincoln. The project would result in the construction of 81 single-family residential homes. Lincoln Municipal Code Section 17.32.040 provides the parkland formula for dedication of park land. According to the Municipal Code, the average density per single-family dwelling unit is 3.6. Using this rate, the proposed project would result in an estimated 291 individuals. The estimated new demand for parks is 1.455 acres. The project does not include the construction of new parks so the developer would be required to pay in-lieu fees. The in-lieu fees would ultimately fund the construction of new park land to offset the increased demand for these facilities. With implementation of Mitigation Measure Public-1, this potential impact would be reduced to a ***less-than-significant*** level.

**Responses b**): The proposed project does not include the construction of recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. Implementation of the proposed project would have ***no impact*** relative to this topic.

## *XVI. TRANSPORTATION AND TRAFFIC*

| ***Would the project:*** | ***Potentially Significant Impact*** | ***Less Than Significant with Mitigation Incorporation*** | ***Less Than Significant Impact*** | ***No Impact*** |
|---|---|---|---|---|
| a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)? | | | X | |
| b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways? | | | X | |
| c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? | | | | X |
| d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | | | X | |
| e) Result in inadequate emergency access? | | | X | |
| f) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)? | | X | | |

### *Background*

The *Traffic and Circulation Section of the Fullerton Ranch Project IS/MND* (August 2017) was prepared by Fehr & Peers for the proposed project under contract to De Novo Planning Group. Based on comments from City of Lincoln staff, the *Traffic and Circulation Section of the Fullerton Ranch Project IS/MND* was updated in August 2017. The following is a summary of the report, which is contained in Appendix K.

The following six study intersections and seven roadway segments have been included in the analysis:

<u>Project Study Intersections</u>

1. Nicolaus Road / Lakeside Drive
2. Nicolaus Road / Project Access
3. Joiner Parkway/ 5th Street
4. Joiner Parkway / 3rd Street
5. Nicolaus Road / Joiner Parkway
6. Joiner Parkway / 1st Street

<u>Project Roadway Segments</u>

1. Nicolaus Road west of Joiner Parkway
2. Nicolaus Road east of Nelson Lane

3. Lakeside south of Nicolaus
4. Celtic Drive / Abbeyhill Road west of project site
5. 5th Street west of Joiner Parkway
6. Savannah Drive east of project site
7. Milan Way west of Savannah Drive and south of project site

Traffic Analysis Scenarios

The study intersections were evaluated for the following four scenarios:

- **Scenario 1: Existing Conditions** – Level of Service (LOS) based on existing peak hour volumes and existing intersection configurations.
- **Scenario 2: Existing Plus Project** – Existing traffic volumes plus trips from the proposed project.
- **Scenario 3: Cumulative Conditions** – This scenario includes cumulative volumes based on the Placer County Regional Travel Demand Forecasting (TDF) Model.
- **Scenario 4: Cumulative Plus Project Conditions** – This scenario includes cumulative volumes plus the trips from the proposed project

Existing Roadway Network

The following is a detailed description of the roadways that could be affected by the project:

- **State Route (SR) 65** is a north-south state highway that begins at Interstate 80 (I-80) and extends north through Lincoln to SR 70 south of Marysville. SR 65 is a four-lane freeway from I-80 to the at-grade intersection with Nelson Lane. The highway continues as a four-lane divided highway from Nelson Lane to north of Wise Road. North of Wise Road, it becomes a two-lane state highway connecting the area to Yuba County and Marysville to the north. The section of SR 65 between Lincoln Boulevard and Riosa Road is known as the Lincoln Bypass. The Lincoln Bypass opened in 2012 to facilitate travel between South Placer County and Yuba County and reduce through traffic in the City of Lincoln. The former SR 65 alignment through Downtown Lincoln is now called Lincoln Boulevard.
- **Nicolaus Road** is an east-west arterial roadway that extends from O Street in Lincoln west to Pleasant Grove Road in unincorporated Placer County. Within the study area, Nicolaus Road is a four-lane divided roadway between Nelson Lane and Joiner Parkway. This roadway has two lanes east of Joiner Parkway and is a two-lane rural roadway west of Nelson Lane. Nicolaus Road has a grade separated overcrossing of the SR 65 bypass. In addition, Nicolaus Road is a Surface Transportation Assistance Act (STAA) truck route, which means that California legal trucks may use it to deliver goods and materials to industrial uses in the Lincoln Airport Industrial Area.
- **Joiner Parkway** is an arterial street that spans much of the City of Lincoln from south to north. Within the study area, Joiner Parkway is a four-lane divided arterial. North of Nicolaus Road, Joiner Parkway narrows from four to two lanes.
- **Abbeyhill Road/Celtic Drive** is an existing east-west local roadway that extends from the western project site boundary west to Tartan Court. Within the study area, Abbeyhill Road is a two-lane undivided residential roadway. Tartan Court, a north-south roadway, extends north to its terminus at Celtic Drive. Celtic Drive, an east-west roadway, terminates at Waverly Drive to the west. From Waverly Drive, drivers can head south approximately 0.32 miles where the road terminates. Alternatively, drivers

can travel north to access Nicolaus Drive. Waverly Drive becomes Teal Hollow Drive at the intersection with Nicolaus Drive.

- **Savannah Drive** is a looped roadway located to the east and southeast of the project site. Within the study area, Savannah Drive is a two-lane undivided residential roadway. This local roadway connects 5th Street to Milan Way and serves the residential areas to the south and southeast of the site.
- **Milan Way** is a local east-west roadway located to the south of the project site. Within the study area, Milan Way is a two-lane undivided residential roadway. This roadway contains cul-de-sacs on both the eastern and western termini.
- **5th Street** is a local roadway located to the south of the project site. Within the study area, 5th Street is a two-lane undivided residential roadway. This roadway traverses across the City east to its terminus at East Avenue.

Intersection Analysis Methodology

The operational performance of the roadway network is commonly described with the term LOS. LOS is a qualitative description of operating conditions, ranging from LOS A (free-flow traffic conditions with little or no delay) to LOS F (oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). The LOS analysis methods outlined in the *Highway Capacity Manual* (HCM) (Transportation Research Board 2010) were used in the *Transportation Impact Analysis Report*.

A signalized intersection's LOS is based on the weighted average control delay of all vehicles passing through the intersection. Delay is measured in seconds per vehicle, and includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration. For side-street control intersections, the delay and LOS is reported for the entire intersection and the minor street movement with the greatest delay. Table 22 summarizes the relationship between the delay and LOS for signalized and unsignalized intersections.

***Table 22: LOS Criteria – Intersections***

| ***LOS*** | ***Description (for Signalized Intersections)*** | ***Average Delay (Seconds/Vehicle)*** | |
|---|---|---|---|
| | | ***Signalized Intersections*** | ***Unsignalized Intersections*** |
| A | Operations with very low delay occurring with favorable traffic signal progression and/or short cycle lengths. | < 10.0 | < 10.0 |
| B | Operations with low delay occurring with good progression and/or short cycle lengths. | > 10.0 to 20.0 | > 10.0 to 15.0 |
| C | Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear. | > 20.0 to 35.0 | > 15.0 to 25.0 |
| D | Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable. | > 35.0 to 55.0 | > 25.0 to 35.0 |
| E | Operations with high delay values indicating poor progression, and long cycle lengths. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay. | > 55.0 to 80.0 | > 35.0 to 50.0 |

| LOS | Description (for Signalized Intersections) | Average Delay (Seconds/Vehicle) | |
|---|---|---|---|
| | | Signalized Intersections | Unsignalized Intersections |
| F | Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths. | > 80.0 | > 50.0 |

*NOTE: LOS = LEVEL OF SERVICE; V/C RATIO= VOLUME-TO-CAPACITY RATIO*
*LOS AT SIGNALIZED INTERSECTIONS AND ROUNDABOUTS BASED ON AVERAGE DELAY FOR ALL VEHICLES. LOS AT UNSIGNALIZED INTERSECTIONS IS REPORTED FOR ENTIRE INTERSECTION AND FOR MINOR STREET MOVEMENT WITH GREATEST DELAY.*
*SOURCE: TRANSPORTATION RESEARCH BOARD 2016*

### Existing Intersection Levels of Service

Existing traffic operations were analyzed at the six study intersections for the two study hours. Table 23 displays the results. Refer to Appendix K for technical calculations. Based on the results presented of the Existing AM and PM peak hour analysis, all intersections currently operate at LOS C or better. These results match Existing conditions, which generally reveal modest levels of queuing and vehicle delay during the study periods.

General Plan Policy T-2.3 establishes the City of Lincoln's level of service C policy for signalized intersections during the p.m. peak hour. Since the City does not have any similar level of service policy for unsignalized intersections or other time periods (i.e., a.m. peak hour), this study applies this LOS C standard to all City of Lincoln intersections during both the a.m. and p.m. peak hour, consistent with previous traffic analyses prepared for the City of Lincoln.

***Table 23: Peak Hour Intersection LOS – Existing Conditions***

| Intersection | Control | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|
| | | Delay[1] | LOS | Delay[1] | LOS |
| Lakeside Drive / Nicolaus Road | AWSC | 14.0 | B | 10.8 | B |
| Fullerton Ranch Access / Nicolaus Road (future) | SSSC | 0.0 | A | 0.0 | A |
| Joiner Parkway/Nicolaus Road | Signal | 22.3 | C | 18.0 | B |
| Joiner Parkway / 5th Street | Signal | 16.2 | B | 14.2 | B |
| Joiner Parkway / 3rd Street | Signal | 17.5 | B | 14.9 | B |
| Joiner Parkway /1st Street | Signal | 28.7 | C | 20.5 | C |

*NOTES: LOS = LEVEL OF SERVICE. AWSC = ALL-WAY STOP CONTROL, SSSC = SIDE-STREET STOP CONTROL.*
*[1] FOR SIGNALIZED AND ALL-WAY STOP CONTROLLED INTERSECTIONS, AVERAGE INTERSECTION DELAY IS REPORTED IN SECONDS PER VEHICLE FOR ALL APPROACHES.*
*SOURCE: FEHR & PEERS, 2017.*

### Transit Service

Transit service in Lincoln consists of the "Lincoln Route", which is operated by Placer County Transit. Although this route serves downtown and other areas of the City, it does not currently extend to the northwest quadrant of the City, in which the project site is located.

### Bicycle and Pedestrian Facilities

The following types of bicycle facilities exist within the study area:

- Multi-use paths (Class I) are paved trails that are separated from roadways, and allow for shared use by both cyclists and pedestrians.

- On-street bike lanes (Class II) are designated for use by bicycles by striping, pavement legends, and signs.

A Class I multi-use path exists along Nicolaus Road (north side) between Joiner Parkway and Lakeside Drive. Class II bike lanes exist along portions of Aviation Boulevard, Nicolaus Road west of Teal Hollow Drive/Waverly Drive, Nicolaus Road east of Joiner Parkway, parts of Joiner Parkway, and First Street east of Joiner Parkway. The south side of the segment of Nicolaus Road west of Waverly Drive has a shoulder of suitable width to facilitate bicycle travel. However, lane marking and signage is not present to designate it as bike lane.

The pedestrian network in the study area includes sidewalks along a majority of residential streets. Arterial streets such as Nicolaus Road and Joiner Parkway also feature sidewalks, although there are gaps particularly where abutting properties which have not been developed. The south side of the segment of Nicolaus Road west of Waverly Drive does not have a sidewalk. All intersections have three or more crosswalks except for Waverly Drive/Nicolaus Road, which has two crosswalks, and Nicolaus Road/Nelson Lane, which has no crosswalks and no adjacent pedestrian facilities.

### *Responses to Checklist Questions*

**Responses a-b):**

*Project Trip Generation*

Table 24 shows the estimated trips generated for the proposed 81 single family residences during weekday daily, AM peak hour, and PM peak hour conditions. As shown below, the project would generate approximately 771 daily vehicle trips, 61 new AM peak hour trips, and 81 new PM peak hour trips. The trips generated by the residential land uses are based on trip rates from the *Trip Generation Manual* (9th Edition, Institute of Transportation Engineers 2012).

***Table 24: Project Trip Generation***

| *Land Use (ITE Code)* | *Size* | *Trip Rate [1]* | | | *Trips* | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Daily* | *AM Peak Hour* | | | *PM Peak Hour* | | |
| | | *Daily* | *AM* | *PM* | | *In* | *Out* | *Total* | *In* | *Out* | *Total* |
| Single Family Residential (210) | 81 DU | 9.52 | 0.75 | 1.00 | 771 | 15 | 46 | 61 | 51 | 30 | 81 |
| **Total External Vehicle Trips** | | | | | **771** | **15** | **46** | **61** | **51** | **30** | **81** |

NOTES: DU = DWELLING UNITS

[1] TRIP RATE FOR SINGLE FAMILY RESIDENTIAL UNITS BASED ON LU CATEGORIES 210 FROM THE TRIP GENERATION MANUAL (INSTITUTE OF TRANSPORTATION ENGINEERS 2012).

SOURCE: FEHR & PEERS, 2017.

*Project Trip Distribution*

The distribution of project generated vehicles trips was based on the following information and analysis methods:

1. Existing directional travel patterns to and from the housing development south of Nicolaus Road between Waverly Drive and Joiner Parkway.

2. Existing travel patterns along Nicolaus Road, Nelson Lane, and Joiner Parkway (to understand regional travel patterns).
3. Complementary land uses (i.e., employment, retail, and schools) within the study area.

*(Note: As shown in Figure 6, the project proposes to construct an access point from Sydney Terrace at the southern portion of the project site. This access point extension from Sydney Terrace provides a connection from the proposed Amelia Way/Amelia Court roadway to the existing Milan Way/Montaro Court roadway to the south of the project site.)*

The AM peak hour trip distribution for the 81 single family residential units was determined to be:

1. 52% to and from the west on Nicolaus Road;
2. 15% to and from the east on Nicolaus Road;
3. 3% to and from the north on Joiner Parkway;
4. 25% to and from the south on Joiner Parkway;
5. 2% to and from the south-east on 1$^{st}$ Street; and
6. 3% to and from the south-west on 1$^{st}$ Street.

The PM peak hour trip distribution for the 81 single family residential units was determined to be:

1. 57% to and from the west on Nicolaus Road;
2. 13% to and from the east on Nicolaus Road;
3. 2% to and from the north on Joiner Parkway;
4. 25% to and from the south on Joiner Parkway;
5. 2% to and from the south-east on 1$^{st}$ Street; and
6. 1% to and from the south-west on 1$^{st}$ Street.

*Existing Plus Project Intersection Levels of Service*

The "project only" trips developed through the trip generation and distribution processes were assigned to the roadway network by adding those new trips to existing traffic volumes. Table 25 displays the results of the Existing Plus Project operations analysis. According to this table, the addition of project generated traffic at all six study intersections would only result in a minor change in control delay. All intersections would operate at LOS C or better under Existing Plus Project conditions during both AM and PM peak hour conditions.

It should be noted that the Fullerton Ranch Access / Nicolaus Road side-street stop controlled intersection was analyzed for:

- Full access, including:
  - EB right-turn in;
  - WB left-turn in;
  - NB left-turn out; and
  - NB right-turn out.

*Table 25: Peak Hour Intersection LOS – Existing Plus Project Conditions*

| Intersection | Control | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|
| | | Delay[1] | LOS | Delay[1] | LOS |
| Lakeside Drive /Nicolaus Road | AWSC | 16.5 | B | 13.4 | B |
| Fullerton Ranch Access / Nicolaus Road | SSSC | 0.1<br>17.4 (NB LT) | A<br>C (NB LT) | 0.4<br>8.7 (WB LT) | A<br>A |
| Joiner Parkway/Nicolaus Road | Signal | 23.6 | C | 19.4 | B |
| Joiner Parkway / 5th Street | Signal | 16.4 | B | 14.3 | B |
| Joiner Parkway / 3rd Street | Signal | 17.7 | B | 15.0 | B |
| Joiner Parkway /1st Street | Signal | 28.9 | C | 20.6 | C |

*NOTES: LOS = LEVEL OF SERVICE. AWSC = ALL-WAY STOP CONTROL, SSSC = SIDE-STREET STOP CONTROL. NB LT = NORTH-BOUND LEFT-TURN. WB LT = WEST-BOUND LEFT-TURN.*
*[1] FOR SIGNALIZED AND ALL-WAY STOP CONTROLLED INTERSECTIONS, AVERAGE INTERSECTION DELAY IS REPORTED IN SECONDS PER VEHICLE FOR ALL APPROACHES.*
*SOURCE: FEHR & PEERS, 2017.*

Table 26 presents average daily trip (ADT) estimates for each study roadway segment and project access point under Existing and Existing Plus Project conditions. By providing full access at the Fullerton Ranch Driveway / Nicolaus Road side-street stop controlled intersection, a lower number of project generated traffic would use Lakeside Drive south of Nicolaus and Celtic Drive west of the project site. Project generated traffic volumes would not change on 5th Street west of Joiner Parkway, Savannah Drive, or Milan Way. As seen in the table, the project would:

- Increase traffic levels along Nicolaus Road on both sides of the project site. However, Nicolaus Road would be operating well below capacity.
- Increase the ADT at the project's points of access, which under Existing Plus Project conditions includes Lakeside Drive, Celtic Drive, Abbeyhill Lane, 5th Street, Savannah Drive, and Milan Way. The resultant volumes are all well below the capacity of a two-lane collector street.

*Table 26: Two-Way Average Daily Traffic – Existing and Existing Plus Project Conditions*

| Roadway Segment | Average Daily Traffic (Existing Conditions) | Average Daily Traffic (Existing Plus Project Conditions) |
|---|---|---|
| Nicolaus Road west of Joiner Parkway | 8,700 | 8,905 |
| Nicolaus Road east of Nelson Lane | 7,300 | 7,640 |
| Lakeside south of Nicolaus | 1,000 | 1,020 |
| Celtic Drive / Abbeyhill Road west of Project Site | 400 | 420 |
| 5th Street west of Joiner Parkway | 1,600 | 1,840 |
| Savannah Drive east of Project Site | 700 | 910 |
| Milan Way west of Savannah Drive and south of the Project Site | 250 | 280 |

*NOTE: N.A. = NOT APPLICABLE*
*SOURCE: FEHR & PEERS, 2017.*

*Cumulative Plus Project Intersection Levels of Service and Two-Way Average Daily Traffic*

Table 27 presents the results of the Cumulative operations analyses. According to this table, vehicle traffic generated by the proposed 81 single family residences would result in a minor change in control delay. All intersections would operate at LOS C or better under Cumulative Plus Project conditions during both AM and PM peak hour conditions.

Table 28 presents ADT estimates for each study roadway segment and project access point under Cumulative and Cumulative Plus Project conditions. By providing full access at the Fullerton Ranch Driveway / Nicolaus Road side-street stop controlled intersection, a lower number of project generated traffic would use Lakeside Drive South of Nicolaus Road and Celtic Drive / Abbeyhill Road west of the project site.

***Table 27: Peak Hour Intersection LOS – Cumulative and Cumulative Plus Project Conditions***

| Intersection | LOS Standard | Control | Cumulative No Project Conditions | | | | Cumulative Plus Project Conditions | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | |
| | | | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS |
| Lakeside Drive/Nicolaus Road | C | Signal | 33.7 | C | 24.9 | C | 34.1 | C | 25.1 | C |
| Fullerton Ranch Access / Nicolaus Road (future) | C | SSSC | 0.0 (Does Not Exist) | A (Does Not Exist) | 0.0 (Does Not Exist) | A (Does Not Exist) | 1.6 (19.5) (NB LT) | A (C) (NB LT) | 0.5 (10.0) (WB LT) | A (A) (WB LT) |
| Joiner Parkway/Nicolaus Road | C | Signal | 29.9 | C | 26.5 | C | 29.9 | C | 27.1 | C |
| Joiner Parkway / 5th Street | C | Signal | 23.5 | C | 20.1 | C | 23.6 | C | 20.4 | C |
| Joiner Parkway / 3rd Street | C | Signal | 22.6 | C | 26.4 | C | 22.6 | C | 26.5 | C |
| Joiner Parkway/1st Street | C | Signal | 28.4 | C | 32.0 | C | 28.5 | C | 32.1 | C |

*NOTES: LOS = LEVEL OF SERVICE. AWSC = ALL-WAY STOP CONTROL. SSSC = SIDE-STREET STOP CONTROL. **BOLDED** CELLS REPRESENT SIGNIFICANT IMPACTS.*

*[1] FOR SIGNALIZED INTERSECTIONS AND ALL-WAY STOP CONTROLLED INTERSECTIONS, AVERAGE INTERSECTION DELAY IS REPORTED IN SECONDS PER VEHICLE FOR ALL APPROACHES. FOR SIDE-STREET STOP CONTROLLED INTERSECTIONS, THE DELAY AND LOS FOR THE MOST-DELAYED INDIVIDUAL MOVEMENT IS SHOWN IN PARENTHESES, AND DELAY/LOS FOR THE ENTIRE INTERSECTION IS SHOWN WITHOUT PARENTHESES.*

*SOURCE: FEHR & PEERS, 2017.*

*Table 28: Two-Way Average Daily Traffic – Cumulative and Cumulative Plus Project Conditions*

| Roadway Segment | Average Daily Traffic | | |
|---|---|---|---|
| | Existing Conditions | Cumulative No Project Conditions | Cumulative Plus Project Conditions |
| Nicolaus Road west of Joiner Parkway | 8,700 | 27,100 | 27,305 |
| Nicolaus Road east of Nelson Lane | 7,300 | 24,400 | 24,740 |
| Lakeside Drive south of Nicolaus Road | 1,000 | 1,100 | 1,120 |
| Celtic Drive / Abbeyhill Road west of Project Site | 400 | 450 | 470 |
| 5th Street west of Joiner Parkway | 1,600 | 4,100 | 4,340 |
| Savannah Drive east of Project Site | 700 | 700 | 910 |
| Milan Way west of Savannah Drive south of Project Site | 250 | 250 | 280 |

NOTE: N.A. = NOT APPLICABLE
SOURCE: FEHR & PEERS, 2017.

*Conclusion*

All intersections would operate at LOS C or better under Existing Plus Project and Cumulative Plus Project conditions during both AM and PM peak hour conditions. Therefore, impacts would be considered ***less than significant***.

**Response c):** The proposed project does not include airport or airstrip facilities and is not located adjacent to an airport or airstrip. According to the Placer County ALUP, project site is located within Compatibility Zone C2 for the Lincoln Regional Airport. The proposed project does not include buildings over two stories, and there are no proposed towers or other elevated structures proposed. The proposed project would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. Implementation of proposed project would have ***no impact*** relative to this topic.

**Responses d-e):** No site circulation or access issues have been identified that would cause a traffic safety problem/hazard or any unusual traffic congestion or delay. The volumes on the internal residential roadways (with homes fronting on them) would be relatively low such that no significant conflicts would be expected with through traffic and vehicles backing out of the driveways and/or garages within the project.

Most emergency vehicles arriving to and from the Fullerton Ranch Project would need to pass through the Nicolaus Road / Joiner Parkway intersection, which is equipped with emergency vehicle pre-emption. The project site includes multiple access points, including Nicolaus Road / Fullerton Ranch Access, Celtic Drive, Abbeyhill Road, Savannah Drive, and Milan Way. All accesses would be designed to City standards that accommodate turning requirements for fire trucks. These multiple entry/exit points provide flexibility for emergency vehicles to access or evacuate from multiple directions during an emergency.

At the proposed project entrances on Nicolaus Road, there are no safety, capacity, or sight distance issues identified with providing a westbound left-turn movement entering the project site. In addition, there were no safety, capacity, or sight distance issues identified with providing a northbound left-turn movement exiting the project site.

In addition, with the addition of project traffic, none of the warrants for a traffic signal would be met at the Nicolaus Road / Fullerton Ranch access location. The analysis indicates the intersections would continue to operate at acceptable City LOS conditions in the future with the side street stop control and a traffic signal would not be required under cumulative plus project conditions. Therefore, impacts associated with design features and emergency access would be considered ***less than significant***.

**Response f):** The Transportation & Circulation Element of the *City of Lincoln General Plan* (March 2008) includes the following goals and policies that are relevant to transportation and circulation:

- **Policy T-4.3:** Promote Public Transit. The City shall promote the use of public transit through development conditions requiring park-and-ride lots, bus turnouts and passenger shelters along major streets adjacent to appropriate land uses.
- **Policy T-5.1:** Develop Bike Lanes. The City shall require bike lanes in the design and construction of major new street and highway improvements, and to establish bike lanes on those city streets wide enough to accommodate bicycles safely.
- **Policy T-5.4:** Bicycle and Pedestrian Crossings. The City shall provide pedestrian/bicycle crossings at appropriate intervals along new roadways that will adequately serve new large-scale commercial office, industrial development, and residential development as well as parks and schools.
- **Policy T-5.6:** Trails and Pathways to Retail and Employment Centers. The City shall promote pedestrian convenience and safety through development conditions requiring sidewalks, walking paths, or hiking trails that connect residential areas with commercial, shopping, and employment centers. Where feasible, trails will be looped and interconnected.
- **Policy T-5.7:** Trails and Pathways along Creeks and Wetland Areas. The City shall encourage the development of trails and pathways along the edges of creeks and wetland areas. Where feasible, trails will be looped and interconnected.
- **Policy T-5.9:** Pedestrian Access. The City shall encourage specific plans and development plans to include design of pedestrian access that enables residents to walk from their homes to places of work, recreation and shopping.
- **Policy HS-3.18:** Design for Transportation Alternatives. The City shall encourage all new development to be designed to promote pedestrian and bicycle access and circulation (including the use of NEVs), to the greatest extent feasible.

The *City of Lincoln Bicycle Transportation Plan Update* (2012) includes the following goals policies related to bicycle circulation in new development areas that are relevant to the project:

- **Policy 1.5:** Provide bicycle connections that allow for regional bike travel to and from the City of Lincoln.
- **Policy 1.6:** Integrate bicycle planning with other community planning, including land use and transportation planning.
- **Policy 2.1:** Require new development projects to reserve the right-of-way for multi-use trails shown in the proposed system of bikeways.
- **Policy 2.3:** Provide pedestrian/bicycle crossings at appropriate intervals along new roadways that will adequately serve new large-scale commercial office, industrial development, and residential development.

The proposed project does not conflict with any of the above listed policies from the General Plan Transportation & Circulation Element. The proposed project would not generate a significant increase in traffic in the area compared to the existing and it would not decrease levels of service to unacceptable levels. In addition, the proposed project would not change the design of any existing pedestrian or bicycle facilities or create any new safety problems in the area. The proposed project will add a small amount of both pedestrians and bicyclists who will utilize both existing and planned facilities connecting the project site with the community at large. The internal streets will be designed to the City's standard for pedestrian sidewalks.

The *City of Lincoln Bikeway Master Plan* shows the following planned bicycle facilities in the project vicinity:

- Planned Class II bike lane on south side of Nicolaus Road between Waverly Drive and Joiner Parkway.
- Planned Class I multi-use trail on north side of Nicolaus Road between Waverly Drive and Nelson Lane.
- Planned Class I multi-use trail that would extend southerly from Nicolaus Road west of Waverly Drive, easterly along Markham Ravine, and then southerly parallel to Chambers Drive to beyond First Street.
- Planned Class III bike lane connecting Nicolaus Road, through the Glenmoor Subdivision via Abbeyhill Road, through the project site, to Savannah Drive.

The site plan for the proposed project does not specify where bicycle lanes would be constructed on-site. Without measures to ensure that the project is consistent with the *City of Lincoln Bikeway Master Plan*, a potentially significant impact would result.

The proposed project would not interfere with any existing bus routes and would not remove or relocate any existing bus stops. The proposed project also would not conflict with any transit plans or goals of the City of Lincoln and, based on the size of the project, it would be expected to generate only limited transit ridership. The project would be expected to provide a minimal amount of additional ridership for local bus companies.

With implementation of the following mitigation measure, the proposed project would have a ***less than significant*** impact related to alternative transportation.

***Mitigation Measure Trans-1:*** *Prior to approval of improvements plans, the improvement plans shall reflect the following bicycle facility improvements on and adjacent to the project site:*

- *Construct the segment of the Class II bike lane along the project frontage on the south side of Nicolaus Road. Alternatively, the project shall dedicate the right-of-way and pay the project's fair share towards the Class II bike lane on the south side of Nicolaus Road between Waverly Drive and Joiner Parkway.*
- *Construct the Class III bike lane connecting Nicolaus Road, through the Glenmoor Subdivision via Abbeyhill Road, through the project site, to Savannah Drive.*

## *XVII. TRIBAL CULTURAL RESOURCES*

| | ***Potentially Significant Impact*** | ***Less Than Significant with Mitigation Incorporation*** | ***Less Than Significant Impact*** | ***No Impact*** |
|---|---|---|---|---|
| Would the project 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 the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: | | | | |
| a) 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)? | | X | | |
| b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set 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 resources to a California Native American tribe. | | X | | |

### *Background*

Pursuant to Assembly Bill 52 (AB 52), by letter dated December 19, 2016, the NAHC was contacted by Peak & Associates for a check of the Sacred Lands file and a list of Native Americans who may have information or concerns relative to the project site. A reply was received from the NAHC on December 21, 2016, indicating there were no resources listed in the Sacred Lands files. A list of contacts that may have concerns or more information was provided in the response. The individuals and organizations identified by the NAHC were contacted by letter on January 6, 2017. Correspondence requesting information and/or comment and a topographic map showing the project were sent to the United Auburn Indian Community of the Auburn Rancheria (Gene Whitehouse), Shingle Springs Band of Miwok Indians (Nicholas Fonseca), Tsi-Akim Maidu (Grayson Coney), and Tsi-Akim Maidu (Don Ryburg). To date, two replies have been received: United Auburn Indian Community of the Auburn Rancheria (Gene Whitehouse), and Shingle Springs Band of Miwok Indians (Nicholas Fonseca). According to the response letters, neither group is aware of any known tribal cultural resources on the project site.

Methodology to identify cultural and paleontological resources in the project site included a cultural resources record search, archival research, and review of historic maps and aerial photographs in 2016-2017; Sacred Lands file search by the NAHC and related consultation with local Native American groups and individuals undertaken in 2016.2017; initiation by the City in 2015 of SB 18 consultation with listed tribes; notification by the City in 2016 in accordance with AB 52 tribal requests; and pedestrian survey by cultural resources specialists conducted in December 2016.

This impact analysis is based on the cultural resources inventory completed for the project (Peak and Associates, 2017), the review of geologic maps and fossil records, and relevant regulations. The project was analyzed in terms of its potential to impact undocumented and potentially significant cultural resources, including buried human remains and tribal cultural resources (TCRs), within the project site, and its potential to impact undocumented paleontological resources within the project site.

### *Responses to Checklist Questions*

**Responses a-b)**: Based on the above information, the project site has a low to moderate potential for the discovery of prehistoric, ethnohistoric, or historic archaeological sites that may meet the definition of TCRs. Although no TCRs have been documented in the project site, the project is located in a region where significant cultural resources have been recorded and there remains a potential that undocumented archaeological resources that may meet the TCR definition could be unearthed or otherwise discovered during ground-disturbing and construction activities. Examples of significant archaeological discoveries that may meet the TCR definition would include villages and cemeteries. Due to the possible presence of undocumented TCRs within the project site, construction-related impacts on tribal cultural resources would be potentially significant. With implementation of the following mitigation measure, the proposed project would have a ***less than significant*** impact related to tribal cultural resources.

> ***Mitigation Measure Tribal-1:*** *If cultural resources are discovered during project-related construction activities, all ground disturbances within a minimum of 50 feet of the find shall be halted until a qualified professional archaeologist can evaluate the discovery, and tribal representatives from the United Auburn Indian Community (UAIC) of the Auburn Rancheria and the Shingle Springs Band of Miwok Indians shall be contacted. The archaeologist, in coordination with the UAIC and Shingle Springs Band of Miwok Indians representatives, shall examine the resources, assess their significance, and recommend appropriate procedures to the lead agency to either further investigate or mitigate adverse impacts. If the find is determined by the lead agency in consultation with the Native American tribe traditionally and culturally affiliated with the geographic area of the project site to be a tribal cultural resource and the discovered archaeological resource cannot be avoided, then applicable mitigation measures for the resource shall be discussed with the geographically affiliated tribe. Applicable mitigation measures that also take into account the cultural values and meaning of the discovered tribal cultural resource, including confidentiality if requested by the tribe, shall be completed (e.g., preservation in place, data recovery program pursuant to PRC §21083.2[i]). During evaluation or mitigative treatment, ground disturbance and construction work could continue on other parts of the project site.*

## *XVIII. UTILITIES AND SERVICE SYSTEMS*

| ***Would the project:*** | ***Potentially Significant Impact*** | ***Less Than Significant with Mitigation Incorporation*** | ***Less Than Significant Impact*** | ***No Impact*** |
|---|---|---|---|---|
| a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board? | | | X | |
| b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? | | | X | |
| c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? | | X | | |
| d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? | | | X | |
| e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments? | | | X | |
| f) Be served by a landfill with sufficient permitted capacity to accommodate the projects solid waste disposal needs? | | | X | |
| g) Comply with federal, state, and local statutes and regulations related to solid waste? | | | X | |

### *Responses to Checklist Questions*

**Responses a), b) and e):** Wastewater generated by the proposed project would be conveyed to the City's Wastewater Treatment and Reclamation Facility (WWTRF) for treatment and disposal. The City's WWTRF is located approximately 2.5 miles southwest of the project site and southeast of the City on Fiddyment Road, between Athens Avenue and Moore Road. The City maintains the collection system facilities that deliver sewage to the WWTRF, which provides secondary and tertiary treatment of municipal wastewater from all parts of the City. Wastewater is mainly collected via a gravity system; however, the system also includes several lift stations. The WWTRF has expansion capacity up to 30 million gallons per day (MGD) for planned buildout and potential regional services. It is currently rated for 4.2 MGD; however, pending approvals, the dry weather capacity WWTRF will be increased to 5.9 MGD. Previous dry weather flows from the Summer of 2015 were 2.7 MGD.

The average dry weather flow (ADWF) from the City of Lincoln at General Plan buildout is estimated at 26.4 MGD. An additional 8 MGD from the Placer Nevada Wastewater Authority (PNWWA) communities is estimated during the same horizon. As shown in the table below, the total ADWF to be conveyed to and treated by the WWTRF is approximately 34.4 MGD, with a total peak wet weather flow (PWWF) of 120 MGD.

***Table 29: Projected WWTRF Flows***

| | *ADWF[1] (MGD)* | *PWWF[2] (MGD)* |
|---|---|---|
| 1998 General Plan Buildout | 10.97 | 38.4 |
| City of Lincoln Village Alternatives (New General Plan) | 13.51 | 47.3 |
| Other[3] | 1.86 | 6.51 |
| PNWWA (Regional) | 8.00 | 28.0 |
| *TOTAL* | *34.40* | *120* |

*NOTES:*

*(1) AVERAGE DRY WEATHER FLOW, IN MILLION GALLONS PER DAY (MGD).*

*(2) PEAK WET WEATHER FLOW, IN MILLION GALLONS PER DAY (MGD).*

*(3) AREA WITHIN THE SPHERE OF INFLUENCE BUT NOT WITHIN A VILLAGE OR THE GENERAL PLAN BOUNDARY.*

*SOURCE: SEWER CONSTRAINTS ANALYSIS AND SEWER FACILITIES COST ESTIMATE (APPENDIX G OF GENERAL PLAN UPDATE EIR), TABLE 3.*

As shown in the table below, the total projected ADWF to be conveyed to and treated by the WWTRF from Lincoln is approximately 26.4 MGD at General Plan buildout. This would provide excess capacity of an estimated 8.0 MGD. The total projected PWWF is 92.2 MGD at General Plan buildout, which would result in an excess of 27.8 MGD. Expansion of the WWTRF to provide capacity for General Plan buildout has been previously envisioned for the main WWTRF components, with the exception of the maturation basin and effluent storage basin. A facility plan for the first WWTRF expansion would increase capacity from the current 4.2 MGD to 6.3 or 8.4 MGD.

***Table 30: Projected WWRTF Flows[1] from City of Lincoln***

| *VILLAGE* | *RESIDENTIAL EDU[2]* | *COMMERCIAL ACRES* | *PUBLIC ACRES* | *INDUSTRIAL ACRES* | *ADWF (MGD)* | *PWWF (MGD)* |
|---|---|---|---|---|---|---|
| V-1 | 3,507 | 20 | 48 | 0 | 1.09 | 3.81 |
| V-2 | 3,874 | 12 | 0 | 0 | 1.08 | 3.78 |
| V-3 | 4,841 | 70 | 0 | 0 | 1.50 | 5.25 |
| V-4 | 5,421 | 12 | 0 | 0 | 1.48 | 5.18 |
| V-5 | 5,779 | 12 | 0 | 0 | 1.59 | 5.57 |
| V-6 | 5,083 | 12 | 0 | 0 | 1.38 | 4.83 |
| V-7 | 2,898 | 5 | 0 | 0 | 0.78 | 2.73 |
| SUD-A | 1,623 | 1,170 | 0 | 142 | 2.56 | 8.96 |
| SUD-B | 426 | 413 | 0 | 0 | 0.77 | 2.70 |
| SUD-C | 0 | 0 | 0 | 644 | 1.29 | 4.52 |
| Other | 286 | 257 | 603 | 387 | 1.86 | 6.51 |
| 1998 GP Buildout | 21,846 | 352 | 660 | 1,834 | 10.97 | 38.4 |
| *TOTAL* | *55,587* | *2,335* | *1,311* | *3,007* | *26.4* | *92.2* |

*NOTES:*

*(1) VILLAGE ALTERNATIVES MODEL.*

*(2) EQUIVALENT DWELLING UNITS.*

*SOURCE: SEWER CONSTRAINTS ANALYSIS AND SEWER FACILITIES COST ESTIMATE (APPENDIX G OF GENERAL PLAN UPDATE EIR), TABLE 4.*

The proposed project includes 8-inch sewer lines in the rights-of-way of the proposed residential roads. Sewer service would be provided by the City of Lincoln. Table 31 summarizes the projected sanitary sewer flow resulting from the proposed project.

***Table 31: Proposed Project Sanitary Sewer Generation***

| *Land Use / Unit Count* | *Flow / Unit* | *Total Project Flow* |
|---|---|---|
| 81 residential dwelling units | 250 gpd/du | 20,250 gpd |

*NOTE: GPD/DU = GALLONS PER DAY PER DWELLING UNIT.*

*SOURCE: SEWER CONSTRAINTS ANALYSIS AND SEWER FACILITIES COST ESTIMATE (APPENDIX G OF GENERAL PLAN UPDATE EIR), TABLE 2.*

Although the project would generate the additional demand for wastewater collection, conveyance, and treatment, the recently completed Chambers Drive and Nicolaus Road Sewer Improvement Project and WWTRF would provide sufficient capacity to serve the project. Conveyance of wastewater to the WWTRF would ensure that wastewater generated by the project meets the Regional Water Quality Control Board's treatment requirements because the WWTRF maintains applicable permits for the treatment of wastewater separate from this project.

Table 32 compares the existing and projected sanitary sewer flow resulting from the proposed project.

***Table 32: Existing and Projected Sanitary Sewer Flow***

| | *ADWF(1) (MGD)* | *ADWF(1) (gallons/day)* |
|---|---|---|
| Existing | 2.7 | 2,700,000 |
| Existing + Approved Projects + Planned Projects(2) | 0.1 | 100,000 |
| Proposed Project | 0.02025 | 20,250 |
| *TOTAL* | *2.82025* | *2,820,250* |

*NOTES:*

*(1) AVERAGE DRY WEATHER FLOW, IN MILLION GALLONS PER DAY (MGD) AND GALLONS PER DAY (GALLONS/DAY).*

*(2) EXISTING INCLUDES PENDING AND APPROVED PROJECTS IN THE CITY OF LINCOLN.*

*SOURCE: SEWER CONSTRAINTS ANALYSIS AND SEWER FACILITIES COST ESTIMATE (APPENDIX G OF GENERAL PLAN UPDATE EIR), TABLE 2 AND TABLE 4.*

Assuming 250 gpd for each of the proposed 81 single-family residences, the project would produce 20,250 gallons of wastewater per day. The WWTRF can treat dry weather flows of 4.2 MGD, and currently treats an average daily dry weather flow of approximately 2.7 MGD.[7] The City's most recent estimates of wastewater generated by existing, approved, and planned projects would increase average daily dry weather flows to approximately 2,800,000 gallons per day (2.8 MGD) at the City WWTRF.[8] As shown in Table 33, the wastewater generated by the proposed project would increase ADFW to approximately 2,820,250 gallons per day (2.8203 MGD) at the City WWTRF when considering the existing, approved, and planned projects. According to the Background Report prepared for the 2013-2021 Housing Element (City of Lincoln 2013), there is more than adequate capacity at the WWTRF to serve build-out of

[7] City of Lincoln. Draft Environmental Impact Report – Independence at Lincoln Development Project (page 4.9-14). September 30, 2016.

[8] *Ibid*.

anticipated residential land in the city, and the distribution system operates at acceptable levels and has been designed to accommodate expansions and service extensions. The proposed project wastewater would not exceed the current capacity of the WWTRF. The project applicant would be required to pay applicable connection fees. With payment of the applicable connection fees, impacts related to City sewer services will be ***less than significant***.

**Response d):** Potable water for the proposed project would be supplied from the City's municipal water system. The City of Lincoln provides potable water to all residents and commercial customers within the City limits. Key services include: water distribution; water quality maintenance and testing; water leak/break repair; well water site maintenance and distribution; maintaining partnerships with PCWA, NID, and other water distributor/wholesalers; collaboration with the State Water Resources Board and Regional Water Authority on regulations and enforcement; and execution of the approved 2010 Urban Water Management Plan.

Water is provided by PCWA (17 MGD) and four City-owned municipal wells (7 MGD). Water supplied by PCWA comprises the City's base water supply and is derived from PCWA and NID entitlement to surface water fed by the Sierra snowpack (City of Lincoln 2016). Water from PCWA is treated at PCWA's Foothill Water Treatment Plant and is then delivered to the City (Tully & Young 2016). The City's wells are used as back-up water supply (City of Lincoln 2016).

The City has a 2012 contract with PCWA for delivery of treated surface water that currently entitles the City to a maximum daily delivery of 18,501,424.5 gallons of PCWA water and includes opportunities for the City to purchase additional supplies. Current water deliveries are significantly lower than the full entitlement and there is substantial additional, unallocated capacity in PCWA's system (1.6 MGD in 2014). The City does not anticipate a need for more than about 20,000 acre-feet per year of treated surface water from PCWA to meet demands through 2040. The City also has rights to an additional 4.5 MGD of treatment capacity at the PCWA plant that it is not currently using. In addition, there was another 5.6 MGD of capacity available on a first-come-first-served basis as of 2013. This capacity is sufficient to supply water to approximately 4,800 additional dwelling units (Tully & Young 2016).

Groundwater for the City is supplied by wells pumping from the North American Subbasin, which is part of the Sacramento Valley Groundwater Basin. The City currently limits groundwater use during normal years to 10 percent of its buildout demand. The area has currently and historically stable groundwater elevations and reliable water quality. The groundwater pumping system has a combined capacity of 8.5 MGD, or about 75 percent of the current maximum day demand, which is sufficient as an emergency supply for all but the hottest summer irrigation days (Tully & Young 2016: 4-4).

The project site would receive potable water via connections to the existing water system. The project is proposed to be primarily served by 8-inch diameter on-site water mains, connected to the existing 16-inch diameter water main on Nicolaus Road, the existing 12-inch diameter water main located on Abbeyhill Road, the existing 18-inch diameter water main located on Montaro Way, and the existing 8-inch diameter water main located on Savannah Drive. The proposed connections to these existing water mains provides for a looped connection of the project to the City's water distribution system.

Table 34 summarizes the City's estimated existing and planned future water demands, inclusive of non-revenue water needs, for each 5-year increment to 2040. As shown in the table, the estimated City water supplies in 2040 is approximately 20,336 acre-feet (AF).

***Table 34: Existing and Planned Future Water Demands (Current – 2040)***

| ***Category*** | ***Estimated Demand (AF/yr)*** | | | | | |
|---|---|---|---|---|---|---|
| | ***Current*** | ***2020*** | ***2025*** | ***2030*** | ***2035*** | ***2040*** |
| Current Customer Use | 10,174 | 10,174 | 9,645 | 9,115 | 8,585 | 8,055 |
| Projects Underway | 0 | 53 | 247 | 324 | 332 | 479 |
| Other Proposed Project | 0 | 1,822 | 3,344 | 5,616 | 7,955 | 10,337 |
| GPU Land Use Growth | 0 | 0 | 0 | 0 | 0 | 1,224 |
| Independence Project | 0 | 241 | 241 | 241 | 241 | 241 |
| *TOTAL DEMAND* | *10,174* | *12,291* | *13,478* | *15,296* | *17,113* | *20,336* |

*NOTE: SF/YR = ACRE-FEET PER YEAR.*

*SOURCE: INDEPENDENCE DEVELOPMENT PROJECT SB 610 WATER SUPPLY ASSESSMENT, TABLE 3-2. SEPTEMBER 2016.*

Table 35 summarizes the projected water demand resulting from the proposed project. As shown in the table, the estimated water demand for the proposed project would be 37.26 AF per year (AF/yr).

***Table 35: Proposed Project Water Demand***

| ***Land Use / Unit Count*** | ***Demand / Unit*** | ***Total Project Demand*** |
|---|---|---|
| 81 low density residential dwelling units | 0.46 AF/account/yr | 37.26 AF/yr |

*NOTE: AF/ACCOUNT/YR = ACRE-FEET PER ACCOUNT PER YEAR.*

*SOURCE: LINCOLN 2015 URBAN WATER MANAGEMENT PLAN, TABLE 4-5.*

The proposed project falls within assumed GPU Land Use Growth and the City is not projecting a shortage in its water supplies during either a single-dry or multiple dry year periods.[9]

The City of Lincoln is working closely with the PCWA and the NID to implement short-term and long-range infrastructure projects to meet the City's water demand projections throughout implementation of the City's General Plan, which includes the project. PCWA has reflected the City's growth and water demand projections in its implementation of water infrastructure projects (i.e., transmission mains, water treatment plants, water rights, etc.). To meet the City's growth projections anticipated in the General Plan, PCWA and the City are on-track with implementation of projects to ensure adequate water supplies and distribution infrastructure are commissioned in advance of need.

In a March 2016 letter, PCWA indicated that unused capacity in their existing treatment plants could be used by the City to meet future growth needs. This is estimated to be about 4.5 MGD that the City currently has rights to but is not using. As of this year (2016), an additional 3.86 MGD is available, on a first come first serve basis, in PCWA's existing facilities.[10]

PCWA is required to deliver raw water to its treatment plants prior to treating and delivering the water to the City. The PCWA's Ophir Pipeline Project, constructed in 2014, will enable PCWA to deliver an additional 22,000 AF from the American River to its treatment facilities (Tully & Young 2016: 5-12).

It should be noted that there is sufficient capacity in existing PCWA transmission mains to deliver all of the City's current contract water (18.5 MGD), plus at least another 5 MGD of additional capacity. The City's distribution system has a physical limitation to receive water in excess of 17.7 MGD until completion of the Phase 3 Pipeline and Metering Station, which

[9] City of Lincoln. City of Lincoln 2015 Urban Water Management Plan (page 6-6). Public Review Draft June 2016.

[10] City of Lincoln. City of Lincoln 2015 Urban Water Management Plan (page 3-4). Public Review Draft June 2016.

provides a secondary point of connection for the City distribution system to PCWA transmission mains. This project is anticipated to be operating by January 2018, prior to buildout of the project.

Water service would be provided by the City of Lincoln, through its partnership with PCWA. PCWA does not reserve water for specific projects. Commitments for service are made only upon the execution of a pipeline extension or service order agreement to construct any necessary on- or offsite pipelines or other facilities and the payment of all required fees, including the Plant Expansion and Replacement Charges. In Lincoln, payment of such fees occurs in conjunction with building permits.

This water demand analysis demonstrates that adequate water supply would be available to serve the project and other existing and planned future water demands. As a condition of approval, the City will require a final written verification that there is sufficient water supply as required by Government Code Section 66473.7(a)(1). Further, adequate treatment and distribution infrastructure is available or would be available prior to buildout of the project.

The additional water demand (37.26 AFY) of the proposed project would not exceed the City's available water supply. The City's water treatment and conveyance infrastructure is adequate to serve existing demand, in addition to the demand created by the proposed project. This is a ***less than significant*** impact and no mitigation is required.

**Response c):** Development of the project site would place impervious surfaces on the approximately 19.7-acre project site. Development of the project site would potentially increase local runoff, and would introduce constituents into storm water that are typically associated with urban runoff. These constituents include heavy metals (such as lead, zinc, and copper) and petroleum hydrocarbons. BMPs will be applied to the proposed site development to limit the concentrations of these constituents in any site runoff that is discharged into downstream facilities to acceptable levels.

The project would be designed and constructed with an on-site storm drainage basin. The water quality basin would be located in the northeastern portion of the project site. The basin area would account for a total surface area of 18,408 square feet (0.42 acres). The construction of the stormwater conveyance and detention system would ensure that the project is consistent with all applicable plans and regulations related to stormwater conveyance and detention as required by the city, and would ensure that offsite, or onsite flooding does not occur during storm events. Permanent onsite storm drainage would be installed to serve the proposed project. The collection system would consist of inlets and underground piping. The potential environmental impacts of construction of the onsite storm drainage system are addressed throughout this Initial Study.

All of the storm drainage facilities required for the proposed project would be located on the project site. As such, there is no potential for the project to result in environmental impacts associated with the construction of off-site drainage facilities. The environmental impacts associated with the construction of onsite drainage facilities fall within the project "footprint" and have been addressed throughout this environmental document.

The following mitigation measure requires the project applicant to install a drainage system that meets this performance standard and, prior to issuance of grading permits, provide a drainage plan and report to the City of Lincoln for review and approval. With the implementation of the following mitigation measure, drainage impacts would be reduced to ***less than significant***.

> ***Mitigation Measure Utilities-1:*** *Prior to the issuance of a building or grading permit, the project applicant shall submit a drainage plan to the City of Lincoln for review and approval. The plan shall include an engineered storm drainage plan that demonstrates attainment of pre-project runoff requirements in accordance with the West Placer Storm Water Quality Design Manual prior to release and describes the volume reduction measures and treatment controls used to reach attainment consistent with the Lincoln Stormwater Post-Construction Ordinance.*

**Responses f), g):** The City's Department of Public Services manages solid waste and green waste collection and disposal. With the exception of "cluster homes," which only have solid waste service because of space limitations, each home within the City is provided with one, 90-galllon can for garbage and recycling, and another 64- or 90-gallon container for green waste material. Garbage is collected weekly and green waste is collected bi-weekly.

Refuse from the project area is transported to the Western Placer Waste Management Authority's (WPWMA's) 316-acre Western Regional Sanitary Landfill (WRSL) adjacent to the intersection of Athens Avenue and Fiddyment Road, west of State Route 65. The WPWMA is a joint powers authority comprised of the cities of Rocklin, Roseville, and Lincoln, and Placer County. Both the WRSL and the associated Material Recovery Facility (MRF) operate under permits issued by the California Integrated Waste Management Board. The MRF separates and recovers waste products for recycling, reuse, or conversion to energy sources. Materials that cannot be recycled are taken to the landfill. The MRF can accommodate over 1,750 tons of garbage per day. Currently, the MRF diverts approximately 40 percent of the material received from going to the landfill, helping Placer County comply with a state-mandated recycling rate.

Total capacity of the WRSL is 36,350,000 cubic yards, and there is 24,836,745 cubic yards of capacity remaining (as of June 3, 2016). The WRSL does not have an average annual capacity, but did received 248,773 tons of solid waste between July 1, 2015 and June 30, 2016. It is projected that the landfill has a lifespan extending to January 2058 (City of Lincoln 2016).

Project construction activities would generate solid waste, including excess construction materials and material removed during site clearing. However, the site is generally vacant, and construction would not require demolition of existing structures or removal of large quantities of waste. It is anticipated that compliance with the construction waste requirements in CALGreen would be sufficient to address the potential for construction of the project to produce excessive quantities of solid waste that could affect the capacity of the local landfill.

During operation of the project, the residences would produce solid waste that would be collected by the City and transferred to the WRSL. Based on a waste generation rate of 4.5 pounds per person per day and 209 residents, the project is expected to produce approximately 343,282.5 pounds (171 tons) of solid waste annually. It is reasonable to conclude that the landfill has sufficient permitted capacity to accommodate the project's solid waste disposal needs in compliance with all applicable laws based on the calculated residential waste generation rate.

Solid waste collection services for the City are funded through an enterprise fund. Costs for operation services (containers, bins, trucks, loaders, and street sweepers) are funded by various fees and charges collected by the City through its utility billing for solid waste collection. As development occurs in the service area, revenue is generated to finance the expansion of operational services through fees generated by new utility customers. All new development must participate in the funding of needed facilities and equipment based on adopted program standards. These costs are spread over new development based on an equivalent dwelling unit factor such that capital facilities costs are equally borne by residential and nonresidential development. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

## *XVIX. MANDATORY FINDINGS OF SIGNIFICANCE*

| | *Potentially Significant Impact* | *Less Than Significant with Mitigation Incorporation* | *Less Than Significant Impact* | *No Impact* |
|---|---|---|---|---|
| a) Does the project have the potential to 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, 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? | | | X | |
| b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? | | | X | |
| c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? | | | X | |

### *Responses to Checklist Questions*

**Response a):** This Initial Study includes an analysis of the project impacts associated with aesthetics, agricultural and forest resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and utilities and service systems. The analysis covers a broad spectrum of topics relative to the potential for the proposed project to have environmental impacts. This includes the potential for the proposed project 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, 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. It was found that the proposed project would have either no impact, a less than significant impact, or a less than significant impact with the implementation of mitigation measures. For the reasons presented throughout this Initial Study, the proposed project would not 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, 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. With the implementation of mitigation measures presented in this Initial Study, the proposed project would have a ***less than significant*** impact relative to this topic.

**Response b):** This Initial Study includes an analysis of the project impacts associated with aesthetics, agricultural and forest resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation/traffic, and utilities and service systems. The analysis covers a broad spectrum of topics relative to the potential for the proposed project to have environmental impacts. It was found that the proposed project would have either no impact, a less than significant impact, or a less than significant impact with the implementation of mitigation measures. These mitigation measures would also function to reduce the project's contribution to cumulative impacts.

The project would increase the population and use of public services and systems; however, it was found that there is adequate capacity to accommodate the project.

There are no significant cumulative or cumulatively considerable effects that are identified associated with the proposed project after the implementation of all mitigation measures presented in this Initial Study. With the implementation of all mitigation measures presented in this Initial Study, the proposed project would have a ***less than significant*** impact relative to this topic.

**Response c):** The construction phase could affect surrounding neighbors through increased air emissions, noise, and traffic; however, the construction effects are temporary and are not substantial. The operational phase could also affect surrounding neighbors through increased air emissions, noise, and traffic; however, mitigation measures have been incorporated into the proposed project that would reduce the impacts to a less than significant level. The proposed project would not cause substantial adverse effects on human beings. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

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# Appendix A

**Preliminary Project Plans**

# VESTING TENTATIVE SUBDIVISION MAP
# FULLERTON RANCH
## A PORTION OF THE NORTHWEST 1/4 SECTION 16, T 12N, R 6E, MOUNT DIABLO BASE AND MERIDIAN, CITY OF LINCOLN, COUNTY OF PLACER, CALIFORNIA

## TENTATIVE MAP INFORMATION

OWNER:
TERRAVEST CAPITAL PARTNERS, LP
3208 WYCLIFFE DRIVE
MODESTO, CA 95355
CHRIS TYLER
925-383-9066

DEVELOPER:
TERRAVEST CAPITAL PARTNERS, LP
3208 WYCLIFFE DRIVE
MODESTO, CA 95355
CHRIS TYLER
925-383-9066

ENGINEER:
VVH CONSULTING ENGINEERS
430 10TH STREET
MODESTO, CA 95354
CHRIS VIERRA, PE: C70054
209-568-4477

ASSESSOR'S PARCEL NUMBERS:

| | |
|---|---|
| 021-310-094 | ±0.7 ACRES |
| 021-310-095 | ±4.5 ACRES |
| 021-310-096 | ±14.5 ACRES |
| TOTAL AREA | ±19.7 ACRES (GROSS) |

LAND USE:

EXISTING GENERAL PLAN: LDR (LOW DENSITY RESIDENTIAL)
PROPOSED GENERAL PLAN: LDR (LOW DENSITY RESIDENTIAL)

EXISTING ZONING: RE (RESIDENTIAL ESTATE)
PROPOSED ZONING: PD (PLANNED DEVELOPMENT)

| | |
|---|---|
| PROPOSED LOTS: | 81 TOTAL (±6,000 SF TO ±24,196 SF) AVERAGE LOT SIZE: 8,087 SF |
| DENSITY: | 4.11 DWELLING UNITS/ACRE |

JURISDICTIONS:

| | |
|---|---|
| SEWER: | CITY OF LINCOLN PUBLIC WORKS |
| WATER: | CITY OF LINCOLN PUBLIC WORKS |
| STORM DRAIN: | CITY OF LINCOLN PUBLIC WORKS |
| ELECTRICAL: | PG&E |
| GAS: | PG&E |
| FIRE PROTECTION: | LINCOLN FIRE DEPARTMENT |
| SCHOOL DISTRICT: | WESTERN PLACER UNIFIED SCHOOL DISTRICT |

## NOTES

1. THIS IS AN APPLICATION FOR A DEVELOPMENT PERMIT.
2. THIS EXHIBIT IS FOR TENTATIVE MAP PURPOSES ONLY. ALL SITE CHARACTERISTICS ARE TO BE VERIFIED PRIOR TO FINAL MAP.
3. A PUBLIC UTILITY EASEMENT (P.U.E OR PUE) WILL BE LOCATED ADJACENT TO ALL PUBLIC RIGHT OF WAYS, AS SHOWN ON MAP.
4. PURSUANT TO GOVERNMENT CODE SECTION 66456.1, THE SUBDIVIDER MAY FILE MULTIPLE FINAL MAPS BASED UPON THIS VESTING TENTATIVE SUBDIVISION MAP. THE FILING OF A FINAL MAP ON A PORTION OF THIS VESTING TENTATIVE SUBDIVISION MAP SHALL NOT INVALIDATE ANY PART OF THIS VESTING TENTATIVE SUBDIVISION MAP.
5. LOT NUMBERS ARE FOR IDENTIFICATION PURPOSES ONLY
6. FIRE HYDRANTS AND ELECTROLIERS ARE TO BE DESIGNED AND LOCATED PER CITY OF LINCOLN STANDARDS AND SPECIFICATIONS.
7. UTILITY SIZING, LOCATIONS, CONNECTION POINTS, STREET GRADES, PAD ELEVATIONS, AND LOT DIMENSIONS ARE PRELIMINARY ONLY AND SUBJECT TO FINAL ENGINEERING DESIGN.
8. ALL UTILITIES WILL BE PLACED UNDERGROUND WITHIN THE PUBLIC UTILITY EASEMENTS. PUBLIC UTILITY EASEMENTS WILL BE PROVIDED AS REQUIRED BY THE CITY OF LINCOLN AND UTILITY COMPANIES.
9. THE BOUNDARY INFORMATION IS BASED UPON A FIELD SURVEY OF THE PROPERTY PREPARED BY VVH CONSULTING ENGINEERS.
10. FINAL LANDSCAPE AND IRRIGATION PLANS ARE TO BE SUBMITTED ALONG WITH FINAL IMPROVEMENT PLANS.
11. SUBDIVISION SIGNAGE PER CITY OF LINCOLN REQUIREMENTS.
12. TOPOGRAPHIC SURVEY PERFORMED ON APRIL 7, 2015 BY VVH CONSULTING ENGINEERS.
13. ALL 90 INTERSECTION ELBOWS TO CONFORM WITH CITY OF LINCOLN STANDARD PLAN H-32.

## PLANNED DEVELOPMENT GUIDELINES

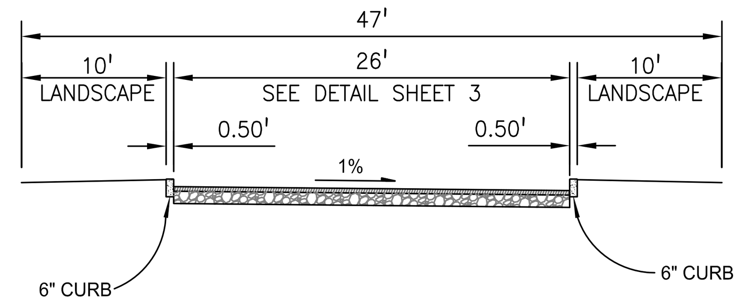
LOT CONFIGURATION

LOT AREA MINIMUM 6,000 SF
INTERIOR LOT MINIMUM WIDTH 60'
CORNER LOT MINIMUM WIDTH 65'
CUL-DE-SAC MINIMUM LOT WIDTH AT RIGHT OF WAY 35'
MINIMUM LOT DEPTH 80'
MAXIMUM LOT DEPTH TO WIDTH RATIO 5:1

SETBACKS AND BUILDING INTENSITY

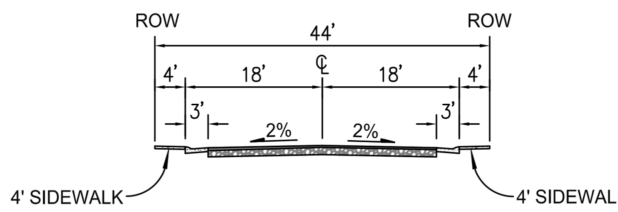
| | |
|---|---|
| FRONT: | PORCH, BALCONY, DECK 12.5'; LIVING SPACE 15'; FRONT FACING GARAGE 18'; SIDE ENTRY GARAGE 12.5' |
| REAR: | BALCONY, DECK, LIVING SPACE 10' SECOND STORY ADJACENT TO NICOLAUS ROAD 15' PATIO COVER 5' |
| SIDE: | LIVING SPACE INTERIOR LOT 5'; LIVING SPACE AND PORCHES CORNER LOT STREET SIDE 10' |

MAXIMUM LOT COVERAGE 60%



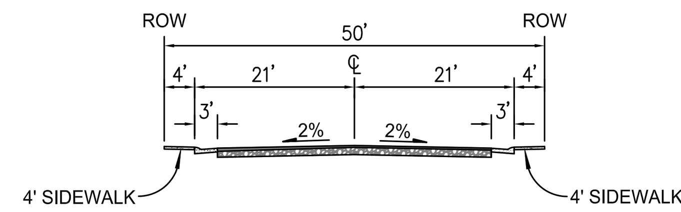

SECTION BETWEEN SYDNEY TERRACE AND AMELIA WAY

SCALE: 1"=10'



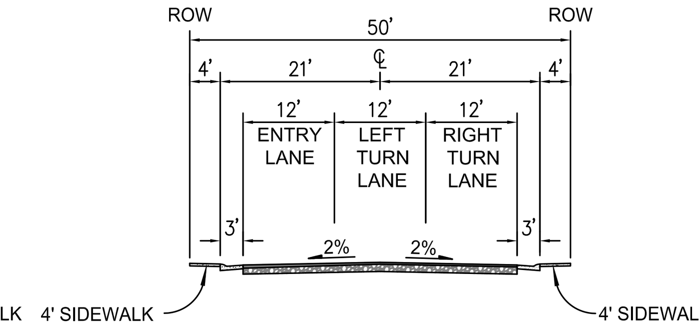

44' R.O.W. RESIDENTIAL STREET CROSS SECTION

SCALE: 1"=20'



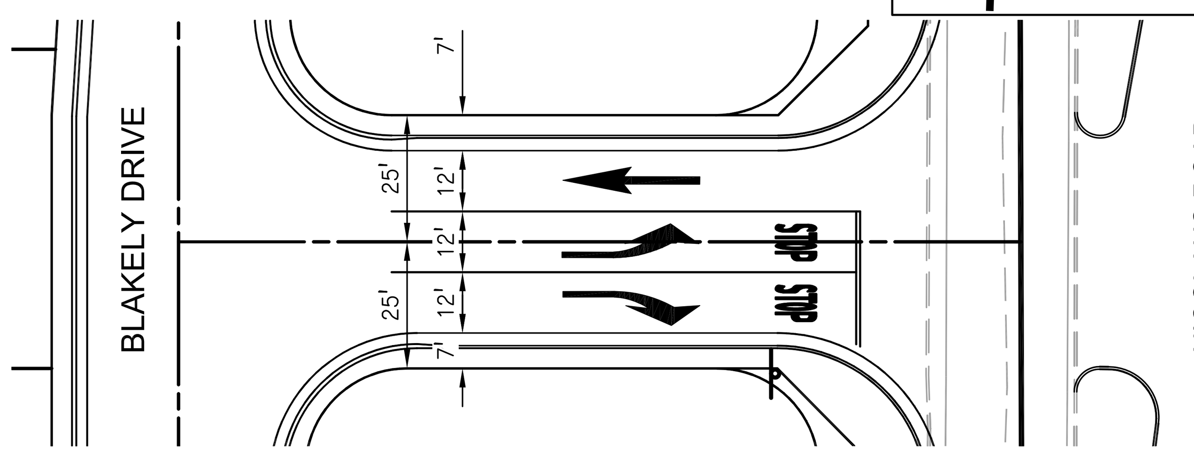

50' R.O.W. RESIDENTIAL STREET CROSS SECTION

SCALE: 1"=20'



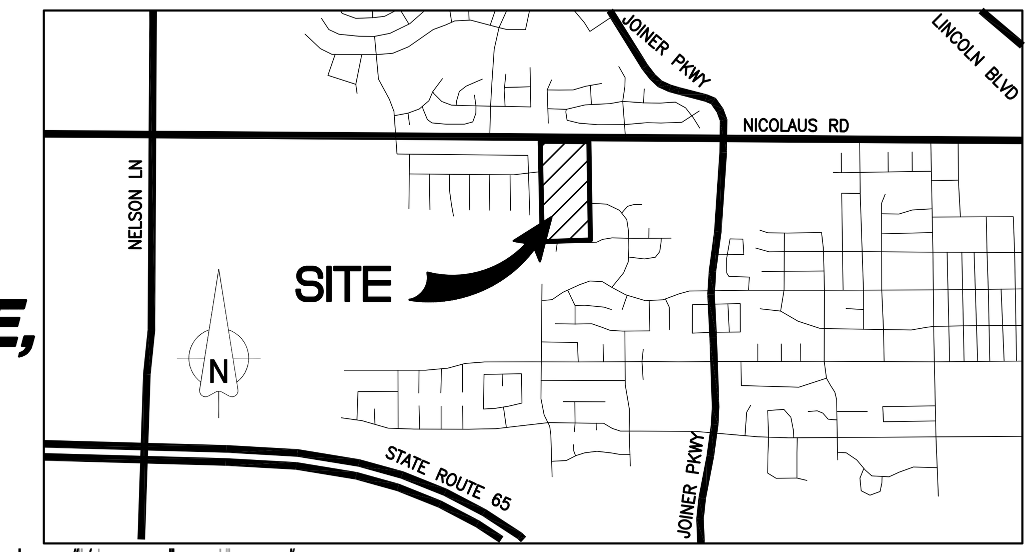

50' R.O.W. RESIDENTIAL ENTRY CROSS SECTION

SCALE: 1"=20'




RANCH WAY ENTRY ACCESS

SCALE: 1"=30'

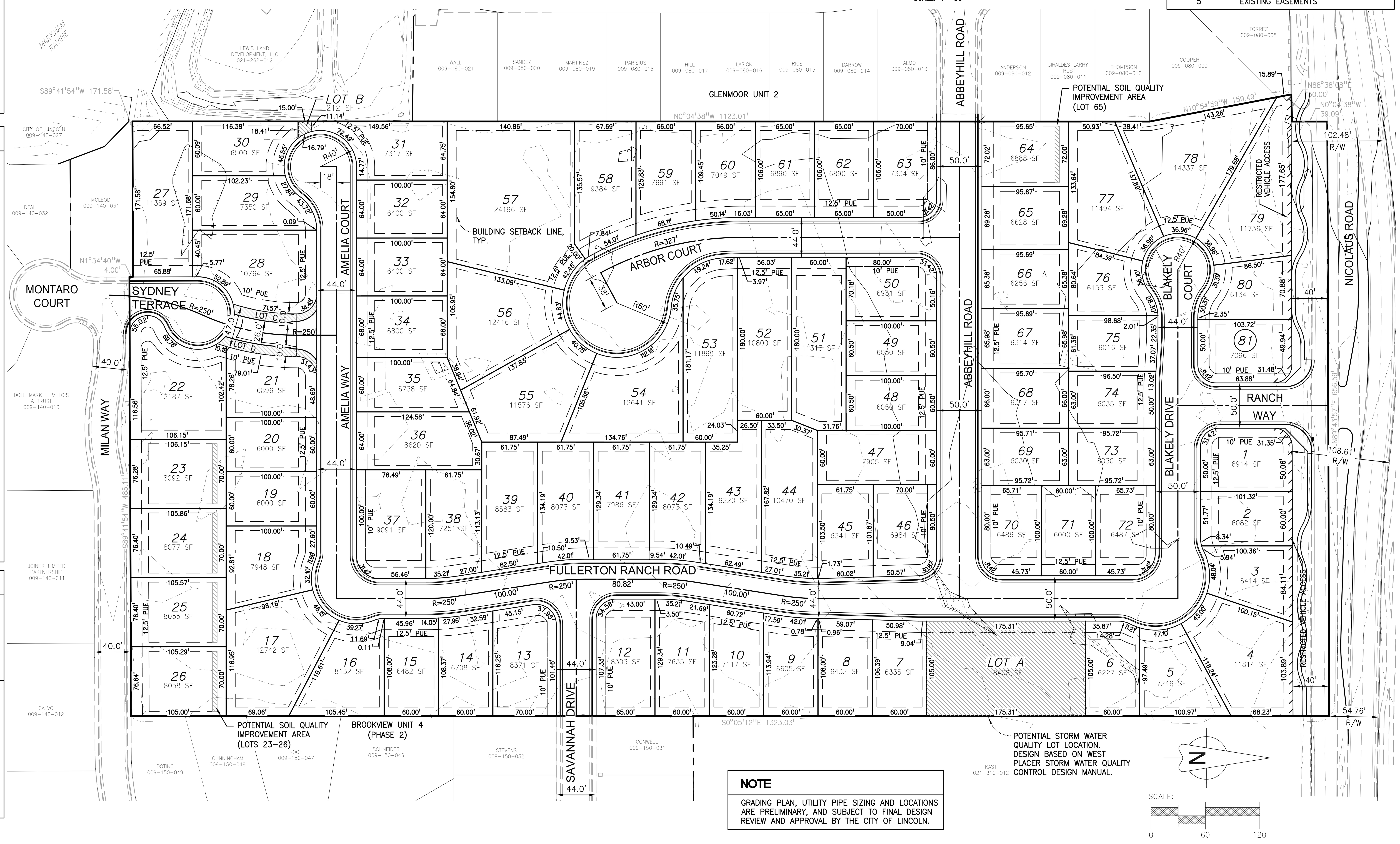



VICINITY MAP

N.T.S.

## SHEET INDEX

| | |
|---|---|
| 1 | LOT LAYOUT |
| 2 | PRELIMINARY UTILITY LAYOUT |
| 3 | PRELIMINARY GRADING AND DRAINAGE |
| 4 | PRELIMINARY TREE REMOVAL PLAN |
| 5 | EXISTING EASEMENTS |




## NOTE

GRADING PLAN, UTILITY PIPE SIZING AND LOCATIONS ARE PRELIMINARY, AND SUBJECT TO FINAL DESIGN REVIEW AND APPROVAL BY THE CITY OF LINCOLN.


VVH CONSULTING ENGINEERS
430 10th Street
Modesto, CA 95354
Tel: 209.568.4477
Fax: 209.568.4478




| No. | MM.YY | Description | By | Appd. |
|---|---|---|---|---|

Revision

Client/Project
TERRAVEST CAPITAL PARTNERS, LP
VESTING TENTATIVE SUBDIVISION MAP
FULLERTON RANCH
LINCOLN, CALIFORNIA

Title
LOT LAYOUT

Engineer's Seal

Engineer's Signature:
Signature Date:

811
Know what's below. Call before you dig.

Project Engineer: BRIAN VEITCH
Project Number: 1032-0200
File Name: 10320200_tm.dwg

| AR/CB/MJR | CB | AR/CB | 02.15.17 |
|---|---|---|---|
| Dwn. | Chkd. | Dsgn. | MM.DD.YY |

Sheet No.
1 of 5 sheets

2017/06/22 1:41 PM By: Casey Borkman
W:\10320200\civil\design\drawing\model_files\tent_map\10320200_tm.dwg

ORIGINAL SHEET – ARCH D

## POTENTIAL VERTICAL CLEARANCE TABLE

(1) PROPOSED STORM DRAIN:
12" SD INV.=132.21
BOTTOM OF PIPE=132.21 - .03 = 132.18
INV. OF PIPE
WALL THICKNESS
0.33'
RE-ROUTED STORM DRAIN:
34"X53" SD INV.=128.60
BOTTOM OF PIPE=128.60 + 2.83 +.42= 131.85
INV. OF PIPE
PIPE HEIGHT
WALL THICKNESS

(2) PROPOSED STORM DRAIN:
12" SD INV.=132.20
BOTTOM OF PIPE=132.20 - .03 = 132.17
INV. OF PIPE
WALL THICKNESS
0.33'
RE-ROUTED STORM DRAIN:
34"X53" SD INV.=128.59
BOTTOM OF PIPE=128.59 + 2.83 +.42= 131.84
INV. OF PIPE
PIPE HEIGHT
WALL THICKNESS

(3) EXISTING STORM DRAIN:
42" SD INV.=127.94
BOTTOM OF PIPE=127.94 - .38 = 127.56
INV. OF PIPE
WALL THICKNESS
2.74'
PROPOSED SANITARY SEWER:
8" SS INV.=124.13
BOTTOM OF PIPE=124.13 + .67 +.02= 124.82
INV. OF PIPE
PIPE DIAMETER
WALL THICKNESS

(4) PROPOSED STORM DRAIN:
12" SD INV.=130.88
BOTTOM OF PIPE=130.88 - .03 = 130.85
INV. OF PIPE
WALL THICKNESS
0.33'
REPLACED STORM DRAIN:
34"X53" SD INV.=127.27
BOTTOM OF PIPE=127.27 + 2.83 +.42= 130.52
INV. OF PIPE
PIPE HEIGHT
WALL THICKNESS

(5) PROPOSED STORM DRAIN:
15" SD INV.=130.67
BOTTOM OF PIPE=130.67 - .04 = 130.63
INV. OF PIPE
WALL THICKNESS
7.02'
PROPOSED SANITARY SEWER:
8" SS INV.=122.92
BOTTOM OF PIPE=122.92 + .67 +.02= 123.61
INV. OF PIPE
PIPE DIAMETER
WALL THICKNESS

(6) PROPOSED STORM DRAIN:
12" SD INV.=130.94
BOTTOM OF PIPE=130.94 - .03 = 130.91
INV. OF PIPE
WALL THICKNESS
7.67'
PROPOSED SANITARY SEWER:
8" SS INV.=122.55
BOTTOM OF PIPE=122.55 + .67 +.02= 123.24
INV. OF PIPE
PIPE DIAMETER
WALL THICKNESS

(7) PROPOSED STORM DRAIN:
24" SD INV.=129.49
BOTTOM OF PIPE=129.49 - .06 = 129.43
INV. OF PIPE
WALL THICKNESS
4.60'
PROPOSED SANITARY SEWER:
8" SS INV.=124.14
BOTTOM OF PIPE=124.14 + .67 +.02= 124.83
INV. OF PIPE
PIPE DIAMETER
WALL THICKNESS

(8) PROPOSED STORM DRAIN:
12" SD INV.=132.23
BOTTOM OF PIPE=132.23 - .03 = 132.20
INV. OF PIPE
WALL THICKNESS
5.83'
PROPOSED SANITARY SEWER:
8" SS INV.=125.68
BOTTOM OF PIPE=125.68 + .67 +.02= 126.37
INV. OF PIPE
PIPE DIAMETER
WALL THICKNESS

(9) PROPOSED STORM DRAIN:
18" SD INV.=131.98
BOTTOM OF PIPE=131.98 - .05 = 131.93
INV. OF PIPE
WALL THICKNESS
3.61'
PROPOSED SANITARY SEWER:
8" SS INV.=127.63
BOTTOM OF PIPE=127.63 + .67 +.02= 128.32
INV. OF PIPE
PIPE DIAMETER
WALL THICKNESS

(10) PROPOSED STORM DRAIN:
24" SD INV.=131.33
BOTTOM OF PIPE=131.33 - .06 = 131.27
INV. OF PIPE
WALL THICKNESS
4.08'
PROPOSED SANITARY SEWER:
8" SS INV.=126.50
BOTTOM OF PIPE=126.50 + .67 +.02= 127.19
INV. OF PIPE
PIPE DIAMETER
WALL THICKNESS

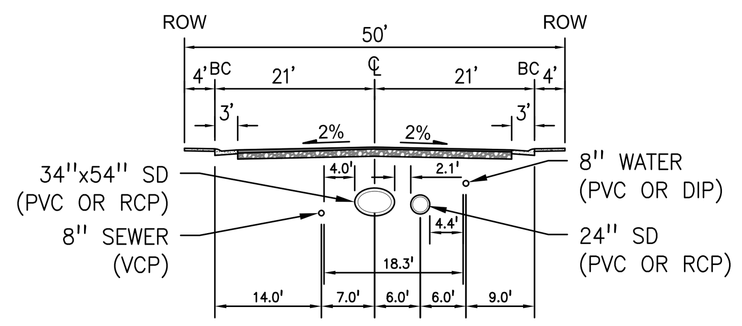
(11) PROPOSED STORM DRAIN:
12" SD INV.=132.83
BOTTOM OF PIPE=132.83 - .03 = 132.80
INV. OF PIPE
WALL THICKNESS
7.85'
PROPOSED SANITARY SEWER:
8" SS INV.=124.26
BOTTOM OF PIPE=124.26 + .67 +.02= 124.95
INV. OF PIPE
PIPE DIAMETER
WALL THICKNESS

(12) PROPOSED STORM DRAIN:
24" SD INV.=131.54
BOTTOM OF PIPE=131.54 - .06 = 131.48
INV. OF PIPE
WALL THICKNESS
2.61'
PROPOSED STORM DRAIN:
12" SD INV.=127.84
BOTTOM OF PIPE=127.84 + 1.0 +.03= 128.97
INV. OF PIPE
PIPE DIAMETER
WALL THICKNESS

## LEGEND

EXISTING STORM DRAIN LINE AND SIZE
EXISTING CATCH BASIN
EXISTING STORM DRAIN MANHOLE
EXISTING SANITARY SEWER LINE AND SIZE
EXISTING SANITARY SEWER MANHOLE
EXISTING WATER LINE AND SIZE
EXISTING WATER VALVE
EXISTING FIRE HYDRANT
WM EXISTING WATER METER
EV EXISTING ELECTRICAL VAULT
ET EXISTING ELECTRICAL TRANSFORMER
T EXISTING TELEPHONE PEDESTAL
TMH EXISTING TELEPHONE MANHOLE
G EXISTING GAS UTILITY BOX

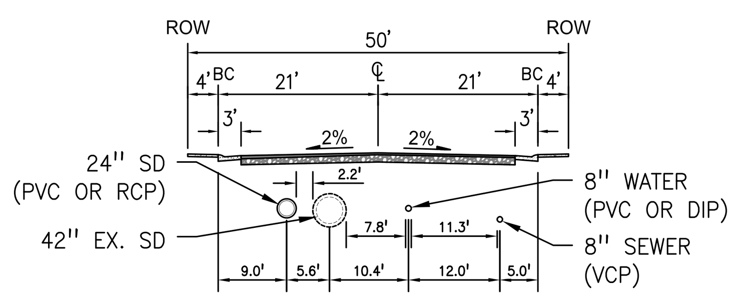
PROPOSED STORM DRAIN LINE AND SIZE
PROPOSED CATCH BASIN
PROPOSED STORM DRAIN MANHOLE
PROPOSED SANITARY SEWER LINE AND SIZE
PROPOSED SANITARY SEWER MANHOLE
PROPOSED 4" SANITARY SEWER LATERAL
PROPOSED WATER LINE AND SIZE
PROPOSED 1" WATER SERVICE
PROPOSED WATER VALVE
PROPOSED BLOW OFF VALVE
PROPOSED FIRE HYDRANT
PROPOSED ELECTROLIER




### BLAKELY DRIVE STREET CROSS SECTION A

SCALE: 1"=20'

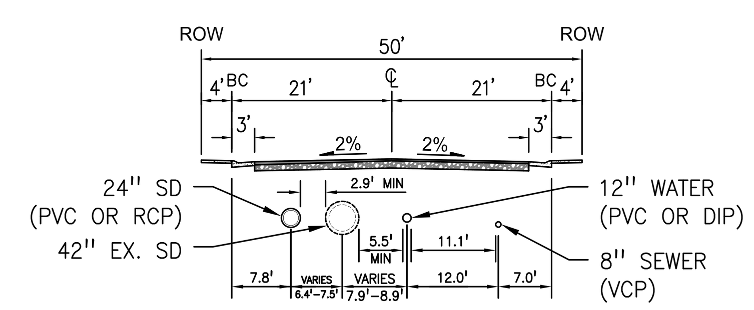
NOTE: HORIZONTAL SEPARATION BETWEEN WATER MAIN AND SANITARY SEWER MAIN MEETS CALIFORNIA DEPARTMENT OF PUBLIC HEALTH 10' CLEAR DISTANCE REQUIREMENTS




### FULLERTON RANCH ROAD STREET CROSS SECTION B

SCALE: 1"=20'

NOTE: HORIZONTAL SEPARATION BETWEEN WATER MAIN AND SANITARY SEWER MAIN MEETS CALIFORNIA DEPARTMENT OF PUBLIC HEALTH 10' CLEAR DISTANCE REQUIREMENTS



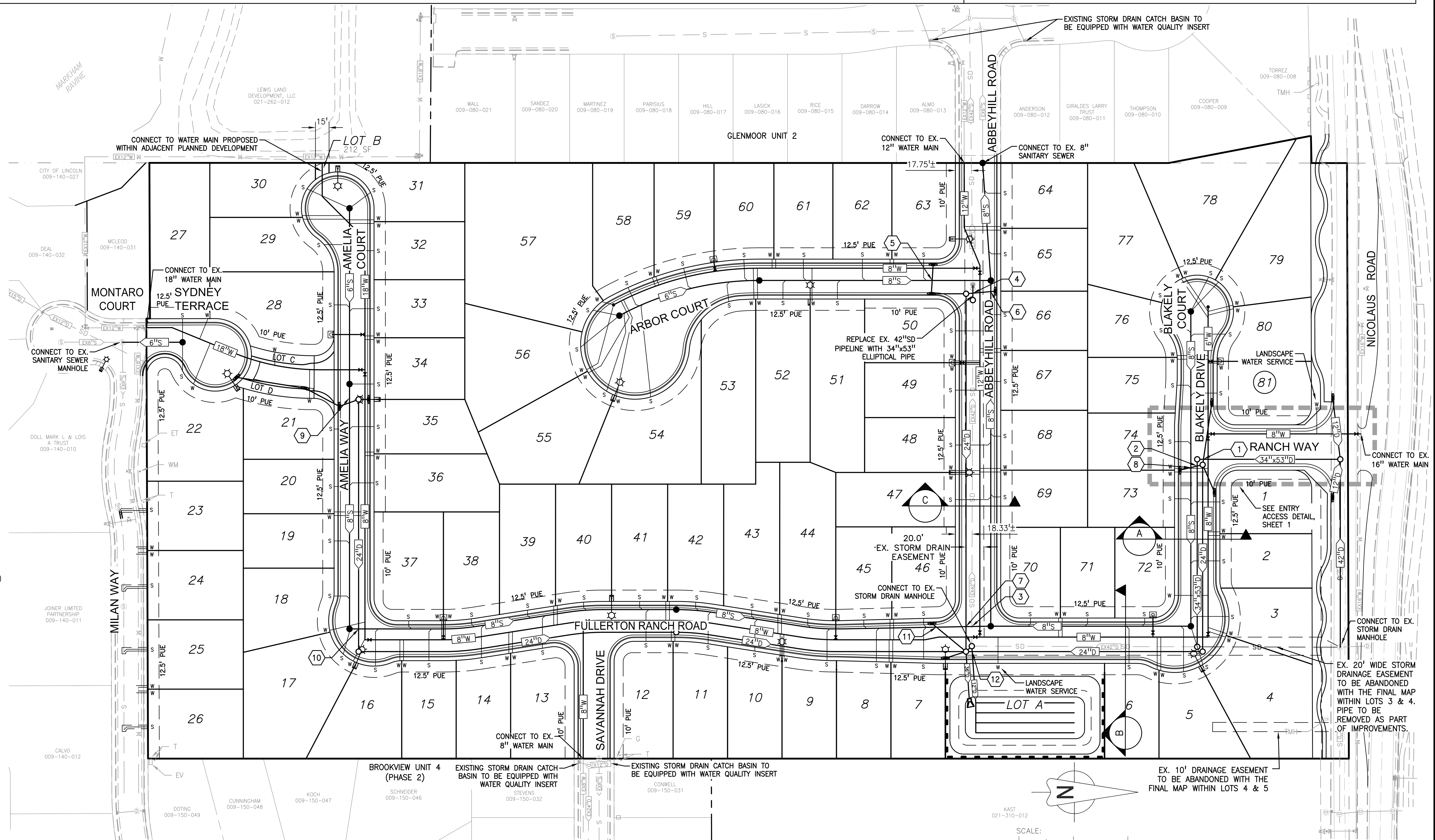

### ABBEYHILL ROAD STREET CROSS SECTION C

SCALE: 1"=20'

NOTE: HORIZONTAL SEPARATION BETWEEN WATER MAIN AND SANITARY SEWER MAIN MEETS CALIFORNIA DEPARTMENT OF PUBLIC HEALTH 10' CLEAR DISTANCE REQUIREMENTS

### NOTE

GRADING PLAN, UTILITY PIPE SIZING AND LOCATIONS ARE PRELIMINARY, AND SUBJECT TO FINAL DESIGN REVIEW AND APPROVAL BY THE CITY OF LINCOLN.





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Modesto, CA 95354
Tel: 209.568.4477
Fax: 209.568.4478




| No. | MM.YY | Description | By | Appd. |
|---|---|---|---|---|

Revision

Client/Project
TERRAVEST CAPITAL PARTNERS, LP
VESTING TENTATIVE SUBDIVISION MAP
FULLERTON RANCH
LINCOLN, CALIFORNIA

Title
PRELIMINARY UTILITY LAYOUT

Engineer's Seal

Engineer's Signature:
Signature Date:

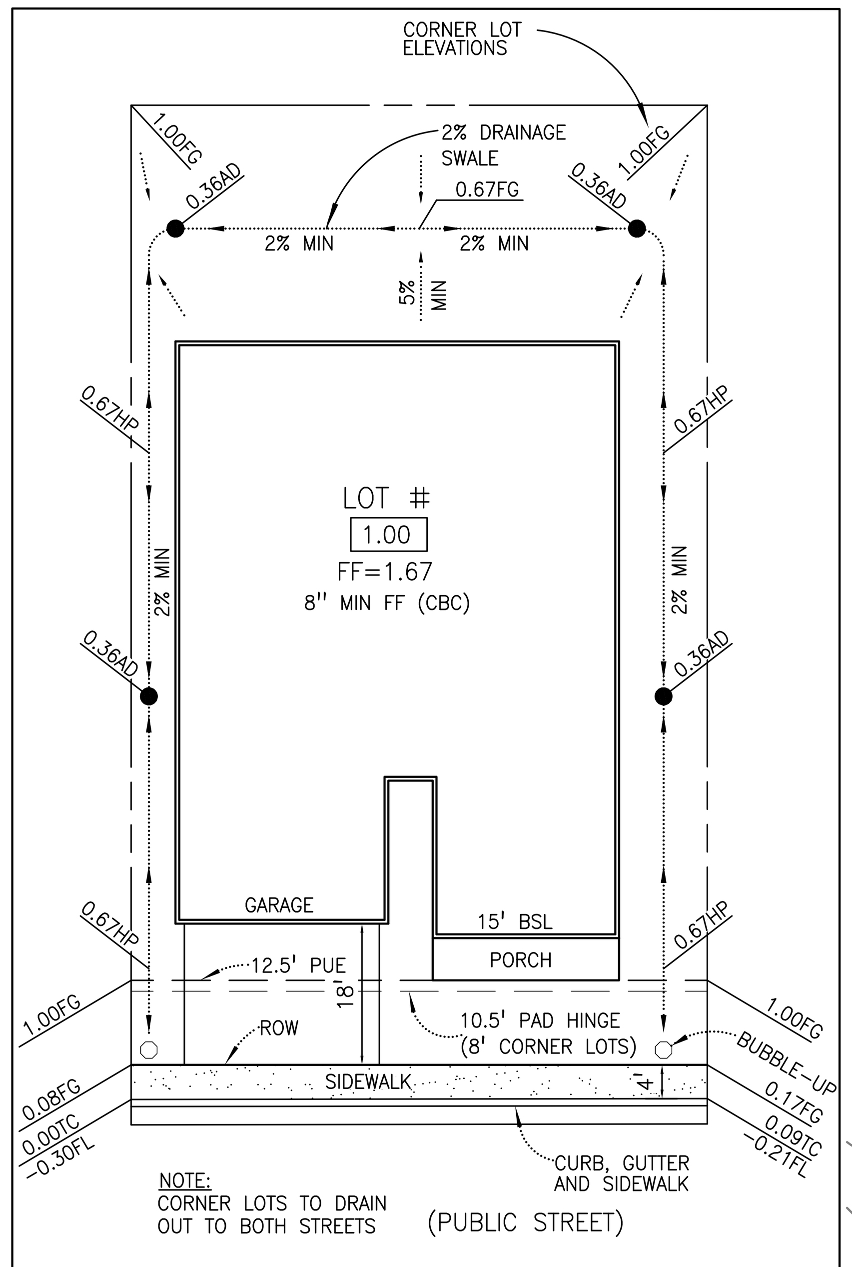
811 Know what's below. Call before you dig.

Project Engineer: BRIAN VEITCH
Project Number: 1032-0200
File Name: 10320200_tm.dwg

| AR/CB/MJR | CB | AR/CB | 02.15.17 |
|---|---|---|---|
| Dwn. | Chkd. | Dsgn. | MM.DD.YY |

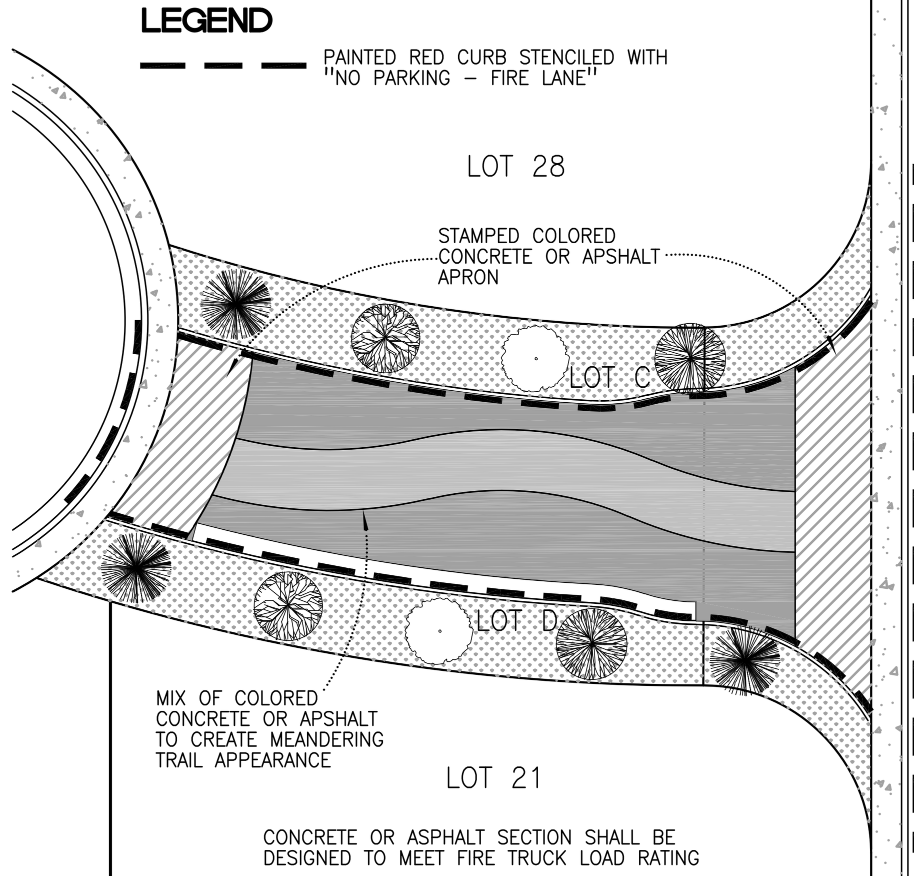
Sheet No.
2 of 5 sheets

2017/06/22 1:42 PM By: Casey Borkman
W:\10320200\civil\design\drawing\model_files\tent_map\10320200_tm.dwg
ORIGINAL SHEET – ARCH D



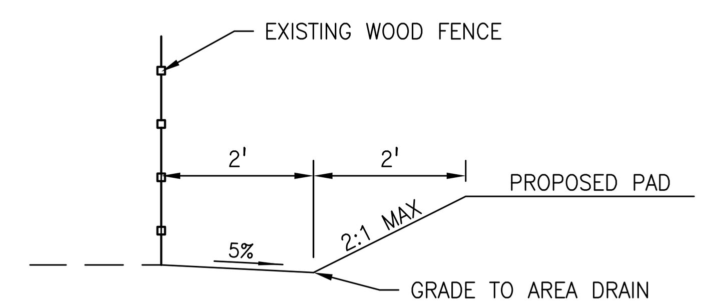

TYPICAL INTERIOR LOT GRADING

N.T.S.




MARKING AND FINISH DETAIL SEGMENT BETWEEN SYDNEY TERRACE AND AMELIA WAY

N.T.S.




**LOT 27 SLOPE TRANSITION DETAIL**

SCALE: NTS

## LEGEND

| | |
|---|---|
| 18" D | PROPOSED STORM DRAIN LINE AND SIZE |
| SD | EXISTING STORM DRAIN LINE AND SIZE |
| | PROPOSED CATCH BASIN |
| | EXISTING CATCH BASIN |
| | PROPOSED STORM DRAIN MANHOLE |
| | EXISTING STORM DRAIN MANHOLE |
| | PROPOSED WOOD RETAINING FENCE (PER DETAIL G-2) |
| | PROPOSED MASONRY WALL WITH RETAINING |
| | PROPOSED MASONRY WALL |
| | EXISTING MASONRY WALL |
| | PROPOSED AREA DRAIN |
| 0.67HP | PROPOSED HIGH POINT AND ELEVATION |

## LEGEND

| | |
|---|---|
| | PROPOSED MASONRY RETAINING WALL (PER DETAIL G-3) |
| | PROPOSED GRADING SLOPE TRANSITION (PER DETAIL G-2) |
| | PROPOSED CURB, GUTTER, AND SIDEWALK (PER DETAIL H-2) |
| | EXISTING CURB, GUTTER, AND SIDEWALK |
| | SPECIAL FLOOD HAZARD AREA – REGULATORY FLOODWAY |
| | SPECIAL FLOOD HAZARD AREA – ZONE AE |
| PAD 137.1 | PROPOSED PAD GRADE ELEVATION |
| PAD 137.1* | PROPOSED PAD GRADE ELEVATION, MAY REQUIRE SPECIAL GRADING TO MAINTAIN EXISTING OAK TREES |

## NOTE

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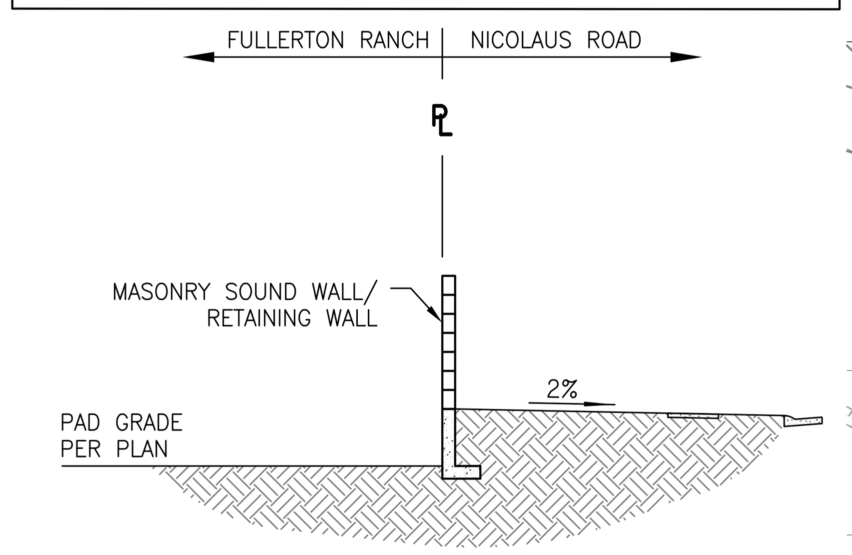
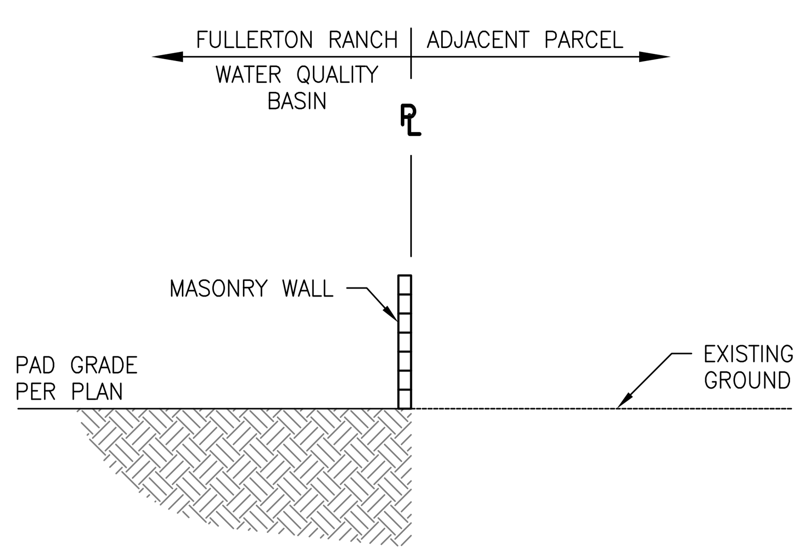


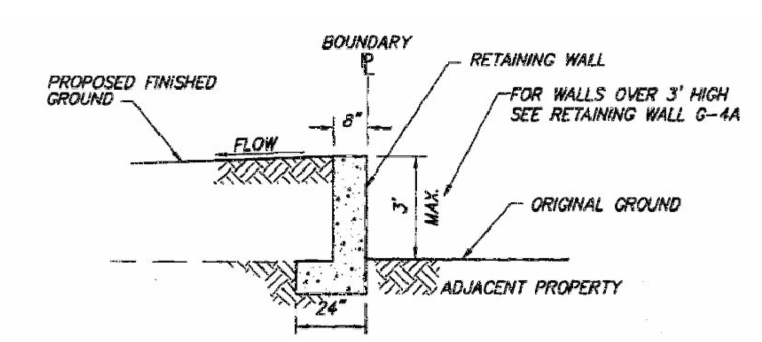

**MASONRY SOUND / RETAINING WALL DETAIL**

SCALE: NTS




**MASONRY WALL DETAIL**

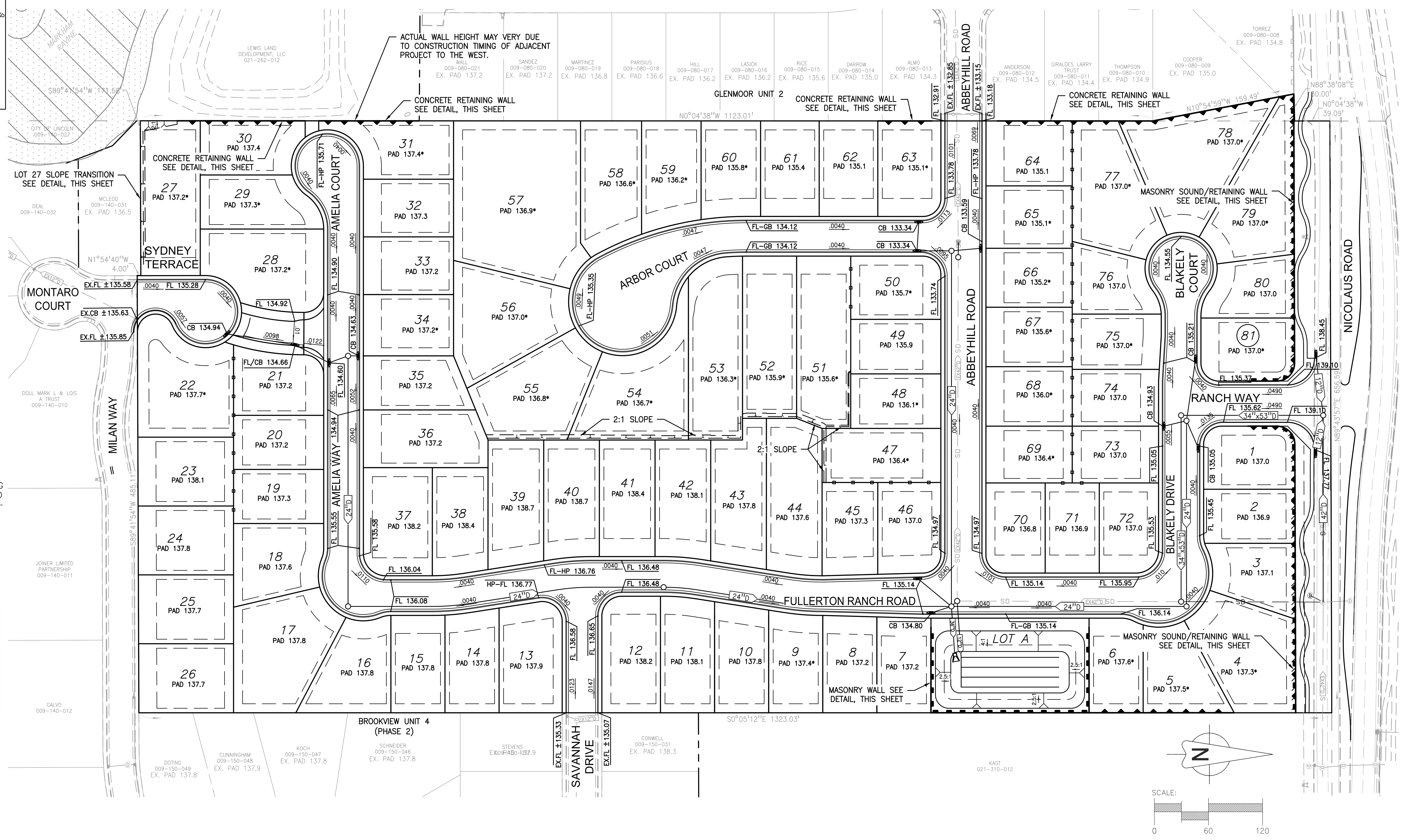
SCALE: NTS




CITY STANDARD DETAIL G-3
ALTERNATE "B"

**CONCRETE RETAINING WALL DETAIL**

SCALE: NTS

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| No. | MM.YY | Description | By | Appd. |
|---|---|---|---|---|

Revision

Client/Project

TERRAVEST CAPITAL PARTNERS, LP
VESTING TENTATIVE SUBDIVISION MAP
FULLERTON RANCH
LINCOLN, CALIFORNIA

Title

PRELIMINARY GRADING AND DRAINAGE

Engineer's Seal

Engineer's Signature:
Signature Date:

811 Know what's below. Call before you dig.

Project Engineer: BRIAN VEITCH
Project Number: 1032-0200
File Name: 10320200_tm.dwg
AR/CB/MJR CB AR/CB 02.15.17
Dwn. Chkd. Dsgn. MM.DD.YY

Sheet No.

3 of 5 sheets

## PRESERVED TREES

| TREE # | SPECIES | "TOTAL TRUNK DIAMETER (INCHES)" | "HEIGHT (FEET)" | "DRIPLINE (FEET)" |
|---|---|---|---|---|
| 802 | Quercus Douglasii | 30.7 | 45 | 50 |
| 803 | Quercus Douglasii | 15.7 | 35 | 30 |
| 804 | Quercus Douglasii | 24.1 | 50 | 50 |
| 805 | Quercus Douglasii | 32.7 | 50 | 50 |
| 807 | Quercus Douglasii | 21.7 | 40 | 30 |
| 808 | Quercus Douglasii | 32.5 | 50 | 60 |
| 811 | Quercus Douglasii | 21.7 | 45 | 45 |
| 814 | Quercus Douglasii | 33.3 | 55 | 60 |
| 816 | Quercus Douglasii | 30.3 | 50 | 50 |
| 818 | Quercus Douglasii | 29.7 | 45 | 45 |
| 819 | Quercus Douglasii | 26.1 | 45 | 50 |
| 825 | Quercus Douglasii | 32.7 | 50 | 50 |
| 827 | Quercus Douglasii | 17.8 | 45 | 35 |
| 828 | Quercus Douglasii | 19.8 | 40 | 40 |
| 829 | Quercus Douglasii | 24.8 | 50 | 40 |
| 830 | Quercus Douglasii | 22.5 | 55 | 45 |
| 834 | Quercus Douglasii | 23.1 | 45 | 40 |
| 836 | Quercus Douglasii | 21.5 | 40 | 30 |
| 837 | Quercus Douglasii | 35.2 | 55 | 55 |
| 838 | Quercus Douglasii | 24.1 | 50 | 50 |
| 839 | Quercus Douglasii | 38.6 | 50 | 70 |
| 844 | Quercus Douglasii | 25.6 | 45 | 50 |
| 845 | Quercus Douglasii | 26.2 | 50 | 40 |
| 846 | Quercus Douglasii | 22.4 | 50 | 40 |
| 847 | Quercus Douglasii | 21.7 | 50 | 45 |
| 848 | Quercus Douglasii | 27.9 | 40 | 35 |
| 849 | Quercus Douglasii | 39.1 | 60 | 70 |
| 850 | Quercus Douglasii | 22.8 | 40 | 45 |
| 853 | Quercus Douglasii | 41.2 | 70 | 60 |
| 854 | Quercus Douglasii | 30.9 | 60 | 60 |
| 855 | Quercus Douglasii | 47.5 | 50 | 70 |
| 864 | Quercus Douglasii | 25.8 | 50 | 50 |
| 865 | Quercus Douglasii | 35 | 45 | 55 |
| 866 | Quercus Douglasii | 26.8 | 40 | 45 |
| 870 | Quercus Douglasii | 30.2 | 45 | 60 |
| 871 | Quercus Douglasii | 26.9 | 45 | 50 |
| 872 | Quercus Douglasii | 25.6 | 45 | 45 |
| 873 | Quercus Douglasii | 21.2 | 40 | 40 |
| 874 | Quercus Douglasii | 25 | 40 | 55 |
| 875 | Quercus Douglasii | 39.7 | 55 | 70 |
| 882 | Quercus Douglasii | 44.1 | 50 | 55 |
| 883 | Quercus Lobata | 28.7 | 55 | 45 |
| 887 | Quercus Lobata | 43.1 | 55 | 60 |
| 888 | Quercus Lobata | 8.9 | 20 | 18 |
| 889 | Quercus Lobata | 28.5 | 25 | 30 |
| 890 | Quercus Lobata | 13.2 | 25 | 25 |
| 891 | Quercus Lobata | 13.5 | 25 | 22 |
| 892 | Quercus Douglasii | 9.1 | 15 | 10 |
| 893 | Quercus Lobata | 13.1 | 25 | 20 |
| 895 | Quercus Lobata | 23.3 | 35 | 25 |
| 896 | Quercus Lobata | 8.4 | 25 | 15 |
| 897 | Quercus Lobata | 11.2 | 30 | 25 |
| 898 | Quercus Lobata | 13.6 | 35 | 15 |
| 899 | Quercus Lobata | 24.7 | 35 | 20 |
| 901 | Quercus Lobata | 13.8 | 40 | 25 |
| 902 | Quercus Lobata | 14.9 | 30 | 30 |
| 903 | Quercus Lobata | 28.3 | 45 | 45 |
| 904 | Quercus Lobata | 36.2 | 45 | 40 |
| 909 | Quercus Lobata | 35.6 | 40 | 40 |
| 910 | Quercus Douglasii | 29.1 | 25 | 25 |
| 921 | Quercus Wislizeni | 29.7 | 25 | 22 |
| 922 | Quercus Lobata | 18.1 | 30 | 30 |
| 923 | Quercus Lobata | 13.9 | 25 | 25 |
| 924 | Quercus Lobata | 22 | 45 | 40 |
| 947 | Quercus Lobata | 32.8 | 45 | 40 |
| 952 | Quercus Douglasii | 12.8 | 20 | 18 |
| 964 | Quercus Lobata | 18.4 | 45 | 30 |
| 965 | Quercus Lobata | 18.3 | 45 | 25 |
| 970 | Quercus Lobata | 27.2 | 35 | 35 |
| 974 | Quercus Douglasii | 82.5 | 50 | 70 |
| 975 | Quercus Douglasii | 25.4 | 40 | 40 |
| 976 | Quercus Douglasii | 31.2 | 55 | 50 |
| 979 | Quercus Douglasii | 36.7 | 55 | 60 |
| 980 | Quercus Lobata | 18.6 | 30 | 40 |
| 981 | Quercus Lobata | 13.4 | 30 | 18 |
| 982 | Quercus Lobata | 9.2 | 25 | 10 |
| 983 | Quercus Lobata | 24.2 | 25 | 18 |
| 984 | Quercus Lobata | 14.2 | 25 | 18 |
| 985 | Quercus Lobata | 20.6 | 25 | 15 |
| 986 | Quercus Douglasii | 36.8 | 50 | 50 |
| 987 | Quercus Lobata | 16.6 | 25 | 20 |
| 989 | Quercus Douglasii | 9.9 | 20 | 15 |
| 1 | Quercus Douglasii | 8.8 | 25 | 20 |
| 2 | Quercus Lobata | 20.1 | 20 | 18 |
| 3 | Quercus Lobata | 11.3 | 18 | 16 |
| 4 | Quercus Lobata | 11.5 | 16 | 14 |
| 10 | Quercus Lobata | 12.3 | 22 | 18 |
| 11 | Quercus Lobata | 12.9 | 20 | 15 |
| 12 | Quercus Lobata | 7.9 | 18 | 15 |
| 14 | Quercus Douglasii | 17.2 | 30 | 20 |
| 15 | Quercus Wislizeni | 12.9 | 12 | 22 |
| 21 | Quercus Wislizeni | 11.9 | 15 | 16 |
| 22 | Quercus Douglasii | 10 | 12 | 12 |
| 26 | Quercus Wislizeni | 10 | 16 | 16 |

## REMOVALS

| TREE # | SPECIES | "TOTAL TRUNK DIAMETER (INCHES)" | "HEIGHT (FEET)" | "DRIPLINE (FEET)" |
|---|---|---|---|---|
| 801 | Quercus Douglasii | 21.5 | 45 | 30 |
| 806 | Quercus Douglasii | 26.3 | 45 | 45 |
| 809 | Quercus Douglasii | 22.5 | 35 | 40 |
| 810 | Quercus Douglasii | 31.2 | 40 | 50 |
| 813 | Quercus Douglasii | 39.5 | 50 | 55 |
| 815 | Quercus Douglasii | 26 | 45 | 45 |
| 817 | Quercus Douglasii | 25.9 | 40 | 40 |
| 821 | Quercus Douglasii | n/a | n/a | n/a |
| 822 | Quercus Douglasii | 28 | 30 | 30 |
| 823 | Quercus Douglasii | 30.1 | 20 | 20 |
| 824 | Quercus Douglasii | 32.3 | 55 | 50 |
| 831 | Quercus Douglasii | 17.6 | 45 | 30 |
| 832 | Quercus Douglasii | 25.4 | 40 | 50 |
| 833 | Quercus Douglasii | 21.5 | 40 | 40 |
| 835 | Quercus Douglasii | 29.2 | 25 | 35 |
| 840 | Quercus Douglasii | 27.8 | 45 | 50 |
| 841 | Quercus Douglasii | 23.6 | 40 | 40 |
| 842 | Quercus Douglasii | 27.6 | 55 | 50 |
| 843 | Quercus Douglasii | 23.4 | 45 | 40 |
| 851 | Quercus Douglasii | 27.8 | 60 | 50 |
| 852 | Quercus Douglasii | 28.7 | 60 | 60 |
| 856 | Quercus Douglasii | 28.6 | 40 | 40 |
| 857 | Quercus Douglasii | 26.3 | 40 | 45 |
| 858 | Quercus Douglasii | 31.2 | 18 | 30 |
| 859 | Quercus Douglasii | 25.2 | 40 | 40 |
| 860 | Quercus Douglasii | 18.2 | 40 | 40 |
| 861 | Quercus Douglasii | 22.2 | 40 | 40 |
| 862 | Quercus Douglasii | 25.1 | 10 | 20 |
| 867 | Quercus Douglasii | 18.3 | 25 | 25 |
| 868 | Quercus Douglasii | 24.2 | 40 | 45 |
| 869 | Quercus Douglasii | 24.1 | 40 | 40 |
| 876 | Quercus Douglasii | 21 | 20 | 25 |
| 877 | Quercus Douglasii | 8.8 | 20 | 22 |
| 878 | Quercus Douglasii | 24.9 | 35 | 40 |
| 881 | Quercus Douglasii | 31.1 | 40 | 60 |
| 884 | Quercus Lobata | 26.6 | 40 | 40 |
| 885 | Quercus Lobata | 25.5 | 35 | 35 |
| 886 | Quercus Lobata | 31.2 | 35 | 35 |
| 900 | Quercus Lobata | 14 | n/a | n/a |
| 905 | Quercus Lobata | 18 | 45 | 30 |
| 906 | Quercus Lobata | 11.5 | 30 | 20 |
| 907 | Quercus Lobata | 31.8 | 40 | 45 |
| 908 | Quercus Lobata | 14.1 | 40 | 35 |
| 911 | Quercus Douglasii | 13.3 | 18 | 18 |
| 912 | Quercus Douglasii | 12.9 | 18 | 20 |
| 913 | Quercus Douglasii | 24.8 | 22 | 25 |
| 914 | Quercus Lobata | 18.2 | 30 | 25 |
| 915 | Quercus Lobata | 12.3 | 25 | 18 |
| 916 | Quercus Douglasii | 15.4 | 30 | 25 |
| 917 | Quercus Lobata | 22.4 | 30 | 45 |
| 918 | Quercus Douglasii | 11.3 | 30 | 18 |
| 919 | Quercus Lobata | 17 | 30 | 35 |
| 920 | Quercus Lobata | 35.3 | 35 | 45 |
| 925 | Quercus Douglasii | 17.9 | 25 | 18 |
| 926 | Quercus Douglasii | 19.1 | 30 | 25 |
| 927 | Quercus Douglasii | 19.3 | 35 | 40 |
| 928 | Quercus Lobata | 16.2 | 40 | 25 |
| 929 | Quercus Lobata | 15.8 | 40 | 30 |
| 930 | Quercus Lobata | 20.1 | 45 | 35 |
| 931 | Quercus Lobata | 10.3 | 45 | 18 |
| 932 | Pyrus Spp. | 0 | n/a | n/a |
| 933 | Quercus Lobata | 12.1 | 45 | 22 |
| 934 | Quercus Lobata | 10.7 | 45 | 22 |
| 935 | Quercus Lobata | 9.5 | 45 | 20 |
| 936 | Quercus Lobata | 12.6 | 45 | 22 |
| 937 | Quercus Lobata | 20.1 | 30 | 22 |
| 938 | Quercus Lobata | 10.6 | 40 | 20 |
| 939 | Quercus Lobata | 10.6 | 40 | 18 |
| 940 | Quercus Lobata | 15.7 | 45 | 25 |
| 941 | Quercus Wislizeni | 8.4 | 20 | 18 |
| 942 | Pyrus Spp. | n/a | n/a | n/a |
| 943 | Quercus Lobata | 10.5 | 45 | 18 |
| 944 | Juglans Californica Hindsii | 45.6 | 25 | 35 |
| 945 | Quercus Lobata | 16.2 | 45 | 25 |
| 946 | Quercus Lobata | 10.5 | 25 | 18 |
| 948 | Quercus Lobata | 12.8 | 40 | 35 |
| 949 | Quercus Lobata | 34.5 | 18 | 30 |
| 950 | Quercus Lobata | 14.9 | 25 | 40 |
| 953 | Quercus Douglasii | 14.1 | 30 | 20 |
| 954 | Quercus Lobata | 19.6 | 40 | 30 |
| 955 | Quercus Lobata | 22.1 | 45 | 30 |
| 956 | Quercus Lobata | 41.9 | 45 | 50 |
| 957 | Quercus Lobata | 43.8 | 50 | 40 |
| 958 | Quercus Lobata | 25.7 | 40 | 35 |
| 959 | Quercus Lobata | 17.9 | 45 | 45 |
| 960 | Quercus Lobata | 22.6 | 50 | 45 |
| 961 | Quercus Lobata | 18.4 | 45 | 30 |
| 962 | Quercus Lobata | 16.3 | 45 | 25 |
| 963 | Quercus Lobata | 16.1 | 45 | 30 |
| 966 | Quercus Lobata | 15.4 | 45 | 25 |
| 967 | Quercus Lobata | 13.1 | 45 | 20 |
| 968 | Quercus Lobata | 17.6 | 40 | 18 |
| 969 | Quercus Lobata | 16.2 | 45 | 25 |
| 971 | Quercus Lobata | n/a | n/a | n/a |
| 977 | Quercus Douglasii | 38 | 60 | 50 |
| 978 | Quercus Douglasii | 23.1 | 50 | 45 |
| 5 | Quercus Lobata | 17.7 | 20 | 18 |
| 6 | Juglans Californica Hindsii | 40.8 | 20 | 22 |
| 7 | Juglans Californica Hindsii | 13 | 18 | 16 |
| 8 | Juglans Californica Hindsii | 7.2 | 18 | 16 |
| 9 | Juglans Californica Hindsii | 7.1 | 18 | 16 |
| 13 | Quercus Douglasii | 19.9 | 15 | 20 |
| 16 | Quercus Wislizeni | 17.9 | 15 | 20 |
| 17 | Quercus Douglasii | 7.9 | 15 | 15 |
| 18 | Quercus Douglasii | 8.4 | 18 | 12 |
| 23 | Quercus Lobata | 6.3 | 18 | 12 |
| 24 | Quercus Lobata | 6.1 | 18 | 8 |
| 25 | Quercus Lobata | 6 | 18 | 10 |

## LEGEND

860 EXISTING TREE AND NUMBER, TO REMAIN

860 EXISTING TREE AND NUMBER, TO BE REMOVED

## NOTE

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WH CONSULTING ENGINEERS
430 10th Street
Modesto, CA 95354
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Revision

Client/Project
TERRAVEST CAPITAL PARTNERS, LP
VESTING TENTATIVE SUBDIVISION MAP
FULLERTON RANCH
LINCOLN, CALIFORNIA

Title
PRELIMINARY TREE REMOVAL PLAN

Engineer's Seal

Engineer's Signature:
Signature Date:

811 Know what's below. Call before you dig.

Project Engineer: BRIAN VEITCH
Project Number: 1032-0200
File Name: 10320200_tm.dwg
AR/CB/MJR CB AR/CB 02.15.17
Dwn. Chkd. Dsgn. MM.DD.YY

Sheet No.
4 of 5 sheets

2017/06/22 1:43 PM By: Casey Barkman
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ORIGINAL SHEET – ARCH D


**NOTE**

GRADING PLAN, UTILITY PIPE SIZING AND LOCATIONS ARE PRELIMINARY, AND SUBJECT TO FINAL DESIGN REVIEW AND APPROVAL BY THE CITY OF LINCOLN.

Engineer's Signature:
Signature Date:

Know what's below. Call before you dig.

Project Engineer: BRIAN VEITCH
Project Number: 1032-0200
File Name: 10320200_tm.dwg
AR/CB/MJR CB AR/CB 02.15.17
Dwn. Chkd. Dsgn. MM.DD.YY

Sheet No. 5 of 5 sheets

Engineer's Seal

Client/Project
TERRAVEST CAPITAL PARTNERS, LP
VESTING TENTATIVE SUBDIVISION MAP
FULLERTON RANCH
LINCOLN, CALIFORNIA

Title
EXISTING EASEMENTS

| No. | MM.YY | Description | By | Appd. |
|---|---|---|---|---|

Revision

VVH CONSULTING ENGINEERS
430 10th Street
Modesto, CA 95354
Tel.: 209.568.4477
Fax: 209.568.4478

# Appendix B

**Air Quality and Greenhouse Gas Modeling**

# Fullerton Ranch Project
# CalEEMod (v.2016) Assumptions

- Air District: Placer County APCD
- Climate Zone: 2
- Land Use Setting: Urban
- Start of Construction: Thursday, May 1, 2018
- Operational Year: 2020
- Utility Company: PG&E
- CO2 intensity factor: 290
    - Updated PG&E emission factor for 2020 reflecting RPS reductions per PGE Gas Emission Factors: Guidance for PG&E Customers, November 2015: https://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf
- Land Uses:

| Land Use Type and Subtype | Unit Amount and Metric | Lot Acreage | Square Footage | Population |
|---|---|---|---|---|
| Residential – Single Family Housing | 81 DU | 19.7 | -- | 209 |

- Construction Tab – Phasing:
    - Demolition: 0 days
    - Site Prep: 4 days
        - 5/1/18 – 5/4/18
        - Assumed 5 acres prepped per day
    - Grading: 60 days
        - 5/4/18 – 7/26/18
        - Assumed 1/3 acre graded per day
        - Assumed non-phased grading, all underground utility construction, worst case scenario
    - Building Construction: 413 days
        - 8/8/18 – 3/6/20
        - Assumed construction of 1 unit per week
        - Assumed construction 5 days per week
    - Paving: 10 days
        - 7/26/18 – 8/8/18
        - Assumed 2 acres paved per day
    - Architectural Coating: 413 days
        - 10/12/18 – 5/12/2020
        - Assumed construction of 1 unit per week
        - Assumed construction 5 days per week
- Construction Tab – Off-Road Equipment:
    - Demolition: N/A
    - Site Prep: 1 dozers, 2 tractors
        - Engineer's estimate
    - Grading: 2 excavators, 1 graders, 1 dozers, 1 scrapers, 1 backhoes
        - Engineer's estimate
    - Building Construction: 1 crane (3 hours per day), 1 forklifts, 1 generator sets, 1 backhoes (4 hours per day), 0 welders
        - 1 machine per subdivision, no welding

- Paving: 1 pavers, 1 paving equipment, 1 rollers
    - 1 machine per subdivision
- Architectural Coating: 1 compressors (6 hours per day)
    - 1 compressor per subdivision

- Construction Tab – Dust From Material Movement:
  - Grading Total Acres Disturbed: 19.7
  - Site Prep Total Acres Disturbed: 19.7
- Construction Tab – Demolition: N/A
- Operational Tab – Mobile:
  - Single Family Housing: 9.52 daily trips, per Fehr & Peers Traffic Study
  - Single Family Housing: trip lengths revised, per Fehr & Peers
    - Annual Project VMT (per Fehr & Peers): 1,292,100
    - Unmitigated Project VMT (per CalEEMod): 2,219,063
      - % change in VMT = 58.2%
    - Calculated Res H-W Trip Length: 6.28855
    - Calculated Res H-S Trip Length: 4.25059
    - Calculated Res H-O Trip Length: 4.36705
- Vegetation Tab
  - Land Use change: 19.7 grassland acres to 0 acres
- Mitigation Tab:
  - Construction:
    - Water exposed areas 3 times per day,
    - Unpaved road mitigation 5 MPH.
  - Traffic:
    - Project Setting: Low Density Suburban,
    - Improve Destination Accessibility (1.45 miles to downtown),
    - Improve Walkability Design (5 intersections per 19.7 acres = 160 intersections per square mile),
    - Increase Transit Accessibility (0.6 miles to bus stop at 3rd and Sandra),
    - Increase Density (4.1 dwelling units per acre),
    - Provide Traffic Calming Measures,
    - Improve Pedestrian Network (on- and off-site).
  - Area:
    - Only Natural Gas Hearths,
    - Low VOC paint (residential interior and exterior and non-res interior and exterior).
  - Energy:
    - Exceed Title 24 (by 15%),
    - Install efficient lighting (16%),
    - All appliance types should be single family housing.
  - Water:
    - Install all low-flow,
    - Water efficient irrigation (6.1% reduction).

# Fullerton Ranch Project

## Placer County APCD Air District, Annual

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Single Family Housing | 81.00 | Dwelling Unit | 19.70 | 145,800.00 | 209 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 74 |
| **Climate Zone** | 2 | | | **Operational Year** | 2020 |
| **Utility Company** | Pacific Gas & Electric Company | | | | |
| **$CO_2$ Intensity (lb/MWhr)** | 290 | **$CH_4$ Intensity (lb/MWhr)** | 0.029 | **$N_2O$ Intensity (lb/MWhr)** | 0.006 |

### 1.3 User Entered Comments & Non-Default Data

Fullerton Ranch Project - Placer County APCD Air District, Annual

Project Characteristics - See assumptions in Appendix B

Land Use - See assumptions in Appendix B

Construction Phase - See assumptions in Appendix B

Off-road Equipment -

Off-road Equipment - See assumptions in Appendix B

Off-road Equipment - See assumptions in Appendix B

Off-road Equipment - See assumptions in Appendix B

Off-road Equipment - See assumptions in Appendix B

Off-road Equipment - See assumptions in Appendix B

Grading - See assumptions in Appendix B

Vehicle Trips - See assumptions in Appendix B

Woodstoves - See assumptions in Appendix B

Energy Use - See assumptions in Appendix B

Land Use Change -

Sequestration -

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Mobile Commute Mitigation - See assumptions in Appendix B

Area Mitigation -

Energy Mitigation -

Water Mitigation -

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblAreaMitigation | UseLowVOCPaintParkingCheck | False | True |
| tblConstDustMitigation | WaterUnpavedRoadVehicleSpeed | 40 | 5 |
| tblConstructionPhase | NumDays | 20.00 | 413.00 |

| | | | |
|---|---|---|---|
| tblConstructionPhase | NumDays | 300.00 | 413.00 |
| tblConstructionPhase | NumDays | 30.00 | 60.00 |
| tblConstructionPhase | NumDays | 20.00 | 10.00 |
| tblConstructionPhase | NumDays | 10.00 | 4.00 |
| tblConstructionPhase | PhaseEndDate | 7/13/2020 | 5/12/2020 |
| tblConstructionPhase | PhaseEndDate | 4/6/2020 | 3/6/2020 |
| tblConstructionPhase | PhaseEndDate | 7/30/2018 | 7/26/2018 |
| tblConstructionPhase | PhaseEndDate | 5/25/2020 | 8/8/2018 |
| tblConstructionPhase | PhaseEndDate | 5/28/2018 | 5/4/2018 |
| tblConstructionPhase | PhaseStartDate | 5/26/2020 | 10/12/2018 |
| tblConstructionPhase | PhaseStartDate | 7/31/2018 | 8/8/2018 |
| tblConstructionPhase | PhaseStartDate | 5/29/2018 | 5/4/2018 |
| tblConstructionPhase | PhaseStartDate | 4/7/2020 | 7/26/2018 |
| tblGrading | AcresOfGrading | 90.00 | 19.70 |
| tblGrading | AcresOfGrading | 0.00 | 19.70 |
| tblLandUse | LotAcreage | 26.30 | 19.70 |
| tblLandUse | Population | 232.00 | 209.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 3.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 3.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 3.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 4.00 | 2.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 1.00 | 0.00 |

| | | | |
|---|---|---|---|
| tblOffRoadEquipment | UsageHours | 7.00 | 3.00 |
| tblProjectCharacteristics | CO2IntensityFactor | 641.35 | 290 |
| tblProjectCharacteristics | OperationalYear | 2018 | 2020 |
| tblTripsAndVMT | WorkerTripNumber | 8.00 | 18.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 20.00 |
| tblTripsAndVMT | WorkerTripNumber | 8.00 | 15.00 |
| tblTripsAndVMT | WorkerTripNumber | 8.00 | 15.00 |
| tblVehicleTrips | HO_TL | 7.50 | 4.37 |
| tblVehicleTrips | HS_TL | 7.30 | 4.25 |
| tblVehicleTrips | HW_TL | 10.80 | 6.29 |

## 2.0 Emissions Summary

## 2.1 Overall Construction

**Unmitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | tons/yr | | | | | | | | | | MT/yr | | | | | |
| 2018 | 0.3237 | 2.0377 | 1.3342 | 2.5000e-003 | 0.2370 | 0.1003 | 0.3373 | 0.1145 | 0.0937 | 0.2082 | 0.0000 | 225.8618 | 225.8618 | 0.0533 | 0.0000 | 227.1953 |
| 2019 | 0.7639 | 1.6436 | 1.4209 | 2.7800e-003 | 0.0435 | 0.0922 | 0.1357 | 0.0118 | 0.0885 | 0.1003 | 0.0000 | 246.8680 | 246.8680 | 0.0339 | 0.0000 | 247.7144 |
| 2020 | 0.2471 | 0.3154 | 0.3017 | 5.9000e-004 | 9.1100e-003 | 0.0173 | 0.0264 | 2.4600e-003 | 0.0167 | 0.0191 | 0.0000 | 51.8196 | 51.8196 | 6.5300e-003 | 0.0000 | 51.9829 |
| **Maximum** | **0.7639** | **2.0377** | **1.4209** | **2.7800e-003** | **0.2370** | **0.1003** | **0.3373** | **0.1145** | **0.0937** | **0.2082** | **0.0000** | **246.8680** | **246.8680** | **0.0533** | **0.0000** | **247.7144** |

**Mitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | tons/yr | | | | | | | | | | MT/yr | | | | | |
| 2018 | 0.3237 | 2.0377 | 1.3342 | 2.5000e-003 | 0.1067 | 0.1003 | 0.2070 | 0.0485 | 0.0937 | 0.1422 | 0.0000 | 225.8616 | 225.8616 | 0.0533 | 0.0000 | 227.1950 |
| 2019 | 0.7639 | 1.6436 | 1.4209 | 2.7800e-003 | 0.0435 | 0.0922 | 0.1357 | 0.0118 | 0.0885 | 0.1003 | 0.0000 | 246.8678 | 246.8678 | 0.0339 | 0.0000 | 247.7142 |
| 2020 | 0.2471 | 0.3154 | 0.3017 | 5.9000e-004 | 9.1100e-003 | 0.0173 | 0.0264 | 2.4600e-003 | 0.0167 | 0.0191 | 0.0000 | 51.8196 | 51.8196 | 6.5300e-003 | 0.0000 | 51.9828 |
| **Maximum** | **0.7639** | **2.0377** | **1.4209** | **2.7800e-003** | **0.1067** | **0.1003** | **0.2070** | **0.0485** | **0.0937** | **0.1422** | **0.0000** | **246.8678** | **246.8678** | **0.0533** | **0.0000** | **247.7142** |

Fullerton Ranch Project - Placer County APCD Air District, Annual

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | 0.00 | 0.00 | 0.00 | 0.00 | 44.98 | 0.00 | 26.09 | 51.27 | 0.00 | 20.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Quarter | Start Date | End Date | Maximum Unmitigated ROG + NOX (tons/quarter) | Maximum Mitigated ROG + NOX (tons/quarter) |
|---|---|---|---|---|
| 1 | 5-1-2018 | 7-31-2018 | 1.4449 | 1.4449 |
| 2 | 8-1-2018 | 10-31-2018 | 0.4758 | 0.4758 |
| 3 | 11-1-2018 | 1-31-2019 | 0.6391 | 0.6391 |
| 4 | 2-1-2019 | 4-30-2019 | 0.5866 | 0.5866 |
| 5 | 5-1-2019 | 7-31-2019 | 0.6056 | 0.6056 |
| 6 | 8-1-2019 | 10-31-2019 | 0.6060 | 0.6060 |
| 7 | 11-1-2019 | 1-31-2020 | 0.5928 | 0.5928 |
| 8 | 2-1-2020 | 4-30-2020 | 0.3404 | 0.3404 |
| 9 | 5-1-2020 | 7-31-2020 | 0.0273 | 0.0273 |
| | | Highest | 1.4449 | 1.4449 |

## 2.2 Overall Operational

**Unmitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 5.7615 | 0.1062 | 6.8772 | 0.0114 | | 0.8830 | 0.8830 | | 0.8830 | 0.8830 | 83.6696 | 36.0722 | 119.7418 | 0.0782 | 6.5800e-003 | 123.6573 |
| Energy | 0.0140 | 0.1194 | 0.0508 | 7.6000e-004 | | 9.6500e-003 | 9.6500e-003 | | 9.6500e-003 | 9.6500e-003 | 0.0000 | 234.7804 | 234.7804 | 0.0123 | 4.5300e-003 | 236.4384 |
| Mobile | 0.2244 | 1.4735 | 2.1805 | 7.0500e-003 | 0.4746 | 7.7700e-003 | 0.4823 | 0.1277 | 7.3300e-003 | 0.1350 | 0.0000 | 648.6329 | 648.6329 | 0.0327 | 0.0000 | 649.4506 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 15.2730 | 0.0000 | 15.2730 | 0.9026 | 0.0000 | 37.8383 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 1.6743 | 5.2882 | 6.9625 | 0.1725 | 4.1700e-003 | 12.5175 |
| **Total** | **5.9998** | **1.6991** | **9.1084** | **0.0192** | **0.4746** | **0.9004** | **1.3749** | **0.1277** | **0.8999** | **1.0276** | **100.6169** | **924.7737** | **1,025.3906** | **1.1983** | **0.0153** | **1,059.9021** |

## 2.2 Overall Operational

**Mitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 0.6848 | 0.0566 | 0.6245 | 3.5000e-004 | | 7.3300e-003 | 7.3300e-003 | | 7.3300e-003 | 7.3300e-003 | 0.0000 | 58.4021 | 58.4021 | 2.0600e-003 | 1.0500e-003 | 58.7673 |
| Energy | 0.0121 | 0.1030 | 0.0438 | 6.6000e-004 | | 8.3300e-003 | 8.3300e-003 | | 8.3300e-003 | 8.3300e-003 | 0.0000 | 210.0198 | 210.0198 | 0.0114 | 4.0600e-003 | 211.5149 |
| Mobile | 0.2199 | 1.4326 | 2.0846 | 6.6400e-003 | 0.4418 | 7.3200e-003 | 0.4492 | 0.1189 | 6.9100e-003 | 0.1258 | 0.0000 | 611.0924 | 611.0924 | 0.0318 | 0.0000 | 611.8862 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 15.2730 | 0.0000 | 15.2730 | 0.9026 | 0.0000 | 37.8383 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 1.3394 | 4.4434 | 5.7829 | 0.1380 | 3.3400e-003 | 10.2287 |
| **Total** | **0.9168** | **1.5921** | **2.7529** | **7.6500e-003** | **0.4418** | **0.0230** | **0.4648** | **0.1189** | **0.0226** | **0.1414** | **16.6125** | **883.9577** | **900.5702** | **1.0858** | **8.4500e-003** | **930.2354** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **84.72** | **6.29** | **69.78** | **60.18** | **6.90** | **97.45** | **66.19** | **6.90** | **97.49** | **86.24** | **83.49** | **4.41** | **12.17** | **9.39** | **44.70** | **12.23** |

## 2.3 Vegetation

**Vegetation**

| | CO2e |
|---|---|
| Category | MT |
| New Trees | 0.0000 |
| Vegetation Land Change | -84.9070 |
| **Total** | **-84.9070** |

# 3.0 Construction Detail

**Construction Phase**

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Site Preparation | Site Preparation | 5/1/2018 | 5/4/2018 | 5 | 4 | |
| 2 | Grading | Grading | 5/4/2018 | 7/26/2018 | 5 | 60 | |
| 3 | Paving | Paving | 7/26/2018 | 8/8/2018 | 5 | 10 | |
| 4 | Building Construction | Building Construction | 8/8/2018 | 3/6/2020 | 5 | 413 | |
| 5 | Architectural Coating | Architectural Coating | 10/12/2018 | 5/12/2020 | 5 | 413 | |

**Acres of Grading (Site Preparation Phase): 19.7**

**Acres of Grading (Grading Phase): 19.7**

**Acres of Paving: 0**

**Residential Indoor: 295,245; Residential Outdoor: 98,415; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)**

## OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 1 | 8.00 | 367 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Paving | Pavers | 1 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 1 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 1 | 8.00 | 80 | 0.38 |
| Building Construction | Cranes | 1 | 3.00 | 231 | 0.29 |
| Building Construction | Forklifts | 1 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 1 | 7.00 | 97 | 0.37 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |
| Building Construction | Welders | 0 | 8.00 | 46 | 0.45 |

## Trips and VMT

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Site Preparation | 3 | 18.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 6 | 20.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 3 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 3 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 4 | 29.00 | 9.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 6.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

## 3.2 Site Preparation - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0225 | 0.0000 | 0.0225 | 7.7500e-003 | 0.0000 | 7.7500e-003 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 3.4000e-003 | 0.0356 | 0.0181 | 3.0000e-005 | | 1.9700e-003 | 1.9700e-003 | | 1.8100e-003 | 1.8100e-003 | 0.0000 | 2.6957 | 2.6957 | 8.4000e-004 | 0.0000 | 2.7166 |
| **Total** | **3.4000e-003** | **0.0356** | **0.0181** | **3.0000e-005** | **0.0225** | **1.9700e-003** | **0.0245** | **7.7500e-003** | **1.8100e-003** | **9.5600e-003** | **0.0000** | **2.6957** | **2.6957** | **8.4000e-004** | **0.0000** | **2.7166** |

## 3.2 Site Preparation - 2018

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 1.5000e-004 | 1.1000e-004 | 1.1700e-003 | 0.0000 | 2.8000e-004 | 0.0000 | 2.8000e-004 | 8.0000e-005 | 0.0000 | 8.0000e-005 | 0.0000 | 0.2599 | 0.2599 | 1.0000e-005 | 0.0000 | 0.2600 |
| **Total** | **1.5000e-004** | **1.1000e-004** | **1.1700e-003** | **0.0000** | **2.8000e-004** | **0.0000** | **2.8000e-004** | **8.0000e-005** | **0.0000** | **8.0000e-005** | **0.0000** | **0.2599** | **0.2599** | **1.0000e-005** | **0.0000** | **0.2600** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 8.7700e-003 | 0.0000 | 8.7700e-003 | 3.0200e-003 | 0.0000 | 3.0200e-003 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 3.4000e-003 | 0.0356 | 0.0181 | 3.0000e-005 | | 1.9700e-003 | 1.9700e-003 | | 1.8100e-003 | 1.8100e-003 | 0.0000 | 2.6957 | 2.6957 | 8.4000e-004 | 0.0000 | 2.7166 |
| **Total** | **3.4000e-003** | **0.0356** | **0.0181** | **3.0000e-005** | **8.7700e-003** | **1.9700e-003** | **0.0107** | **3.0200e-003** | **1.8100e-003** | **4.8300e-003** | **0.0000** | **2.6957** | **2.6957** | **8.4000e-004** | **0.0000** | **2.7166** |

## 3.2 Site Preparation - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 1.5000e-004 | 1.1000e-004 | 1.1700e-003 | 0.0000 | 2.8000e-004 | 0.0000 | 2.8000e-004 | 8.0000e-005 | 0.0000 | 8.0000e-005 | 0.0000 | 0.2599 | 0.2599 | 1.0000e-005 | 0.0000 | 0.2600 |
| **Total** | **1.5000e-004** | **1.1000e-004** | **1.1700e-003** | **0.0000** | **2.8000e-004** | **0.0000** | **2.8000e-004** | **8.0000e-005** | **0.0000** | **8.0000e-005** | **0.0000** | **0.2599** | **0.2599** | **1.0000e-005** | **0.0000** | **0.2600** |

## 3.3 Grading - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.1911 | 0.0000 | 0.1911 | 0.1004 | 0.0000 | 0.1004 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.1103 | 1.2810 | 0.7190 | 1.3100e-003 | | 0.0566 | 0.0566 | | 0.0521 | 0.0521 | 0.0000 | 119.9349 | 119.9349 | 0.0373 | 0.0000 | 120.8683 |
| **Total** | **0.1103** | **1.2810** | **0.7190** | **1.3100e-003** | **0.1911** | **0.0566** | **0.2478** | **0.1004** | **0.0521** | **0.1525** | **0.0000** | **119.9349** | **119.9349** | **0.0373** | **0.0000** | **120.8683** |

### 3.3 Grading - 2018

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.5100e-003 | 1.8700e-003 | 0.0195 | 5.0000e-005 | 4.7100e-003 | 3.0000e-005 | 4.7400e-003 | 1.2500e-003 | 3.0000e-005 | 1.2800e-003 | 0.0000 | 4.3308 | 4.3308 | 1.3000e-004 | 0.0000 | 4.3341 |
| **Total** | **2.5100e-003** | **1.8700e-003** | **0.0195** | **5.0000e-005** | **4.7100e-003** | **3.0000e-005** | **4.7400e-003** | **1.2500e-003** | **3.0000e-005** | **1.2800e-003** | **0.0000** | **4.3308** | **4.3308** | **1.3000e-004** | **0.0000** | **4.3341** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0745 | 0.0000 | 0.0745 | 0.0392 | 0.0000 | 0.0392 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.1103 | 1.2810 | 0.7190 | 1.3100e-003 | | 0.0566 | 0.0566 | | 0.0521 | 0.0521 | 0.0000 | 119.9348 | 119.9348 | 0.0373 | 0.0000 | 120.8682 |
| **Total** | **0.1103** | **1.2810** | **0.7190** | **1.3100e-003** | **0.0745** | **0.0566** | **0.1312** | **0.0392** | **0.0521** | **0.0913** | **0.0000** | **119.9348** | **119.9348** | **0.0373** | **0.0000** | **120.8682** |

### 3.3 Grading - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.5100e-003 | 1.8700e-003 | 0.0195 | 5.0000e-005 | 4.7100e-003 | 3.0000e-005 | 4.7400e-003 | 1.2500e-003 | 3.0000e-005 | 1.2800e-003 | 0.0000 | 4.3308 | 4.3308 | 1.3000e-004 | 0.0000 | 4.3341 |
| **Total** | **2.5100e-003** | **1.8700e-003** | **0.0195** | **5.0000e-005** | **4.7100e-003** | **3.0000e-005** | **4.7400e-003** | **1.2500e-003** | **3.0000e-005** | **1.2800e-003** | **0.0000** | **4.3308** | **4.3308** | **1.3000e-004** | **0.0000** | **4.3341** |

### 3.4 Paving - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 4.1100e-003 | 0.0438 | 0.0370 | 6.0000e-005 | | 2.3900e-003 | 2.3900e-003 | | 2.2000e-003 | 2.2000e-003 | 0.0000 | 5.2029 | 5.2029 | 1.6200e-003 | 0.0000 | 5.2434 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **4.1100e-003** | **0.0438** | **0.0370** | **6.0000e-005** | | **2.3900e-003** | **2.3900e-003** | | **2.2000e-003** | **2.2000e-003** | **0.0000** | **5.2029** | **5.2029** | **1.6200e-003** | **0.0000** | **5.2434** |

## 3.4 Paving - 2018

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 6.3000e-004 | 4.7000e-004 | 4.8700e-003 | 1.0000e-005 | 2.1900e-003 | 1.0000e-005 | 2.2000e-003 | 5.6000e-004 | 1.0000e-005 | 5.7000e-004 | 0.0000 | 1.0827 | 1.0827 | 3.0000e-005 | 0.0000 | 1.0835 |
| **Total** | **6.3000e-004** | **4.7000e-004** | **4.8700e-003** | **1.0000e-005** | **2.1900e-003** | **1.0000e-005** | **2.2000e-003** | **5.6000e-004** | **1.0000e-005** | **5.7000e-004** | **0.0000** | **1.0827** | **1.0827** | **3.0000e-005** | **0.0000** | **1.0835** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 4.1100e-003 | 0.0438 | 0.0370 | 6.0000e-005 | | 2.3900e-003 | 2.3900e-003 | | 2.2000e-003 | 2.2000e-003 | 0.0000 | 5.2029 | 5.2029 | 1.6200e-003 | 0.0000 | 5.2434 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **4.1100e-003** | **0.0438** | **0.0370** | **6.0000e-005** | | **2.3900e-003** | **2.3900e-003** | | **2.2000e-003** | **2.2000e-003** | **0.0000** | **5.2029** | **5.2029** | **1.6200e-003** | **0.0000** | **5.2434** |

### 3.4 Paving - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 6.3000e-004 | 4.7000e-004 | 4.8700e-003 | 1.0000e-005 | 2.1900e-003 | 1.0000e-005 | 2.2000e-003 | 5.6000e-004 | 1.0000e-005 | 5.7000e-004 | 0.0000 | 1.0827 | 1.0827 | 3.0000e-005 | 0.0000 | 1.0835 |
| **Total** | **6.3000e-004** | **4.7000e-004** | **4.8700e-003** | **1.0000e-005** | **2.1900e-003** | **1.0000e-005** | **2.2000e-003** | **5.6000e-004** | **1.0000e-005** | **5.7000e-004** | **0.0000** | **1.0827** | **1.0827** | **3.0000e-005** | **0.0000** | **1.0835** |

### 3.5 Building Construction - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0588 | 0.5484 | 0.4133 | 6.8000e-004 | | 0.0344 | 0.0344 | | 0.0327 | 0.0327 | 0.0000 | 59.8268 | 59.8268 | 0.0116 | 0.0000 | 60.1167 |
| **Total** | **0.0588** | **0.5484** | **0.4133** | **6.8000e-004** | | **0.0344** | **0.0344** | | **0.0327** | **0.0327** | **0.0000** | **59.8268** | **59.8268** | **0.0116** | **0.0000** | **60.1167** |

## 3.5 Building Construction - 2018

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 2.3500e-003 | 0.0639 | 0.0140 | 1.4000e-004 | 3.0600e-003 | 4.5000e-004 | 3.5100e-003 | 8.8000e-004 | 4.3000e-004 | 1.3100e-003 | 0.0000 | 13.1324 | 13.1324 | 7.2000e-004 | 0.0000 | 13.1504 |
| Worker | 6.3000e-003 | 4.7000e-003 | 0.0489 | 1.2000e-004 | 0.0118 | 8.0000e-005 | 0.0119 | 3.1500e-003 | 7.0000e-005 | 3.2300e-003 | 0.0000 | 10.8848 | 10.8848 | 3.3000e-004 | 0.0000 | 10.8929 |
| **Total** | **8.6500e-003** | **0.0686** | **0.0629** | **2.6000e-004** | **0.0149** | **5.3000e-004** | **0.0154** | **4.0300e-003** | **5.0000e-004** | **4.5400e-003** | **0.0000** | **24.0171** | **24.0171** | **1.0500e-003** | **0.0000** | **24.0434** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0588 | 0.5484 | 0.4133 | 6.8000e-004 | | 0.0344 | 0.0344 | | 0.0327 | 0.0327 | 0.0000 | 59.8267 | 59.8267 | 0.0116 | 0.0000 | 60.1166 |
| **Total** | **0.0588** | **0.5484** | **0.4133** | **6.8000e-004** | | **0.0344** | **0.0344** | | **0.0327** | **0.0327** | **0.0000** | **59.8267** | **59.8267** | **0.0116** | **0.0000** | **60.1166** |

## 3.5 Building Construction - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 2.3500e-003 | 0.0639 | 0.0140 | 1.4000e-004 | 3.0600e-003 | 4.5000e-004 | 3.5100e-003 | 8.8000e-004 | 4.3000e-004 | 1.3100e-003 | 0.0000 | 13.1324 | 13.1324 | 7.2000e-004 | 0.0000 | 13.1504 |
| Worker | 6.3000e-003 | 4.7000e-003 | 0.0489 | 1.2000e-004 | 0.0118 | 8.0000e-005 | 0.0119 | 3.1500e-003 | 7.0000e-005 | 3.2300e-003 | 0.0000 | 10.8848 | 10.8848 | 3.3000e-004 | 0.0000 | 10.8929 |
| **Total** | **8.6500e-003** | **0.0686** | **0.0629** | **2.6000e-004** | **0.0149** | **5.3000e-004** | **0.0154** | **4.0300e-003** | **5.0000e-004** | **4.5400e-003** | **0.0000** | **24.0171** | **24.0171** | **1.0500e-003** | **0.0000** | **24.0434** |

## 3.5 Building Construction - 2019

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.1301 | 1.2403 | 1.0169 | 1.6900e-003 | | 0.0742 | 0.0742 | | 0.0706 | 0.0706 | 0.0000 | 148.8911 | 148.8911 | 0.0284 | 0.0000 | 149.6022 |
| **Total** | **0.1301** | **1.2403** | **1.0169** | **1.6900e-003** | | **0.0742** | **0.0742** | | **0.0706** | **0.0706** | **0.0000** | **148.8911** | **148.8911** | **0.0284** | **0.0000** | **149.6022** |

## 3.5 Building Construction - 2019

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 5.2000e-003 | 0.1513 | 0.0314 | 3.4000e-004 | 7.6700e-003 | 9.2000e-004 | 8.5800e-003 | 2.2200e-003 | 8.8000e-004 | 3.1000e-003 | 0.0000 | 32.6765 | 32.6765 | 1.7200e-003 | 0.0000 | 32.7195 |
| Worker | 0.0143 | 0.0104 | 0.1097 | 2.9000e-004 | 0.0297 | 2.0000e-004 | 0.0299 | 7.9100e-003 | 1.9000e-004 | 8.1000e-003 | 0.0000 | 26.4981 | 26.4981 | 7.3000e-004 | 0.0000 | 26.5162 |
| **Total** | **0.0195** | **0.1617** | **0.1410** | **6.3000e-004** | **0.0374** | **1.1200e-003** | **0.0385** | **0.0101** | **1.0700e-003** | **0.0112** | **0.0000** | **59.1746** | **59.1746** | **2.4500e-003** | **0.0000** | **59.2358** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.1301 | 1.2403 | 1.0169 | 1.6900e-003 | | 0.0742 | 0.0742 | | 0.0706 | 0.0706 | 0.0000 | 148.8910 | 148.8910 | 0.0284 | 0.0000 | 149.6020 |
| **Total** | **0.1301** | **1.2403** | **1.0169** | **1.6900e-003** | | **0.0742** | **0.0742** | | **0.0706** | **0.0706** | **0.0000** | **148.8910** | **148.8910** | **0.0284** | **0.0000** | **149.6020** |

## 3.5 Building Construction - 2019

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 5.2000e-003 | 0.1513 | 0.0314 | 3.4000e-004 | 7.6700e-003 | 9.2000e-004 | 8.5800e-003 | 2.2200e-003 | 8.8000e-004 | 3.1000e-003 | 0.0000 | 32.6765 | 32.6765 | 1.7200e-003 | 0.0000 | 32.7195 |
| Worker | 0.0143 | 0.0104 | 0.1097 | 2.9000e-004 | 0.0297 | 2.0000e-004 | 0.0299 | 7.9100e-003 | 1.9000e-004 | 8.1000e-003 | 0.0000 | 26.4981 | 26.4981 | 7.3000e-004 | 0.0000 | 26.5162 |
| **Total** | **0.0195** | **0.1617** | **0.1410** | **6.3000e-004** | **0.0374** | **1.1200e-003** | **0.0385** | **0.0101** | **1.0700e-003** | **0.0112** | **0.0000** | **59.1746** | **59.1746** | **2.4500e-003** | **0.0000** | **59.2358** |

## 3.5 Building Construction - 2020

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0215 | 0.2074 | 0.1842 | 3.1000e-004 | | 0.0118 | 0.0118 | | 0.0113 | 0.0113 | 0.0000 | 27.0802 | 27.0802 | 5.1300e-003 | 0.0000 | 27.2086 |
| **Total** | **0.0215** | **0.2074** | **0.1842** | **3.1000e-004** | | **0.0118** | **0.0118** | | **0.0113** | **0.0113** | **0.0000** | **27.0802** | **27.0802** | **5.1300e-003** | **0.0000** | **27.2086** |

## 3.5 Building Construction - 2020

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 8.0000e-004 | 0.0257 | 5.0700e-003 | 6.0000e-005 | 1.4100e-003 | 1.1000e-004 | 1.5200e-003 | 4.1000e-004 | 1.1000e-004 | 5.2000e-004 | 0.0000 | 5.9624 | 5.9624 | 2.9000e-004 | 0.0000 | 5.9697 |
| Worker | 2.4100e-003 | 1.6900e-003 | 0.0181 | 5.0000e-005 | 5.4700e-003 | 4.0000e-005 | 5.5000e-003 | 1.4500e-003 | 3.0000e-005 | 1.4900e-003 | 0.0000 | 4.7174 | 4.7174 | 1.2000e-004 | 0.0000 | 4.7203 |
| **Total** | **3.2100e-003** | **0.0274** | **0.0231** | **1.1000e-004** | **6.8800e-003** | **1.5000e-004** | **7.0200e-003** | **1.8600e-003** | **1.4000e-004** | **2.0100e-003** | **0.0000** | **10.6798** | **10.6798** | **4.1000e-004** | **0.0000** | **10.6900** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0215 | 0.2074 | 0.1842 | 3.1000e-004 | | 0.0118 | 0.0118 | | 0.0113 | 0.0113 | 0.0000 | 27.0802 | 27.0802 | 5.1300e-003 | 0.0000 | 27.2085 |
| **Total** | **0.0215** | **0.2074** | **0.1842** | **3.1000e-004** | | **0.0118** | **0.0118** | | **0.0113** | **0.0113** | **0.0000** | **27.0802** | **27.0802** | **5.1300e-003** | **0.0000** | **27.2085** |

## 3.5 Building Construction - 2020

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 8.0000e-004 | 0.0257 | 5.0700e-003 | 6.0000e-005 | 1.4100e-003 | 1.1000e-004 | 1.5200e-003 | 4.1000e-004 | 1.1000e-004 | 5.2000e-004 | 0.0000 | 5.9624 | 5.9624 | 2.9000e-004 | 0.0000 | 5.9697 |
| Worker | 2.4100e-003 | 1.6900e-003 | 0.0181 | 5.0000e-005 | 5.4700e-003 | 4.0000e-005 | 5.5000e-003 | 1.4500e-003 | 3.0000e-005 | 1.4900e-003 | 0.0000 | 4.7174 | 4.7174 | 1.2000e-004 | 0.0000 | 4.7203 |
| **Total** | **3.2100e-003** | **0.0274** | **0.0231** | **1.1000e-004** | **6.8800e-003** | **1.5000e-004** | **7.0200e-003** | **1.8600e-003** | **1.4000e-004** | **2.0100e-003** | **0.0000** | **10.6798** | **10.6798** | **4.1000e-004** | **0.0000** | **10.6900** |

## 3.6 Architectural Coating - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.1259 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 8.5100e-003 | 0.0572 | 0.0528 | 8.0000e-005 | | 4.2900e-003 | 4.2900e-003 | | 4.2900e-003 | 4.2900e-003 | 0.0000 | 7.2768 | 7.2768 | 6.9000e-004 | 0.0000 | 7.2941 |
| **Total** | **0.1344** | **0.0572** | **0.0528** | **8.0000e-005** | | **4.2900e-003** | **4.2900e-003** | | **4.2900e-003** | **4.2900e-003** | **0.0000** | **7.2768** | **7.2768** | **6.9000e-004** | **0.0000** | **7.2941** |

## 3.6 Architectural Coating - 2018

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 7.1000e-004 | 5.3000e-004 | 5.5500e-003 | 1.0000e-005 | 1.3400e-003 | 1.0000e-005 | 1.3500e-003 | 3.6000e-004 | 1.0000e-005 | 3.7000e-004 | 0.0000 | 1.2343 | 1.2343 | 4.0000e-005 | 0.0000 | 1.2352 |
| **Total** | **7.1000e-004** | **5.3000e-004** | **5.5500e-003** | **1.0000e-005** | **1.3400e-003** | **1.0000e-005** | **1.3500e-003** | **3.6000e-004** | **1.0000e-005** | **3.7000e-004** | **0.0000** | **1.2343** | **1.2343** | **4.0000e-005** | **0.0000** | **1.2352** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.1259 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 8.5100e-003 | 0.0572 | 0.0528 | 8.0000e-005 | | 4.2900e-003 | 4.2900e-003 | | 4.2900e-003 | 4.2900e-003 | 0.0000 | 7.2768 | 7.2768 | 6.9000e-004 | 0.0000 | 7.2941 |
| **Total** | **0.1344** | **0.0572** | **0.0528** | **8.0000e-005** | | **4.2900e-003** | **4.2900e-003** | | **4.2900e-003** | **4.2900e-003** | **0.0000** | **7.2768** | **7.2768** | **6.9000e-004** | **0.0000** | **7.2941** |

## 3.6 Architectural Coating - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 7.1000e-004 | 5.3000e-004 | 5.5500e-003 | 1.0000e-005 | 1.3400e-003 | 1.0000e-005 | 1.3500e-003 | 3.6000e-004 | 1.0000e-005 | 3.7000e-004 | 0.0000 | 1.2343 | 1.2343 | 4.0000e-005 | 0.0000 | 1.2352 |
| **Total** | **7.1000e-004** | **5.3000e-004** | **5.5500e-003** | **1.0000e-005** | **1.3400e-003** | **1.0000e-005** | **1.3500e-003** | **3.6000e-004** | **1.0000e-005** | **3.7000e-004** | **0.0000** | **1.2343** | **1.2343** | **4.0000e-005** | **0.0000** | **1.2352** |

## 3.6 Architectural Coating - 2019

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.5765 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0348 | 0.2395 | 0.2403 | 3.9000e-004 | | 0.0168 | 0.0168 | | 0.0168 | 0.0168 | 0.0000 | 33.3200 | 33.3200 | 2.8100e-003 | 0.0000 | 33.3903 |
| **Total** | **0.6113** | **0.2395** | **0.2403** | **3.9000e-004** | | **0.0168** | **0.0168** | | **0.0168** | **0.0168** | **0.0000** | **33.3200** | **33.3200** | **2.8100e-003** | **0.0000** | **33.3903** |

## 3.6 Architectural Coating - 2019

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.9600e-003 | 2.1400e-003 | 0.0227 | 6.0000e-005 | 6.1500e-003 | 4.0000e-005 | 6.1900e-003 | 1.6400e-003 | 4.0000e-005 | 1.6800e-003 | 0.0000 | 5.4824 | 5.4824 | 1.5000e-004 | 0.0000 | 5.4861 |
| **Total** | **2.9600e-003** | **2.1400e-003** | **0.0227** | **6.0000e-005** | **6.1500e-003** | **4.0000e-005** | **6.1900e-003** | **1.6400e-003** | **4.0000e-005** | **1.6800e-003** | **0.0000** | **5.4824** | **5.4824** | **1.5000e-004** | **0.0000** | **5.4861** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.5765 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0348 | 0.2395 | 0.2403 | 3.9000e-004 | | 0.0168 | 0.0168 | | 0.0168 | 0.0168 | 0.0000 | 33.3199 | 33.3199 | 2.8100e-003 | 0.0000 | 33.3903 |
| **Total** | **0.6113** | **0.2395** | **0.2403** | **3.9000e-004** | | **0.0168** | **0.0168** | | **0.0168** | **0.0168** | **0.0000** | **33.3199** | **33.3199** | **2.8100e-003** | **0.0000** | **33.3903** |

## 3.6 Architectural Coating - 2019

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.9600e-003 | 2.1400e-003 | 0.0227 | 6.0000e-005 | 6.1500e-003 | 4.0000e-005 | 6.1900e-003 | 1.6400e-003 | 4.0000e-005 | 1.6800e-003 | 0.0000 | 5.4824 | 5.4824 | 1.5000e-004 | 0.0000 | 5.4861 |
| **Total** | **2.9600e-003** | **2.1400e-003** | **0.0227** | **6.0000e-005** | **6.1500e-003** | **4.0000e-005** | **6.1900e-003** | **1.6400e-003** | **4.0000e-005** | **1.6800e-003** | **0.0000** | **5.4824** | **5.4824** | **1.5000e-004** | **0.0000** | **5.4861** |

## 3.6 Architectural Coating - 2020

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.2099 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0115 | 0.0800 | 0.0870 | 1.4000e-004 | | 5.2700e-003 | 5.2700e-003 | | 5.2700e-003 | 5.2700e-003 | 0.0000 | 12.1280 | 12.1280 | 9.4000e-004 | 0.0000 | 12.1514 |
| **Total** | **0.2214** | **0.0800** | **0.0870** | **1.4000e-004** | | **5.2700e-003** | **5.2700e-003** | | **5.2700e-003** | **5.2700e-003** | **0.0000** | **12.1280** | **12.1280** | **9.4000e-004** | **0.0000** | **12.1514** |

## 3.6 Architectural Coating - 2020

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 9.9000e-004 | 6.9000e-004 | 7.4000e-003 | 2.0000e-005 | 2.2400e-003 | 1.0000e-005 | 2.2500e-003 | 6.0000e-004 | 1.0000e-005 | 6.1000e-004 | 0.0000 | 1.9317 | 1.9317 | 5.0000e-005 | 0.0000 | 1.9329 |
| **Total** | **9.9000e-004** | **6.9000e-004** | **7.4000e-003** | **2.0000e-005** | **2.2400e-003** | **1.0000e-005** | **2.2500e-003** | **6.0000e-004** | **1.0000e-005** | **6.1000e-004** | **0.0000** | **1.9317** | **1.9317** | **5.0000e-005** | **0.0000** | **1.9329** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.2099 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0115 | 0.0800 | 0.0870 | 1.4000e-004 | | 5.2700e-003 | 5.2700e-003 | | 5.2700e-003 | 5.2700e-003 | 0.0000 | 12.1279 | 12.1279 | 9.4000e-004 | 0.0000 | 12.1514 |
| **Total** | **0.2214** | **0.0800** | **0.0870** | **1.4000e-004** | | **5.2700e-003** | **5.2700e-003** | | **5.2700e-003** | **5.2700e-003** | **0.0000** | **12.1279** | **12.1279** | **9.4000e-004** | **0.0000** | **12.1514** |

### 3.6 Architectural Coating - 2020

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 9.9000e-004 | 6.9000e-004 | 7.4000e-003 | 2.0000e-005 | 2.2400e-003 | 1.0000e-005 | 2.2500e-003 | 6.0000e-004 | 1.0000e-005 | 6.1000e-004 | 0.0000 | 1.9317 | 1.9317 | 5.0000e-005 | 0.0000 | 1.9329 |
| **Total** | **9.9000e-004** | **6.9000e-004** | **7.4000e-003** | **2.0000e-005** | **2.2400e-003** | **1.0000e-005** | **2.2500e-003** | **6.0000e-004** | **1.0000e-005** | **6.1000e-004** | **0.0000** | **1.9317** | **1.9317** | **5.0000e-005** | **0.0000** | **1.9329** |

## 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile

Increase Density

Improve Walkability Design

Improve Destination Accessibility

Increase Transit Accessibility

Improve Pedestrian Network

Provide Traffic Calming Measures

Fullerton Ranch Project - Placer County APCD Air District, Annual

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 0.2199 | 1.4326 | 2.0846 | 6.6400e-003 | 0.4418 | 7.3200e-003 | 0.4492 | 0.1189 | 6.9100e-003 | 0.1258 | 0.0000 | 611.0924 | 611.0924 | 0.0318 | 0.0000 | 611.8862 |
| Unmitigated | 0.2244 | 1.4735 | 2.1805 | 7.0500e-003 | 0.4746 | 7.7700e-003 | 0.4823 | 0.1277 | 7.3300e-003 | 0.1350 | 0.0000 | 648.6329 | 648.6329 | 0.0327 | 0.0000 | 649.4506 |

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| Single Family Housing | 771.12 | 802.71 | 698.22 | 1,276,692 | 1,188,601 |
| Total | 771.12 | 802.71 | 698.22 | 1,276,692 | 1,188,601 |

## 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| Single Family Housing | 6.29 | 4.25 | 4.37 | 42.60 | 21.00 | 36.40 | 86 | 11 | 3 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 0.489257 | 0.041257 | 0.220156 | 0.132626 | 0.025790 | 0.006586 | 0.027831 | 0.045583 | 0.001467 | 0.001229 | 0.006102 | 0.000783 | 0.001333 |

# 5.0 Energy Detail

Historical Energy Use: N

## 5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Electricity Mitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 90.7510 | 90.7510 | 9.0800e-003 | 1.8800e-003 | 91.5374 |
| Electricity Unmitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 96.5139 | 96.5139 | 9.6500e-003 | 2.0000e-003 | 97.3502 |
| NaturalGas Mitigated | 0.0121 | 0.1030 | 0.0438 | 6.6000e-004 | | 8.3300e-003 | 8.3300e-003 | | 8.3300e-003 | 8.3300e-003 | 0.0000 | 119.2688 | 119.2688 | 2.2900e-003 | 2.1900e-003 | 119.9775 |
| NaturalGas Unmitigated | 0.0140 | 0.1194 | 0.0508 | 7.6000e-004 | | 9.6500e-003 | 9.6500e-003 | | 9.6500e-003 | 9.6500e-003 | 0.0000 | 138.2666 | 138.2666 | 2.6500e-003 | 2.5300e-003 | 139.0882 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Single Family Housing | 2.59102e+006 | 0.0140 | 0.1194 | 0.0508 | 7.6000e-004 | | 9.6500e-003 | 9.6500e-003 | | 9.6500e-003 | 9.6500e-003 | 0.0000 | 138.2666 | 138.2666 | 2.6500e-003 | 2.5300e-003 | 139.0882 |
| **Total** | | **0.0140** | **0.1194** | **0.0508** | **7.6000e-004** | | **9.6500e-003** | **9.6500e-003** | | **9.6500e-003** | **9.6500e-003** | **0.0000** | **138.2666** | **138.2666** | **2.6500e-003** | **2.5300e-003** | **139.0882** |

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Single Family Housing | 2.23501e+006 | 0.0121 | 0.1030 | 0.0438 | 6.6000e-004 | | 8.3300e-003 | 8.3300e-003 | | 8.3300e-003 | 8.3300e-003 | 0.0000 | 119.2688 | 119.2688 | 2.2900e-003 | 2.1900e-003 | 119.9775 |
| **Total** | | **0.0121** | **0.1030** | **0.0438** | **6.6000e-004** | | **8.3300e-003** | **8.3300e-003** | | **8.3300e-003** | **8.3300e-003** | **0.0000** | **119.2688** | **119.2688** | **2.2900e-003** | **2.1900e-003** | **119.9775** |

## 5.3 Energy by Land Use - Electricity

**Unmitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| Single Family Housing | 733713 | 96.5139 | 9.6500e-003 | 2.0000e-003 | 97.3502 |
| **Total** | | **96.5139** | **9.6500e-003** | **2.0000e-003** | **97.3502** |

**Mitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| Single Family Housing | 689903 | 90.7510 | 9.0800e-003 | 1.8800e-003 | 91.5374 |
| **Total** | | **90.7510** | **9.0800e-003** | **1.8800e-003** | **91.5374** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

Fullerton Ranch Project - Placer County APCD Air District, Annual

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 0.6848 | 0.0566 | 0.6245 | 3.5000e-004 | | 7.3300e-003 | 7.3300e-003 | | 7.3300e-003 | 7.3300e-003 | 0.0000 | 58.4021 | 58.4021 | 2.0600e-003 | 1.0500e-003 | 58.7673 |
| Unmitigated | 5.7615 | 0.1062 | 6.8772 | 0.0114 | | 0.8830 | 0.8830 | | 0.8830 | 0.8830 | 83.6696 | 36.0722 | 119.7418 | 0.0782 | 6.5800e-003 | 123.6573 |

## 6.2 Area by SubCategory

**Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 0.0912 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 0.5694 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hearth | 5.0824 | 0.0993 | 6.2737 | 0.0114 | | 0.8796 | 0.8796 | | 0.8796 | 0.8796 | 83.6696 | 35.0898 | 118.7594 | 0.0772 | 6.5800e-003 | 122.6509 |
| Landscaping | 0.0184 | 6.9800e-003 | 0.6034 | 3.0000e-005 | | 3.3200e-003 | 3.3200e-003 | | 3.3200e-003 | 3.3200e-003 | 0.0000 | 0.9824 | 0.9824 | 9.6000e-004 | 0.0000 | 1.0064 |
| **Total** | **5.7615** | **0.1062** | **6.8772** | **0.0114** | | **0.8830** | **0.8830** | | **0.8830** | **0.8830** | **83.6696** | **36.0722** | **119.7418** | **0.0782** | **6.5800e-003** | **123.6573** |

## 6.2 Area by SubCategory

**Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 0.0912 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 0.5694 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hearth | 5.8000e-003 | 0.0496 | 0.0211 | 3.2000e-004 | | 4.0100e-003 | 4.0100e-003 | | 4.0100e-003 | 4.0100e-003 | 0.0000 | 57.4197 | 57.4197 | 1.1000e-003 | 1.0500e-003 | 57.7609 |
| Landscaping | 0.0184 | 6.9800e-003 | 0.6034 | 3.0000e-005 | | 3.3200e-003 | 3.3200e-003 | | 3.3200e-003 | 3.3200e-003 | 0.0000 | 0.9824 | 0.9824 | 9.6000e-004 | 0.0000 | 1.0064 |
| **Total** | **0.6848** | **0.0566** | **0.6245** | **3.5000e-004** | | **7.3300e-003** | **7.3300e-003** | | **7.3300e-003** | **7.3300e-003** | **0.0000** | **58.4021** | **58.4021** | **2.0600e-003** | **1.0500e-003** | **58.7673** |

# 7.0 Water Detail

## 7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| Category | MT/yr | | | |
| Mitigated | 5.7829 | 0.1380 | 3.3400e-003 | 10.2287 |
| Unmitigated | 6.9625 | 0.1725 | 4.1700e-003 | 12.5175 |

## 7.2 Water by Land Use

**Unmitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| Single Family Housing | 5.27748 / 3.3271 | 6.9625 | 0.1725 | 4.1700e-003 | 12.5175 |
| **Total** | | **6.9625** | **0.1725** | **4.1700e-003** | **12.5175** |

## 7.2 Water by Land Use

**Mitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| Single Family Housing | 4.22198 / 3.12415 | 5.7829 | 0.1380 | 3.3400e-003 | 10.2287 |
| **Total** | | **5.7829** | **0.1380** | **3.3400e-003** | **10.2287** |

# 8.0 Waste Detail

## 8.1 Mitigation Measures Waste

**Category/Year**

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| | MT/yr | | | |
| Mitigated | 15.2730 | 0.9026 | 0.0000 | 37.8383 |
| Unmitigated | 15.2730 | 0.9026 | 0.0000 | 37.8383 |

## 8.2 Waste by Land Use

**Unmitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| Single Family Housing | 75.24 | 15.2730 | 0.9026 | 0.0000 | 37.8383 |
| **Total** | | **15.2730** | **0.9026** | **0.0000** | **37.8383** |

**Mitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| Single Family Housing | 75.24 | 15.2730 | 0.9026 | 0.0000 | 37.8383 |
| **Total** | | **15.2730** | **0.9026** | **0.0000** | **37.8383** |

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| Category | MT | | | |
| Unmitigated | -84.9070 | 0.0000 | 0.0000 | -84.9070 |

## 11.1 Vegetation Land Change

**Vegetation Type**

| | Initial/Final | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| | Acres | MT | | | |
| Grassland | 19.7 / 0 | -84.9070 | 0.0000 | 0.0000 | -84.9070 |
| **Total** | | **-84.9070** | **0.0000** | **0.0000** | **-84.9070** |

## 11.2 Net New Trees

**Species Class**

| | Number of Trees | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| | | MT | | | |
| Miscellaneous | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

# Fullerton Ranch Project

**Placer County APCD Air District, Summer**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Single Family Housing | 81.00 | Dwelling Unit | 19.70 | 145,800.00 | 209 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 74 |
| **Climate Zone** | 2 | | | **Operational Year** | 2020 |
| **Utility Company** | Pacific Gas & Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 290 | **CH4 Intensity (lb/MWhr)** | 0.029 | **N2O Intensity (lb/MWhr)** | 0.006 |

### 1.3 User Entered Comments & Non-Default Data

Fullerton Ranch Project - Placer County APCD Air District, Summer

Project Characteristics - See assumptions in Appendix B

Land Use - See assumptions in Appendix B

Construction Phase - See assumptions in Appendix B

Off-road Equipment -

Off-road Equipment - See assumptions in Appendix B

Off-road Equipment - See assumptions in Appendix B

Off-road Equipment - See assumptions in Appendix B

Off-road Equipment - See assumptions in Appendix B

Off-road Equipment - See assumptions in Appendix B

Grading - See assumptions in Appendix B

Vehicle Trips - See assumptions in Appendix B

Woodstoves - See assumptions in Appendix B

Energy Use - See assumptions in Appendix B

Land Use Change -

Sequestration -

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Mobile Commute Mitigation - See assumptions in Appendix B

Area Mitigation -

Energy Mitigation -

Water Mitigation -

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblAreaMitigation | UseLowVOCPaintParkingCheck | False | True |
| tblConstDustMitigation | WaterUnpavedRoadVehicleSpeed | 40 | 5 |
| tblConstructionPhase | NumDays | 20.00 | 413.00 |

| | | | |
|---|---|---|---|
| tblConstructionPhase | NumDays | 300.00 | 413.00 |
| tblConstructionPhase | NumDays | 30.00 | 60.00 |
| tblConstructionPhase | NumDays | 20.00 | 10.00 |
| tblConstructionPhase | NumDays | 10.00 | 4.00 |
| tblConstructionPhase | PhaseEndDate | 7/13/2020 | 5/12/2020 |
| tblConstructionPhase | PhaseEndDate | 4/6/2020 | 3/6/2020 |
| tblConstructionPhase | PhaseEndDate | 7/30/2018 | 7/26/2018 |
| tblConstructionPhase | PhaseEndDate | 5/25/2020 | 8/8/2018 |
| tblConstructionPhase | PhaseEndDate | 5/28/2018 | 5/4/2018 |
| tblConstructionPhase | PhaseStartDate | 5/26/2020 | 10/12/2018 |
| tblConstructionPhase | PhaseStartDate | 7/31/2018 | 8/8/2018 |
| tblConstructionPhase | PhaseStartDate | 5/29/2018 | 5/4/2018 |
| tblConstructionPhase | PhaseStartDate | 4/7/2020 | 7/26/2018 |
| tblGrading | AcresOfGrading | 90.00 | 19.70 |
| tblGrading | AcresOfGrading | 0.00 | 19.70 |
| tblLandUse | LotAcreage | 26.30 | 19.70 |
| tblLandUse | Population | 232.00 | 209.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 3.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 3.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 3.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 4.00 | 2.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 1.00 | 0.00 |

| | | | |
|---|---|---|---|
| tblOffRoadEquipment | UsageHours | 7.00 | 3.00 |
| tblProjectCharacteristics | CO2IntensityFactor | 641.35 | 290 |
| tblProjectCharacteristics | OperationalYear | 2018 | 2020 |
| tblTripsAndVMT | WorkerTripNumber | 8.00 | 18.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 20.00 |
| tblTripsAndVMT | WorkerTripNumber | 8.00 | 15.00 |
| tblTripsAndVMT | WorkerTripNumber | 8.00 | 15.00 |
| tblVehicleTrips | HO_TL | 7.50 | 4.37 |
| tblVehicleTrips | HS_TL | 7.30 | 4.25 |
| tblVehicleTrips | HW_TL | 10.80 | 6.29 |

## 2.0 Emissions Summary

## 2.1 Overall Construction (Maximum Daily Emission)

**Unmitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2018 | 6.0549 | 60.6242 | 34.3944 | 0.0619 | 17.9275 | 2.8734 | 20.8009 | 7.3048 | 2.6435 | 9.9483 | 0.0000 | 6,223.834 3 | 6,223.834 3 | 1.8443 | 0.0000 | 6,269.940 6 |
| 2019 | 5.8684 | 12.5636 | 10.9929 | 0.0216 | 0.3485 | 0.7061 | 1.0546 | 0.0938 | 0.6782 | 0.7720 | 0.0000 | 2,115.007 7 | 2,115.0077 | 0.2858 | 0.0000 | 2,122.153 1 |
| 2020 | 5.7248 | 11.4530 | 10.7243 | 0.0215 | 0.3485 | 0.6101 | 0.9586 | 0.0938 | 0.5861 | 0.6799 | 0.0000 | 2,089.526 1 | 2,089.526 1 | 0.2773 | 0.0000 | 2,096.459 4 |
| **Maximum** | **6.0549** | **60.6242** | **34.3944** | **0.0619** | **17.9275** | **2.8734** | **20.8009** | **7.3048** | **2.6435** | **9.9483** | **0.0000** | **6,223.834 3** | **6,223.834 3** | **1.8443** | **0.0000** | **6,269.940 6** |

**Mitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2018 | 6.0549 | 60.6242 | 34.3944 | 0.0619 | 7.1822 | 2.8734 | 10.0555 | 2.8994 | 2.6435 | 5.5429 | 0.0000 | 6,223.834 3 | 6,223.834 3 | 1.8443 | 0.0000 | 6,269.940 6 |
| 2019 | 5.8684 | 12.5636 | 10.9929 | 0.0216 | 0.3485 | 0.7061 | 1.0546 | 0.0938 | 0.6782 | 0.7720 | 0.0000 | 2,115.0077 | 2,115.0077 | 0.2858 | 0.0000 | 2,122.153 1 |
| 2020 | 5.7248 | 11.4530 | 10.7243 | 0.0215 | 0.3485 | 0.6101 | 0.9586 | 0.0938 | 0.5861 | 0.6799 | 0.0000 | 2,089.526 1 | 2,089.526 1 | 0.2773 | 0.0000 | 2,096.459 4 |
| **Maximum** | **6.0549** | **60.6242** | **34.3944** | **0.0619** | **7.1822** | **2.8734** | **10.0555** | **2.8994** | **2.6435** | **5.5429** | **0.0000** | **6,223.834 3** | **6,223.834 3** | **1.8443** | **0.0000** | **6,269.940 6** |

Fullerton Ranch Project - Placer County APCD Air District, Summer

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Reduction | 0.00 | 0.00 | 0.00 | 0.00 | 57.69 | 0.00 | 47.10 | 58.80 | 0.00 | 38.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 2.2 Overall Operational

### Unmitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 127.7862 | 2.4984 | 159.7224 | 0.2776 | | 21.4914 | 21.4914 | | 21.4914 | 21.4914 | 2,249.510 2 | 955.4445 | 3,204.954 7 | 2.0877 | 0.1769 | 3,309.874 5 |
| Energy | 0.0766 | 0.6542 | 0.2784 | 4.1800e-003 | | 0.0529 | 0.0529 | | 0.0529 | 0.0529 | | 835.1386 | 835.1386 | 0.0160 | 0.0153 | 840.1014 |
| Mobile | 1.5841 | 8.3027 | 12.9484 | 0.0433 | 2.8586 | 0.0444 | 2.9030 | 0.7661 | 0.0419 | 0.8080 | | 4,386.700 9 | 4,386.700 9 | 0.2037 | | 4,391.793 8 |
| **Total** | **129.4469** | **11.4553** | **172.9492** | **0.3250** | **2.8586** | **21.5887** | **24.4473** | **0.7661** | **21.5862** | **22.3523** | **2,249.510 2** | **6,177.284 0** | **8,426.794 2** | **2.3074** | **0.1923** | **8,541.769 7** |

### Mitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 3.9657 | 1.2868 | 7.2194 | 8.0700e-003 | | 0.1346 | 0.1346 | | 0.1346 | 0.1346 | 0.0000 | 1,555.797 4 | 1,555.797 4 | 0.0413 | 0.0283 | 1,565.264 6 |
| Energy | 0.0660 | 0.5643 | 0.2401 | 3.6000e-003 | | 0.0456 | 0.0456 | | 0.0456 | 0.0456 | | 720.3906 | 720.3906 | 0.0138 | 0.0132 | 724.6715 |
| Mobile | 1.5580 | 8.0835 | 12.3051 | 0.0408 | 2.6613 | 0.0418 | 2.7032 | 0.7132 | 0.0395 | 0.7527 | | 4,132.092 3 | 4,132.092 3 | 0.1972 | | 4,137.022 9 |
| **Total** | **5.5898** | **9.9347** | **19.7647** | **0.0524** | **2.6613** | **0.2221** | **2.8834** | **0.7132** | **0.2197** | **0.9329** | **0.0000** | **6,408.280 3** | **6,408.280 3** | **0.2524** | **0.0415** | **6,426.959 1** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Reduction | 95.68 | 13.27 | 88.57 | 83.87 | 6.90 | 98.97 | 88.21 | 6.90 | 98.98 | 95.83 | 100.00 | -3.74 | 23.95 | 89.06 | 78.41 | 24.76 |

## 3.0 Construction Detail

**Construction Phase**

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Site Preparation | Site Preparation | 5/1/2018 | 5/4/2018 | 5 | 4 | |
| 2 | Grading | Grading | 5/4/2018 | 7/26/2018 | 5 | 60 | |
| 3 | Paving | Paving | 7/26/2018 | 8/8/2018 | 5 | 10 | |
| 4 | Building Construction | Building Construction | 8/8/2018 | 3/6/2020 | 5 | 413 | |
| 5 | Architectural Coating | Architectural Coating | 10/12/2018 | 5/12/2020 | 5 | 413 | |

**Acres of Grading (Site Preparation Phase): 19.7**

**Acres of Grading (Grading Phase): 19.7**

**Acres of Paving: 0**

**Residential Indoor: 295,245; Residential Outdoor: 98,415; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)**

**OffRoad Equipment**

Fullerton Ranch Project - Placer County APCD Air District, Summer

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 1 | 8.00 | 367 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Paving | Pavers | 1 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 1 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 1 | 8.00 | 80 | 0.38 |
| Building Construction | Cranes | 1 | 3.00 | 231 | 0.29 |
| Building Construction | Forklifts | 1 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 1 | 7.00 | 97 | 0.37 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |
| Building Construction | Welders | 0 | 8.00 | 46 | 0.45 |

**Trips and VMT**

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Site Preparation | 3 | 18.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 6 | 20.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 3 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 3 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 4 | 29.00 | 9.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 6.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

## 3.2 Site Preparation - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 11.2451 | 0.0000 | 11.2451 | 3.8742 | 0.0000 | 3.8742 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.6983 | 17.8194 | 9.0499 | 0.0148 | | 0.9832 | 0.9832 | | 0.9045 | 0.9045 | | 1,485.725 3 | 1,485.725 3 | 0.4625 | | 1,497.288 4 |
| **Total** | **1.6983** | **17.8194** | **9.0499** | **0.0148** | **11.2451** | **0.9832** | **12.2282** | **3.8742** | **0.9045** | **4.7787** | | **1,485.725 3** | **1,485.725 3** | **0.4625** | | **1,497.288 4** |

## 3.2 Site Preparation - 2018

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0842 | 0.0494 | 0.6530 | 1.5800e-003 | 0.1479 | 9.7000e-004 | 0.1488 | 0.0392 | 9.0000e-004 | 0.0401 | | 156.9105 | 156.9105 | 4.6500e-003 | | 157.0267 |
| **Total** | **0.0842** | **0.0494** | **0.6530** | **1.5800e-003** | **0.1479** | **9.7000e-004** | **0.1488** | **0.0392** | **9.0000e-004** | **0.0401** | | **156.9105** | **156.9105** | **4.6500e-003** | | **157.0267** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 4.3856 | 0.0000 | 4.3856 | 1.5109 | 0.0000 | 1.5109 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.6983 | 17.8194 | 9.0499 | 0.0148 | | 0.9832 | 0.9832 | | 0.9045 | 0.9045 | 0.0000 | 1,485.7253 | 1,485.7253 | 0.4625 | | 1,497.2884 |
| **Total** | **1.6983** | **17.8194** | **9.0499** | **0.0148** | **4.3856** | **0.9832** | **5.3687** | **1.5109** | **0.9045** | **2.4155** | **0.0000** | **1,485.7253** | **1,485.7253** | **0.4625** | | **1,497.2884** |

## 3.2 Site Preparation - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0842 | 0.0494 | 0.6530 | 1.5800e-003 | 0.1479 | 9.7000e-004 | 0.1488 | 0.0392 | 9.0000e-004 | 0.0401 | | 156.9105 | 156.9105 | 4.6500e-003 | | 157.0267 |
| **Total** | **0.0842** | **0.0494** | **0.6530** | **1.5800e-003** | **0.1479** | **9.7000e-004** | **0.1488** | **0.0392** | **9.0000e-004** | **0.0401** | | **156.9105** | **156.9105** | **4.6500e-003** | | **157.0267** |

## 3.3 Grading - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 6.3703 | 0.0000 | 6.3703 | 3.3478 | 0.0000 | 3.3478 | | | 0.0000 | | | 0.0000 |
| Off-Road | 3.6771 | 42.7005 | 23.9659 | 0.0438 | | 1.8882 | 1.8882 | | 1.7371 | 1.7371 | | 4,406.853 6 | 4,406.853 6 | 1.3719 | | 4,441.151 4 |
| **Total** | **3.6771** | **42.7005** | **23.9659** | **0.0438** | **6.3703** | **1.8882** | **8.2584** | **3.3478** | **1.7371** | **5.0849** | | **4,406.853 6** | **4,406.853 6** | **1.3719** | | **4,441.151 4** |

## 3.3 Grading - 2018

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0935 | 0.0549 | 0.7255 | 1.7500e-003 | 0.1643 | 1.0800e-003 | 0.1654 | 0.0436 | 9.9000e-004 | 0.0446 | | 174.3450 | 174.3450 | 5.1700e-003 | | 174.4741 |
| **Total** | **0.0935** | **0.0549** | **0.7255** | **1.7500e-003** | **0.1643** | **1.0800e-003** | **0.1654** | **0.0436** | **9.9000e-004** | **0.0446** | | **174.3450** | **174.3450** | **5.1700e-003** | | **174.4741** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 2.4844 | 0.0000 | 2.4844 | 1.3057 | 0.0000 | 1.3057 | | | 0.0000 | | | 0.0000 |
| Off-Road | 3.6771 | 42.7005 | 23.9659 | 0.0438 | | 1.8882 | 1.8882 | | 1.7371 | 1.7371 | 0.0000 | 4,406.853 6 | 4,406.853 6 | 1.3719 | | 4,441.151 4 |
| **Total** | **3.6771** | **42.7005** | **23.9659** | **0.0438** | **2.4844** | **1.8882** | **4.3726** | **1.3057** | **1.7371** | **3.0428** | **0.0000** | **4,406.853 6** | **4,406.853 6** | **1.3719** | | **4,441.151 4** |

### 3.3 Grading - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0935 | 0.0549 | 0.7255 | 1.7500e-003 | 0.1643 | 1.0800e-003 | 0.1654 | 0.0436 | 9.9000e-004 | 0.0446 | | 174.3450 | 174.3450 | 5.1700e-003 | | 174.4741 |
| **Total** | **0.0935** | **0.0549** | **0.7255** | **1.7500e-003** | **0.1643** | **1.0800e-003** | **0.1654** | **0.0436** | **9.9000e-004** | **0.0446** | | **174.3450** | **174.3450** | **5.1700e-003** | | **174.4741** |

### 3.4 Paving - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.8219 | 8.7605 | 7.3982 | 0.0114 | | 0.4781 | 0.4781 | | 0.4398 | 0.4398 | | 1,147.044 4 | 1,147.044 4 | 0.3571 | | 1,155.971 6 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.8219** | **8.7605** | **7.3982** | **0.0114** | | **0.4781** | **0.4781** | | **0.4398** | **0.4398** | | **1,147.044 4** | **1,147.044 4** | **0.3571** | | **1,155.971 6** |

## 3.4 Paving - 2018

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.1403 | 0.0823 | 1.0883 | 2.6300e-003 | 0.4606 | 1.6200e-003 | 0.4622 | 0.1179 | 1.4900e-003 | 0.1194 | | 261.5175 | 261.5175 | 7.7500e-003 | | 261.7112 |
| **Total** | **0.1403** | **0.0823** | **1.0883** | **2.6300e-003** | **0.4606** | **1.6200e-003** | **0.4622** | **0.1179** | **1.4900e-003** | **0.1194** | | **261.5175** | **261.5175** | **7.7500e-003** | | **261.7112** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.8219 | 8.7605 | 7.3982 | 0.0114 | | 0.4781 | 0.4781 | | 0.4398 | 0.4398 | 0.0000 | 1,147.0444 | 1,147.0444 | 0.3571 | | 1,155.9716 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.8219** | **8.7605** | **7.3982** | **0.0114** | | **0.4781** | **0.4781** | | **0.4398** | **0.4398** | **0.0000** | **1,147.0444** | **1,147.0444** | **0.3571** | | **1,155.9716** |

### 3.4 Paving - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.1403 | 0.0823 | 1.0883 | 2.6300e-003 | 0.4606 | 1.6200e-003 | 0.4622 | 0.1179 | 1.4900e-003 | 0.1194 | | 261.5175 | 261.5175 | 7.7500e-003 | | 261.7112 |
| **Total** | **0.1403** | **0.0823** | **1.0883** | **2.6300e-003** | **0.4606** | **1.6200e-003** | **0.4622** | **0.1179** | **1.4900e-003** | **0.1194** | | **261.5175** | **261.5175** | **7.7500e-003** | | **261.7112** |

### 3.5 Building Construction - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.1304 | 10.5467 | 7.9488 | 0.0130 | | 0.6614 | 0.6614 | | 0.6294 | 0.6294 | | 1,268.2253 | 1,268.2253 | 0.2458 | | 1,274.3705 |
| **Total** | **1.1304** | **10.5467** | **7.9488** | **0.0130** | | **0.6614** | **0.6614** | | **0.6294** | **0.6294** | | **1,268.2253** | **1,268.2253** | **0.2458** | | **1,274.3705** |

## 3.5 Building Construction - 2018

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0443 | 1.2070 | 0.2460 | 2.7000e-003 | 0.0610 | 8.5700e-003 | 0.0695 | 0.0176 | 8.2000e-003 | 0.0258 | | 282.2921 | 282.2921 | 0.0145 | | 282.6544 |
| Worker | 0.1356 | 0.0796 | 1.0520 | 2.5400e-003 | 0.2382 | 1.5600e-003 | 0.2398 | 0.0632 | 1.4400e-003 | 0.0646 | | 252.8002 | 252.8002 | 7.4900e-003 | | 252.9875 |
| **Total** | **0.1798** | **1.2865** | **1.2980** | **5.2400e-003** | **0.2992** | **0.0101** | **0.3093** | **0.0807** | **9.6400e-003** | **0.0904** | | **535.0923** | **535.0923** | **0.0220** | | **535.6419** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.1304 | 10.5467 | 7.9488 | 0.0130 | | 0.6614 | 0.6614 | | 0.6294 | 0.6294 | 0.0000 | 1,268.2253 | 1,268.2253 | 0.2458 | | 1,274.3705 |
| **Total** | **1.1304** | **10.5467** | **7.9488** | **0.0130** | | **0.6614** | **0.6614** | | **0.6294** | **0.6294** | **0.0000** | **1,268.2253** | **1,268.2253** | **0.2458** | | **1,274.3705** |

## 3.5 Building Construction - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0443 | 1.2070 | 0.2460 | 2.7000e-003 | 0.0610 | 8.5700e-003 | 0.0695 | 0.0176 | 8.2000e-003 | 0.0258 | | 282.2921 | 282.2921 | 0.0145 | | 282.6544 |
| Worker | 0.1356 | 0.0796 | 1.0520 | 2.5400e-003 | 0.2382 | 1.5600e-003 | 0.2398 | 0.0632 | 1.4400e-003 | 0.0646 | | 252.8002 | 252.8002 | 7.4900e-003 | | 252.9875 |
| **Total** | **0.1798** | **1.2865** | **1.2980** | **5.2400e-003** | **0.2992** | **0.0101** | **0.3093** | **0.0807** | **9.6400e-003** | **0.0904** | | **535.0923** | **535.0923** | **0.0220** | | **535.6419** |

## 3.5 Building Construction - 2019

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.9967 | 9.5040 | 7.7920 | 0.0130 | | 0.5685 | 0.5685 | | 0.5411 | 0.5411 | | 1,257.658 1 | 1,257.658 1 | 0.2403 | | 1,263.664 5 |
| **Total** | **0.9967** | **9.5040** | **7.7920** | **0.0130** | | **0.5685** | **0.5685** | | **0.5411** | **0.5411** | | **1,257.658 1** | **1,257.658 1** | **0.2403** | | **1,263.664 5** |

## 3.5 Building Construction - 2019

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0390 | 1.1398 | 0.2190 | 2.6800e-003 | 0.0610 | 6.9500e-003 | 0.0679 | 0.0176 | 6.6500e-003 | 0.0242 | | 279.9192 | 279.9192 | 0.0137 | | 280.2628 |
| Worker | 0.1229 | 0.0699 | 0.9451 | 2.4600e-003 | 0.2382 | 1.5500e-003 | 0.2398 | 0.0632 | 1.4300e-003 | 0.0646 | | 245.2426 | 245.2426 | 6.6600e-003 | | 245.4092 |
| **Total** | **0.1619** | **1.2097** | **1.1641** | **5.1400e-003** | **0.2992** | **8.5000e-003** | **0.3077** | **0.0807** | **8.0800e-003** | **0.0888** | | **525.1618** | **525.1618** | **0.0204** | | **525.6720** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.9967 | 9.5040 | 7.7920 | 0.0130 | | 0.5685 | 0.5685 | | 0.5411 | 0.5411 | 0.0000 | 1,257.658 1 | 1,257.658 1 | 0.2403 | | 1,263.664 5 |
| **Total** | **0.9967** | **9.5040** | **7.7920** | **0.0130** | | **0.5685** | **0.5685** | | **0.5411** | **0.5411** | **0.0000** | **1,257.658 1** | **1,257.658 1** | **0.2403** | | **1,263.664 5** |

## 3.5 Building Construction - 2019

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0390 | 1.1398 | 0.2190 | 2.6800e-003 | 0.0610 | 6.9500e-003 | 0.0679 | 0.0176 | 6.6500e-003 | 0.0242 | | 279.9192 | 279.9192 | 0.0137 | | 280.2628 |
| Worker | 0.1229 | 0.0699 | 0.9451 | 2.4600e-003 | 0.2382 | 1.5500e-003 | 0.2398 | 0.0632 | 1.4300e-003 | 0.0646 | | 245.2426 | 245.2426 | 6.6600e-003 | | 245.4092 |
| **Total** | **0.1619** | **1.2097** | **1.1641** | **5.1400e-003** | **0.2992** | **8.5000e-003** | **0.3077** | **0.0807** | **8.0800e-003** | **0.0888** | | **525.1618** | **525.1618** | **0.0204** | | **525.6720** |

## 3.5 Building Construction - 2020

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.8964 | 8.6399 | 7.6738 | 0.0130 | | 0.4927 | 0.4927 | | 0.4690 | 0.4690 | | 1,243.7840 | 1,243.7840 | 0.2358 | | 1,249.6801 |
| **Total** | **0.8964** | **8.6399** | **7.6738** | **0.0130** | | **0.4927** | **0.4927** | | **0.4690** | **0.4690** | | **1,243.7840** | **1,243.7840** | **0.2358** | | **1,249.6801** |

## 3.5 Building Construction - 2020

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0324 | 1.0545 | 0.1921 | 2.6500e-003 | 0.0610 | 4.6200e-003 | 0.0656 | 0.0176 | 4.4200e-003 | 0.0220 | | 277.7622 | 277.7622 | 0.0127 | | 278.0787 |
| Worker | 0.1126 | 0.0619 | 0.8510 | 2.3800e-003 | 0.2382 | 1.5100e-003 | 0.2397 | 0.0632 | 1.3900e-003 | 0.0646 | | 237.4121 | 237.4121 | 5.8300e-003 | | 237.5579 |
| **Total** | **0.1450** | **1.1164** | **1.0430** | **5.0300e-003** | **0.2992** | **6.1300e-003** | **0.3053** | **0.0807** | **5.8100e-003** | **0.0866** | | **515.1743** | **515.1743** | **0.0185** | | **515.6366** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.8964 | 8.6399 | 7.6738 | 0.0130 | | 0.4927 | 0.4927 | | 0.4690 | 0.4690 | 0.0000 | 1,243.7840 | 1,243.7840 | 0.2358 | | 1,249.6801 |
| **Total** | **0.8964** | **8.6399** | **7.6738** | **0.0130** | | **0.4927** | **0.4927** | | **0.4690** | **0.4690** | **0.0000** | **1,243.7840** | **1,243.7840** | **0.2358** | | **1,249.6801** |

## 3.5 Building Construction - 2020

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0324 | 1.0545 | 0.1921 | 2.6500e-003 | 0.0610 | 4.6200e-003 | 0.0656 | 0.0176 | 4.4200e-003 | 0.0220 | | 277.7622 | 277.7622 | 0.0127 | | 278.0787 |
| Worker | 0.1126 | 0.0619 | 0.8510 | 2.3800e-003 | 0.2382 | 1.5100e-003 | 0.2397 | 0.0632 | 1.3900e-003 | 0.0646 | | 237.4121 | 237.4121 | 5.8300e-003 | | 237.5579 |
| **Total** | **0.1450** | **1.1164** | **1.0430** | **5.0300e-003** | **0.2992** | **6.1300e-003** | **0.3053** | **0.0807** | **5.8100e-003** | **0.0866** | | **515.1743** | **515.1743** | **0.0185** | | **515.6366** |

## 3.6 Architectural Coating - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 4.4180 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2986 | 2.0058 | 1.8542 | 2.9700e-003 | | 0.1506 | 0.1506 | | 0.1506 | 0.1506 | | 281.4485 | 281.4485 | 0.0267 | | 282.1171 |
| **Total** | **4.7166** | **2.0058** | **1.8542** | **2.9700e-003** | | **0.1506** | **0.1506** | | **0.1506** | **0.1506** | | **281.4485** | **281.4485** | **0.0267** | | **282.1171** |

## 3.6 Architectural Coating - 2018

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0281 | 0.0165 | 0.2177 | 5.3000e-004 | 0.0493 | 3.2000e-004 | 0.0496 | 0.0131 | 3.0000e-004 | 0.0134 | | 52.3035 | 52.3035 | 1.5500e-003 | | 52.3422 |
| **Total** | **0.0281** | **0.0165** | **0.2177** | **5.3000e-004** | **0.0493** | **3.2000e-004** | **0.0496** | **0.0131** | **3.0000e-004** | **0.0134** | | **52.3035** | **52.3035** | **1.5500e-003** | | **52.3422** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 4.4180 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2986 | 2.0058 | 1.8542 | 2.9700e-003 | | 0.1506 | 0.1506 | | 0.1506 | 0.1506 | 0.0000 | 281.4485 | 281.4485 | 0.0267 | | 282.1171 |
| **Total** | **4.7166** | **2.0058** | **1.8542** | **2.9700e-003** | | **0.1506** | **0.1506** | | **0.1506** | **0.1506** | **0.0000** | **281.4485** | **281.4485** | **0.0267** | | **282.1171** |

## 3.6 Architectural Coating - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0281 | 0.0165 | 0.2177 | 5.3000e-004 | 0.0493 | 3.2000e-004 | 0.0496 | 0.0131 | 3.0000e-004 | 0.0134 | | 52.3035 | 52.3035 | 1.5500e-003 | | 52.3422 |
| **Total** | **0.0281** | **0.0165** | **0.2177** | **5.3000e-004** | **0.0493** | **3.2000e-004** | **0.0496** | **0.0131** | **3.0000e-004** | **0.0134** | | **52.3035** | **52.3035** | **1.5500e-003** | | **52.3422** |

## 3.6 Architectural Coating - 2019

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 4.4180 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2664 | 1.8354 | 1.8413 | 2.9700e-003 | | 0.1288 | 0.1288 | | 0.1288 | 0.1288 | | 281.4481 | 281.4481 | 0.0238 | | 282.0423 |
| **Total** | **4.6844** | **1.8354** | **1.8413** | **2.9700e-003** | | **0.1288** | **0.1288** | | **0.1288** | **0.1288** | | **281.4481** | **281.4481** | **0.0238** | | **282.0423** |

## 3.6 Architectural Coating - 2019

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0254 | 0.0145 | 0.1955 | 5.1000e-004 | 0.0493 | 3.2000e-004 | 0.0496 | 0.0131 | 2.9000e-004 | 0.0134 | | 50.7398 | 50.7398 | 1.3800e-003 | | 50.7743 |
| **Total** | **0.0254** | **0.0145** | **0.1955** | **5.1000e-004** | **0.0493** | **3.2000e-004** | **0.0496** | **0.0131** | **2.9000e-004** | **0.0134** | | **50.7398** | **50.7398** | **1.3800e-003** | | **50.7743** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 4.4180 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2664 | 1.8354 | 1.8413 | 2.9700e-003 | | 0.1288 | 0.1288 | | 0.1288 | 0.1288 | 0.0000 | 281.4481 | 281.4481 | 0.0238 | | 282.0423 |
| **Total** | **4.6844** | **1.8354** | **1.8413** | **2.9700e-003** | | **0.1288** | **0.1288** | | **0.1288** | **0.1288** | **0.0000** | **281.4481** | **281.4481** | **0.0238** | | **282.0423** |

## 3.6 Architectural Coating - 2019

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0254 | 0.0145 | 0.1955 | 5.1000e-004 | 0.0493 | 3.2000e-004 | 0.0496 | 0.0131 | 2.9000e-004 | 0.0134 | | 50.7398 | 50.7398 | 1.3800e-003 | | 50.7743 |
| **Total** | **0.0254** | **0.0145** | **0.1955** | **5.1000e-004** | **0.0493** | **3.2000e-004** | **0.0496** | **0.0131** | **2.9000e-004** | **0.0134** | | **50.7398** | **50.7398** | **1.3800e-003** | | **50.7743** |

## 3.6 Architectural Coating - 2020

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 4.4180 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2422 | 1.6838 | 1.8314 | 2.9700e-003 | | 0.1109 | 0.1109 | | 0.1109 | 0.1109 | | 281.4481 | 281.4481 | 0.0218 | | 281.9928 |
| **Total** | **4.6601** | **1.6838** | **1.8314** | **2.9700e-003** | | **0.1109** | **0.1109** | | **0.1109** | **0.1109** | | **281.4481** | **281.4481** | **0.0218** | | **281.9928** |

## 3.6 Architectural Coating - 2020

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0233 | 0.0128 | 0.1761 | 4.9000e-004 | 0.0493 | 3.1000e-004 | 0.0496 | 0.0131 | 2.9000e-004 | 0.0134 | | 49.1198 | 49.1198 | 1.2100e-003 | | 49.1499 |
| **Total** | **0.0233** | **0.0128** | **0.1761** | **4.9000e-004** | **0.0493** | **3.1000e-004** | **0.0496** | **0.0131** | **2.9000e-004** | **0.0134** | | **49.1198** | **49.1198** | **1.2100e-003** | | **49.1499** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 4.4180 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2422 | 1.6838 | 1.8314 | 2.9700e-003 | | 0.1109 | 0.1109 | | 0.1109 | 0.1109 | 0.0000 | 281.4481 | 281.4481 | 0.0218 | | 281.9928 |
| **Total** | **4.6601** | **1.6838** | **1.8314** | **2.9700e-003** | | **0.1109** | **0.1109** | | **0.1109** | **0.1109** | **0.0000** | **281.4481** | **281.4481** | **0.0218** | | **281.9928** |

## 3.6 Architectural Coating - 2020

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0233 | 0.0128 | 0.1761 | 4.9000e-004 | 0.0493 | 3.1000e-004 | 0.0496 | 0.0131 | 2.9000e-004 | 0.0134 | | 49.1198 | 49.1198 | 1.2100e-003 | | 49.1499 |
| **Total** | **0.0233** | **0.0128** | **0.1761** | **4.9000e-004** | **0.0493** | **3.1000e-004** | **0.0496** | **0.0131** | **2.9000e-004** | **0.0134** | | **49.1198** | **49.1198** | **1.2100e-003** | | **49.1499** |

## 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile

Increase Density

Improve Walkability Design

Improve Destination Accessibility

Increase Transit Accessibility

Improve Pedestrian Network

Provide Traffic Calming Measures

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 1.5580 | 8.0835 | 12.3051 | 0.0408 | 2.6613 | 0.0418 | 2.7032 | 0.7132 | 0.0395 | 0.7527 | | 4,132.092 3 | 4,132.092 3 | 0.1972 | | 4,137.022 9 |
| Unmitigated | 1.5841 | 8.3027 | 12.9484 | 0.0433 | 2.8586 | 0.0444 | 2.9030 | 0.7661 | 0.0419 | 0.8080 | | 4,386.700 9 | 4,386.700 9 | 0.2037 | | 4,391.793 8 |

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| Single Family Housing | 771.12 | 802.71 | 698.22 | 1,276,692 | 1,188,601 |
| Total | 771.12 | 802.71 | 698.22 | 1,276,692 | 1,188,601 |

## 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| Single Family Housing | 6.29 | 4.25 | 4.37 | 42.60 | 21.00 | 36.40 | 86 | 11 | 3 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 0.489257 | 0.041257 | 0.220156 | 0.132626 | 0.025790 | 0.006586 | 0.027831 | 0.045583 | 0.001467 | 0.001229 | 0.006102 | 0.000783 | 0.001333 |

# 5.0 Energy Detail

Historical Energy Use: N

## 5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

---

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| NaturalGas Mitigated | 0.0660 | 0.5643 | 0.2401 | 3.6000e-003 | | 0.0456 | 0.0456 | | 0.0456 | 0.0456 | | 720.3906 | 720.3906 | 0.0138 | 0.0132 | 724.6715 |
| NaturalGas Unmitigated | 0.0766 | 0.6542 | 0.2784 | 4.1800e-003 | | 0.0529 | 0.0529 | | 0.0529 | 0.0529 | | 835.1386 | 835.1386 | 0.0160 | 0.0153 | 840.1014 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| Single Family Housing | 7098.68 | 0.0766 | 0.6542 | 0.2784 | 4.1800e-003 | | 0.0529 | 0.0529 | | 0.0529 | 0.0529 | | 835.1386 | 835.1386 | 0.0160 | 0.0153 | 840.1014 |
| **Total** | | **0.0766** | **0.6542** | **0.2784** | **4.1800e-003** | | **0.0529** | **0.0529** | | **0.0529** | **0.0529** | | **835.1386** | **835.1386** | **0.0160** | **0.0153** | **840.1014** |

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| Single Family Housing | 6.12332 | 0.0660 | 0.5643 | 0.2401 | 3.6000e-003 | | 0.0456 | 0.0456 | | 0.0456 | 0.0456 | | 720.3906 | 720.3906 | 0.0138 | 0.0132 | 724.6715 |
| **Total** | | **0.0660** | **0.5643** | **0.2401** | **3.6000e-003** | | **0.0456** | **0.0456** | | **0.0456** | **0.0456** | | **720.3906** | **720.3906** | **0.0138** | **0.0132** | **724.6715** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 3.9657 | 1.2868 | 7.2194 | 8.0700e-003 | | 0.1346 | 0.1346 | | 0.1346 | 0.1346 | 0.0000 | 1,555.7974 | 1,555.7974 | 0.0413 | 0.0283 | 1,565.2646 |
| Unmitigated | 127.7862 | 2.4984 | 159.7224 | 0.2776 | | 21.4914 | 21.4914 | | 21.4914 | 21.4914 | 2,249.5102 | 955.4445 | 3,204.9547 | 2.0877 | 0.1769 | 3,309.8745 |

## 6.2 Area by SubCategory

**Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 0.4999 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 3.1201 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 123.9620 | 2.4208 | 153.0176 | 0.2772 | | 21.4545 | 21.4545 | | 21.4545 | 21.4545 | 2,249.510 2 | 943.4118 | 3,192.922 0 | 2.0759 | 0.1769 | 3,297.548 5 |
| Landscaping | 0.2042 | 0.0776 | 6.7048 | 3.5000e-004 | | 0.0369 | 0.0369 | | 0.0369 | 0.0369 | | 12.0327 | 12.0327 | 0.0117 | | 12.3261 |
| **Total** | **127.7862** | **2.4984** | **159.7224** | **0.2776** | | **21.4914** | **21.4914** | | **21.4914** | **21.4914** | **2,249.510 2** | **955.4445** | **3,204.954 7** | **2.0877** | **0.1769** | **3,309.874 5** |

## 6.2 Area by SubCategory

**Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 0.4999 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 3.1201 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 0.1415 | 1.2093 | 0.5146 | 7.7200e-003 | | 0.0978 | 0.0978 | | 0.0978 | 0.0978 | 0.0000 | 1,543.7647 | 1,543.7647 | 0.0296 | 0.0283 | 1,552.9385 |
| Landscaping | 0.2042 | 0.0776 | 6.7048 | 3.5000e-004 | | 0.0369 | 0.0369 | | 0.0369 | 0.0369 | | 12.0327 | 12.0327 | 0.0117 | | 12.3261 |
| **Total** | **3.9657** | **1.2868** | **7.2194** | **8.0700e-003** | | **0.1346** | **0.1346** | | **0.1346** | **0.1346** | **0.0000** | **1,555.7975** | **1,555.7975** | **0.0413** | **0.0283** | **1,565.2646** |

## 7.0 Water Detail

### 7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

## 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

# Fullerton Ranch Project

**Placer County APCD Air District, Winter**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Single Family Housing | 81.00 | Dwelling Unit | 19.70 | 145,800.00 | 209 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 74 |
| **Climate Zone** | 2 | | | **Operational Year** | 2020 |
| **Utility Company** | Pacific Gas & Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 290 | **CH4 Intensity (lb/MWhr)** | 0.029 | **N2O Intensity (lb/MWhr)** | 0.006 |

### 1.3 User Entered Comments & Non-Default Data

Fullerton Ranch Project - Placer County APCD Air District, Winter

Project Characteristics - See assumptions in Appendix B

Land Use - See assumptions in Appendix B

Construction Phase - See assumptions in Appendix B

Off-road Equipment -

Off-road Equipment - See assumptions in Appendix B

Off-road Equipment - See assumptions in Appendix B

Off-road Equipment - See assumptions in Appendix B

Off-road Equipment - See assumptions in Appendix B

Off-road Equipment - See assumptions in Appendix B

Grading - See assumptions in Appendix B

Vehicle Trips - See assumptions in Appendix B

Woodstoves - See assumptions in Appendix B

Energy Use - See assumptions in Appendix B

Land Use Change -

Sequestration -

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Mobile Commute Mitigation - See assumptions in Appendix B

Area Mitigation -

Energy Mitigation -

Water Mitigation -

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblAreaMitigation | UseLowVOCPaintParkingCheck | False | True |
| tblConstDustMitigation | WaterUnpavedRoadVehicleSpeed | 40 | 5 |
| tblConstructionPhase | NumDays | 20.00 | 413.00 |

| | | | |
|---|---|---|---|
| tblConstructionPhase | NumDays | 300.00 | 413.00 |
| tblConstructionPhase | NumDays | 30.00 | 60.00 |
| tblConstructionPhase | NumDays | 20.00 | 10.00 |
| tblConstructionPhase | NumDays | 10.00 | 4.00 |
| tblConstructionPhase | PhaseEndDate | 7/13/2020 | 5/12/2020 |
| tblConstructionPhase | PhaseEndDate | 4/6/2020 | 3/6/2020 |
| tblConstructionPhase | PhaseEndDate | 7/30/2018 | 7/26/2018 |
| tblConstructionPhase | PhaseEndDate | 5/25/2020 | 8/8/2018 |
| tblConstructionPhase | PhaseEndDate | 5/28/2018 | 5/4/2018 |
| tblConstructionPhase | PhaseStartDate | 5/26/2020 | 10/12/2018 |
| tblConstructionPhase | PhaseStartDate | 7/31/2018 | 8/8/2018 |
| tblConstructionPhase | PhaseStartDate | 5/29/2018 | 5/4/2018 |
| tblConstructionPhase | PhaseStartDate | 4/7/2020 | 7/26/2018 |
| tblGrading | AcresOfGrading | 90.00 | 19.70 |
| tblGrading | AcresOfGrading | 0.00 | 19.70 |
| tblLandUse | LotAcreage | 26.30 | 19.70 |
| tblLandUse | Population | 232.00 | 209.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 3.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 3.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 3.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 4.00 | 2.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 1.00 | 0.00 |

| | | | |
|---|---|---|---|
| tblOffRoadEquipment | UsageHours | 7.00 | 3.00 |
| tblProjectCharacteristics | CO2IntensityFactor | 641.35 | 290 |
| tblProjectCharacteristics | OperationalYear | 2018 | 2020 |
| tblTripsAndVMT | WorkerTripNumber | 8.00 | 18.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 20.00 |
| tblTripsAndVMT | WorkerTripNumber | 8.00 | 15.00 |
| tblTripsAndVMT | WorkerTripNumber | 8.00 | 15.00 |
| tblVehicleTrips | HO_TL | 7.50 | 4.37 |
| tblVehicleTrips | HS_TL | 7.30 | 4.25 |
| tblVehicleTrips | HW_TL | 10.80 | 6.29 |

## 2.0 Emissions Summary

## 2.1 Overall Construction (Maximum Daily Emission)

**Unmitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2018 | 6.0523 | 60.6508 | 34.2724 | 0.0615 | 17.9275 | 2.8734 | 20.8009 | 7.3048 | 2.6435 | 9.9483 | 0.0000 | 6,187.525 2 | 6,187.525 2 | 1.8435 | 0.0000 | 6,233.612 9 |
| 2019 | 5.8658 | 12.6001 | 10.9277 | 0.0212 | 0.3485 | 0.7063 | 1.0547 | 0.0938 | 0.6784 | 0.7722 | 0.0000 | 2,073.243 9 | 2,073.243 9 | 0.2869 | 0.0000 | 2,080.416 4 |
| 2020 | 5.7223 | 11.4828 | 10.6581 | 0.0211 | 0.3485 | 0.6103 | 0.9587 | 0.0938 | 0.5862 | 0.6800 | 0.0000 | 2,048.767 0 | 2,048.767 0 | 0.2784 | 0.0000 | 2,055.725 7 |
| **Maximum** | **6.0523** | **60.6508** | **34.2724** | **0.0615** | **17.9275** | **2.8734** | **20.8009** | **7.3048** | **2.6435** | **9.9483** | **0.0000** | **6,187.525 2** | **6,187.525 2** | **1.8435** | **0.0000** | **6,233.612 9** |

**Mitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2018 | 6.0523 | 60.6508 | 34.2724 | 0.0615 | 7.1822 | 2.8734 | 10.0555 | 2.8994 | 2.6435 | 5.5429 | 0.0000 | 6,187.525 2 | 6,187.525 2 | 1.8435 | 0.0000 | 6,233.612 9 |
| 2019 | 5.8658 | 12.6001 | 10.9277 | 0.0212 | 0.3485 | 0.7063 | 1.0547 | 0.0938 | 0.6784 | 0.7722 | 0.0000 | 2,073.243 9 | 2,073.243 9 | 0.2869 | 0.0000 | 2,080.416 4 |
| 2020 | 5.7223 | 11.4828 | 10.6581 | 0.0211 | 0.3485 | 0.6103 | 0.9587 | 0.0938 | 0.5862 | 0.6800 | 0.0000 | 2,048.767 0 | 2,048.767 0 | 0.2784 | 0.0000 | 2,055.725 7 |
| **Maximum** | **6.0523** | **60.6508** | **34.2724** | **0.0615** | **7.1822** | **2.8734** | **10.0555** | **2.8994** | **2.6435** | **5.5429** | **0.0000** | **6,187.525 2** | **6,187.525 2** | **1.8435** | **0.0000** | **6,233.612 9** |

Fullerton Ranch Project - Placer County APCD Air District, Winter

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Reduction | 0.00 | 0.00 | 0.00 | 0.00 | 57.69 | 0.00 | 47.10 | 58.80 | 0.00 | 38.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 2.2 Overall Operational

### Unmitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 127.7862 | 2.4984 | 159.7224 | 0.2776 | | 21.4914 | 21.4914 | | 21.4914 | 21.4914 | 2,249.5102 | 955.4445 | 3,204.9547 | 2.0877 | 0.1769 | 3,309.8745 |
| Energy | 0.0766 | 0.6542 | 0.2784 | 4.1800e-003 | | 0.0529 | 0.0529 | | 0.0529 | 0.0529 | | 835.1386 | 835.1386 | 0.0160 | 0.0153 | 840.1014 |
| Mobile | 1.2526 | 8.5518 | 13.3853 | 0.0397 | 2.8586 | 0.0454 | 2.9040 | 0.7661 | 0.0428 | 0.8089 | | 4,023.6201 | 4,023.6201 | 0.2180 | | 4,029.0690 |
| **Total** | **129.1153** | **11.7043** | **173.3862** | **0.3215** | **2.8586** | **21.5897** | **24.4483** | **0.7661** | **21.5871** | **22.3532** | **2,249.5102** | **5,814.2032** | **8,063.7134** | **2.3216** | **0.1923** | **8,179.0450** |

### Mitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 3.9657 | 1.2868 | 7.2194 | 8.0700e-003 | | 0.1346 | 0.1346 | | 0.1346 | 0.1346 | 0.0000 | 1,555.7974 | 1,555.7974 | 0.0413 | 0.0283 | 1,565.2646 |
| Energy | 0.0660 | 0.5643 | 0.2401 | 3.6000e-003 | | 0.0456 | 0.0456 | | 0.0456 | 0.0456 | | 720.3906 | 720.3906 | 0.0138 | 0.0132 | 724.6715 |
| Mobile | 1.2269 | 8.3078 | 12.8401 | 0.0374 | 2.6613 | 0.0428 | 2.7041 | 0.7132 | 0.0404 | 0.7536 | | 3,788.8784 | 3,788.8784 | 0.2120 | | 3,794.1770 |
| **Total** | **5.2586** | **10.1589** | **20.2997** | **0.0491** | **2.6613** | **0.2231** | **2.8844** | **0.7132** | **0.2207** | **0.9339** | **0.0000** | **6,065.0664** | **6,065.0664** | **0.2671** | **0.0415** | **6,084.1132** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Reduction | 95.93 | 13.20 | 88.29 | 84.74 | 6.90 | 98.97 | 88.20 | 6.90 | 98.98 | 95.82 | 100.00 | -4.31 | 24.79 | 88.50 | 78.41 | 25.61 |

## 3.0 Construction Detail

**Construction Phase**

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Site Preparation | Site Preparation | 5/1/2018 | 5/4/2018 | 5 | 4 | |
| 2 | Grading | Grading | 5/4/2018 | 7/26/2018 | 5 | 60 | |
| 3 | Paving | Paving | 7/26/2018 | 8/8/2018 | 5 | 10 | |
| 4 | Building Construction | Building Construction | 8/8/2018 | 3/6/2020 | 5 | 413 | |
| 5 | Architectural Coating | Architectural Coating | 10/12/2018 | 5/12/2020 | 5 | 413 | |

**Acres of Grading (Site Preparation Phase): 19.7**

**Acres of Grading (Grading Phase): 19.7**

**Acres of Paving: 0**

**Residential Indoor: 295,245; Residential Outdoor: 98,415; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)**

**OffRoad Equipment**

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 1 | 8.00 | 367 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Paving | Pavers | 1 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 1 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 1 | 8.00 | 80 | 0.38 |
| Building Construction | Cranes | 1 | 3.00 | 231 | 0.29 |
| Building Construction | Forklifts | 1 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 1 | 7.00 | 97 | 0.37 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |
| Building Construction | Welders | 0 | 8.00 | 46 | 0.45 |

**Trips and VMT**

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Site Preparation | 3 | 18.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 6 | 20.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 3 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 3 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 4 | 29.00 | 9.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 6.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

## 3.2 Site Preparation - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 11.2451 | 0.0000 | 11.2451 | 3.8742 | 0.0000 | 3.8742 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.6983 | 17.8194 | 9.0499 | 0.0148 | | 0.9832 | 0.9832 | | 0.9045 | 0.9045 | | 1,485.725 3 | 1,485.725 3 | 0.4625 | | 1,497.288 4 |
| **Total** | **1.6983** | **17.8194** | **9.0499** | **0.0148** | **11.2451** | **0.9832** | **12.2282** | **3.8742** | **0.9045** | **4.7787** | | **1,485.725 3** | **1,485.725 3** | **0.4625** | | **1,497.288 4** |

## 3.2 Site Preparation - 2018

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0816 | 0.0620 | 0.5952 | 1.4000e-003 | 0.1479 | 9.7000e-004 | 0.1488 | 0.0392 | 9.0000e-004 | 0.0401 | | 139.7114 | 139.7114 | 4.3000e-003 | | 139.8188 |
| **Total** | **0.0816** | **0.0620** | **0.5952** | **1.4000e-003** | **0.1479** | **9.7000e-004** | **0.1488** | **0.0392** | **9.0000e-004** | **0.0401** | | **139.7114** | **139.7114** | **4.3000e-003** | | **139.8188** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 4.3856 | 0.0000 | 4.3856 | 1.5109 | 0.0000 | 1.5109 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.6983 | 17.8194 | 9.0499 | 0.0148 | | 0.9832 | 0.9832 | | 0.9045 | 0.9045 | 0.0000 | 1,485.725 3 | 1,485.725 3 | 0.4625 | | 1,497.288 4 |
| **Total** | **1.6983** | **17.8194** | **9.0499** | **0.0148** | **4.3856** | **0.9832** | **5.3687** | **1.5109** | **0.9045** | **2.4155** | **0.0000** | **1,485.725 3** | **1,485.725 3** | **0.4625** | | **1,497.288 4** |

## 3.2 Site Preparation - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0816 | 0.0620 | 0.5952 | 1.4000e-003 | 0.1479 | 9.7000e-004 | 0.1488 | 0.0392 | 9.0000e-004 | 0.0401 | | 139.7114 | 139.7114 | 4.3000e-003 | | 139.8188 |
| **Total** | **0.0816** | **0.0620** | **0.5952** | **1.4000e-003** | **0.1479** | **9.7000e-004** | **0.1488** | **0.0392** | **9.0000e-004** | **0.0401** | | **139.7114** | **139.7114** | **4.3000e-003** | | **139.8188** |

## 3.3 Grading - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 6.3703 | 0.0000 | 6.3703 | 3.3478 | 0.0000 | 3.3478 | | | 0.0000 | | | 0.0000 |
| Off-Road | 3.6771 | 42.7005 | 23.9659 | 0.0438 | | 1.8882 | 1.8882 | | 1.7371 | 1.7371 | | 4,406.853 6 | 4,406.853 6 | 1.3719 | | 4,441.151 4 |
| **Total** | **3.6771** | **42.7005** | **23.9659** | **0.0438** | **6.3703** | **1.8882** | **8.2584** | **3.3478** | **1.7371** | **5.0849** | | **4,406.853 6** | **4,406.853 6** | **1.3719** | | **4,441.151 4** |

## 3.3 Grading - 2018

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0907 | 0.0689 | 0.6614 | 1.5600e-003 | 0.1643 | 1.0800e-003 | 0.1654 | 0.0436 | 9.9000e-004 | 0.0446 | | 155.2349 | 155.2349 | 4.7700e-003 | | 155.3542 |
| **Total** | **0.0907** | **0.0689** | **0.6614** | **1.5600e-003** | **0.1643** | **1.0800e-003** | **0.1654** | **0.0436** | **9.9000e-004** | **0.0446** | | **155.2349** | **155.2349** | **4.7700e-003** | | **155.3542** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 2.4844 | 0.0000 | 2.4844 | 1.3057 | 0.0000 | 1.3057 | | | 0.0000 | | | 0.0000 |
| Off-Road | 3.6771 | 42.7005 | 23.9659 | 0.0438 | | 1.8882 | 1.8882 | | 1.7371 | 1.7371 | 0.0000 | 4,406.853 6 | 4,406.853 6 | 1.3719 | | 4,441.151 4 |
| **Total** | **3.6771** | **42.7005** | **23.9659** | **0.0438** | **2.4844** | **1.8882** | **4.3726** | **1.3057** | **1.7371** | **3.0428** | **0.0000** | **4,406.853 6** | **4,406.853 6** | **1.3719** | | **4,441.151 4** |

Fullerton Ranch Project - Placer County APCD Air District, Winter

## 3.3 Grading - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0907 | 0.0689 | 0.6614 | 1.5600e-003 | 0.1643 | 1.0800e-003 | 0.1654 | 0.0436 | 9.9000e-004 | 0.0446 | | 155.2349 | 155.2349 | 4.7700e-003 | | 155.3542 |
| **Total** | **0.0907** | **0.0689** | **0.6614** | **1.5600e-003** | **0.1643** | **1.0800e-003** | **0.1654** | **0.0436** | **9.9000e-004** | **0.0446** | | **155.2349** | **155.2349** | **4.7700e-003** | | **155.3542** |

## 3.4 Paving - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.8219 | 8.7605 | 7.3982 | 0.0114 | | 0.4781 | 0.4781 | | 0.4398 | 0.4398 | | 1,147.0444 | 1,147.0444 | 0.3571 | | 1,155.9716 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.8219** | **8.7605** | **7.3982** | **0.0114** | | **0.4781** | **0.4781** | | **0.4398** | **0.4398** | | **1,147.0444** | **1,147.0444** | **0.3571** | | **1,155.9716** |

## 3.4 Paving - 2018

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.1360 | 0.1033 | 0.9921 | 2.3400e-003 | 0.4606 | 1.6200e-003 | 0.4622 | 0.1179 | 1.4900e-003 | 0.1194 | | 232.8524 | 232.8524 | 7.1600e-003 | | 233.0314 |
| **Total** | **0.1360** | **0.1033** | **0.9921** | **2.3400e-003** | **0.4606** | **1.6200e-003** | **0.4622** | **0.1179** | **1.4900e-003** | **0.1194** | | **232.8524** | **232.8524** | **7.1600e-003** | | **233.0314** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.8219 | 8.7605 | 7.3982 | 0.0114 | | 0.4781 | 0.4781 | | 0.4398 | 0.4398 | 0.0000 | 1,147.0444 | 1,147.0444 | 0.3571 | | 1,155.9716 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.8219** | **8.7605** | **7.3982** | **0.0114** | | **0.4781** | **0.4781** | | **0.4398** | **0.4398** | **0.0000** | **1,147.0444** | **1,147.0444** | **0.3571** | | **1,155.9716** |

## 3.4 Paving - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.1360 | 0.1033 | 0.9921 | 2.3400e-003 | 0.4606 | 1.6200e-003 | 0.4622 | 0.1179 | 1.4900e-003 | 0.1194 | | 232.8524 | 232.8524 | 7.1600e-003 | | 233.0314 |
| **Total** | **0.1360** | **0.1033** | **0.9921** | **2.3400e-003** | **0.4606** | **1.6200e-003** | **0.4622** | **0.1179** | **1.4900e-003** | **0.1194** | | **232.8524** | **232.8524** | **7.1600e-003** | | **233.0314** |

## 3.5 Building Construction - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.1304 | 10.5467 | 7.9488 | 0.0130 | | 0.6614 | 0.6614 | | 0.6294 | 0.6294 | | 1,268.2253 | 1,268.2253 | 0.2458 | | 1,274.3705 |
| **Total** | **1.1304** | **10.5467** | **7.9488** | **0.0130** | | **0.6614** | **0.6614** | | **0.6294** | **0.6294** | | **1,268.2253** | **1,268.2253** | **0.2458** | | **1,274.3705** |

## 3.5 Building Construction - 2018

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0466 | 1.2252 | 0.2952 | 2.6100e-003 | 0.0610 | 8.7600e-003 | 0.0697 | 0.0176 | 8.3800e-003 | 0.0259 | | 272.9902 | 272.9902 | 0.0163 | | 273.3975 |
| Worker | 0.1315 | 0.0999 | 0.9590 | 2.2600e-003 | 0.2382 | 1.5600e-003 | 0.2398 | 0.0632 | 1.4400e-003 | 0.0646 | | 225.0906 | 225.0906 | 6.9200e-003 | | 225.2636 |
| **Total** | **0.1781** | **1.3251** | **1.2542** | **4.8700e-003** | **0.2992** | **0.0103** | **0.3095** | **0.0807** | **9.8200e-003** | **0.0906** | | **498.0809** | **498.0809** | **0.0232** | | **498.6611** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.1304 | 10.5467 | 7.9488 | 0.0130 | | 0.6614 | 0.6614 | | 0.6294 | 0.6294 | 0.0000 | 1,268.225 3 | 1,268.225 3 | 0.2458 | | 1,274.370 5 |
| **Total** | **1.1304** | **10.5467** | **7.9488** | **0.0130** | | **0.6614** | **0.6614** | | **0.6294** | **0.6294** | **0.0000** | **1,268.225 3** | **1,268.225 3** | **0.2458** | | **1,274.370 5** |

## 3.5 Building Construction - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0466 | 1.2252 | 0.2952 | 2.6100e-003 | 0.0610 | 8.7600e-003 | 0.0697 | 0.0176 | 8.3800e-003 | 0.0259 | | 272.9902 | 272.9902 | 0.0163 | | 273.3975 |
| Worker | 0.1315 | 0.0999 | 0.9590 | 2.2600e-003 | 0.2382 | 1.5600e-003 | 0.2398 | 0.0632 | 1.4400e-003 | 0.0646 | | 225.0906 | 225.0906 | 6.9200e-003 | | 225.2636 |
| **Total** | **0.1781** | **1.3251** | **1.2542** | **4.8700e-003** | **0.2992** | **0.0103** | **0.3095** | **0.0807** | **9.8200e-003** | **0.0906** | | **498.0809** | **498.0809** | **0.0232** | | **498.6611** |

## 3.5 Building Construction - 2019

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.9967 | 9.5040 | 7.7920 | 0.0130 | | 0.5685 | 0.5685 | | 0.5411 | 0.5411 | | 1,257.658 1 | 1,257.658 1 | 0.2403 | | 1,263.664 5 |
| **Total** | **0.9967** | **9.5040** | **7.7920** | **0.0130** | | **0.5685** | **0.5685** | | **0.5411** | **0.5411** | | **1,257.658 1** | **1,257.658 1** | **0.2403** | | **1,263.664 5** |

## 3.5 Building Construction - 2019

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0411 | 1.1548 | 0.2642 | 2.5900e-003 | 0.0610 | 7.1200e-003 | 0.0681 | 0.0176 | 6.8100e-003 | 0.0244 | | 270.6207 | 270.6207 | 0.0155 | | 271.0081 |
| Worker | 0.1190 | 0.0877 | 0.8536 | 2.1900e-003 | 0.2382 | 1.5500e-003 | 0.2398 | 0.0632 | 1.4300e-003 | 0.0646 | | 218.3427 | 218.3427 | 6.1100e-003 | | 218.4956 |
| **Total** | **0.1601** | **1.2426** | **1.1178** | **4.7800e-003** | **0.2992** | **8.6700e-003** | **0.3079** | **0.0807** | **8.2400e-003** | **0.0890** | | **488.9635** | **488.9635** | **0.0216** | | **489.5036** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.9967 | 9.5040 | 7.7920 | 0.0130 | | 0.5685 | 0.5685 | | 0.5411 | 0.5411 | 0.0000 | 1,257.658 1 | 1,257.658 1 | 0.2403 | | 1,263.664 5 |
| **Total** | **0.9967** | **9.5040** | **7.7920** | **0.0130** | | **0.5685** | **0.5685** | | **0.5411** | **0.5411** | **0.0000** | **1,257.658 1** | **1,257.658 1** | **0.2403** | | **1,263.664 5** |

## 3.5 Building Construction - 2019

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0411 | 1.1548 | 0.2642 | 2.5900e-003 | 0.0610 | 7.1200e-003 | 0.0681 | 0.0176 | 6.8100e-003 | 0.0244 | | 270.6207 | 270.6207 | 0.0155 | | 271.0081 |
| Worker | 0.1190 | 0.0877 | 0.8536 | 2.1900e-003 | 0.2382 | 1.5500e-003 | 0.2398 | 0.0632 | 1.4300e-003 | 0.0646 | | 218.3427 | 218.3427 | 6.1100e-003 | | 218.4956 |
| **Total** | **0.1601** | **1.2426** | **1.1178** | **4.7800e-003** | **0.2992** | **8.6700e-003** | **0.3079** | **0.0807** | **8.2400e-003** | **0.0890** | | **488.9635** | **488.9635** | **0.0216** | | **489.5036** |

## 3.5 Building Construction - 2020

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.8964 | 8.6399 | 7.6738 | 0.0130 | | 0.4927 | 0.4927 | | 0.4690 | 0.4690 | | 1,243.7840 | 1,243.7840 | 0.2358 | | 1,249.6801 |
| **Total** | **0.8964** | **8.6399** | **7.6738** | **0.0130** | | **0.4927** | **0.4927** | | **0.4690** | **0.4690** | | **1,243.7840** | **1,243.7840** | **0.2358** | | **1,249.6801** |

## 3.5 Building Construction - 2020

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0343 | 1.0654 | 0.2328 | 2.5700e-003 | 0.0610 | 4.7500e-003 | 0.0657 | 0.0176 | 4.5400e-003 | 0.0221 | | 268.4463 | 268.4463 | 0.0143 | | 268.8042 |
| Worker | 0.1089 | 0.0776 | 0.7623 | 2.1200e-003 | 0.2382 | 1.5100e-003 | 0.2397 | 0.0632 | 1.3900e-003 | 0.0646 | | 211.3592 | 211.3592 | 5.3000e-003 | | 211.4917 |
| **Total** | **0.1432** | **1.1430** | **0.9952** | **4.6900e-003** | **0.2992** | **6.2600e-003** | **0.3055** | **0.0807** | **5.9300e-003** | **0.0867** | | **479.8055** | **479.8055** | **0.0196** | | **480.2959** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.8964 | 8.6399 | 7.6738 | 0.0130 | | 0.4927 | 0.4927 | | 0.4690 | 0.4690 | 0.0000 | 1,243.7840 | 1,243.7840 | 0.2358 | | 1,249.6801 |
| **Total** | **0.8964** | **8.6399** | **7.6738** | **0.0130** | | **0.4927** | **0.4927** | | **0.4690** | **0.4690** | **0.0000** | **1,243.7840** | **1,243.7840** | **0.2358** | | **1,249.6801** |

## 3.5 Building Construction - 2020

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0343 | 1.0654 | 0.2328 | 2.5700e-003 | 0.0610 | 4.7500e-003 | 0.0657 | 0.0176 | 4.5400e-003 | 0.0221 | | 268.4463 | 268.4463 | 0.0143 | | 268.8042 |
| Worker | 0.1089 | 0.0776 | 0.7623 | 2.1200e-003 | 0.2382 | 1.5100e-003 | 0.2397 | 0.0632 | 1.3900e-003 | 0.0646 | | 211.3592 | 211.3592 | 5.3000e-003 | | 211.4917 |
| **Total** | **0.1432** | **1.1430** | **0.9952** | **4.6900e-003** | **0.2992** | **6.2600e-003** | **0.3055** | **0.0807** | **5.9300e-003** | **0.0867** | | **479.8055** | **479.8055** | **0.0196** | | **480.2959** |

## 3.6 Architectural Coating - 2018

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 4.4180 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2986 | 2.0058 | 1.8542 | 2.9700e-003 | | 0.1506 | 0.1506 | | 0.1506 | 0.1506 | | 281.4485 | 281.4485 | 0.0267 | | 282.1171 |
| **Total** | **4.7166** | **2.0058** | **1.8542** | **2.9700e-003** | | **0.1506** | **0.1506** | | **0.1506** | **0.1506** | | **281.4485** | **281.4485** | **0.0267** | | **282.1171** |

## 3.6 Architectural Coating - 2018

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0272 | 0.0207 | 0.1984 | 4.7000e-004 | 0.0493 | 3.2000e-004 | 0.0496 | 0.0131 | 3.0000e-004 | 0.0134 | | 46.5705 | 46.5705 | 1.4300e-003 | | 46.6063 |
| **Total** | **0.0272** | **0.0207** | **0.1984** | **4.7000e-004** | **0.0493** | **3.2000e-004** | **0.0496** | **0.0131** | **3.0000e-004** | **0.0134** | | **46.5705** | **46.5705** | **1.4300e-003** | | **46.6063** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 4.4180 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2986 | 2.0058 | 1.8542 | 2.9700e-003 | | 0.1506 | 0.1506 | | 0.1506 | 0.1506 | 0.0000 | 281.4485 | 281.4485 | 0.0267 | | 282.1171 |
| **Total** | **4.7166** | **2.0058** | **1.8542** | **2.9700e-003** | | **0.1506** | **0.1506** | | **0.1506** | **0.1506** | **0.0000** | **281.4485** | **281.4485** | **0.0267** | | **282.1171** |

## 3.6 Architectural Coating - 2018

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0272 | 0.0207 | 0.1984 | 4.7000e-004 | 0.0493 | 3.2000e-004 | 0.0496 | 0.0131 | 3.0000e-004 | 0.0134 | | 46.5705 | 46.5705 | 1.4300e-003 | | 46.6063 |
| **Total** | **0.0272** | **0.0207** | **0.1984** | **4.7000e-004** | **0.0493** | **3.2000e-004** | **0.0496** | **0.0131** | **3.0000e-004** | **0.0134** | | **46.5705** | **46.5705** | **1.4300e-003** | | **46.6063** |

## 3.6 Architectural Coating - 2019

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 4.4180 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2664 | 1.8354 | 1.8413 | 2.9700e-003 | | 0.1288 | 0.1288 | | 0.1288 | 0.1288 | | 281.4481 | 281.4481 | 0.0238 | | 282.0423 |
| **Total** | **4.6844** | **1.8354** | **1.8413** | **2.9700e-003** | | **0.1288** | **0.1288** | | **0.1288** | **0.1288** | | **281.4481** | **281.4481** | **0.0238** | | **282.0423** |

## 3.6 Architectural Coating - 2019

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0246 | 0.0182 | 0.1766 | 4.5000e-004 | 0.0493 | 3.2000e-004 | 0.0496 | 0.0131 | 2.9000e-004 | 0.0134 | | 45.1744 | 45.1744 | 1.2600e-003 | | 45.2060 |
| **Total** | **0.0246** | **0.0182** | **0.1766** | **4.5000e-004** | **0.0493** | **3.2000e-004** | **0.0496** | **0.0131** | **2.9000e-004** | **0.0134** | | **45.1744** | **45.1744** | **1.2600e-003** | | **45.2060** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 4.4180 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2664 | 1.8354 | 1.8413 | 2.9700e-003 | | 0.1288 | 0.1288 | | 0.1288 | 0.1288 | 0.0000 | 281.4481 | 281.4481 | 0.0238 | | 282.0423 |
| **Total** | **4.6844** | **1.8354** | **1.8413** | **2.9700e-003** | | **0.1288** | **0.1288** | | **0.1288** | **0.1288** | **0.0000** | **281.4481** | **281.4481** | **0.0238** | | **282.0423** |

## 3.6 Architectural Coating - 2019

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0246 | 0.0182 | 0.1766 | 4.5000e-004 | 0.0493 | 3.2000e-004 | 0.0496 | 0.0131 | 2.9000e-004 | 0.0134 | | 45.1744 | 45.1744 | 1.2600e-003 | | 45.2060 |
| **Total** | **0.0246** | **0.0182** | **0.1766** | **4.5000e-004** | **0.0493** | **3.2000e-004** | **0.0496** | **0.0131** | **2.9000e-004** | **0.0134** | | **45.1744** | **45.1744** | **1.2600e-003** | | **45.2060** |

## 3.6 Architectural Coating - 2020

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 4.4180 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2422 | 1.6838 | 1.8314 | 2.9700e-003 | | 0.1109 | 0.1109 | | 0.1109 | 0.1109 | | 281.4481 | 281.4481 | 0.0218 | | 281.9928 |
| **Total** | **4.6601** | **1.6838** | **1.8314** | **2.9700e-003** | | **0.1109** | **0.1109** | | **0.1109** | **0.1109** | | **281.4481** | **281.4481** | **0.0218** | | **281.9928** |

## 3.6 Architectural Coating - 2020

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0225 | 0.0161 | 0.1577 | 4.4000e-004 | 0.0493 | 3.1000e-004 | 0.0496 | 0.0131 | 2.9000e-004 | 0.0134 | | 43.7295 | 43.7295 | 1.1000e-003 | | 43.7569 |
| **Total** | **0.0225** | **0.0161** | **0.1577** | **4.4000e-004** | **0.0493** | **3.1000e-004** | **0.0496** | **0.0131** | **2.9000e-004** | **0.0134** | | **43.7295** | **43.7295** | **1.1000e-003** | | **43.7569** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 4.4180 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2422 | 1.6838 | 1.8314 | 2.9700e-003 | | 0.1109 | 0.1109 | | 0.1109 | 0.1109 | 0.0000 | 281.4481 | 281.4481 | 0.0218 | | 281.9928 |
| **Total** | **4.6601** | **1.6838** | **1.8314** | **2.9700e-003** | | **0.1109** | **0.1109** | | **0.1109** | **0.1109** | **0.0000** | **281.4481** | **281.4481** | **0.0218** | | **281.9928** |

## 3.6 Architectural Coating - 2020

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | | 0.0000 |
| Worker | 0.0225 | 0.0161 | 0.1577 | 4.4000e-004 | 0.0493 | 3.1000e-004 | 0.0496 | 0.0131 | 2.9000e-004 | 0.0134 | | 43.7295 | 43.7295 | 1.1000e-003 | | 43.7569 |
| **Total** | **0.0225** | **0.0161** | **0.1577** | **4.4000e-004** | **0.0493** | **3.1000e-004** | **0.0496** | **0.0131** | **2.9000e-004** | **0.0134** | | **43.7295** | **43.7295** | **1.1000e-003** | | **43.7569** |

# 4.0 Operational Detail - Mobile

## 4.1 Mitigation Measures Mobile

Increase Density

Improve Walkability Design

Improve Destination Accessibility

Increase Transit Accessibility

Improve Pedestrian Network

Provide Traffic Calming Measures

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 1.2269 | 8.3078 | 12.8401 | 0.0374 | 2.6613 | 0.0428 | 2.7041 | 0.7132 | 0.0404 | 0.7536 | | 3,788.8784 | 3,788.8784 | 0.2120 | | 3,794.1770 |
| Unmitigated | 1.2526 | 8.5518 | 13.3853 | 0.0397 | 2.8586 | 0.0454 | 2.9040 | 0.7661 | 0.0428 | 0.8089 | | 4,023.6201 | 4,023.6201 | 0.2180 | | 4,029.0690 |

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| Single Family Housing | 771.12 | 802.71 | 698.22 | 1,276,692 | 1,188,601 |
| Total | 771.12 | 802.71 | 698.22 | 1,276,692 | 1,188,601 |

## 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| Single Family Housing | 6.29 | 4.25 | 4.37 | 42.60 | 21.00 | 36.40 | 86 | 11 | 3 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 0.489257 | 0.041257 | 0.220156 | 0.132626 | 0.025790 | 0.006586 | 0.027831 | 0.045583 | 0.001467 | 0.001229 | 0.006102 | 0.000783 | 0.001333 |

# 5.0 Energy Detail

Historical Energy Use: N

## 5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| NaturalGas Mitigated | 0.0660 | 0.5643 | 0.2401 | 3.6000e-003 | | 0.0456 | 0.0456 | | 0.0456 | 0.0456 | | 720.3906 | 720.3906 | 0.0138 | 0.0132 | 724.6715 |
| NaturalGas Unmitigated | 0.0766 | 0.6542 | 0.2784 | 4.1800e-003 | | 0.0529 | 0.0529 | | 0.0529 | 0.0529 | | 835.1386 | 835.1386 | 0.0160 | 0.0153 | 840.1014 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| Single Family Housing | 7098.68 | 0.0766 | 0.6542 | 0.2784 | 4.1800e-003 | | 0.0529 | 0.0529 | | 0.0529 | 0.0529 | | 835.1386 | 835.1386 | 0.0160 | 0.0153 | 840.1014 |
| **Total** | | **0.0766** | **0.6542** | **0.2784** | **4.1800e-003** | | **0.0529** | **0.0529** | | **0.0529** | **0.0529** | | **835.1386** | **835.1386** | **0.0160** | **0.0153** | **840.1014** |

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| Single Family Housing | 6.12332 | 0.0660 | 0.5643 | 0.2401 | 3.6000e-003 | | 0.0456 | 0.0456 | | 0.0456 | 0.0456 | | 720.3906 | 720.3906 | 0.0138 | 0.0132 | 724.6715 |
| **Total** | | **0.0660** | **0.5643** | **0.2401** | **3.6000e-003** | | **0.0456** | **0.0456** | | **0.0456** | **0.0456** | | **720.3906** | **720.3906** | **0.0138** | **0.0132** | **724.6715** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

Fullerton Ranch Project - Placer County APCD Air District, Winter

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 3.9657 | 1.2868 | 7.2194 | 8.0700e-003 | | 0.1346 | 0.1346 | | 0.1346 | 0.1346 | 0.0000 | 1,555.7974 | 1,555.7974 | 0.0413 | 0.0283 | 1,565.2646 |
| Unmitigated | 127.7862 | 2.4984 | 159.7224 | 0.2776 | | 21.4914 | 21.4914 | | 21.4914 | 21.4914 | 2,249.5102 | 955.4445 | 3,204.9547 | 2.0877 | 0.1769 | 3,309.8745 |

## 6.2 Area by SubCategory

**Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 0.4999 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 3.1201 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 123.9620 | 2.4208 | 153.0176 | 0.2772 | | 21.4545 | 21.4545 | | 21.4545 | 21.4545 | 2,249.510 2 | 943.4118 | 3,192.922 0 | 2.0759 | 0.1769 | 3,297.548 5 |
| Landscaping | 0.2042 | 0.0776 | 6.7048 | 3.5000e-004 | | 0.0369 | 0.0369 | | 0.0369 | 0.0369 | | 12.0327 | 12.0327 | 0.0117 | | 12.3261 |
| **Total** | **127.7862** | **2.4984** | **159.7224** | **0.2776** | | **21.4914** | **21.4914** | | **21.4914** | **21.4914** | **2,249.510 2** | **955.4445** | **3,204.954 7** | **2.0877** | **0.1769** | **3,309.874 5** |

## 6.2 Area by SubCategory

**Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 0.4999 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 3.1201 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 0.1415 | 1.2093 | 0.5146 | 7.7200e-003 | | 0.0978 | 0.0978 | | 0.0978 | 0.0978 | 0.0000 | 1,543.7647 | 1,543.7647 | 0.0296 | 0.0283 | 1,552.9385 |
| Landscaping | 0.2042 | 0.0776 | 6.7048 | 3.5000e-004 | | 0.0369 | 0.0369 | | 0.0369 | 0.0369 | | 12.0327 | 12.0327 | 0.0117 | | 12.3261 |
| **Total** | **3.9657** | **1.2868** | **7.2194** | **8.0700e-003** | | **0.1346** | **0.1346** | | **0.1346** | **0.1346** | **0.0000** | **1,555.7975** | **1,555.7975** | **0.0413** | **0.0283** | **1,565.2646** |

## 7.0 Water Detail

### 7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

## 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

# Appendix C

**Special-Status Plant Survey**

FOOTHILL ASSOCIATES
ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE

June 14, 2016

Chris Tyler
Terravest Capital Partners, Inc.
3208 Wycliffe Drive
Modesto, CA 95355

**RE: Special-Status Plant Surveys on the Fullerton Ranch Site, within the City of Lincoln, Placer County, California**

Dear Mr. Tyler:

This report summarizes the results of a focused botanical survey for six special-status plant species: Ahart's dwarf rush (*Juncus leiospermus* var. *aharti*), big-scale balsam-root (*Balsamorhiza macrolepis* var. *macrolepis*), Bogg's Lake hedge-hyssop (*Gratiola heterosepala*), dwarf downingia (*Downingia pusilla*), legenere (*Legenere limosa*), and pincushion navarretia (*Navarretia myersii* ssp. *myersii*) on the Fullerton Ranch Site (Site), within the City of Lincoln, in Placer County, California. The Site was previously known as the Whispering Oaks Site. The survey was conducted in accordance with the recommended measure identified within the Biological Resource Assessment Update for the Whispering Oaks Site, Lincoln, Placer County, California (North Fork Associates 2006). The purpose of the survey was to determine whether potentially occurring special-status plants exist within the Site.

**Location**

The ±20-acre Site is located on the southern side of Nicolaus Road, roughly 800 feet east of Lakeside Drive. It is bordered on the north by Nicolaus Road, on the east by rural residences and a residential subdivision, on the south by a residential subdivision, and on the west by open annual grassland and a residential subdivision. The Site occurs in Section 16, Township 12 North, and Range 6 East on the 7.5-minute *Lincoln, California* quadrangle map (**Figure 1**).

**Methodology**

A Foothill Associates' botanist conducted a focused botanical survey within the evident and identifiable blooming period for the six potentially occurring special-status species on June 1, 2016. In addition, a comprehensive botanical inventory was conducted within the Site, in accordance with the California Department of Fish and Wildlife's (CDFW) (2009) protocol plant surveys. The survey was conducted by a biologist with the following qualifications: experience with conducting floristic surveys; intimate knowledge of plant taxonomy and plant community ecology and classification; familiarity with the plants of the area, including special-status and locally significant plants; familiarity with the appropriate State and federal statutes related to plants and plant collecting; and experience with analyzing impacts of project activities on native plants and plant communities. The biologist walked transects in a north-south direction throughout the Site to provide total coverage. Five of the six potentially occurring species are found in vernal pools, so increased focus was placed on vernal pools and other depressional areas (see **Table 1**). Plants observed within the Site are provided in **Appendix A**.

**Table 1 — Summary of Special-Status Species with Potential to Occur on the Site**

| Species | Federal | State | CNPS | Habitat | Potential for Occurrence |
|---|---|---|---|---|---|
| Ahart's dwarf rush<br>*Juncus leiospermus* var. *aharti* | SC | None | 1B | Vernal pools | **Possible**; Not observed during previous site visits. |
| Big-scale balsam-root<br>*Balsamorhiza macroleps* var. *macrolepis* | SC | None | 1B | Open woodlands and grasslands | **Possible**; Not observed during previous site visits. |
| Bogg's Lake hedge-hyssop<br>*Gratiola heterosepala* | None | CE | 1B | Moist margins of vernal pools and marshes | **Possible**; Not observed during previous site visits. |
| Dwarf downingia<br>*Downingia pusilla* | None | None | 2 | Vernal Pools | **Possible**; Not observed during previous site visits. |
| Legenere<br>*Legenere limosa* | SC | None | 1B | Vernal Pools | **Possible**; Not observed during previous site visits. |
| Pincushion navarretia<br>*Navarretia myersii* ssp. *myersii* | None | None | 1B | Vernal Pools | **Possible**; Not observed during previous site visits. |
| **Status Codes** | | | | | |
| Federal | SC - Species of Concern | | | | |
| State | CE - California Endangered | | | | |
| CNPS | List 1B - Rare or Endangered in California | | | | |
| | List 2 - R and E in California, more common elsewhere | | | | |

### Environmental Setting
The Site is comprised of annual grassland and oak woodland with seasonal wetland features interspersed in the southern half of the Site. The western half of the Site is comprised of oak woodland with an annual grassland understory. The topography within the Site is generally level with elevations ranging from 133 to 135 feet above mean sea level (MSL).

### Results and Conclusion
Although the Site provides habitat for the six special-status species, these species were not observed during the June 1, 2016 focused botanical survey conducted within the evident and identifiable blooming period. These species do not occur within the Site. Therefore, the

Proposed Project would have no impact on special-status plants. No additional rare plant surveys are recommended.

If you have any questions, please contact me at your earliest convenience at (916) 435-1202 or email kbayne@foothill.com.

Sincerely,

Kelly Bayne, M.S.
Senior Biologist

Enclosures (2)

**Attachment A**

Plants Observed within the Fullerton Ranch Site

| Family | Scientific Name | Common Name | * |
|---|---|---|---|
| **Apiaceae** | *Eryngium castrense* | Great Valley coyote-thistle | N |
| **Apiaceae** | *Eryngium vaseyi* | Coyote-thistle | N |
| **Asteraceae** | *Carduus pycnocephalus* ssp. *pycnocephalus* | Italian thistle | I |
| **Asteraceae** | *Filago pyramidata* var. *pyramidata* | Broadleaf cottonrose | I |
| **Asteraceae** | *Holocarpha virgata* | Tarweed, tarplant | N |
| **Asteraceae** | *Hypochaeris glabra* | Smooth cat's-ear | I |
| **Asteraceae** | *Lactuca serriola* | Prickly lettuce | I |
| **Asteraceae** | *Leontodon saxatilis* | Hairy hawkbit | I |
| **Asteraceae** | *Psilocarphus brevissimus* | Woolly-marbles, woollyheads | N |
| **Asteraceae** | *Sonchus oleraceus* | Common sow thistle | I |
| **Asteraceae** | *Taraxacum officinale* | Common dandelion | I |
| **Boraginaceae** | *Amsinckia menziesii* | Common fiddleneck, small-flowered fiddleneck | N |
| **Boraginaceae** | *Plagiobothrys stipitatus* | Great Valley popcornflower | N |
| **Brassicaceae** | *Brassica rapa* | Turnip, field mustard | I |
| **Brassicaceae** | *Hirschfeldia incana* | Perennial, shortpot, or summer mustard | I |
| **Brassicaceae** | *Raphanus sativus* | Radish | I |
| **Campanulaceae** | *Downingia bicornuta* | Downingia | N |
| **Campanulaceae** | *Downingia ornatissima* | Downingia | N |
| **Caryophyllaceae** | *Silene gallica* | Small-flower catchfly, windmill pink | I |
| **Convolvulaceae** | *Convolvulus arvensis* | Bindweed, orchard morning-glory | I |
| **Crassulaceae** | *Crassula* sp. | Crassula | -- |
| **Euphorbiaceae** | *Croton setigerus* | Turkey-mullein | N |
| **Fabaceae** | *Acmispon americanus* var. *americanus* | Deervetch, deerweed | N |
| **Fabaceae** | *Lupinus bicolor* | Miniature lupine | N |
| **Fabaceae** | *Medicago polymorpha* | California burclover | I |
| **Fabaceae** | *Trifolium hirtum* | Rose clover | I |
| **Fabaceae** | *Vicia villosa* | Hairy vetch, winter vetch | I |
| **Fagaceae** | *Quercus lobata* | Valley oak, roble | N |
| **Fagaceae** | *Quercus wislizeni* | Interior live oak | N |
| **Geraniaceae** | *Erodium botrys* | Storksbill, filaree | I |
| **Geraniaceae** | *Erodium cicutarium* | Redstem filaree | I |
| **Geraniaceae** | *Geranium dissectum* | Cranesbill, geranium | I |
| **Juglandaceae** | *Juglans* sp. | Walnut | -- |
| **Juncaceae** | *Juncus bufonius* | Toad rush | N |
| **Juncaceae** | *Juncus capitatus* | Dwarf rush | I |
| **Lythraceae** | *Lythrum hyssopifolia* | Loosestrife | I |
| **Malvaceae** | *Malva* sp. | Mallow | -- |
| **Marsileaceae** | *Pilularia americana* | Pilularia | N |
| **Montiaceae** | *Claytonia* sp. | Claytonia | N |
| **Moraceae** | *Ficus carica* | Edible fig | I |
| **Oleaceae** | *Olea sp.* | Olive | I |
| **Orobanchaceae** | *Castilleja attenuata* | Valley tassels | N |
| **Orobanchaceae** | *Castilleja campestris* | Paintbrush, owl's-clover | N |
| **Plantaginaceae** | *Gratiola ebracteata* | Bractless hedge-hyssop | N |
| **Plantaginaceae** | *Plantago lanceolata* | English plantain | I |
| **Poaceae** | *Aira elegans* | Elegant hair grass | I |
| **Poaceae** | *Avena fatua* | Wild oat | I |
| **Poaceae** | *Briza minor* | Annual quaking grass, small quaking grass | I |
| **Poaceae** | *Bromus diandrus* | Ripgut grass | I |
| **Poaceae** | *Bromus hordeaceus* | Soft chess | I |
| **Poaceae** | *Deschampsia danthonioides* | Annual hair grass | N |
| **Poaceae** | *Elymus caput-medusae* | Medusa head | I |
| **Poaceae** | *Festuca bromoides* | Brome fescue | I |
| **Poaceae** | *Festuca perennis* | Rye grass | I |
| **Poaceae** | *Hordeum marinum* ssp. *gussoneanum* | Mediterranean barley | I |
| **Poaceae** | *Hordeum murinum* | Wall barley | I |
| **Poaceae** | *Phalaris* sp. | Canary grass | -- |
| **Poaceae** | *Poa annua* | Annual blue grass | I |
| **Poaceae** | *Polypogon monspeliensis* | Annual beard grass, rabbitfoot grass | I |
| **Polemoniaceae** | *Navarretia leucocephala* | Navarretia | N |
| **Polygonaceae** | *Rumex conglomeratus* | Dock | I |
| **Polygonaceae** | *Rumex crassus* | Dock | N |
| **Ranunculaceae** | *Ranunculus bonariensis* var. *trisepalus* | Buttercup | N |
| **Rubiaceae** | *Galium parisiense* | Wall bedstraw | I |
| **Themidaceae** | *Dichelostemma multiflorum* | Wild hyacinth | N |
| **Themidaceae** | *Triteleia hyacinthina* | White brodiaea, fool's onion | N |
| *N = Native* | *I = Invasive* | | |

# Appendix D

**Dry-Season Sampling for Federally Listed Large Branchiopods**

# DRY-SEASON SAMPLING
# FOR
# FEDERALLY LISTED LARGE BRANCHIOPODS
# AT THE
# FULLERTON RANCH PROJECT,
# LINCOLN, PLACER COUNTY, CALIFORNIA
**(USFWS # 2017-TA-0297)**


*Prepared for:*
**FOOTHILL ASSOCIATES**
590 Menlo Drive, Suite 5
Rocklin, CA 95765
*Contact:* Meredith Branstad
(916) 435-1202

*Prepared by:*
**HELM BIOLOGICAL CONSULTING**
4600 Karchner Road
Sheridan, CA 95681
*Contact:* Brent Helm
(530) 633-0220


**November 2016**

HELM
BIOLOGICAL CONSULTING
A Tansley Team Division
4600 Karchner Rd, Sheridan, CA 95681

# DRY-SEASON SAMPLING
# FOR
# FEDERALLY LISTED LARGE BRANCHIOPODS
# AT THE
# FULLERTON RANCH PROJECT,
# LINCOLN, PLACER COUNTY, CALIFORNIA
**(USFWS # 2017-TA-0297)**

## INTRODUCTION

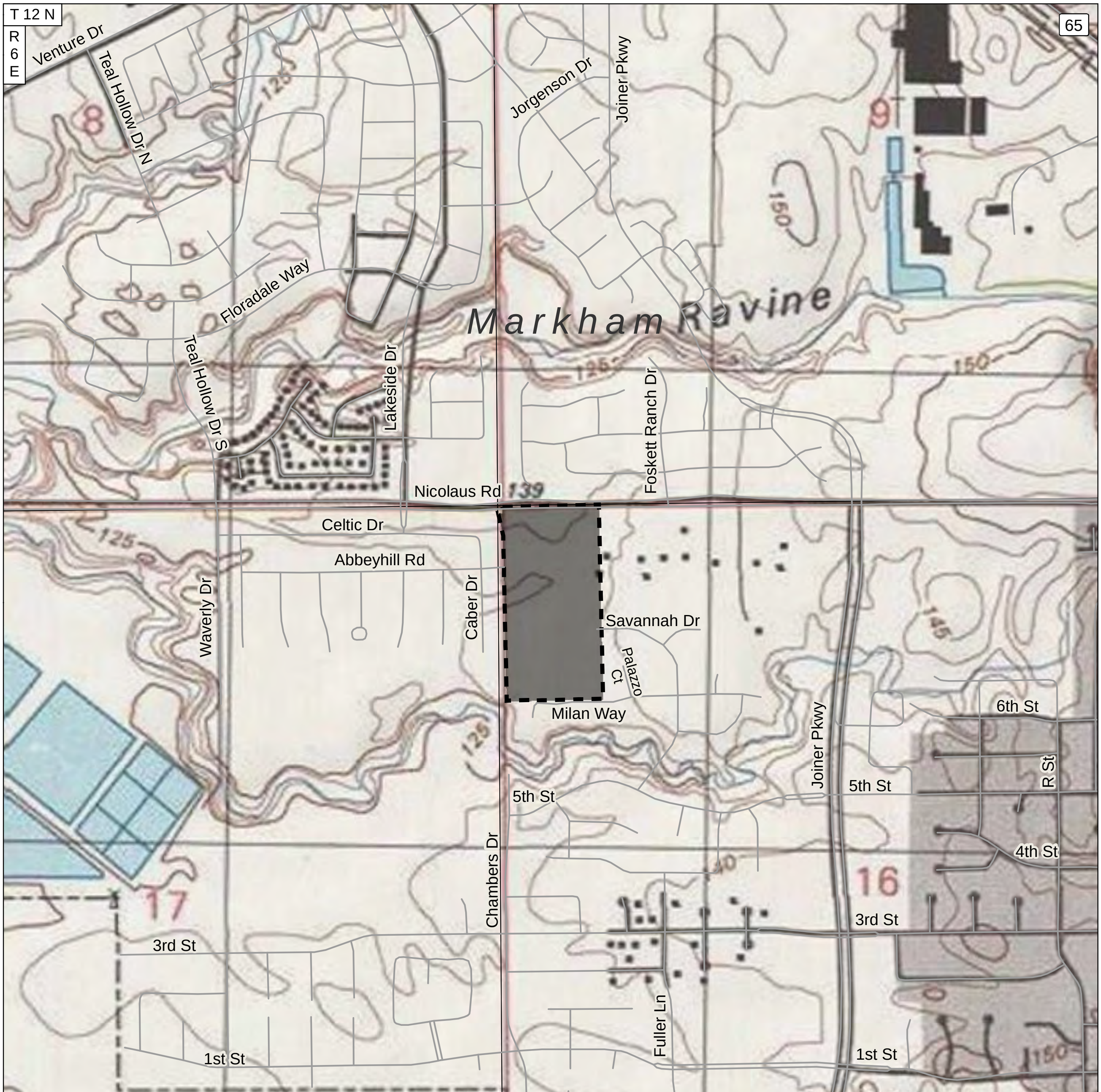
Helm Biological Consulting (HBC), a division of Tansley Team, Inc., was contracted by Foothill Associates to conduct reconnaissance-level dry-season sampling for large branchiopods (fairy shrimp, tadpole shrimp, and clam shrimp) that are listed as threatened or endangered under the federal Endangered Species Act (e.g., vernal pool fairy shrimp [*Branchinecta lynchi*] and vernal pool tadpole shrimp [*Lepidurus packardi*]) at the Fullerton Ranch Project.

The Fullerton Ranch Project consists of a 20-acre parcel located just south of Nicolous Road, ¾ mile north of More Road, and 1 mile west of Nelson Road, in the City of Lincoln, Placer County, California (NW ½ of NW ¼ of NW ¼ of Section 16 Township, 12 North, Range 6 East, and Mount Diablo Base & Meridian of the Lincoln 7.5 minute US Geological Survey topographic quadrangle map [Center coordinates of the properties are WGS84 Latitude 38.895439$^{o}$ and Longitude -121.320317$^{o}$, Figure 1]).

The remainder of this report discusses the methods and results of the dry-season sampling for the presence of federally listed large branchiopods at the Fullerton Ranch Project.

"I certify that the information in this survey report and attached exhibits fully and accurately represents my work."

Brent P. Helm Signature ________________ Date 11-28-2016




Study Area

Freeway (inset)

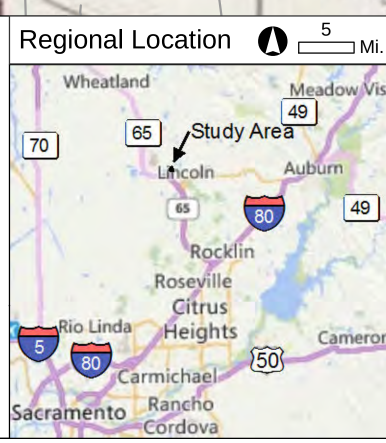
Water Body

Street

The Study Area is approximately 20 acres. It is located in Placer County on the Lincoln US Geological Survey (USGS) 7.5-minute topographical quadrangle map;
Section 16 of Township 12 North, Range 6 East,
Mount Diablo Base & Meridian.

Center coordinates are:
WGS84 Latitude 38.895400, Longitude -121.320223.

Regional Location




0 500 1,000 Feet

1 inch = 1,000 feet

Data Sources:
- Bing accessed Nov 2016
- ESRI StreetMap North America 2013
- ESRI US Topo Maps accessed Nov 2016
- Foothill Associates 2016

Prepared by:

HELM BIOLOGICAL CONSULTING
4600 Karchner Rd, Sheridan, CA 95681

Date: 11-13-16

C:\SRM\Helm\Fullerton Ranch\ArcMap\Fig1. Vicinity.mxd

Figure 1. Study Area Vicinity

## METHODS

Dry-season sampling methods followed USFWS's (2015) *Survey Guidelines for the Listed Large Branchiopods* and are briefly as described below.

Dr. Brent Helm of HBC conducted dry-season sampling on November 18, 2016 as authorized by the U.S. Fish and Wildlife Service (USFWS) (Appendix A) under recovery permit TE-795930-10 of Section 10(a)(1)(A) of the federal Endangered Species Act, 16 U.S.C. 1531 et seq., and its implementing regulations.

Dry sampling was conducted in all habitats on site that had potential to support federally-listed large branchiopods. Habitat characteristics of large branchiopods are based on the life history of Central Valley endemics (Eriksen and Belk 1999; Helm 1998, 1999; Helm and Vollmar 2002, Helm and Noyes, *in review*). The presence of water marks, algae mats, driftlines, hydrophytic vegetation ("water-loving plants"), slope, contributing watershed, maximum potential ponding depth, and aquatic arthropods (i.e., crustaceans and insects) exoskeletons were helpful indicators for evidence of ponding depth and duration. Habitats that swiftly flow water (e.g., creeks, streams, and ephemeral drainages) or semi-to-permanently inundated areas that support population of predators (e.g., bullfrogs, fish, and crayfish) were not generally considered suitable habitat for federally listed large branchiopods.

Soil samples were collected mainly from the lowest topographic areas within each pool. Soil samples were placed in liter size plastic sealable bags and marked with the project name, basin number, and date. The soil was then transported to HBC for processing and analysis as described below.

In HBC's laboratory, a brine solution was prepared by mixing table salt (NaCl) with lukewarm tap water in a large container. The collected soil material was placed in the brine solution. The soil material was then gently worked by hand to breakdown any persistent soil structure. The organic material rising to the top of the brine solution was skimmed off and placed in a 600-micron diameter pore-size sieve stacked atop a 75-micron diameter pore-size sieve. The soil material was processed through the top sieve by flushing it with lukewarm tap water while gently rubbing it with a soft-bristle brush. The soil retained from the 75-micron diameter pore size sieve was then removed and thinly (≈1.0 mm) spread into plastic petri dishes.

The contents of each petri dish were examined under a 10 to 252-power zoom binocular microscope. A minimum of 0.5-hour was spent searching the contents of each petri dish for large branchiopod cysts (embryonic eggs). Dr. Helm's large branchiopod cyst reference collection and scanning electron micrographs of cysts (Rabet 2010, Brendock *et al*. 2008, Hill and Shepard

1998, Mura 1991, Belk 1989, and Gilchrist 1978) were used to identify and compare any cysts observed within the soil samples. Evidence of other macroscopic aquatic invertebrates encountered was also noted on the laboratory data sheet.

# RESULTS

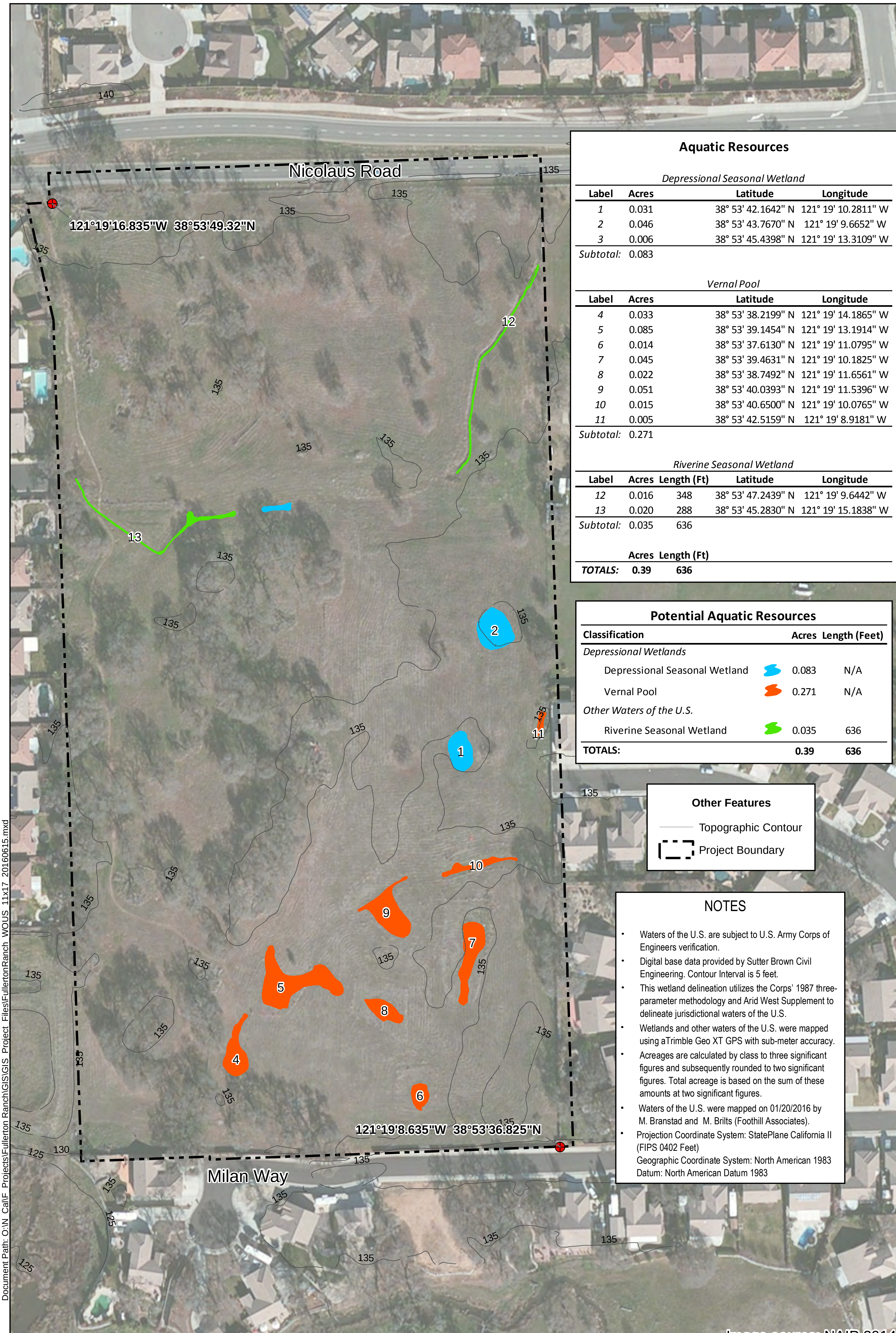
A total of 13 wetlands (basins) were sampled using dry-season techniques (Exhibit A). No evidence of federally listed large branchiopods (cysts belonging to the genus *Branchinecta* or *Lepidurus* or carapaces of *Lepidurus*) were observed in the soils collected (Table 1).

Table 1. Results of Soil Examinations

| Basin No. | Insects Exo-skeletons | (Flatworm) Micro-turbularin Cysts | (Seed Shrimp) Ostracod Carapaces | (Water Flea) Cladocera Ephippia | Copepod Cysts |
|---|---|---|---|---|---|
| 1 | X | | X | | |
| 2 | X | | | | |
| 3 | X | X | X | | |
| 4 | X | | X | | |
| 5 | X | X | X | X | X |
| 6 | X | X | X | | |
| 7 | X | X | | X | X |
| 8 | X | X | X | | |
| 9 | X | | | X | X |
| 10 | X | X | X | X | |
| 11 | X | X | X | | |
| 12 | X | | X | | |
| 13 | X | | X | | |

X = Taxon Present

# EXHIBIT A.
# FIGURE 2. AQUATIC RESOURCES DELINEATION MAP




### Aquatic Resources

*Depressional Seasonal Wetland*

| Label | Acres | Latitude | Longitude |
|---|---|---|---|
| *1* | 0.031 | 38° 53' 42.1642" N | 121° 19' 10.2811" W |
| *2* | 0.046 | 38° 53' 43.7670" N | 121° 19' 9.6652" W |
| *3* | 0.006 | 38° 53' 45.4398" N | 121° 19' 13.3109" W |
| *Subtotal:* | 0.083 | | |

*Vernal Pool*

| Label | Acres | Latitude | Longitude |
|---|---|---|---|
| *4* | 0.033 | 38° 53' 38.2199" N | 121° 19' 14.1865" W |
| *5* | 0.085 | 38° 53' 39.1454" N | 121° 19' 13.1914" W |
| *6* | 0.014 | 38° 53' 37.6130" N | 121° 19' 11.0795" W |
| *7* | 0.045 | 38° 53' 39.4631" N | 121° 19' 10.1825" W |
| *8* | 0.022 | 38° 53' 38.7492" N | 121° 19' 11.6561" W |
| *9* | 0.051 | 38° 53' 40.0393" N | 121° 19' 11.5396" W |
| *10* | 0.015 | 38° 53' 40.6500" N | 121° 19' 10.0765" W |
| *11* | 0.005 | 38° 53' 42.5159" N | 121° 19' 8.9181" W |
| *Subtotal:* | 0.271 | | |

*Riverine Seasonal Wetland*

| Label | Acres | Length (Ft) | Latitude | Longitude |
|---|---|---|---|---|
| *12* | 0.016 | 348 | 38° 53' 47.2439" N | 121° 19' 9.6442" W |
| *13* | 0.020 | 288 | 38° 53' 45.2830" N | 121° 19' 15.1838" W |
| *Subtotal:* | 0.035 | 636 | | |

| | Acres | Length (Ft) |
|---|---|---|
| ***TOTALS:*** | **0.39** | **636** |

### Potential Aquatic Resources

| Classification | Acres | Length (Feet) |
|---|---|---|
| *Depressional Wetlands* | | |
| Depressional Seasonal Wetland | 0.083 | N/A |
| Vernal Pool | 0.271 | N/A |
| *Other Waters of the U.S.* | | |
| Riverine Seasonal Wetland | 0.035 | 636 |
| **TOTALS:** | **0.39** | **636** |

### Other Features

Topographic Contour
Project Boundary

### NOTES

- Waters of the U.S. are subject to U.S. Army Corps of Engineers verification.
- Digital base data provided by Sutter Brown Civil Engineering. Contour Interval is 5 feet.
- This wetland delineation utilizes the Corps' 1987 three-parameter methodology and Arid West Supplement to delineate jurisdictional waters of the U.S.
- Wetlands and other waters of the U.S. were mapped using aTrimble Geo XT GPS with sub-meter accuracy.
- Acreages are calculated by class to three significant figures and subsequently rounded to two significant figures. Total acreage is based on the sum of these amounts at two significant figures.
- Waters of the U.S. were mapped on 01/20/2016 by M. Branstad and M. Brilts (Foothill Associates).
- Projection Coordinate System: StatePlane California II (FIPS 0402 Feet)
Geographic Coordinate System: North American 1983
Datum: North American Datum 1983

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# AQUATIC RESOURCES DELINEATION MAP

FOOTHILL ASSOCIATES
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N

0 60 120 Feet
1 inch = 120 Feet

Drawn By: JFI
Date: 06/16/2016

**FIGURE 2**

## LITERATURE CITED

Eriksen, C. H., and D. Belk. 1999. Fairy shrimps of California's puddles, pools, and playas. Mad River Press, Inc. Eureka, CA. 196 pp.

Gilchrist, B. M. 1978. Scanning electron microscope studies of the egg shell in some Anostraca (Crustacea: Branchiopoda). Cell Tiss. Res. 193: 337-351.

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Hill, R. E., and W. D. Shepard. 1998. Observation on the identification of California anostracan cysts. Hydrobiologia 359: 113-123.

Mura, G. 1991. SEM morphology of resting eggs in the species of the genus *Branchinecta* from North America. J. Crust. Biol. 11: 432-436.

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# APPENDIX A.
# USFWS AUTHORIZATION LETTER

**From:** Markegard, Sarah <sarah_markegard@fws.gov>
**To:** Brent P Helm <bhelm69485@aol.com>
**Cc:** Kellie Berry <kellie_berry@fws.gov>; Jason Hanni <jason_hanni@fws.gov>
**Subject:** Re: Authorization Request
**Date:** Thu, Nov 17, 2016 3:02 pm

---

Brent Helm,

By this email message, you are authorized to conduct dry-season surveys (2016) for federally-listed large branchiopods per the conditions of recovery permit TE-795930-10 and as specified in your email request and maps dated November 14, 2016. The surveys will be conducted at the Fullerton Ranch in Placer County, CA and the Crooked Creek Project in Sacramento County, CA. Surveys may be conducted within all seasonally inundated wetlands identified on-site that may provide suitable habitat.

Please remember to carry a copy of your permit while conducting surveys, and to follow the terms and conditions of the permit and the 2015 survey guidelines, including the reporting requirements. Let us know if the surveys are not performed as authorized, or if they are done by a different permittee under a separate authorization. This authorization does not include access to the property which must be arranged with the landowner or manager.

Electronic copies of the report(s) should be sent to Sarah Markegard, of the SFWO Recovery Branch and Kellie Berry, Sacramento Valley Division Chief. We ask that you use UTM coordinates for all spatial data, and please include which surveys were authorized, the names of all persons involved in the surveys, their recovery permit numbers, if applicable, and the date of this authorization, to help ensure that we correctly record the fulfillment of the reporting requirement under this authorization.

Please use the following Service reference numbers in future correspondence regarding these surveys/analyses:

Crooked Creek Property: **2008-TA-0178**

Fullerton Ranch: **2017-TA-0297**

To ensure the accuracy and data integrity of your projects, it is requested that you provide spatial information (boundaries, study areas, parcels, point locations, etc.) in the form of an ESRI shape file with projection, a GPS file with projection, or locations in an Excel spreadsheet with projection information. The preferred projection is UTM, Zone 10S, NAD83; the Sacramento Fish and Wildlife Office (SFWO) standard. FGDC compliant metadata must accompany each file. Please include any USFWS File Numbers associated with the data in your documentation. For additional information regarding metadata standards refer to http://www.fgdc.gov. For more information regarding spatial data please contact: Cheryl L. Hickam, GIS Branch Chief, U.S. Fish and Wildlife Service, 2800 Cottage Way, Suite W-2605, Sacramento, Ca 95825-1846, office: 916-414-6708.

On Mon, Nov 14, 2016 at 2:02 PM, Brent P Helm <bhelm69485@aol.com> wrote:
Sarah,

I hope your enjoying the beautiful fall weather. HBC is requesting USFWS authorization to conduct dry-season sampling at the Crooked Creek Project (Elk Grove) and Fullerton Ranch (Lincoln)(See Attached PDF's). To date, the habitats proposed for sampling at both sites are dry and have not been inundated this season. Thank you for your time and consideration of this matter.

Brent

Tansley Team, Inc.
DBA Helm Biological Consulting
4600 Karchner Rd
Sheridan, CA 95681
Phone: (530) 633-0220
Fax: (530) 633-0230
Email: bhelm69485@aol.com

--

Sarah Markegard
Recovery Biologist
Sacramento Fish and Wildlife Office
2800 Cottage Way W-2605
Sacramento, CA 95825-1888

phone: 916-414-6492
email: sarah_markegard@fws.gov

# APPENDIX B.
# REPRESENTATIVE PHOTOGRAPHS

Wetland 13. Facing southeast.

Wetland 5. Facing northeast.

Wetland 8. Facing northeast.

Wetland 6. Facing north.

Wetland 7. Facing north.

Wetland 12. Facing east.

# Appendix E

## 90-Day Report: Wet-Season Sampling for Listed Vernal Pool Branchiopods

# 90-Day Report
# 2016-2017 Wet-Season Survey
# for Listed Vernal Pool Branchiopods

Fullerton Ranch, Placer County, California

**Prepared for**:

U.S. Fish and Wildlife Service

**Contracted By**:

Terravest Capital Partners, LP

May 24, 2017

Prepared by:

FOOTHILL ASSOCIATES

FULLERTON RANCH

90-Day Report

Prepared for:

Terravest Capital Partners, LP

Data Collection and Report Preparation by:

Foothill Associates
590 Menlo Drive, Suite 5
Rocklin, CA 95765

Permit TE810380-05

I certify that the information in this survey report and attached exhibits fully and accurately represent my work.

_______________________________

Charlotte Marks

M. Brilts
_______________________________

Marisa Brilts

May 24, 2017

# TABLE OF CONTENTS



**List of Figures**



**List of Appendices**

# Executive Summary

This report presents the results of the 2016-2017 wet-season surveys for listed vernal pool branchiopods conducted within the Fullerton Ranch site located in the City of Lincoln, Placer County, California (Site). The purpose of this survey was to determine the presence or absence of listed vernal pool branchiopods in the created and natural vernal pools as an indicator of the condition and function of vernal pool ecosystems within the Site.

The Site was surveyed on December 27, 2016, January 11 and 24, 2017, February 10 and 28, 2017, March 31, 2017, April 14 and 28, 2017, and May 12, 2017. A total of 13 features were sampled. No listed or non-listed branchiopod species were found in any of the sampled pools.

In 2004, dry-season surveys for large branchiopods were conducted on the Site, and no evidence of federally-listed branchiopods was observed (Helm 2004). The following year in 2005, wet-season branchiopod surveys were conducted on the Site, and no evidence of federally-listed large branchiopods were observed (Helm 2005). In 2016 when site ownership changed, dry-season sampling was conducted again within the Site and no evidence of federally listed large branchiopods were observed (Helm 2016). Since it has been more than 10 years since the previous wet-season invertebrate sampling surveys, and in due diligence of potential special-status species that may be present on the Site, protocol-level wet-season surveys for branchiopods was conducted and results from that survey are discussed in this report.

# 1.0 INTRODUCTION

This report presents the results of the 2016-2017 wet-season survey for listed vernal pool branchiopods conducted within the Fullerton Ranch project site. The Site is located south of Nicolaus Road, and north of Milan Way in northwest City of Lincoln (**Figure 1**). The Site is located in Township 12 North, Range 6 East, Section 16 of the *Lincoln* 7.5-minute USGS quadrangle. The approximate location of the center of the Site is 38° 53' 44" North, 121° 19' 13" West. The 19.7-acre Site contains 13 aquatic features including, two riverine seasonal wetlands, three depressional seasonal wetlands, and eight vernal pools.

# 2.0 METHODS

Vernal pool invertebrate surveys were conducted on December 27, 2016, January 11 and 24, 2017, February 10 and 28, 2017, March 31, 2017, April 14 and 28, 2017, and May 12, 2017. The surveys were conducted in accordance with the U.S. Fish and Wildlife Service (USFWS) 2015 *Survey Guidelines for the Listed Large Branchiopods*. The wetlands were sampled by pulling a D-frame, 150-micron aquatic dip-net through the water column. The dip-net was undulated up and down through the water column to ensure a representative sample from each of the wetlands sampled. A minimum of three five-foot passes were made with the dip-net in each sampled pool. No voucher specimens were collected. Locations of all sampled pools were recorded using the ArcGIS *Collector* app for Android and iPhones and are shown in **Figures 2**.

The estimated number (e.g., 10s, 100s, 1,000s, etc.) of listed branchiopods along with the presence of common invertebrates, insects, and other wildlife species within each wetland was indicated on the data sheets (**Appendix A**). Other data collected during sampling included the wetland number, water depth, estimated maximum depth, percent of inundation, water temperature, and general habitat and weather conditions. Representative site photographs were taken with a digital camera (**Appendix B**).

# 3.0 RESULTS

## *3.1. Biological Community Description*

The vernal pools and seasonal wetlands on the Site are surrounded by oak woodland and annual grassland habitat that supports numerous grasses and herbaceous species. Dominant upland plants include: miner's lettuce (*Claytonia perfoliata*), broad-leaf filaree (*Erodium botrys*), foxtail barley (*Hordeum murinum*), ripgut brome (*Bromus diandrus*), rose clover (*Trifolium hirtum*), wild radish (*Raphanus sativus*), and vetch (*Vicia* sp.). Dominant wetland plant species observed within the vernal pools include: curly dock (*Rumex crispus*), coyote thistle (*Eryngium vaseyi*), and buttercup (*Ranunculus* sp.).

## *3.2. Sampling Results*

A total of three depressional seasonal wetlands, two riverine seasonal wetlands, and eight vernal pools were sampled within the Site (**Figure 2**). No listed branchiopods were found in any of the sampled pools.

Non-listed aquatic invertebrates observed during the surveys include: seed shrimp (Ostracoda), flatworms (Turbellaria), diving water beetles (Dytiscidae), midges (Chironomidae), crawling water beetles (Haliplidae), and backswimmers (Notonectidae). Sierran treefrog tadpoles (*Pseudacris sierrae*), spiders, annelids, slugs, snails, caterpillars, and mosquito larvae were also observed within the pools. Detailed invertebrate sampling data sheets are provided in **Appendix A**.

## *3.3. Site Conditions*

The Site is comprised of non-native annual grassland, vernal pools, seasonal wetlands, and oak woodland. Overall, the Site continues to provide suitable wetland and upland habitat for a variety of wildlife species.

In addition to the aquatic species described above, wildlife observed on the Site includes: acorn woodpecker (*Melanerpes formicivorous*), American robin (*Turdus migratorius*), Anna's hummingbird (*Calypte anna*), black phoebe (*Sayornis nigricans*), black-tailed jackrabbit (*Lepus californicus*), Brewer's blackbird (*Euphagus cyanocephalus*), Canada goose (*Branta canadensis*), mourning dove (*Zenaida macroura*), mountain bluebird (*Sialia currucoides*) northern flicker (*Colaptes auratus*), red-shouldered hawk (*Buteo lineatus*), red-winged blackbird (*Agelaius phoeniceus*), and turkey vulture (*Cathartes aura*).

# 4.0 CONCLUSIONS

No listed branchiopods species, including vernal pool fairy shrimp or vernal pool tadpole shrimp, were observed during the 2016-1017 wet-season sampling effort. However, the vernal pools and seasonal wetlands support a variety of common aquatic invertebrates and amphibians. No further monitoring surveys are required for this Site.

# 5.0 REFERENCES


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USGS 7.5 Min. Lincoln Quadrangle
Township 12N, Range 6E, Section 16
Approximate Location:
38º 53' 44" N 121º 19' 13" W
Datum:
NAD 83 State Plane CA Zone II (US Feet)
Approximate acreage:
± 19.7 Acres

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# SITE AND VICINITY

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N

0 625 1,250
Feet
1 inch = 1,250 feet

Drawn By: JFI/MUB
QA/QC: AMP
Date: 05/23/2017

**FIGURE 1**

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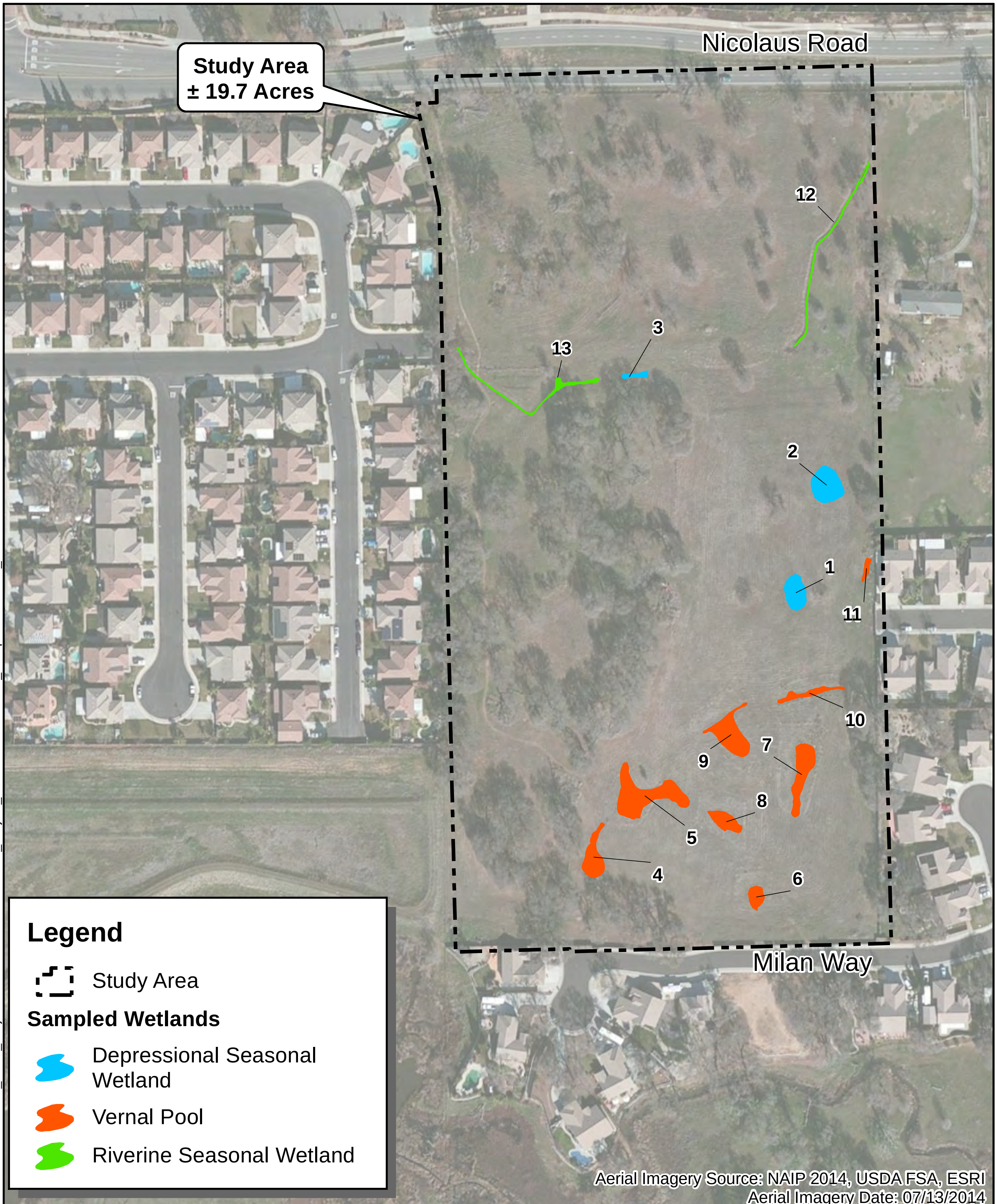



# SAMPLED WETLANDS

| | | | | |
|---|---|---|---|---|
| FOOTHILL ASSOCIATES<br>ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE<br>© 2017 | N | 0 100 200<br>Feet<br>1 inch = 200 feet | Drawn By: MUB<br>QA/QC: AMP<br>Date: 05/23/2017 | FIGURE 2 |



Document Name: FullertonRanch_SampledWetlands_20170309.mxd:
5/23/2017 3:02:54 PM

# Appendix A — Invertebrate Sampling Data Sheets

Project Site: Fullerton Ranch
County: Placer
Township: 12 North
Permit #: TE-810380-5
Weather Conditions: sunny, partly cloudy, wind ~5mph

Date: December 27, 2016
Collectors: Charlotte Marks, Marisa Brilts
Range: 6 East

Quad: Lincoln
Time: 9:30 AM - 10:30 AM
Section: 16
Air Temp: 41°F

| Vernal Pool # | Water Temp | Water Temp. (°C) | Water Depth (cm) | Estimated Maximum Depth (cm) | Present Surface Area (mxm) | Percent inundation | Photo # | Crustacea | | | | | | | Turbellaria Flatworms | Insecta | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Anostraca | | Notostraca | | | | | | Coleoptera | | Hemiptera | Diptera | |
| | | | | | | | | Vernal Pool Fairy Shrimp (B. lynchi) | California Linderiella | Vernal Pool Tadpole Shrimp | Cladocera (Water Fleas) | Conchostraca (Clam Shrimps) | Copepoda (Copepods) | Ostracoda (Seed Shrimp) | | Dytiscidae (Diving Water Beetles) | Haliplidae (Crawling Water Beetles) | Notonectidae (Backswimmers) | Chironomidae (Midge) | |
| 6 | 50 | 10 | 5 | 10 | | 40% | 65 | | | | | | | | x | | | | | |
| 7 | NS | | 3 | 5 | | 5% | 7743, 7744 | | | | | | | | | | | | | |
| 8 | DRY | | | | | | | | | | | | | | | | | | | |
| 4 | DRY | | | | | | | | | | | | | | | | | | | |
| 5 | 49 | 9 | 5 | 15 | | 0.3 | 67 | | | | x | | | | | | | | | spiders |
| 9 | DRY | | | | | | | | | | | | | | | | | | | |
| 10 | DRY | | | | | | | | | | | | | | | | | | | |
| 1 | DRY | | | | | | | | | | | | | | | | | | | |
| 11 | DRY | | | | | | | | | | | | | | | | | | | |
| 2 | DRY | | | | | | | | | | | | | | | | | | | |
| 12 | DRY | | | | | | | | | | | | | | | | | | | |
| 3 | DRY | | | | | | | | | | | | | | | | | | | |
| 13 | DRY | | | | | | | | | | | | | | | | | | | |

Project Site: Fullerton Ranch
County: Placer
Township: 12 North
Permit #: TE-810380-5
Weather Conditions: rain clouds, partly sunny, wind ~15mph

Date: January 11, 2017
Collectors: Charlotte Marks
Range: 6 East

Quad: Lincoln
Time: 9:55 AM - 11:50 AM
Section: 16
Air Temp: 52°F

| Vernal Pool # | Water Temp. (°C) | Water Depth (cm) | Estimated Maximum Depth (cm) | Present Surface Area (mxm) | Percent inundation | Photo # | Crustacea | | | | | | | | Insecta | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Anostraca | | Notostraca | | | | | | Coleoptera | | Hemiptera | Diptera | |
| | | | | | | | Vernal Pool Fairy Shrimp (B. lynchi) | California Linderiella | Vernal Pool Tadpole Shrimp | Cladocera (Water Fleas) | Conchostraca (Clam Shrimps) | Copepoda (Copepods) | Ostracoda (Seed Shrimp) | Turbellaria Flatworms | Dytiscidae (Diving Water Beetles) | Haliplidae (Crawling Water Beetles) | Notonectidae (Backswimmers) | Chironomidae (Midge) | |
| 6 | 16 | 10 | 25 | 9x2 | 100% + | 7991 | | | | | | | x | x | | | | | Sierran tree frog (eggs) |
| 8 | 16 | 13 | 18 | 15x6 | 100% + | 7992 | | | | | | | | x | x | | | | |
| 7 | 16 | 13 | 20 | 18x6 | 100% + | 7993 | | | | | | | | x | x | | | | caterpillar |
| 10 | 16 | 10 | 20 | 14x3 | 100% | 7995 | | | | | | | | x | | | | | spiders |
| 9 | 16 | 10 | 15 | 11x8 | 100% + | 7994 | | | | | | | | x | | | | | |
| 1 | 15 | 18 | 36 | 9x11 | 100% + | 7996 | | | | | | | | | | | | | spiders |
| 11 | 15 | 15 | 23 | 6x2 | 100% + | 7997 | | | | | | | | | larvae | | | | spiders, snails, |
| 2 | 16 | 18 | 33 | 14x9 | 100% + | 7998 | | | | | | | | x | larvae | | | | spiders, moquito larvae, slug |
| 12 | 15 | 25 | 38 | 61x2 | 100% | 7999, 8000, 8001 | | | | | | | | | | | | | slug, snails, spiders |
| 3 | 15 | 15 | 33 | 26x9 | 100% + | 8002, 8003 | | | | | | | | | | | | x | caterpillar, pupae, spiders |
| 13 | 15 | 23 | 36 | 38x14 | 100% + | 8004, 8005, 8006 | | | | | | | | | | | | x | caterpillar, spiders, black ground beetle |
| 5 | 17 | 10 | 20 | 20x18 | 100% + | 8007, 8008 | | | | | | | | x | larvae | | | | spiders, caterpillar, Sierran tree frog (eggs) |
| 4 | 16 | 13 | 25 | 15x27 | 100% + | 8009, 8010 | | | | | | | | | | | | | |

Project Site: Fullerton Ranch
County: Placer
Township: 12 North
Permit #: TE-810380-5
Weather Conditions: partly cloudy, sunny

Date: January 24, 2017
Collectors: Maris Brilts
Range: 6 East

Quad: Lincoln
Time: 8:30 AM - 10:15 AM
Section: 16
Air Temp: 37°F

| | | | | | | | Crustacea | | | | | | | | Insecta | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Anostraca | | Notostraca | | | | | | Coleoptera | | Hemiptera | Diptera | |
| Vernal Pool # | Water Temp. (°C) | Water Depth (cm) | Estimated Maximum Depth (cm) | Present Surface Area (mxm) | Percent inundation | Photo # | Vernal Pool Fairy Shrimp (B. lynchi) | California Linderiella | Vernal Pool Tadpole Shrimp | Cladocera (Water Fleas) | Conchostraca (Clam Shrimps) | Copepoda (Copepods) | Ostracoda (Seed Shrimp) | Turbellaria Flatworms | Dytiscidae (Diving Water Beetles) | Haliplidae (Crawling Water Beetles) | Notonectidae (Backswimmers) | Chironomidae (Midge) | Notes |
| 4 | 4 | 10 | 28 | | 100+ | 1 | | | | | | | | | | | | | |
| 5 | 6 | 13 | 25 | | 100+ | 2 | | | | | | | | x | | | | x | Sierran tree frog (eggs) |
| 8 | 6 | 10 | 15 | | 100+ | 3 | | | | | | | | x | | | | | |
| 9 | 6 | 10 | 15 | | 100 | 4 | | | | | | | | x | | | | | |
| 7 | 6 | 15 | 20 | | 98 | 5 | | | | | | | | x | | | | | Sierran tree frog (eggs) |
| 10 | 6 | 10 | 18 | | 98 | 6 | | | | | | | | x | | | | | |
| 1 | 5 | 18 | 25 | | 100 | 7 | | | | | | | | | | | | | |
| 11 | 5 | 15 | 25 | | 100 | 8 | | | | | | | | | | | | | |
| 2 | 4 | 25 | 36 | | 100 | 9 | | | | | | | | | x | | | | |
| 12 | 5 | 25 | 41 | | 100 | 10 | | | | | | | | | | | | | Spider |
| 3 | 5 | 20 | 36 | | 100 | 11 | | | | | | | | | | | | x | Spider |
| 13 | 5 | 25 | 36 | | 100+ | 12,13 | | | | | | | | | | | | | |
| 6 | 6 | 10 | 20 | | 100 | 14 | | | | | | | x | x | | | | x | Sierran tree frog (eggs) |

Project Site: Fullerton Ranch
County: Placer
Township: 12 North
Permit #: TE-810380-5
Weather Conditions: partly cloudy (rain); wind ~5-8 mph

Date: February 10, 2017
Collectors: Charlotte Marks
Range: 6 East

Quad: Lincoln
Time: 12:15 PM - 2:30 PM
Section: 16
Air Temp: 62°F

| | | | | | | | Crustacea | | | | | | | | Insecta | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Anostraca | | Notostraca | | | | | | Coleoptera | | Hemiptera | Diptera | |
| Vernal Pool # | Water Temp. (°C) | Water Depth (cm) | Estimated Maximum Depth (cm) | Present Surface Area (mxm) | Percent inundation | Photo # | Vernal Pool Fairy Shrimp (B. lynchi) | California Linderiella | Vernal Pool Tadpole Shrimp | Cladocera (Water Fleas) | Conchostraca (Clam Shrimps) | Copepoda (Copepods) | Ostracoda (Seed Shrimp) | Turbellaria Flatworms | Dytiscidae (Diving Water Beetles) | Haliplidae (Crawling Water Beetles) | Notonectidae (Backswimmers) | Chironomidae (Midge) | Notes |
| 6 | 21 | 15 | 25 | 5x8 | 100+ | 8131 | | | | | | | | x | | | | | Sierran tree frog (tadpoles) |
| 8 | 21 | 13 | 20 | 6x14 | 100+ | 8132 | | | | | | | | x | | | | | Sierran tree frog (tadpoles) |
| 7 | 22 | 10 | 20 | 21x8 | 100 | 8133 | | | | | | | | x | | x | | | Sierran tree frog (tadpoles), annelids |
| 9 | 23 | 15 | 18 | 15x18 | 100+ | 8134 | | | | | | | | x | | | | | Sierran tree frog (tadpoles and eggs), unknown invertebrate egg sac |
| 10 | 24 | 15 | 20 | 21x3 | 100+ | 8135 | | | | | | | | x | | | | | Sierran tree frog (tadpoles), unknown invertebrate egg sac |
| 1 | 21 | 20 | 25 | 14x14 | 100+ | 8136 | | | | | | | | | x | | | | annelids |
| 11 | 21 | 15 | 28 | 8x2 | 100+ | 8137 | | | | | | | | | | | | | annelids |
| 2 | 21 | 18 | 33 | 18x14 | 100+ | 8138 | | | | | | | | | | | | | Sierran tree frog (eggs) |
| 12 | 21 | 23 | 33 | 37x2 | 100 | 8139 | | | | | | | x | | | | | | |
| 3 | 21 | 23 | 33 | 24x8 | 100+ | 8140 | | | | | | | | | | | | | Sierran tree frog (eggs) |
| 13 | 21 | 25 | 41 | 37x9 | 100+ | 8141, 8142 | | | | | | | | | | | | | unknown invertebrate egg sac |
| 4 | 24 | 36 | 23 | 17x11 | 100+ | 8144 | | | | | | | | | | | | | annelids |
| 5 | 23 | 18 | 25 | 21x15 | 100+ | 8143 | | | | | | | | x | | | | | Sierran tree frog (tadpoles and eggs) |

Project Site: Fullerton Ranch
County: Placer
Township: 12 North
Permit #: TE-810380-5
Weather Conditions: sunny with a slight haze, ~ 1 mph wind

Date: February 28, 2017
Collectors: Marisa Brilts
Range: 6 East

Quad: Lincoln
Time: 8:30 AM - 10:15 AM
Section: 16
Air Temp: 35°F

| Vernal Pool # | Water Temp. (°C) | Water Depth (cm) | Estimated Maximum Depth (cm) | Present Surface Area (mxm) | Percent inundation | Photo # | Crustacea | | | | | | | Turbellaria Flatworms | Insecta | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Anostraca | | Notostraca | | | | | | Coleoptera | | Hemiptera | Diptera | |
| | | | | | | | Vernal Pool Fairy Shrimp (B. lynchi) | California Linderiella | Vernal Pool Tadpole Shrimp | Cladocera (Water Fleas) | Conchostraca (Clam Shrimps) | Copepoda (Copepods) | Ostracoda (Seed Shrimp) | | Dytiscidae (Diving Water Beetles) | Haliplidae (Crawling Water Beetles) | Notonectidae (Backswimmers) | Chironomidae (Midge) | |
| 5 | 9 | 10 | 20 | 20x20 | 90 | 1 | | | | | | | x | x | | x | | x | Sierran tree frog (tadpoles) |
| 8 | 10 | 3 | 8 | 12x5 | 95 | 2 | | | | | | | | | | x | | x | Sierran tree frog (tadpoles), spider |
| 9 | 10 | 13 | 15 | 7x4 | 98 | 3 | | | | | | | | x | | x | | x | Sierran tree frog (tadpoles), spider |
| 7 | 10 | 5 | 13 | 9x4 | 98 | 4 | | | | | | | | x | | | | | Sierran tree frog (tadpoles), bullfrog (tadpoles) |
| 10 | 11 | 3 | 8 | 11x2 | 95 | 5 | | | | | | | | x | x | x | | | Sierran tree frog (tadpoles) |
| 1 | 10 | 5 | 13 | 8x8 | 75 | 6 | | | | | | | x | | | | | x | Sierran tree frog (tadpoles),red mosquito larvae |
| 11 | 10 | 8 | 15 | 5x2 | 75 | 7 | | | | | | | | | | | | x | Mosquito larvae |
| 2 | 10 | 8 | 15 | 9x9 | 70 | 8 | | | | | | | | | x | x | x | x | Sierran tree frog (eggs and tadpoles) |
| 12 | 11 | 20 | 25 | 91x2 | 50 | 9 | | | | | | | | | | | | x | Sierran tree frog (eggs), mosquito larvae |
| 3 | 10 | 13 | 20 | 30x6 | 98 | 10 | | | | | | | | | | | | x | Sierran tree frog (eggs), mosquito larvae |
| 13 | 10 | 10 | 20 | 23x5 | 90 | 11 | | | | | | | | | | | | x | Sierran tree frog (eggs) |
| 4 | 11 | 10 | 18 | 8x4 | 98 | 12 | | | | | | | | | | | | x | Sierran tree frog (eggs), mosquito larvae |
| 6 | 10 | 10 | 10 | 4x4 | 95 | 13 | | | | | | | x | x | x | x | | | Sierran tree frog (eggs and tadpoles) |

Project Site: Fullerton Ranch
County: Placer
Township: 12 North
Permit #: TE-810380-5
Weather Conditions: sunny, ~15-20 mph winds

Date: March 31, 2017
Collectors: Charlotte Marks
Range: 6 East

Quad: Lincoln
Time: 1:15 PM - 2:45 PM
Section: 16
Air Temp: 68°F

| Vernal Pool # | Water Temp. (°C) | Water Depth (cm) | Estimated Maximum Depth (cm) | Present Surface Area (mxm) | Percent inundation | Photo # | Crustacea | | | | | | | Turbellaria Flatworms | Insecta | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Anostraca | | Notostraca | | | | | | Coleoptera | | Hemiptera | Diptera | |
| | | | | | | | Vernal Pool Fairy Shrimp (B. lynchi) | California Linderiella | Vernal Pool Tadpole Shrimp | Cladocera (Water Fleas) | Conchostraca (Clam Shrimps) | Copepoda (Copepods) | Ostracoda (Seed Shrimp) | | Dytiscidae (Diving Water Beetles) | Haliplidae (Crawling Water Beetles) | Notonectidae (Backswimmers) | Chironomidae (Midge) | |
| 6 | 24 | 10 | 15 | 4x4 | 95 | 8877 | | | | | | | | | x | | | | Sierran tree frog (eggs) |
| 8 | 27 | 5 | 10 | 5x5 | 70 | 8878 | | | | | | | | | x | | | | mayfly larvae |
| 7 | 28 | 5 | 8 | 8x6 | 70 | 8879 | | | | | | | | | x | | | | Sierran tree frog (eggs) |
| 9 | 26 | 5 | 10 | 5x6 | 55 | 8880 | | | | | | | | | x | | | | Sierran tree frog (eggs); mayfly larvae |
| 10 | NS | | | | | 8881 | | | | | | | | | | | | | |
| 1 | DRY | | | | | 8882 | | | | | | | | | | | | | |
| 11 | NS | | | | | 8883 | | | | | | | | | | | | | |
| 2 | DRY | | | | | 8884 | | | | | | | | | | | | | |
| 12 | 25 | 15 | 20 | 35x1 | 80 | 8885 | | | | | | | x | | x | | | | Sierran tree frog (eggs and tadpoles); mosquito larvae |
| 3 | 24 | 18 | 28 | 27x8 | 90 | 8886, 8887 | | | | x | | | | x | | | | | Sierran tree frog (tadpoles); mayfly larvae |
| 13 | 27 | 8 | 10 | 8x2 | 10 | 8888, 8889 | | | | | | | | | x | | | x | mosquito larvae; spider |
| 5 | 28 | 13 | 18 | 9x11 | 70 | 8890 | | | | | | | | | | x | x | | Sierran tree frog (tadpoles); mayfly larvae |
| 4 | 32 | 5 | 8 | 6x5 | 40 | 8891 | | | | | | | | | | x | | | Sierran tree frog (tadpoles) |

Project Site: Fullerton Ranch
County: Placer
Township: 12 North
Permit #: TE-810380-5
Weather Conditions: clear, ~5-6 mph wind

Date: April 14, 2017
Collectors: Marisa Brilts
Range: 6 East

Quad: Lincoln
Time: 1:30 PM - 3:30 PM
Section: 16
Air Temp: 57°F

| Vernal Pool # | Water Temp. (°C) | Water Depth (cm) | Estimated Maximum Depth (cm) | Present Surface Area (mxm) | Percent inundation | Photo # | Crustacea: Anostraca: Vernal Pool Fairy Shrimp (B. lynchi) | Crustacea: Anostraca: California Linderiella | Crustacea: Notostraca: Vernal Pool Tadpole Shrimp | Crustacea: Cladocera (Water Fleas) | Crustacea: Conchostraca (Clam Shrimps) | Crustacea: Copepoda (Copepods) | Crustacea: Ostracoda (Seed Shrimp) | Turbellaria Flatworms | Insecta: Coleoptera: Dytiscidae (Diving Water Beetles) | Insecta: Coleoptera: Haliplidae (Crawling Water Beetles) | Insecta: Hemiptera: Notonectidae (Backswimmers) | Insecta: Diptera: Chironomidae (Midge) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 26 | 8 | 20 | 6x3 | 80 | 1 | | | | | | | | | | | | | Sierran tree frog (tadpoles) |
| 5 | 26 | 8 | 15 | 18x18 | 70 | 2 | | | | | | | x | x | x | | | | Sierran tree frog (tadpoles) |
| 8 | 26 | 5 | 8 | 14x5 | 100 | 3 | | | | | | | | x | x | | | | |
| 9 | 26 | 5 | 8 | 6x3 | 85 | 4 | | | | | | | | x | x | | | | Sierran tree frog (eggs and tadpoles) |
| 10 | 26 | 8 | 8 | 9x2 | 90 | 5 | | | | | | | | | | | | | |
| 7 | 26 | 8 | 20 | 6x3 | 70 | 6 | | | | | | | | | x | x | | | Sierran tree frog (eggs) |
| 1 | 26 | 8 | 15 | 6x6 | 60 | 7 | | | | | | | | | x | x | | | |
| 11 | 25 | 15 | 20 | 5x2 | 100 | 8 | | | | | | | | | | | | | |
| 2 | 26 | 5 | 10 | 5x2 | 30 | 9 | | | | | | | | | | | | | |
| 12 | 26 | 15 | 20 | 91x2 | 80 | 10 | | | | | | | | | | | | | |
| 3 | 26 | 10 | 20 | 30x6 | 100+ | 11 | | | | | | | | | x | x | x | | Sierran tree frog (tadpoles) |
| 13 | 26 | 5 | 13 | 18x3 | 60 | 12 | | | | | | | | | x | x | x | | |
| 6 | 25 | 8 | 23 | 3x3 | 85 | 13 | | | | | | | x | | | | | | |

Project Site: Fullerton Ranch
County: Placer
Township: 12 North
Permit #: TE-810380-5
Weather Conditions: sunny, ~15 mph wind

Date: April 28, 2017
Collectors: Charlotte Marks
Range: 6 East

Quad: Lincoln
Time: 9:30 AM - 10:45 AM
Section: 16
Air Temp: 64°F

| Vernal Pool # | Water Temp. (°C) | Water Depth (cm) | Estimated Maximum Depth (cm) | Present Surface Area (mxm) | Percent inundation | Photo # | Crustacea: Anostraca: Vernal Pool Fairy Shrimp (B. lynchi) | Crustacea: Anostraca: California Linderiella | Crustacea: Notostraca: Vernal Pool Tadpole Shrimp | Crustacea: Cladocera (Water Fleas) | Crustacea: Conchostraca (Clam Shrimps) | Crustacea: Copepoda (Copepods) | Crustacea: Ostracoda (Seed Shrimp) | Turbellaria Flatworms | Insecta: Coleoptera: Dytiscidae (Diving Water Beetles) | Insecta: Coleoptera: Haliplidae (Crawling Water Beetles) | Insecta: Hemiptera: Notonectidae (Backswimmers) | Insecta: Diptera: Chironomidae (Midge) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | DRY | | | | | 9703 | | | | | | | | | | | | | |
| 8 | DRY | | | | | 9704 | | | | | | | | | | | | | |
| 7 | DRY | | | | | 9705 | | | | | | | | | | | | | |
| 9 | DRY | | | | | 9708 | | | | | | | | | | | | | |
| 10 | DRY | | | | | 9707, 9706 | | | | | | | | | | | | | |
| 1 | DRY | | | | | 9709 | | | | | | | | | | | | | |
| 11 | DRY | | | | | 9710 | | | | | | | | | | | | | |
| 2 | DRY | | | | | 9711 | | | | | | | | | | | | | |
| 12 | NS | | | | | 9712, 9713 | | | | | | | | | | | | | |
| 3 | 21 | 10 | 15 | 15x5 | 40 | 9718 | | | | x | | | | x | | | x | | Sierran tree frog (tadpoles) |
| 13 | DRY | | | | | 9719, 9720 | | | | | | | | | | | | | |
| 5 | 26 | 8 | 13 | 9x3 | 60 | 9721 | | | | | | | x | x | x | | x | | Sierran tree frog (metamorphs and tadpoles), mosquito larvae, mayfly larvae |
| 6 | DRY | | | | | 9722 | | | | | | | | | | | | | |

Project Site: Fullerton Ranch
County: Placer
Township: 12 North
Permit #: TE-810380-5
Weather Conditions: sunny, scattered clouds, ~3-5 mph wind

Date: May 12, 2017
Collectors: Charlotte Marks
Range: 6 East

Quad: Lincoln
Time: 11:10 AM - 12:05 PM
Section: 16
Air Temp: 65°F

| | | | | | | | Crustacea | | | | | | | | Insecta | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Anostraca | | Notostraca | | | | | | Coleoptera | | Hemiptera | Diptera | |
| Vernal Pool # | Water Temp. (°C) | Water Depth (cm) | Estimated Maximum Depth (cm) | Present Surface Area (mxm) | Percent inundation | Photo # | Vernal Pool Fairy Shrimp (B. lynchi) | California Linderiella | Vernal Pool Tadpole Shrimp | Cladocera (Water Fleas) | Conchostraca (Clam Shrimps) | Copepoda (Copepods) | Ostracoda (Seed Shrimp) | Turbellaria Flatworms | Dytiscidae (Diving Water Beetles) | Haliplidae (Crawling Water Beetles) | Notonectidae (Backswimmers) | Chironomidae (Midge) | Notes |
| 4 | DRY | | | | | 290 | | | | | | | | | | | | | |
| 5 | DRY | | | | | 291 | | | | | | | | | | | | | |
| 13 | DRY | | | | | 292, 293 | | | | | | | | | | | | | |
| 3 | DRY | | | | | 294 | | | | | | | | | | | | | |
| 12 | DRY | | | | | 295, 296 | | | | | | | | | | | | | |
| 2 | DRY | | | | | 297 | | | | | | | | | | | | | |
| 1 | DRY | | | | | 299 | | | | | | | | | | | | | |
| 11 | DRY | | | | | 298 | | | | | | | | | | | | | |
| 10 | DRY | | | | | 300 | | | | | | | | | | | | | |
| 7 | DRY | | | | | 301 | | | | | | | | | | | | | |
| 9 | DRY | | | | | 302 | | | | | | | | | | | | | |
| 8 | DRY | | | | | 303 | | | | | | | | | | | | | |
| 6 | DRY | | | | | 304 | | | | | | | | | | | | | |

# Appendix B — Representative Site Photographs

Description: Looking north across Depressional Seasonal Wetland #1.

Date: February 10, 2017 Photographer: Charlotte Marks

Description: Looking north across Depressional Seasonal Wetland #2.

Date: February 10, 2017 Photographer: Charlotte Marks

REPRESENTATIVE SITE PHOTOGRAPHS

FOOTHILL ASSOCIATES
ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE

Description: Looking east across Depressional Seasonal Wetland #3.

Date: January 11, 2017 Photographer: Charlotte Marks

Description: Looking southwest across Vernal Pool #4.

Date: January 11, 2017 Photographer: Charlotte Marks

REPRESENTATIVE SITE PHOTOGRAPHS

| FOOTHILL ASSOCIATES<br>ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE | PAGE 2 OF 7 | APPENDIX B |
|---|---|---|

Description: Looking north across Vernal Pool #5.

Date: January 11, 2017 Photographer: Charlotte Marks

Description: Looking east across Vernal Pool #6.

Date: February 28, 2017 Photographer: Marisa Brilts

REPRESENTATIVE SITE PHOTOGRAPHS

| | | |
|---|---|---|
| FOOTHILL ASSOCIATES ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE | PAGE 3 OF 7 | APPENDIX B |

Description: Looking north across Vernal Pool #7.

Date: January 11, 2017 Photographer: Charlotte Marks

Description: Looking west across Vernal Pool #8.

Date: January 11, 2017 Photographer: Charlotte Marks

REPRESENTATIVE SITE PHOTOGRAPHS

| | | |
|---|---|---|
| FOOTHILL ASSOCIATES<br>ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE | PAGE 4 OF 7 | APPENDIX B |

Description: Looking west across Vernal Pool #9.

Date: February 10, 2017 Photographer: Charlotte Marks

Description: Looking east across Vernal Pool #10.

Date: January 11, 2017 Photographer: Charlotte Marks

REPRESENTATIVE SITE PHOTOGRAPHS

| FOOTHILL ASSOCIATES<br>ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE | PAGE 5 OF 7 | APPENDIX B |
|---|---|---|

Description: Looking east across Vernal Pool #11.

Date: February 10, 2017 Photographer: Charlotte Marks

Description: Looking north across Riverine Seasonal Wetland #12.

Date: January 11, 2017 Photographer: Charlotte Marks

REPRESENTATIVE SITE PHOTOGRAPHS

| | | |
|---|---|---|
| FOOTHILL ASSOCIATES<br>ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE | PAGE 6 OF 7 | APPENDIX B |

Description: Looking west across Riverine Seasonal Wetland #13.

Date: January 11, 2017 Photographer: Charlotte Marks

Description: Looking west across Riverine Seasonal Wetland #13.

Date: February 10, 2017 Photographer: Charlotte Marks

REPRESENTATIVE SITE PHOTOGRAPHS

FOOTHILL ASSOCIATES
ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE



APPENDIX B

# Appendix F

**Request for a Preliminary Jurisdictional Determination and USACE Redetermination Letter**

July 15, 2016

Leah Fisher
U.S. Army Corps of Engineers
Sacramento District, Regulatory Division
1325 J Street, Room 1350
Sacramento, CA 95814

**RE: Request for a Preliminary Jurisdictional Determination for a Previously Verified Delineation of Waters of the United States at the Fullerton Ranch Site in the City of Lincoln, Placer County, California**

Dear Ms. Fisher;

On behalf of Terravest Capital Partners, Inc., Foothill Associates requests a Preliminary Jurisdictional Determination of the ±20-acre Fullerton Ranch Site (Site), located in the City of Lincoln, Placer County, California. The Site, which was originally named Whispering Oaks, was previously verified by the U.S. Army Corps of Engineers (Corps) in a letter, dated February 2, 2007 (Corps ID #200400843). The Site is located in Section 16, Township 12 North, Range 6 East, Placer County, California.

The shapefiles of the wetlands that were previously mapped were uploaded onto a Trimble GeoXT Global Positioning System (GPS) hand-held unit. A Foothill Associates' biologist conducted a site visit on May 4, 2016 to ground-truth the Site to confirm that no changes have occurred since the 2007 delineation. The following items are enclosed for your review:

1) Figure 1 —Site and Vicinity;
2) Figure 2 — Aquatic Resources Delineation Map, dated June 16, 2016; and
3) Aquatic Resources Inventory Spreadsheet (Excel Format) on compact disk.

Please contact me if you need any additional information. Thank you for your assistance.

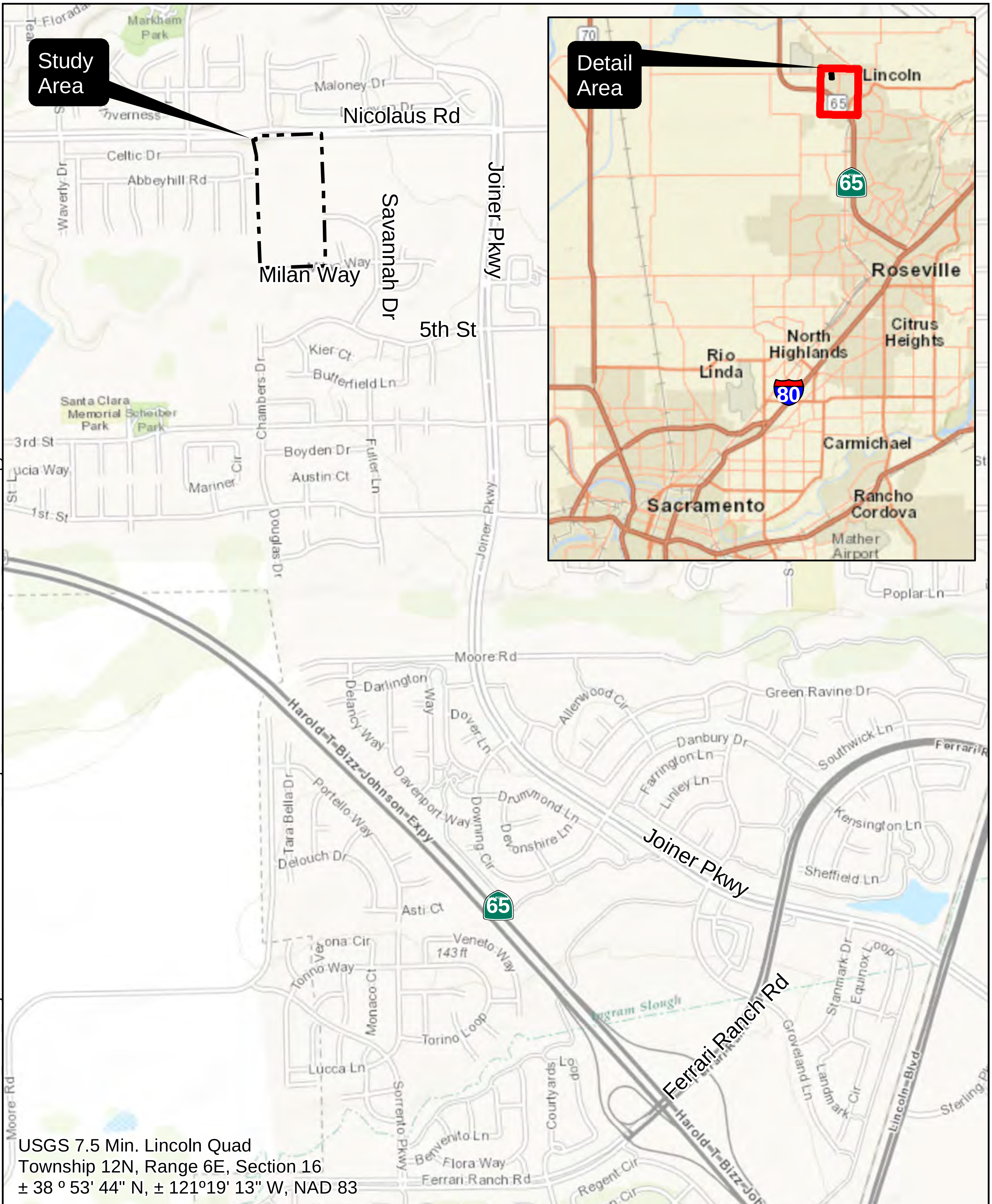
Sincerely,

Kelly Bayne

Kelly Bayne, M.S.
Senior Biologist

Enclosures (3)

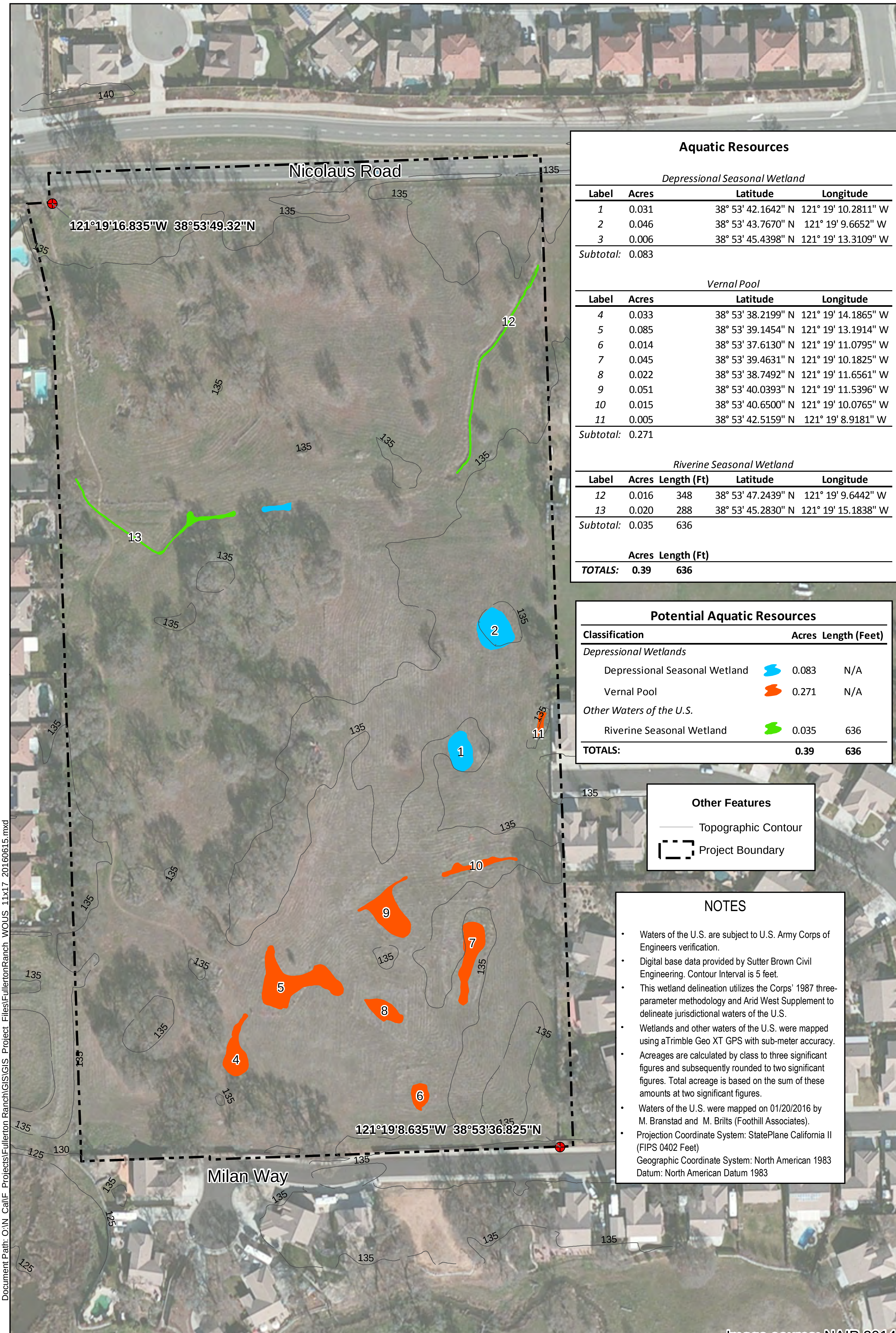
cc: Chris Tyler, Terravest Capital Partners, Inc.




Document Path: O:\N_Cal\F_Projects\Fullerton Ranch\GIS\GIS_Project_Files\FullertonRanch_SnV_20160615 - Copy.mxd

## AQUATIC RESOURCES DELINEATION MAP

| FOOTHILL ASSOCIATES<br>ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE | N | 0 660 1,320 Feet<br>1 inch = 1,320 Feet | Drawn By: JFI<br>Date: 07/07/2016 | **FIGURE 1** |
|---|---|---|---|---|




## Aquatic Resources

*Depressional Seasonal Wetland*

| Label | Acres | Latitude | Longitude |
|---|---|---|---|
| *1* | 0.031 | 38° 53' 42.1642" N | 121° 19' 10.2811" W |
| *2* | 0.046 | 38° 53' 43.7670" N | 121° 19' 9.6652" W |
| *3* | 0.006 | 38° 53' 45.4398" N | 121° 19' 13.3109" W |
| *Subtotal:* | 0.083 | | |

*Vernal Pool*

| Label | Acres | Latitude | Longitude |
|---|---|---|---|
| *4* | 0.033 | 38° 53' 38.2199" N | 121° 19' 14.1865" W |
| *5* | 0.085 | 38° 53' 39.1454" N | 121° 19' 13.1914" W |
| *6* | 0.014 | 38° 53' 37.6130" N | 121° 19' 11.0795" W |
| *7* | 0.045 | 38° 53' 39.4631" N | 121° 19' 10.1825" W |
| *8* | 0.022 | 38° 53' 38.7492" N | 121° 19' 11.6561" W |
| *9* | 0.051 | 38° 53' 40.0393" N | 121° 19' 11.5396" W |
| *10* | 0.015 | 38° 53' 40.6500" N | 121° 19' 10.0765" W |
| *11* | 0.005 | 38° 53' 42.5159" N | 121° 19' 8.9181" W |
| *Subtotal:* | 0.271 | | |

*Riverine Seasonal Wetland*

| Label | Acres | Length (Ft) | Latitude | Longitude |
|---|---|---|---|---|
| *12* | 0.016 | 348 | 38° 53' 47.2439" N | 121° 19' 9.6442" W |
| *13* | 0.020 | 288 | 38° 53' 45.2830" N | 121° 19' 15.1838" W |
| *Subtotal:* | 0.035 | 636 | | |

| | Acres | Length (Ft) |
|---|---|---|
| ***TOTALS:*** | **0.39** | **636** |

## Potential Aquatic Resources

| Classification | Acres | Length (Feet) |
|---|---|---|
| *Depressional Wetlands* | | |
| Depressional Seasonal Wetland | 0.083 | N/A |
| Vernal Pool | 0.271 | N/A |
| *Other Waters of the U.S.* | | |
| Riverine Seasonal Wetland | 0.035 | 636 |
| **TOTALS:** | **0.39** | **636** |

**Other Features**

Topographic Contour

Project Boundary

## NOTES

- Waters of the U.S. are subject to U.S. Army Corps of Engineers verification.
- Digital base data provided by Sutter Brown Civil Engineering. Contour Interval is 5 feet.
- This wetland delineation utilizes the Corps' 1987 three-parameter methodology and Arid West Supplement to delineate jurisdictional waters of the U.S.
- Wetlands and other waters of the U.S. were mapped using aTrimble Geo XT GPS with sub-meter accuracy.
- Acreages are calculated by class to three significant figures and subsequently rounded to two significant figures. Total acreage is based on the sum of these amounts at two significant figures.
- Waters of the U.S. were mapped on 01/20/2016 by M. Branstad and M. Brilts (Foothill Associates).
- Projection Coordinate System: StatePlane California II (FIPS 0402 Feet)
  Geographic Coordinate System: North American 1983
  Datum: North American Datum 1983

# AQUATIC RESOURCES DELINEATION MAP

FOOTHILL ASSOCIATES
ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE

N

0 60 120 Feet

1 inch = 120 Feet

Drawn By: JFI
Date: 06/16/2016

**FIGURE 2**

| Waters_Name | State | Cowardin_Code | HGM_Code | Meas_Type | Amount | Units | Waters_Type | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| DSW1 | CALIFORNIA | PEM2 | | Area | 0.03103667 | ACRE | ISOLATE | 38.89504561 | -121.3195225 |
| DSW2 | CALIFORNIA | PEM2 | | Area | 0.04624691 | ACRE | ISOLATE | 38.89549083 | -121.3193514 |
| DSW3 | CALIFORNIA | PEM2 | | Area | 0.00601168 | ACRE | ISOLATE | 38.8959555 | -121.3203641 |
| VP4 | CALIFORNIA | PEM2 | | Area | 0.03327248 | ACRE | ISOLATE | 38.89394997 | -121.3206074 |
| VP5 | CALIFORNIA | PEM2 | | Area | 0.08518995 | ACRE | ISOLATE | 38.89420706 | -121.3203309 |
| VP6 | CALIFORNIA | PEM2 | | Area | 0.01444363 | ACRE | ISOLATE | 38.89378139 | -121.3197443 |
| VP7 | CALIFORNIA | PEM2 | | Area | 0.04525921 | ACRE | ISOLATE | 38.89429531 | -121.3194951 |
| VP8 | CALIFORNIA | PEM2 | | Area | 0.0218844 | ACRE | ISOLATE | 38.894097 | -121.3199045 |
| VP9 | CALIFORNIA | PEM2 | | Area | 0.05065606 | ACRE | ISOLATE | 38.89445536 | -121.3198721 |
| VP10 | CALIFORNIA | PEM2 | | Area | 0.01533962 | ACRE | ISOLATE | 38.894625 | -121.3194657 |
| VP11 | CALIFORNIA | PEM2 | | Area | 0.00536482 | ACRE | ISOLATE | 38.89514331 | -121.3191439 |
| RSW12 | CALIFORNIA | PEM2 | | Linear | 695.7693 | FOOT | ISOLATE | 38.89645664 | -121.3193456 |
| RSW13 | CALIFORNIA | PEM2 | | Linear | 576.68405 | FOOT | ISOLATE | 38.89591194 | -121.3208844 |

**DEPARTMENT OF THE ARMY**
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

July 25, 2016

Regulatory Division (SPK-2004-00843)

Terravest Capital Partners, LP
Attn: Mr. Christopher Tyler
3208 Wycliffe Drive
Modesto, California 95355

Dear Mr. Tyler:

We are responding to your consultant's July 15, 2016, request for a preliminary jurisdictional determination (JD), in accordance with our Regulatory Guidance Letter (RGL) 08-02, for the Fullerton Ranch site. The approximately 20-acre project site is located near Markham Ravine, south of Nicolaus Road and north of Milan Way, Latitude 38.8953380°, Longitude -121.32023°, in Lincoln (historical), Placer County, California.

Based on available information, **we concur with the amount and location of wetlands on the site as depicted on the enclosed June 16, 2016, Aquatic Resources Delineation Map, Figure 2, drawing prepared by Foothill Associates.** The approximately 0.39 acres of wetlands present within the survey area are potential waters of the United States regulated under Section 404 of the Clean Water Act.

We have enclosed a copy of the *Preliminary Jurisdictional Determination Form* for this site. Please sign and return a copy of the completed form to this office. Once we receive a copy of the form with your signature we can accept and process a Pre-Construction Notification or permit application for your proposed project.

You should not start any work in potentially jurisdictional waters of the United States unless you have Department of the Army permit authorization for the activity. You may request an approved JD for this site at any time prior to starting work within waters. In certain circumstances, as described in RGL 08-02, an approved JD may later be necessary.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This preliminary determination has been conducted to identify the potential limits of wetlands and other water bodies which may be subject to Corps of Engineers' jurisdiction for the particular site identified in this request. A Notification of Appeal Process and Request for Appeal form is enclosed to notify you of your options with this determination. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are U.S. Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2004-00843 in any correspondence concerning this project. If you have any questions, please contact me at our California North Branch Office, Regulatory Division, U.S. Army Corps of Engineers, 1325 J Street, Room 1350, Sacramento, California 95814-2922, by email at *Leah.M.Fisher@usace.army.mil*, or telephone at 916-557-6639. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/Missions/Regulatory.aspx*.

Sincerely,

Leah M. Fisher
Senior Regulatory Project Manager
California North Branch
Regulatory Division

Enclosures

cc: (w/o encls)
Ms. Kelly Bayne, Foothill Associates, kbayne@foothill.com

# *PRELIMINARY JURISDICTIONAL DETERMINATION FORM*
## Sacramento District

**This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:**

Regulatory Branch: **California North** File/ORM #: **SPK-2004-00843** PJD Date: **July 25, 2016**

| | |
|---|---|
| State: **CA** City/County: **Lincoln (historical), Placer County**<br>Nearest Waterbody: **Markham Ravine**<br>Location (Lat/Long): **38.8953380°, -121.32023°**<br>Size of Review Area: **20** acres | Name/Address Of Property Owner/ Potential Applicant: **Terravest Capital Partners, Inc.**<br>**Attn: Mr. Christopher Tyler**<br>**3208 Wycliffe Drive**<br>**Modesto, California 95355** |
| **Identify (Estimate) Amount of Waters in the Review Area**<br>**Non-Wetland Waters:**<br>linear feet ft wide acre(s)<br>Stream Flow: **N/A**<br>**Wetlands: 0.39** acre(s)<br>Cowardin Class: **Palustrine, emergent** | Name of any Water Bodies on the site identified as Section 10 Waters: Tidal: **None** Non-Tidal: **None**<br>☒ Office (Desk) Determination<br>☐ Field Determination:<br>Date(s) of Site Visit(s): |

**SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply – checked items should be included in case file and, where checked and requested, appropriately reference sources below)**

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: **Aquatic Resources Delineation Map, Figure 2, dated June 16, 2016, prepared by Foothill Associates**
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
- ☐ Data sheets prepared by the Corps.
- ☐ Corps navigable waters' study.
- ☒ U.S. Geological Survey Hydrologic Atlas:
  - ☒ USGS NHD data.
  - ☒ USGS HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: **1:24K; CA-LINCOLN**
- ☒ USDA Natural Resources Conservation Service Soil Survey.
- ☒ National wetlands inventory map(s).
- ☒ State/Local wetland inventory map(s).
- ☐ FEMA/FIRM maps.
- ☐ 100-year Floodplain Elevation (if known):
- ☒ Photographs: ☒ Aerial
  - ☐ Other
- ☒ Previous determination(s). File no. and date of response letter: **SPK-2004-00843, Approved JD dated February 2, 2007**
- ☒ Other information (please specify): **Bing Maps, 2015**

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.**

Signature and Date of Regulatory Project Manager (REQUIRED)

Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

**EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:**

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.
2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

# Appendix G

**Arborist Report**

DUDEK

853 LINCOLN WAY, SUITE #208
AUBURN, CALIFORNIA 95603
T 530.885.8232 F 530.885.8372

August 15, 2016 Job No. 7982

Mr. Chris Tyler
Terravest Capital Partners
3208 Wycliffe Dr.
Modesto, CA 95355

***Subject:*** ***Arborist Report for the Fullerton Ranch Project Site (APNs 021-310-094, 021-310-095, and 021-310-096), City of Lincoln, California.***

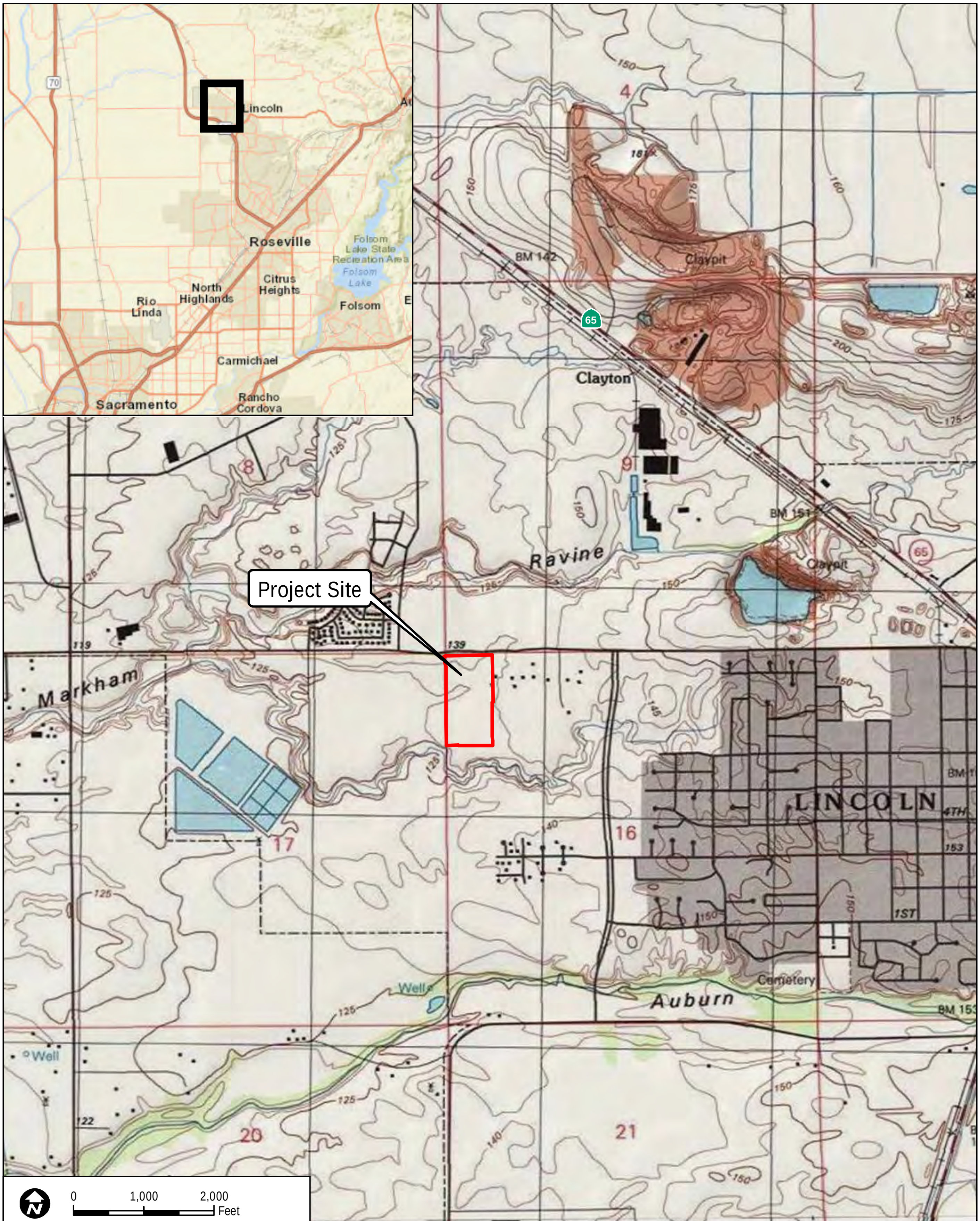
Dear Mr. Tyler:

This Arborist Report summarizes Dudek's evaluation and analysis of tree resources on the Fullerton Ranch project site, located in the City of Lincoln, California. Field inventory and assessments of the project site's trees were originally conducted by Dudek in 2013 and 2015, with re-assessments conducted in August 2016. The focus of Dudek's field evaluations was to inventory and assess all on-site trees that are subject to regulation by the City of Lincoln that could be affected by proposed development. This report includes a discussion of tree inventory, evaluation, and analysis methods, a summary of findings, identification of anticipated impacts, and tree protection recommendations.

## SITE AND PROJECT DESCRIPTION

The project site (APNs 021-310-094, 021-310-095, and 021-310-096) is located in the City of Lincoln, Placer County, California (Figure 1). The project site is bounded by Nicolaus Road on the north, the Glenmore subdivision and the City's former Waste Water Treatment Plant (proposed for re-development by Lewis Communities) on the west, the Brookview subdivision and Milan Way on the south, and the Brookview subdivision and 2.5 acre minimum residential lots on the east. The site is nearly level at an elevation of approximately 130 feet above mean sea level (AMSL). Tree cover on site is dominated by blue oak (*Quercus douglasii*) in the south and valley oak (*Quercus lobata*) in the north. Interior live oak (*Quercus wislizeni*), northern California black walnut (*Juglans californica* var. *hindsii*), and pear (*Pyrus* spp.) are also present on site in smaller numbers.

The project consists of a re-zone from Residential Estate (RE) to Planned Development and approval of an 82 lot vesting tentative subdivision map. The 19.7 acre site is designated Low Density Residential (LDR) in the City of Lincoln General Plan and the proposed development density of 4.16 dwelling units per acre (du/ac) is consistent with the LDR density ranges of 3 to




DUDEK

7982

SOURCE: USGS 7.5-Minute Series Quadrangle.

**FIGURE 1**
**Project Location**

Arborist Report for the Fullterton Ranch Project Site (APNs 021-310-094, 021-310-095, and 021-310-096)

5.9 du/ac so no general plan amendment is required. The project site has been the subject of previous development proposals, including Premier Oaks Estates (2004) and Whispering Oaks (2007).

## REGULATORY FRAMEWORK

The City of Lincoln's 'Guidelines for Development around Oak Trees' document covers all species of oak trees and defines a tree as:

> *"… any living oak tree having at least one trunk of six inches or more in diameter measured four and one-half (4 ½) feet above the ground, or a multi-trunked oak tree having an aggregate diameter of ten inches or more, measured four and one-half (4 ½) feet above the ground."*

These guidelines also require that development applicants provide a tree survey, presenting location, number, size (diameter), approximate height, and approximate canopy diameter of all oak trees on the project site, and identification of which trees may be affected by proposed development. This Arborist Report has been developed to address City requirements and includes mapped tree locations (Attachment 1), individual tree size and attribute data (Attachment 2), a summary of tree impacts, and recommendations for protection of trees to be retained on the project site (Attachment 3).

## METHODS

An inventory and evaluation of the project site's trees was conducted by a Dudek International Society of Arboriculture (ISA) Certified Arborist on September 12 and 13, 2013, August 4, 2015, and again on August 16, 2016. The following data was collected for any newly-mapped trees: tag number, species, trunk diameter(s) at breast height (4.5 feet above grade), canopy dripline diameter (feet), tree height, and overall tree health and structural condition. Additionally, detailed information regarding tree health and structure, including observed tree defects and pest/disease presence, were noted for each tree.

Trunk diameter measurements were taken at 4.5 feet above the ground along the trunk axis, with a few common exceptions. In cases where a tree's trunk split into multiple stems at approximately 4.5 feet above ground, the measurement was made at the location that best represented the trunk's diameter. Tree height measurements were estimated by the arborist and tree canopy radius measurements were estimated by "pacing-off" the measurement based on the arborist's knowledge of his stride length or by visually estimating the canopy width for trees not located near proposed development areas.

Pursuant to the Guide for Plant Appraisal, tree health and structure were evaluated with respect to five distinct tree components: roots, trunk, scaffold branches, small branches, and foliage. Each tree component was assessed with regard to health factors such as insect, fungal or pathogen damage, mechanical damage, presence of decay, presence of wilted or dead leaves, and wound closure. Components were graded as *good*, *fair*, *poor*, and *dead* with 'good' representing no apparent problems, and 'dead' representing a dying and/or dead tree. This method of tree condition rating is comprehensive and results in ratings that are useful for determining the status of trees based on common industry standards. Trees in natural settings have important habitat value, as evidenced by numerous cavity nesters and insects that thrive on and within oak trees, even when they are considered in poor structural or health condition. However, this assessment focuses on tree condition with regards to health and structure for purposes of analyzing potential project impacts and where necessary, providing recommendations for mitigating potential tree hazards, such as trees with weak limb attachments, cavities and rot, or excessive lean.

Concurrent with individual tree attribute measurement and assessment, trees were tagged with a unique tree identification number and the location of each individual tree was hand mapped on a site aerial photograph. Following the field tree assessment, project surveyors conducted an engineering survey of tree locations (VVH Consulting Engineers). Surveyed tree locations are presented in Attachment 1 and individual tree data is presented in Attachment 2.

## RESULTS

### Tree Inventory

A total of 189 individual trees are included in the oak tree assessment data set for the Fullerton Ranch Project site, which includes 99 blue oaks (*Quercus douglasii*), 85 valley oaks (*Quercus lobata*), and 6 interior live oaks (*Quercus wislizenii*). Table 1 provides a summary of the species of oak trees mapped on the project site.

**Table 1**
**Summary of Existing Trees**

| Scientific Name | Common Name | Tree Quantity |
|---|---|---|
| *Quercus douglassii* | Blue oak | **98** |
| *Quercus lobata* | Valley oak | **85** |
| *Quercus wislizenii* | Interior live oak | **6** |
| | **Total:** | **189** |

For the purposes of this report, trees were rated according to their "natural setting attributes." Good condition trees exhibit acceptable vigor, healthy foliage, adequate structure, and lack of any major maladies. Fair condition trees are typical, with few maladies, but declining vigor. Poor condition trees exhibit declining vigor, unhealthy foliage, poor branch structure or excessive lean. The oak trees that are proposed for retention on site vary in respect to health and structural condition. It is estimated that the larger diameter blue oak trees in the southern and western portions of the property are older than 60 years old, based on observations of historic aerial imagery of the site from 1954. Based on this imagery analysis, the majority of valley oaks on site are less than 60 years old, as they were not visible in the 1954 image. Blue oak life spans are approximately 90-100 years[1]; therefore, the large-diameter blue oaks on site are expected to be nearing the end of their natural life span. This is correlated with field observations of rot, dead/dying trees, and large limb failure in tree canopies of the largest blue oaks on site, which are typical maladies of senescent trees.

It should also be noted that tree health assessments consider a number of observable tree characteristics. For example, a tree with a 'Fair' health rating is one that exhibits average overall health. There is nothing necessarily wrong with a tree given a 'Fair' rating, but it is simply not exhibiting good health. Trees with 'Fair' ratings can live for a very long time. Structural condition relates to the architecture of the tree. Trees with 'Poor' structural ratings usually have trunk issues (cavities, cracks, etc.), poor branch attachments that can lead to branch failure, or other structural soundness issues. This relates to the risk of the tree or tree part failing. From a wildlife habitat perspective, trees with fair or poor ratings would be perfectly normal in a woodland or forest setting, in which one would find trees of all rating categories. Poor structured trees typically provide great habitat value.

## Tree Impact Assessment

Tree impacts were determined by evaluating surveyed tree locations relative to the project development areas. Impact totals presented herein are based on the project's vesting tentative subdivision map as of the date of this report. As such, the actual number of trees that are subject to impact may change if site plan modifications are made. Table 2 summarizes tree preservation and removal totals, by species. As presented, a total of 95 trees (representing a total of 1,935 trunk diameter inches) are identified for removal and 94 trees (representing a total of 2,241 trunk diameter inches) are identified for preservation on site. Given the characteristics of the project site and the proposed subdivision map, it is anticipated that all trees retained on site may require

---

[1] http://www.fs.fed.us/database/feis/plants/tree/quedou/all.html

canopy or root pruning, or may be subject to dripline encroachment. Therefore, recommendations to minimize the extent of impact to preserved trees are provided in Attachment 3.

**Table 2**
**Summary of Potential Tree Impacts**

| Scientific Name | Common Name | Tree Quantity, by Impact Status | |
|---|---|---|---|
| | | Remove | Retain |
| *Quercus douglassii* | Blue oak | **45** | **53** |
| *Quercus lobata* | Valley oak | **48** | **37** |
| *Quercus wislizenii* | Interior live oak | **2** | **4** |
| | **Total:** | **95** | **94** |

## RECOMMENDATIONS

### Tree Removal

The proposed project development footprint may require removal of up to 95 of the site's oak trees. Mitigation for removal of oak trees from the project site is expected to be negotiated with the City of Lincoln, and may include on- or off-site tree planting, payment of an in-lieu fee, or a combination thereof, or other measures approved by the City.

### Protection of Retained Trees

This report recommends implementing the measures included in Attachment 3, which have been prepared to minimize impacts to trees retained on-site. These measures incorporate the tree protection standards included in the City of Lincoln's 'Guidelines for Development around Oak Trees.'

## ARBORIST'S DISCLOSURE

This report provides conclusions and recommendations based only on a visual examination of the trees and surrounding site by an ISA Certified Arborist and reasonable reliance upon the completeness and accuracy of the information provided to the arborist. The examination did not include subterranean or internal examination of the trees.

Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near them. Although trees provide many benefits to those who live near them, they also include inherent risks from breakage or failure that can be minimized, but not eliminated.

Arborists cannot detect every condition that could possibly lead to the failure of a tree. Trees are living organisms subject to attack by disease, insects, fungi, weather, and other forces of nature, and conditions that lead to failure are often hidden within trees and below ground. There are some inherent risks with trees that cannot be predicted with any degree of certainty, even by a skilled and experienced arborist.

Arborists cannot predict acts of nature including, without limitation, storms of sufficient strength, which can cause even an apparently healthy tree to fail. Additionally, arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for any specific period of time. A tree’s condition could change over a short or long period of time due to climatic, cultural or environmental conditions. Further, there is no guaranty or certainty that recommendations or efforts to correct unsafe conditions will prevent future breakage or failure of a tree.

To live or work near trees is to accept some degree of risk. Neither the author of this report nor Dudek have assumed any responsibility for, nor will either of them be liable for, any claims, losses or damages for damage to any tree, death or injury to any person, or any loss of or damage to any personal or real property.

If you need further information, please contact me at (530) 885-8232.

Sincerely,

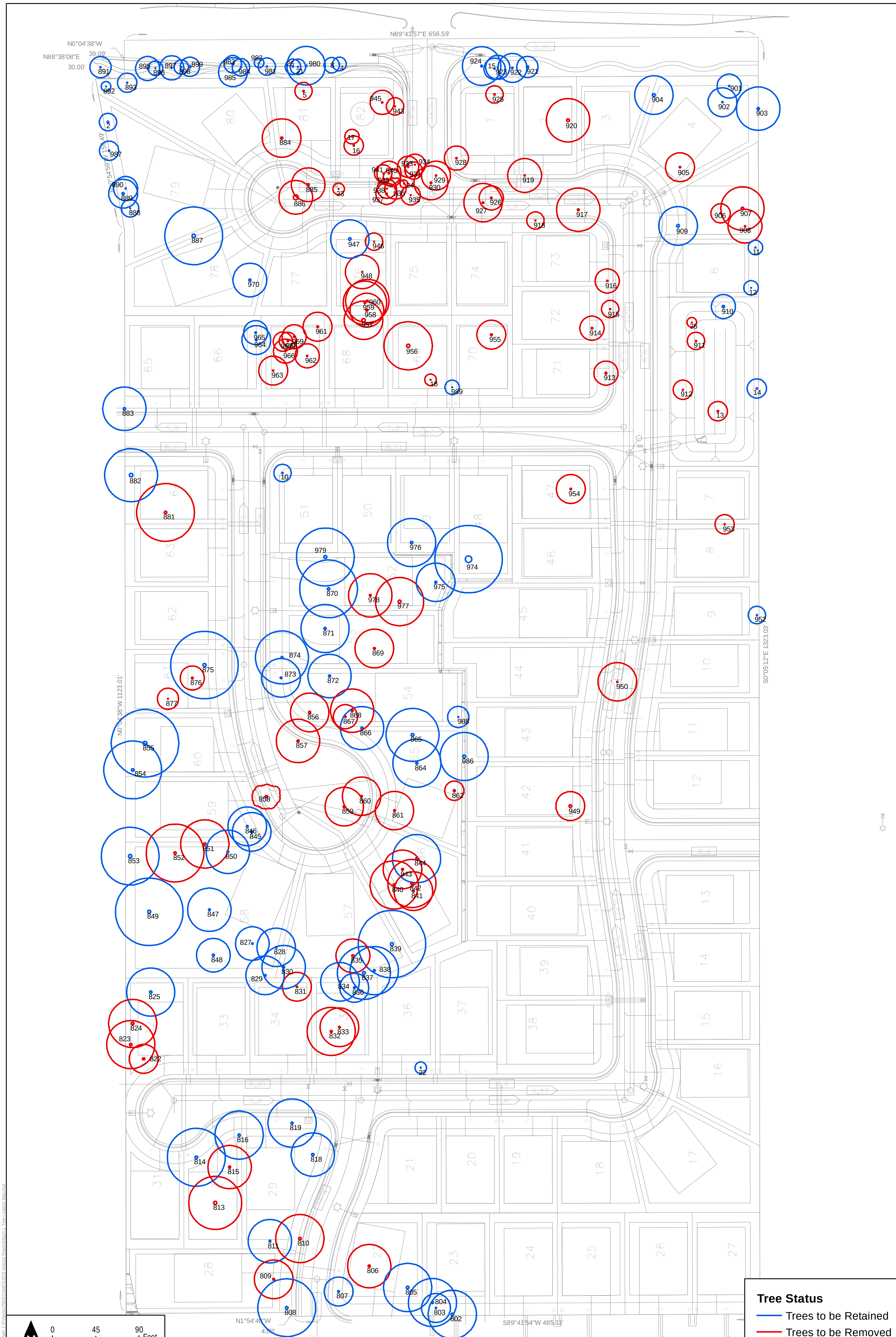
Scott W. Eckardt

Scott Eckardt
ISA Certified Arborist #WE-5914A
Registered Professional Forester #2835

*Attachments:*

1. *Tree Location Exhibit*
2. *Tree Inventory Data Sheet*
3. *Tree Protection Recommendations*

# Attachment 1
# Tree Location Exhibit




DUDEK

SOURCE: VVH Consulting Engineers 2016

**Attachment 1**

Tree Location Exhibit

Arborist Report for the Fullterton Ranch Project Site (APNs 021-310-094, 021-310-095, and 021-310-096)

# Attachment 2
# Tree Inventory Data Sheet

| | | Individual Trunk Diameters | | | | | | | | | Tree Health | | | | | Tree Structure | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tag Number | Species | T1 | T2 | T3 | T4 | T5 | T6 | Total Trunk Diameter Inches | Height (feet) | Dripline (feet) | Overall Health Rating | Epicormic sprouting | Canopy dieback | Gall presence | Other pests/disease | Overall Structural Rating | Included bark | Broken limbs/branches | Trunk wound w/ decay | Cavity in trunk or main stem | Cavity in canopy branches | Dead wood in canopy | Leaning/arching trunk | Lopsided canopy | Poor branch attachment | Comments |
| 802 | *Quercus douglasii* | 30.7 | | | | | | 30.7 | 45 | 50 | Fair/Poor | X | X | | | Fair | | | | | | X | | | | Trunk splits at 7' |
| 803 | *Quercus douglasii* | 15.7 | | | | | | 15.7 | 35 | 30 | Fair | | | | | Poor | | | | | | | X | | | Narrow canopy, suppressed |
| 804 | *Quercus douglasii* | 24.1 | | | | | | 24.1 | 50 | 50 | Fair/Poor | | X | | X | Poor | | | X | X | | | | | | Beetle exit holes in trunk, cavity at 20' (at branch split) |
| 805 | *Quercus douglasii* | 32.7 | | | | | | 32.7 | 50 | 50 | Good/Fair | | X | | | Fair | | | | | | | | | | Trunk splits at 5', minor branch dieback, good canopy balance |
| 806 | *Quercus douglasii* | 26.3 | | | | | | 26.3 | 45 | 45 | Fair | | X | | | Fair | | | | | | | | | | Minor branch dieback, trunk splits at 15', open canopy branches |
| 807 | *Quercus douglasii* | 21.7 | | | | | | 21.7 | 40 | 30 | Poor | X | X | | | Very Poor | X | | X | | | | | X | | Trunk splits at 12', included bark at primary crotch, 50% of canopy dead, trunk wound at 7' with exposed dead wood, partial dead topm, woodpecker damage |
| 808 | *Quercus douglasii* | 32.5 | | | | | | 32.5 | 50 | 60 | Fair | | | | X | Fair | X | X | | | | | | | | Trunk splits at 12', including bark at primary crotch, old broken 10" limb at 15', small dead limb in lower canopy, woodpecker holes at 25' in main limb |
| 809 | *Quercus douglasii* | 22.5 | | | | | | 22.5 | 35 | 40 | Fair/Poor | X | X | | | Fair | | | | | | | | | | Short, dense tree, trunk splits at 10' |
| 810 | *Quercus douglasii* | 31.2 | | | | | | 31.2 | 40 | 50 | Fair/Poor | X | | | | Fair/Poor | | X | X | | | | | | | Few broken/dead limbs, trunk splits at 8', low hanging limbs, barbed wire through tree, trunk crack with possible decay at base, large limb (12") broken out on south side of canopy, old broken and dislodged limb in canopy |
| 811 | *Quercus douglasii* | 21.7 | | | | | | 21.7 | 45 | 45 | Fair | | X | | | Fair | | | | | | | | X | | Trunk splits at 10', slight lean to west, unbalanced tree canopy from adjacent tree #810 |
| 813 | *Quercus douglasii* | 39.5 | | | | | | 39.5 | 50 | 55 | Fair/Poor | X | X | | | Fair | | | X | | | | | | X | Burl at base, several poor branch crotches |
| 814 | *Quercus douglasii* | 33.3 | | | | | | 33.3 | 55 | 60 | Fair | X | X | | X | Fair | X | X | | | | | | | | Several low hanging branches, trunk splits at 12', large broken limbs at 20' and 25', woodpecker holes in upper trunk |
| 815 | *Quercus douglasii* | 26.0 | | | | | | 26.0 | 45 | 45 | Fair/Poor | X | X | | | Fair | | X | | | X | | | | | Trunk splits at 8', some low branches on southeast side, large broken limb at 15' with possible decay |
| 816 | *Quercus douglasii* | 30.3 | | | | | | 30.3 | 50 | 50 | Fair | X | | | | Fair | X | | | | | | | | | Included bark at primary branch crotch |
| 818 | *Quercus douglasii* | 29.7 | | | | | | 29.7 | 45 | 45 | Fair/Poor | X | X | | X | Fair | | | X | | | X | | | | Barbwire through trunk, trunk wound at 4' with ants and beetle exit holes |
| 819 | *Quercus douglasii* | 26.1 | | | | | | 26.1 | 45 | 50 | Fair/Poor | X | X | | | Poor | | X | | | | | X | | | Trunk leans slightly east, low hanging branches, epicormic sprouting, canopy dieback, broken limb at 15' (approx. 8" dia.) |
| 822 | *Quercus douglasii* | 28.0 | | | | | | 28.0 | 30 | 30 | Poor | X | X | | | Very Poor | | X | | | | | X | | | Several low hanging limbs, trunk splits at 10', both trunks droop toward ground, heavy lean away from adjacent tree #823, poor branching structure, broken limb at 20' (approx. 14" dia.), part of canopy from #823 fallen into tree |
| 823 | *Quercus douglasii* | 30.1 | | | | | | 30.1 | 20 | 20 | Very Poor | X | X | | X | Very Poor | | X | X | | X | X | X | | | Top broken out of tree |
| 824 | *Quercus douglasii* | 32.3 | | | | | | 32.3 | 55 | 50 | Poor | X | X | | | Poor | | X | X | | X | X | X | | | Several broken limbs, small cavities in canopy branches, trunk leans east at 20°, some low hanging limbs |
| 825 | *Quercus douglasii* | 32.7 | | | | | | 32.7 | 50 | 50 | Fair | X | | | | Fair/Poor | | X | X | X | | | | | | Large main limb broken off at 25' (approx. 24" dia.) |
| 827 | *Quercus douglasii* | 17.8 | | | | | | 17.8 | 45 | 35 | Fair | X | X | | | Fair | | | | | | | X | X | | Most branches to north and south, narrow canopy |
| 828 | *Quercus douglasii* | 19.8 | | | | | | 19.8 | 40 | 40 | Fair | X | X | X | | Fair | | | | | | | | | | Trunk splits at 8' |
| 829 | *Quercus douglasii* | 24.8 | | | | | | 24.8 | 50 | 40 | Fair | | | | | Fair | | X | | | | | | | | Several low hanging limbs, a few large branches broken on west side, narrow canopy, large limb broken out at 20' (approx. 12" dia.) |
| 830 | *Quercus douglasii* | 22.5 | | | | | | 22.5 | 55 | 45 | Fair | X | X | | | Fair | | | | | | | | | | Sparse canopy, 3 primary trunks split at 20' |
| 831 | *Quercus douglasii* | 17.6 | | | | | | 17.6 | 45 | 30 | Poor | | X | | | Poor | | | | X | | X | | | | Few large branches, decay at 10' and 15' in main leader |
| 832 | *Quercus douglasii* | 25.4 | | | | | | 25.4 | 40 | 50 | Fair | X | X | | | Fair | | X | | | | | | | | Barbwire through trunk, trunk splits at 12', 2 large horizontal limbs grown from split |
| 833 | *Quercus douglasii* | 21.5 | | | | | | 21.5 | 40 | 40 | Fair | X | X | | | Fair | | | | | | | | | | Poor branch and twig development, barbed wire through trunk |
| 834 | *Quercus douglasii* | 23.1 | | | | | | 23.1 | 45 | 40 | Fair | X | X | | | Fair | | | | | | | X | X | | Canopy growth to west, crowded by adjacent trees to the east, trunk leans slightly west |
| 835 | *Quercus douglasii* | 13.3 | 15.9 | | | | | 29.2 | 25 | 35 | Fair | X | X | | | Poor | | | | | | | X | X | | Crowded by trees to the east, canopy growth heavily to west and north, trunk splits at 3', one main limb dead, suppressed |
| 836 | *Quercus douglasii* | 21.5 | | | | | | 21.5 | 40 | 30 | Fair | | | | | Fair | X | | | | | | | X | | Canopy growth to south, crowded by adjacent trees to the north, some low hanging branches, narrow branch attachment with included bark |
| 837 | *Quercus douglasii* | 35.2 | | | | | | 35.2 | 55 | 55 | Fair | X | X | | | Fair/Poor | X | X | | | | | | | | Included bark at primary crotch at 5', some low hanging limbs, failure of 2 large limbs (approx. 14" and 16" dia.) |
| 838 | *Quercus douglasii* | 24.1 | | | | | | 24.1 | 50 | 50 | Fair | | X | X | | Fair | | | | | X | | X | | | Trunk bends east away from tree # 837, some low hanging branches |
| 839 | *Quercus douglasii* | 38.6 | | | | | | 38.6 | 50 | 70 | Fair | | X | | | Fair | | | | | | | | | | Large spreading canopy, several low hanging branches, minor canopy dieback, trunk grown around adjacent pole |

| Tag Number | Species | Individual Trunk Diameters T1 | T2 | T3 | T4 | T5 | T6 | Total Trunk Diameter Inches | Height (feet) | Dripline (feet) | Tree Health Overall Health Rating | Epicormic sprouting | Canopy dieback | Gall presence | Other pests/disease | Tree Structure Overall Structural Rating | Included bark | Broken limbs/branches | Trunk wound w/ decay | Cavity in trunk or main stem | Cavity in canopy branches | Dead wood in canopy | Leaning/arching trunk | Lopsided canopy | Poor branch attachment | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 840 | *Quercus douglasii* | 27.8 | | | | | | 27.8 | 45 | 50 | Fair | | X | | | Fair/Poor | | X | | | | | X | X | | Tree leans west, canopy growth to west, 2 large limbs broken on west side |
| 841 | *Quercus douglasii* | 23.6 | | | | | | 23.6 | 40 | 40 | Fair | X | X | | | Poor | | | | | X | | X | X | | Barbed wire along trunk, some small cavities in canopy branches, canopy to south east, trunk leans and bends to south, heavily arching trunk |
| 842 | *Quercus douglasii* | 27.6 | | | | | | 27.6 | 55 | 50 | Poor | | X | | | Poor | | | | | X | | | | | Sparse canopy, trunk splits at 8', large limb failure |
| 843 | *Quercus douglasii* | 23.4 | | | | | | 23.4 | 45 | 40 | Very Poor | X | X | | | Poor | | | X | | | X | | | | Cracked/weathered trunk, exposed core, basal wound, dead wood in trunk |
| 844 | *Quercus douglasii* | 25.6 | | | | | | 25.6 | 45 | 50 | Good/Fair | | X | | | Good | | | | | | | | | | Minor branch dieback |
| 845 | *Quercus douglasii* | 26.2 | | | | | | 26.2 | 50 | 40 | Good/Fair | | X | | | Fair | X | | | | | | | | | Trunk splits at 12' into 3 main stems, included bark at several large limb crotches, minor canopy dieback |
| 846 | *Quercus douglasii* | 22.4 | | | | | | 22.4 | 50 | 40 | Good/Fair | X | X | | | Fair | | | | | | | | X | | Trunk splits into 3 stems at 15', canopy growth to north and north east, minor canopy dieback |
| 847 | *Quercus douglasii* | 21.7 | | | | | | 21.7 | 50 | 45 | Fair | X | X | | | Fair | | | | | | | | X | | Trunk splits into 3 stems at 12', canopy growth to east and north |
| 848 | *Quercus douglasii* | 27.9 | | | | | | 27.9 | 40 | 35 | Very Poor | X | | | | Very Poor | | X | | X | | | | X | | Canopy growth to south east, few low hanging branches, large main stem broken out on south side (approx. 16" diameter) at 20 feet, trunk cavity |
| 849 | *Quercus douglasii* | 39.1 | | | | | | 39.1 | 60 | 70 | Fair/Poor | | | | X | Fair/Poor | | | | | | X | | | | Woodpecker cavities, several low hanging branches, trunk splits into 3 main stems at 15', dead limbs, large branch overlap over adjacent backyard |
| 850 | *Quercus douglasii* | 22.8 | | | | | | 22.8 | 40 | 45 | Poor | | X | | | Fair | | X | | | | | | | | Poor twig/branch development, sparse canopy |
| 851 | *Quercus douglasii* | 27.8 | | | | | | 27.8 | 60 | 50 | Fair | X | X | | | Fair/Poor | | | X | | | | X | | | Trunk leans slightly west, good branching structure, sparse canopy |
| 852 | *Quercus douglasii* | 28.7 | | | | | | 28.7 | 60 | 60 | Fair | X | X | | | Fair/Poor | | | | X | | | X | | | Trunk leans slightly west, a few low hanging branches, cavity in main stem at 25' |
| 853 | *Quercus douglasii* | 41.2 | | | | | | 41.2 | 70 | 60 | Fair | X | | | | Fair | | | | | X | X | | | | Small nest in tree, trunk splits into 3 main stems at 12' |
| 854 | *Quercus douglasii* | 30.9 | | | | | | 30.9 | 60 | 60 | Fair | X | | | | Fair | | | | | X | | | | | Spreading canopy |
| 855 | *Quercus douglasii* | 47.5 | | | | | | 47.5 | 50 | 70 | Fair | | | | | Fair | X | | | | | X | | X | | Trunk splits at 6', canopy growth to the east, several low hanging limbs, included bark in large limbs on north side, minor dead wood in canopy |
| 856 | *Quercus douglasii* | 28.6 | | | | | | 28.6 | 40 | 40 | Poor | X | X | | | Poor | | X | X | X | X | | | X | | Several cavities throughout tree, canopy growth to north west, old broken limbs/branches in canopy, large decay column in main trunk |
| 857 | *Quercus douglasii* | 26.3 | | | | | | 26.3 | 40 | 45 | Fair | | X | | | Fair | | X | | X | | | | X | | Canopy growth to north west and south, canopy dieback, potential decay in lower limb at 20' (approx. 10" dia.), broken limb at 25' (approx. 8" dia.) |
| 858 | *Quercus douglasii* | 31.2 | | | | | | 31.2 | 18 | 30 | Poor | | | | | Very Poor | | | X | X | | | | | | Trunk broken at 8', one large limb prostrate to east, significant decay in main trunk |
| 859 | *Quercus douglasii* | 25.2 | | | | | | 25.2 | 40 | 40 | Fair | X | X | | | Fair | | X | | | | | | X | | Compact, arched canopy with low hanging branches, large limb broken out of canopy at 25' (approx. 9" dia.) |
| 860 | *Quercus douglasii* | 18.2 | | | | | | 18.2 | 40 | 40 | Fair/Poor | | | | | Fair | | | X | | | X | X | X | | 2 large cavities in trunk (3' and 12'), canopy growth to south east, trunk leans to south |
| 861 | *Quercus douglasii* | 22.2 | | | | | | 22.2 | 40 | 40 | Fair | X | X | | | Fair | | | | | | | X | X | | Trunk lean and canopy growth to south, small limbs, sparse canopy |
| 862 | *Quercus douglasii* | 25.1 | | | | | | 25.1 | 10 | 20 | Very Poor | | | | | Very Poor | | | X | | | | | | | Tree has fallen over but still contains live tissue |
| 864 | *Quercus douglasii* | 25.8 | | | | | | 25.8 | 50 | 50 | Fair | X | X | | | Fair | | | | | | | | | | Broken limb from tree #862 or 863 hanging in canopy, irregular canopy form |
| 865 | *Quercus douglasii* | 35.0 | | | | | | 35.0 | 45 | 55 | Fair | | X | | | Fair | | | | X | | X | | | | 1 large low limb, basal cavity and decay on west side of trunk base |
| 866 | *Quercus douglasii* | 26.8 | | | | | | 26.8 | 40 | 45 | Fair | X | X | | | Fair | | X | | | X | X | | X | | Trunk splits at 6', canopy growth to south, low-hanging limbs, large broken limb at 20' (approx. 10" dia.) |
| 867 | *Quercus douglasii* | 18.3 | | | | | | 18.3 | 25 | 25 | Very Poor | X | X | | | Very Poor | | X | | X | | X | | | | Main stem broken off at 25' |
| 868 | *Quercus douglasii* | 24.2 | | | | | | 24.2 | 40 | 45 | Poor | X | X | | | Poor | | | | | | | X | | | Large co-dominant stem broken out of canopy on south side (approx. 15" diameter) at 20 feet, resulting in lopsided canopy |
| 869 | *Quercus douglasii* | 24.1 | | | | | | 24.1 | 40 | 40 | Fair | X | X | | | Fair | | | | | | | | | | Several dead branches, sparse and lopsided canopy |
| 870 | *Quercus douglasii* | 30.2 | | | | | | 30.2 | 45 | 60 | Fair/Poor | X | X | | | Fair | | | | X | | X | | X | X | Trunk splits at 8', poor branch structure |
| 871 | *Quercus douglasii* | 26.9 | | | | | | 26.9 | 45 | 50 | Fair | X | X | | | Fair | | | | | | X | | X | | Sparse canopy |
| 872 | *Quercus douglasii* | 25.6 | | | | | | 25.6 | 45 | 45 | Fair | X | X | | | Fair | | | | | | X | | | | Trunk splits at 12' into 2 primary stems |
| 873 | *Quercus douglasii* | 21.2 | | | | | | 21.2 | 40 | 40 | Fair | | X | | | Fair | | | | | | X | | | | Tall & thin, relatively narrow canopy |

| Tag Number | Species | Individual Trunk Diameters T1 | T2 | T3 | T4 | T5 | T6 | Total Trunk Diameter Inches | Height (feet) | Dripline (feet) | Tree Health: Overall Health Rating | Epicormic sprouting | Canopy dieback | Gall presence | Other pests/disease | Tree Structure: Overall Structural Rating | Included bark | Broken limbs/branches | Trunk wound w/ decay | Cavity in trunk or main stem | Cavity in canopy branches | Dead wood in canopy | Leaning/arching trunk | Lopsided canopy | Poor branch attachment | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 874 | *Quercus douglasii* | 25.0 | | | | | | 25.0 | 40 | 55 | Fair | X | X | | | Fair | X | | | | X | X | | | | Large, open canopy, trunk splits at 8' with included bark at attachment |
| 875 | *Quercus douglasii* | 39.7 | | | | | | 39.7 | 55 | 70 | Fair | X | X | | | Fair | X | | | | | | | X | | Large, open canopy, trunk splits at 7' with included bark at attachment |
| 876 | *Quercus douglasii* | 12.3 | 8.7 | | | | | 21.0 | 20 | 25 | Fair | | X | | | Fair | X | | | X | | | | | | Trunk splits at 3' with included bark at attachment, loose bark at base |
| 877 | *Quercus douglasii* | 8.8 | | | | | | 8.8 | 20 | 22 | Good | | | | | Fair | | | | | | | | | | |
| 881 | *Quercus douglasii* | 31.1 | | | | | | 31.1 | 40 | 60 | Fair | | | | X | Fair | | | X | X | | | | | | Slime flux on south side |
| 882 | *Quercus douglasii* | 44.1 | | | | | | 44.1 | 50 | 55 | Fair | | X | | | Fair | | X | X | X | X | X | | | | Barbed wire around trunk, large arching canopy, canopy overhangs neighboring backyard, deadwood in trunk (west side) |
| 883 | *Quercus lobata* | 28.7 | | | | | | 28.7 | 55 | 45 | Good | | | | | Good | | | | | | | X | | | Trunk splits at 8', tall arching canopy, canopy overhangs neighboring backyard, narrow stem attachment |
| 884 | *Quercus lobata* | 26.6 | | | | | | 26.6 | 40 | 40 | Fair | | X | X | | Fair | X | | | | | | | | | Minor canopy dieback |
| 885 | *Quercus lobata* | 11.2 | 14.3 | | | | | 25.5 | 35 | 35 | Fair/Poor | X | X | X | | Fair/Poor | X | | X | | | X | | | | Included bark at primary crotch, loose bark at base |
| 886 | *Quercus lobata* | 12.8 | 18.4 | | | | | 31.2 | 35 | 35 | Fair | X | X | X | | Fair | | | | | | X | | | | |
| 887 | *Quercus lobata* | 43.1 | | | | | | 43.1 | 55 | 60 | Fair/Poor | X | X | | | Fair/Poor | | X | | | | | | | | Major limb broken at 25' (approx. 22" dia.) on south side |
| 888 | *Quercus lobata* | 8.9 | | | | | | 8.9 | 20 | 18 | Fair | | X | X | | Fair | | | X | | | | | | | Small trunk wound, suppressed |
| 889 | *Quercus lobata* | 15.6 | 12.9 | | | | | 28.5 | 25 | 30 | Poor | | X | | | Poor | | | | X | | | X | | | One healthy limb overhangs adjacent backyard |
| 890 | *Quercus lobata* | 13.2 | | | | | | 13.2 | 25 | 25 | Fair | | X | | | Poor | | | | | | | X | | | Lean |
| 891 | *Quercus lobata* | 13.5 | | | | | | 13.5 | 25 | 22 | Fair | X | X | | | Fair | | | | | | | | | | Minor canopy dieback, power line through canopy |
| 892 | *Quercus douglasii* | 9.1 | | | | | | 9.1 | 15 | 10 | Fair | X | | | | Poor | | | X | | | | | | | |
| 893 | *Quercus lobata* | 13.1 | | | | | | 13.1 | 25 | 20 | Very Poor | X | X | | | Poor | | X | | | | | X | | | Sparse canopy |
| 895 | *Quercus lobata* | 15.1 | 8.2 | | | | | 23.3 | 35 | 25 | Poor | X | X | | | Poor | X | | | | | | | | | Included bank at primary branch |
| 896 | *Quercus lobata* | 8.4 | | | | | | 8.4 | 25 | 15 | Poor | X | X | | | Poor | | X | | | | | | X | | Suppressed tree |
| 897 | *Quercus lobata* | 11.2 | | | | | | 11.2 | 30 | 25 | Poor | X | X | | | Poor | | | | | | X | | | | |
| 898 | *Quercus lobata* | 13.6 | | | | | | 13.6 | 35 | 15 | Very Poor | X | X | X | | Very Poor | X | | | | | | | | | Power line through canopy, main trunk splits at 15' with included bark at attachment, dead top |
| 899 | *Quercus lobata* | 11.6 | 13.1 | | | | | 24.7 | 35 | 20 | Poor | X | X | X | | Poor | | | X | | | | | | | Poor branch development, included bark at primary crotch, northern main stem dead |
| 901 | *Quercus lobata* | 13.8 | | | | | | 13.8 | 40 | 25 | Fair | | X | X | | Fair | | | | | | X | | | | Significant oak gall, several dead branches, narrow dense form |
| 902 | *Quercus lobata* | 14.9 | | | | | | 14.9 | 30 | 30 | Good/Fair | X | X | | | Fair | | | | | | | | | | Trunk splits into 3 primary trunks at 10' |
| 903 | *Quercus lobata* | 28.3 | | | | | | 28.3 | 45 | 45 | Fair | X | X | X | | Fair | X | | | | | | | | | Barbed wire through trunk, trunk splits at 6' with included bark at attachment |
| 904 | *Quercus lobata* | 15.1 | 21.1 | | | | | 36.2 | 45 | 40 | Good/Fair | X | X | X | | Fair | X | | | | | | | | | Trunk splits at 3' with included bark at attachment |
| 905 | *Quercus lobata* | 18.0 | | | | | | 18.0 | 45 | 30 | Fair | X | X | | | Fair | | | | | | | | | | Foliage primarily on branches, dense upright form |
| 906 | *Quercus lobata* | 11.5 | | | | | | 11.5 | 30 | 20 | Fair | X | X | | | Fair | | | | | | | | | | Thin, compact tree with dense foliage and few large branches |
| 907 | *Quercus lobata* | 15.5 | 16.3 | | | | | 31.8 | 40 | 45 | Fair | X | X | | | Fair | X | | | | | | | | | Trunk splits at 2' with included bark at attachment |
| 908 | *Quercus lobata* | 14.1 | | | | | | 14.1 | 40 | 35 | Fair/Poor | X | X | X | | Fair | | | | | | | | X | | |
| 909 | *Quercus lobata* | 17.5 | 18.1 | | | | | 35.6 | 40 | 40 | Fair | X | X | | | Fair | X | | | | | X | | | | Trunk splits at 3' with included bark at attachment |
| 910 | *Quercus douglasii* | 10.5 | 12.0 | 6.6 | | | | 29.1 | 25 | 25 | Fair | | | X | | Fair | X | | | | | | | | | Trunk splits at 1' with included bark at attachment |
| 911 | *Quercus douglasii* | 13.3 | | | | | | 13.3 | 18 | 18 | Fair | | X | | | Fair | | | | | | | | | | Trunk diameter measured at 4', trunk splits at 4.5 feet into 3 main stems |

| Tag Number | Species | Individual Trunk Diameters | | | | | | Total Trunk Diameter Inches | Height (feet) | Dripline (feet) | Tree Health | | | | | Tree Structure | | | | | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T3 | T4 | T5 | T6 | | | | Overall Health Rating | Epicormic sprouting | Canopy dieback | Gall presence | Other pests/disease | Overall Structural Rating | Included bark | Broken limbs/branches | Trunk wound w/ decay | Cavity in trunk or main stem | Cavity in canopy branches | Dead wood in canopy | Leaning/arching trunk | Lopsided canopy | Poor branch attachment | |
| 912 | *Quercus douglasii* | 12.9 | | | | | | 12.9 | 18 | 20 | Fair/Poor | | | X | | Fair | | | | X | | | | | | Trunk diameter measured at 4', trunk splits at 4.5 feet into 2 main stems, sapsucker damage on main trunk |
| 913 | *Quercus douglasii* | 13.6 | 11.2 | | | | | 24.8 | 22 | 25 | Fair | | | X | | Poor | X | | | X | | X | | | | Trunk splits at 3' with included bark at attachment |
| 914 | *Quercus lobata* | 18.2 | | | | | | 18.2 | 30 | 25 | Good/Fair | | X | X | | Fair | | | | | | | | | | |
| 915 | *Quercus lobata* | 12.3 | | | | | | 12.3 | 25 | 18 | Fair | | | X | | Fair | | | | | | | | | | |
| 916 | *Quercus douglasii* | 15.4 | | | | | | 15.4 | 30 | 25 | Good | | | | | Fair | X | | | | | | | | | |
| 917 | *Quercus lobata* | 22.4 | | | | | | 22.4 | 30 | 45 | Fair | | | X | | Fair | | | | | | | X | | X | Good new growth |
| 918 | *Quercus douglasii* | 11.3 | | | | | | 11.3 | 30 | 18 | Fair | | X | | | Fair | | | | | | | | | | Trunk splits into 2 primary trunks at 12' |
| 919 | *Quercus lobata* | 17.0 | | | | | | 17.0 | 30 | 35 | Fair | X | X | X | | Poor | | | | | | | | X | X | Trunk splits into 2 primary trunks at 7' |
| 920 | *Quercus lobata* | 16.1 | 19.2 | | | | | 35.3 | 35 | 45 | Fair/Poor | X | X | X | | Fair | | | | | | X | | | | |
| 921 | *Quercus wislizeni* | 11.6 | 11.5 | 6.6 | | | | 29.7 | 25 | 22 | Fair | | | | | Fair | | | | | | | | | | Trunk splits at 3', barbed wire through tree at trunk split |
| 922 | *Quercus lobata* | 18.1 | | | | | | 18.1 | 30 | 30 | Fair/Poor | X | X | | | Fair | X | | | | | X | | | | Poor twig development, a few dead branches, wire through canopy |
| 923 | *Quercus lobata* | 13.9 | | | | | | 13.9 | 25 | 25 | Fair/Poor | X | | X | | Fair | | | | | | X | | | | Poor twig development |
| 924 | *Quercus lobata* | 22.0 | | | | | | 22.0 | 45 | 40 | Fair | | | | | Fair/Poor | | | | | | X | X | | | Primary trunk leans north at 15°, power line through canopy, canopy sparse, located outside fence |
| 925 | *Quercus douglasii* | 8.4 | 9.5 | | | | | 17.9 | 25 | 18 | Fair | | | | | Fair | | | | | | | | | | Trunk splits at base, 2 small primary trunks, no large branches |
| 926 | *Quercus douglasii* | 13.1 | 6.0 | | | | | 19.1 | 30 | 25 | Fair | | X | | | Fair | X | | | | | | | | | Trunk splits at 2' with included bark |
| 927 | *Quercus douglasii* | 19.3 | | | | | | 19.3 | 35 | 40 | Fair | X | X | | | Fair/Poor | X | | | | | | | | | Trunk splits into 2 primary trunks at 6' |
| 928 | *Quercus lobata* | 16.2 | | | | | | 16.2 | 40 | 25 | Fair | X | X | | | Fair | | | | | | | | | | Trunk splits at 20' into 2 stems |
| 929 | *Quercus lobata* | 15.8 | | | | | | 15.8 | 40 | 30 | Fair | | X | | | Fair/Poor | X | | | | | | | | | Trunk splits at 6', included bark at primary crotch, open crown, narrow branch attachment |
| 930 | *Quercus lobata* | 20.1 | | | | | | 20.1 | 45 | 35 | Fair | X | X | | | Fair | X | | | | | | | X | | Trunk splits at 6', included bark at primary crotch, most limbs to south |
| 931 | *Quercus lobata* | 10.3 | | | | | | 10.3 | 45 | 18 | Fair | | | | | Fair/Poor | X | | | | | X | | | | Trunk splits at 8', included bark at primary crotch, narrow canopy |
| 933 | *Quercus lobata* | 12.1 | | | | | | 12.1 | 45 | 22 | Fair | | X | | | Fair/Poor | X | | | | | | | | | Poor branch development, trunk splits into 2 at 10' |
| 934 | *Quercus lobata* | 10.7 | | | | | | 10.7 | 45 | 22 | Fair | | X | X | | Fair | | | | | | | X | | | Trunk leans N slightly |
| 935 | *Quercus lobata* | 9.5 | | | | | | 9.5 | 45 | 20 | Fair | | X | X | | Fair | | | | | | | | X | | Few large branches, canopy growth to south |
| 936 | *Quercus lobata* | 12.6 | | | | | | 12.6 | 45 | 22 | Fair | | X | | | Fair | | | | | | | | | | Trunk splits into 2 trunks at 12', twisted trunk, poor twig development |
| 937 | *Quercus lobata* | 9.7 | 10.4 | | | | | 20.1 | 30 | 22 | Fair | | X | | | Fair/Poor | | | | | | | | X | | Trunk splits at 1', most branches to south, suppressed |
| 938 | *Quercus lobata* | 10.6 | | | | | | 10.6 | 40 | 20 | Fair | | | | | Fair/Poor | | | | | | | | X | | Few large branches, lean from stand of trees to north |
| 939 | *Quercus lobata* | 10.6 | | | | | | 10.6 | 40 | 18 | Fair | | X | | | Fair | | | | | | X | | | | Trunk splits at 15' into 2, co-dominant tree |
| 940 | *Quercus lobata* | 15.7 | | | | | | 15.7 | 45 | 25 | Fair | | X | | | Fair | | | | | | X | | | | Straight trunk with a few large branches, dominant tree |
| 941 | *Quercus wislizeni* | 8.4 | | | | | | 8.4 | 20 | 18 | Fair | | | | | Fair | | | | | | | X | | | Dense canopy, trunk leans north west |
| 943 | *Quercus lobata* | 10.5 | | | | | | 10.5 | 45 | 18 | Fair | | X | X | X | Fair | | | | | | | | | | Small, thin tree, no large branches, leaf roller |
| 945 | *Quercus lobata* | 16.2 | | | | | | 16.2 | 45 | 25 | Good/Fair | X | | X | | Fair | | | | | | | X | | | 1 primary trunk with few large branches, leans north west slightly |
| 946 | *Quercus lobata* | 10.5 | | | | | | 10.5 | 25 | 18 | Fair | | | X | | Fair | X | | | | | | | | | Small tree with good lateral branch development, included bark at main branch attachment, sparse canopy |
| 947 | *Quercus lobata* | 17.5 | 15.3 | | | | | 32.8 | 45 | 40 | Fair | | | X | | Fair | X | | | | | | | | | Trunk splits at 3', included bark at crotch |

| Tag Number | Species | Individual Trunk Diameters T1 | T2 | T3 | T4 | T5 | T6 | Total Trunk Diameter Inches | Height (feet) | Dripline (feet) | Tree Health: Overall Health Rating | Epicormic sprouting | Canopy dieback | Gall presence | Other pests/disease | Tree Structure: Overall Structural Rating | Included bark | Broken limbs/branches | Trunk wound w/ decay | Cavity in trunk or main stem | Cavity in canopy branches | Dead wood in canopy | Leaning/arching trunk | Lopsided canopy | Poor branch attachment | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 948 | *Quercus lobata* | 12.8 | | | | | | 12.8 | 40 | 35 | Fair | | | | | Fair | X | | | | | | | | | Narrow, dense form, many lateral branches |
| 949 | *Quercus lobata* | 14.8 | 11.5 | 8.2 | | | | 34.5 | 18 | 30 | Fair/Poor | X | X | X | | Poor | X | | X | | | | | | | Decay at trunk base |
| 950 | *Quercus lobata* | 14.9 | | | | | | 14.9 | 25 | 40 | Fair | X | X | | | Fair | | | | | | | | | | Small & twisted tree |
| 952 | *Quercus douglasii* | 12.8 | | | | | | 12.8 | 20 | 18 | Good | | | X | | Fair | | | | | | | | | | Small tree with rounded canopy, along fence line |
| 953 | *Quercus douglasii* | 14.1 | | | | | | 14.1 | 30 | 20 | Good | | | | | Fair | | | | | | | | | | Small, dense tree with narrow canopy |
| 954 | *Quercus lobata* | 19.6 | | | | | | 19.6 | 40 | 30 | Fair | | X | X | | Fair | | | | | | | | | | Significant oak gall, dense canopy with many dead twigs |
| 955 | *Quercus lobata* | 22.1 | | | | | | 22.1 | 45 | 30 | Fair | | | X | | Fair | X | | | | | | | | | Trunk splits at 4', good new growth |
| 956 | *Quercus lobata* | 25.7 | 16.2 | | | | | 41.9 | 45 | 50 | Fair | X | | | | Fair | X | | | | | | | | | Good branch development, poor twig development, included bark at branch crotches |
| 957 | *Quercus lobata* | 8.5 | 14.4 | 20.9 | | | | 43.8 | 50 | 40 | Fair | X | X | X | | Fair | X | | | | | | | | | Included bark at primary crotches, dense crown |
| 958 | *Quercus lobata* | 12.9 | 12.8 | | | | | 25.7 | 40 | 35 | Fair | X | X | X | | Fair | X | | | | | | | | | Included bark at primary crotch, split crown |
| 959 | *Quercus lobata* | 17.9 | | | | | | 17.9 | 45 | 45 | Fair | X | | | | Fair | | | | | | X | | X | | Some dead/low hanging branches, most limbs to north west |
| 960 | *Quercus lobata* | 22.6 | | | | | | 22.6 | 50 | 45 | Fair | X | | | | Fair | X | | | | | | | X | | Canopy growth to west, included bark at several branch crotches, sparse canopy |
| 961 | *Quercus lobata* | 18.4 | | | | | | 18.4 | 45 | 30 | Fair | X | X | X | | Fair | | | | | | | | | | |
| 962 | *Quercus lobata* | 16.3 | | | | | | 16.3 | 45 | 25 | Fair | X | X | | | Fair | | | | | | | | | | Included bark at primary crotch |
| 963 | *Quercus lobata* | 16.1 | | | | | | 16.1 | 45 | 30 | Fair | X | X | X | | Fair | X | | | | | | | | | Open canopy, several low limbs |
| 964 | *Quercus lobata* | 18.4 | | | | | | 18.4 | 45 | 30 | Fair | X | X | X | | Fair | X | | | | | | | | | Trunk splits into 2 primary trunks at 10' |
| 965 | *Quercus lobata* | 18.3 | | | | | | 18.3 | 45 | 25 | Fair | X | X | X | | Poor | | | | | | | | | | Dense canopy and narrow branch attachments |
| 966 | *Quercus lobata* | 15.4 | | | | | | 15.4 | 45 | 25 | Fair | X | X | X | | Fair | | | | | | | | | | Several dead branches and twigs some narrow crotches |
| 967 | *Quercus lobata* | 13.1 | | | | | | 13.1 | 45 | 20 | Fair | X | X | X | | Fair | | | | | | | | | | Thin tree, a few large branches |
| 968 | *Quercus lobata* | 11.9 | 5.7 | | | | | 17.6 | 40 | 18 | Fair | X | X | X | | Poor | | | | | | | X | X | | Small trunk has dead top |
| 969 | *Quercus lobata* | 16.2 | | | | | | 16.2 | 45 | 25 | Fair | X | X | X | | Fair | | | | | | | | | | Dense branches, narrow form |
| 970 | *Quercus lobata* | 27.2 | | | | | | 27.2 | 35 | 35 | Good | | X | X | | Fair | X | | | | | | X | | | Several crotches with included bark, trunk leans south |
| 974 | *Quercus douglasii* | 27.2 | 27.1 | 28.2 | | | | 82.5 | 50 | 70 | Fair | | X | | | Fair | | X | | | X | | | | | Splits at 4' into 3 primary trunks, spreading canopy, low limbs on east side, barbed wire in trunk on east side, large limb broken out on east side at 30' (approx. 10" dia.), 2 large limbs broken out on southwest side at 15' |
| 975 | *Quercus douglasii* | 25.4 | | | | | | 25.4 | 40 | 40 | Fair | | X | | | Fair | | | X | | | X | | | | Twisted trunk, splits into 3 at 18', small basal wound on north side, sparse canopy |
| 976 | *Quercus douglasii* | 31.2 | | | | | | 31.2 | 55 | 50 | Good/Fair | | X | | | Good | | | | | | X | | | | Trunk splits at 20' into 3 limbs, open canopy |
| 977 | *Quercus douglasii* | 38.0 | | | | | | 38.0 | 60 | 50 | Fair | | X | | | Fair | | | | | X | X | | | | Large limb broken out on south side at 20' (approx. 18" dia.), sparse canopy |
| 978 | *Quercus douglasii* | 23.1 | | | | | | 23.1 | 50 | 45 | Fair | X | X | | | Fair | | | | | | | | | | Sparse canopy, minimal twig development |
| 979 | *Quercus douglasii* | 36.7 | | | | | | 36.7 | 55 | 60 | Fair | | X | | | Fair | | | | | | X | | | | Split at 15' into 2 primary trunks, large broken limbs on north west side at 25' (approx. 12" dia.) and north side at 28' (approx. 9" dia.), broken limbs on north side, large dead limb in lower canopy |
| 980 | *Quercus lobata* | 18.6 | | | | | | 18.6 | 30 | 40 | Good/Fair | | X | | | Fair | | X | | | | | | | | Open crown, many large limbs, wire through canopy, adjacent to power pole (approx. 8') |
| 981 | *Quercus lobata* | 13.4 | | | | | | 13.4 | 30 | 18 | Very Poor | X | X | X | | Very Poor | | | | | | | | | | Sparse canopy, thin branches, 2 primary stems, wire through canopy |
| 982 | *Quercus lobata* | 9.2 | | | | | | 9.2 | 25 | 10 | Very Poor | | | | | Very Poor | | | | | | | | | | Dead top, live sprouts at approx. 4', otherwise dead |
| 983 | *Quercus lobata* | 14.8 | 9.4 | | | | | 24.2 | 25 | 18 | Very Poor | X | X | X | | Very Poor | | X | X | | | | | | | Included bark at most branch crotches, wire through canopy, trunk wound on west side |
| 984 | *Quercus lobata* | 14.2 | | | | | | 14.2 | 25 | 18 | Very Poor | X | X | X | | Very Poor | | | X | | | | | | | Narrow crown, poor branch development, 2 primary trunks, canopy top dead, trunk wound on south side |

| Tag Number | Species | Individual Trunk Diameters | | | | | | Total Trunk Diameter Inches | Height (feet) | Dripline (feet) | Tree Health | | | | | Tree Structure | | | | | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T3 | T4 | T5 | T6 | | | | Overall Health Rating | Epicormic sprouting | Canopy dieback | Gall presence | Other pests/disease | Overall Structural Rating | Included bark | Broken limbs/branches | Trunk wound w/ decay | Cavity in trunk or main stem | Cavity in canopy branches | Dead wood in canopy | Leaning/arching trunk | Lopsided canopy | Poor branch attachment | |
| 985 | *Quercus lobata* | 12.7 | 7.9 | | | | | 20.6 | 25 | 15 | Very Poor | X | X | X | | Very Poor | | | | | | | | | | Narrow crown, poor branch development |
| 986 | *Quercus douglasii* | 36.8 | | | | | | 36.8 | 50 | 50 | Fair | | X | | | Fair | | X | | | X | X | | | | Large broken limb on north side, several other broken limbs in canopy (>8") |
| 987 | *Quercus lobata* | 9.2 | 7.4 | | | | | 16.6 | 25 | 20 | Good | | | | | Fair | | | | | | | | | | On property line |
| 988 | *Quercus douglasii* | 9.1 | | | | | | 9.1 | 25 | 22 | Good | | | | | Fair | | | | | | | | | | Small tree, narrow trunk split at 8' with included bark |
| 989 | *Quercus douglasii* | 9.9 | | | | | | 9.9 | 20 | 15 | Good | X | | | | Fair | | | | | | | | | | Isolated, small tree |
| 2 | *Quercus lobata* | 9.1 | 5.6 | 5.4 | | | | 20.1 | 20 | 18 | Fair | | | | | Fair | | | X | | | | | | | Trunk wound on largest trunk |
| 3 | *Quercus lobata* | 7.9 | 3.4 | | | | | 11.3 | 18 | 16 | Good | | X | X | | Fair | | | | | | | | X | | Canopy growth to west side |
| 4 | *Quercus lobata* | 7.2 | 4.3 | | | | | 11.5 | 16 | 14 | Good | | | X | | Fair | | | | | | | | X | | Canopy growth the east side |
| 5 | *Quercus lobata* | 9.1 | 8.6 | | | | | 17.7 | 20 | 18 | Good | | X | | | Fair | | | | | | | | | | Minor twig dieback |
| 10 | *Quercus lobata* | 12.3 | | | | | | 12.3 | 22 | 18 | Good | | | | | Good | | | | | | | | | | Good, small-stature tree |
| 11 | *Quercus lobata* | 7.1 | 5.8 | | | | | 12.9 | 20 | 15 | Fair | | | | | Fair | X | | | | | | | | | Trunk splits at 2', included bark at trunk split, barbed wire through larger stem at 1', galls |
| 12 | *Quercus lobata* | 7.9 | | | | | | 7.9 | 18 | 15 | Fair | | X | X | | Fair | | | | | | | | | | Heavy gall presence, wet soil at base (drainage from neighboring property), narrow canopy, minor twig dieback |
| 13 | *Quercus douglasii* | 13.1 | 6.8 | | | | | 19.9 | 15 | 20 | Fair | | | X | | Fair | X | | | | | | | | | Trunk diameter measured at 4', trunk splits at 4.5 feet into 3 main stems |
| 14 | *Quercus douglasii* | 8.1 | 9.1 | | | | | 17.2 | 30 | 20 | Fair | | | | | Fair | | | | | | | | | | Located along property line, barbed wire through trunk split at 2.5', galls |
| 15 | *Quercus wislizeni* | 8.1 | 4.8 | | | | | 12.9 | 12 | 22 | Fair | | | | | Poor | | | | | | | | | | Suppressed, fence between trunks, shrubby form |
| 16 | *Quercus wislizeni* | 5.9 | 4.0 | 4.0 | 4.0 | | | 17.9 | 15 | 20 | Fair | | | | | Fair | | | | | | | | | | Suppressed, shrubby form |
| 17 | *Quercus douglasii* | 7.9 | | | | | | 7.9 | 15 | 15 | Good | | | | | Fair | | | | | | | | | | Isolated, small tree, crooked trunk |
| 18 | *Quercus douglasii* | 8.4 | | | | | | 8.4 | 18 | 12 | Fair | | | | | Fair | | | | | | | | | | Isolated, small tree |
| 21 | *Quercus wislizeni* | 5.2 | 3.4 | 3.3 | | | | 11.9 | 15 | 16 | Good | | | | | Fair | | | | | | | | | | Suppressed, growing up against utility pole, shrubby form |
| 22 | *Quercus douglasii* | 6.0 | 4.0 | | | | | 10.0 | 12 | 12 | Fair | | | | | Fair | | | | | | | | | | Suppressed, shrubby form |
| 23 | *Quercus lobata* | 6.3 | | | | | | 6.3 | 18 | 12 | Good | | X | | | Fair | | | | | | | | | | |
| 24 | *Quercus lobata* | 6.1 | | | | | | 6.1 | 18 | 8 | Fair/Poor | | X | | | Fair | | | | | | | | | | Suppressed |
| 25 | *Quercus lobata* | 6.0 | | | | | | 6.0 | 18 | 10 | Fair | | X | X | | Fair | | | | | | | | | | |
| 26 | *Quercus wislizeni* | 10.0 | | | | | | 10.0 | 16 | 16 | Good | | | | | Fair | | | | | | | | | | |

# Attachment 3
# Tree Protection Recommendations

# Attachment 3
# Tree Management Recommendations and Protection Measures

*The following tree protection measures include requirements based on the City of Lincoln's 'Guidelines for Development around Oak Trees' document and additional recommended measures intended to avoid or minimize impacts to trees during construction. The measures presented should be monitored by arborists and enforced by contractors and developers for maximum benefit to the trees.*

## Tree Protection Measures Prior to Construction

Prior to any grading activity, preserved trees with canopies that fall within 30 feet of construction activity should be protected by fencing and signage. All contractors should be made aware of the tree protection measures. A project arborist should be assigned to monitor tree health and construction activity near retained trees on site. The project arborist should be an International Society of Arboriculture (ISA) Certified Arborist.

Inspection: Any large tree proposed for preservation on site should be thoroughly inspected for internal or subterranean decay by a qualified arborist prior to construction activity to determine if retention/protection on site is a viable management option.

Site Preparation: Tree removal, pruning, and inspection should be conducted during site preparation activities. Where permitted by the City, tree removal and pruning activity should be conducted according to industry standards (ANSI A300). ISA Certified Arborist inspection of trees to be retained on site is recommended to identify any health or structural issues which may warrant further management action (pruning, cabling, bracing, removal, etc.). Additionally, pruning should be conducted to remove deadwood, hazard branches, or limbs/branches that may conflict with proposed construction activity.

Fencing and Signage: A 4-foot high, orange-webbing, polypropylene barricade fence with tree protection signs should be erected around all trees (or tree groups) to be preserved. The protective fence should be installed at the dripline of the tree(s). This will delineate the tree protection area and prevent unwanted activity in and around the trees in order to reduce soil compaction in the root zones of the trees and other damage from heavy equipment. The fence webbing should be secured to 6-foot, heavy gauge t-bar line posts, pounded in the ground a minimum of 18-inches and spaced 8-feet on-center. Fence webbing should be attached to t-bar posts with minimum 14-gage wire fastened to the top, middle and bottom of each post. Tree protection signs should be attached to every fourth post. The contractor should maintain the fence to keep it upright, taut, and aligned at all times. Fencing should be removed only after all construction activities are complete.

Pre-Construction Meeting: A pre-construction meeting should be held between all contractors (including grading, tree removal/pruning, builders, etc.) and the arborist. The arborist will instruct the contractors on tree protection practices and answer any questions. All equipment operators and spotters, assistants, or those directing operators from the ground, should provide written acknowledgement of their receiving tree protection training. This training should include information on the location and marking of protected trees, the necessity of preventing damage, and the discussion of work practices that will accomplish such.

## Protection and Maintenance during Construction

Once construction activities have begun the following measures should be adhered to:

Avoidance: Signs, ropes, cables, or any other items should not be attached to any preserved tree.

Equipment Operation and Storage: Operating heavy machinery around the root zones of trees will increase soil compaction, which decreases soil aeration and subsequently reduces water penetration in the soil. All heavy equipment and vehicles should stay out of the fenced tree protection zone, unless where specifically approved in writing by the City and under the supervision of an ISA Certified Arborist.

Storage and Disposal: Do not store or discard any supply or material, including paint, lumber, concrete overflow, etc. within the fenced tree protection zone. Remove all foreign debris within the fenced tree protection zone; it is important to leave the duff, mulch, chips, and leaves around the retained trees for water retention and nutrients. Avoid draining or leakage of equipment fluids near retained trees. Fluids such as: gasoline, diesel, oils, hydraulics, brake and transmission fluids, paint, paint thinners, and glycol (anti-freeze) should be disposed of properly. Keep equipment parked outside of the fenced tree protection zone of retained trees to avoid the possibility of leakage of equipment fluids into the soil.

Grade Changes: Grade changes (including fill) are not permitted within a tree's dripline. Lowering the grade within a tree's dripline will necessitate cutting main support and feeder roots, jeopardizing the health and structural integrity of the tree(s). Adding soil, even temporarily, on top of the existing grade will compact the soil further, and decrease both water and air availability to the trees' roots. Where grade changes are necessary, slopes, retaining walls, alternative fill materials, or aerating tiles may be installed outside canopy driplines as an alternative technique.

Moving Construction Materials: Care will be taken when moving equipment or supplies near the trees, especially overhead. Avoid damaging the tree(s) when transporting or moving construction materials and working around retained trees (even outside of the fenced tree protection zone). Above ground tree parts that could be damaged (e.g., low limbs, trunks) should be flagged with red ribbon. If contact with the tree crown is unavoidable, prune the conflicting branch(es) using ISA or ANSI A300 standards.

Trenching: All trenching should be outside of the canopy driplines. Where trenching is necessary within the canopy dripline, boring or drilling should be used as an alternative technique.

Drainage: Site grading should not result in water being diverted toward tree canopy driplines and new footings, curbs, and/or walls should not be constructed as to trap or dam water within the canopy dripline.

Paving: Only pervious paving materials should be used for paving within the driplines of retained trees, where necessary.

Canopy Pruning: All pruning should be completed under the direction of an ISA Certified Arborist and done according to ISA and ANSI A300 standards. Only conflicting limbs, deadwood, and hazard branches/limbs should be removed.

Inspection: An ISA Certified Arborist should inspect the preserved trees on at least a monthly basis for the duration of construction activity. A summary report documenting observations and management recommendations should be submitted to the owner following each inspection.

## Maintenance after Construction

Once construction is complete the tree protection fencing may be removed and the following measures performed to sustain and enhance the vigor of the preserved trees.

Mulch: Provide a 4-inch mulch layer under the canopy of trees. Mulch should include clean, organic mulch that will provide long-term soil conditioning, soil moisture retention, and soil temperature control.

Pruning: Pruning should *only* be done to maintain clearance and remove broken, dead or diseased branches. Pruning should only take place following a recommendation by an ISA Certified Arborist and performed under the supervision of an ISA Certified Arborist. No more than 15% of the canopy should be removed at any one time. All pruning should conform to ISA or ANSI A300 standards.

Watering: Retained trees on site should be watered as they were prior to the commencement of construction activity. Supplemental irrigation may be necessary for twelve months following substantial root pruning.

Watering Adjacent Plant Material: All plants near the trees should be compatible with water requirements of said trees. Watering regime included in the site's landscape plan should be developed with consideration for the water needs of retained trees.

Spraying: If the trees are maintained in a healthy state, regular spraying for insect or disease control should not be necessary. If a problem does develop, an ISA Certified Arborist should be consulted; the trees may require application of insecticides to prevent the intrusion of bark-boring beetles and other invading pests. All chemical spraying should be performed by a licensed applicator under the direction of a licensed pest control advisor.

Monitoring: All trees within 30 feet of construction activity should be monitored by an ISA Certified Arborist for the first three years after construction completion. An annual monitoring report should be submitted to the owner and the City. Each report should summarize the inspection efforts, document observations and management actions taken, include photographs of each tree, and compare post-construction tree conditions with the original, pre-construction baseline condition. If any retained trees die within this inspection period, they should be replaced at a ratio approved by the City or an in-lieu mitigation fee paid as directed by the City.

# Appendix H

**Cultural Resources Information (Confidential)**

# Appendix I

**Cultural Consultation Letters**

**PEAK & ASSOCIATES, INC.**
Consulting Archeology
*40 Years: 1975-2015*

January 6, 2017

T'si-Akim Maidu
Mr. Grayson Coney, Cultural Director
PO Box 1316
Colfax, CA 95713

Dear Mr. Coney:

Peak & Associates, Inc. has contracted with De Novo Environmental to perform a cultural resources assessment of the proposed Fullerton Ranch Project, a proposed residential subdivision in Lincoln, Placer County. The project area, of about 19.7 acres, is depicted on the enclosed map. The project area lies in section 16 of township 12N, range 6E on the south side of Nicolas Road west of the new Joiner Parkway.

This same property was surveyed for cultural resources in 2002 and again last month. Results were negative in terms of Native American resources on both occasions.

We are contacting individuals identified by the Native American Heritage Commission as persons who might have information to contribute regarding potential Native American concerns in the project area. Any information or concerns that you may have regarding village sites, traditional properties or modern Native American uses in any portion of the project vicinity will be welcomed. If you know other individuals who are familiar with the vicinity, we would welcome this information as well.

We recognize that much of the information about protected and sacred sites may be confidential within your community and cannot be shared with those outside of your community. We will work with you to minimize impact on your cultural resources. Please contact me to discuss how we can accomplish protection of your cultural resources within your limits of confidentiality and the needs of the project.

Thank you for your assistance.

Sincerely,

Consulting Archeologist

//RG
Encl.

O 3941 Park Drive, Suite 20, #329, El Dorado Hills, CA 95762/Phone: (916)939-2405/Fax: 939-2406/email: peakinc@jps.net
G 3161 Godman Avenue, Suite A, Chico, CA 95973/Phone: (530)342-2800/Fax: 342-0273/email: peakinc@cmc.net

**PEAK & ASSOCIATES, INC.**
Consulting Archeology
*40 Years: 1975-2015*

January 6, 2017

Shingle Springs Band of Miwok Indians
Mr. Nicholas Fonseca, Chairperson
PO Box 1340
Shingle Springs, CA 95682

Dear Mr. Fonseca:

Peak & Associates, Inc. has contracted with De Novo Environmental to perform a cultural resources assessment of the proposed Fullerton Ranch Project, a proposed residential subdivision in Lincoln, Placer County. The project area, of about 19.7 acres, is depicted on the enclosed map. The project area lies in section 16 of township 12N, range 6E on the south side of Nicolas Road west of the new Joiner Parkway.

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We recognize that much of the information about protected and sacred sites may be confidential within your community and cannot be shared with those outside of your community. We will work with you to minimize impact on your cultural resources. Please contact me to discuss how we can accomplish protection of your cultural resources within your limits of confidentiality and the needs of the project.

Thank you for your assistance.

Sincerely,

Consulting Archeologist

//RG
Encl.

O 3941 Park Drive, Suite 20, #329, El Dorado Hills, CA 95762/Phone: (916)939-2405/Fax: 939-2406/email: peakinc@jps.net
G 3161 Godman Avenue, Suite A, Chico, CA 95973/Phone: (530)342-2800/Fax: 342-0273/email: peakinc@cmc.net

**PEAK & ASSOCIATES, INC.**
Consulting Archeology
*40 Years: 1975-2015*

January 6, 2017

T'si-Akim Maidu
Mr. Don Ryburg, Chairperson
11442 Butler Road
Grass Valley, CA 95945

Dear Mr. Ryburg:

Peak & Associates, Inc. has contracted with De Novo Environmental to perform a cultural resources assessment of the proposed Fullerton Ranch Project, a proposed residential subdivision in Lincoln, Placer County. The project area, of about 19.7 acres, is depicted on the enclosed map. The project area lies in section 16 of township 12N, range 6E on the south side of Nicolas Road west of the new Joiner Parkway.

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We recognize that much of the information about protected and sacred sites may be confidential within your community and cannot be shared with those outside of your community. We will work with you to minimize impact on your cultural resources. Please contact me to discuss how we can accomplish protection of your cultural resources within your limits of confidentiality and the needs of the project.

Thank you for your assistance.

Sincerely,

Robert A. Gerry

Consulting Archeologist

//RG
Encl.

O 3941 Park Drive, Suite 20, #329, El Dorado Hills, CA 95762/Phone: (916)939-2405/Fax: 939-2406/email: peakinc@jps.net
G 3161 Godman Avenue, Suite A, Chico, CA 95973/Phone: (530)342-2800/Fax: 342-0273/email: peakinc@cmc.net

**PEAK & ASSOCIATES, INC.**
Consulting Archeology
*40 Years: 1975-2015*

January 6, 2017

United Auburn Indian Community of the Auburn Rancheria
Mr. Gene Whitehouse, Chairperson
10720 Indian Hill Road
Auburn, CA 95603

Dear Mr. Whitehouse:

Peak & Associates, Inc. has contracted with De Novo Environmental to perform a cultural resources assessment of the proposed Fullerton Ranch Project, a proposed residential subdivision in Lincoln, Placer County. The project area, of about 19.7 acres, is depicted on the enclosed map. The project area lies in section 16 of township 12N, range 6E on the south side of Nicolas Road west of the new Joiner Parkway.

This same property was surveyed for cultural resources in 2002 and again last month. Results were negative in terms of Native American resources on both occasions.

We are contacting individuals identified by the Native American Heritage Commission as persons who might have information to contribute regarding potential Native American concerns in the project area. Any information or concerns that you may have regarding village sites, traditional properties or modern Native American uses in any portion of the project vicinity will be welcomed. If you know other individuals who are familiar with the vicinity, we would welcome this information as well.

We recognize that much of the information about protected and sacred sites may be confidential within your community and cannot be shared with those outside of your community. We will work with you to minimize impact on your cultural resources. Please contact me to discuss how we can accomplish protection of your cultural resources within your limits of confidentiality and the needs of the project.

Thank you for your assistance.

Sincerely,

Consulting Archeologist

//RG
Encl.

O 3941 Park Drive, Suite 20, #329, El Dorado Hills, CA 95762/Phone: (916)939-2405/Fax: 939-2406/email: peakinc@jps.net
G 3161 Godman Avenue, Suite A, Chico, CA 95973/Phone: (530)342-2800/Fax: 342-0273/email: peakinc@cmc.net

# Appendix J

**Noise Study**


# Fullerton Ranch Planned Development

**City of Lincoln, California**

**March 28, 2017**

**jcb Project # 2017-104**

**Prepared for:**

DE NOVO PLANNING GROUP

**Attn:**
**Steve McMurtry**
**1020 Suncast Lane, Suite 106**
**El Dorado Hills, California 95762**

**Prepared by:**


**j.c. brennan & associates, Inc.**

**Luke Saxelby, INCE Bd. Cert.**
**Vice President**
**Board Certified, Institute of Noise Control Engineering (INCE)**

The proposed project includes a Rezone and a Vesting Tentative Map that would facilitate the development of 82 single family residential units on approximately 19.7 acres located southwest of the Nicolaus Road and Joiner Parkway intersection. The project applicant has submitted a vesting tentative map which contains a lot layout plan, preliminary utility layout plan, preliminary grading and drainage plan, existing easements plan, and a preliminary tree removal plan.

This section provides a general description of the existing noise sources in the project vicinity, a discussion of the regulatory setting, and identifies potential noise impacts associated with the proposed project. Project impacts are evaluated relative to applicable noise level criteria and to the existing ambient noise environment. Mitigation measures have been identified for significant noise-related impacts.

# ENVIRONMENTAL SETTING

## KEY TERMS

| | |
|---|---|
| **Acoustics** | The science of sound. |
| **Ambient Noise** | The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study. |
| **Attenuation** | The reduction of noise. |
| **A-Weighting** | A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response. |
| **Decibel or dB** | Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared. |
| **CNEL** | Community noise equivalent level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging. |
| **Frequency** | The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz. |
| **Impulsive** | Sound of short duration, usually less than one second, with an abrupt onset and rapid decay. |
| **$L_{dn}$** | Day/Night Average Sound Level. Similar to CNEL but with no evening weighting. |
| **$L_{eq}$** | Equivalent or energy-averaged sound level. |
| **$L_{max}$** | The highest root-mean-square (RMS) sound level measured over a given period of time. |

| | |
|---|---|
| **$L_{(n)}$** | The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50 percent of the time during the one hour period. |
| **Loudness** | A subjective term for the sensation of the magnitude of sound. |
| **Noise** | Unwanted sound. |
| **SEL** | Sound exposure levels. A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event. |

## FUNDAMENTALS OF ACOUSTICS

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (Leq), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The Leq is the foundation of the composite noise descriptor, $L_{dn}$, and shows very good correlation with community response to noise.

The day/night average level ($L_{dn}$) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because $L_{dn}$ represents a 24-hour average, it tends to disguise short-term variations in the noise environment. CNEL is similar to $L_{dn}$, but includes a +5 dB penalty for evening noise. Typically CNEL and Ldn values are within 0.5 dB of each other and are often considered to be synonymous. Table 1 lists several examples of the noise levels associated with common situations.

***TABLE 1 : TYPICAL NOISE LEVELS***

| COMMON OUTDOOR ACTIVITIES | NOISE LEVEL (DBA) | COMMON INDOOR ACTIVITIES |
|---|---|---|
| | --110-- | Rock Band |
| Jet Fly-over at 300 m (1,000 ft) | --100-- | |
| Gas Lawn Mower at 1 m (3 ft) | --90-- | |
| Diesel Truck at 15 m (50 ft),<br>at 80 km/hr (50 mph) | --80-- | Food Blender at 1 m (3 ft)<br>Garbage Disposal at 1 m (3 ft) |
| Noisy Urban Area, Daytime<br>Gas Lawn Mower, 30 m (100 ft) | --70-- | Vacuum Cleaner at 3 m (10 ft) |
| Commercial Area<br>Heavy Traffic at 90 m (300 ft) | --60-- | Normal Speech at 1 m (3 ft) |
| Quiet Urban Daytime | --50-- | Large Business Office<br>Dishwasher in Next Room |
| Quiet Urban Nighttime | --40-- | Theater, Large Conference Room<br>(Background) |
| Quiet Suburban Nighttime | --30-- | Library |
| Quiet Rural Nighttime | --20-- | Bedroom at Night, Concert Hall<br>(Background) |
| | --10-- | Broadcast/Recording Studio |
| Lowest Threshold of Human Hearing | --0-- | Lowest Threshold of Human Hearing |

*SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL. NOVEMBER 2009.*

## EFFECTS OF NOISE ON PEOPLE

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

## EXISTING NOISE LEVELS

### Traffic Noise Levels

The FHWA Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop $L_{dn}$ (24-hour average) noise contours for the primary project-area roadways. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model predicts hourly $L_{eq}$ values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict $L_{dn}$ values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour period.

Existing traffic volumes were obtained from the traffic consultant (Fehr & Peers, January 2017). Day/night traffic distributions were based upon file data for similar roadways and field-measured values where available. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing conditions. Table 2 shows the results of this analysis. Appendix A provides the complete inputs and results for the FHWA traffic noise modeling.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segments. In some locations sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the project-area roadway segments analyzed in this report. Where sound walls occur, a -5 dB offset was applied to account for typical acoustic shielding provided by a 6-foot tall sound wall.

The actual distances to noise level contours may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. The distances reported in Table 2 are generally considered to be conservative estimates of noise exposure along the project-area roadways.

**TABLE 2: PREDICTED EXISTING TRAFFIC NOISE LEVELS**

| ROADWAY | SEGMENT | NOISE LEVEL AT CLOSEST RECEPTORS (LDN/CNEL) | DISTANCES TO TRAFFIC NOISE CONTOURS, LDN/CNEL (FEET) | | |
|---|---|---|---|---|---|
| | | | 70 DB | 65 DB | 60 DB |
| Nicolaus Rd. | West of Lakeside | 57.0 | 11 | 23 | 50 |
| Nicolaus Rd. | Lakeside to Fullerton Ranch | 57.7 | 11 | 25 | 53 |
| Nicolaus Rd. | Fullerton Ranch to Joiner | 56.9 | 11 | 25 | 53 |
| Nicolaus Rd. | East of Joiner | 60.9 | 15 | 32 | 68 |
| Joiner Parkway | Nicolaus to 1st | 55.8 | 10 | 21 | 45 |
| Joiner Parkway | South of 1st | 56.9 | 13 | 29 | 63 |

*NOTES: DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS.*
*SOURCE: FHWA-RD-77-108 WITH INPUTS FROM FEHR & PEERS AND J.C. BRENNAN & ASSOCIATES, INC. 2017.*

## COMMUNITY NOISE SURVEY

A community noise survey was conducted to document existing ambient noise levels at the project site. The data collected included the hourly average (Leq), median (L50), and the maximum level (Lmax) during the measurement period. Noise monitoring sites and the measured noise levels at each site are summarized in Table 3. Figure 1 shows the locations of the noise monitoring site.

Community noise monitoring equipment included a Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter equipped with an LDL ½" microphone. The measurement system was calibrated using a LDL Model CAL200 acoustical calibrator before and after testing. The measurement equipment meets all pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

***TABLE 3: SUMMARY OF EXISTING BACKGROUND NOISE MEASUREMENT DATA***

| | | | AVERAGE MEASURED HOURLY NOISE LEVELS, dB | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | DAYTIME (7AM-10PM) | | | NIGHTTIME (10PM-7AM) | | |
| SITE | LOCATION | CNEL/$L_{DN}$ | $L_{EQ}$ | $L_{50}$ | $L_{MAX}$ | $L_{EQ}$ | $L_{50}$ | $L_{MAX}$ |
| ***Continuous (24-hour) Noise Level Measurements*** | | | | | | | | |
| A | North border of site | 65 | 63 | 58 | 81 | 57 | 45 | 76 |
| ***Short-Term Noise Level Measurements*** | | | | | | | | |
| 1 | Abbeyhill Dr. @ W. border of project Site | NA | 51 | 46 | 63 | 1/12/17, 2:26 pm. – Roadway traffic, birds, rain | | |
| 2 | Milan Way @ S. border of project site. | NA | 53 | 53 | 55 | 1/12/17, 2:51 pm. – Birds/wildlife/rain | | |
| 3 | Savannah Dr. @ E. border of project site. | NA | 58 | 58 | 60 | 1/12/17, 3:10 pm. – Birds/wildlife/rain | | |

*NOTE: SOURCE: J.C. BRENNAN & ASSOCIATES, INC., 2016.*

# REGULATORY FRAMEWORK

## STATE

### Governor's Office of Planning and Research (OPR)

The *State of California General Plan Guidelines* (State of California 1998), published by OPR provides guidance for the acceptability of projects within specific CNEL contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

## LOCAL

### City of Lincoln General Plan Health & Safety Element

The City of Lincoln 2050 General Plan Health and Safety Element was adopted March 2008, establishes the following goals and policies that are pertinent to the proposed project:

| | |
|---|---|
| Goal HS-8: | To protect residents from health hazards and annoyance associated with excessive noise levels. |
| Policy HS 8.1 | Sensitive Receptors: The City will allow the development of new noise-sensitive land uses (which include but are not limited to residential, health care facilities and schools) only in areas exposed to existing or projected levels of noise which satisfy the levels specified in Table 8.1. Noise mitigation measures spaces to levels specified in Table 8.1. (Figure 2 of this Report) |
| Policy HS 8.2 | Protect Residential Areas: The City will strive to achieve exterior noise levels for existing and future dwellings in residential areas that do not exceed exterior noise levels of 60 dBA CNEL and interior noise levels of 45 dBA CNEL. |
| Policy HS 8.3 | Railroad Noise: The City will work with railroad operators to assess the feasibility of noise mitigation measures, where sensitive noise receptors are impacted by rail operations. |
| Policy HS 8.4 | Controlling Truck Traffic: The City shall control noise sources in residential areas and other noise-sensitive areas by restricting truck traffic to designated truck routes. |
| Policy HS 8.5 | Noise Monitoring: The City shall establish an ongoing noise monitoring program for the purpose of enforcing noise standards established by the City. |

Policy HS 8.6 Development Around Airports: The City shall require that development around Lincoln Airport be consistent with the noise standards contained in the approved Airport Land Use Commission Plan, and where deemed appropriate, require aviation easements from new development.

Policy HS 8.7 Update Airport Master Plan: The City shall pursue the update of the Airport Master Plan noise contours through the year 2030, consistent with the anticipated use of the airport by larger aircraft, and to revise the General Plan as necessary to reflect new noise contours.

Policy HS 8.8 Construction Noise: The City will provide guidelines to developers for reducing potential construction noise impacts on surrounding land uses.

Policy HS 8.9 Noise Compatibility Guidelines The City shall use adopted noise compatibility guidelines to evaluate compatibility of proposed new development and ensure compatibility between residential, commercial and other surrounding land uses (See Table 8-1, Maximum Allowable Noise Exposure by Land Use).

Policy HS 8.10 Sound Attenuation Features: The City shall require sound attenuation features such as walls, berming, and heavy landscaping between commercial and industrial uses and residential uses to reduce noise and vibration. Setback distances may also be used to reduce noise. Policy HS 8.11 Update Airport Master Plan: The City shall pursue the update of the Airport Master Plan noise contours through the year 2030, consistent with the anticipated use of the airport by larger aircraft, and to revise the General Plan as necessary to reflect new noise contours.

Policy HS 8.11 Noise Buffering: The City shall require a variety of sound attenuation features (including noise buffering or insulation) in new development along major streets and highways, and along railroad tracks.

Policy HS 8.15 Limiting Construction Activities: The City shall establish restrictions regarding the hours and days of construction activities throughout the City.

# IMPACTS AND MITIGATION MEASURES

## THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the project will have a significant impact related to noise if it will result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without project;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels within two miles of a public airport or public use airport; or
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

### Noise Standards

The noise standards applicable to the project include the relevant portions of the City of Lincoln General Plan as described in the Regulatory Framework section above, and the following standards.

### Vibration Standards

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

The City of Lincoln does not have specific policies pertaining to vibration levels. However, vibration levels associated with construction activities are addressed as potential noise impacts associated with project implementation.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 4 indicates that the threshold for damage to structures ranges from 0.2 to 0.6 peak particle velocity in inches per second (in/sec p.p.v). The general threshold at which human annoyance could occur is notes as 0.1 in/sec p.p.v.

***TABLE 4: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS***

| PEAK PARTICLE VELOCITY MM/SECOND | PEAK PARTICLE VELOCITY IN/SECOND | HUMAN REACTION | EFFECT ON BUILDINGS |
|---|---|---|---|
| 0.15-0.30 | 0.006-0.019 | Threshold of perception; possibility of intrusion | Vibrations unlikely to cause damage of any type |
| 2.0 | 0.08 | Vibrations readily perceptible | Recommended upper level of the vibration to which ruins and ancient monuments should be subjected |
| 2.5 | 0.10 | Level at which continuous vibrations begin to annoy people | Virtually no risk of “architectural” damage to normal buildings |
| 5.0 | 0.20 | Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations) | Threshold at which there is a risk of “architectural” damage to normal dwelling - houses with plastered walls and ceilings<br><br>Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize “architectural” damage |
| 10-15 | 0.4-0.6 | Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges | Vibrations at a greater level than normally expected from traffic, but would cause “architectural” damage and possibly minor structural damage. |

*SOURCE: CALTRANS. TRANSPORTATION RELATED EARTHBORNE VIBRATIONS. TAV-02-01-R9601 FEBRUARY 20, 2002.*

## ITEMS NOT ADDRESSED FURTHER IN THIS STUDY

**Lincoln Regional Airport**

Figure 3 shows the predicted annual noise contours for the Lincoln Regional Airport. Based upon the Figure 3 noise contours, the project site is located approximately 1-mile outside of the 60 dB CNEL noise contour for the airport. Therefore, no new sensitive receptors would be exposed to aircraft noise exceeding the City of Lincoln 60 dB CNEL exterior and 45 dB CNEL interior noise level standard. Additionally, j.c. brennan & associates, Inc. staff did not observe aircraft overflights directly over the project site during visits to the project site. While occasional overlflights could occur, they are not predicted to cause any exceedance of the City of Lincoln exterior or interior noise level standards as discussed above. Therefore, this item is not analyzed further.

**Sierra Pacific Lumber Mill and Union Pacific Railroad**

Traffic noise was the dominant noise sources observed on the project site. These sources of noise were not observed to be generate substantial noise on the project site. This is due to substantial distance and shielding from intervening residential uses. Therefore, this item is not analyzed further.

## IMPACT 1: EXPOSURE OF PERSONS TO, OR GENERATION OF NOISE LEVELS IN EXCESS OF APPLICABLE STANDARDS OR A SUBSTANTIAL PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE LEVELS EXISTING WITHOUT THE PROJECT - TRAFFIC NOISE AT EXISTING RECEPTORS (LESS THAN SIGNIFICANT)

To describe future noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. Inputs to the model included traffic volumes provided by Fehr & Peers. The FHWA model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly $L_{eq}$ values for free-flowing traffic conditions. To predict Ldn/CNEL values, it is necessary to determine the day/night distribution of traffic and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Table 5 shows the noise levels associated with traffic on the local roadway network under the existing and existing plus project traffic conditions. As indicated by Table 5, the related noise level increases under development of the proposed project are predicted to be no more than 0.2 dB. As described earlier, a 3-dBA change is considered to be a just-perceivable difference. Therefore, this would be a less than significant impact.

**It is important to note that the predicted noise levels shown in Table 5 include shielding from existing 6-foot tall sound walls at existing residential areas**

***TABLE 5: EXISTING TRAFFIC NOISE LEVELS VS. EXISTING PLUS PROJECT TRAFFIC NOISE LEVELS***

| ROADWAY | SEGMENT | NOISE LEVELS (CNEL/LDN, DB) | | | DISTANCE TO EXISTING + PROJECT TRAFFIC NOISE CONTOURS, FEET[1] | | |
|---|---|---|---|---|---|---|---|
| | | EXISTING | EXISTING + PROJECT | CHANGE (DB) | 70 DB LDN | 65 DB LDN | 60 DB LDN |
| Nicolaus Rd. | West of Lakeside | 57.0 | 57.1 | 0.1 | 11 | 24 | 51 |
| Nicolaus Rd. | Lakeside to Fullerton Ranch | 57.7 | 57.8 | 0.1 | 12 | 25 | 54 |
| Nicolaus Rd. | Fullerton Ranch to Joiner | 56.9 | 57.0 | 0.1 | 12 | 25 | 54 |
| Nicolaus Rd. | East of Joiner | 60.9 | 60.9 | 0.0 | 15 | 32 | 69 |
| Joiner Parkway | Nicolaus to 1st | 55.8 | 55.9 | 0.1 | 10 | 21 | 45 |
| Joiner Parkway | South of 1st | 56.9 | 57.1 | 0.2 | 14 | 30 | 64 |

*[1] Distances to traffic noise contours are measured in feet from the centerlines of the roadways. Actual distances may vary due to shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.*

*SOURCE: FHWA-RD-77-108 WITH INPUTS FROM FEHR & PEERS AND J.C. BRENNAN & ASSOCIATES, INC. 2017.*

## IMPACT 2: POTENTIAL TO EXPOSE PERSONS TO, OR GENERATE NOISE LEVELS IN EXCESS OF APPLICABLE STANDARDS OR TO RESULT IN A SUBSTANTIAL TEMPORARY OR PERIODIC INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE LEVELS EXISTING WITHOUT PROJECT - CONSTRUCTION NOISE (LESS THAN SIGNIFICANT)

The new development, maintenance of roadways, installation of public utilities, and infrastructure improvements associated with the project will require construction activities. These activities include the use of heavy equipment and impact tools. Table 6 provides a list of the types of equipment which may be associated with construction activities and the associated noise levels.

***TABLE 6: CONSTRUCTION EQUIPMENT NOISE***

| TYPE OF EQUIPMENT | PREDICTED NOISE LEVELS, LMAX DB | | | | DISTANCES TO NOISE CONTOURS (FEET) | |
|---|---|---|---|---|---|---|
| | NOISE LEVEL AT 50’ | NOISE LEVEL AT 100’ | NOISE LEVEL AT 200’ | NOISE LEVEL AT 400’ | 70 DB LMAX CONTOUR | 65 DB LMAX CONTOUR |
| Backhoe | 78 | 72 | 66 | 60 | 126 | 223 |
| Compactor | 83 | 77 | 71 | 65 | 223 | 397 |
| Compressor (air) | 78 | 72 | 66 | 60 | 126 | 223 |
| Concrete Saw | 90 | 84 | 78 | 72 | 500 | 889 |
| Dozer | 82 | 76 | 70 | 64 | 199 | 354 |
| Dump Truck | 76 | 70 | 64 | 58 | 100 | 177 |
| Excavator | 81 | 75 | 69 | 63 | 177 | 315 |
| Generator | 81 | 75 | 69 | 63 | 177 | 315 |
| Jackhammer | 89 | 83 | 77 | 71 | 446 | 792 |
| Pneumatic Tools | 85 | 79 | 73 | 67 | 281 | 500 |

*SOURCE: ROADWAY CONSTRUCTION NOISE MODEL USER’S GUIDE. FEDERAL HIGHWAY ADMINISTRATION. FHWA-HEP-05-054. JANUARY 2006. J.C. BRENNAN & ASSOCIATES, INC. 2013.*

Activities involved in project construction would typically generate maximum noise levels ranging from 85 to 90 dB at a distance of 50 feet. The nearest residential receptors would be located 25-50 feet or more from the majority of project construction activities.

There is generally an increase in ambient noise between the hours of 7 a.m. and 7 p.m. By limiting the hours of construction to these hours, the potential for nuisance noise is reduced because project construction-related noise increases would be less noticeable. The use of mufflers on construction equipment would decrease the overall noise generated during construction. Because sound diminishes with distance, locating noise-generating equipment away from noise sensitive uses would reduce overall noise impacts associated with project construction. Implementation of the following mitigation measure would reduce impacts to a **less-than-significant** level.

### MITIGATION MEASURES

***Mitigation Measure 2-1:*** The City shall ensure construction contractors comply with the following:

- Construction hours shall be limited to 7am to 7pm, Monday through Friday (unless extended by a special permit).
- All heavy construction equipment and all stationary noise sources (such as diesel generators) shall have manufacturer-installed mufflers.
- Equipment warm up areas, water tanks, and equipment storage areas shall be located in an area as far away from existing residences as is feasible.

## Impact 3: Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels (Potentially Significant)

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and roadway construction occur. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located approximately 25-50 feet or further from the project site. At this distance construction vibrations are not predicted to exceed acceptable levels. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours.

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural. Table 7 shows the typical vibration levels produced by construction equipment.

***Table 7: Vibration Levels for Varying Construction Equipment***

| *Type of Equipment* | *Peak Particle Velocity @ 25 feet (inches/second)* | *Peak Particle Velocity @ 50 feet (inches/second)* | *Peak Particle Velocity @ 100 feet (inches/second)* |
|---|---|---|---|
| Large Bulldozer | 0.089 | 0.031 | 0.011 |
| Loaded Trucks | 0.076 | 0.027 | 0.010 |
| Small Bulldozer | 0.003 | 0.001 | 0.000 |
| Auger/drill Rigs | 0.089 | 0.031 | 0.011 |
| Jackhammer | 0.035 | 0.012 | 0.004 |
| Vibratory Hammer | 0.070 | 0.025 | 0.009 |
| Vibratory Compactor/roller | 0.210 (<0.200 @ 26’) | 0.074 | 0.026 |

*Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006*

The Table 7 data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec p.p.v. threshold of damage to buildings and less than the 0.1 in/sec threshold of annoyance criteria at distances over 25 feet. Therefore, construction vibrations are not predicted to cause damage to existing buildings or cause annoyance to sensitive receptors. Therefore, this impact would be considered **less than significant.**

## IMPACT 4: EXPOSURE OF PERSONS TO, OR GENERATION OF NOISE LEVELS IN EXCESS OF STANDARDS ESTABLISHED IN THE LOCAL GENERAL PLAN OR NOISE ORDINANCE – TRAFFIC NOISE AT NEW RECEPTORS (LESS THAN SIGNIFICANT)

The FHWA traffic noise prediction model was used to predict Cumulative + Project traffic noise levels at the proposed residential uses associated with the project. Table 8 shows the predicted traffic noise levels at the proposed residential uses adjacent to the major project-area roadways.

Appendix B provides the complete inputs and results to the FHWA traffic noise prediction model for on-site receptors.

**TABLE 8: CUMULATIVE + PROJECT TRANSPORTATION NOISE LEVELS AT PROPOSED RESIDENTIAL USES**

| Roadway | Receptor Description | Approximate Residential Setback, feet1 | ADT | Predicted Traffic Noise Levels, CNEL/Ldn | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | No Wall | 6' Wall | 7' Wall | 8' Wall | 9' Wall |
| Nicolaus Road | Nearest Backyards | 70' | 25,710 | 67 dB | 61 dB | 59 dB | 58 dB | 57 dB |

[1] SETBACK DISTANCES ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS TO THE CENTER OF RESIDENTIAL BACKYARDS.
-- MEETS THE CITY OF EXTERIOR NOISE STANDARD WITHOUT MITIGATION.
SOURCE: FHWA-RD-77-108 WITH INPUTS FROM ABRAMS ASSOCIATES, AND J.C. BRENNAN & ASSOCIATES, INC. 2015.

The Table 8 data indicate that a 7-foot tall sound wall would achieve the City of Lincoln 60 dB CNEL exterior noise level standard. However, a 6-foot tall would achieve 61 dB CNEL which meets the City's conditionally acceptable noise level standard of up to 65 dB CNEL, as shown in Figure 2 of this document. Based upon discussions with City staff and review of existing sound wall heights around the project site, a 6-foot tall wall would be consistent with surrounding wall heights while also ensuring that future residents are not exposed to excessive noise levels. Therefore, a 6-foot tall sound wall should be constructed, as shown on Figure 4.

***Interior Noise Impacts:***

Modern construction typically provides a 25 dB exterior-to-interior noise level reduction with windows closed. Therefore, sensitive receptors exposed to exterior noise of 70 dB CNEL/$L_{dn}$, or less, will typically comply with the City of Lincoln 45 dB CNEL interior noise level standard. Additional noise reduction measures, such as acoustically rated windows are generally required for exterior noise levels exceeding 70 dB CNEL/$L_{dn}$.

It should be noted that exterior noise levels are typically 2-3 dB higher at second floor locations. The proposed residential uses are predicted to be exposed to unmitigated first floor exterior transportation noise levels of 67 dB CNEL/$L_{dn}$. Therefore, second floor facades are predicted to be exposed to exterior noise levels of up to 70 dB CNLE/$L_{dn}$. Based upon a 25 dB exterior-to-interior noise level reduction, interior noise levels are predicted to be 45 dB CNEL. These interior noise levels would meet the City of Lincoln 45 dB CNEL interior noise level standard and no interior noise mitigation would be required.

The following mitigation measures will minimize noise impacts resulting from transportation noise impacts on the proposed project site. Implementation of this mitigation measure would ensure consistency with the City's noise standards and would reduce this potentially significant impact to a **less than significant** level.

### MITIGATION MEASURES

***Mitigation Measure 4-1:*** *A 6-foot tall sound wall shall be constructed along Nicolaus Road.*

## IMPACT 5: POTENTIAL TO EXPOSE OF PERSONS TO, OR GENERATE NOISE LEVELS IN EXCESS OF STANDARDS ESTABLISHED IN THE LOCAL GENERAL PLAN OR NOISE ORDINANCE, OR APPLICABLE STANDARDS OF OTHER AGENCIES OR TO RESULT IN A SUBSTANTIAL PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE LEVELS EXISTING WITHOUT THE PROJECT (LESS THAN CUMULATIVELY CONSIDERABLE)

The cumulative context for noise impacts associated with the Proposed Project consists of the existing and future noise sources that could affect the project or surrounding uses. Noise generated by construction would be temporary, and would not add to the permanent noise environment or be considered as part of the cumulative context. The total noise impact of the Proposed Project would be fairly small and would not be a substantial increase to the existing future noise environment.

### TRAFFIC

Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to the proposed project and other projects within the area. Tables 9 show cumulative traffic noise levels with and without the proposed project.

Under cumulative conditions, there would not be significant increases in noise levels compared to the no project conditions. However, the 60, 65 and 70 dB $L_{dn}$ contours would extend farther under cumulative conditions and potentially impact additional sensitive receptors. As shown, the proposed project would contribute no more than 0.2 dB $L_{dn}$ to noise levels on roadways fronting residential uses along the study area roadways. As described earlier, a 3-dBA change is considered to be a just-perceivable difference. Additionally, the project would not cause new exceedances of the City of Lincoln 60 dB CNEL exterior noise level standard. Consequently, this would result in a **less than cumulatively considerable** contribution to cumulative noise levels.

**TABLE 9: CUMULATIVE NO PROJECT VS. CUMULATIVE PLUS PROJECT**

| Roadway | Segment | Noise Levels (CNEL/Ldn, dB) | | | Distance to Cumulative + Project Traffic Noise Contours, feet1 | | |
|---|---|---|---|---|---|---|---|
| | | Cumulative No Project | Cumulative + Project | Change (dB) | 70 dB Ldn | 65 dB Ldn | 60 dB Ldn |
| Nicolaus Rd. | West of Lakeside | 61.0 | 61.0 | 0.0 | 20 | 43 | 94 |
| Nicolaus Rd. | Lakeside to Fullerton Ranch | 61.4 | 61.5 | 0.1 | 20 | 44 | 94 |
| Nicolaus Rd. | Fullerton Ranch to Joiner | 60.6 | 60.7 | 0.1 | 20 | 44 | 94 |
| Nicolaus Rd. | East of Joiner | 64.5 | 64.5 | 0.0 | 26 | 56 | 120 |
| Joiner Parkway | Nicolaus to 1st | 58.8 | 58.8 | 0.0 | 15 | 33 | 71 |
| Joiner Parkway | South of 1st | 59.7 | 59.7 | 0.0 | 21 | 45 | 96 |

[1] *Distances to traffic noise contours are measured in feet from the centerlines of the roadways. Actual distances may vary due to shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.*

*SOURCE: FHWA-RD-77-108 WITH INPUTS FROM FEHR & PEERS AND J.C. BRENNAN & ASSOCIATES, INC. 2017.*

Authors Note: The traffic noise levels shown in Table 9 are based upon the existing land uses and in some cases include shielding from existing sound walls. The predicted traffic noise levels for Nicolaus Road between Fullerton Ranch and Joiner Parkway assume shielding from the current sound walls adjacent to residential uses. Table 8 which is shown previously, is specific to the project site where no sound walls occur

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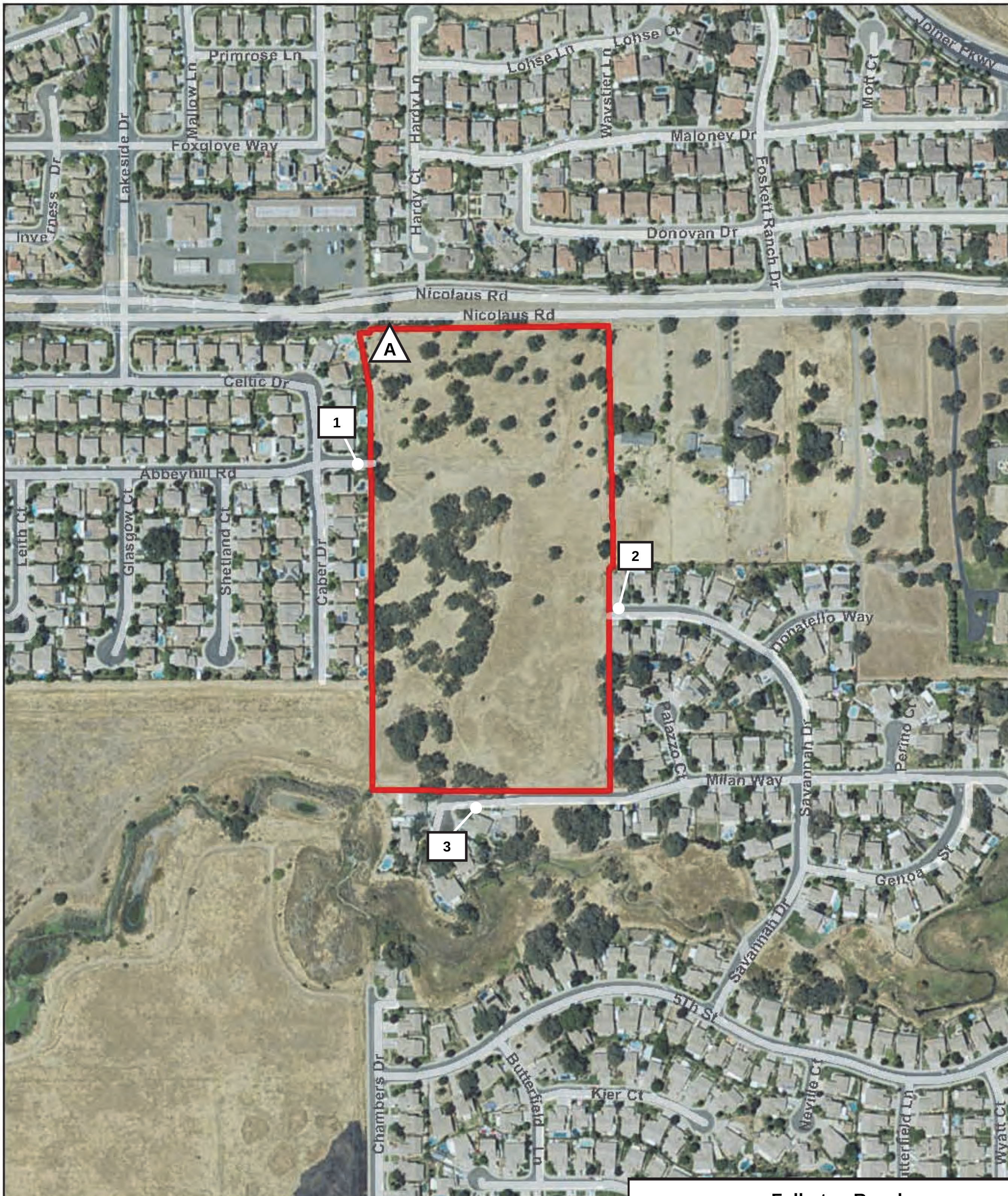


**Fullerton Ranch**

**Figure 1: Noise Measurement Locations**

N

**Legend**

X : Continuous (24-hr) Noise Measurement Site

\# : Short-Term Noise Measurement Site

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*Figure Prepared: January 2017*

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*Figure 2 – Table 8.1 of the City of Lincoln General Plan*

**Table 8-1. Maximum Allowable Noise Exposure by Land Use**

| | Noise Level (CNEL) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0-55 | 56-60 | 61-65 | 66-70 | 71-75 | 75-80 | >81 |
| Residential - Low Density Single Family, Duplex, Mobile Homes | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Unacceptable | Unacceptable |
| Residential - Multiple Family, Group Homes | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Unacceptable | Unacceptable |
| Motels / Hotels | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Normally Unacceptable | Unacceptable |
| Schools, Libraries, Churches, Hospitals, Extended Care Facilities | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Normally Unacceptable | Unacceptable |
| Auditoriums, Concert Halls, Amphitheaters | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Unacceptable | Unacceptable | Unacceptable | Unacceptable |
| Sports Arenas, Outdoor Spectator Sports | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Unacceptable | Unacceptable | Unacceptable |
| Playgrounds, Neighborhood Parks | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Acceptable | Unacceptable | Unacceptable | Unacceptable |
| Golf Courses, Riding Stables, Water Recreation, Cemeteries | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Unacceptable | Normally Unacceptable | Unacceptable |
| Office Buildings, Business Commercial and Professional | Normally Acceptable | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Normally Unacceptable |
| Industrial, Manufacturing, Utilities, Agriculture | Normally Acceptable | Normally Acceptable | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable |

| | |
|---|---|
| (blank) | **Normally Acceptable.** Specified land use is satisfactory, based on the assumption that any buildings involved are of normal, conventional construction, without any special noise insulation requirements. |
| (hatched) | **Conditionally Acceptable.** New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed insulation features have been included in the design. |
| (checkered) | **Normally Unacceptable.** New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor areas must be shielded. |
| (black) | **Unacceptable.** New construction or development should not be undertaken. |

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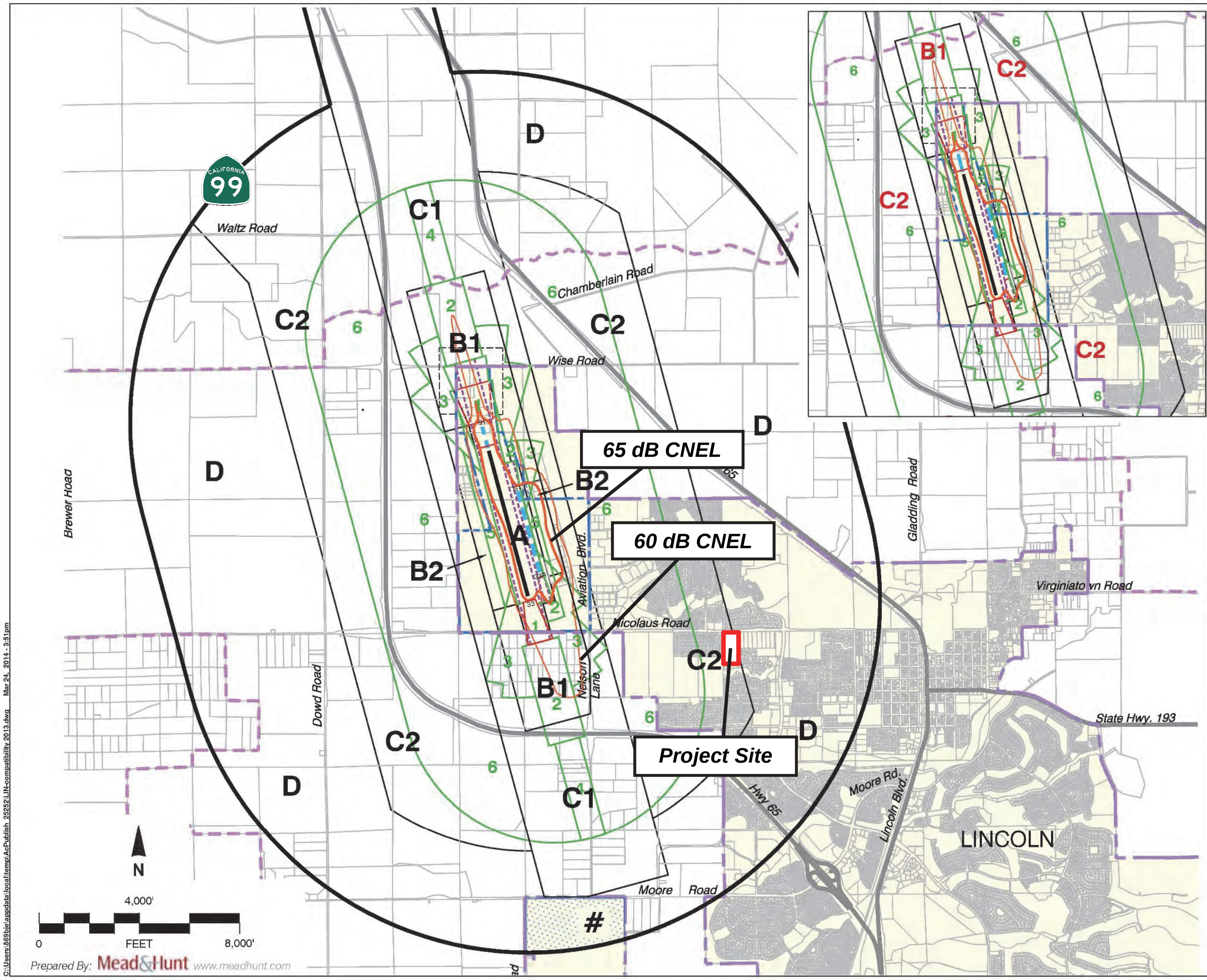


Legend

Boundary Lines
- Placer County Limits (outside map view)
- Lincoln City Limits
- Lincoln Sphere of Influence
- Existing Airport Property Line
- Future Airport Property Line
- Future Avigation Easement
- Existing Runway 15-33 (6,000 ft.)
- Future Runway 15R-33L (7,000 ft.)
- Future Runway 15L-33R (3,350 ft.)
- Airport Influence Area (Adopted 2014)
- Compatibility Policy Zones (Adopted 2014)
- # See Special Conditions Policy 6.2.3.

Runway Factors[1]
- Runway Protection Zone (RPZ)
- Runway Object Free Area (ROFA)

Noise Factors
- 65 dB CNEL
- 60 dB CNEL

} 138,000 Annual Operations[2]

Safety Factors
- Generic Safety Zones (Composite)[3]
  - Zone 1, Runway Protection Zone
  - Zone 2, Inner Approach/Departure Zone
  - Zone 3, Inner Turning Zone
  - Zone 4, Outer Approach/Departure Zone
  - Zone 5, Sideline Zone
  - Zone 6, Traffic Pattern Zone

Notes:
1. Source: Lincoln Regional Airport Layout Plan, approved May 2008.
2. Source: Lincoln Regional Airport Master Plan, adopted May 2007.
3. Source: California Airport Land Use Planning Handbook, published October 2011. Generic safety zones are a composite of safety zones for Short, Medium and Long General Aviation Runways applied to future Runway 15L-33R, Existing Runway 15-33 and Future Runway 15R-33L, respectively. Zone 1 modified to reflect RPZs.

***Lincoln Regional Airport***
***Land Use Compatibility Plan***
***(Adopted February 26, 2014)***

Exhibit 9D
**Compatibility Factors Map: Noise and Safety**
Lincoln Regional Airport

C:\Users\669ble\appdata\local\temp\AcPublish_25252\LIN-compatibility 2013.dwg Mar 24, 2014 - 3:51pm

## Fullerton Ranch
**Figure: 3.12-3**
**Lincoln Airport Noise Contours**

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***Figure Prepared: 3/28/2017***

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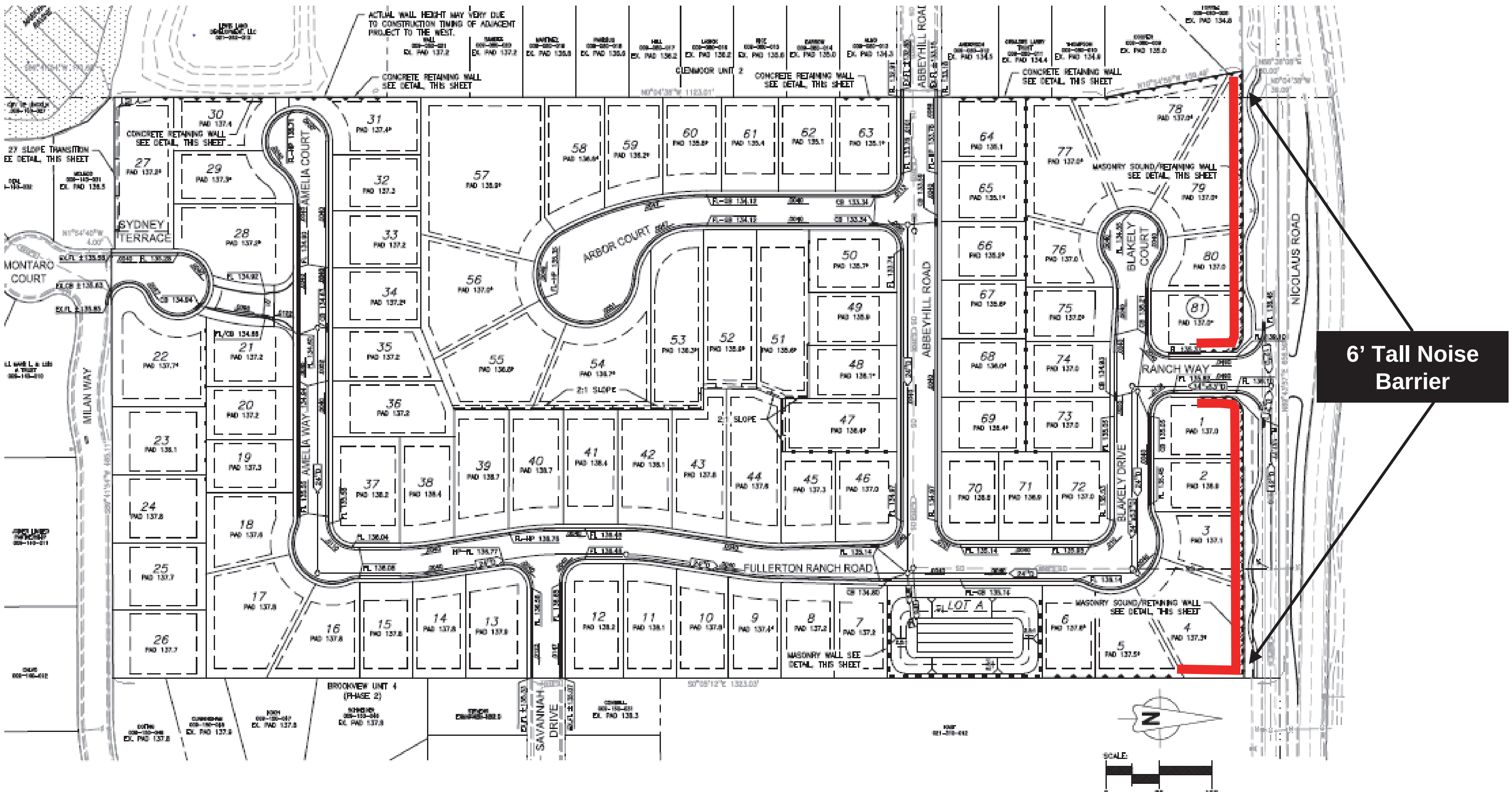


**Fullerton Ranch**

**Figure 3.12-4: Recommended Noise Barrier Location**

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Rev. 3/28/2017

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**Appendix A**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2017-104

Description: Existing

Ldn/CNEL: Ldn

Hard/Soft: Soft

| Segment | Roadway Name | Segment Description | ADT | Day % | Eve % | Night % | % Med. Trucks | % Hvy. Trucks | Speed | Distance | Offset (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Nicolaus Rd. | West of Lakeside | 10,070 | 87 | | 13 | 1.0 | 0.5 | 40 | 80 | -5 |
| 2 | Nicolaus Rd. | Lakeside to Fullerton Ranch | 10,790 | 87 | | 13 | 1.0 | 0.5 | 40 | 75 | -5 |
| 3 | Nicolaus Rd. | Fullerton Ranch to Joiner | 10,790 | 87 | | 13 | 1.0 | 0.5 | 40 | 85 | -5 |
| 4 | Nicolaus Rd. | East of Joiner | 7,070 | 87 | | 13 | 1.0 | 0.5 | 35 | 60 | 0 |
| 5 | Joiner Parkway | Nicolaus to 1st | 8,360 | 87 | | 13 | 1.0 | 0.5 | 40 | 85 | -5 |
| 6 | Joiner Parkway | South of 1st | 13,890 | 87 | | 13 | 1.0 | 0.5 | 40 | 100 | -5 |

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**Appendix A**

## FHWA-RD-77-108 Highway Traffic Noise Prediction Model

## Predicted Levels

Project #: 2017-104
Description: Existing
Ldn/CNEL: Ldn
Hard/Soft: Soft

| Segment | Roadway Name | Segment Description | Autos | Medium Trucks | Heavy Trucks | Total |
|---|---|---|---|---|---|---|
| 1 | Nicolaus Rd. | West of Lakeside | 56.2 | 45.2 | 47.0 | 57.0 |
| 2 | Nicolaus Rd. | Lakeside to Fullerton Ranch | 56.9 | 45.9 | 47.7 | 57.7 |
| 3 | Nicolaus Rd. | Fullerton Ranch to Joiner | 56.1 | 45.1 | 46.9 | 56.9 |
| 4 | Nicolaus Rd. | East of Joiner | 59.9 | 49.6 | 51.8 | 60.9 |
| 5 | Joiner Parkway | Nicolaus to 1st | 55.0 | 44.0 | 45.8 | 55.8 |
| 6 | Joiner Parkway | South of 1st | 56.2 | 45.1 | 47.0 | 56.9 |

**Appendix A**

## FHWA-RD-77-108 Highway Traffic Noise Prediction Model

## Noise Contour Output

Project #: 2016-154 Oakwood Landing EIR

Description: Existing

Ldn/CNEL: Ldn

Hard/Soft: Soft

| Segment | Roadway Name | Segment Description | -------- Distances to Traffic Noise Contours -------- | | | | |
|---|---|---|---|---|---|---|---|
| | | | 75 | 70 | 65 | 60 | 55 |
| 1 | Nicolaus Rd. | West of Lakeside | 5 | 11 | 23 | 50 | 109 |
| 2 | Nicolaus Rd. | Lakeside to Fullerton Ranch | 5 | 11 | 25 | 53 | 114 |
| 3 | Nicolaus Rd. | Fullerton Ranch to Joiner | 5 | 11 | 25 | 53 | 114 |
| 4 | Nicolaus Rd. | East of Joiner | 7 | 15 | 32 | 68 | 147 |
| 5 | Joiner Parkway | Nicolaus to 1st | 4 | 10 | 21 | 45 | 96 |
| 6 | Joiner Parkway | South of 1st | 6 | 13 | 29 | 63 | 135 |

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**Appendix A**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2017-104

Description: Existing + Project

Ldn/CNEL: Ldn

Hard/Soft: Soft

| Segment | Roadway Name | Segment Description | ADT | Day % | Eve % | Night % | % Med. Trucks | % Hvy. Trucks | Speed | Distance | Offset (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Nicolaus Rd. | West of Lakeside | 10,260 | 87 | | 13 | 1.0 | 0.5 | 40 | 80 | -5 |
| 2 | Nicolaus Rd. | Lakeside to Fullerton Ranch | 11,000 | 87 | | 13 | 1.0 | 0.5 | 40 | 75 | -5 |
| 3 | Nicolaus Rd. | Fullerton Ranch to Joiner | 11,150 | 87 | | 13 | 1.0 | 0.5 | 40 | 85 | -5 |
| 4 | Nicolaus Rd. | East of Joiner | 7,180 | 87 | | 13 | 1.0 | 0.5 | 35 | 60 | 0 |
| 5 | Joiner Parkway | Nicolaus to 1st | 8,590 | 87 | | 13 | 1.0 | 0.5 | 40 | 85 | -5 |
| 6 | Joiner Parkway | South of 1st | 14,340 | 87 | | 13 | 1.0 | 0.5 | 40 | 100 | -5 |

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**Appendix A**

## FHWA-RD-77-108 Highway Traffic Noise Prediction Model

## Predicted Levels

Project #: 2017-104
Description: Existing + Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

| Segment | Roadway Name | Segment Description | Autos | Medium Trucks | Heavy Trucks | Total |
|---|---|---|---|---|---|---|
| 1 | Nicolaus Rd. | West of Lakeside | 56.3 | 45.3 | 47.1 | 57.1 |
| 2 | Nicolaus Rd. | Lakeside to Fullerton Ranch | 57.0 | 46.0 | 47.8 | 57.8 |
| 3 | Nicolaus Rd. | Fullerton Ranch to Joiner | 56.3 | 45.2 | 47.1 | 57.0 |
| 4 | Nicolaus Rd. | East of Joiner | 59.9 | 49.7 | 51.9 | 60.9 |
| 5 | Joiner Parkway | Nicolaus to 1st | 55.1 | 44.1 | 45.9 | 55.9 |
| 6 | Joiner Parkway | South of 1st | 56.3 | 45.3 | 47.1 | 57.1 |

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**Appendix A**

## FHWA-RD-77-108 Highway Traffic Noise Prediction Model

## Noise Contour Output

Project #: 2016-154 Oakwood Landing EIR

Description: Existing + Project

Ldn/CNEL: Ldn

Hard/Soft: Soft

| | | | -------- Distances to Traffic Noise Contours -------- | | | | |
|---|---|---|---|---|---|---|---|
| Segment | Roadway Name | Segment Description | 75 | 70 | 65 | 60 | 55 |
| 1 | Nicolaus Rd. | West of Lakeside | 5 | 11 | 24 | 51 | 110 |
| 2 | Nicolaus Rd. | Lakeside to Fullerton Ranch | 5 | 12 | 25 | 54 | 115 |
| 3 | Nicolaus Rd. | Fullerton Ranch to Joiner | 5 | 12 | 25 | 54 | 116 |
| 4 | Nicolaus Rd. | East of Joiner | 7 | 15 | 32 | 69 | 149 |
| 5 | Joiner Parkway | Nicolaus to 1st | 5 | 10 | 21 | 45 | 98 |
| 6 | Joiner Parkway | South of 1st | 6 | 14 | 30 | 64 | 138 |

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**Appendix A**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2017-104

Description: Cumulative

Ldn/CNEL: Ldn

Hard/Soft: Soft

| Segment | Roadway Name | Segment Description | ADT | Day % | Eve % | Night % | % Med. Trucks | % Hvy. Trucks | Speed | Distance | Offset (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Nicolaus Rd. | West of Lakeside | 25,200 | 87 | | 13 | 1.0 | 0.5 | 40 | 80 | -5 |
| 2 | Nicolaus Rd. | Lakeside to Fullerton Ranch | 25,350 | 87 | | 13 | 1.0 | 0.5 | 40 | 75 | -5 |
| 3 | Nicolaus Rd. | Fullerton Ranch to Joiner | 25,350 | 87 | | 13 | 1.0 | 0.5 | 40 | 85 | -5 |
| 4 | Nicolaus Rd. | East of Joiner | 16,400 | 87 | | 13 | 1.0 | 0.5 | 35 | 60 | 0 |
| 5 | Joiner Parkway | Nicolaus to 1st | 16,600 | 87 | | 13 | 1.0 | 0.5 | 40 | 85 | -5 |
| 6 | Joiner Parkway | South of 1st | 25,900 | 87 | | 13 | 1.0 | 0.5 | 40 | 100 | -5 |

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**Appendix A**

## FHWA-RD-77-108 Highway Traffic Noise Prediction Model

## Predicted Levels

Project #: 2017-104
Description: Cumulative
Ldn/CNEL: Ldn
Hard/Soft: Soft

| Segment | Roadway Name | Segment Description | Autos | Medium Trucks | Heavy Trucks | Total |
|---|---|---|---|---|---|---|
| 1 | Nicolaus Rd. | West of Lakeside | 60.2 | 49.2 | 51.0 | 61.0 |
| 2 | Nicolaus Rd. | Lakeside to Fullerton Ranch | 60.6 | 49.6 | 51.4 | 61.4 |
| 3 | Nicolaus Rd. | Fullerton Ranch to Joiner | 59.8 | 48.8 | 50.6 | 60.6 |
| 4 | Nicolaus Rd. | East of Joiner | 63.5 | 53.3 | 55.5 | 64.5 |
| 5 | Joiner Parkway | Nicolaus to 1st | 58.0 | 47.0 | 48.8 | 58.8 |
| 6 | Joiner Parkway | South of 1st | 58.9 | 47.9 | 49.7 | 59.7 |

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**Appendix A**

## FHWA-RD-77-108 Highway Traffic Noise Prediction Model

## Noise Contour Output

Project #: 2016-154 Oakwood Landing EIR

Description: Cumulative

Ldn/CNEL: Ldn

Hard/Soft: Soft

| | | | -------- Distances to Traffic Noise Contours -------- | | | | |
|---|---|---|---|---|---|---|---|
| Segment | Roadway Name | Segment Description | 75 | 70 | 65 | 60 | 55 |
| 1 | Nicolaus Rd. | West of Lakeside | 9 | 20 | 43 | 93 | 201 |
| 2 | Nicolaus Rd. | Lakeside to Fullerton Ranch | 9 | 20 | 43 | 93 | 201 |
| 3 | Nicolaus Rd. | Fullerton Ranch to Joiner | 9 | 20 | 43 | 93 | 201 |
| 4 | Nicolaus Rd. | East of Joiner | 12 | 26 | 56 | 120 | 258 |
| 5 | Joiner Parkway | Nicolaus to 1st | 7 | 15 | 33 | 70 | 152 |
| 6 | Joiner Parkway | South of 1st | 9 | 20 | 44 | 95 | 204 |

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**Appendix A**
**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**
**Data Input Sheet**

Project #: 2017-104
Description: Cumulative + Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

| Segment | Roadway Name | Segment Description | ADT | Day % | Eve % | Night % | % Med. Trucks | % Hvy. Trucks | Speed | Distance | Offset (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Nicolaus Rd. | West of Lakeside | 25,390 | 87 | | 13 | 1.0 | 0.5 | 40 | 80 | -5 |
| 2 | Nicolaus Rd. | Lakeside to Fullerton Ranch | 25,560 | 87 | | 13 | 1.0 | 0.5 | 40 | 75 | -5 |
| 3 | Nicolaus Rd. | Fullerton Ranch to Joiner | 25,710 | 87 | | 13 | 1.0 | 0.5 | 40 | 85 | -5 |
| 4 | Nicolaus Rd. | East of Joiner | 16,510 | 87 | | 13 | 1.0 | 0.5 | 35 | 60 | 0 |
| 5 | Joiner Parkway | Nicolaus to 1st | 16,830 | 87 | | 13 | 1.0 | 0.5 | 40 | 85 | -5 |
| 6 | Joiner Parkway | South of 1st | 26,370 | 87 | | 13 | 1.0 | 0.5 | 40 | 100 | -5 |

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**Appendix A**

## FHWA-RD-77-108 Highway Traffic Noise Prediction Model

## Predicted Levels

Project #: 2017-104
Description: Cumulative + Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

| Segment | Roadway Name | Segment Description | Autos | Medium Trucks | Heavy Trucks | Total |
|---|---|---|---|---|---|---|
| 1 | Nicolaus Rd. | West of Lakeside | 60.2 | 49.2 | 51.0 | 61.0 |
| 2 | Nicolaus Rd. | Lakeside to Fullerton Ranch | 60.7 | 49.7 | 51.5 | 61.5 |
| 3 | Nicolaus Rd. | Fullerton Ranch to Joiner | 59.9 | 48.9 | 50.7 | 60.7 |
| 4 | Nicolaus Rd. | East of Joiner | 63.6 | 53.3 | 55.5 | 64.5 |
| 5 | Joiner Parkway | Nicolaus to 1st | 58.0 | 47.0 | 48.9 | 58.8 |
| 6 | Joiner Parkway | South of 1st | 58.9 | 47.9 | 49.7 | 59.7 |

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**Appendix A**

## FHWA-RD-77-108 Highway Traffic Noise Prediction Model

## Noise Contour Output

Project #: 2016-154 Oakwood Landing EIR

Description: Cumulative + Project

Ldn/CNEL: Ldn

Hard/Soft: Soft

| | | | -------- Distances to Traffic Noise Contours -------- | | | | |
|---|---|---|---|---|---|---|---|
| Segment | Roadway Name | Segment Description | 75 | 70 | 65 | 60 | 55 |
| 1 | Nicolaus Rd. | West of Lakeside | 9 | 20 | 43 | 94 | 202 |
| 2 | Nicolaus Rd. | Lakeside to Fullerton Ranch | 9 | 20 | 44 | 94 | 202 |
| 3 | Nicolaus Rd. | Fullerton Ranch to Joiner | 9 | 20 | 44 | 94 | 203 |
| 4 | Nicolaus Rd. | East of Joiner | 12 | 26 | 56 | 120 | 259 |
| 5 | Joiner Parkway | Nicolaus to 1st | 7 | 15 | 33 | 71 | 153 |
| 6 | Joiner Parkway | South of 1st | 10 | 21 | 45 | 96 | 207 |

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**Appendix B**

## FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
## Noise Prediction Worksheet

**Project Information:**

| | |
|---|---|
| Job Number: | 2017-104 |
| Project Name: | Fullerton Ranch |
| Roadway Name: | Nicolaus Road |

**Traffic Data:**

| | |
|---|---|
| Year: | Future |
| Average Daily Traffic Volume: | 25,710 |
| Percent Daytime Traffic: | 87 |
| Percent Nighttime Traffic: | 13 |
| Percent Medium Trucks (2 axle): | 1 |
| Percent Heavy Trucks (3+ axle): | 0.5 |
| Assumed Vehicle Speed (mph): | 40 |
| Intervening Ground Type (hard/soft): | **Soft** |

**Traffic Noise Levels:**

| | | | | ------------------$L_{dn}$, dB------------------ | | | |
|---|---|---|---|---|---|---|---|
| **Location:** | **Description** | **Distance** | **Offset (dB)** | **Autos** | **Medium Trucks** | **Heavy Trucks** | **Total** |
| 1 | Nearest Backyards | 70 | | 66 | 55 | 57 | 67 |

**Traffic Noise Contours (No Calibration Offset):**

| $L_{dn}$ Contour, dB | Distance from Centerline, (ft) |
|---|---|
| 75 | 20 |
| 70 | 44 |
| 65 | 94 |
| 60 | 203 |

**Notes:**

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**Appendix B**

## FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
## Noise Barrier Effectiveness Prediction Worksheet

**Project Information:**

Job Number: 2017-104
Project Name: Fullerton Ranch
Roadway Name: Nicolaus Road
Location(s): 1

**Noise Level Data:**

Year: Future
Auto $L_{dn}$, dB: 66
Medium Truck $L_{dn}$, dB: 55
Heavy Truck $L_{dn}$, dB: 57

**Site Geometry:**

Receiver Description: Nearest Backyards
Centerline to Barrier Distance ($C_1$): 55
Barrier to Receiver Distance ($C_2$): 15
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 0
Receiver Elevation[1]: 5
Base of Barrier Elevation: 0
Starting Barrier Height 6

**Barrier Effectiveness:**

| Top of Barrier Elevation (ft) | Barrier Height[2] (ft) | -------------------- $L_{dn}$, dB -------------------- Autos | Medium Trucks | Heavy Trucks | Total | Barrier Breaks Line of Sight to… Autos? | Medium Trucks? | Heavy Trucks? |
|---|---|---|---|---|---|---|---|---|
| 6 | 6 | 60 | 49 | 52 | **61** | Yes | Yes | Yes |
| 7 | 7 | 58 | 48 | 51 | **59** | Yes | Yes | Yes |
| 8 | 8 | 57 | 46 | 50 | **58** | Yes | Yes | Yes |
| 9 | 9 | 56 | 45 | 49 | **57** | Yes | Yes | Yes |
| 10 | 10 | 55 | 44 | 47 | **56** | Yes | Yes | Yes |
| 11 | 11 | 54 | 43 | 46 | **55** | Yes | Yes | Yes |
| 12 | 12 | 53 | 42 | 46 | **54** | Yes | Yes | Yes |
| 13 | 13 | 52 | 42 | 44 | **53** | Yes | Yes | Yes |
| 14 | 14 | 52 | 41 | 44 | **53** | Yes | Yes | Yes |

**Notes:** 1.Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

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# Appendix K

**Traffic Study**

# TRAFFIC AND CIRCULATION SECTION OF THE

# FULLERTON RANCH PROJECT IS/MND

Prepared for:

Submitted on August 16, 2017 by:

FEHR PEERS

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# FIGURES

FIGURES (Continued)



TABLES

The Fullerton Ranch Project site is located on the south of Nicolaus Road west of Joiner Parkway and East of Lakeside Drive; directly east of the existing Glenmoor Subdivision Development and east of the future Lincoln Independence Project. Access to the 81 single family residences would be provided by a new intersection on Nicolaus Road, and from existing roadways, Abbeyhill Road, Savannah Drive, and Milan Way.

This section of the Initial Study / Mitigated Negative Declaration (IS/MND) analyzed the potential impacts of the proposed Fullerton Ranch Project on the surrounding transportation system including intersections, roadways, bicycle/pedestrian facilities, transit facilities/services and construction traffic. This report identifies the significant impacts of the proposed Project and recommends mitigation measures to lessen their significance.

# SECTION1 - ENVIRONMENTAL SETTING

## PROJECT LOCATION

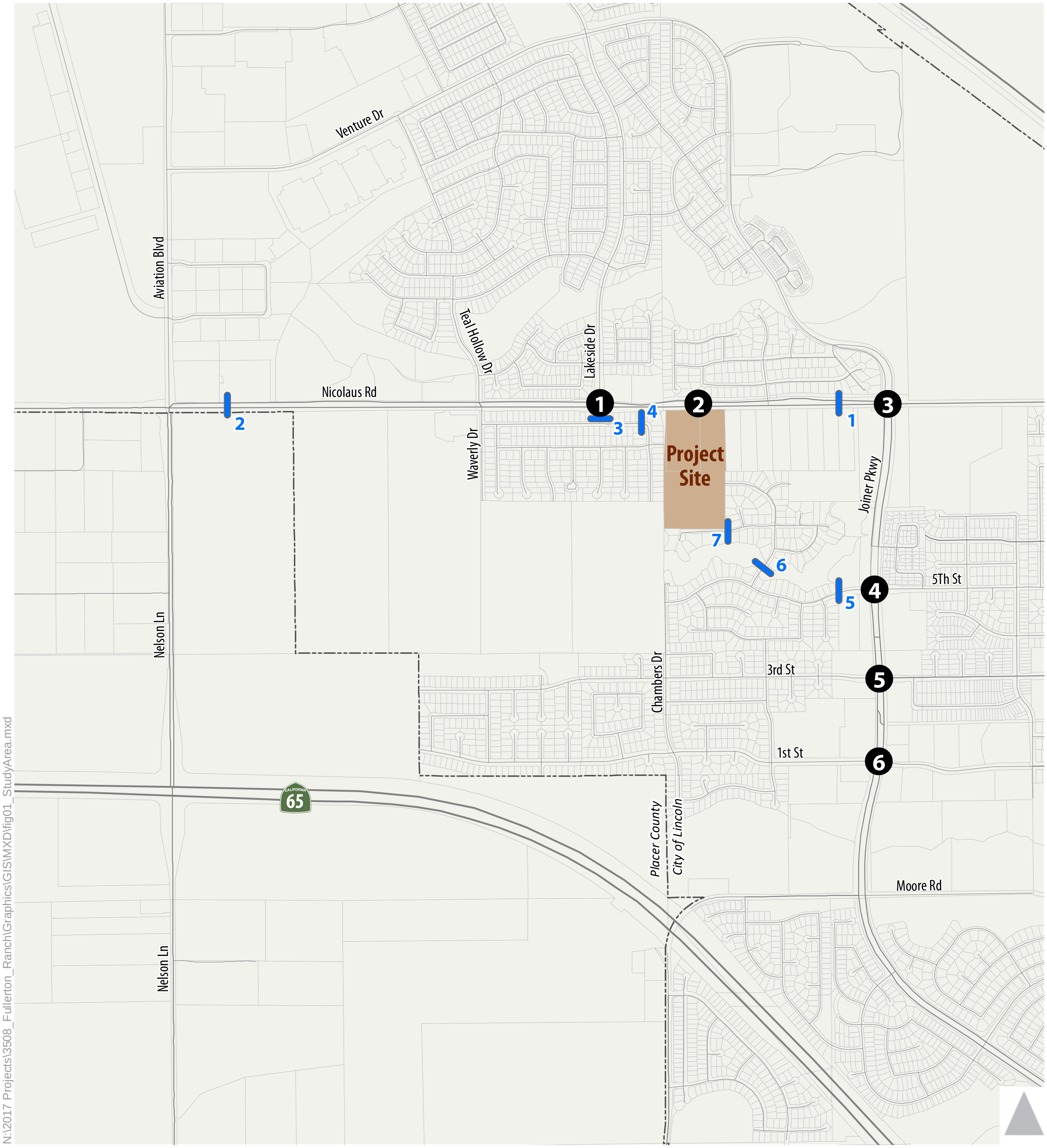
The Project site is located on the south of Nicolaus Road west of Joiner Parkway and East of Lakeside Drive. The proposed Fullerton Ranch Project would be located directly east of the existing Glenmoor Subdivision Development and east of the future Lincoln Independence Project. Therefore, the transportation analysis contained in this report tiers off the analysis completed for Existing + Project and Cumulative + Project Scenarios from Independence of Lincoln Development Project EIR (2016).

Access to the 81 single family residences would be provided by a new intersection on Nicolaus Road and from existing roadways, Abbeyhill Road, Savannah Drive, and Milan Way. Figure 1 displays the regional location of the Project site relative to the surrounding transportation system. Figure2 displays roadway classification, number of lanes, speed limits, and intersection control types within the study area.

## STUDY AREA ROADWAYS AND INTERSECTIONS

The following describes the key roadways in the study area.

**State Route 65** is a north-south state highway that begins at Interstate 80 (I-80) and extends north through Lincoln to SR 70 south of Marysville. SR 65 is a four-lane freeway from I-80 to the at-grade intersection with Nelson Lane. It continues as a four-lane divided highway from Nelson Lane to north of Wise Road. North of Wise Road, it becomes a two-lane state highway connecting the area to Yuba County and Marysville to the north. The section of SR 65 between Lincoln Boulevard and Riosa Road is known as the Lincoln Bypass. The Lincoln Bypass opened in 2012 to facilitate travel between South Placer County and Yuba County and reduce through traffic in the City of Lincoln. The former SR 65 alignment through Downtown Lincoln is now called Lincoln Boulevard.



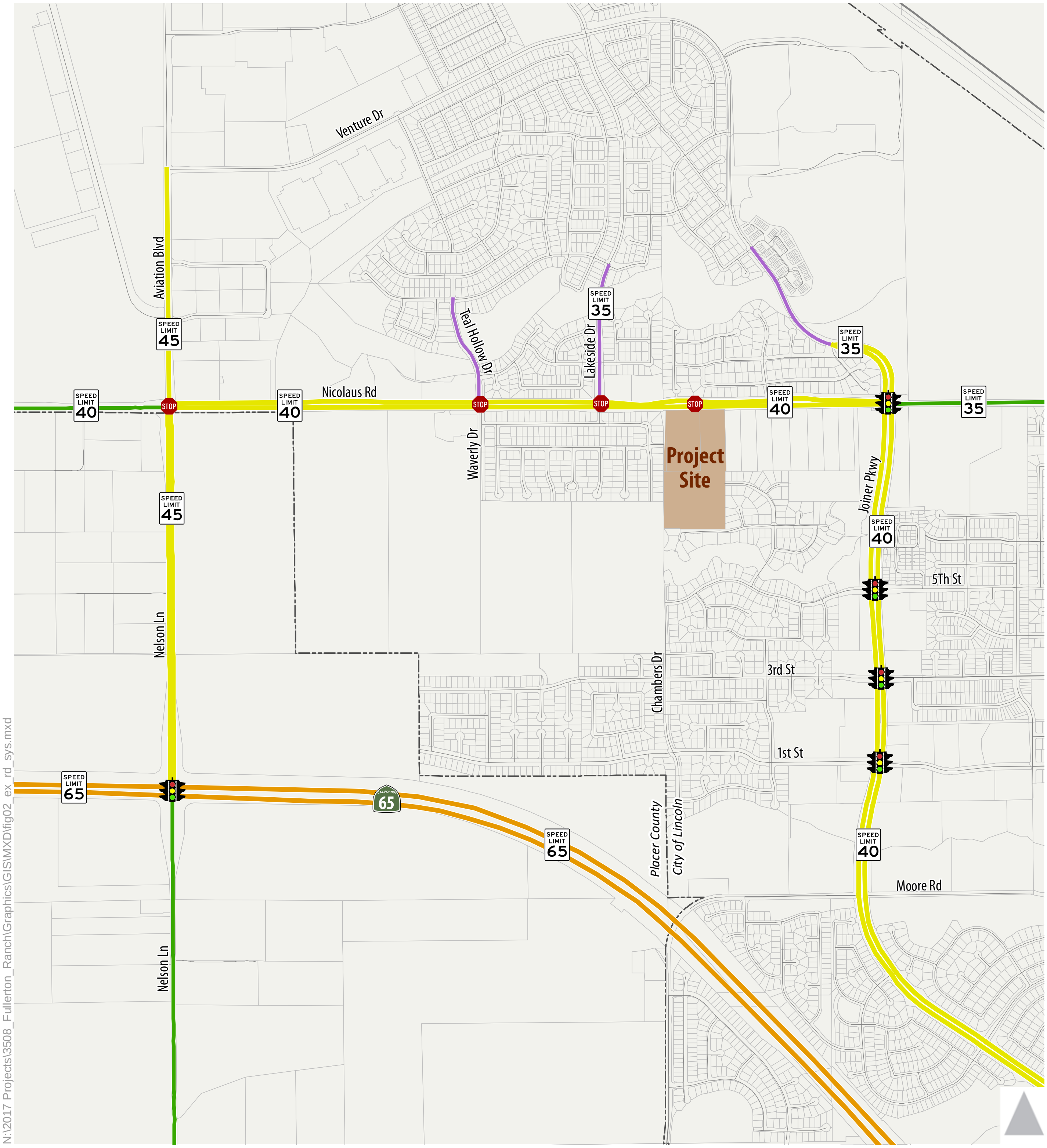

Study Intersection

Study Roadway

Project Site

Figure 1

Fullerton Ranch Project Study Area






All-Way Stop-Control

Traffic Signal

Roadway Classification and Number of Lanes

- 4-Lane Freeway/Highway
- 4-Lane Divided Arterial
- 2-Lane Arterial
- 2-Lane Collector

Figure 2

## Existing Roadway System

**Nicolaus Road** is an east-west major arterial roadway from Joiner Parkway to Pleasant Grove Road in unincorporated Placer County and a collector street from Joiner Parkway to Seventh Street. Within the study area, it is a four-lane divided roadway between Nelson Lane and Joiner Parkway. It is two lanes east of Joiner Parkway and a two-lane rural roadway west of Nelson Lane. It has a grade separated overcrossing of the SR 65 bypass. In addition, Nicolaus Road is an STAA truck route, which means that California legal trucks may use it to deliver goods and materials to industrial uses in the Lincoln Airport Industrial Area.

**Joiner Parkway** is a major arterial street that spans much of the City of Lincoln from south to north. Within the study area, Joiner Parkway is a four-lane divided arterial. North of Nicolaus Road, Joiner Parkway narrows from four to two lanes.

**Lakeside Drive, Celtic Drive, Savannah Drive and Milan Way** are all two-lane collector streets that serve existing residential neighborhoods. Savannah Drive, Abbeyhill Road, and Milan Way would provide access to the Fullerton Ranch Project.

## EXISTING PEDESTRIAN AND BICYCLE FACILITIES

The following types of bicycle facilities exist within the study area:

- Multi-use paths (Class I) are paved trails that are separated from roadways, and allow for shared use by both cyclists and pedestrians.
- On-street bike lanes (Class II) are designated for use by bicycles by striping, pavement legends, and signs.

Figure 3 displays existing bicycle facilities within the project vicinity. A Class I multi-use path exists along Nicolaus Road (north side) between Joiner Parkway and Lakeside Drive. Class II bike lanes exist at all other segments marked on Figure 3, including portions of Aviation Boulevard, Nicolaus Road west of Teal Hollow Drive/Waverly Drive, Nicolaus Road east of Joiner Parkway, parts of Joiner Parkway, and First Street east of Joiner Parkway. The south side of the segment of Nicolaus Road west of Waverly Drive has a shoulder of suitable width to facilitate bicycle travel. However, lane marking and signage is not present to designate it as bike lane.

As also seen in Figure 3, the pedestrian network in the study area includes sidewalks along a majority of residential streets. Arterial streets such as Nicolaus Road and Joiner Parkway also feature sidewalks, although there are gaps particularly where abutting properties have not been developed. The south side of the segment of Nicolaus Road west of Waverly Drive does not have a sidewalk. All intersections have three or more crosswalks except for Waverly Drive/Nicolaus Road, which has two crosswalks, and Nicolaus Road/Nelson Lane, which has no crosswalks and no adjacent pedestrian facilities.

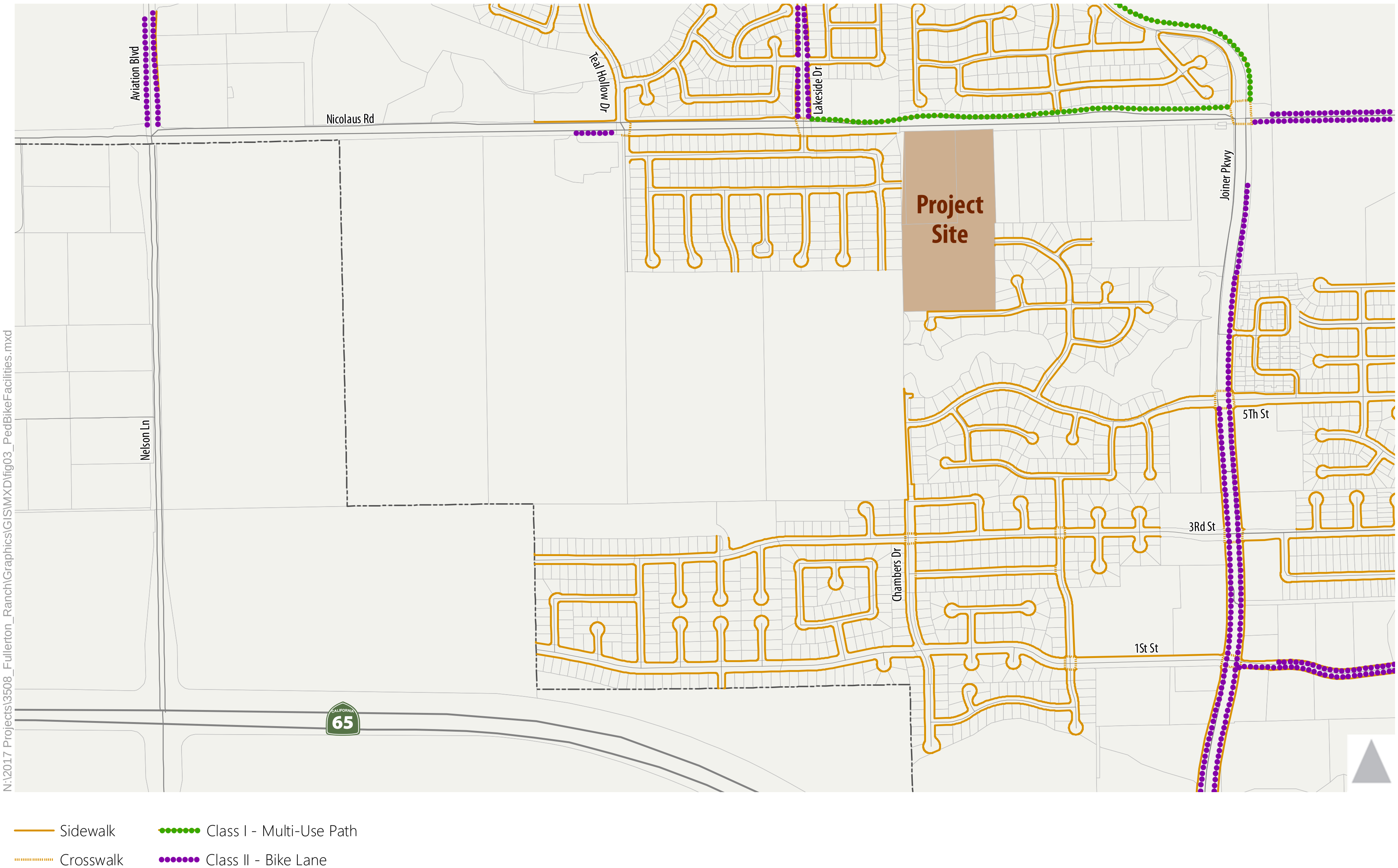



Figure 3

## Pedestrian and Bicycle Facilities - Existing Conditions

## TRANSIT SERVICE

Transit service in Lincoln consists of the "Lincoln Route", which is operated by Placer County Transit. Although this route serves downtown and other areas of the City, it does not currently extend to the northwest quadrant of the City, in which the project site is located. The closest transit route is located approximately 1.2 miles to the south-east near the corner of 3rd Street / R Street in downtown Lincoln.

## SECTION 2 - ANALYSIS METHODS

The operational performance of the roadway network is commonly described with the term Level of Service, or LOS. LOS is a qualitative description of operating conditions, ranging from LOS A (free-flow traffic conditions with little or no delay) to LOS F (oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). The LOS analysis methods outlined in the *Highway Capacity Manual* (HCM) (Transportation Research Board, 2000 and 2010) were used in this study.

Table 1 summarizes the relationship between the control delay and LOS for signalized and unsignalized intersections. The delay ranges for unsignalized intersections are lower than for signalized intersections as drivers expect less delay at unsignalized intersections.

**Table 1 LOS Criteria – Intersections**

| Level of Service | Description (for Signalized Intersections) | Average Delay (Seconds/Vehicle) | |
|---|---|---|---|
| | | Signalized Intersections | Unsignalized Intersections |
| A | Operations with very low delay occurring with favorable traffic signal progression and/or short cycle lengths. | ≤ 10.0 | ≤ 10.0 |
| B | Operations with low delay occurring with good progression and/or short cycle lengths. | > 10.0 to 20.0 | > 10.0 to 15.0 |
| C | Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear. | > 20.0 to 35.0 | > 15.0 to 25.0 |
| D | Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable. | > 35.0 to 55.0 | > 25.0 to 35.0 |
| E | Operations with high delay values indicating poor progression, and long cycle lengths. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay. | > 55.0 to 80.0 | > 35.0 to 50.0 |
| F | Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths. | > 80.0 | > 50.0 |

Note: LOS = level of service; V/C ratio= volume-to-capacity ratio

LOS at signalized intersections and roundabouts based on average delay for all vehicles. LOS at unsignalized intersections is reported for entire intersection and for minor street movement with greatest delay.

Source: Transportation Research Board 2010

The HCM procedures were applied using the Synchro 8 traffic analysis software. The Synchro analysis relies on peak hour factors and heavy vehicle percentages that were measured in the field. Other model inputs include lane configurations, traffic volumes, and traffic controls (including signal phasing/timing). For side-street stop-controlled intersections, delay is calculated for each stop-controlled movement and for the uncontrolled left turns, if any, from the main street. The delay and LOS for the entire intersection and for the worst movement are reported for side-street stop intersections.

## ANALYSIS SCENARIOS

The transportation system was analyzed for the following scenarios:

***Existing Conditions*** – establishes the existing setting, which is used to measure the significance of Project impacts. It should be noted that for the Fullerton Ranch IS/MND, the traffic analysis from the Independence of Lincoln Development Project EIR (2016) Existing + Project Analysis was used to represent Existing Conditions.

***Existing Plus Project Conditions*** – adds traffic from the proposed Project to existing conditions.

***Cumulative No Project Conditions*** – represents cumulative travel conditions based on output from the Placer County Travel Demand Model assuming no development on the Project site. It should be noted that for the Fullerton Ranch IS/MND, the traffic analysis from the Independence of Lincoln Development Project EIR (2016) Cumulative + Project Analysis was used to represent Existing Conditions.

***Cumulative Plus Project Conditions*** – adds traffic from the proposed Project to the Cumulative No Project condition.

## DATA COLLECTION

Study facilities were selected based on the Project's expected travel characteristics (i.e., location and amount of Project trips) as well as facilities susceptible to being impacted by the Project.

### *INTERSECTIONS*

The following Six (6) existing intersections were selected for detailed intersection level of service analysis.

1. Nicolaus Road / Lakeside Drive;
2. Nicolaus Road / Project Access;
3. Nicolaus Road / Joiner Parkway;
4. Joiner Parkway / 5th Street;
5. Joiner Parkway / 3rd Street; and
6. Joiner Parkway / 1st Street.

In addition, the following seven (7) roadway segments were also evaluated for average daily traffic (ADT) volumes:

1. Nicolaus Road west of Joiner Parkway;
2. Nicolaus Road east of Nelson Lane
3. Lakeside south of Nicolaus Road;
4. Celtic Drive west of project site;
5. Fifth ($5^{th}$) Street west of Joiner Parkway
6. Savannah Drive east of project site
7. Milan Way west of Savannah Drive and south of the project site

This report analyzes project impacts during the following analysis periods:

- Weekday AM Peak Hour – the AM peak hour is defined as the consecutive 60-minute period that has the greatest traffic volume within the 7:00 to 9:00 a.m. peak period.

- Weekday PM Peak Hour – the PM peak hour is defined as the consecutive 60-minute period that has the greatest traffic volume within the 4:00 to 6:00 p.m. peak period

Peak hours were defined on the basis of individual intersection peak hours because (1) it is more conservative to analyze peak hours at the intersection level, (2) intersections are relatively isolated from each other so balancing is not always critical, and (3) there are no coordinated corridors being studied. The most common AM peak hour was from 7:30 to 8:30 a.m., while the most common PM peak hour was from 4:30 to 5:30 p.m.

## EXISTING INTERSECTION OPERATIONS

Existing operations were analyzed for the weekday AM and PM peak hours at the six study intersections based on the volumes, geometry and intersection control shown in Figure 4. Based on the results presented Table 2, all intersections currently operate at LOS C or better. These results match existing conditions, which generally reveal modest levels of queuing and vehicle delay during the study periods.

**Table 2 Peak Hour Intersection Level of Service – Existing Conditions**

| Intersection | Control | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|
| | | Delay[1] | LOS | Delay[1] | LOS |
| Nicolaus Road / Lakeside Drive | AWSC | 14.0 | B | 10.8 | B |
| Nicolaus Road / Fullerton Ranch Access (Does Not Exist) | SSSC | 0.0 | A | 0.0 | A |
| Nicolaus Road / Joiner Parkway | Signal | 22.3 | C | 18.0 | B |
| Joiner Parkway / 5th Street | Signal | 16.2 | B | 14.2 | B |
| Joiner Parkway / 3rd Street | Signal | 17.5 | B | 14.9 | B |
| Joiner Parkway /1st Street | Signal | 28.7 | C | 20.5 | C |

Notes: LOS = level of service. AWSC = All-Way Stop Control and SSSC = Side Street Stop Control

[1] For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for all approaches.

Source: Fehr & Peers 2017

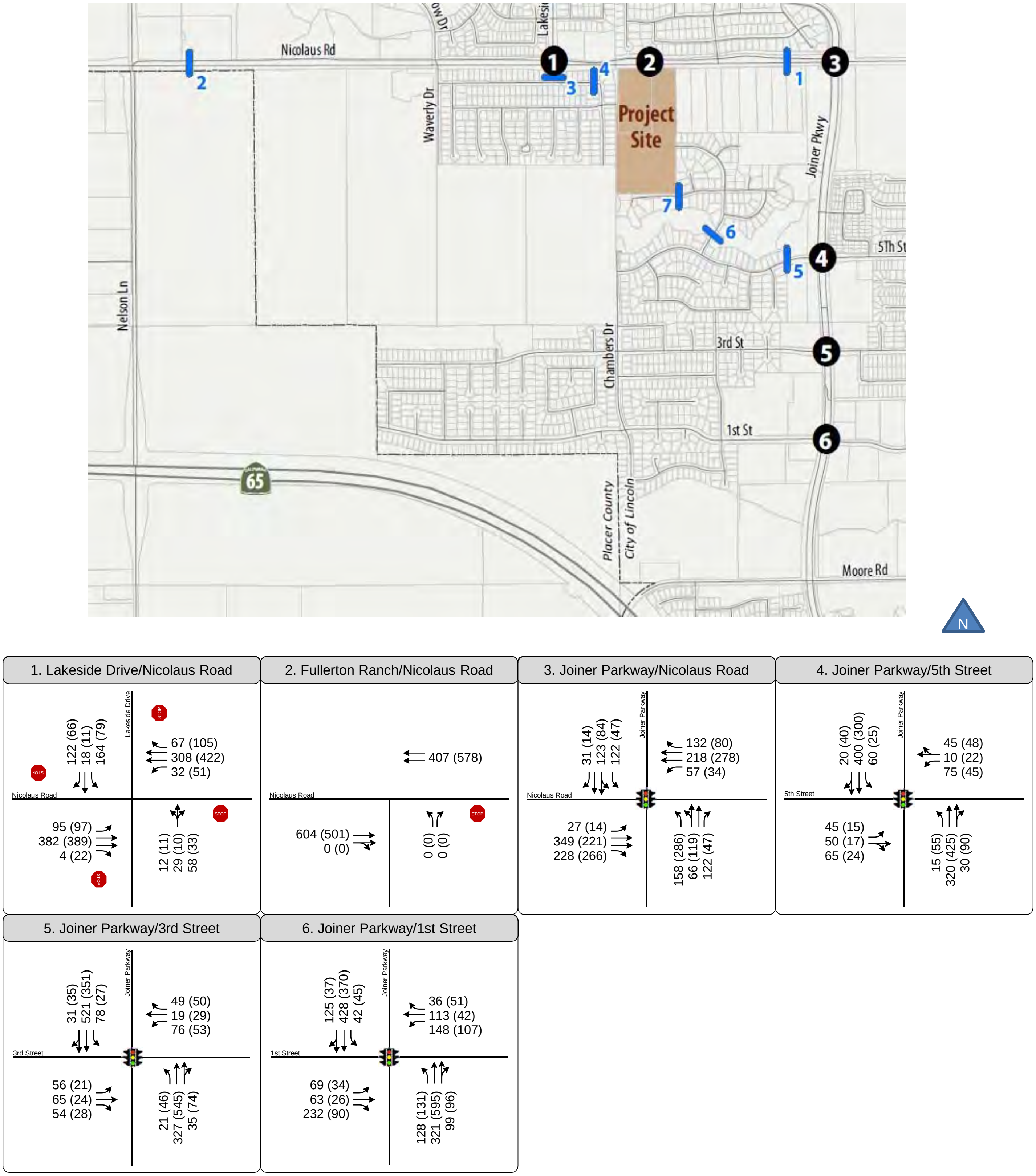



Figure 4

Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions

The all-way stop controlled intersection of Lakeside Drive / Nicolaus Road operates at acceptable LOS B conditions during both AM and PM peak hours. The signalized intersection of Joiner Parkway / Nicolaus Road operates at acceptable LOS C conditions during the AM peak hour and acceptable LOS B conditions during the PM peak hour. And the signalized intersection of Joiner Parkway / 1st Street operates at acceptable LOS C conditions during both AM and PM peak hours.

# SECTION 3 - PROJECT TRAVEL CHARACTERISTICS

## PROJECT DESCRIPTION

The Fullerton Ranch Project site is located on the south of Nicolaus Road west of Joiner Parkway and East of Lakeside Drive; directly east of the existing Glenmoor Subdivision Development and east of the future Lincoln Independence Project. Access to the 81 single family residences would be provided by a new intersection on Nicolaus Road, and from existing roadways, Celtic Drive, Lakeside Drive, Abbeyhill Road, Savannah Drive, and Milan Way. The Nicolaus Road / Project Access intersection will provide full access for the proposed Fullerton Ranch Project (81 single family residential units), including:

- An Eastbound right-turn in;
- A Westbound left-turn in;
- A Northbound left-turn out; and
- A Northbound right-turn out.

## TRIP GENERATION

Table 3 shows the estimated trips generated for the proposed 81 single family residential Fullerton Ranch Project during weekday daily, AM peak hour, and PM peak hour conditions. As shown below, the project would generate approximately 771daily vehicle trips, 61 new AM peak hour trips, and 81 new PM peak hour trips. The trips generated by the residential land uses are based on trip rates from the *Trip Generation Manual* (9th Edition, Institute of Transportation Engineers 2012).

## TRIP DISTRIBUTION/ASSIGNMENT

The distribution of project generated vehicles trips was based on the following information and analysis methods:

1. Existing directional travel patterns to and from the housing development south of Nicolaus Road between Waverly Drive and Joiner Parkway.

2. Existing travel patterns along Nicolaus Road, Nelson Lane, and Joiner Parkway (to understand regional travel patterns).

3. Complementary land uses (i.e., employment, retail, and schools) within the study area.

**Table 16-3 Project Trip Generation**

| Land Use (ITE Code) | Quantity | Unit | Trip Rate [1] | | | Trips | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Daily | A.M. Peak Hour | | | P.M. Peak Hour | | |
| | | | Daily | AM | PM | | In | Out | Total | In | Out | Total |
| Single Family Residential (210) | 81 | du | 9.52 | 0.75 | 1.00 | 771 | 15 | 46 | 61 | 51 | 30 | 81 |
| **Total External Vehicle Trips** | | | | | | **771** | **15** | **46** | **61** | **51** | **30** | **81** |

Notes: du = dwelling units

[1] Trip rate for single family residential units based on LU categories 210 from the *Trip Generation Manual* (Institute of Transportation Engineers 2012).

Source: Fehr & Peers 2017

The AM peak hour trip distribution for the 81 single family residential units was determined to be:

1. 52% to and from the west on Nicolaus Road;
2. 15% to and from the east on Nicolaus Road;
3. 3% to and from the north on Joiner Parkway;
4. 25% to and from the south on Joiner Parkway;
5. 2% to and from the south-east on 1st Street; and
6. 3% to and from the south-west on 1st Street.

The PM peak hour trip distribution for the 81 single family residential units was determined to be:

1. 57% to and from the west on Nicolaus Road;
2. 13% to and from the east on Nicolaus Road;
3. 2% to and from the north on Joiner Parkway;
4. 25% to and from the south on Joiner Parkway;
5. 2% to and from the south-east on 1st Street; and
6. 1% to and from the south-west on 1st Street.

# SECTION 4 - REGULATORY SETTING

Existing transportation polices, laws, and regulations that would apply to the proposed Project are summarized below. This information provides a context for the impact discussion related to the Project's consistency with applicable regulatory conditions and development of significance criteria for evaluating Project impacts.

## FEDERAL AND STATE REGULATIONS

The California Department of Transportation (Caltrans) is responsible for operating and maintaining the state highway system. In the project vicinity, none of the six study intersections fall under Caltrans' jurisdiction.

## LOCAL REGULATIONS

### City of Lincoln General Plan

The Transportation & Circulation Element of the *City of Lincoln General Plan* (March 2008) includes the following policies that are relevant to transportation and circulation.

- **Policy T-2.2:** New Development. The City shall ensure that streets and highways will be available to serve new development by requiring detailed traffic studies and necessary improvements as a part of all major development proposals.

- **Policy T-2.3:** Level of Service for Local Streets and Intersections. Strive to maintain a LOS C at all signalized intersections in the City during the p.m. peak hours. Exceptions to this standard may be considered for intersections where the city determines that the required road improvements are not acceptable (i.e., due to factors such as the cost of improvements exceeding benefits achieved, results are contrary to achieving a pedestrian design, or other factors) or that based upon overriding considerations regarding project benefits, an alternative LOS may be accepted. For purposes of this policy, City intersections along McBean Park Drive between East Avenue and G Street, and G Street between First Street and Seventh Street, are excluded from the LOS C standard, and will operate at a lower LOS. [Note that G Street is also known as Lincoln Boulevard and/or "Old Highway 65."]

- **Policy T-2.14:** Developer Requirements. The City shall require developers to construct at least the first two lanes of any road (including curbs, gutters and sidewalks) within their projects.

- **Policy T-4.3:** Promote Public Transit. The City shall promote the use of public transit through development conditions requiring park-and-ride lots, bus turnouts and passenger shelters along major streets adjacent to appropriate land uses.

- **Policy T-5.1:** Develop Bike Lanes. The City shall require bike lanes in the design and construction of major new street and highway improvements, and to establish bike lanes on those city streets wide enough to accommodate bicycles safely.

- **Policy T-5.4:** Bicycle and Pedestrian Crossings. The City shall provide pedestrian/bicycle crossings at appropriate intervals along new roadways that will adequately serve new large-scale commercial office, industrial development, and residential development as well as parks and schools.

- **Policy T-5.6:** Trails and Pathways to Retail and Employment Centers. The City shall promote pedestrian convenience and safety through development conditions requiring sidewalks, walking paths, or hiking trails that connect residential areas with commercial, shopping, and employment centers. Where feasible, trails will be looped and interconnected.

- **Policy T-5.7:** Trails and Pathways along Creeks and Wetland Areas. The City shall encourage the development of trails and pathways along the edges of creeks and wetland areas. Where feasible, trails will be looped and interconnected.

- **Policy T-5.9:** Pedestrian Access. The City shall encourage specific plans and development plans to include design of pedestrian access that enables residents to walk from their homes to places of work, recreation and shopping.

**The Health & Safety Element of the City of Lincoln General Plan (March 2008) includes the following policies that are relevant to transportation and circulation.**

- **Policy HS-3.10:** Travel Demand Measures. Coordinating with the PCAPCD, the City shall require large development projects to mitigate air quality impacts. As feasible, mitigations may include, but are not limited to, the following:
  - providing bicycle access and bicycle parking facilities,
  - providing preferential parking for high-occupancy vehicles, car pools, or alternative fuels vehicles (including neighborhood electric vehicles or NEVs), and
  - establishing telecommuting programs or satellite work centers.

- **Policy HS-3.18:** Design for Transportation Alternatives. The City shall encourage all new development to be designed to promote pedestrian and bicycle access and circulation (including the use of NEVs), to the greatest extent feasible.

Policy T-2.3 establishes the City of Lincoln's LOS C policy for signalized intersections during the PM peak hour. Because the City does not have an adopted LOS policy for unsignalized intersections or other time periods (i.e., AM peak hour), this study applies this LOS C standard to all City of Lincoln intersections—signalized and unsignalized—during both the AM and PM peak hour, consistent with previous traffic analyses prepared for the City of Lincoln. Unacceptable AM peak hour and/or unsignalized conditions are conservatively treated as significant impacts if caused or exacerbated (to a significant degree) by the project, even if such a result is not prescribed under the City's level of service policy.

### City of Lincoln 2012 Bicycle Transportation Plan Update

The *City of Lincoln Bicycle Transportation Plan Update* (2012) includes the following goals policies related to bicycle circulation in new development areas that are relevant to the project.

- **Policy 1.5:** Provide bicycle connections that allow for regional bike travel to and from the City of Lincoln.
- **Policy 1.6:** Integrate bicycle planning with other community planning, including land use and transportation planning.
- **Policy 2.1:** Require new development projects to reserve the right-of-way for multi-use trails shown in the proposed system of bikeways.
- **Policy 2.3:** Provide pedestrian/bicycle crossings at appropriate intervals along new roadways that will adequately serve new large-scale commercial office, industrial development, and residential development.

## SECTION 5 - THRESHOLDS OF SIGNIFICANCE

The following section describes the standards of significance utilized to analyze and determine the project's potential impacts related to transportation and circulation. These criteria take into account the applicable level of service policies and standards from Appendix G of the CEQA Guidelines and the City of Lincoln and Caltrans adopted policies.

### INTERSECTIONS

Impacts to intersections are considered significant if the project would:

1. Cause the LOS to worsen from acceptable to unacceptable levels according to the following:
    a. For all intersections within Lincoln city limits, LOS C or better is considered acceptable and LOS D-F is considered unacceptable.
    b. For the SR 65/Nelson Lane intersection, LOS E or better is considered acceptable and LOS F is considered unacceptable.
2. Worsen unacceptable existing (or projected cumulative) operations according to the following:

a. For all intersections within Lincoln city limits, it is considered unacceptable if the average vehicle delay increases by five seconds or more for an intersection that is already (or projected to be) operating at an unacceptable LOS without the project.

## BICYCLE AND PEDESTRIAN FACILITIES

The following significance criteria related to bicycle and pedestrian facilities reflect whether the project would conflict with adopted plans, policies, or programs regarding bicycle and pedestrian facilities. Impacts to bicycle and pedestrian facilities are considered significant if the project would:

1. Disrupt or interfere with existing or planned bicycle and pedestrian facilities.
2. Create a demand for bicycling or walking above the capacity which is provided or planned.
3. Create inconsistencies with adopted pedestrian or bicycle system plans, guidelines, policies, or standards.

## TRANSIT FACILITIES

The following significance criteria related to transit facilities reflect whether the project would conflict with adopted plans, policies, or programs regarding transit facilities. Impacts to the transit system are considered significant if the project would:

1. Create a demand for mass transit services above the capacity which is provided or planned.
2. Interfere with existing or planned transit facilities.

## EMERGENCY VEHICLE ACCESS AND EMERGENCY EVACUATION

Impacts to transportation and circulation are considered significant if the project would:

1. Result in inadequate emergency access.
2. Fail to provide an adequate means for residents/visitors to evacuate the project site in a reasonable period of time in the event of an emergency.

## CONSTRUCTION IMPACTS

Impacts to the transportation and circulation system are considered significant if construction activities for the project would:

1. Create a prolonged impact on travel conditions or facilities, including inadequate emergency vehicle access, traffic hazards to bicyclists and pedestrians, damage to roadbeds, or substantial truck traffic on roadways not designated as truck routes.

# SECTION 6 – EXISTING PLUS PROJECT IMPACTS AND MITIGATION MEASURES

An Existing Plus Project analysis was performed to identify potential impacts under existing conditions. This scenario focuses on the Project-specific effects of the Project. Existing Plus Project operations were analyzed for the weekday AM and PM peak hours at the study intersections. Existing Plus Project operations were analyzed at the six study intersections based on the volumes, geometry and intersection control shown in Figure 5. Table 4 displays the results of the existing plus project operations analysis. According to this table, the addition of project generated traffic at all six study intersections would only result in a minor change in control delay. All intersections would operate at LOS C or better under existing plus project conditions during both AM and PM peak hour conditions.

**Table 4 Peak Hour Intersection Level of Service – Existing + Project Conditions**

| Intersection | Control | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|
| | | Delay[1] | LOS | Delay[1] | LOS |
| Nicolaus Road / Lakeside Drive | AWSC | 16.5 | B | 13.4 | B |
| Nicolaus Road / Fullerton Ranch Access (Does Not Exist) | SSSC | 0.1<br>(17.4 NB LT) | A<br>C (NB LT) | 0.4<br>8.7 ( WB LT) | A<br>A |
| Nicolaus Road / Joiner Parkway | Signal | 23.6 | C | 19.4 | B |
| Joiner Parkway / 5th Street | Signal | 16.4 | B | 14.3 | B |
| Joiner Parkway / 3rd Street | Signal | 17.7 | B | 15.0 | B |
| Joiner Parkway /1st Street | Signal | 28.9 | C | 20.6 | C |

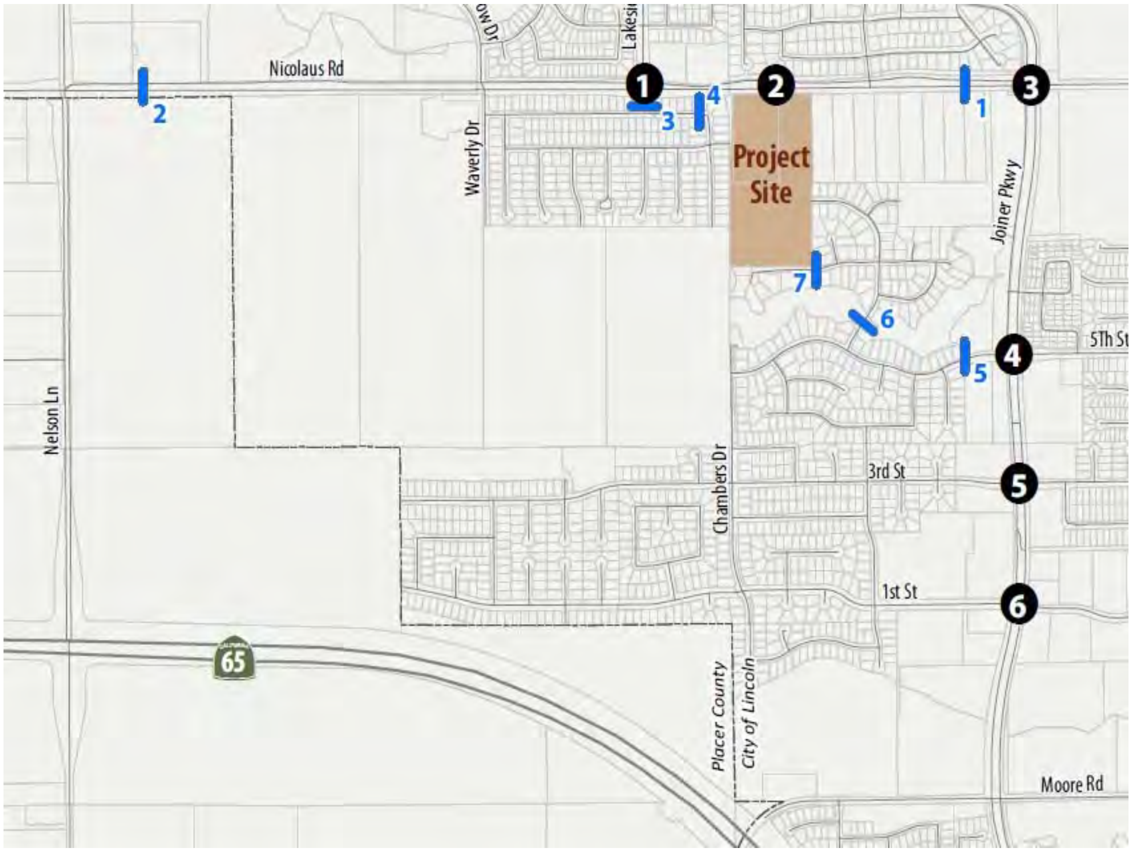
Notes: LOS = level of service. AWSC = All-Way Stop Control and SSSC = Side Street Stop Control

[1] For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for all approaches.

Source: Fehr & Peers 2017

It should be noted that the Fullerton Ranch Access / Nicolaus Road side-street stop controlled intersection will provide full access for the proposed Fullerton Ranch Project (81 single family residential units), including:

- An Eastbound right-turn in;
- A Westbound left-turn in;
- A Northbound left-turn out; and
- A Northbound right-turn out.





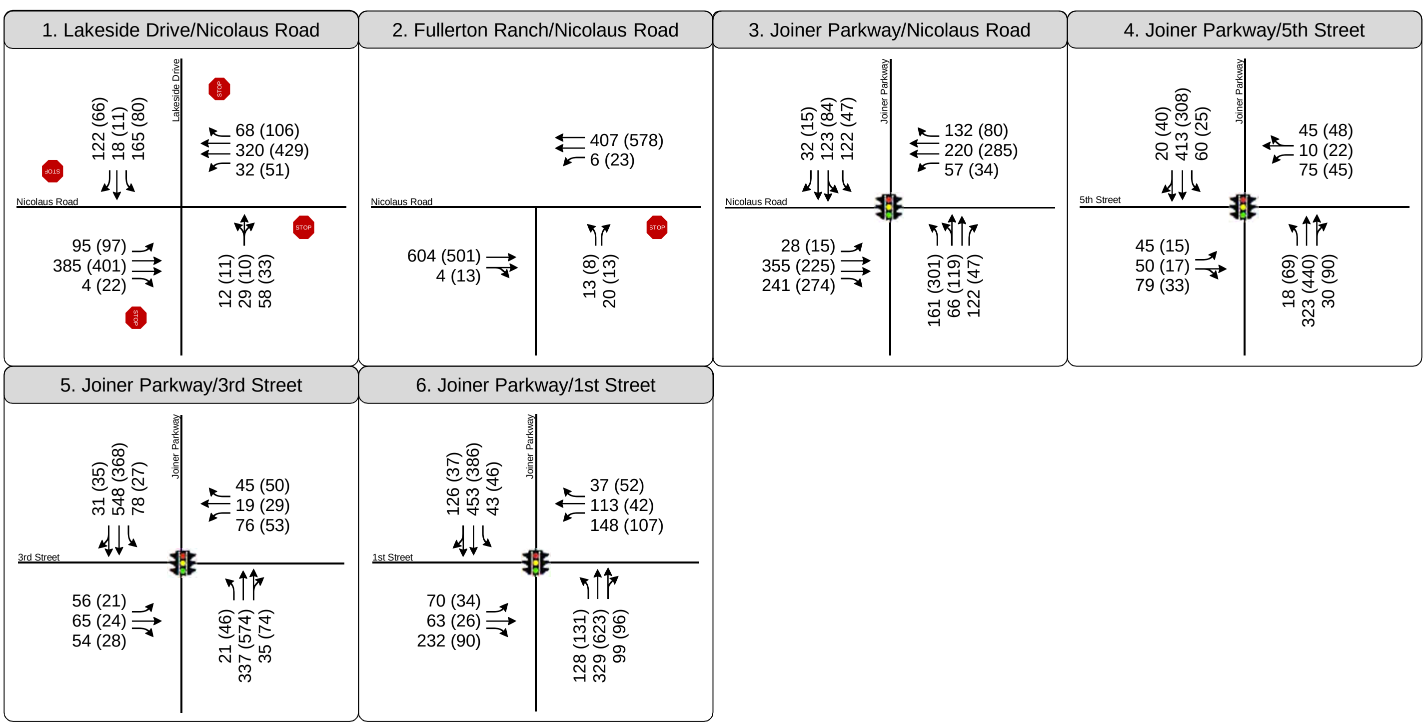



Figure 5

Peak Hour Traffic Volumes and Lane Configurations - Existing Plus Project Conditions

Table 5 presents ADT estimates for each study roadway segment and project access point under Existing and Existing Plus Project conditions. By providing full access at the Fullerton Ranch Driveway / Nicolaus Road side-street stop controlled intersection, a lower number of project generated traffic would use Lakeside Drive south of Nicolaus Road and Celtic Drive west of the project site.

**Table 5 Two-Way Average Daily Traffic – Existing and Existing Plus Project Conditions**

| Roadway Segment | Average Daily Traffic (Existing Conditions) | Average Daily Traffic (Existing Plus Project Conditions) |
|---|---|---|
| Nicolaus Road west of Joiner Parkway | 8,700 | 8,905 |
| Nicolaus Road east of Nelson Lane | 7,300 | 7,640 |
| Lakeside south of Nicolaus Road | 1,000 | 1,020 |
| Celtic Drive / Abbeyhill Road west of Project Site | 400 | 420 |
| Fifth Street west of Joiner Parkway | 1,600 | 1,840 |
| Savannah Drive east of Project Site | 700 | 910 |
| Milan Way west of Savannah Drive and south of the Project Site | 250 | 280 |

Note: N.A. = Not Applicable

Source Fehr & Peers 2017

As shown in Table 5, the project would:

- Increase traffic levels along Nicolaus Road on both sides of the project site. However, Nicolaus Road would be operating well below capacity.
- Increase the ADT at the project's points of access, which under existing plus project conditions includes Lakeside Drive, Celtic Drive Abbeyhill Lane, Fifth Street, Savannah Drive and Milan Way. The resultant volumes are all well below the capacity of a two-lane collector street.

## Impact 1: Impacts to City of Lincoln Intersections

The Project would not cause any of the study intersection to deteriorate to an unacceptable LOS. Therefore, the Project's intersection impacts would be **less than significant**.

As shown in Table 4, the addition of Project generated traffic at all six study intersections would only result in a minor change in control delay. All intersections would operate at LOS C or better under existing plus project conditions during both AM and PM peak hour conditions.

Intersection impacts would be **less than significant**.

***Mitigation Measure***

No mitigation required.

## Impact 2: Impacts to Pedestrian Facilities

The project would not create a demand for pedestrian travel above the capacity which is provided or planned. Therefore, the project's intersection impacts would be **less than significant** impact.

The Project would extend the existing sidewalk on the south side of Nicolaus Road along the frontage of the proposed Fullerton Ranch Project. In addition, all the internal collector streets would also provide continuous sidewalks connecting the 81 single family residences to Abbeyhill Road (to the west), Savannah Drive (to the east) and Milan Way (to the south).

Pedestrian Facilities impacts would be **less than significant**.

***Mitigation Measure***

No mitigation required.

## Impact 3: Impacts to Bicycle Facilities

The project would not create inconsistencies with any adopted policies related to bicycle systems or any plan bicycle system improvements. This would be a **less-than-significant** impact

The *City of Lincoln Bikeway Master Plan* shows the following planned bicycle facilities in the project vicinity:

- Planned Class II bike lane on south side of Nicolaus Road between Waverly Drive and Joiner Parkway.
- Planned Class I multi-use trail on north side of Nicolaus Road between Waverly Drive and Nelson Lane.
- Planned Class I multi-use trail that would extend southerly from Nicolaus Road west of Waverly Drive, and then easterly along Markham Ravine, and then southerly parallel to Chambers Drive to beyond First Street.
- Planned Class III bike lane connecting Nicolaus Road, through the Glenmoor Subdivision via Abbeyhill Road, through the project site, to Savannah Drive.

Therefore, the project is in compliance with the planned bicycle system in the *City of Lincoln Bikeway Master Plan.* This would be a **less-than-significant with mitigation**.

***Mitigation Measures***

Construct the segment of the Class II bike lane along the project frontage on the south side of Nicolaus Road. And alternative is to dedicate the right-of-way and pay the Project's fair share towards the Class II bike lane on the south side of Nicolaus Road between Waverly Drive and Joiner Parkway.

Construct the Class III bike lane connecting Nicolaus Road, through the Glenmoor Subdivision via Abbeyhill Road, through the project site, to Savannah Drive.

## Impact 4: Impacts to Transit Facilities

The project is a residential development comprised of 81 single family residences. Transit service in Lincoln consists of the "Lincoln Route", which is operated by Placer County Transit. Although this route serves downtown and other areas of the City, it does not currently extend to the northwest quadrant of the City, in which the project site is located.

It should be noted that a bus stop is planned to be constructed on Nicolaus Road approximately 0.75 miles to the west as part of the proposed L. Based on future growth in the City of Lincoln, an extension of the existing Lincoln Route or a second transit route may serve the north-west area of the City of Lincoln.

Therefore, based on the number of residential units and the fact that the Lincoln Route does not currently extend to the area, this would be a **less-than-significant with mitigation**.

***Mitigation Measure***

Pay the Project's fair share towards the cost of constructing the transit stop on both westbound and eastbound Nicolaus Road as part of the future Lincoln Independence Project.

## Impact 5: Impacts to Emergency Vehicle Access, Evacuation, and Circulation

The project would provide adequate emergency vehicle access to and from the project site and internal circulation consistent with the City and County policies and standards. This impact would be **less than significant.**

The nearest police station to the project site is the Lincoln Police Department, located approximately 1.7 miles east of the Nicolaus Road / Fullerton Ranch access intersection at the intersection of 7th Street and H Street. The nearest fire station is the Lincoln Fire Station (No. 34), which is south of the Joiner Parkway/First Street intersection and about 1.2 miles away from the Nicolaus Road / Fullerton Ranch access intersection. Most emergency vehicles arriving from Lincoln would need to pass through the Nicolaus Road/Joiner Parkway intersection, which is equipped with emergency vehicle pre-emption. The project site includes a primary access points (Nicolaus Road / Fullerton Ranch Access) as well as secondary access points from (Fifth Street, Celtic Drive, Abbeyhill Road, Savannah Drive and Milan Way). The primary access would permit all turning movements and be designed to City standards that accommodate turning requirements for fire trucks. Therefore, the project would provide adequate emergency vehicle access to and from the project site consistent with the City and County policies and standards. This would be a **less-than-significant** impact.

***Mitigation Measure***

No mitigation required.

## Impact 6: Construction Impacts

The project could result in temporary impacts to transportation facilities including heavy vehicle and truck traffic, and potential damage to roadbeds. This would be a significant impact.

The project would generate a variety of truck and employee trips during its construction. Because the magnitude of these trips during peak hours would be less than that of the project, absolute impacts (in terms of delay and queuing) when compared to project operations would not be significant. However, construction activity would require heavy vehicles to access the site and may include the possibility of temporary traffic lane closures, travel hazards to bicyclists and pedestrians, increased loading and potential damage to roadbeds, or substantial truck traffic on roadways not designated as truck routes. These activities could result in temporarily degraded roadway operating conditions, and introduce potentially hazardous travel conditions for vehicles, bicycles, and pedestrians. This would be a **significant** impact.

## Mitigation Measure 6: Construction impacts.

Prior to issuance of a grading permit, or Subdivision Improvements (whichever comes first) the project applicant shall develop a Construction Traffic Management Plan (TMP) that adheres to various performance standards describe below.

◢ Prior to the beginning of construction for each project phase, the project applicant shall develop a Construction TMP to the satisfaction of the City ’ The plan shall include items such as: the number and size of trucks per day, expected arrival/departure times, truck circulation patterns, location of truck staging areas, location/amount of employee parking, and any proposed use of traffic control/partial street closures on public streets. The overall goal of the Construction TMP will be to ensure maintenance of acceptable operating conditions and to maintain a high level of safety for all roadway users. The Construction TMP shall adhere to the following performance standards throughout project construction:

1. Any lane closures on eastbound Nicolaus Road during project construction should be limited to a single lane during off-peak hours (9:00 a.m. to 2:30 p.m.), and shall not create unsafe travel conditions for bicyclists or pedestrians.

2. 3. Delivery/refuse trucks shall not idle/stage on Nicolaus Road nor shall any single lane closures impede traffic flow on eastbound / westbound Nicolaus Road.

4. Roadways, sidewalks, crosswalks, and bicycle facilities shall be maintained clear of debris (e.g., rocks) that could otherwise impede travel and impact public safety and swept daily at the end of the construction day.

A copy of the Construction TMP shall be submitted to local emergency response agencies and these agencies shall be notified at least 30 days before the commencement of construction that would partially or fully obstruct roadways.

***Significance after Mitigation***

Implementation of this mitigation measure would reduce this impact to a **less-than-significant** level because adequate access and safety of the roadways would be maintained during construction activities.

# SECTION 7 –CUMULATIVE CONDITIONS IMPACTS AND MITIGATION MEASURES

A Cumulative Conditions analysis was performed to identify potential impacts of the proposed Project under Cumulative AM and PM peak hour conditions. Local roadway and regional freeway improvements, corresponding Travel Demand Model Forecasts, and intersection and roadway segment operations analysis results are presented in this section.

## Traffic Forecasts

The cumulative analysis consists of two scenarios:

1. Cumulative No Project Conditions – This scenario represents reasonably foreseeable land developments and roadway improvements (see description below) anticipated under cumulative conditions. Under this scenario, the project site is assumed to remain undeveloped. It should be noted that for the Fullerton Ranch IS/MND, the traffic analysis from the Independence of Lincoln Development Project EIR (2016) Cumulative + Project Analysis was used to represent Existing Conditions.

2. Cumulative Plus Project conditions – This scenario assumes development of the project under the same cumulative setting to measure the project's contribution to cumulative impacts.

This study uses a version of the Placer County cumulative year TDF model that has been updated to include the SR 65 Lincoln Bypass. In addition, this version of the TDF model was utilized in the transportation impact studies for the Independence of Lincoln Development Project EIR (2016). Planned roadway improvements and land use changes from these and other previous projects are incorporated into this version of the TDF model.

Within the study area, the following roadway improvements are anticipated under cumulative conditions (based on their inclusion in the City's Public Facilities Element):

- Traffic signal at the Nicolaus Road / Lakeside Drive intersection

All other study intersections were assumed to have identical lane configurations and traffic controls as existing conditions. To develop peak hour turning movements under both cumulative scenarios, the "difference method" was employed. The "difference method" accounts for model error through the following adjustment technique:

*Cumulative Forecast = Existing Traffic Count + (Cumulative Model Volume – Base Year Model Volume)*

## Intersection Operations

Table 6 presents the results of the cumulative operations analyses. According to this table, vehicle traffic generated by the 81 single family residential Fullerton Ranch project would only result in a minor change in control delay. Cumulative operations were analyzed for the weekday AM and PM peak hours at the six study intersections based on the volumes, geometry and intersection control shown in Figure 6.Cumulative Plus Project operations were analyzed for the weekday AM and PM peak hours at the six study intersections based on the volumes, geometry and intersection control shown in Figure 7.

**Table 6 Peak Hour Intersection Level of Service – Cumulative and Cumulative Plus Project Conditions**

| Intersection | LOS Standard | Control | Cumulative No Project Conditions | | | | Cumulative Plus Project Conditions | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | |
| | | | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS |
| Nicolaus Road / Lakeside Drive | C | Signal | 33.7 | C | 24.9 | C | 34.1 | C | 25.1 | C |
| Nicolaus Road / Fullerton Ranch Access (Does Not Exist) | C | Side Street Stop Controlled | 0.0 Does Not Exist | A Does Not Exist | 0.0 Does Not Exist | A Does Not Exist | 1.6 (19.5) (NB LT) | A (C) (NB LT) | 0.5 (10.0) ( WB LT) | A (A) ( WB LT) |
| Nicolaus Road / Joiner Parkway | C | Signal | 29.9 | C | 26.5 | C | 29.9 | C | 27.1 | C |
| Joiner Parkway / 5th Street | C | Signal | 23.5 | C | 20.1 | C | 23.6 | C | 20.4 | C |
| Joiner Parkway / 3rd Street | C | Signal | 22.6 | C | 26.4 | C | 22.6 | C | 26.5 | C |
| Joiner Parkway/1st Street | C | Signal | 28.4 | C | 32.0 | C | 28.5 | C | 32.1 | C |

Notes: LOS = level of service. SSSC = Side-street stop control. **Bolded** cells represent significant impacts.

[1] For signalized intersections and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for all approaches. For side-street stop controlled intersections, the delay and LOS for the most-delayed individual movement is shown in parentheses, and delay/LOS for the entire intersection is shown without parentheses.

Source: Fehr & Peers 2017

All intersections would operate at LOS C or better under existing plus project conditions during both AM and PM peak hour conditions. Similar to Existing Plus Project Conditions, the Fullerton Ranch Access / Nicolaus Road side-street stop controlled intersection will provide full access for the proposed Fullerton Ranch Project (81 single family residential units), including:

- An Eastbound right-turn in;
- A Westbound left-turn in;
- A Northbound left-turn out; and
- A Northbound right-turn out.

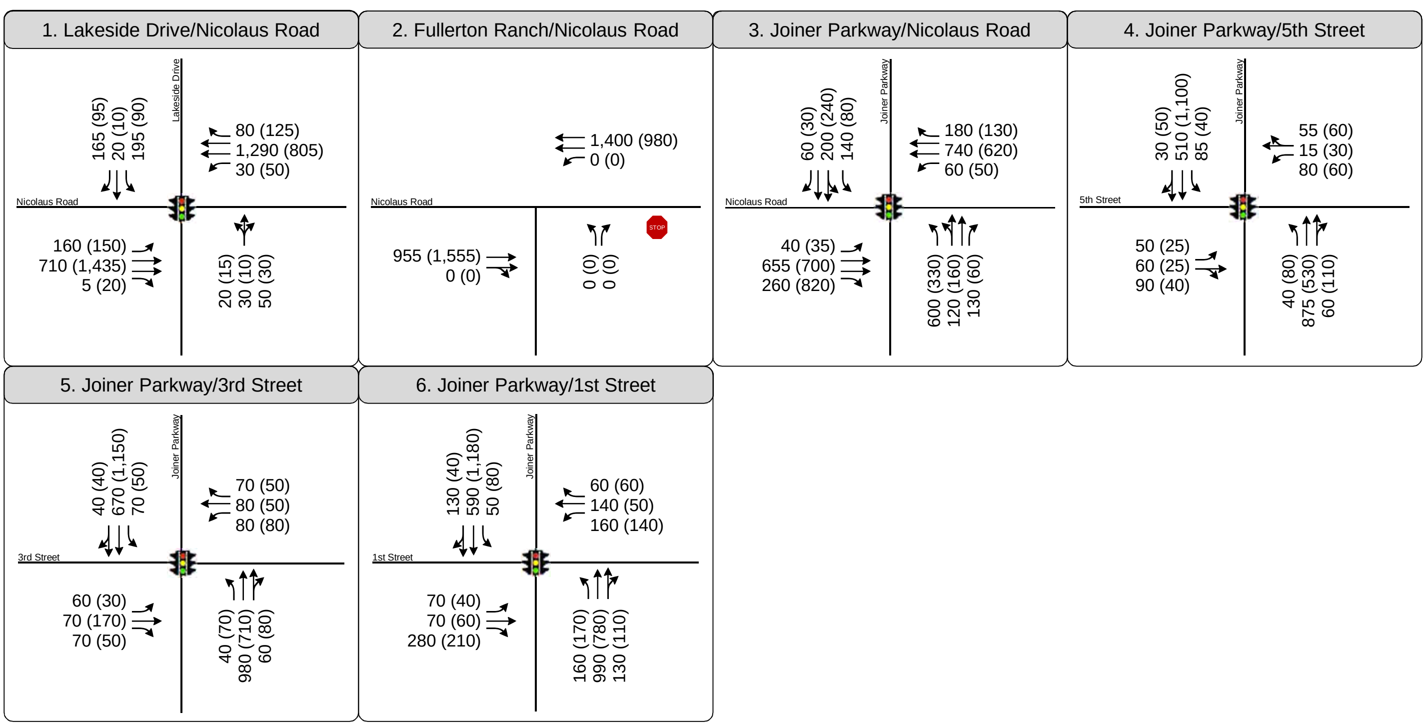




Figure 6

## Peak Hour Traffic Volumes and Lane Configurations - Cumulative Conditions

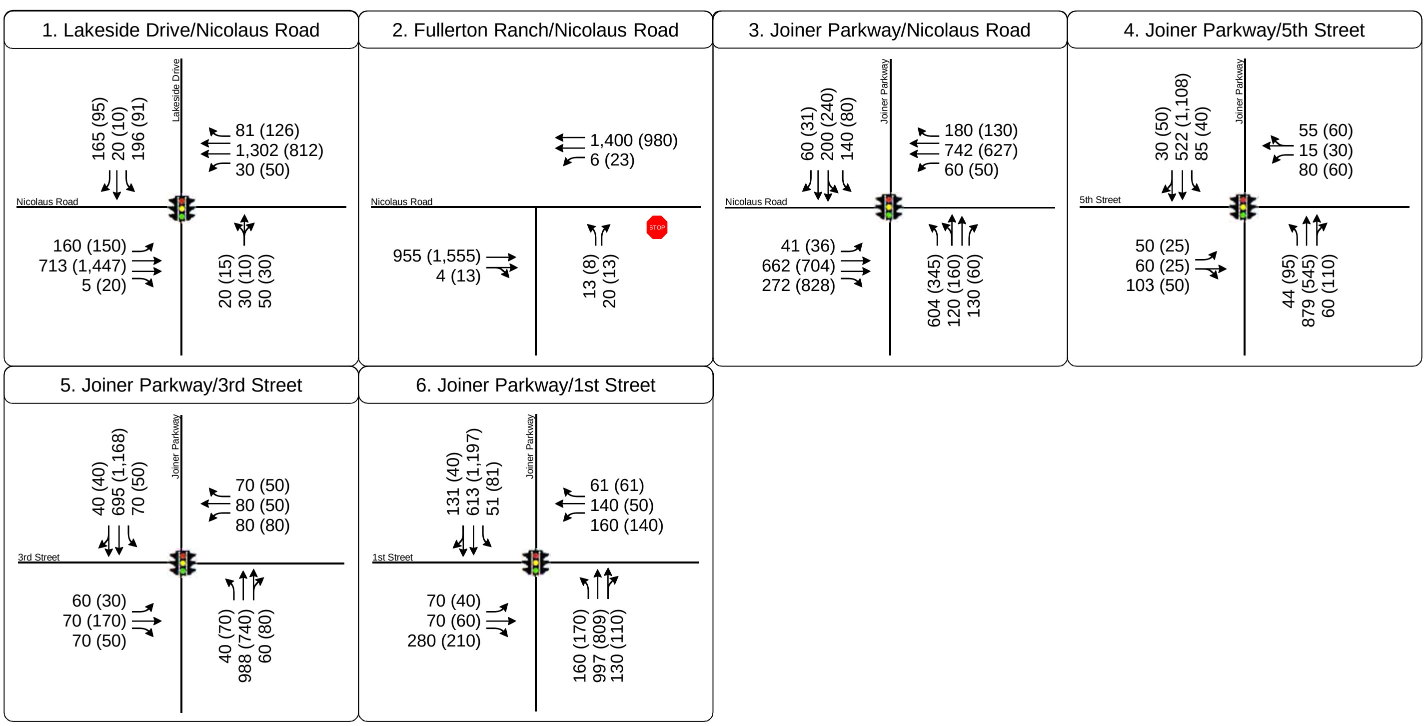




Figure 7
Peak Hour Traffic Volumes and Lane Configurations - Cumulative Plus Project Conditions

Table 7 presents ADT estimates for each study roadway segment and project access point under Cumulative and Cumulative Plus Project conditions. By providing full access at the Fullerton Ranch Driveway / Nicolaus Road side-street stop controlled intersection, a lower number of project generated traffic would use Lakeside Drive South of Nicolaus Road and Celtic Drive / Abbeyhill Road west of the project site.

**Table 7 Two-Way Average Daily Traffic – Cumulative and Cumulative Plus Project Conditions**

| Roadway Segment | Average Daily Traffic | | |
|---|---|---|---|
| | Existing Conditions | Cumulative No Project Conditions | Cumulative Plus Project Conditions |
| Nicolaus Road west of Joiner Parkway | 8,700 | 27,100 | 27,305 |
| Nicolaus Road east of Nelson Lane | 7,300 | 24,400 | 24,740 |
| Lakeside south of Nicolaus Road | 1,000 | 1,100 | 1,120 |
| Celtic Drive / Abbeyhill Road west of Project Site | 400 | 450 | 470 |
| Fifth Street west of Joiner Parkway | 1,600 | 4,100 | 4,340 |
| Savannah Drive east of Project Site | 700 | 700 | 910 |
| Milan Way west of Savannah Drive south of the Project Site | 250 | 250 | 280 |

Source: Fehr & Peers 2017

## Impact 7: Cumulative Impacts to City of Lincoln Intersections

The project would not cause any of the study intersection to deteriorate to an unacceptable LOS. Therefore, the project's intersection impacts would be **less than significant**. As shown in Table 6, the addition of project generated traffic at all six study intersections would only result in a minor change in control delay. All intersections would operate at LOS C or better under cumulative plus project conditions during both AM and PM peak hour conditions.

Intersection impacts would be **less than significant**.

***Mitigation Measure***

No mitigation required.

## Impact 8: Cumulative Impacts to Pedestrian Facilities

The project would not create a demand for pedestrian travel above the capacity which is provided or planned. Therefore, the project's intersection impacts would be **less than significant** impact. The Project would provide extend the existing sidewalk on the south side of Nicolaus Road along the frontage of the proposed Fullerton Ranch Project. In addition, all the internal collector streets would also provide continuous sidewalks connecting the 81 single family residences to the Celtic Drive / Abbeyhill Road (to the west), Savannah Drive (to the east) and Milan Way (to the south).

Pedestrian Facilities impacts would be **less than significant**.

***Mitigation Measure***

No mitigation required.

## Impact 9: Cumulative Impacts to Bicycle Facilities

The project would not create inconsistencies with any adopted policies related to bicycle systems or any plan bicycle system improvements. This would be a **less-than-significant** impact

The *City of Lincoln Bikeway Master Plan* shows the following planned bicycle facilities in the project vicinity:

- Planned Class II bike lane on south side of Nicolaus Road between Waverly Drive and Joiner Parkway.
- Planned Class I multi-use trail on north side of Nicolaus Road between Waverly Drive and Nelson Lane.
- Planned Class I multi-use trail that would extend southerly from Nicolaus Road west of Waverly Drive, and then easterly along Markham Ravine, and then southerly parallel to Chambers Drive to beyond First Street.
- Planned Class III bike lane connecting Nicolaus Road, through the Glenmoor Subdivision via Abbeyhill Road, through the project site, to Savannah Drive.

Therefore, the project is in compliance with the planned bicycle system in the *City of Lincoln Bikeway Master Plan.* This would be a **less-than-significant with mitigation**.

***Mitigation Measures***

Construct the segment of the Class II bike lane along the project frontage on the south side of Nicolaus Road. And alternative is to dedicate the right-of-way and pay the Project's fair share towards the Class II bike lane on the south side of Nicolaus Road between Waverly Drive and Joiner Parkway. Construct the Class III bike lane connecting Nicolaus Road, through the Glenmoor Subdivision via Abbeyhill Road, through the project site, to Savannah Drive.

# APPENDIX A – EXISTING

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 95 | 382 | 4 | 32 | 308 | 67 | 12 | 29 | 58 | 164 | 18 | 122 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 174 | | 174 | 176 | | 176 | 0 | | 0 | 0 | | 174 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 0 | | 0 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | 0.921 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.994 | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1705 | 0 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.994 | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1705 | 0 | 1770 | 1863 | 1583 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1129 | | | 1030 | | | 428 | | | 612 | |
| Travel Time (s) | | 25.7 | | | 23.4 | | | 9.7 | | | 13.9 | |
| Peak Hour Factor | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 |
| Adj. Flow (vph) | 125 | 503 | 5 | 42 | 405 | 88 | 16 | 38 | 76 | 216 | 24 | 161 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 125 | 503 | 5 | 42 | 405 | 88 | 0 | 130 | 0 | 216 | 24 | 161 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Control Type: Unsignalized | |
| Intersection Delay 14.0 | Level of Service B |
| Analysis Period (min) 15 | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 604 | 0 | 0 | 407 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 0 | 150 | | 0 | 25 |
| Storage Lanes | | 0 | 0 | | 1 | 1 |
| Taper Length (ft) | | | 60 | | 60 | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 3539 | 0 | 0 | 3539 | 1863 | 1863 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 3539 | 0 | 0 | 3539 | 1863 | 1863 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 1030 | | | 2067 | 308 | |
| Travel Time (s) | 23.4 | | | 47.0 | 7.0 | |
| Peak Hour Factor | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 |
| Adj. Flow (vph) | 851 | 0 | 0 | 573 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 851 | 0 | 0 | 573 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 12 | 12 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Stop | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Control Type: Unsignalized | |
| IIntersection Delay 0.0 | Level of Service A |
| Analysis Period (min) 15 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 27 | 349 | 228 | 57 | 218 | 132 | 158 | 66 | 122 | 122 | 123 | 31 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 193 | | 193 | 0 | | 81 | 210 | | 210 | 151 | | 151 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 0.91 | 0.91 | 1.00 | 0.91 | 0.91 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.973 | | 0.950 | 0.987 | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3299 | 1583 | 1610 | 3346 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.973 | | 0.950 | 0.987 | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3299 | 1583 | 1610 | 3346 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 351 | | | 203 | | | 188 | | | 125 |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 35 | |
| Link Distance (ft) | | 2067 | | | 258 | | | 1053 | | | 928 | |
| Travel Time (s) | | 40.3 | | | 5.0 | | | 17.9 | | | 18.1 | |
| Peak Hour Factor | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 |
| Adj. Flow (vph) | 42 | 537 | 351 | 88 | 335 | 203 | 243 | 102 | 188 | 188 | 189 | 48 |
| Shared Lane Traffic (%) | | | | | | | 50% | | | 35% | | |
| Lane Group Flow (vph) | 42 | 537 | 351 | 88 | 335 | 203 | 121 | 224 | 188 | 122 | 255 | 48 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Split | NA | Perm | Split | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 9.0 | 26.0 | 26.0 | 9.0 | 26.0 | 26.0 | 28.0 | 28.0 | 28.0 | 26.0 | 26.0 | 26.0 |
| Total Split (s) | 15.0 | 30.0 | 30.0 | 15.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 |
| Total Split (%) | 14.3% | 28.6% | 28.6% | 14.3% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% |
| Maximum Green (s) | 10.0 | 25.0 | 25.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | None | Min | Min | Min | Min | Min | Min |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 16.0 | 16.0 | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 16.0 | 16.0 | 16.0 |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Act Effct Green (s) | 7.7 | 18.4 | 18.4 | 8.8 | 22.0 | 22.0 | 12.6 | 12.6 | 12.6 | 12.4 | 12.4 | 12.4 |
| Actuated g/C Ratio | 0.11 | 0.26 | 0.26 | 0.12 | 0.31 | 0.31 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| v/c Ratio | 0.22 | 0.58 | 0.52 | 0.40 | 0.30 | 0.32 | 0.42 | 0.38 | 0.43 | 0.43 | 0.43 | 0.13 |
| Control Delay | 38.4 | 27.7 | 6.5 | 40.6 | 22.5 | 5.9 | 34.2 | 30.2 | 8.5 | 35.3 | 31.4 | 0.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 38.4 | 27.7 | 6.5 | 40.6 | 22.5 | 5.9 | 34.2 | 30.2 | 8.5 | 35.3 | 31.4 | 0.7 |
| LOS | D | C | A | D | C | A | C | C | A | D | C | A |
| Approach Delay | | 20.2 | | | 19.7 | | | 23.4 | | | 29.0 | |
| Approach LOS | | C | | | B | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 105 | |
| Actuated Cycle Length: 70.4 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.58 | |
| Intersection Signal Delay: 22.3 | Intersection LOS: C |
| Intersection Capacity Utilization 38.7% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Joiner Parkway & Nicolaus Road

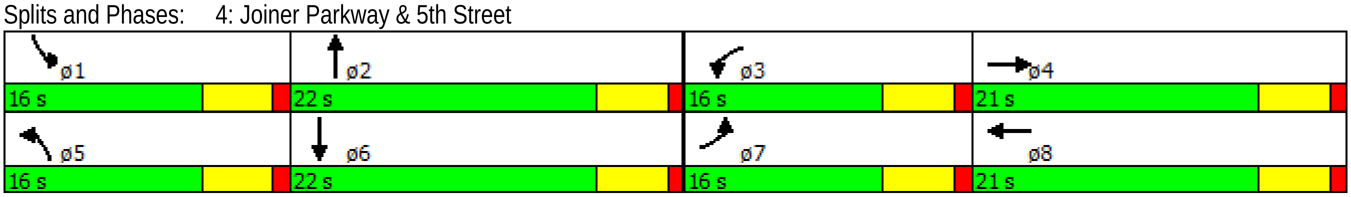
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 45 | 50 | 65 | 75 | 10 | 45 | 15 | 320 | 30 | 60 | 400 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 0 | 145 | | 0 | 150 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.916 | | | 0.878 | | | 0.987 | | | 0.993 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1706 | 0 | 1770 | 1635 | 0 | 1770 | 3493 | 0 | 1770 | 3514 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1706 | 0 | 1770 | 1635 | 0 | 1770 | 3493 | 0 | 1770 | 3514 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 68 | | | 47 | | | 12 | | | 6 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 634 | | | 550 | | | 966 | | | 2010 | |
| Travel Time (s) | | 12.4 | | | 10.7 | | | 16.5 | | | 34.3 | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 47 | 53 | 68 | 79 | 11 | 47 | 16 | 337 | 32 | 63 | 421 | 21 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 47 | 121 | 0 | 79 | 58 | 0 | 16 | 369 | 0 | 63 | 442 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | | | | | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 22.0 | | 16.0 | 22.0 | |
| Total Split (%) | 21.3% | 28.0% | | 21.3% | 28.0% | | 21.3% | 29.3% | | 21.3% | 29.3% | |
| Maximum Green (s) | 11.0 | 16.0 | | 11.0 | 16.0 | | 11.0 | 17.0 | | 11.0 | 17.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | | | 5 | | | 5 | | | 5 | |
| Act Effct Green (s) | 8.0 | 8.9 | | 8.7 | 11.6 | | 7.2 | 19.2 | | 8.4 | 24.0 | |
| Actuated g/C Ratio | 0.17 | 0.19 | | 0.18 | 0.24 | | 0.15 | 0.40 | | 0.18 | 0.50 | |
| v/c Ratio | 0.16 | 0.32 | | 0.24 | 0.13 | | 0.06 | 0.26 | | 0.20 | 0.25 | |
| Control Delay | 26.0 | 14.8 | | 25.4 | 10.3 | | 27.6 | 18.1 | | 25.5 | 12.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 26.0 | 14.8 | | 25.4 | 10.3 | | 27.6 | 18.1 | | 25.5 | 12.9 | |
| LOS | C | B | | C | B | | C | B | | C | B | |
| Approach Delay | | 17.9 | | | 19.0 | | | 18.5 | | | 14.5 | |
| Approach LOS | | B | | | B | | | B | | | B | |

**Intersection Summary**

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 47.6
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.32
Intersection Signal Delay: 16.2 Intersection LOS: B
Intersection Capacity Utilization 38.3% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Joiner Parkway & 5th Street

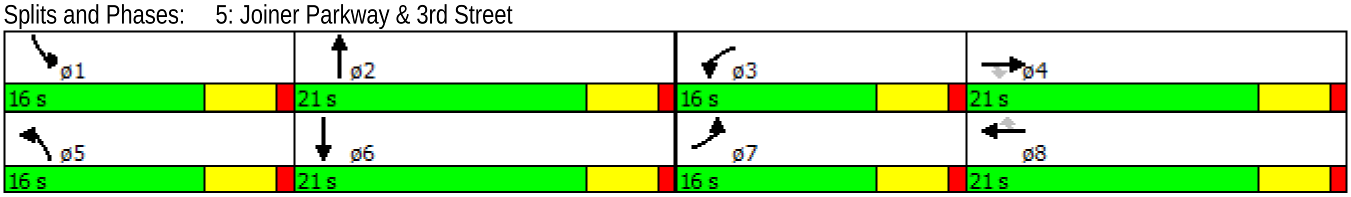


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 56 | 65 | 54 | 76 | 19 | 49 | 21 | 327 | 35 | 78 | 521 | 31 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 145 | 150 | | 150 | 140 | | 0 | 140 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | 0.986 | | | 0.992 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3490 | 0 | 1770 | 3511 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3490 | 0 | 1770 | 3511 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 177 | | | 177 | | 14 | | | 7 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 621 | | | 610 | | | 897 | | | 966 | |
| Travel Time (s) | | 12.1 | | | 11.9 | | | 15.3 | | | 16.5 | |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Adj. Flow (vph) | 71 | 82 | 68 | 96 | 24 | 62 | 27 | 414 | 44 | 99 | 659 | 39 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 71 | 82 | 68 | 96 | 24 | 62 | 27 | 458 | 0 | 99 | 698 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (%) | 21.6% | 28.4% | 28.4% | 21.6% | 28.4% | 28.4% | 21.6% | 28.4% | | 21.6% | 28.4% | |
| Maximum Green (s) | 11.0 | 16.0 | 16.0 | 11.0 | 16.0 | 16.0 | 11.0 | 16.0 | | 11.0 | 16.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 8.2 | 9.1 | 9.1 | 8.8 | 12.1 | 12.1 | 7.1 | 21.0 | | 8.8 | 27.2 | |
| Actuated g/C Ratio | 0.15 | 0.16 | 0.16 | 0.16 | 0.22 | 0.22 | 0.13 | 0.38 | | 0.16 | 0.49 | |
| v/c Ratio | 0.27 | 0.27 | 0.17 | 0.35 | 0.06 | 0.13 | 0.12 | 0.35 | | 0.35 | 0.41 | |
| Control Delay | 28.7 | 26.3 | 0.9 | 29.3 | 23.2 | 0.6 | 28.9 | 21.0 | | 29.3 | 17.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 28.7 | 26.3 | 0.9 | 29.3 | 23.2 | 0.6 | 28.9 | 21.0 | | 29.3 | 17.5 | |
| LOS | C | C | A | C | C | A | C | C | | C | B | |
| Approach Delay | | 19.2 | | | 18.7 | | | 21.4 | | | 19.0 | |
| Approach LOS | | B | | | B | | | C | | | B | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 74 | |
| Actuated Cycle Length: 55.7 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.41 | |
| Intersection Signal Delay: 17.5 | Intersection LOS: B |
| Intersection Capacity Utilization 42.1% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Joiner Parkway & 3rd Street

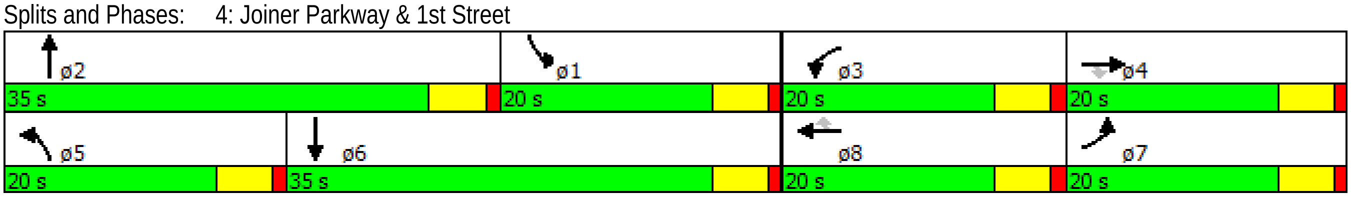


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 69 | 63 | 232 | 148 | 113 | 36 | 128 | 321 | 99 | 42 | 428 | 125 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 124 | | 124 | 129 | | 129 | 111 | | 0 | 169 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | 0.965 | | | 0.966 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3415 | 0 | 1770 | 3419 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3415 | 0 | 1770 | 3419 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 297 | | | 195 | | 45 | | | 42 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1101 | | | 816 | | | 875 | | | 912 | |
| Travel Time (s) | | 25.0 | | | 18.5 | | | 19.9 | | | 20.7 | |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Adj. Flow (vph) | 88 | 81 | 297 | 190 | 145 | 46 | 164 | 412 | 127 | 54 | 549 | 160 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 88 | 81 | 297 | 190 | 145 | 46 | 164 | 539 | 0 | 54 | 709 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 9.0 | 20.0 | 20.0 | 9.0 | 20.0 | 20.0 | 9.0 | 31.0 | | 9.0 | 31.0 | |
| Total Split (s) | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 35.0 | | 20.0 | 35.0 | |
| Total Split (%) | 21.1% | 21.1% | 21.1% | 21.1% | 21.1% | 21.1% | 21.1% | 36.8% | | 21.1% | 36.8% | |
| Maximum Green (s) | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 30.0 | | 15.0 | 30.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lead | Lead | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 10.0 | 10.0 | | 10.0 | 10.0 | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 10.5 | 9.3 | 9.3 | 12.7 | 11.1 | 11.1 | 11.9 | 26.2 | | 13.1 | 21.8 | |
| Actuated g/C Ratio | 0.14 | 0.12 | 0.12 | 0.17 | 0.15 | 0.15 | 0.16 | 0.34 | | 0.17 | 0.28 | |
| v/c Ratio | 0.36 | 0.36 | 0.66 | 0.65 | 0.54 | 0.12 | 0.59 | 0.45 | | 0.18 | 0.71 | |
| Control Delay | 37.8 | 38.7 | 12.2 | 44.1 | 41.0 | 0.6 | 42.4 | 23.3 | | 29.9 | 28.0 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 37.8 | 38.7 | 12.2 | 44.1 | 41.0 | 0.6 | 42.4 | 23.3 | | 29.9 | 28.0 | |
| LOS | D | D | B | D | D | A | D | C | | C | C | |
| Approach Delay | | 21.6 | | | 37.6 | | | 27.7 | | | 28.1 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 95 | |
| Actuated Cycle Length: 76.5 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.71 Intersection | |
| Signal Delay: 28.7 | Intersection LOS: C |
| Intersection Capacity Utilization 50.9% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Joiner Parkway & 1st Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 97 | 389 | 22 | 51 | 422 | 105 | 11 | 10 | 33 | 79 | 11 | 66 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 174 | | 174 | 176 | | 176 | 0 | | 0 | 0 | | 174 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 0 | | 0 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | 0.919 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.990 | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1695 | 0 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.990 | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1695 | 0 | 1770 | 1863 | 1583 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1129 | | | 1030 | | | 428 | | | 612 | |
| Travel Time (s) | | 25.7 | | | 23.4 | | | 9.7 | | | 13.9 | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 104 | 418 | 24 | 55 | 454 | 113 | 12 | 11 | 35 | 85 | 12 | 71 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 104 | 418 | 24 | 55 | 454 | 113 | 0 | 58 | 0 | 85 | 12 | 71 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Control Type: Unsignalized | |
| Intersection Delay 10.8 | Level of Service B |
| Analysis Period (min) 15 | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 501 | 0 | 0 | 578 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 0 | 150 | | 0 | 25 |
| Storage Lanes | | 0 | 0 | | 1 | 1 |
| Taper Length (ft) | | | 60 | | 60 | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 3539 | 0 | 0 | 3539 | 1863 | 1863 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 3539 | 0 | 0 | 3539 | 1863 | 1863 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 1030 | | | 2067 | 308 | |
| Travel Time (s) | 23.4 | | | 47.0 | 7.0 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 545 | 0 | 0 | 628 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 545 | 0 | 0 | 628 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 12 | 12 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Stop | |

| Intersection Summary | | |
|---|---|---|
| Area Type: | Other | |
| Control Type: Unsignalized | | |
| Intersection Delay 0.0 | | ILevel of Service A |
| Analysis Period (min) 15 | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 14 | 221 | 266 | 34 | 278 | 80 | 286 | 119 | 47 | 47 | 84 | 14 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 193 | | 193 | 0 | | 81 | 210 | | 210 | 151 | | 151 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 0.91 | 0.91 | 1.00 | 0.91 | 0.91 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.973 | | 0.950 | 0.997 | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3299 | 1583 | 1610 | 3380 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.973 | | 0.950 | 0.997 | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3299 | 1583 | 1610 | 3380 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 289 | | | 125 | | | 125 | | | 125 |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 35 | |
| Link Distance (ft) | | 2067 | | | 258 | | | 1053 | | | 928 | |
| Travel Time (s) | | 40.3 | | | 5.0 | | | 17.9 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 15 | 240 | 289 | 37 | 302 | 87 | 311 | 129 | 51 | 51 | 91 | 15 |
| Shared Lane Traffic (%) | | | | | | | 50% | | | 10% | | |
| Lane Group Flow (vph) | 15 | 240 | 289 | 37 | 302 | 87 | 155 | 285 | 51 | 46 | 96 | 15 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Split | NA | Perm | Split | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 9.0 | 26.0 | 26.0 | 9.0 | 26.0 | 26.0 | 28.0 | 28.0 | 28.0 | 26.0 | 26.0 | 26.0 |
| Total Split (s) | 15.0 | 30.0 | 30.0 | 15.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 |
| Total Split (%) | 14.3% | 28.6% | 28.6% | 14.3% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% |
| Maximum Green (s) | 10.0 | 25.0 | 25.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | None | Min | Min | Min | Min | Min | Min |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 16.0 | 16.0 | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 16.0 | 16.0 | 16.0 |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Act Effct Green (s) | 6.8 | 11.6 | 11.6 | 7.6 | 14.1 | 14.1 | 12.4 | 12.4 | 12.4 | 9.2 | 9.2 | 9.2 |
| Actuated g/C Ratio | 0.13 | 0.21 | 0.21 | 0.14 | 0.26 | 0.26 | 0.23 | 0.23 | 0.23 | 0.17 | 0.17 | 0.17 |
| v/c Ratio | 0.07 | 0.32 | 0.51 | 0.15 | 0.33 | 0.17 | 0.42 | 0.38 | 0.11 | 0.17 | 0.17 | 0.04 |
| Control Delay | 32.1 | 22.5 | 7.5 | 30.5 | 19.3 | 3.2 | 25.7 | 21.9 | 0.5 | 25.9 | 24.0 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 32.1 | 22.5 | 7.5 | 30.5 | 19.3 | 3.2 | 25.7 | 21.9 | 0.5 | 25.9 | 24.0 | 0.2 |
| LOS | C | C | A | C | B | A | C | C | A | C | C | A |
| Approach Delay | | 14.8 | | | 17.0 | | | 20.9 | | | 22.3 | |
| Approach LOS | | B | | | B | | | C | | | C | |

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 54.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 18.0 Intersection LOS: B
Intersection Capacity Utilization 38.1% ICU Level of Service A
Analysis Period (min) 15

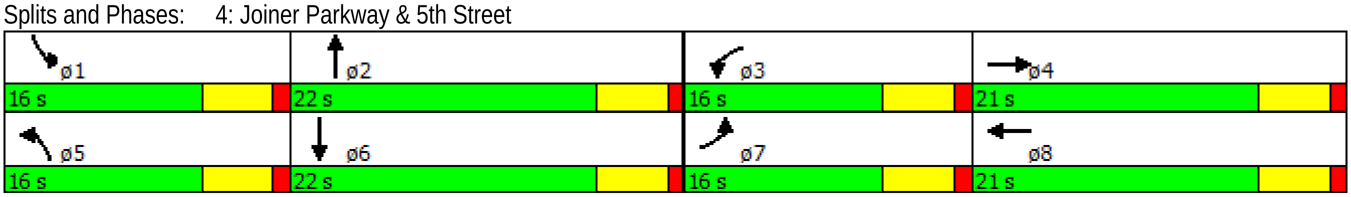
Splits and Phases: 3: Joiner Parkway & Nicolaus Road

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 15 | 17 | 24 | 45 | 22 | 48 | 55 | 425 | 90 | 25 | 300 | 40 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | | | 0.99 | | | 0.99 | | | 1.00 | |
| Frt | | 0.913 | | | 0.897 | | | 0.974 | | | 0.982 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1682 | 0 | 1770 | 1649 | 0 | 1770 | 3428 | 0 | 1770 | 3463 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1682 | 0 | 1770 | 1649 | 0 | 1770 | 3428 | 0 | 1770 | 3463 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 25 | | | 51 | | | 31 | | | 18 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 645 | | | 664 | | | 951 | | | 2020 | |
| Travel Time (s) | | 12.6 | | | 12.9 | | | 16.2 | | | 34.4 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 16 | 18 | 25 | 47 | 23 | 51 | 58 | 447 | 95 | 26 | 316 | 42 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 16 | 43 | 0 | 47 | 74 | 0 | 58 | 542 | 0 | 26 | 358 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | | | | | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Initial (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 22.0 | | 16.0 | 22.0 | |
| Total Split (%) | 21.3% | 28.0% | | 21.3% | 28.0% | | 21.3% | 29.3% | | 21.3% | 29.3% | |
| Maximum Green (s) | 11.0 | 16.0 | | 11.0 | 16.0 | | 11.0 | 17.0 | | 11.0 | 17.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | | | 5 | | | 5 | | | 5 | |
| Act Effct Green (s) | 6.8 | 8.0 | | 7.6 | 10.3 | | 7.9 | 28.8 | | 7.1 | 23.7 | |
| Actuated g/C Ratio | 0.16 | 0.18 | | 0.17 | 0.24 | | 0.18 | 0.66 | | 0.16 | 0.54 | |
| v/c Ratio | 0.06 | 0.13 | | 0.15 | 0.17 | | 0.18 | 0.24 | | 0.09 | 0.19 | |
| Control Delay | 25.0 | 14.1 | | 23.3 | 9.5 | | 22.9 | 10.3 | | 24.5 | 14.8 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 25.0 | 14.1 | | 23.3 | 9.5 | | 22.9 | 10.3 | | 24.5 | 14.8 | |
| LOS | C | B | | C | A | | C | B | | C | B | |
| Approach Delay | | 17.0 | | | 14.9 | | | 11.6 | | | 15.4 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 75 | |
| Actuated Cycle Length: 43.8 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.24 | |
| Intersection Signal Delay: 14.2 | Intersection LOS: B |
| Intersection Capacity Utilization 40.3% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Joiner Parkway & 5th Street

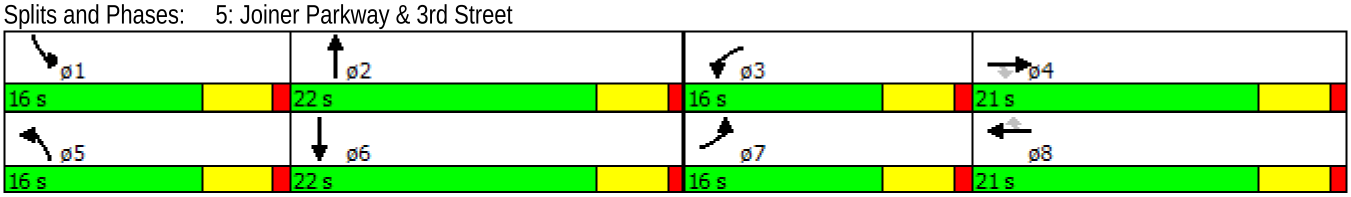


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 21 | 24 | 28 | 53 | 29 | 50 | 46 | 545 | 74 | 27 | 351 | 35 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | 0.98 | | | 0.98 | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | | 0.850 | | 0.982 | | | 0.986 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3462 | 0 | 1770 | 3480 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1553 | 1770 | 1863 | 1553 | 1770 | 3462 | 0 | 1770 | 3480 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 175 | | | 175 | | 18 | | | 13 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 826 | | | 796 | | | 901 | | | 951 | |
| Travel Time (s) | | 16.1 | | | 15.5 | | | 15.4 | | | 16.2 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 22 | 26 | 30 | 56 | 31 | 53 | 49 | 580 | 79 | 29 | 373 | 37 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 22 | 26 | 30 | 56 | 31 | 53 | 49 | 659 | 0 | 29 | 410 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 22.0 | | 16.0 | 22.0 | |
| Total Split (%) | 21.3% | 28.0% | 28.0% | 21.3% | 28.0% | 28.0% | 21.3% | 29.3% | | 21.3% | 29.3% | |
| Maximum Green (s) | 11.0 | 16.0 | 16.0 | 11.0 | 16.0 | 16.0 | 11.0 | 17.0 | | 11.0 | 17.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 7.0 | 8.1 | 8.1 | 7.9 | 13.1 | 13.1 | 7.7 | 26.5 | | 7.2 | 26.2 | |
| Actuated g/C Ratio | 0.15 | 0.18 | 0.18 | 0.17 | 0.28 | 0.28 | 0.17 | 0.57 | | 0.16 | 0.57 | |
| v/c Ratio | 0.08 | 0.08 | 0.07 | 0.18 | 0.06 | 0.09 | 0.17 | 0.33 | | 0.11 | 0.21 | |
| Control Delay | 26.1 | 22.4 | 0.3 | 24.5 | 16.2 | 0.3 | 24.7 | 14.8 | | 25.7 | 14.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 26.1 | 22.4 | 0.3 | 24.5 | 16.2 | 0.3 | 24.7 | 14.8 | | 25.7 | 14.4 | |
| LOS | C | C | A | C | B | A | C | B | | C | B | |
| Approach Delay | | 15.0 | | | 13.5 | | | 15.4 | | | 15.1 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 75 | |
| Actuated Cycle Length: 46.1 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.33 | |
| Intersection Signal Delay: 14.9 | Intersection LOS: B |
| Intersection Capacity Utilization 43.5% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Joiner Parkway & 3rd Street

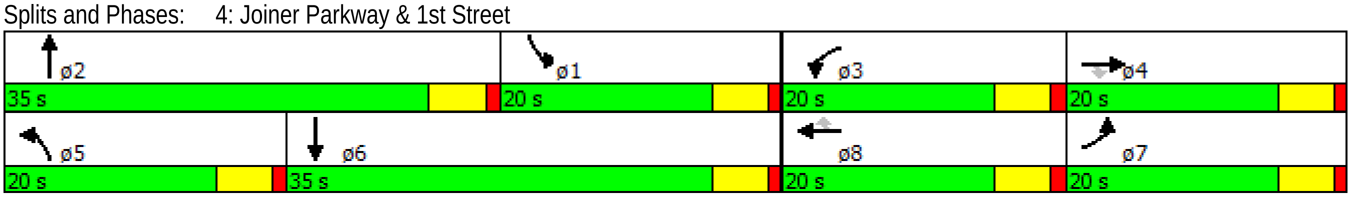


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 34 | 26 | 90 | 107 | 42 | 51 | 131 | 595 | 96 | 45 | 370 | 37 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 124 | | 124 | 129 | | 129 | 111 | | 0 | 169 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | 0.979 | | | 0.986 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3465 | 0 | 1770 | 3490 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3465 | 0 | 1770 | 3490 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 195 | | | 195 | | 20 | | | 12 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1101 | | | 816 | | | 875 | | | 912 | |
| Travel Time (s) | | 25.0 | | | 18.5 | | | 19.9 | | | 20.7 | |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Adj. Flow (vph) | 35 | 27 | 94 | 111 | 44 | 53 | 136 | 620 | 100 | 47 | 385 | 39 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 35 | 27 | 94 | 111 | 44 | 53 | 136 | 720 | 0 | 47 | 424 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 9.0 | 20.0 | 20.0 | 9.0 | 20.0 | 20.0 | 9.0 | 31.0 | | 9.0 | 31.0 | |
| Total Split (s) | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 35.0 | | 20.0 | 35.0 | |
| Total Split (%) | 21.1% | 21.1% | 21.1% | 21.1% | 21.1% | 21.1% | 21.1% | 36.8% | | 21.1% | 36.8% | |
| Maximum Green (s) | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 30.0 | | 15.0 | 30.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lead | Lead | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 10.0 | 10.0 | | 10.0 | 10.0 | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 8.9 | 8.2 | 8.2 | 10.3 | 11.3 | 11.3 | 11.0 | 29.7 | | 8.1 | 24.7 | |
| Actuated g/C Ratio | 0.15 | 0.13 | 0.13 | 0.17 | 0.19 | 0.19 | 0.18 | 0.49 | | 0.13 | 0.40 | |
| v/c Ratio | 0.14 | 0.11 | 0.25 | 0.37 | 0.13 | 0.12 | 0.43 | 0.42 | | 0.20 | 0.30 | |
| Control Delay | 30.1 | 31.0 | 1.5 | 32.3 | 28.2 | 0.5 | 32.7 | 18.1 | | 33.0 | 20.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 30.1 | 31.0 | 1.5 | 32.3 | 28.2 | 0.5 | 32.7 | 18.1 | | 33.0 | 20.6 | |
| LOS | C | C | A | C | C | A | C | B | | C | C | |
| Approach Delay | | 13.0 | | | 23.3 | | | 20.4 | | | 21.8 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 95 | |
| Actuated Cycle Length: 61 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.43 | |
| Intersection Signal Delay: 20.5 | Intersection LOS: C |
| Intersection Capacity Utilization 47.9% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Joiner Parkway & 1st Street



# APPENDIX B – EXISTING PLUS PROJECT

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 95 | 385 | 4 | 32 | 320 | 68 | 12 | 29 | 58 | 165 | 18 | 122 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 174 | | 174 | 176 | | 176 | 0 | | 0 | 0 | | 174 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 0 | | 0 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | 0.921 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.994 | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1705 | 0 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.994 | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1705 | 0 | 1770 | 1863 | 1583 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1129 | | | 1030 | | | 428 | | | 612 | |
| Travel Time (s) | | 25.7 | | | 23.4 | | | 9.7 | | | 13.9 | |
| Peak Hour Factor | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 |
| Adj. Flow (vph) | 125 | 507 | 5 | 42 | 421 | 89 | 16 | 38 | 76 | 217 | 24 | 161 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 125 | 507 | 5 | 42 | 421 | 89 | 0 | 130 | 0 | 217 | 24 | 161 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Control Type: Unsignalized | |
| Intersection Delay 16.5 | Level of Service B |
| Analysis Period (min) 15 | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 604 | 4 | 6 | 407 | 13 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 0 | 150 | | 0 | 25 |
| Storage Lanes | | 0 | 1 | | 1 | 1 |
| Taper Length (ft) | | | 60 | | 60 | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | 0.999 | | | | | 0.850 |
| Flt Protected | | | 0.950 | | 0.950 | |
| Satd. Flow (prot) | 3536 | 0 | 1770 | 3539 | 1770 | 1583 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3536 | 0 | 1770 | 3539 | 1770 | 1583 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 1030 | | | 2067 | 308 | |
| Travel Time (s) | 23.4 | | | 47.0 | 7.0 | |
| Peak Hour Factor | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 |
| Adj. Flow (vph) | 851 | 6 | 8 | 573 | 18 | 28 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 857 | 0 | 8 | 573 | 18 | 28 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 12 | 12 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Stop | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Control Type: Unsignalized | |
| Intersection Delay 0.1 | Level of Service A |
| Analysis Period (min) 15 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 28 | 355 | 241 | 57 | 220 | 132 | 161 | 66 | 122 | 122 | 123 | 32 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 193 | | 193 | 0 | | 81 | 210 | | 210 | 151 | | 151 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 0.91 | 0.91 | 1.00 | 0.91 | 0.91 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.973 | | 0.950 | 0.987 | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3299 | 1583 | 1610 | 3346 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.973 | | 0.950 | 0.987 | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3299 | 1583 | 1610 | 3346 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 371 | | | 203 | | | 188 | | | 125 |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 35 | |
| Link Distance (ft) | | 2067 | | | 258 | | | 1053 | | | 928 | |
| Travel Time (s) | | 40.3 | | | 5.0 | | | 17.9 | | | 18.1 | |
| Peak Hour Factor | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 |
| Adj. Flow (vph) | 43 | 546 | 371 | 88 | 338 | 203 | 248 | 102 | 188 | 188 | 189 | 49 |
| Shared Lane Traffic (%) | | | | | | | 50% | | | 35% | | |
| Lane Group Flow (vph) | 43 | 546 | 371 | 88 | 338 | 203 | 124 | 226 | 188 | 122 | 255 | 49 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Split | NA | Perm | Split | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 9.0 | 26.0 | 26.0 | 9.0 | 26.0 | 26.0 | 28.0 | 28.0 | 28.0 | 26.0 | 26.0 | 26.0 |
| Total Split (s) | 15.0 | 30.0 | 30.0 | 15.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 |
| Total Split (%) | 14.3% | 28.6% | 28.6% | 14.3% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% |
| Maximum Green (s) | 10.0 | 25.0 | 25.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | None | Min | Min | Min | Min | Min | Min |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 16.0 | 16.0 | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 16.0 | 16.0 | 16.0 |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Act Effct Green (s) | 7.7 | 18.6 | 18.6 | 8.8 | 22.1 | 22.1 | 12.7 | 12.7 | 12.7 | 12.4 | 12.4 | 12.4 |
| Actuated g/C Ratio | 0.11 | 0.26 | 0.26 | 0.12 | 0.31 | 0.31 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| v/c Ratio | 0.22 | 0.59 | 0.54 | 0.40 | 0.31 | 0.32 | 0.43 | 0.38 | 0.43 | 0.43 | 0.43 | 0.13 |
| Control Delay | 38.6 | 27.9 | 6.5 | 40.7 | 22.6 | 5.9 | 34.5 | 30.3 | 8.4 | 35.4 | 31.5 | 0.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 38.6 | 27.9 | 6.5 | 40.7 | 22.6 | 5.9 | 34.5 | 30.3 | 8.4 | 35.4 | 31.5 | 0.7 |
| LOS | D | C | A | D | C | A | C | C | A | D | C | A |
| Approach Delay | | 20.1 | | | 19.8 | | | 23.6 | | | 29.1 | |
| Approach LOS | | C | | | B | | | C | | | C | |

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 70.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 23.6 Intersection LOS: C
Intersection Capacity Utilization 38.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: Joiner Parkway & Nicolaus Road

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 45 | 50 | 79 | 75 | 10 | 45 | 18 | 323 | 30 | 60 | 413 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 0 | 145 | | 0 | 150 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.908 | | | 0.878 | | | 0.987 | | | 0.993 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1691 | 0 | 1770 | 1635 | 0 | 1770 | 3493 | 0 | 1770 | 3514 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1691 | 0 | 1770 | 1635 | 0 | 1770 | 3493 | 0 | 1770 | 3514 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 84 | | | 47 | | | 12 | | | 6 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 648 | | | 664 | | | 951 | | | 2019 | |
| Travel Time (s) | | 12.6 | | | 12.9 | | | 16.2 | | | 34.4 | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 47 | 53 | 84 | 79 | 11 | 47 | 19 | 340 | 32 | 63 | 435 | 21 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 47 | 137 | 0 | 79 | 58 | 0 | 19 | 372 | 0 | 63 | 456 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | | | | | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 22.0 | | 16.0 | 22.0 | |
| Total Split (%) | 21.3% | 28.0% | | 21.3% | 28.0% | | 21.3% | 29.3% | | 21.3% | 29.3% | |
| Maximum Green (s) | 11.0 | 16.0 | | 11.0 | 16.0 | | 11.0 | 17.0 | | 11.0 | 17.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | | | 5 | | | 5 | | | 5 | |
| Act Effct Green (s) | 8.0 | 9.0 | | 8.7 | 11.6 | | 7.2 | 19.1 | | 8.4 | 23.9 | |
| Actuated g/C Ratio | 0.17 | 0.19 | | 0.18 | 0.24 | | 0.15 | 0.40 | | 0.18 | 0.50 | |
| v/c Ratio | 0.16 | 0.35 | | 0.24 | 0.13 | | 0.07 | 0.26 | | 0.20 | 0.26 | |
| Control Delay | 26.0 | 14.1 | | 25.5 | 10.3 | | 27.6 | 18.1 | | 25.5 | 13.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 26.0 | 14.1 | | 25.5 | 10.3 | | 27.6 | 18.1 | | 25.5 | 13.0 | |
| LOS | C | B | | C | B | | C | B | | C | B | |
| Approach Delay | | 17.1 | | | 19.1 | | | 18.6 | | | 14.6 | |
| Approach LOS | | B | | | B | | | B | | | B | |

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 47.6

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

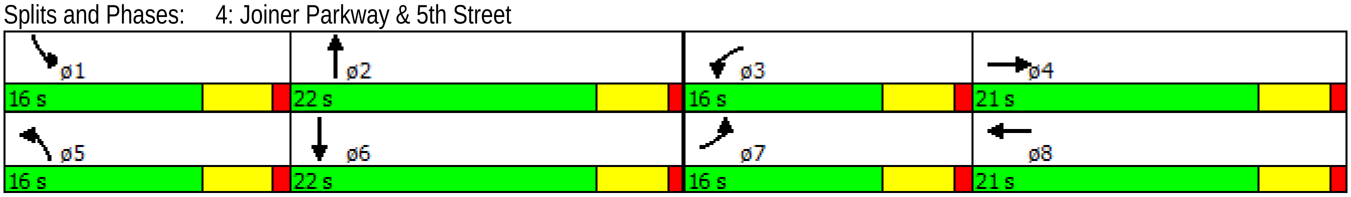
Maximum v/c Ratio: 0.35

Intersection Signal Delay: 16.4 Intersection LOS: B

Intersection Capacity Utilization 43.7% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 4: Joiner Parkway & 5th Street

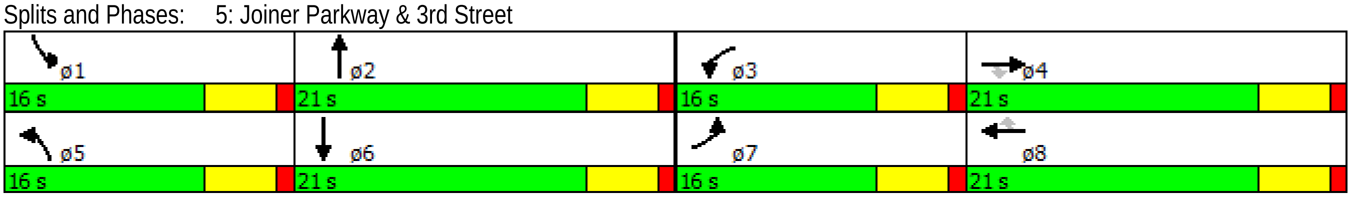


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 56 | 65 | 54 | 76 | 19 | 45 | 21 | 337 | 35 | 78 | 548 | 31 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 145 | 150 | | 150 | 140 | | 0 | 140 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | 0.98 | | | 0.98 | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | | 0.850 | | 0.986 | | | 0.992 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3479 | 0 | 1770 | 3505 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1554 | 1770 | 1863 | 1554 | 1770 | 3479 | 0 | 1770 | 3505 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 177 | | | 177 | | 13 | | | 7 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 826 | | | 796 | | | 901 | | | 951 | |
| Travel Time (s) | | 16.1 | | | 15.5 | | | 15.4 | | | 16.2 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Adj. Flow (vph) | 71 | 82 | 68 | 96 | 24 | 57 | 27 | 427 | 44 | 99 | 695 | 39 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 71 | 82 | 68 | 96 | 24 | 57 | 27 | 471 | 0 | 99 | 734 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (%) | 21.6% | 28.4% | 28.4% | 21.6% | 28.4% | 28.4% | 21.6% | 28.4% | | 21.6% | 28.4% | |
| Maximum Green (s) | 11.0 | 16.0 | 16.0 | 11.0 | 16.0 | 16.0 | 11.0 | 16.0 | | 11.0 | 16.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 8.1 | 9.1 | 9.1 | 8.7 | 12.1 | 12.1 | 7.0 | 21.2 | | 8.8 | 27.4 | |
| Actuated g/C Ratio | 0.14 | 0.16 | 0.16 | 0.16 | 0.22 | 0.22 | 0.12 | 0.38 | | 0.16 | 0.49 | |
| v/c Ratio | 0.28 | 0.27 | 0.17 | 0.35 | 0.06 | 0.12 | 0.12 | 0.36 | | 0.36 | 0.43 | |
| Control Delay | 28.8 | 26.4 | 0.9 | 29.4 | 23.3 | 0.5 | 29.0 | 21.1 | | 29.5 | 18.0 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 28.8 | 26.4 | 0.9 | 29.4 | 23.3 | 0.5 | 29.0 | 21.1 | | 29.5 | 18.0 | |
| LOS | C | C | A | C | C | A | C | C | | C | B | |
| Approach Delay | | 19.3 | | | 19.3 | | | 21.5 | | | 19.4 | |
| Approach LOS | | B | | | B | | | C | | | B | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 74 | |
| Actuated Cycle Length: 56.1 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.43 | |
| Intersection Signal Delay: 17.7 | Intersection LOS: B |
| Intersection Capacity Utilization 43.3% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Joiner Parkway & 3rd Street

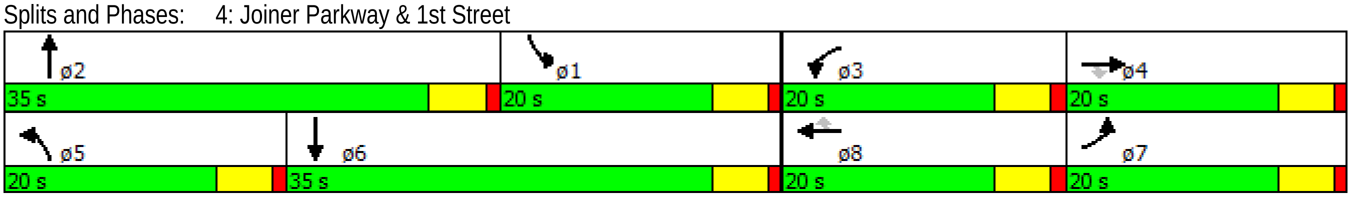


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 70 | 63 | 232 | 148 | 113 | 37 | 128 | 329 | 99 | 43 | 453 | 126 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 124 | | 124 | 129 | | 129 | 111 | | 0 | 169 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | 0.965 | | | 0.967 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3415 | 0 | 1770 | 3422 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3415 | 0 | 1770 | 3422 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 297 | | | 195 | | 43 | | | 39 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1101 | | | 816 | | | 875 | | | 912 | |
| Travel Time (s) | | 25.0 | | | 18.5 | | | 19.9 | | | 20.7 | |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Adj. Flow (vph) | 90 | 81 | 297 | 190 | 145 | 47 | 164 | 422 | 127 | 55 | 582 | 162 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 90 | 81 | 297 | 190 | 145 | 47 | 164 | 549 | 0 | 55 | 744 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 9.0 | 20.0 | 20.0 | 9.0 | 20.0 | 20.0 | 9.0 | 31.0 | | 9.0 | 31.0 | |
| Total Split (s) | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 35.0 | | 20.0 | 35.0 | |
| Total Split (%) | 21.1% | 21.1% | 21.1% | 21.1% | 21.1% | 21.1% | 21.1% | 36.8% | | 21.1% | 36.8% | |
| Maximum Green (s) | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 30.0 | | 15.0 | 30.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lead | Lead | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 10.0 | 10.0 | | 10.0 | 10.0 | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 10.5 | 9.3 | 9.3 | 12.8 | 11.2 | 11.2 | 12.0 | 26.9 | | 13.3 | 22.8 | |
| Actuated g/C Ratio | 0.14 | 0.12 | 0.12 | 0.16 | 0.14 | 0.14 | 0.15 | 0.35 | | 0.17 | 0.29 | |
| v/c Ratio | 0.38 | 0.36 | 0.66 | 0.65 | 0.54 | 0.12 | 0.60 | 0.45 | | 0.18 | 0.72 | |
| Control Delay | 38.5 | 39.3 | 12.3 | 44.8 | 41.6 | 0.6 | 43.1 | 23.6 | | 30.1 | 28.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 38.5 | 39.3 | 12.3 | 44.8 | 41.6 | 0.6 | 43.1 | 23.6 | | 30.1 | 28.4 | |
| LOS | D | D | B | D | D | A | D | C | | C | C | |
| Approach Delay | | 22.0 | | | 38.1 | | | 28.1 | | | 28.6 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 95 | |
| Actuated Cycle Length: 77.6 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.72 Intersection | |
| Signal Delay: 28.9 | Intersection LOS: C |
| Intersection Capacity Utilization | ICU Level of Service A |
| 51.6%Analysis Period (min) 15 | |

Splits and Phases: 4: Joiner Parkway & 1st Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 97 | 401 | 22 | 51 | 429 | 106 | 11 | 10 | 33 | 80 | 11 | 66 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 174 | | 174 | 176 | | 176 | 0 | | 0 | 0 | | 174 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 0 | | 0 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | 0.919 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.990 | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1695 | 0 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.990 | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1695 | 0 | 1770 | 1863 | 1583 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1129 | | | 1030 | | | 428 | | | 612 | |
| Travel Time (s) | | 25.7 | | | 23.4 | | | 9.7 | | | 13.9 | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 104 | 431 | 24 | 55 | 461 | 114 | 12 | 11 | 35 | 86 | 12 | 71 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 104 | 431 | 24 | 55 | 461 | 114 | 0 | 58 | 0 | 86 | 12 | 71 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |

| Intersection Summary | | |
|---|---|---|
| Area Type: | Other | |
| Control Type: Unsignalized | | |
| Intersection Delay 13.4 | | ILevel of Service B |
| Analysis Period (min) 15 | | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 501 | 13 | 23 | 578 | 8 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 0 | 150 | | 0 | 25 |
| Storage Lanes | | 0 | 1 | | 1 | 1 |
| Taper Length (ft) | | | 60 | | 60 | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | 0.996 | | | | | 0.850 |
| Flt Protected | | | 0.950 | | 0.950 | |
| Satd. Flow (prot) | 3525 | 0 | 1770 | 3539 | 1770 | 1583 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3525 | 0 | 1770 | 3539 | 1770 | 1583 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 1030 | | | 2067 | 308 | |
| Travel Time (s) | 23.4 | | | 47.0 | 7.0 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 545 | 14 | 25 | 628 | 9 | 14 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 559 | 0 | 25 | 628 | 9 | 14 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 12 | 12 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Stop | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Control Type: Unsignalized | |
| Intersection Delay 0.4 | Level of Service A |
| Analysis Period (min) 15 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 15 | 225 | 274 | 34 | 285 | 80 | 301 | 119 | 47 | 47 | 84 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 193 | | 193 | 0 | | 81 | 210 | | 210 | 151 | | 151 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 0.91 | 0.91 | 1.00 | 0.91 | 0.91 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.973 | | 0.950 | 0.997 | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3299 | 1583 | 1610 | 3380 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.973 | | 0.950 | 0.997 | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3299 | 1583 | 1610 | 3380 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 298 | | | 125 | | | 125 | | | 125 |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 35 | |
| Link Distance (ft) | | 2067 | | | 258 | | | 1053 | | | 928 | |
| Travel Time (s) | | 40.3 | | | 5.0 | | | 17.9 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 16 | 245 | 298 | 37 | 310 | 87 | 327 | 129 | 51 | 51 | 91 | 16 |
| Shared Lane Traffic (%) | | | | | | | 50% | | | 10% | | |
| Lane Group Flow (vph) | 16 | 245 | 298 | 37 | 310 | 87 | 163 | 293 | 51 | 46 | 96 | 16 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Split | NA | Perm | Split | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 9.0 | 26.0 | 26.0 | 9.0 | 26.0 | 26.0 | 28.0 | 28.0 | 28.0 | 26.0 | 26.0 | 26.0 |
| Total Split (s) | 15.0 | 30.0 | 30.0 | 15.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 |
| Total Split (%) | 14.3% | 28.6% | 28.6% | 14.3% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% |
| Maximum Green (s) | 10.0 | 25.0 | 25.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | None | Min | Min | Min | Min | Min | Min |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 16.0 | 16.0 | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 16.0 | 16.0 | 16.0 |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Act Effct Green (s) | 6.8 | 11.7 | 11.7 | 7.5 | 14.2 | 14.2 | 12.6 | 12.6 | 12.6 | 9.2 | 9.2 | 9.2 |
| Actuated g/C Ratio | 0.12 | 0.21 | 0.21 | 0.14 | 0.26 | 0.26 | 0.23 | 0.23 | 0.23 | 0.17 | 0.17 | 0.17 |
| v/c Ratio | 0.07 | 0.32 | 0.52 | 0.15 | 0.34 | 0.17 | 0.44 | 0.38 | 0.11 | 0.17 | 0.17 | 0.04 |
| Control Delay | 32.2 | 22.6 | 7.5 | 30.7 | 19.5 | 3.2 | 25.9 | 21.9 | 0.5 | 26.1 | 24.2 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 32.2 | 22.6 | 7.5 | 30.7 | 19.5 | 3.2 | 25.9 | 21.9 | 0.5 | 26.1 | 24.2 | 0.2 |
| LOS | C | C | A | C | B | A | C | C | A | C | C | A |
| Approach Delay | | 14.9 | | | 17.2 | | | 21.1 | | | 22.3 | |
| Approach LOS | | B | | | B | | | C | | | C | |

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 54.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 19.4 Intersection LOS: B
Intersection Capacity Utilization 38.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: Joiner Parkway & Nicolaus Road

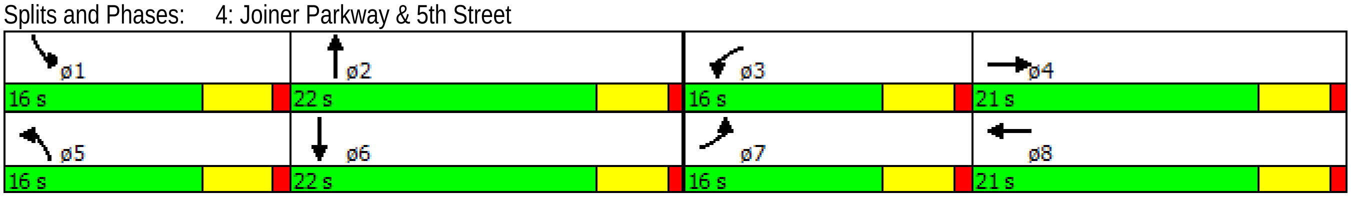
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 15 | 17 | 33 | 45 | 22 | 48 | 69 | 440 | 90 | 25 | 308 | 40 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 0 | 145 | | 0 | 150 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | | | 0.99 | | | 0.99 | | | 1.00 | |
| Frt | | 0.901 | | | 0.897 | | | 0.974 | | | 0.983 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1657 | 0 | 1770 | 1649 | 0 | 1770 | 3429 | 0 | 1770 | 3466 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1657 | 0 | 1770 | 1649 | 0 | 1770 | 3429 | 0 | 1770 | 3466 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 35 | | | 51 | | | 30 | | | 17 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 648 | | | 664 | | | 951 | | | 2021 | |
| Travel Time (s) | | 12.6 | | | 12.9 | | | 16.2 | | | 34.4 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 16 | 18 | 35 | 47 | 23 | 51 | 74 | 463 | 95 | 26 | 324 | 42 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 16 | 53 | 0 | 47 | 74 | 0 | 74 | 558 | 0 | 26 | 366 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permitted Phases | | | | | | | | | | | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 22.0 | | 16.0 | 22.0 | |
| Total Split (%) | 21.3% | 28.0% | | 21.3% | 28.0% | | 21.3% | 29.3% | | 21.3% | 29.3% | |
| Maximum Green (s) | 11.0 | 16.0 | | 11.0 | 16.0 | | 11.0 | 17.0 | | 11.0 | 17.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | | | 5 | | | 5 | | | 5 | |
| Act Effct Green (s) | 7.0 | 8.1 | | 7.8 | 10.4 | | 8.5 | 29.2 | | 7.3 | 23.9 | |
| Actuated g/C Ratio | 0.16 | 0.18 | | 0.18 | 0.24 | | 0.19 | 0.66 | | 0.17 | 0.54 | |
| v/c Ratio | 0.06 | 0.16 | | 0.15 | 0.17 | | 0.22 | 0.24 | | 0.09 | 0.19 | |
| Control Delay | 25.7 | 13.2 | | 23.8 | 9.8 | | 23.1 | 10.2 | | 25.1 | 14.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 25.7 | 13.2 | | 23.8 | 9.8 | | 23.1 | 10.2 | | 25.1 | 14.9 | |
| LOS | C | B | | C | A | | C | B | | C | B | |
| Approach Delay | | 16.1 | | | 15.2 | | | 11.7 | | | 15.6 | |
| Approach LOS | | B | | | B | | | B | | | B | |

**Intersection Summary**

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 44
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.24
Intersection Signal Delay: 14.3 Intersection LOS: B
Intersection Capacity Utilization 40.8% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Joiner Parkway & 5th Street



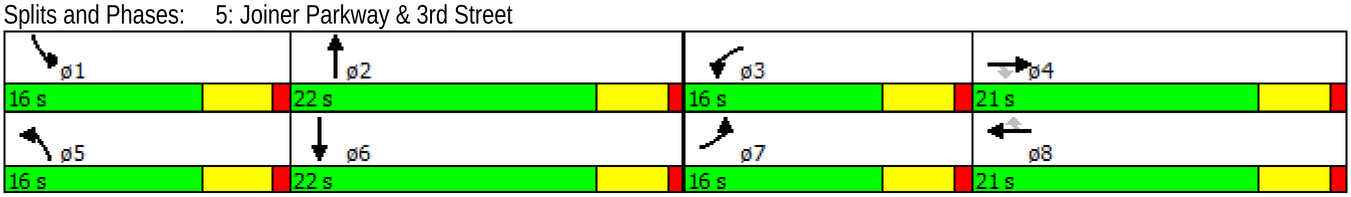
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 21 | 24 | 28 | 53 | 29 | 50 | 46 | 574 | 74 | 27 | 368 | 35 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 145 | 150 | | 150 | 140 | | 0 | 140 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | 0.98 | | | 0.98 | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | | 0.850 | | 0.983 | | | 0.987 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3467 | 0 | 1770 | 3484 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1553 | 1770 | 1863 | 1553 | 1770 | 3467 | 0 | 1770 | 3484 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 175 | | | 175 | | 17 | | | 12 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 826 | | | 796 | | | 901 | | | 951 | |
| Travel Time (s) | | 16.1 | | | 15.5 | | | 15.4 | | | 16.2 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 22 | 26 | 30 | 56 | 31 | 53 | 49 | 612 | 79 | 29 | 391 | 37 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 22 | 26 | 30 | 56 | 31 | 53 | 49 | 691 | 0 | 29 | 428 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 22.0 | | 16.0 | 22.0 | |
| Total Split (%) | 21.3% | 28.0% | 28.0% | 21.3% | 28.0% | 28.0% | 21.3% | 29.3% | | 21.3% | 29.3% | |
| Maximum Green (s) | 11.0 | 16.0 | 16.0 | 11.0 | 16.0 | 16.0 | 11.0 | 17.0 | | 11.0 | 17.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 7.0 | 8.1 | 8.1 | 7.9 | 13.0 | 13.0 | 7.7 | 26.8 | | 7.2 | 26.5 | |
| Actuated g/C Ratio | 0.15 | 0.17 | 0.17 | 0.17 | 0.28 | 0.28 | 0.17 | 0.58 | | 0.16 | 0.57 | |
| v/c Ratio | 0.08 | 0.08 | 0.07 | 0.19 | 0.06 | 0.09 | 0.17 | 0.34 | | 0.11 | 0.21 | |
| Control Delay | 26.2 | 22.5 | 0.4 | 24.6 | 16.3 | 0.3 | 24.9 | 15.1 | | 25.9 | 14.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 26.2 | 22.5 | 0.4 | 24.6 | 16.3 | 0.3 | 24.9 | 15.1 | | 25.9 | 14.4 | |
| LOS | C | C | A | C | B | A | C | B | | C | B | |
| Approach Delay | | 15.0 | | | 13.6 | | | 15.8 | | | 15.1 | |
| Approach LOS | | B | | | B | | | B | | | B | |

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 46.4
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.34
Intersection Signal Delay: 15.0 — Intersection LOS: B
Intersection Capacity Utilization 44.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Joiner Parkway & 3rd Street

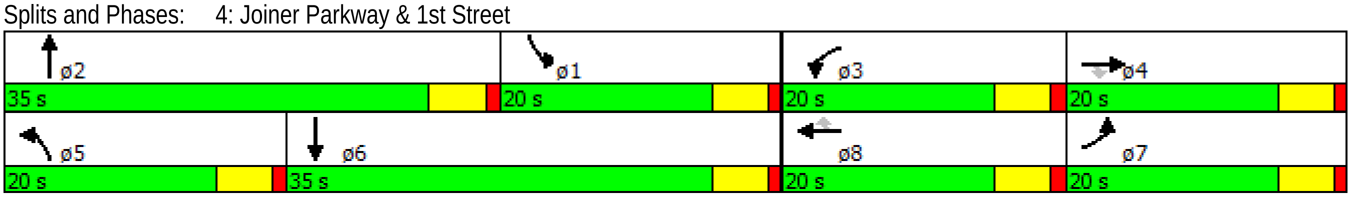


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 34 | 26 | 90 | 107 | 42 | 52 | 131 | 623 | 96 | 46 | 386 | 37 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 124 | | 124 | 129 | | 129 | 111 | | 0 | 169 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | 0.980 | | | 0.987 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3468 | 0 | 1770 | 3493 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3468 | 0 | 1770 | 3493 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 195 | | | 195 | | 19 | | | 11 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1101 | | | 816 | | | 875 | | | 912 | |
| Travel Time (s) | | 25.0 | | | 18.5 | | | 19.9 | | | 20.7 | |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Adj. Flow (vph) | 35 | 27 | 94 | 111 | 44 | 54 | 136 | 650 | 100 | 48 | 402 | 39 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 35 | 27 | 94 | 111 | 44 | 54 | 136 | 750 | 0 | 48 | 441 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 9.0 | 20.0 | 20.0 | 9.0 | 20.0 | 20.0 | 9.0 | 31.0 | | 9.0 | 31.0 | |
| Total Split (s) | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 35.0 | | 20.0 | 35.0 | |
| Total Split (%) | 21.1% | 21.1% | 21.1% | 21.1% | 21.1% | 21.1% | 21.1% | 36.8% | | 21.1% | 36.8% | |
| Maximum Green (s) | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 30.0 | | 15.0 | 30.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lead | Lead | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 10.0 | 10.0 | | 10.0 | 10.0 | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 8.9 | 8.2 | 8.2 | 10.3 | 11.3 | 11.3 | 11.0 | 30.1 | | 8.2 | 25.1 | |
| Actuated g/C Ratio | 0.14 | 0.13 | 0.13 | 0.17 | 0.18 | 0.18 | 0.18 | 0.49 | | 0.13 | 0.41 | |
| v/c Ratio | 0.14 | 0.11 | 0.25 | 0.37 | 0.13 | 0.12 | 0.43 | 0.44 | | 0.20 | 0.31 | |
| Control Delay | 30.4 | 31.2 | 1.5 | 32.5 | 28.4 | 0.5 | 33.0 | 18.3 | | 33.2 | 20.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 30.4 | 31.2 | 1.5 | 32.5 | 28.4 | 0.5 | 33.0 | 18.3 | | 33.2 | 20.6 | |
| LOS | C | C | A | C | C | A | C | B | | C | C | |
| Approach Delay | | 13.1 | | | 23.4 | | | 20.5 | | | 21.9 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 95 | |
| Actuated Cycle Length: 61.4 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.44 | |
| Intersection Signal Delay: 20.6 | Intersection LOS: C |
| Intersection Capacity Utilization 48.7% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Joiner Parkway & 1st Street



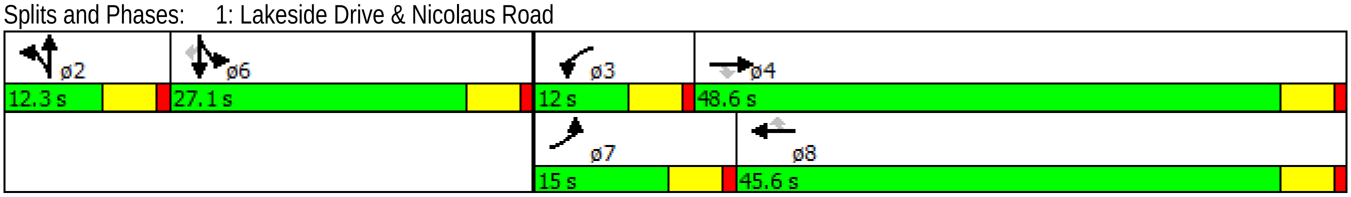
# APPENDIX C – CUMULATIVE NO PROJECT

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 160 | 710 | 5 | 30 | 1290 | 80 | 20 | 30 | 50 | 195 | 20 | 165 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 174 | | 174 | 176 | | 176 | 0 | | 0 | 0 | | 174 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 0 | | 0 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | 0.933 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.990 | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1721 | 0 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.990 | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1721 | 0 | 1770 | 1863 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 131 | | | 131 | | 38 | | | | 179 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1129 | | | 1030 | | | 428 | | | 612 | |
| Travel Time (s) | | 25.7 | | | 23.4 | | | 9.7 | | | 13.9 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 174 | 772 | 5 | 33 | 1402 | 87 | 22 | 33 | 54 | 212 | 22 | 179 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 174 | 772 | 5 | 33 | 1402 | 87 | 0 | 109 | 0 | 212 | 22 | 179 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Split | NA | | Split | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | 6 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 12.0 | 27.1 | 27.1 | 12.0 | 27.1 | 27.1 | 12.0 | 12.0 | | 27.1 | 27.1 | 27.1 |
| Total Split (s) | 15.0 | 48.6 | 48.6 | 12.0 | 45.6 | 45.6 | 12.3 | 12.3 | | 27.1 | 27.1 | 27.1 |
| Total Split (%) | 15.0% | 48.6% | 48.6% | 12.0% | 45.6% | 45.6% | 12.3% | 12.3% | | 27.1% | 27.1% | 27.1% |
| Maximum Green (s) | 10.0 | 43.6 | 43.6 | 7.0 | 40.6 | 40.6 | 7.3 | 7.3 | | 22.1 | 22.1 | 22.1 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | | 5.0 | 5.0 | 5.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | None | Min | Min | | Min | Min | Min |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | | | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 17.1 | 17.1 | | 17.1 | 17.1 | | | | 17.1 | 17.1 | 17.1 |
| Pedestrian Calls (#/hr) | | 10 | 10 | | 10 | 10 | | | | 10 | 10 | 10 |
| Act Effct Green (s) | 10.0 | 48.7 | 48.7 | 6.5 | 40.6 | 40.6 | | 7.0 | | 16.4 | 16.4 | 16.4 |
| Actuated g/C Ratio | 0.11 | 0.52 | 0.52 | 0.07 | 0.43 | 0.43 | | 0.07 | | 0.17 | 0.17 | 0.17 |
| v/c Ratio | 0.93 | 0.42 | 0.01 | 0.27 | 0.92 | 0.11 | | 0.67 | | 0.69 | 0.07 | 0.42 |
| Control Delay | 93.0 | 16.8 | 0.0 | 48.9 | 37.1 | 1.5 | | 50.3 | | 48.5 | 32.1 | 8.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 93.0 | 16.8 | 0.0 | 48.9 | 37.1 | 1.5 | | 50.3 | | 48.5 | 32.1 | 8.4 |
| LOS | F | B | A | D | D | A | | D | | D | C | A |
| Approach Delay | | 30.7 | | | 35.3 | | | 50.3 | | | 30.3 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 100 | |
| Actuated Cycle Length: 94.1 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.93 | |
| Intersection Signal Delay: 33.7 | Intersection LOS: C |
| Intersection Capacity Utilization 74.5% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Lakeside Drive & Nicolaus Road



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 955 | 0 | 0 | 1400 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 0 | 150 | | 0 | 25 |
| Storage Lanes | | 0 | 1 | | 1 | 1 |
| Taper Length (ft) | | | 60 | | 60 | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 3539 | 0 | 1863 | 3539 | 1863 | 1863 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 3539 | 0 | 1863 | 3539 | 1863 | 1863 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 1030 | | | 2067 | 308 | |
| Travel Time (s) | 23.4 | | | 47.0 | 7.0 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 1038 | 0 | 0 | 1522 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 1038 | 0 | 0 | 1522 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 12 | 12 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Stop | |

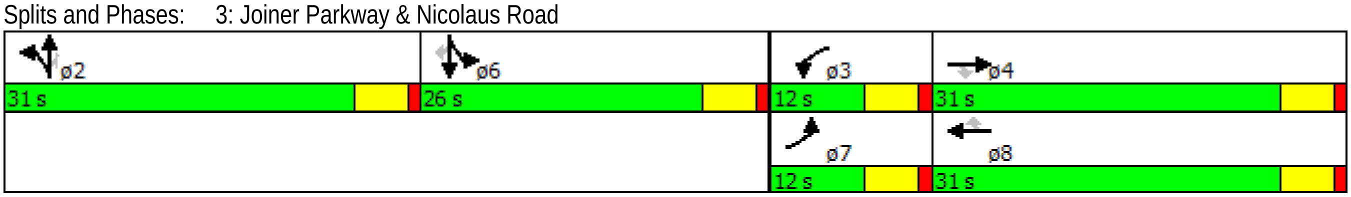
| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Control Type: Unsignalized | |
| Intersection Delay 0.0 | Level of Service A |
| Analysis Period (min) 15 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 40 | 655 | 260 | 60 | 740 | 180 | 600 | 120 | 130 | 140 | 200 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 193 | | 193 | 0 | | 81 | 210 | | 210 | 151 | | 151 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 0.91 | 0.91 | 1.00 | 0.91 | 0.91 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.965 | | 0.950 | 0.994 | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3272 | 1583 | 1610 | 3370 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.965 | | 0.950 | 0.994 | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3272 | 1583 | 1610 | 3370 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 283 | | | 131 | | | 141 | | | 131 |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 35 | |
| Link Distance (ft) | | 2067 | | | 258 | | | 1053 | | | 928 | |
| Travel Time (s) | | 40.3 | | | 5.0 | | | 17.9 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 43 | 712 | 283 | 65 | 804 | 196 | 652 | 130 | 141 | 152 | 217 | 65 |
| Shared Lane Traffic (%) | | | | | | | 50% | | | 21% | | |
| Lane Group Flow (vph) | 43 | 712 | 283 | 65 | 804 | 196 | 326 | 456 | 141 | 120 | 249 | 65 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Split | NA | Perm | Split | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 12.0 | 26.0 | 26.0 | 12.0 | 26.0 | 26.0 | 28.0 | 28.0 | 28.0 | 26.0 | 26.0 | 26.0 |
| Total Split (s) | 12.0 | 31.0 | 31.0 | 12.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 26.0 | 26.0 | 26.0 |
| Total Split (%) | 12.0% | 31.0% | 31.0% | 12.0% | 31.0% | 31.0% | 31.0% | 31.0% | 31.0% | 26.0% | 26.0% | 26.0% |
| Maximum Green (s) | 7.0 | 26.0 | 26.0 | 7.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 21.0 | 21.0 | 21.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | None | Min | Min | Min | Min | Min | Min |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 16.0 | 16.0 | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 16.0 | 16.0 | 16.0 |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Act Effct Green (s) | 6.8 | 23.4 | 23.4 | 6.9 | 25.9 | 25.9 | 22.6 | 22.6 | 22.6 | 13.0 | 13.0 | 13.0 |
| Actuated g/C Ratio | 0.08 | 0.28 | 0.28 | 0.08 | 0.31 | 0.31 | 0.27 | 0.27 | 0.27 | 0.16 | 0.16 | 0.16 |
| v/c Ratio | 0.30 | 0.72 | 0.44 | 0.45 | 0.73 | 0.34 | 0.75 | 0.52 | 0.27 | 0.48 | 0.48 | 0.18 |
| Control Delay | 47.6 | 33.9 | 6.1 | 52.4 | 33.2 | 12.4 | 42.7 | 30.0 | 6.7 | 42.1 | 37.4 | 1.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 47.6 | 33.9 | 6.1 | 52.4 | 33.2 | 12.4 | 42.7 | 30.0 | 6.7 | 42.1 | 37.4 | 1.1 |
| LOS | D | C | A | D | C | B | D | C | A | D | D | A |
| Approach Delay | | 26.9 | | | 30.5 | | | 30.9 | | | 33.3 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 100 | |
| Actuated Cycle Length: 83.7 | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.75 | |
| Intersection Signal Delay: 29.9 | Intersection LOS: C |
| Intersection Capacity Utilization 63.5% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Joiner Parkway & Nicolaus Road

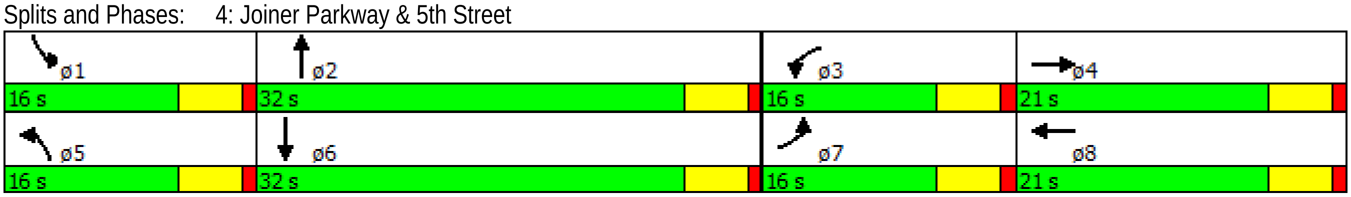


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 50 | 60 | 90 | 80 | 15 | 55 | 40 | 875 | 60 | 85 | 510 | 30 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 0 | 145 | | 0 | 150 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | | | 0.98 | | | 1.00 | | | 1.00 | |
| Frt | | 0.910 | | | 0.882 | | | 0.990 | | | 0.992 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1675 | 0 | 1770 | 1617 | 0 | 1770 | 3496 | 0 | 1770 | 3504 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1675 | 0 | 1770 | 1617 | 0 | 1770 | 3496 | 0 | 1770 | 3504 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 79 | | | 58 | | | 9 | | | 7 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 578 | | | 664 | | | 954 | | | 2012 | |
| Travel Time (s) | | 11.3 | | | 12.9 | | | 16.3 | | | 34.3 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 53 | 63 | 95 | 84 | 16 | 58 | 42 | 921 | 63 | 89 | 537 | 32 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 53 | 158 | 0 | 84 | 74 | 0 | 42 | 984 | 0 | 89 | 569 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permitted Phases | | | | | | | | | | | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 32.0 | | 16.0 | 32.0 | |
| Total Split (%) | 18.8% | 24.7% | | 18.8% | 24.7% | | 18.8% | 37.6% | | 18.8% | 37.6% | |
| Maximum Green (s) | 11.0 | 16.0 | | 11.0 | 16.0 | | 11.0 | 27.0 | | 11.0 | 27.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | | | 5 | | | 5 | | | 5 | |
| Act Effct Green (s) | 7.8 | 9.5 | | 8.7 | 12.7 | | 7.5 | 28.2 | | 8.8 | 31.8 | |
| Actuated g/C Ratio | 0.11 | 0.14 | | 0.13 | 0.18 | | 0.11 | 0.41 | | 0.13 | 0.46 | |
| v/c Ratio | 0.27 | 0.53 | | 0.38 | 0.22 | | 0.22 | 0.69 | | 0.40 | 0.35 | |
| Control Delay | 35.9 | 23.9 | | 37.3 | 13.4 | | 35.8 | 24.5 | | 37.5 | 16.8 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 35.9 | 23.9 | | 37.3 | 13.4 | | 35.8 | 24.5 | | 37.5 | 16.8 | |
| LOS | D | C | | D | B | | D | C | | D | B | |
| Approach Delay | | 26.9 | | | 26.1 | | | 25.0 | | | 19.6 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 85 | |
| Actuated Cycle Length: 69.5 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.69 | |
| Intersection Signal Delay: 23.5 | Intersection LOS: C |
| Intersection Capacity Utilization 61.6% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Joiner Parkway & 5th Street

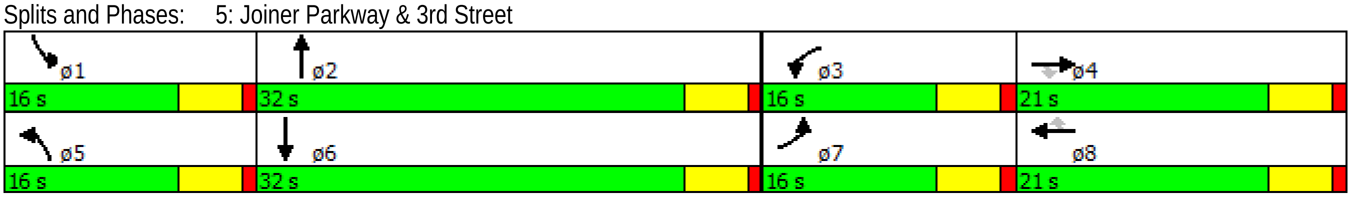


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | ↰ | ↑ | ↱ | ↰ | ↑ | ↱ | ↰ | ↑↱ | | ↰ | ↑↱ | |
| Volume (vph) | 60 | 70 | 70 | 80 | 80 | 70 | 40 | 980 | 60 | 70 | 670 | 40 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 145 | 150 | | 150 | 140 | | 0 | 140 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | 0.98 | | | 0.98 | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | | 0.850 | | 0.991 | | | 0.992 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3501 | 0 | 1770 | 3504 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1552 | 1770 | 1863 | 1552 | 1770 | 3501 | 0 | 1770 | 3504 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 154 | | | 154 | | 8 | | | 7 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 874 | | | 1023 | | | 906 | | | 954 | |
| Travel Time (s) | | 17.0 | | | 19.9 | | | 15.4 | | | 16.3 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 65 | 76 | 76 | 87 | 87 | 76 | 43 | 1065 | 65 | 76 | 728 | 43 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 65 | 76 | 76 | 87 | 87 | 76 | 43 | 1130 | 0 | 76 | 771 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 32.0 | | 16.0 | 32.0 | |
| Total Split (%) | 18.8% | 24.7% | 24.7% | 18.8% | 24.7% | 24.7% | 18.8% | 37.6% | | 18.8% | 37.6% | |
| Maximum Green (s) | 11.0 | 16.0 | 16.0 | 11.0 | 16.0 | 16.0 | 11.0 | 27.0 | | 11.0 | 27.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 8.2 | 9.2 | 9.2 | 8.8 | 12.1 | 12.1 | 7.6 | 33.5 | | 8.5 | 36.7 | |
| Actuated g/C Ratio | 0.12 | 0.13 | 0.13 | 0.13 | 0.18 | 0.18 | 0.11 | 0.49 | | 0.12 | 0.53 | |
| v/c Ratio | 0.31 | 0.31 | 0.22 | 0.39 | 0.27 | 0.19 | 0.22 | 0.66 | | 0.35 | 0.41 | |
| Control Delay | 35.9 | 33.4 | 1.5 | 37.0 | 30.7 | 1.1 | 35.3 | 24.3 | | 36.5 | 17.3 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 35.9 | 33.4 | 1.5 | 37.0 | 30.7 | 1.1 | 35.3 | 24.3 | | 36.5 | 17.3 | |
| LOS | D | C | A | D | C | A | D | C | | D | B | |
| Approach Delay | | 23.0 | | | 23.9 | | | 24.7 | | | 19.0 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 85 | |
| Actuated Cycle Length: 68.9 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.66 | |
| Intersection Signal Delay: 22.6 | Intersection LOS: C |
| Intersection Capacity Utilization 56.9% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Joiner Parkway & 3rd Street

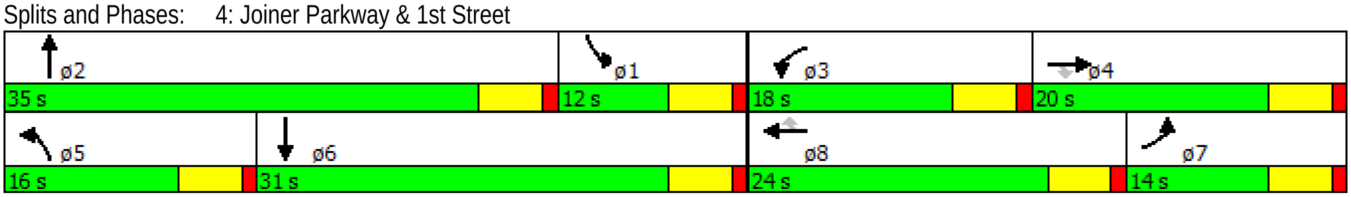


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 70 | 70 | 280 | 160 | 140 | 60 | 160 | 990 | 130 | 50 | 590 | 130 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 124 | | 124 | 129 | | 129 | 111 | | 0 | 169 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | 0.983 | | | 0.973 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3479 | 0 | 1770 | 3444 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3479 | 0 | 1770 | 3444 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 304 | | | 218 | | 18 | | | 32 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1101 | | | 816 | | | 875 | | | 912 | |
| Travel Time (s) | | 25.0 | | | 18.5 | | | 19.9 | | | 20.7 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 76 | 76 | 304 | 174 | 152 | 65 | 174 | 1076 | 141 | 54 | 641 | 141 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 76 | 76 | 304 | 174 | 152 | 65 | 174 | 1217 | 0 | 54 | 782 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 12.0 | 20.0 | 20.0 | 12.0 | 20.0 | 20.0 | 12.0 | 31.0 | | 12.0 | 31.0 | |
| Total Split (s) | 14.0 | 20.0 | 20.0 | 18.0 | 24.0 | 24.0 | 16.0 | 35.0 | | 12.0 | 31.0 | |
| Total Split (%) | 16.5% | 23.5% | 23.5% | 21.2% | 28.2% | 28.2% | 18.8% | 41.2% | | 14.1% | 36.5% | |
| Maximum Green (s) | 9.0 | 15.0 | 15.0 | 13.0 | 19.0 | 19.0 | 11.0 | 30.0 | | 7.0 | 26.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lead | Lead | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 10.0 | 10.0 | | 10.0 | 10.0 | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 8.9 | 9.2 | 9.2 | 11.4 | 11.3 | 11.3 | 10.5 | 31.4 | | 6.7 | 22.3 | |
| Actuated g/C Ratio | 0.12 | 0.12 | 0.12 | 0.15 | 0.15 | 0.15 | 0.14 | 0.43 | | 0.09 | 0.30 | |
| v/c Ratio | 0.36 | 0.33 | 0.66 | 0.64 | 0.53 | 0.15 | 0.69 | 0.82 | | 0.34 | 0.74 | |
| Control Delay | 37.3 | 35.2 | 11.7 | 43.1 | 37.4 | 0.8 | 48.9 | 27.0 | | 41.2 | 27.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 37.3 | 35.2 | 11.7 | 43.1 | 37.4 | 0.8 | 48.9 | 27.0 | | 41.2 | 27.4 | |
| LOS | D | D | B | D | D | A | D | C | | D | C | |
| Approach Delay | | 19.9 | | | 33.8 | | | 29.8 | | | 28.3 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 85 | |
| Actuated Cycle Length: 73.8 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.82 | |
| Intersection Signal Delay: 28.4 | Intersection LOS: C |
| Intersection Capacity Utilization 64.1% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Joiner Parkway & 1st Street

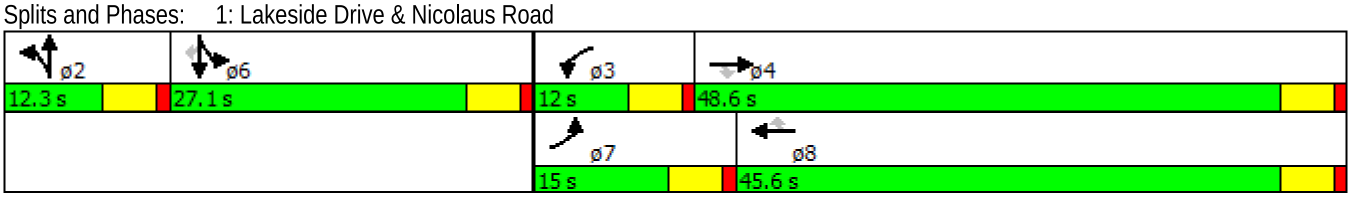


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 150 | 1435 | 20 | 50 | 805 | 125 | 15 | 10 | 30 | 90 | 10 | 95 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 174 | | 174 | 176 | | 176 | 0 | | 0 | 0 | | 174 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 0 | | 0 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | 0.97 | | | 0.98 | | 0.99 | | | | 0.98 |
| Frt | | | 0.850 | | | 0.850 | | 0.926 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.987 | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1686 | 0 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.987 | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3539 | 1531 | 1770 | 3539 | 1552 | 0 | 1683 | 0 | 1770 | 1863 | 1551 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 131 | | | 136 | | 33 | | | | 131 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1129 | | | 1030 | | | 428 | | | 612 | |
| Travel Time (s) | | 25.7 | | | 23.4 | | | 9.7 | | | 13.9 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | 5 | | | | | 5 |
| Confl. Bikes (#/hr) | | | 2 | | | 2 | | | 2 | | | 2 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 163 | 1560 | 22 | 54 | 875 | 136 | 16 | 11 | 33 | 98 | 11 | 103 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 163 | 1560 | 22 | 54 | 875 | 136 | 0 | 60 | 0 | 98 | 11 | 103 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Split | NA | | Split | NA | Perm |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 12.0 | 27.1 | 27.1 | 12.0 | 27.1 | 27.1 | 12.0 | 12.0 | | 27.1 | 27.1 | 27.1 |
| Total Split (s) | 15.0 | 48.6 | 48.6 | 12.0 | 45.6 | 45.6 | 12.3 | 12.3 | | 27.1 | 27.1 | 27.1 |
| Total Split (%) | 15.0% | 48.6% | 48.6% | 12.0% | 45.6% | 45.6% | 12.3% | 12.3% | | 27.1% | 27.1% | 27.1% |
| Maximum Green (s) | 10.0 | 43.6 | 43.6 | 7.0 | 40.6 | 40.6 | 7.3 | 7.3 | | 22.1 | 22.1 | 22.1 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | | 5.0 | 5.0 | 5.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | None | Min | Min | | Min | Min | Min |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | | | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 17.1 | 17.1 | | 17.1 | 17.1 | | | | 17.1 | 17.1 | 17.1 |
| Pedestrian Calls (#/hr) | | 10 | 10 | | 10 | 10 | | | | 10 | 10 | 10 |
| Act Effct Green (s) | 10.2 | 44.4 | 44.4 | 6.7 | 35.7 | 35.7 | | 6.5 | | 11.3 | 11.3 | 11.3 |
| Actuated g/C Ratio | 0.12 | 0.53 | 0.53 | 0.08 | 0.42 | 0.42 | | 0.08 | | 0.13 | 0.13 | 0.13 |
| v/c Ratio | 0.76 | 0.84 | 0.03 | 0.38 | 0.58 | 0.18 | | 0.37 | | 0.41 | 0.04 | 0.32 |
| Control Delay | 62.8 | 24.6 | 0.1 | 48.8 | 20.9 | 3.9 | | 30.2 | | 39.5 | 32.8 | 6.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 62.8 | 24.6 | 0.1 | 48.8 | 20.9 | 3.9 | | 30.2 | | 39.5 | 32.8 | 6.2 |
| LOS | E | C | A | D | C | A | | C | | D | C | A |
| Approach Delay | | 27.9 | | | 20.1 | | | 30.2 | | | 23.0 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 100 | |
| Actuated Cycle Length: 84.1 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay: 24.9 | Intersection LOS: C |
| Intersection Capacity Utilization 68.2% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Lakeside Drive & Nicolaus Road



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 1555 | 0 | 0 | 980 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 0 | 150 | | 0 | 25 |
| Storage Lanes | | 0 | 1 | | 1 | 1 |
| Taper Length (ft) | | | 60 | | 60 | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 3539 | 0 | 1863 | 3539 | 1863 | 1863 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 3539 | 0 | 1863 | 3539 | 1863 | 1863 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 1030 | | | 2067 | 308 | |
| Travel Time (s) | 23.4 | | | 47.0 | 7.0 | |
| Peak Hour Factor | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 |
| Adj. Flow (vph) | 2190 | 0 | 0 | 1380 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 2190 | 0 | 0 | 1380 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 12 | 12 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Stop | |

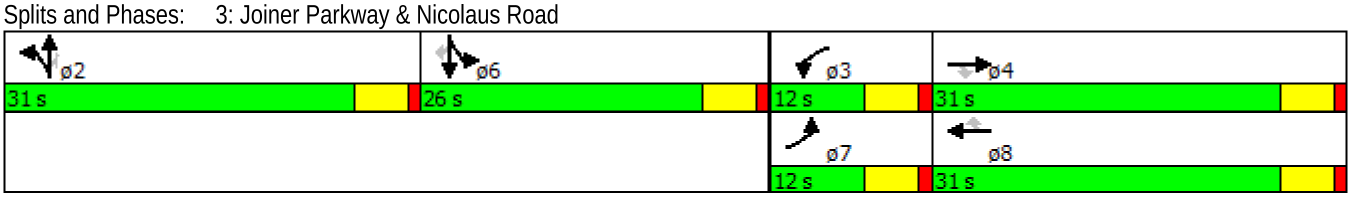
| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Control Type: Unsignalized | |
| Intersection Delay 0.0 | Level of Service A |
| Analysis Period (min) 15 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 35 | 700 | 820 | 50 | 620 | 130 | 330 | 160 | 60 | 80 | 240 | 30 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 193 | | 193 | 0 | | 81 | 210 | | 210 | 151 | | 151 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 0.91 | 0.91 | 1.00 | 0.91 | 0.91 | 1.00 |
| Ped Bike Factor | | | 0.98 | | | 0.98 | | | 0.98 | | | 0.98 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.975 | | 0.950 | 0.998 | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3305 | 1583 | 1610 | 3383 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.975 | | 0.950 | 0.998 | |
| Satd. Flow (perm) | 1770 | 3539 | 1551 | 1770 | 3539 | 1551 | 1610 | 3305 | 1552 | 1610 | 3383 | 1553 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 655 | | | 131 | | | 131 | | | 131 |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 35 | |
| Link Distance (ft) | | 2067 | | | 258 | | | 1053 | | | 928 | |
| Travel Time (s) | | 40.3 | | | 5.0 | | | 17.9 | | | 18.1 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Confl. Bikes (#/hr) | | | 2 | | | 2 | | | 2 | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 38 | 761 | 891 | 54 | 674 | 141 | 359 | 174 | 65 | 87 | 261 | 33 |
| Shared Lane Traffic (%) | | | | | | | 50% | | | 10% | | |
| Lane Group Flow (vph) | 38 | 761 | 891 | 54 | 674 | 141 | 179 | 354 | 65 | 78 | 270 | 33 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Split | NA | Perm | Split | NA | Perm |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 12.0 | 26.0 | 26.0 | 12.0 | 26.0 | 26.0 | 28.0 | 28.0 | 28.0 | 26.0 | 26.0 | 26.0 |
| Total Split (s) | 12.0 | 31.0 | 31.0 | 12.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 26.0 | 26.0 | 26.0 |
| Total Split (%) | 12.0% | 31.0% | 31.0% | 12.0% | 31.0% | 31.0% | 31.0% | 31.0% | 31.0% | 26.0% | 26.0% | 26.0% |
| Maximum Green (s) | 7.0 | 26.0 | 26.0 | 7.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 21.0 | 21.0 | 21.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | None | Min | Min | Min | Min | Min | Min |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 16.0 | 16.0 | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 16.0 | 16.0 | 16.0 |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Act Effct Green (s) | 6.7 | 27.0 | 27.0 | 6.8 | 27.0 | 27.0 | 15.4 | 15.4 | 15.4 | 12.5 | 12.5 | 12.5 |
| Actuated g/C Ratio | 0.09 | 0.35 | 0.35 | 0.09 | 0.35 | 0.35 | 0.20 | 0.20 | 0.20 | 0.16 | 0.16 | 0.16 |
| v/c Ratio | 0.25 | 0.61 | 0.92 | 0.35 | 0.54 | 0.22 | 0.56 | 0.53 | 0.16 | 0.30 | 0.49 | 0.09 |
| Control Delay | 42.8 | 26.6 | 24.5 | 45.0 | 25.2 | 7.1 | 36.3 | 31.7 | 0.8 | 34.2 | 34.0 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.8 | 26.6 | 24.5 | 45.0 | 25.2 | 7.1 | 36.3 | 31.7 | 0.8 | 34.2 | 34.0 | 0.5 |
| LOS | D | C | C | D | C | A | D | C | A | C | C | A |
| Approach Delay | | 25.8 | | | 23.5 | | | 29.7 | | | 31.2 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 100 | |
| Actuated Cycle Length: 76.9 | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.92 | |
| Intersection Signal Delay: 26.5 | Intersection LOS: C |
| Intersection Capacity Utilization 75.4% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Joiner Parkway & Nicolaus Road



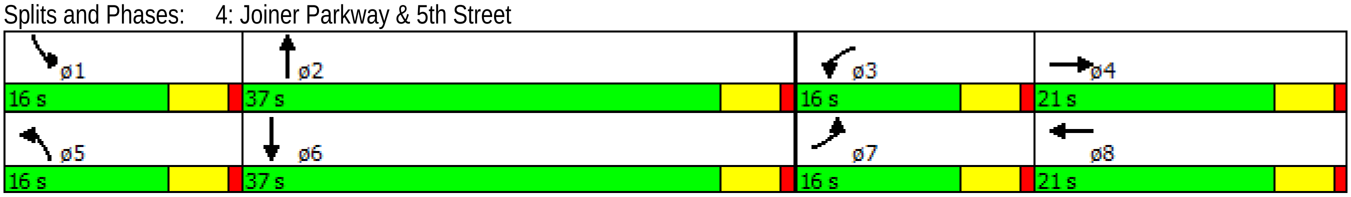
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 25 | 25 | 40 | 60 | 30 | 60 | 80 | 530 | 110 | 40 | 1100 | 50 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 0 | 145 | | 0 | 150 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | | | 0.99 | | | 0.99 | | | 1.00 | |
| Frt | | 0.907 | | | 0.901 | | | 0.974 | | | 0.993 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1668 | 0 | 1770 | 1656 | 0 | 1770 | 3427 | 0 | 1770 | 3509 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1668 | 0 | 1770 | 1656 | 0 | 1770 | 3427 | 0 | 1770 | 3509 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 42 | | | 63 | | | 30 | | | 6 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 557 | | | 698 | | | 953 | | | 2008 | |
| Travel Time (s) | | 10.9 | | | 13.6 | | | 16.2 | | | 34.2 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 26 | 26 | 42 | 63 | 32 | 63 | 84 | 558 | 116 | 42 | 1158 | 53 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 26 | 68 | 0 | 63 | 95 | 0 | 84 | 674 | 0 | 42 | 1211 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permitted Phases | | | | | | | | | | | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 37.0 | | 16.0 | 37.0 | |
| Total Split (%) | 17.8% | 23.3% | | 17.8% | 23.3% | | 17.8% | 41.1% | | 17.8% | 41.1% | |
| Maximum Green (s) | 11.0 | 16.0 | | 11.0 | 16.0 | | 11.0 | 32.0 | | 11.0 | 32.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | | | 5 | | | 5 | | | 5 | |
| Act Effct Green (s) | 7.1 | 8.3 | | 8.4 | 11.4 | | 8.9 | 40.7 | | 7.7 | 37.1 | |
| Actuated g/C Ratio | 0.10 | 0.12 | | 0.12 | 0.17 | | 0.13 | 0.60 | | 0.11 | 0.54 | |
| v/c Ratio | 0.14 | 0.28 | | 0.29 | 0.29 | | 0.36 | 0.33 | | 0.21 | 0.64 | |
| Control Delay | 36.8 | 19.9 | | 36.8 | 15.9 | | 37.6 | 13.8 | | 36.5 | 21.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 36.8 | 19.9 | | 36.8 | 15.9 | | 37.6 | 13.8 | | 36.5 | 21.0 | |
| LOS | D | B | | D | B | | D | B | | D | C | |
| Approach Delay | | 24.6 | | | 24.2 | | | 16.4 | | | 21.5 | |
| Approach LOS | | C | | | C | | | B | | | C | |

**Intersection Summary**

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 68.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 20.1 Intersection LOS: C
Intersection Capacity Utilization 59.5% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Joiner Parkway & 5th Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 30 | 170 | 50 | 80 | 50 | 50 | 70 | 710 | 80 | 50 | 1150 | 40 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 145 | 150 | | 150 | 140 | | 0 | 140 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | 0.98 | | | 0.98 | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | | 0.850 | | 0.985 | | | 0.995 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3473 | 0 | 1770 | 3517 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1549 | 1770 | 1863 | 1549 | 1770 | 3473 | 0 | 1770 | 3517 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 125 | | | 125 | | 15 | | | 4 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 784 | | | 698 | | | 910 | | | 953 | |
| Travel Time (s) | | 15.3 | | | 13.6 | | | 15.5 | | | 16.2 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 32 | 181 | 53 | 85 | 53 | 53 | 74 | 755 | 85 | 53 | 1223 | 43 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 32 | 181 | 53 | 85 | 53 | 53 | 74 | 840 | 0 | 53 | 1266 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 52.0 | | 16.0 | 52.0 | |
| Total Split (%) | 15.2% | 20.0% | 20.0% | 15.2% | 20.0% | 20.0% | 15.2% | 49.5% | | 15.2% | 49.5% | |
| Maximum Green (s) | 11.0 | 16.0 | 16.0 | 11.0 | 16.0 | 16.0 | 11.0 | 47.0 | | 11.0 | 47.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 7.6 | 13.5 | 13.5 | 9.4 | 17.4 | 17.4 | 9.2 | 42.7 | | 8.5 | 42.1 | |
| Actuated g/C Ratio | 0.09 | 0.15 | 0.15 | 0.11 | 0.20 | 0.20 | 0.10 | 0.49 | | 0.10 | 0.48 | |
| v/c Ratio | 0.21 | 0.64 | 0.15 | 0.45 | 0.14 | 0.13 | 0.40 | 0.50 | | 0.31 | 0.75 | |
| Control Delay | 47.3 | 50.5 | 1.0 | 50.9 | 36.2 | 0.7 | 49.7 | 18.9 | | 48.1 | 25.1 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 47.3 | 50.5 | 1.0 | 50.9 | 36.2 | 0.7 | 49.7 | 18.9 | | 48.1 | 25.1 | |
| LOS | D | D | A | D | D | A | D | B | | D | C | |
| Approach Delay | | 40.2 | | | 32.9 | | | 21.4 | | | 26.1 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 105 | |
| Actuated Cycle Length: 88 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.75 | |
| Intersection Signal Delay: 26.4 | Intersection LOS: C |
| Intersection Capacity Utilization 67.7% | ICU Level of Service C |
| Analysis Period (min) 15 | |

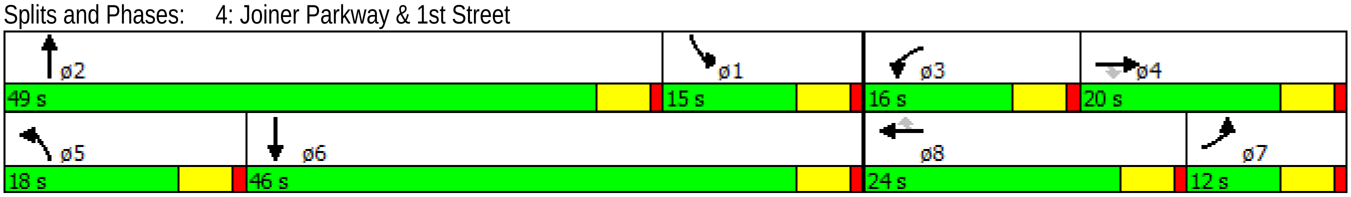
Splits and Phases: 5: Joiner Parkway & 3rd Street

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 40 | 60 | 210 | 140 | 50 | 60 | 170 | 780 | 110 | 80 | 1180 | 40 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 124 | | 124 | 129 | | 129 | 111 | | 0 | 169 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | 0.981 | | | 0.995 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3472 | 0 | 1770 | 3522 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3472 | 0 | 1770 | 3522 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 228 | | | 185 | | 20 | | | 4 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1101 | | | 816 | | | 875 | | | 912 | |
| Travel Time (s) | | 25.0 | | | 18.5 | | | 19.9 | | | 20.7 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 43 | 65 | 228 | 152 | 54 | 65 | 185 | 848 | 120 | 87 | 1283 | 43 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 43 | 65 | 228 | 152 | 54 | 65 | 185 | 968 | 0 | 87 | 1326 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 12.0 | 20.0 | 20.0 | 12.0 | 20.0 | 20.0 | 12.0 | 31.0 | | 12.0 | 31.0 | |
| Total Split (s) | 12.0 | 20.0 | 20.0 | 16.0 | 24.0 | 24.0 | 18.0 | 49.0 | | 15.0 | 46.0 | |
| Total Split (%) | 12.0% | 20.0% | 20.0% | 16.0% | 24.0% | 24.0% | 18.0% | 49.0% | | 15.0% | 46.0% | |
| Maximum Green (s) | 7.0 | 15.0 | 15.0 | 11.0 | 19.0 | 19.0 | 13.0 | 44.0 | | 10.0 | 41.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lead | Lead | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 10.0 | 10.0 | | 10.0 | 10.0 | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 9.1 | 9.1 | 9.1 | 10.6 | 12.1 | 12.1 | 12.4 | 39.2 | | 15.2 | 39.4 | |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.10 | 0.12 | 0.13 | 0.13 | 0.14 | 0.43 | | 0.17 | 0.43 | |
| v/c Ratio | 0.24 | 0.35 | 0.63 | 0.75 | 0.22 | 0.18 | 0.77 | 0.65 | | 0.30 | 0.88 | |
| Control Delay | 42.9 | 44.6 | 13.8 | 63.7 | 40.0 | 1.1 | 62.0 | 24.7 | | 38.7 | 32.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 42.9 | 44.6 | 13.8 | 63.7 | 40.0 | 1.1 | 62.0 | 24.7 | | 38.7 | 32.4 | |
| LOS | D | D | B | E | D | A | E | C | | D | C | |
| Approach Delay | | 23.5 | | | 43.9 | | | 30.7 | | | 32.8 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 100 | |
| Actuated Cycle Length: 91.7 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.88 | |
| Intersection Signal Delay: 32.0 | Intersection LOS: C |
| Intersection Capacity Utilization 70.2% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Joiner Parkway & 1st Street



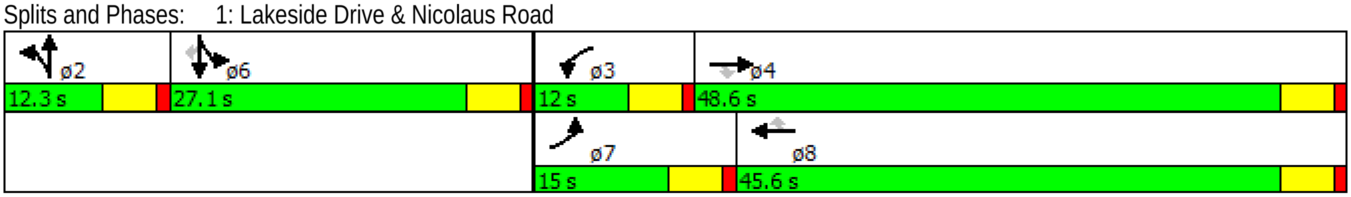
# APPENDIX D – CUMULATIVE PLUS PROJECT

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 160 | 713 | 5 | 30 | 1302 | 81 | 20 | 30 | 50 | 196 | 20 | 165 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 174 | | 174 | 176 | | 176 | 0 | | 0 | 0 | | 174 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 0 | | 0 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | 0.933 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.990 | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1721 | 0 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.990 | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1721 | 0 | 1770 | 1863 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 131 | | | 131 | | 38 | | | | 179 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1129 | | | 1030 | | | 428 | | | 612 | |
| Travel Time (s) | | 25.7 | | | 23.4 | | | 9.7 | | | 13.9 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 174 | 775 | 5 | 33 | 1415 | 88 | 22 | 33 | 54 | 213 | 22 | 179 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 174 | 775 | 5 | 33 | 1415 | 88 | 0 | 109 | 0 | 213 | 22 | 179 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Split | NA | | Split | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | 6 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 12.0 | 27.1 | 27.1 | 12.0 | 27.1 | 27.1 | 12.0 | 12.0 | | 27.1 | 27.1 | 27.1 |
| Total Split (s) | 15.0 | 48.6 | 48.6 | 12.0 | 45.6 | 45.6 | 12.3 | 12.3 | | 27.1 | 27.1 | 27.1 |
| Total Split (%) | 15.0% | 48.6% | 48.6% | 12.0% | 45.6% | 45.6% | 12.3% | 12.3% | | 27.1% | 27.1% | 27.1% |
| Maximum Green (s) | 10.0 | 43.6 | 43.6 | 7.0 | 40.6 | 40.6 | 7.3 | 7.3 | | 22.1 | 22.1 | 22.1 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | | 5.0 | 5.0 | 5.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | None | Min | Min | | Min | Min | Min |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | | | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 17.1 | 17.1 | | 17.1 | 17.1 | | | | 17.1 | 17.1 | 17.1 |
| Pedestrian Calls (#/hr) | | 10 | 10 | | 10 | 10 | | | | 10 | 10 | 10 |
| Act Effct Green (s) | 10.0 | 48.8 | 48.8 | 6.5 | 40.7 | 40.7 | | 7.0 | | 16.4 | 16.4 | 16.4 |
| Actuated g/C Ratio | 0.11 | 0.52 | 0.52 | 0.07 | 0.43 | 0.43 | | 0.07 | | 0.17 | 0.17 | 0.17 |
| v/c Ratio | 0.93 | 0.42 | 0.01 | 0.27 | 0.93 | 0.12 | | 0.67 | | 0.69 | 0.07 | 0.42 |
| Control Delay | 93.2 | 16.9 | 0.0 | 48.9 | 37.9 | 1.5 | | 50.4 | | 48.7 | 32.1 | 8.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 93.2 | 16.9 | 0.0 | 48.9 | 37.9 | 1.5 | | 50.4 | | 48.7 | 32.1 | 8.4 |
| LOS | F | B | A | D | D | A | | D | | D | C | A |
| Approach Delay | | 30.7 | | | 36.0 | | | 50.4 | | | 30.4 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 100 | |
| Actuated Cycle Length: 94.2 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.93 | |
| Intersection Signal Delay: 34.1 | Intersection LOS: C |
| Intersection Capacity Utilization 74.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Lakeside Drive & Nicolaus Road



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 955 | 4 | 6 | 1400 | 13 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 0 | 150 | | 0 | 25 |
| Storage Lanes | | 0 | 1 | | 1 | 1 |
| Taper Length (ft) | | | 60 | | 60 | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | 0.999 | | | | | 0.850 |
| Flt Protected | | | 0.950 | | 0.950 | |
| Satd. Flow (prot) | 3536 | 0 | 1770 | 3539 | 1770 | 1583 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3536 | 0 | 1770 | 3539 | 1770 | 1583 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 1030 | | | 2067 | 308 | |
| Travel Time (s) | 23.4 | | | 47.0 | 7.0 | |
| Peak Hour Factor | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 |
| Adj. Flow (vph) | 1345 | 6 | 8 | 1972 | 18 | 28 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 1351 | 0 | 8 | 1972 | 18 | 28 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 12 | 12 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Stop | |

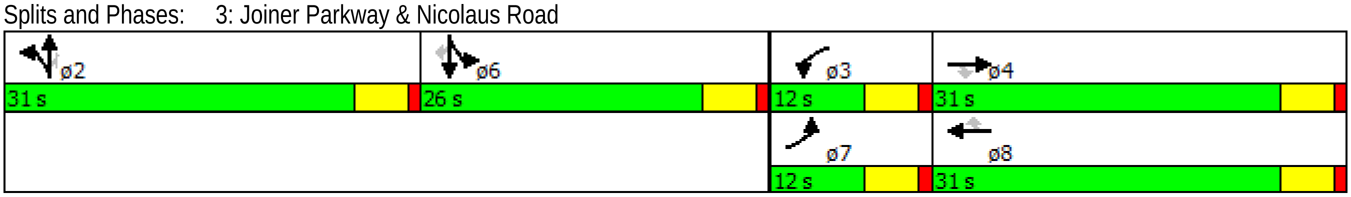
| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Control Type: Unsignalized | |
| Intersection Delay 1.6 | Level of Service A |
| Analysis Period (min) 15 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 41 | 662 | 272 | 60 | 742 | 180 | 604 | 120 | 130 | 140 | 200 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 193 | | 193 | 0 | | 81 | 210 | | 210 | 151 | | 151 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 0.91 | 0.91 | 1.00 | 0.91 | 0.91 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.965 | | 0.950 | 0.994 | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3272 | 1583 | 1610 | 3370 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.965 | | 0.950 | 0.994 | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3272 | 1583 | 1610 | 3370 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 296 | | | 131 | | | 141 | | | 131 |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 35 | |
| Link Distance (ft) | | 2067 | | | 258 | | | 1053 | | | 928 | |
| Travel Time (s) | | 40.3 | | | 5.0 | | | 17.9 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 45 | 720 | 296 | 65 | 807 | 196 | 657 | 130 | 141 | 152 | 217 | 65 |
| Shared Lane Traffic (%) | | | | | | | 50% | | | 21% | | |
| Lane Group Flow (vph) | 45 | 720 | 296 | 65 | 807 | 196 | 328 | 459 | 141 | 120 | 249 | 65 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Split | NA | Perm | Split | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 12.0 | 26.0 | 26.0 | 12.0 | 26.0 | 26.0 | 28.0 | 28.0 | 28.0 | 26.0 | 26.0 | 26.0 |
| Total Split (s) | 12.0 | 31.0 | 31.0 | 12.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 26.0 | 26.0 | 26.0 |
| Total Split (%) | 12.0% | 31.0% | 31.0% | 12.0% | 31.0% | 31.0% | 31.0% | 31.0% | 31.0% | 26.0% | 26.0% | 26.0% |
| Maximum Green (s) | 7.0 | 26.0 | 26.0 | 7.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 21.0 | 21.0 | 21.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | None | Min | Min | Min | Min | Min | Min |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 16.0 | 16.0 | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 16.0 | 16.0 | 16.0 |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Act Effct Green (s) | 6.8 | 23.5 | 23.5 | 6.9 | 26.0 | 26.0 | 22.6 | 22.6 | 22.6 | 13.0 | 13.0 | 13.0 |
| Actuated g/C Ratio | 0.08 | 0.28 | 0.28 | 0.08 | 0.31 | 0.31 | 0.27 | 0.27 | 0.27 | 0.16 | 0.16 | 0.16 |
| v/c Ratio | 0.31 | 0.72 | 0.45 | 0.45 | 0.73 | 0.34 | 0.76 | 0.52 | 0.27 | 0.48 | 0.48 | 0.18 |
| Control Delay | 48.0 | 34.1 | 6.1 | 52.4 | 33.2 | 12.4 | 42.9 | 30.1 | 6.7 | 42.2 | 37.5 | 1.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 48.0 | 34.1 | 6.1 | 52.4 | 33.2 | 12.4 | 42.9 | 30.1 | 6.7 | 42.2 | 37.5 | 1.1 |
| LOS | D | C | A | D | C | B | D | C | A | D | D | A |
| Approach Delay | | 26.9 | | | 30.6 | | | 31.1 | | | 33.3 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 100 | |
| Actuated Cycle Length: 83.8 | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.76 | |
| Intersection Signal Delay: 29.9 | Intersection LOS: C |
| Intersection Capacity Utilization 63.6% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Joiner Parkway & Nicolaus Road



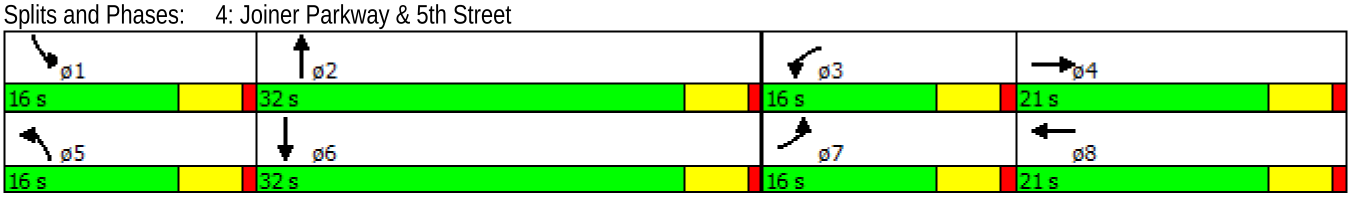
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 50 | 60 | 103 | 80 | 15 | 55 | 44 | 879 | 60 | 85 | 522 | 30 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 0 | 145 | | 0 | 150 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | | | 0.98 | | | 1.00 | | | 1.00 | |
| Frt | | 0.905 | | | 0.882 | | | 0.990 | | | 0.992 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1665 | 0 | 1770 | 1617 | 0 | 1770 | 3496 | 0 | 1770 | 3505 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1665 | 0 | 1770 | 1617 | 0 | 1770 | 3496 | 0 | 1770 | 3505 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 90 | | | 58 | | | 9 | | | 7 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 594 | | | 669 | | | 959 | | | 2007 | |
| Travel Time (s) | | 11.6 | | | 13.0 | | | 16.3 | | | 34.2 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 53 | 63 | 109 | 84 | 16 | 58 | 46 | 925 | 63 | 89 | 549 | 32 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 53 | 172 | 0 | 84 | 74 | 0 | 46 | 988 | 0 | 89 | 581 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permitted Phases | | | | | | | | | | | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 32.0 | | 16.0 | 32.0 | |
| Total Split (%) | 18.8% | 24.7% | | 18.8% | 24.7% | | 18.8% | 37.6% | | 18.8% | 37.6% | |
| Maximum Green (s) | 11.0 | 16.0 | | 11.0 | 16.0 | | 11.0 | 27.0 | | 11.0 | 27.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | | | 5 | | | 5 | | | 5 | |
| Act Effct Green (s) | 7.9 | 9.6 | | 8.7 | 12.8 | | 7.6 | 28.5 | | 8.8 | 32.0 | |
| Actuated g/C Ratio | 0.11 | 0.14 | | 0.12 | 0.18 | | 0.11 | 0.41 | | 0.13 | 0.46 | |
| v/c Ratio | 0.27 | 0.56 | | 0.38 | 0.22 | | 0.24 | 0.69 | | 0.40 | 0.36 | |
| Control Delay | 36.0 | 23.8 | | 37.4 | 13.3 | | 36.0 | 24.6 | | 37.7 | 17.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 36.0 | 23.8 | | 37.4 | 13.3 | | 36.0 | 24.6 | | 37.7 | 17.0 | |
| LOS | D | C | | D | B | | D | C | | D | B | |
| Approach Delay | | 26.7 | | | 26.1 | | | 25.1 | | | 19.8 | |
| Approach LOS | | C | | | C | | | C | | | B | |

**Intersection Summary**

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 69.9
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 23.6 Intersection LOS: C
Intersection Capacity Utilization 62.5% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Joiner Parkway & 5th Street

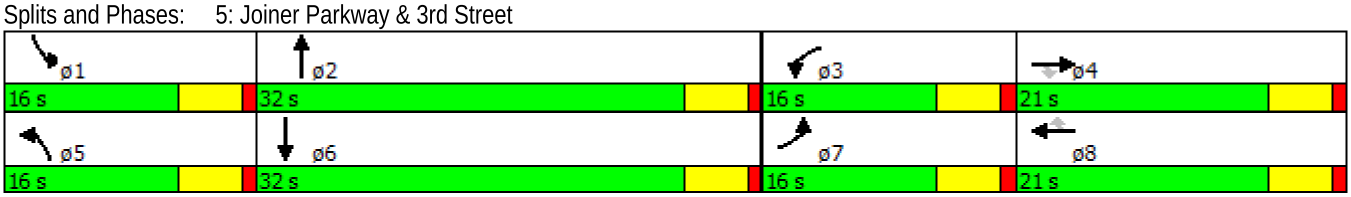


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 60 | 70 | 70 | 80 | 80 | 70 | 40 | 988 | 60 | 70 | 695 | 40 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 145 | 150 | | 150 | 140 | | 0 | 140 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | 0.98 | | | 0.98 | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | | 0.850 | | 0.991 | | | 0.992 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3501 | 0 | 1770 | 3505 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1552 | 1770 | 1863 | 1552 | 1770 | 3501 | 0 | 1770 | 3505 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 154 | | | 154 | | 8 | | | 7 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 866 | | | 595 | | | 906 | | | 959 | |
| Travel Time (s) | | 16.9 | | | 11.6 | | | 15.4 | | | 16.3 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 65 | 76 | 76 | 87 | 87 | 76 | 43 | 1074 | 65 | 76 | 757 | 43 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 65 | 76 | 76 | 87 | 87 | 76 | 43 | 1139 | 0 | 76 | 800 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 32.0 | | 16.0 | 32.0 | |
| Total Split (%) | 18.8% | 24.7% | 24.7% | 18.8% | 24.7% | 24.7% | 18.8% | 37.6% | | 18.8% | 37.6% | |
| Maximum Green (s) | 11.0 | 16.0 | 16.0 | 11.0 | 16.0 | 16.0 | 11.0 | 27.0 | | 11.0 | 27.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 8.2 | 9.1 | 9.1 | 8.7 | 12.1 | 12.1 | 7.5 | 33.6 | | 8.4 | 36.8 | |
| Actuated g/C Ratio | 0.12 | 0.13 | 0.13 | 0.13 | 0.18 | 0.18 | 0.11 | 0.49 | | 0.12 | 0.53 | |
| v/c Ratio | 0.31 | 0.31 | 0.22 | 0.39 | 0.27 | 0.19 | 0.22 | 0.67 | | 0.35 | 0.43 | |
| Control Delay | 36.0 | 33.5 | 1.5 | 37.1 | 30.8 | 1.1 | 35.4 | 24.4 | | 36.6 | 17.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 36.0 | 33.5 | 1.5 | 37.1 | 30.8 | 1.1 | 35.4 | 24.4 | | 36.6 | 17.5 | |
| LOS | D | C | A | D | C | A | D | C | | D | B | |
| Approach Delay | | 23.1 | | | 23.9 | | | 24.8 | | | 19.2 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 85 | |
| Actuated Cycle Length: 69.1 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.67 | |
| Intersection Signal Delay: 22.6 | Intersection LOS: C |
| Intersection Capacity Utilization 57.1% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Joiner Parkway & 3rd Street

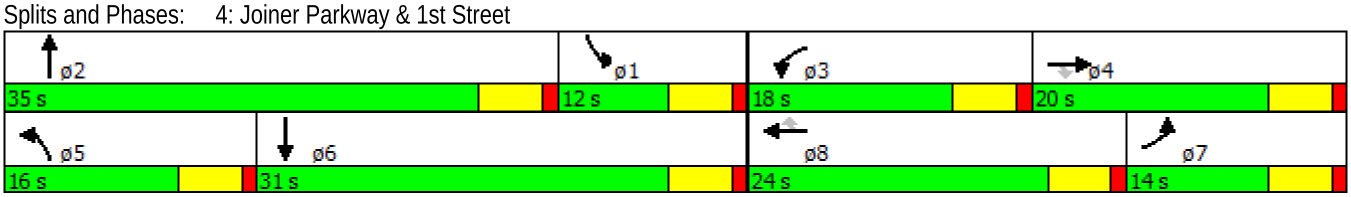


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 70 | 70 | 280 | 160 | 140 | 61 | 160 | 997 | 130 | 51 | 613 | 131 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 124 | | 124 | 129 | | 129 | 111 | | 0 | 169 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | 0.983 | | | 0.974 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3479 | 0 | 1770 | 3447 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3479 | 0 | 1770 | 3447 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 304 | | | 218 | | 18 | | | 31 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1101 | | | 816 | | | 875 | | | 912 | |
| Travel Time (s) | | 25.0 | | | 18.5 | | | 19.9 | | | 20.7 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 76 | 76 | 304 | 174 | 152 | 66 | 174 | 1084 | 141 | 55 | 667 | 142 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 76 | 76 | 304 | 174 | 152 | 66 | 174 | 1225 | 0 | 55 | 809 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 12.0 | 20.0 | 20.0 | 12.0 | 20.0 | 20.0 | 12.0 | 31.0 | | 12.0 | 31.0 | |
| Total Split (s) | 14.0 | 20.0 | 20.0 | 18.0 | 24.0 | 24.0 | 16.0 | 35.0 | | 12.0 | 31.0 | |
| Total Split (%) | 16.5% | 23.5% | 23.5% | 21.2% | 28.2% | 28.2% | 18.8% | 41.2% | | 14.1% | 36.5% | |
| Maximum Green (s) | 9.0 | 15.0 | 15.0 | 13.0 | 19.0 | 19.0 | 11.0 | 30.0 | | 7.0 | 26.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lead | Lead | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 10.0 | 10.0 | | 10.0 | 10.0 | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 8.9 | 9.2 | 9.2 | 11.4 | 11.4 | 11.4 | 10.5 | 31.7 | | 6.7 | 22.6 | |
| Actuated g/C Ratio | 0.12 | 0.12 | 0.12 | 0.15 | 0.15 | 0.15 | 0.14 | 0.43 | | 0.09 | 0.30 | |
| v/c Ratio | 0.36 | 0.33 | 0.66 | 0.64 | 0.53 | 0.15 | 0.70 | 0.82 | | 0.35 | 0.75 | |
| Control Delay | 37.4 | 35.3 | 11.7 | 43.4 | 37.4 | 0.8 | 49.3 | 27.1 | | 41.5 | 28.0 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 37.4 | 35.3 | 11.7 | 43.4 | 37.4 | 0.8 | 49.3 | 27.1 | | 41.5 | 28.0 | |
| LOS | D | D | B | D | D | A | D | C | | D | C | |
| Approach Delay | | 19.9 | | | 33.9 | | | 29.9 | | | 28.9 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 85 | |
| Actuated Cycle Length: 74.1 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.82 Intersection | |
| Signal Delay: 28.5 | Intersection LOS: C |
| Intersection Capacity Utilization 64.3% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Joiner Parkway & 1st Street



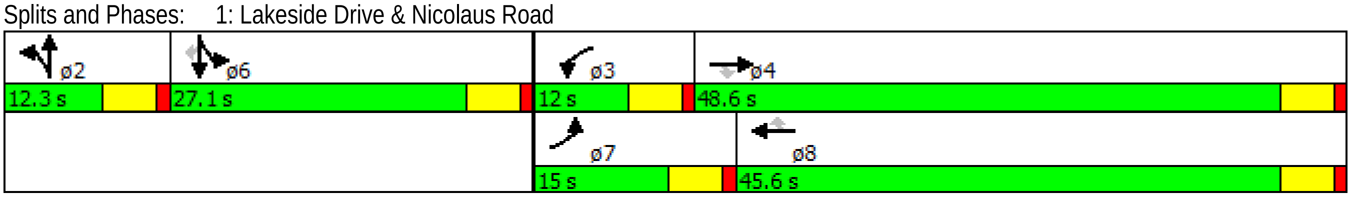
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 150 | 1447 | 20 | 50 | 812 | 126 | 15 | 10 | 30 | 91 | 10 | 95 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 174 | | 174 | 176 | | 176 | 0 | | 0 | 0 | | 174 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 0 | | 0 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | 0.97 | | | 0.98 | | 0.99 | | | | 0.98 |
| Frt | | | 0.850 | | | 0.850 | | 0.926 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.987 | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 0 | 1686 | 0 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.987 | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3539 | 1531 | 1770 | 3539 | 1552 | 0 | 1683 | 0 | 1770 | 1863 | 1551 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 131 | | | 137 | | 33 | | | | 131 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1129 | | | 1030 | | | 428 | | | 612 | |
| Travel Time (s) | | 25.7 | | | 23.4 | | | 9.7 | | | 13.9 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | 5 | | | | | 5 |
| Confl. Bikes (#/hr) | | | 2 | | | 2 | | | 2 | | | 2 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 163 | 1573 | 22 | 54 | 883 | 137 | 16 | 11 | 33 | 99 | 11 | 103 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 163 | 1573 | 22 | 54 | 883 | 137 | 0 | 60 | 0 | 99 | 11 | 103 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Split | NA | | Split | NA | Perm |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 12.0 | 27.1 | 27.1 | 12.0 | 27.1 | 27.1 | 12.0 | 12.0 | | 27.1 | 27.1 | 27.1 |
| Total Split (s) | 15.0 | 48.6 | 48.6 | 12.0 | 45.6 | 45.6 | 12.3 | 12.3 | | 27.1 | 27.1 | 27.1 |
| Total Split (%) | 15.0% | 48.6% | 48.6% | 12.0% | 45.6% | 45.6% | 12.3% | 12.3% | | 27.1% | 27.1% | 27.1% |
| Maximum Green (s) | 10.0 | 43.6 | 43.6 | 7.0 | 40.6 | 40.6 | 7.3 | 7.3 | | 22.1 | 22.1 | 22.1 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | | 5.0 | 5.0 | 5.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | None | Min | Min | | Min | Min | Min |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | | | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 17.1 | 17.1 | | 17.1 | 17.1 | | | | 17.1 | 17.1 | 17.1 |
| Pedestrian Calls (#/hr) | | 10 | 10 | | 10 | 10 | | | | 10 | 10 | 10 |
| Act Effct Green (s) | 10.2 | 44.4 | 44.4 | 6.7 | 35.7 | 35.7 | | 6.5 | | 11.4 | 11.4 | 11.4 |
| Actuated g/C Ratio | 0.12 | 0.53 | 0.53 | 0.08 | 0.42 | 0.42 | | 0.08 | | 0.14 | 0.14 | 0.14 |
| v/c Ratio | 0.76 | 0.84 | 0.03 | 0.38 | 0.59 | 0.19 | | 0.37 | | 0.41 | 0.04 | 0.32 |
| Control Delay | 62.8 | 25.0 | 0.1 | 48.8 | 21.0 | 3.9 | | 30.2 | | 39.6 | 32.8 | 6.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 62.8 | 25.0 | 0.1 | 48.8 | 21.0 | 3.9 | | 30.2 | | 39.6 | 32.8 | 6.2 |
| LOS | E | C | A | D | C | A | | C | | D | C | A |
| Approach Delay | | 28.2 | | | 20.2 | | | 30.2 | | | 23.1 | |
| Approach LOS | | C | | | C | | | C | | | C | |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 84.1
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 25.1 Intersection LOS: C
Intersection Capacity Utilization 68.6% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Lakeside Drive & Nicolaus Road



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 1555 | 13 | 23 | 980 | 8 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 0 | 150 | | 0 | 25 |
| Storage Lanes | | 0 | 1 | | 1 | 1 |
| Taper Length (ft) | | | 60 | | 60 | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | 0.999 | | | | | 0.850 |
| Flt Protected | | | 0.950 | | 0.950 | |
| Satd. Flow (prot) | 3536 | 0 | 1770 | 3539 | 1770 | 1583 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3536 | 0 | 1770 | 3539 | 1770 | 1583 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 1030 | | | 2067 | 308 | |
| Travel Time (s) | 23.4 | | | 47.0 | 7.0 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 1690 | 14 | 25 | 1065 | 9 | 14 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 1704 | 0 | 25 | 1065 | 9 | 14 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 12 | 12 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Stop | |

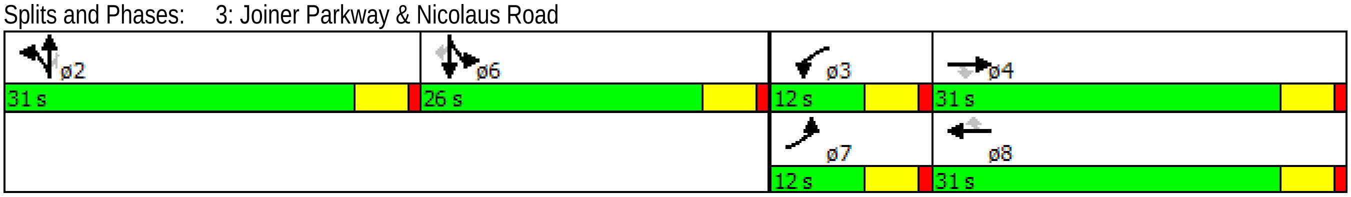
| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Control Type: Unsignalized | |
| Intersection Delay 0.5 | Level of Service A |
| Analysis Period (min) 15 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 36 | 704 | 828 | 50 | 627 | 130 | 345 | 160 | 60 | 80 | 240 | 31 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 193 | | 193 | 0 | | 81 | 210 | | 210 | 151 | | 151 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 0.91 | 0.91 | 1.00 | 0.91 | 0.91 | 1.00 |
| Ped Bike Factor | | | 0.98 | | | 0.98 | | | 0.98 | | | 0.98 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.975 | | 0.950 | 0.998 | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 | 1610 | 3305 | 1583 | 1610 | 3383 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.975 | | 0.950 | 0.998 | |
| Satd. Flow (perm) | 1770 | 3539 | 1551 | 1770 | 3539 | 1551 | 1610 | 3305 | 1552 | 1610 | 3383 | 1553 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 655 | | | 131 | | | 131 | | | 131 |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 35 | |
| Link Distance (ft) | | 2067 | | | 258 | | | 1053 | | | 928 | |
| Travel Time (s) | | 40.3 | | | 5.0 | | | 17.9 | | | 18.1 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Confl. Bikes (#/hr) | | | 2 | | | 2 | | | 2 | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 39 | 765 | 900 | 54 | 682 | 141 | 375 | 174 | 65 | 87 | 261 | 34 |
| Shared Lane Traffic (%) | | | | | | | 50% | | | 10% | | |
| Lane Group Flow (vph) | 39 | 765 | 900 | 54 | 682 | 141 | 187 | 362 | 65 | 78 | 270 | 34 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Split | NA | Perm | Split | NA | Perm |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 12.0 | 26.0 | 26.0 | 12.0 | 26.0 | 26.0 | 28.0 | 28.0 | 28.0 | 26.0 | 26.0 | 26.0 |
| Total Split (s) | 12.0 | 31.0 | 31.0 | 12.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 26.0 | 26.0 | 26.0 |
| Total Split (%) | 12.0% | 31.0% | 31.0% | 12.0% | 31.0% | 31.0% | 31.0% | 31.0% | 31.0% | 26.0% | 26.0% | 26.0% |
| Maximum Green (s) | 7.0 | 26.0 | 26.0 | 7.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 21.0 | 21.0 | 21.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | None | Min | Min | Min | Min | Min | Min |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 16.0 | 16.0 | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 16.0 | 16.0 | 16.0 |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Act Effct Green (s) | 6.7 | 27.0 | 27.0 | 6.8 | 27.0 | 27.0 | 15.7 | 15.7 | 15.7 | 12.5 | 12.5 | 12.5 |
| Actuated g/C Ratio | 0.09 | 0.35 | 0.35 | 0.09 | 0.35 | 0.35 | 0.20 | 0.20 | 0.20 | 0.16 | 0.16 | 0.16 |
| v/c Ratio | 0.25 | 0.62 | 0.93 | 0.35 | 0.55 | 0.22 | 0.57 | 0.54 | 0.15 | 0.30 | 0.49 | 0.09 |
| Control Delay | 43.2 | 26.9 | 26.1 | 45.3 | 25.6 | 7.1 | 36.6 | 31.6 | 0.8 | 34.5 | 34.3 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 43.2 | 26.9 | 26.1 | 45.3 | 25.6 | 7.1 | 36.6 | 31.6 | 0.8 | 34.5 | 34.3 | 0.5 |
| LOS | D | C | C | D | C | A | D | C | A | C | C | A |
| Approach Delay | | 26.9 | | | 23.8 | | | 29.9 | | | 31.3 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 100 | |
| Actuated Cycle Length: 77.2 | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.93 | |
| Intersection Signal Delay: 27.1 | Intersection LOS: C |
| Intersection Capacity Utilization 75.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Joiner Parkway & Nicolaus Road

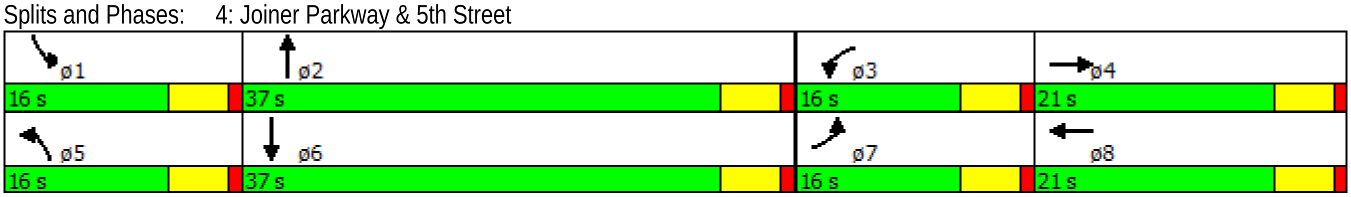


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 25 | 25 | 50 | 60 | 30 | 60 | 95 | 545 | 110 | 40 | 1108 | 50 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 0 | 145 | | 0 | 150 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | | | 0.99 | | | 0.99 | | | 1.00 | |
| Frt | | 0.899 | | | 0.901 | | | 0.975 | | | 0.993 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1652 | 0 | 1770 | 1656 | 0 | 1770 | 3431 | 0 | 1770 | 3509 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1652 | 0 | 1770 | 1656 | 0 | 1770 | 3431 | 0 | 1770 | 3509 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 53 | | | 63 | | | 29 | | | 6 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 501 | | | 597 | | | 953 | | | 2007 | |
| Travel Time (s) | | 9.8 | | | 11.6 | | | 16.2 | | | 34.2 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 26 | 26 | 53 | 63 | 32 | 63 | 101 | 574 | 116 | 42 | 1166 | 53 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 26 | 79 | 0 | 63 | 95 | 0 | 101 | 690 | 0 | 42 | 1219 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permitted Phases | | | | | | | | | | | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | | 16.0 | 21.0 | | 16.0 | 37.0 | | 16.0 | 37.0 | |
| Total Split (%) | 17.8% | 23.3% | | 17.8% | 23.3% | | 17.8% | 41.1% | | 17.8% | 41.1% | |
| Maximum Green (s) | 11.0 | 16.0 | | 11.0 | 16.0 | | 11.0 | 32.0 | | 11.0 | 32.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | | | 5 | | | 5 | | | 5 | |
| Act Effct Green (s) | 7.1 | 8.4 | | 8.4 | 11.4 | | 9.4 | 41.2 | | 7.7 | 37.2 | |
| Actuated g/C Ratio | 0.10 | 0.12 | | 0.12 | 0.17 | | 0.14 | 0.60 | | 0.11 | 0.54 | |
| v/c Ratio | 0.14 | 0.32 | | 0.29 | 0.29 | | 0.42 | 0.33 | | 0.21 | 0.64 | |
| Control Delay | 37.0 | 18.9 | | 37.1 | 15.9 | | 38.7 | 13.9 | | 36.8 | 21.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 37.0 | 18.9 | | 37.1 | 15.9 | | 38.7 | 13.9 | | 36.8 | 21.4 | |
| LOS | D | B | | D | B | | D | B | | D | C | |
| Approach Delay | | 23.4 | | | 24.4 | | | 17.0 | | | 21.9 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 90 | |
| Actuated Cycle Length: 68.9 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.64 Intersection | |
| Signal Delay: 20.4 | Intersection LOS: C |
| Intersection Capacity Utilization 60.6% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Joiner Parkway & 5th Street



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 30 | 170 | 50 | 80 | 50 | 50 | 70 | 740 | 80 | 50 | 1168 | 40 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 145 | | 145 | 150 | | 150 | 140 | | 0 | 140 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | 0.98 | | | 0.98 | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | | 0.850 | | 0.985 | | | 0.995 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3474 | 0 | 1770 | 3517 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1549 | 1770 | 1863 | 1549 | 1770 | 3474 | 0 | 1770 | 3517 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 125 | | | 125 | | 14 | | | 4 | |
| Link Speed (mph) | | 35 | | | 35 | | | 40 | | | 40 | |
| Link Distance (ft) | | 615 | | | 555 | | | 910 | | | 953 | |
| Travel Time (s) | | 12.0 | | | 10.8 | | | 15.5 | | | 16.2 | |
| Confl. Peds. (#/hr) | | | 5 | | | 5 | | | 5 | | | 5 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 32 | 181 | 53 | 85 | 53 | 53 | 74 | 788 | 85 | 53 | 1243 | 43 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 32 | 181 | 53 | 85 | 53 | 53 | 74 | 873 | 0 | 53 | 1286 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | | 16.0 | 21.0 | |
| Total Split (s) | 16.0 | 21.0 | 21.0 | 16.0 | 21.0 | 21.0 | 16.0 | 52.0 | | 16.0 | 52.0 | |
| Total Split (%) | 15.2% | 20.0% | 20.0% | 15.2% | 20.0% | 20.0% | 15.2% | 49.5% | | 15.2% | 49.5% | |
| Maximum Green (s) | 11.0 | 16.0 | 16.0 | 11.0 | 16.0 | 16.0 | 11.0 | 47.0 | | 11.0 | 47.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 7.6 | 13.5 | 13.5 | 9.5 | 17.5 | 17.5 | 9.2 | 43.0 | | 8.5 | 42.4 | |
| Actuated g/C Ratio | 0.09 | 0.15 | 0.15 | 0.11 | 0.20 | 0.20 | 0.10 | 0.49 | | 0.10 | 0.48 | |
| v/c Ratio | 0.21 | 0.64 | 0.15 | 0.45 | 0.14 | 0.13 | 0.40 | 0.51 | | 0.31 | 0.76 | |
| Control Delay | 47.5 | 50.7 | 1.0 | 51.1 | 36.3 | 0.7 | 49.9 | 19.2 | | 48.3 | 25.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 47.5 | 50.7 | 1.0 | 51.1 | 36.3 | 0.7 | 49.9 | 19.2 | | 48.3 | 25.5 | |
| LOS | D | D | A | D | D | A | D | B | | D | C | |
| Approach Delay | | 40.4 | | | 33.0 | | | 21.6 | | | 26.4 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 105 | |
| Actuated Cycle Length: 88.4 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.76 | |
| Intersection Signal Delay: 26.5 | Intersection LOS: C |
| Intersection Capacity Utilization 68.2% | ICU Level of Service C |
| Analysis Period (min) 15 | |

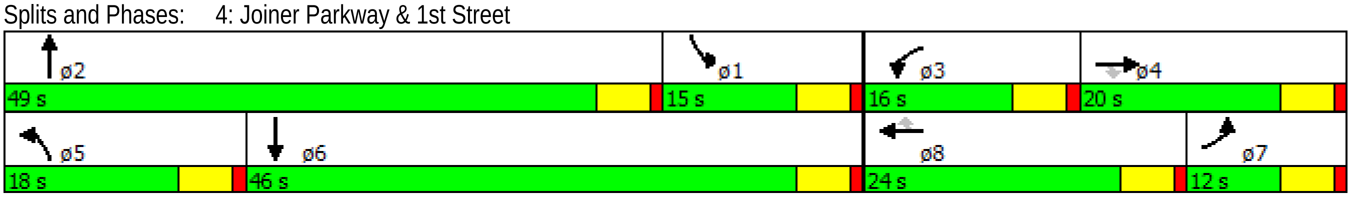
Splits and Phases: 5: Joiner Parkway & 3rd Street

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 40 | 60 | 210 | 140 | 50 | 61 | 170 | 809 | 110 | 81 | 1197 | 40 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 124 | | 124 | 129 | | 129 | 111 | | 0 | 169 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 60 | | | 60 | | | 60 | | | 60 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | 0.982 | | | 0.995 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3476 | 0 | 1770 | 3522 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 | 1770 | 3476 | 0 | 1770 | 3522 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 228 | | | 185 | | 19 | | | 4 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1101 | | | 816 | | | 875 | | | 912 | |
| Travel Time (s) | | 25.0 | | | 18.5 | | | 19.9 | | | 20.7 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 43 | 65 | 228 | 152 | 54 | 66 | 185 | 880 | 120 | 88 | 1301 | 43 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 43 | 65 | 228 | 152 | 54 | 66 | 185 | 1000 | 0 | 88 | 1344 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Minimum Split (s) | 12.0 | 20.0 | 20.0 | 12.0 | 20.0 | 20.0 | 12.0 | 31.0 | | 12.0 | 31.0 | |
| Total Split (s) | 12.0 | 20.0 | 20.0 | 16.0 | 24.0 | 24.0 | 18.0 | 49.0 | | 15.0 | 46.0 | |
| Total Split (%) | 12.0% | 20.0% | 20.0% | 16.0% | 24.0% | 24.0% | 18.0% | 49.0% | | 15.0% | 46.0% | |
| Maximum Green (s) | 7.0 | 15.0 | 15.0 | 11.0 | 19.0 | 19.0 | 13.0 | 44.0 | | 10.0 | 41.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lead | Lead | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | Min | | None | Min | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 10.0 | 10.0 | | 10.0 | 10.0 | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 5 | 5 | | 5 | 5 | | 5 | | | 5 | |
| Act Effct Green (s) | 9.1 | 9.1 | 9.1 | 10.6 | 12.1 | 12.1 | 12.4 | 40.2 | | 14.4 | 39.6 | |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.10 | 0.12 | 0.13 | 0.13 | 0.13 | 0.44 | | 0.16 | 0.43 | |
| v/c Ratio | 0.25 | 0.35 | 0.63 | 0.75 | 0.22 | 0.18 | 0.77 | 0.65 | | 0.32 | 0.88 | |
| Control Delay | 42.9 | 44.7 | 13.8 | 64.0 | 40.0 | 1.1 | 62.3 | 24.2 | | 39.9 | 33.1 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 42.9 | 44.7 | 13.8 | 64.0 | 40.0 | 1.1 | 62.3 | 24.2 | | 39.9 | 33.1 | |
| LOS | D | D | B | E | D | A | E | C | | D | C | |
| Approach Delay | | 23.5 | | | 43.9 | | | 30.1 | | | 33.5 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Area Type: Other | |
| Cycle Length: 100 | |
| Actuated Cycle Length: 91.9 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.88 | |
| Intersection Signal Delay: 32.1 | Intersection LOS: C |
| Intersection Capacity Utilization 70.7% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Joiner Parkway & 1st Street



# Appendix L

**Sewer and Water Demand Analysis**

## Preliminary Sanitary Sewer Demand Analysis

The purpose of this analysis is to present the results of the wastewater flow analysis and to quantify the sanitary sewer generation resulting from the Fullerton Ranch Planned Development Project. The following analysis was based on the land use proposed in the URS "Village Alternative" model, which was developed as an update to the City of Lincoln 1998 General Plan.[1]

The average dry weather flow (ADWF) at the City's Wastewater Treatment and Reclamation Facility (WWTRF) from the City of Lincoln at General Plan buildout is estimated at 26.4 million gallons per day (MGD). An additional 8 MGD from the Placer Nevada Wastewater Authority (PNWWA) communities is estimated during the same horizon. As shown in Table 1 below, the total ADWF to be conveyed to and treated by the WWTRF is approximately 34.4 MGD, with a total peak wet weather flow (PWWF) of 120 MGD.

***Table 1: Projected WWRTF Flows***

| | ***ADWF$^{(1)}$ (MGD)*** | ***PWWF$^{(2)}$ (MGD)*** |
|---|---|---|
| 1998 General Plan Buildout | 10.97 | 38.4 |
| City of Lincoln Village Alternatives (New General Plan) | 13.51 | 47.3 |
| Other$^{(3)}$ | 1.86 | 6.51 |
| PNWWA (Regional) | 8.00 | 28.0 |
| *TOTAL* | *34.40* | *120* |

*Notes:*

*(1) Average Dry Weather Flow, in million gallons per day (MGD).*

*(2) Peak Wet Weather Flow, in million gallons per day (MGD).*

*(3) Area within the sphere of influence but not within a village or the General Plan boundary.*

*Source: Sewer Constraints Analysis and Sewer Facilities Cost Estimate (Appendix G of General Plan Update EIR), Table 3.*

As shown in Table 2 below, the total projected ADWF to be conveyed to and treated by the WWTRF from Lincoln is approximately 26.4 MGD at General Plan buildout. This would provide excess capacity of an estimated 8.0 MGD. The total projected PWWF is 92.2 MGD at General Plan buildout, which would result in an excess of 27.8 MGD. Expansion of the WWTRF to provide capacity for General Plan buildout has been previously envisioned for the main WWTRF components, with the exception of the maturation basin and effluent storage basin. A facility plan for the first WWTRF expansion would increase capacity from the current 4.2 MGD to 6.3 or 8.4 MGD.

[1] City of Lincoln. Appendix G: Sewer Constraints Analysis and Sewer Facilities Cost Estimate. February 24, 2006.

***Table 2: Projected WWRTF Flows[1] from City of Lincoln***

| Village | Residential EDU[2] | Commercial Acres | Public Acres | Industrial Acres | ADWF (MGD) | PWWF (MGD) |
|---|---|---|---|---|---|---|
| V-1 | 3,507 | 20 | 48 | 0 | 1.09 | 3.81 |
| V-2 | 3,874 | 12 | 0 | 0 | 1.08 | 3.78 |
| V-3 | 4,841 | 70 | 0 | 0 | 1.50 | 5.25 |
| V-4 | 5,421 | 12 | 0 | 0 | 1.48 | 5.18 |
| V-5 | 5,779 | 12 | 0 | 0 | 1.59 | 5.57 |
| V-6 | 5,083 | 12 | 0 | 0 | 1.38 | 4.83 |
| V-7 | 2,898 | 5 | 0 | 0 | 0.78 | 2.73 |
| SUD-A | 1,623 | 1,170 | 0 | 142 | 2.56 | 8.96 |
| SUD-B | 426 | 413 | 0 | 0 | 0.77 | 2.70 |
| SUD-C | 0 | 0 | 0 | 644 | 1.29 | 4.52 |
| Other | 286 | 257 | 603 | 387 | 1.86 | 6.51 |
| 1998 GP Buildout | 21,846 | 352 | 660 | 1,834 | 10.97 | 38.4 |
| *TOTAL* | *55,587* | *2,335* | *1,311* | *3,007* | *26.4* | *92.2* |

*Notes:*

*[1] Village Alternatives model.*

*[2] Equivalent dwelling units.*

*Source: Sewer Constraints Analysis and Sewer Facilities Cost Estimate (Appendix G of General Plan Update EIR), Table 4.*

The Fullerton Ranch Planned Development Project includes 8-inch sewer lines in the rights-of-way of the proposed residential roads. Sewer service would be provided by the City of Lincoln. Table 3 summarizes the projected sanitary sewer flow resulting from the Fullerton Ranch Planned Development Project.

***Table 3: Proposed Project Sanitary Sewer Generation***

| Land Use / Unit Count | Flow / Unit | Total Project Flow |
|---|---|---|
| 81 residential dwelling units | 250 gpd/du | 20,250 gpd |

*Note: gpd/du = gallons per day per dwelling unit.*

*Source: Sewer Constraints Analysis and Sewer Facilities Cost Estimate (Appendix G of General Plan Update EIR), Table 2.*

Although the project would generate the additional demand for wastewater collection, conveyance, and treatment, the recently completed Chambers Drive and Nicolaus Road Sewer Improvement Project and WWTRF would provide sufficient capacity to serve the project. Conveyance of wastewater to the WWTRF would ensure that wastewater generated by the project meets the Regional Water Quality Control Board's treatment requirements because the WWTRF maintains applicable permits for the treatment of wastewater separate from this project.

Table 4 compares the existing and projected sanitary sewer flow resulting from the Fullerton Ranch Planned Development Project.

*Table 4: Existing and Projected Sanitary Sewer Flow*

| | *ADWF$^{(1)}$ (MGD)* | *ADWF$^{(1)}$ (gallons/day)* |
|---|---|---|
| Existing | 2.7 | 2,700,000 |
| Existing + Approved Projects + Planned Projects[(2)] | 0.1 | 100,000 |
| Proposed Project | 0.02025 | 20,250 |
| *TOTAL* | *2.82025* | *2,820,250* |

*Notes:*

*[(1)] Average Dry Weather Flow, in million gallons per day (MGD) and gallons per day (gallons/day).*

*[(2)] Existing includes pending and approved projects in the City of Lincoln.*

*Source: Sewer Constraints Analysis and Sewer Facilities Cost Estimate (Appendix G of General Plan Update EIR), Table 2 and Table 4.*

Assuming 250 gpd for each of the proposed 81 single-family residences, the project would produce 20,250 gallons of wastewater per day. The WWTRF can treat dry weather flows of 4.2 MGD, and currently treats an average daily dry weather flow of approximately 2.7 MGD.[2] The City's most recent estimates of wastewater generated by existing, approved, and planned projects would increase average daily dry weather flows to approximately 2,800,000 gallons per day (2.8 MGD) at the City WWTRF.[3] As shown in Table 4, the wastewater generated by the Fullerton Ranch Planned Development Project would increase ADFW to approximately 2,820,250 gallons per day (2.82025 MGD) at the City WWTRF when considering the existing, approved, and planned projects. According to the Background Report prepared for the 2013-2021 Housing Element (City of Lincoln 2013), there is more than adequate capacity at the treatment plant to serve build-out of anticipated residential land in the city, and the distribution system operates at acceptable levels and has been designed to accommodate expansions and service extensions. The proposed project wastewater would not exceed the current capacity of the plant. The project applicant would be required to pay applicable connection fees.

## Preliminary Water Demand Analysis

The purpose of this analysis is to present the results of the water demand analysis and to quantify the water demand resulting from the Fullerton Ranch Planned Development Project. The following analysis was based on the City's 2015 Urban Water Management Plan, as well as the SB 610 Water Supply Assessment prepared for the Independence at Lincoln Development Project EIR.

Table 5 summarizes the City's estimated existing and planned future water demands, inclusive of non-revenue water needs, for each 5-year increment to 2040. As shown in the table, the estimated City water supplies in 2040 is approximately 20,336 acre-feet (AF).

---

[2] City of Lincoln. Draft Environmental Impact Report – Independence at Lincoln Development Project (page 4.9-14). September 30, 2016.

[3] *Ibid*.

***TABLE 5: EXISTING AND PLANNED FUTURE WATER DEMANDS (CURRENT – 2040)***

| CATEGORY | ESTIMATED DEMAND (AF/YR) | | | | | |
|---|---|---|---|---|---|---|
| | CURRENT | 2020 | 2025 | 2030 | 2035 | 2040 |
| Current Customer Use | 10,174 | 10,174 | 9,645 | 9,115 | 8,585 | 8,055 |
| Projects Underway | 0 | 53 | 247 | 324 | 332 | 479 |
| Other Proposed Project | 0 | 1,822 | 3,344 | 5,616 | 7,955 | 10,337 |
| GPU Land Use Growth | 0 | 0 | 0 | 0 | 0 | 1,224 |
| Independence Project | 0 | 241 | 241 | 241 | 241 | 241 |
| *TOTAL DEMAND* | *10,174* | *12,291* | *13,478* | *15,296* | *17,113* | *20,336* |

*Note: SF/yr = acre-feet per year.*

*Source: Independence Development Project SB 610 Water Supply Assessment, Table 3-2. September 2016.*

Table 6 summarizes the projected water demand resulting from the Fullerton Ranch Planned Development Project. As shown in the table, the estimated water demand for the proposed project would be 37.26 AF per year (AF/yr).

***TABLE 6: PROPOSED PROJECT WATER DEMAND***

| LAND USE / UNIT COUNT | DEMAND / UNIT | TOTAL PROJECT DEMAND |
|---|---|---|
| 81 low density residential dwelling units | 0.46 AF/account/yr | 37.26 AF/yr |

*Note: AF/account/yr = acre-feet per account per year.*

*Source: Lincoln 2015 Urban Water Management Plan, Table 4-5.*

The proposed project falls within assumed GPU Land Use Growth and the City is not projecting a shortage in its water supplies during either a single-dry or multiple dry year periods.[4]

The City of Lincoln is working closely with the Placer County Water Agency (PCWA) and the Nevada Irrigation District (NID) to implement short-term and long-range infrastructure projects to meet the City's water demand projections throughout implementation of the City's General Plan, which includes the project. PCWA has reflected the City's growth and water demand projections in its implementation of water infrastructure projects (i.e., transmission mains, water treatment plants, water rights, etc.). To meet the City's growth projections anticipated in the General Plan, PCWA and the City are on-track with implementation of projects to ensure adequate water supplies and distribution infrastructure are commissioned in advance of need.

In a March 2016 letter, PCWA indicated that unused capacity in their existing treatment plants could be used by the City to meet future growth needs. This is estimated to be about 4.5 MGD that the City currently has rights to but is not using. As of this year (2016), an additional 3.86 MGD is available, on a first come first serve basis, in PCWA's existing facilities.[5]

PCWA is required to deliver raw water to its treatment plants prior to treating and delivering the water to the City. The PCWA's Ophir Pipeline Project, constructed in 2014, will enable PCWA to deliver an additional 22,000 AF from the American River to its treatment facilities (Tully & Young 2016: 5-12).

It should be noted that there is sufficient capacity in existing PCWA transmission mains to deliver all of the City's current contract water (18.5 MGD), plus at least another 5 MGD of additional capacity. The City's

[4] City of Lincoln. City of Lincoln 2015 Urban Water Management Plan (page 6-6). Public Review Draft June 2016.

[5] City of Lincoln. City of Lincoln 2015 Urban Water Management Plan (page 3-4). Public Review Draft June 2016.

distribution system has a physical limitation to receive water in excess of 17.7 MGD until completion of the Phase 3 Pipeline and Metering Station, which provides a secondary point of connection for the City distribution system to PCWA transmission mains. This project is anticipated to be operating by January 2018, prior to buildout of the project.

Water service would be provided by the City of Lincoln, through its partnership with PCWA. PCWA does not reserve water for specific projects. Commitments for service are made only upon the execution of a pipeline extension or service order agreement to construct any necessary on- or offsite pipelines or other facilities and the payment of all required fees, including the Plant Expansion and Replacement Charges. In Lincoln, payment of such fees occurs in conjunction with building permits.

This water demand analysis demonstrates that adequate water supply would be available to serve the project and other existing and planned future water demands. As a condition of approval, the City shall require a final written verification that there is sufficient water supply as required by Government Code Section 66473.7(a)(1). Further, adequate treatment and distribution infrastructure is available or would be available prior to buildout of the project.