Appendix D

Michael Baker INTERNATIONAL

80 YEARS Making a Difference

TRAFFIC IMPACT ANALYSIS

Joiner Ranch East

Prepared for:

City of Lincoln
600 6th Street
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February 28, 2020

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EXECUTIVE SUMMARY

This study analyzes the forecast traffic conditions associated with the proposed Joiner Ranch East project (proposed project) in the City of Lincoln. The proposed project would develop 199 single-family dwelling units on 25.5 acres of undeveloped land on the southeast corner of the Joiner Parkway/Nicolaus Road intersection. The proposed project would be built in one phase and is scheduled to be fully constructed by Year 2021. The project site would take access via a full access driveway on Nicolaus Road and a right-in/right-out/left-in driveway on Joiner Parkway.

The proposed project is forecast to generate approximately 1,958 new daily trips, which includes approximately 146 AM (36 inbound and 110 outbound) peak hour trips and 197 PM (124 inbound and 73 outbound) peak hour trips.

Level of Service Analysis Results

Existing Conditions:

The results of the Existing conditions analysis show that all study intersections currently operate at acceptable levels of service (LOS C or better) except for the following locations:

- Joiner Parkway / Moore Road (LOS D in the AM Peak Hour)
- Ferrari Ranch Road / Groveland Lane (LOS D in the AM & PM Peak Hours)

The roadway segment analysis shows that all study segments currently operate at acceptable levels of service (LOS C or better).

Existing Plus Project Conditions:

With the addition of project related traffic, all study intersections continue to operate at acceptable levels of service for the Existing Plus Project conditions with the exception of the following locations:

- Joiner Parkway / Moore Road (LOS E in the AM Peak Hour)
- Ferrari Ranch Road / Groveland Lane (LOS D in the AM & PM Peak Hours)

Of the locations operating deficiently, no direct significant impacts are expected to occur according to the significance criteria for study intersections. Therefore, no mitigation is required.

The roadway segment analysis shows that all study roadway segments operate at acceptable levels of service (LOS C or better) under Existing Plus Project Conditions. Therefore, no significant impacts are identified and no mitigation is required.

Existing Plus Approved/Pending Projects Without Project Conditions:

The results of the Existing Plus Approved/Pending Projects Without Project analysis show that all study intersections operate at acceptable levels of service (LOS C or better) except for the following locations:

- Nicolaus Road / Nelson Lane (LOS D in the AM Peak Hour)
- Joiner Parkway / Moore Road (LOS E in the AM Peak Hour)

- Ferrari Ranch Road / Groveland Lane (LOS D in the AM Peak Hour & LOS E in the PM Peak Hour)

The roadway segment analysis shows that all study segments operate at acceptable levels of service (LOS C or better) under Existing Plus Approved/Pending Projects Without Project conditions.

Existing Plus Approved/Pending Projects Plus Project Conditions:

With the addition of project related traffic, all study intersections continue to operate at acceptable levels of service (LOS C or better) for the Existing Plus Approved/Pending Projects Plus Project conditions except for the following locations:

- Nicolaus Road / Nelson Lane (LOS E in the AM Peak Hour)
- Joiner Parkway / Moore Road (LOS E in the AM Peak Hour)
- Ferrari Ranch Road / Groveland Lane (LOS D in the AM Peak Hour & LOS E in the PM Peak Hour)

Of the locations operating deficiently, no significant impacts are expected to occur according to the significance criteria for study intersections. Therefore, no mitigation is required.

The roadway segment analysis shows that all study roadway segments operate at acceptable levels of service (LOS C or better) under Existing Plus Approved/Pending Projects Plus Project Conditions. Therefore, no significant impacts are identified and no mitigation is required.

Cumulative Year 2040 Without Project Conditions:

The results of the Cumulative Year 2040 Without Project analysis show that all study intersections are forecast to operate at acceptable levels of service (LOS C or better) except for the following locations:

- Nicolaus Road / Nelson Lane (LOS D in the AM Peak Hour & LOS E in the PM Peak Hour)
- Joiner Parkway / Nicolaus Road (LOS E in the AM Peak Hour)
- Joiner Parkway / 1st Street (LOS E in the AM Peak Hour)
- Joiner Parkway / Moore Road (LOS F in the AM Peak Hour & LOS E in the PM Peak Hour)
- Joiner Parkway / Groveland Lane (LOS F in the AM Peak Hour & LOS D in the PM Peak Hour)
- Ferrari Ranch Road / Groveland Lane (LOS D in the AM and PM Peak Hours)

The roadway segment analysis shows that six out of eight study segments currently operate at deficient levels of service (LOS D or worse) under Cumulative Year 2040 Without Project conditions which include the following locations:

- Nicolaus Road from Lakeside Drive to Joiner Parkway (LOS D)
- Nicolaus Road from Joiner Parkway to O Street (LOS D)
- Joiner Parkway from 1st Street to Moore Road (LOS E)
- Joiner Parkway from Danbury Drive to Groveland Lane (LOS E)
- Ferrari Ranch Road from Joiner Parkway to Danbury Drive (LOS F)
- Ferrari Ranch Road from SR-65 NB Ramps to Groveland Lane (LOS E)

Cumulative Year 2040 Plus Project Conditions:

With the addition of project related traffic, all study intersections continue to operate at acceptable levels of service (LOS C or better) for the Cumulative Year 2040 Plus Project conditions except for the following locations:

- Nicolaus Road / Nelson Lane (LOS D in the AM Peak Hour & LOS E in the PM Peak Hour)
- Joiner Parkway / Nicolaus Road (LOS E in the AM Peak Hour)
- Joiner Parkway / 1st Street (LOS F in the AM Peak Hour)
- Joiner Parkway / Moore Road (LOS F in the AM & PM Peak Hour)
- Joiner Parkway / Groveland Lane (LOS F in the AM Peak Hour & LOS D in the PM Peak Hour)
- Ferrari Ranch Road / Groveland Lane (LOS D in the AM and PM Peak Hours)

Of the locations operating deficiently, one of the six is forecast to result in a significant impact according to the significance criteria and would require mitigation. The mitigation measure shown in **Table ES-1** has been identified to achieve acceptable levels of service and fully mitigate project forecast significant impact at the study intersection for Cumulative Year 2040 Plus Project conditions.

> **Joiner Parkway / Moore Road Mitigation Measure:** The project applicant will contribute its fair share cost toward installation of a traffic signal at the Joiner Parkway / Moore Road intersection within the existing right-of-way. The City of Lincoln's Public Facilities Element (PFE) has already identified the need for signalization at this intersection (# 71 in PFE Map). Thus, mitigation proposed is consistent with the project's qualifying for funding in the PFE. **Table ES-1** shows the improved level of service at Joiner Parkway / Moore Road with the installation of a traffic signal.

The roadway segment analysis shows that six out of eight study segments currently operate at deficient levels of service (LOS D or worse) under Cumulative Year 2040 Plus Project conditions which include the following locations:

- Nicolaus Road from Lakeside Drive to Joiner Parkway (LOS D)
- Nicolaus Road from Joiner Parkway to O Street (LOS E)
- Joiner Parkway from 1st Street to Moore Road (LOS E)
- Joiner Parkway from Danbury Drive to Groveland Lane (LOS E)
- Ferrari Ranch Road from Joiner Parkway to Danbury Drive (LOS F)
- Ferrari Ranch Road from SR-65 NB Ramps to Groveland Lane (LOS E)

Of the locations operating deficiently, one of the eight study roadway segments is forecast to result in a cumulative significant impact according to the significance criteria and would require mitigation.

> **Nicolaus Road from Joiner Parkway to O Street Mitigation Measure:** The project plans to widen Nicolaus Road on the south side along the project frontage (approximately 1,150 feet). The widening would consist of adding approximately 30 feet to the existing 40-foot pavement width to match the existing curb-to-curb width of 70 feet immediately east of the project site. This new section of roadway would include one travel lane in each direction with a center two-way left-turn lane (3 total lanes) which will increase roadway capacity from 18,000 to 27,000 vehicles per day. In addition, the center two-way left-turn lane would allow for westbound left-turn movements into the project site. As shown in **Table ES-1**, this mitigation would improve the level of service to an acceptable level (LOS

C) and fully mitigate the project forecast significant impact at the study segment under Cumulative Year 2040 Plus Project conditions.

Vehicle Miles Traveled (VMT) Summary:

This report evaluates potential VMT impacts as it relates to the proposed project. VMT per capita maps were used to determine if the project is located within a low or high VMT per capita area compared to the average VMT per capita in the Sacramento region. According to the VMT maps, the project site is located within an area that is expected to generate 100% to 115% of the regional average VMT per capita. This map indicates the project site is not located within a VMT efficient area. As there is not high-quality transit within ¼ mile of the site, the project is also not included in a transit priority area. Based on screening criteria established by OPR, the project would likely be subject to a CEQA VMT analysis. Since the VMT per capita maps show the project site to be in an area where VMT is currently 100% to 115% of the regional average, it is reasonable to assume the proposed residential project in the City of Lincoln falls above the 85% threshold and will most likely have a significant VMT impact that will require mitigation.

For the project to reduce VMT-related impacts, recommended mitigation would be for the project to implement Transportation Demand Management (TDM) strategies. The California Air Pollution Control Officers Association (CAPCOA) report may be used to determine a wide range of TDM measures that could offset the project's VMT impacts. The following TDM measures have been identified to offset potential VMT impacts related to the proposed project:

- Provide Class II bike lanes along the project frontage to encourage an alternative travel mode.
- Provide pedestrian network improvements such as sidewalks and crosswalks within the project site and along the project frontage connecting to existing pedestrian facilities to encourage people to walk instead of drive.
- Provide traffic calming measures within the project site to encourage people to walk or bike instead of using a vehicle. Traffic calming measures may include marked crosswalks, curb extensions, speed tables, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.

TABLE ES-1. CUMULATIVE YEAR 2040 PLUS PROJECT MITIGATION MEASURES

Study Location	Pre-Mitigation LOS	Recommended Mitigation	Post Mitigation LOS
Joiner Parkway / Moore Road	LOS F (AM & PM Peak Hour)	The project applicant will contribute its fair share cost toward installation of a traffic signal at the Joiner Parkway / Moore Road intersection within the existing right-of-way. The City of Lincoln's Public Facilities Element (PFE) has already identified the need for signalization at this intersection (identified as #71 in PFE Map). Thus, mitigation proposed is consistent with the project's qualifying for funding in the PFE.	AM Peak Hour = LOS A PM Peak Hour = LOS A
Nicolaus Road from Joiner Parkway to O Street	LOS E	The project plans to widen Nicolaus Road on the south side along the project frontage (approximately 1,150 feet). The widening would consist of adding approximately 30 feet to the existing 40-foot pavement width to match the existing curb-to-curb width of 70 feet immediately east of the project site. This new section of roadway would include one travel lane in each direction with a center two-way left-turn lane (3 total lanes) which will increase roadway capacity from 18,000 to 27,000 vehicles per day. In addition, the center two-way left-turn lane would allow for WB left turn movements into the project site.	LOS B

1 INTRODUCTION

This study analyzes the forecast traffic conditions associated with the proposed Joiner Ranch East project in the City of Lincoln. The project is planning to construct 199 single-family dwelling units on 25.5 acres of vacant undeveloped land.

Exhibit 1 shows the regional location of the project site. **Exhibit 2** shows the proposed site plan.

The proposed project is forecast to generate approximately 1,958 new daily trips which includes approximately 146 AM (36 inbound and 110 outbound) peak hour trips and 197 PM (124 inbound and 73 outbound) peak hour trips.

This traffic impact study has been prepared in accordance with the City of Lincoln's General Plan policies as well as the Transportation and Circulation Element. The scope of this traffic study was coordinated with the City of Lincoln in December 2019. **Appendix A** includes the Traffic Study Scoping Agreement.

1.1 STUDY AREA

The study evaluates the following fifteen (15) intersections during the AM and PM peak hours in the vicinity of the project site:

1. Nicolaus Road/Nelson Lane
2. Nicolaus Road/Lakeside Drive
3. Joiner Parkway/Nicolaus Road
4. Joiner Parkway/5th Street
5. Joiner Parkway/3rd Street
6. Joiner Parkway/1st Street
7. Joiner Parkway/Moore Road
8. Joiner Parkway/Danbury Drive
9. Joiner Parkway/Groveland Lane
10. Joiner Parkway/Ferrari Ranch Road
11. Ferrari Ranch Road/Groveland Lane
12. Ferrari Ranch Road/SR-65 Northbound Ramps
13. Ferrari Ranch Road/SR-65 Southbound Ramps
14. Nicolaus Road/Site Driveway #1
15. Joiner Parkway/Site Driveway #2

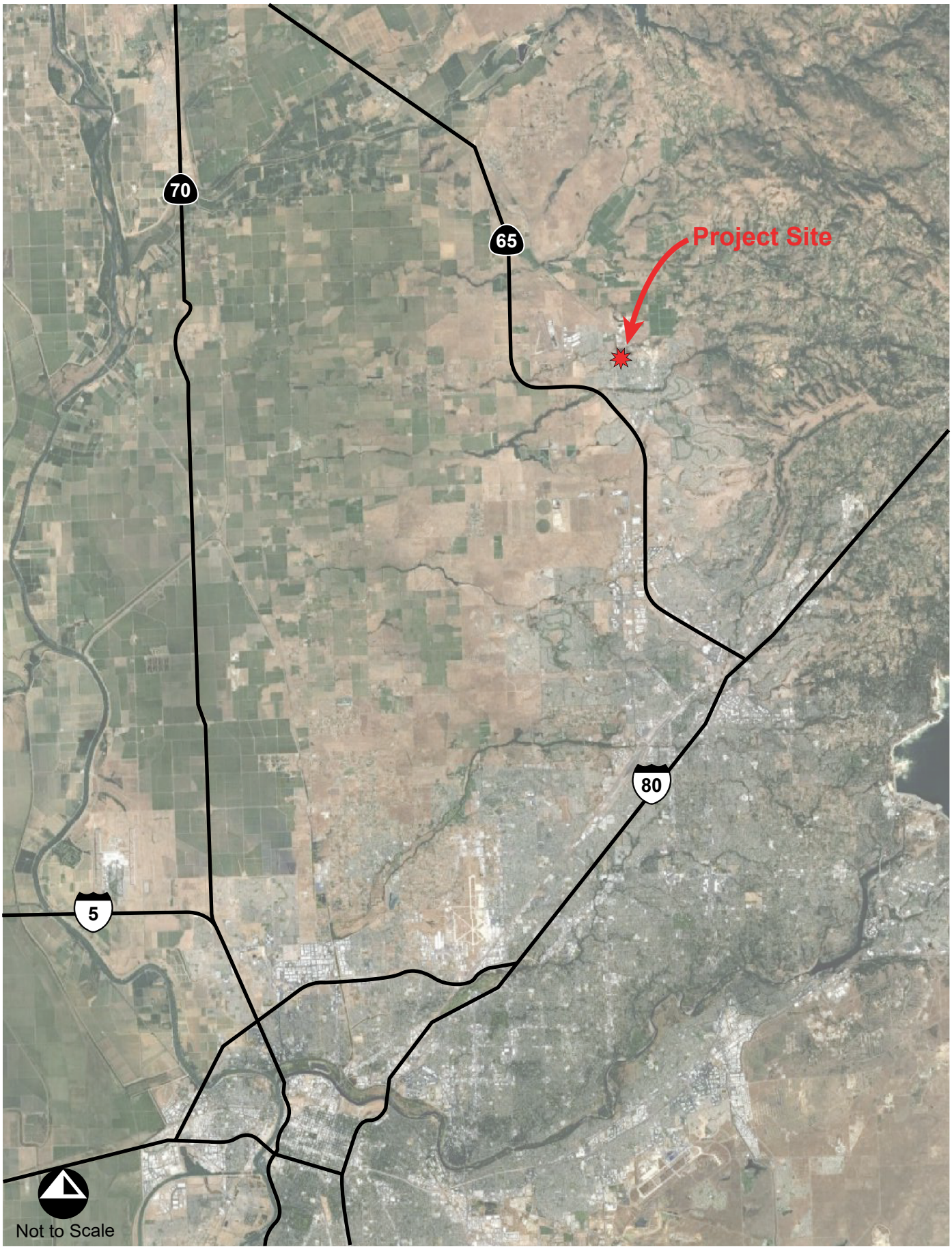
The study also evaluates the following eight (8) roadway segments for average daily traffic volumes in a 24-hour period in the vicinity of the project site:

A. Nicolaus Road from Lakeside Drive to Joiner Parkway
B. Nicolaus Road from Joiner Parkway to O Street
C. Joiner Parkway from Nicolaus Road to 5th Street
D. Joiner Parkway from 1st Street to Moore Road
E. Joiner Parkway from Danbury Drive to Groveland Lane
F. Joiner Parkway from Ferrari Ranch Road to Lincoln Boulevard

G. Ferrari Ranch Road from Joiner Parkway to Danbury Drive
H. Ferrari Ranch Road from SR-65 Northbound Ramps to Groveland Lane

These 15 intersections and 8 roadway segments have been identified in coordination with City staff as potential locations impacted by the proposed project as shown in **Exhibit 3**. These study locations are analyzed for the following conditions:

- Existing Conditions
- Existing Plus Project Conditions
- Existing Plus Approved/Pending Projects Without Project Conditions
- Existing Plus Approved/Pending Projects Plus Project Conditions
- Cumulative Year 2040 Without Project Conditions
- Cumulative Year 2040 Plus Project Conditions



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Regional Project Location

Exhibit 1

February 2020
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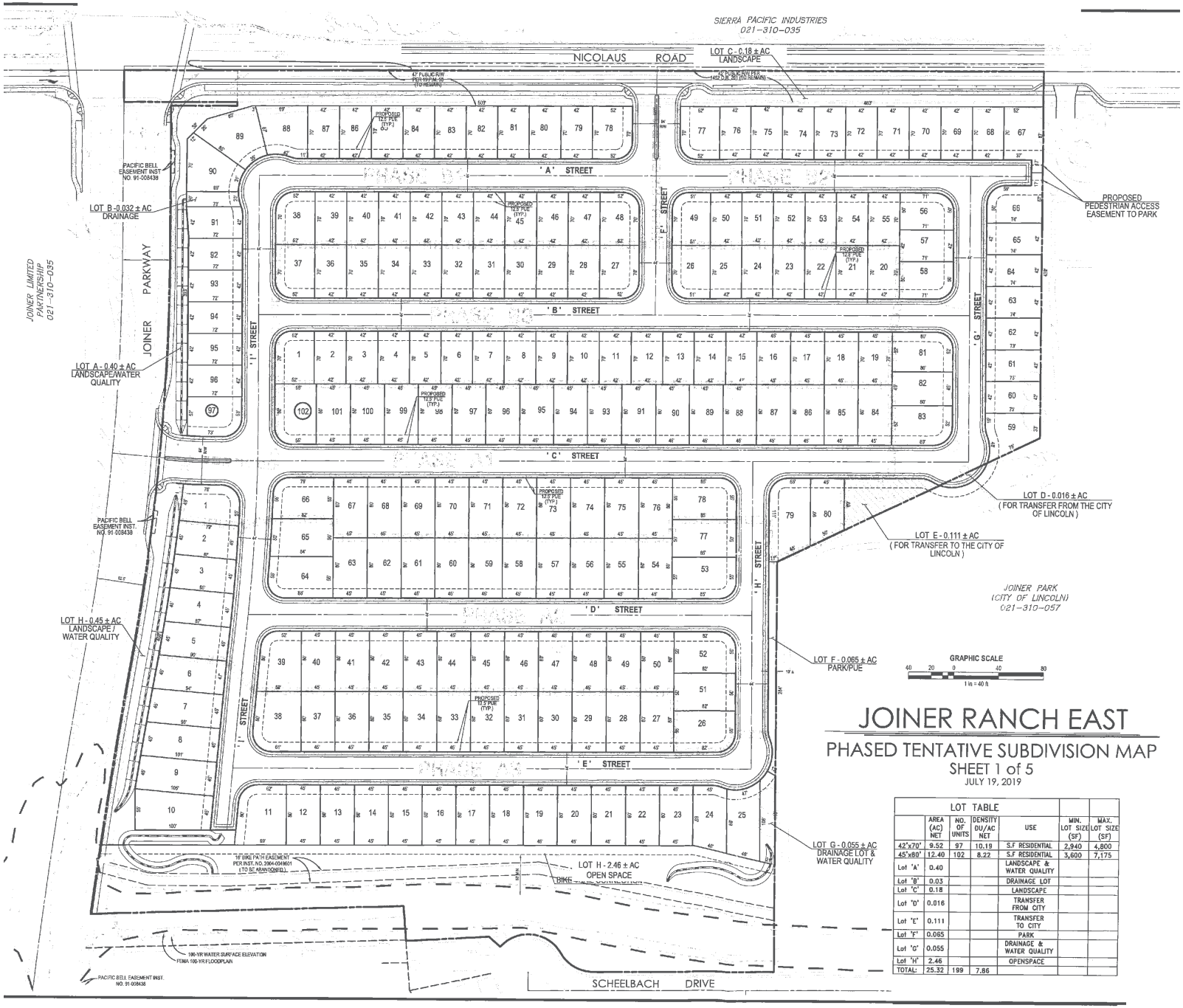

JOINER RANCH EAST

PHASED TENTATIVE SUBDIVISION MAP

SHEET 1 of 5

JULY 19, 2019

LOT TABLE						
	AREA (AC) NET	NO. OF UNITS	DENSITY DU/AC NET	USE	MIN. LOT SIZE (SF)	MAX. LOT SIZE (SF)
42'x70'	9.52	97	10.19	S.F RESIDENTIAL	2,940	4,800
45'x80'	12.40	102	8.22	S.F RESIDENTIAL	3,600	7,175
Lot 'A'	0.40			LANDSCAPE & WATER QUALITY		
Lot 'B'	0.03			DRAINAGE LOT		
Lot 'C'	0.18			LANDSCAPE		
Lot 'D'	0.016			TRANSFER FROM CITY		
Lot 'E'	0.111			TRANSFER TO CITY		
Lot 'F'	0.065			PARK		
Lot 'G'	0.055			DRAINAGE & WATER QUALITY		
Lot 'H'	2.46			OPENSPACE		
TOTAL:	25.32	199	7.86			

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February 2020

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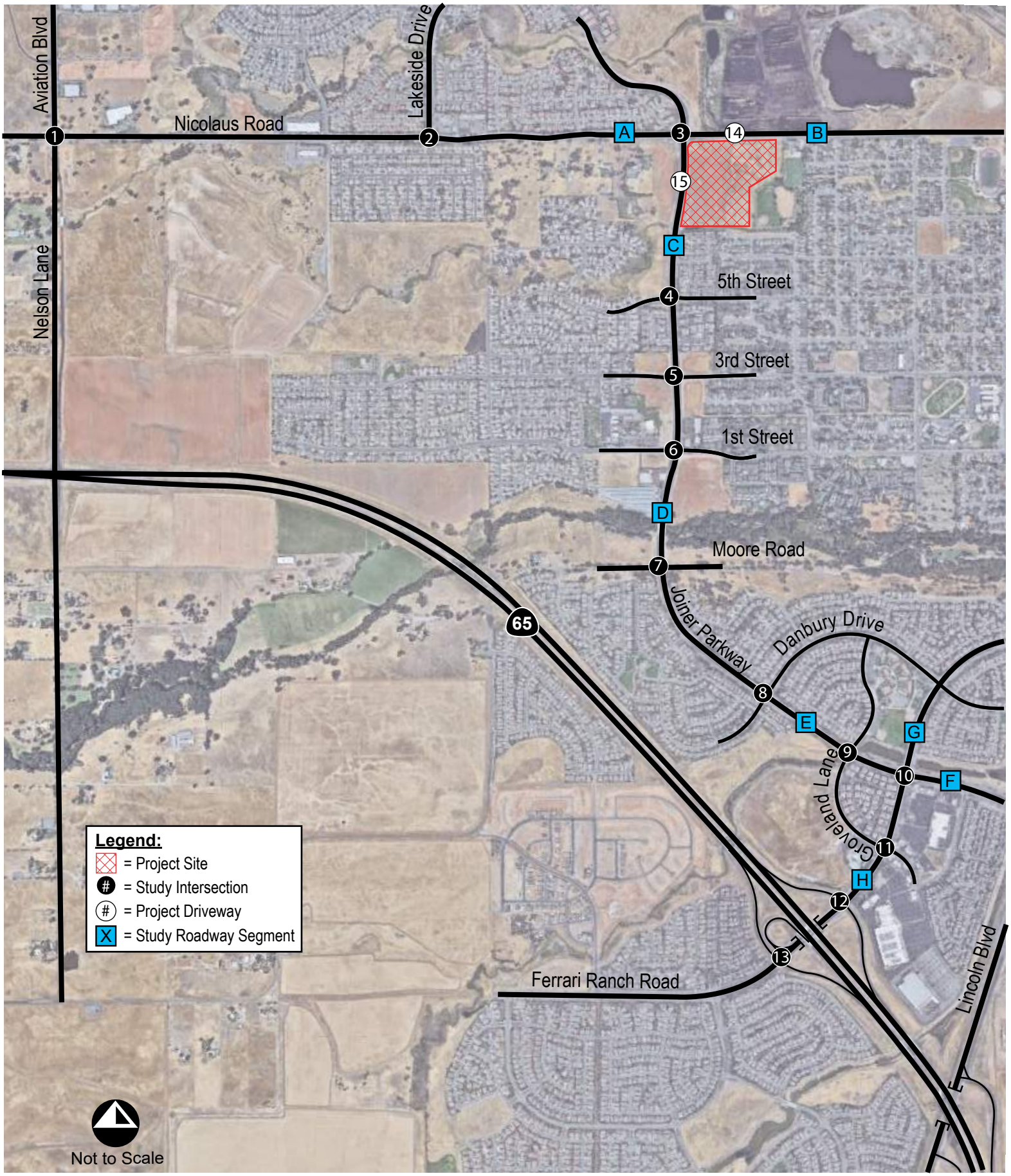
Project Site Plan

Exhibit 2



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Project Study Area

Exhibit 3

December 2019
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1.2 ANALYSIS METHODOLOGY

1.2.1 Intersection Methodology

Level of Service (LOS) is commonly used as a qualitative description of intersection operation and is based on the capacity of the intersection and the volume of traffic using the intersection. The intersection analysis conforms to the operational analysis methodology outlined the *Highway Capacity Manual (HCM 6th Edition)* and performed utilizing the *Synchro 10* traffic analysis software.

The *HCM* analysis methodology describes the operation of an intersection using a range of level of service from LOS A (free-flow conditions) to LOS F (severely congested conditions), based on the corresponding stopped delay experienced per vehicle for study intersections as shown in **Table 1**.

For signalized intersections, signal timing data and parameters such as cycle lengths, splits, clearance intervals, etc. were obtained from the current signal timing sheets provided by City staff and incorporated into the Synchro model (see **Appendix B**). Synchro reports average delays for a signalized intersection, which correspond to a particular LOS, to describe the overall operation of an intersection.

Unsignalized intersection LOS for all-way stops is based on the average delay for all approaches. Delay for one-way or two-way stop-controlled intersections is based on available gaps in traffic flow on the non-controlled approach and LOS is based on the approach with the worst delay.

Signal Warrants: For the unsignalized intersections that are potentially impacted by the project, a signal warrant will be evaluated using the Peak Hour Volume Warrant (Warrant #3) based on the *California Manual on Uniform Traffic Control Devices (CA MUTCD),* 2014 Edition. Warrant #3 in the CA MUTCD evaluates the peak hour volumes at the intersection which is the most appropriate warrant for this analysis. Signal warrants evaluated in this analysis are provided in **Appendix J**.

TABLE 1. LEVEL OF SERVICE & DELAY RANGE

Level of Service	Control Delay (seconds/vehicle)		Description
	Signalized Intersections	Unsignalized Intersections	
A	≤ 10.0	≤ 10.0	Operates with very low delay and most vehicles do not stop.
B	> 10.0 to 20.0	> 10.0 to 15.0	Operates with good progression with some restricted movements.
C	> 21.0 to 35.0	>15.1 to 25.0	Operates with significant number of vehicles stopping with some backup and light congestion.
D	> 35.1 to 55.0	> 25.0 to 35.0	Operates with noticeable congestion, longer delays occur, and many vehicles stop.
E	>55.0 to 80.0	> 35.1 to 50.0	Operates with significant delay, extensive queuing and unfavorable progression.
F	> 80.0	> 50.0	Operates at a level that is unacceptable to most drivers. Arrival rates exceed capacity of the intersection. Extensive queuing occurs.

Source: Highway Capacity Manual (HCM) 6th Edition.

1.2.2 Roadway Segment Methodology

The City of Lincoln does not have adopted criteria for daily roadway segment level of service thresholds. Therefore, the roadway segment levels of service were calculated based on Placer County's established capacity thresholds defined by roadway classification and ADT volumes. **Table 2** provides the maximum daily traffic volume per lane level of service thresholds based on roadway classification.

TABLE 2. PLACER COUNTY ROADWAY SEGMENT LEVEL OF SERVICE

Roadway Classification	Maximum Daily Traffic Volume Per Lane Level of Service				
	LOS A	LOS B	LOS C	LOS D	LOS E
Freeway – Level Terrain	6,300	10,620	13,680	17,740	18,000
Freeway - Rolling Terrain	5,290	8,920	11,650	14,070	15,120
Freeway - Mountainous Terrain	3,400	5,740	7,490	6,040	9,720
Arterial - High Access Control	6,000	7,000	8,000	9,000	10,000
Arterial - Moderate Access Control	5,400	6,300	7,200	8,100	9,000
Arterial - Low Access Control	4,500	5,250	6,000	6,870	7,500
Rural 2-Lane Highway - Level Terrain	1,500	2,950	4,800	7,750	12,500
Rural 2-Lane Highway - Rolling Terrain	800	2,100	3,800	5,700	10,500
Rural 2-Lane Highway - Mountainous Terrain	400	1,200	2,100	3,400	7,000

Source: Placer County General Plan FEIR.

1.2.3 Bikeway Facilities

Design standards and bikeway facilities are established by the California Department of Transportation (Caltrans) and provided in the Caltrans Highway Design Manual (2015). Bicycle facilities are defined using the following four classifications:

- **Class I Bikeway (Bike Path)** – facilities with exclusive right-of-way for bicyclists and pedestrians, away from the roadway and with cross flows by motor traffic minimized.
- **Class II Bikeway (Bike Lanes)** – bike lanes established along streets and defined by pavement striping and signage to delineate a portion of the roadway for bicycle travel. Bike lanes are one-way facilities, typically striped adjacent to motor traffic travelling in the same direction.
- **Class III Bikeways (Bike Routes)** – a preferred route for bicyclists on streets shared with motor traffic not served by dedicated bikeways to provide continuity to the bikeway network. Bike routes are generally not appropriate for roadways with higher motor traffic speeds or volumes. Bike routes are established by placing bike route signs and optional shared roadway markings (sharrow) along roadways.
- **Class IV Bikeways** – often referred to as a cycle track or protected bike lane and is for the exclusive use of bicycles, physically separated from motor traffic with a vertical feature. The separation may include grade separation, flexible posts, inflexible barriers, or on-street parking. Separated bikeways can provide for one-way or two-way travel.

1.3 THRESHOLDS OF SIGNIFICANCE

According to the *City of Lincoln General Plan* (March 2008), the City has adopted level of service "C" or better as acceptable operating conditions for roadway segments and signalized intersections during the PM peak hour. Refer to Policy T-2.3 in the City's General Plan. For purposes of this analysis, the LOS "C" standard also applies to all intersections in the City of Lincoln, including unsignalized intersections in both peak hours. General Plan Policy T-2.4 states that the City shall coordinate with Caltrans with the goal of maintaining a minimum of LOS "D" conditions for SR-65. For the purpose of this analysis, LOS D is the minimum LOS standard at the Ferrari Ranch Road/SR-65 interchange. The City of Lincoln has not established significance thresholds to determine project-related impacts. Therefore, this analysis uses Placer County's methodologies for determining significance of traffic impacts which include:

Signalized Intersections:

- *If a project would worsen an intersection peak hour LOS to D or worse, it is considered a significant impact that must be mitigated,* ***or***
- *If a project would increase the overall average intersection delay of 4 seconds or more to an intersection currently operating below LOS D, it is considered a significant impact that must be mitigated.*

Unsignalized Intersections:

- *If a project would worsen an all-way stop or side street stop-controlled intersection peak hour LOS to D or worse* ***and*** *cause the intersection to meet MUTCD traffic signal warrants, it is considered a significant impact that must be mitigated,* ***or***
- *If a project would worsen an already deficient all-way stop or side street stop-controlled intersection to an overall increase of 2.5 seconds or more with the project* ***and*** *meets MUTCD signal warrants, it is considered a significant impact that must be mitigated.*

Roadway Segments:

- *If a project would worsen a roadway segment operating at a deficient LOS D or worse that is operating at an acceptable LOS D or better without the project, it is considered a significant impact that must be mitigated,* ***or***
- *If a project would worsen an already deficient roadway segment to experience an increase in V/C ratio of 0.05 or greater, it is considered a significant impact that must be mitigated,* ***or***
- *If a project would worse an already deficient roadway segment to experience an increase in ADT of 100 or more project generated trips, per lane, it is considered a significant impact that must be mitigated.*

2 EXISTING CONDITIONS

2.1 SURROUNDING ROADWAY NETWORK

The characteristics of the roadway system in the vicinity of the project site are described below:

- **State Route 65 (SR-65)** is a state highway that begins in the City of Roseville at Interstate 80 and continues through the City of Lincoln to the Cities of Sheridan, Wheatland and Yuba to the north. The Lincoln Bypass now directs SR-65 traffic west of Lincoln. SR-65 is a four-lane freeway with interchanges at Ferrari Ranch Road, Lincoln Boulevard and Twelve Bridges Drive to the south of the project site and Nelson Lane to the west of the project site. Regional access to the project site will be provided via the Ferrari Ranch Road/SR-65 interchange and Nelson Lane/SR-65 intersection.

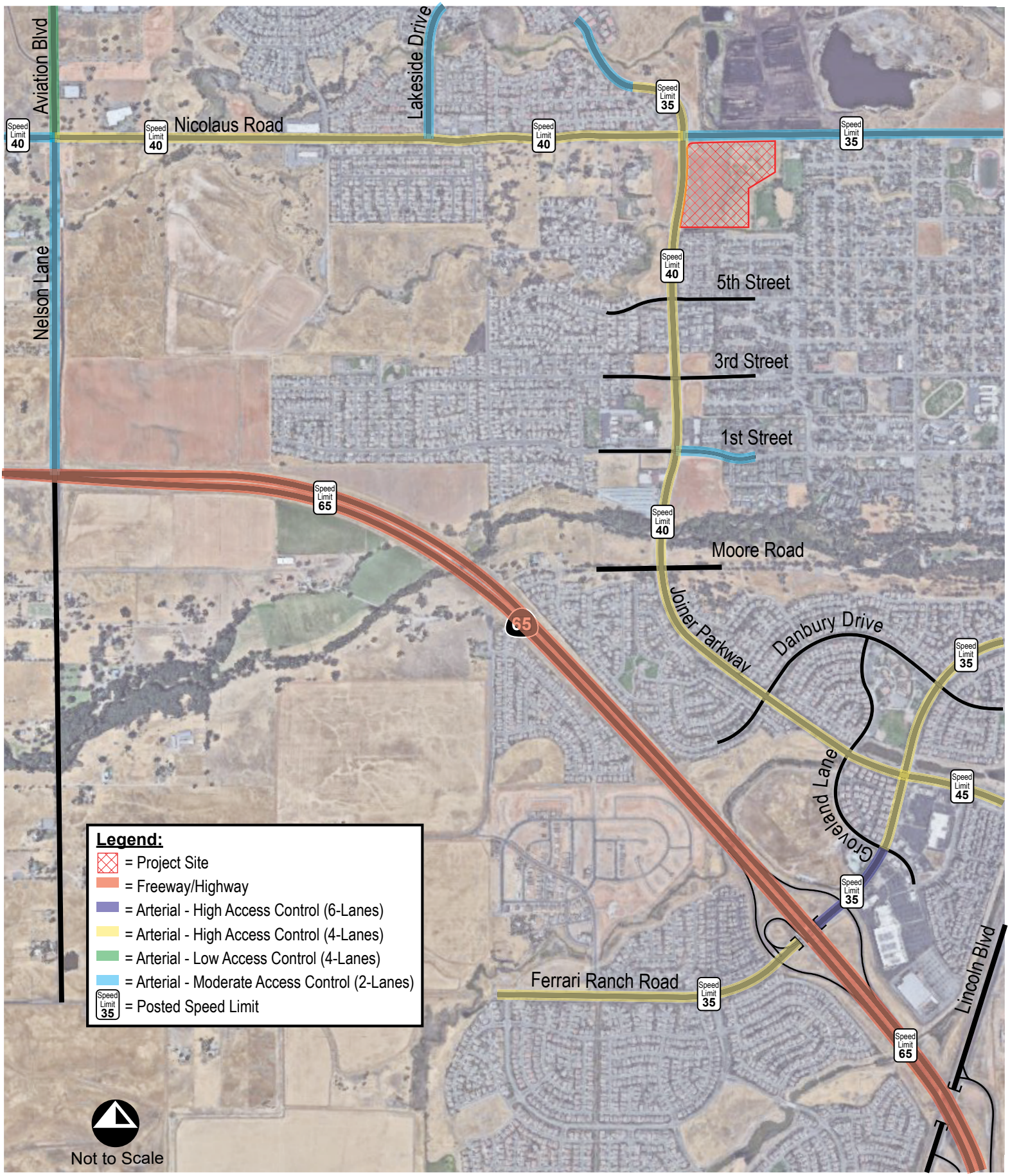
- **Nelson Lane** is a north-south divided roadway to the west of the current boundary of the City of Lincoln. Nelson Lane is a four-lane divided roadway that provides direct access to SR-65. On-street parking is prohibited and the posted speed limit is 55 MPH. There are no Class II bike lanes or sidewalks on either side of the roadway. North of Nicolaus Road, Nelson Lane becomes Aviation Boulevard that provides access to Lincoln Airport and Lincoln Air Center.

- **Nicolaus Road** is an east-west divided roadway from Nelson Lane to Joiner Parkway. This section of Nicolaus Road is a four-lane roadway that provides direct access to the project site. On this section of Nicolaus Road, a Class I multi-use path is provided along the north side of the roadway and Class II bike lanes are provided along the south side of the road. The posted speed limit is 40 MPH west of Joiner Parkway. East of Joiner Parkway, Nicolaus Road is a two-lane undivided roadway with a posted speed limit of 35 MPH. Class II bike lanes are provided on both sides of the road with a sidewalk provided on the south side of Nicolaus Road.

- **Joiner Parkway** is a north-south divided roadway within the project study area. Joiner Parkway is a four-lane roadway with a posted speed limit of 40 MPH near the project site and 45 MPH to the south near Ferrari Ranch Road. Class II bike lanes and sidewalks are provided on both sides of the roadway. On street parking is prohibited on both sides.

- **Ferrari Ranch Road** is an east-west divided roadway within the project study area. Ferrari Ranch Road is a six-lane roadway from Joiner Parkway to the SR-65 northbound ramps and then transitions to a five-lane roadway from SR-65 northbound ramps to Courtyards Way. A Class I multi-use path is provided along the north side of Ferrari Ranch Road from Courtyards Way to Caledon Circle where the road terminates. A Class II bike lane is provided along the south side of the Ferrari Ranch Road from Danbury Drive to Caledon Circle. The posted speed limit is 35 MPH. Sidewalks are provided on both sides of the road within the study area.

Exhibit 4 shows the existing roadway network within the project study area.



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Existing Roadway Network

Exhibit 4

February 2020
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2.2 EXISTING PEDESTRIAN, BICYCLE, AND TRANSIT FACILITIES

2.2.1 Pedestrian Facilities

Sidewalks are currently provided on both sides of the streets in the residential neighborhoods to the east, west, and north of the project site. **Exhibit 5** shows the presence of sidewalks within the study area on the major roadways. On Nicolaus Road east of the project site, sidewalks are currently provided on the south side of the roadway. A Class I multi-use path is provided for pedestrians along the north side of Nicolaus Road west of Joiner Parkway and also on the east side of Joiner Parkway north of Nicolaus Road. Sidewalks are currently provided on both sides of Joiner Parkway. The project will be responsible for providing a sidewalk along the project frontage on Nicolaus Road and Joiner Parkway.

2.2.2 Bicycle Facilities

The bicycle facilities outlined in this report are consistent with the City of Lincoln's *2012 Bicycle Transportation Plan Update*. Within the vicinity of the project site, Class II bike lanes are provided on several roadways adjacent to project including Joiner Parkway and Nicolaus Road as shown in **Exhibit 5**. In addition, Class I multi-use paths currently exist along Nicolaus Road between Waverly Drive and Joiner Parkway. The Class I facilities are used by bicyclists as well as pedestrians. The project will be responsible for extending the Class II bike lanes along Nicolaus Road and Joiner Parkway along the project's frontage.

2.2.3 Transit Facilities

Transit service in the City of 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 northeast quadrant of the City where the project is located. The closest transit route to the project site is located approximately 1.2 miles to the southeast near the corner of 3rd Street/R Street in downtown Lincoln.

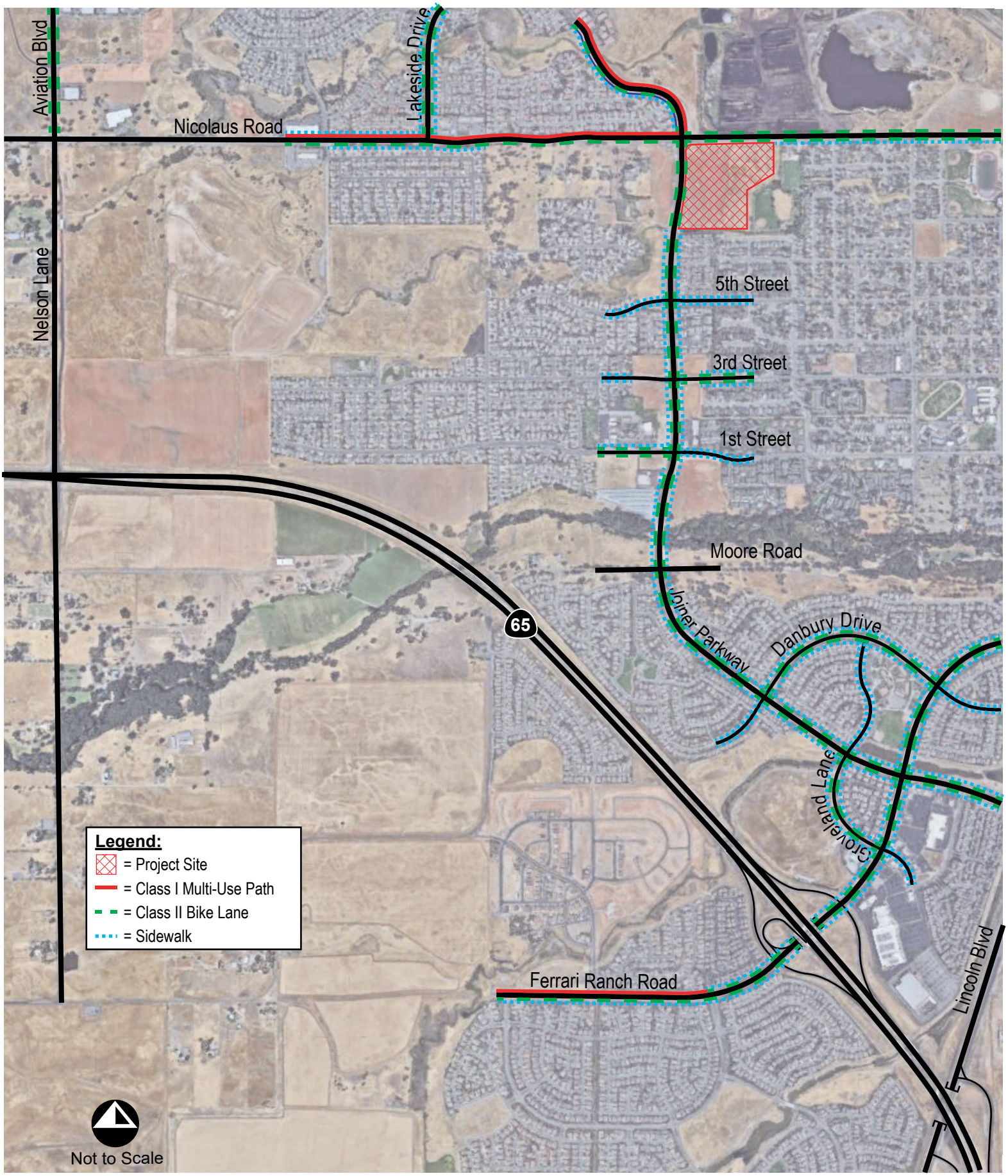
2.3 EXISTING TRAFFIC VOLUMES

To determine the existing operations of the study intersections and roadway segments, peak hour intersection movement count and average daily traffic counts were collected on Wednesday, December 11, 2019. AM peak period counts were generally collected from 7:00 AM to 9:00 AM and PM peak period counts were generally collected from 4:00 PM to 6:00 PM. The counts used in this analysis were taken from the highest hour within the peak periods counted for each intersection. Traffic counts were collected while local schools were in session. Detailed count data is contained in **Appendix B**.

Exhibit 6 shows the Existing study intersection lane geometry. **Exhibit 7** shows the daily and peak hour volumes in the study area.

2.4 EXISTING PEAK HOUR STUDY INTERSECTION LOS

Table 3 summarizes existing conditions AM/PM peak hour level of service for all study intersections. Detailed analysis sheets are contained in **Appendix C**. Study intersections 1 and 2 are all-way stop controlled intersections with multiple lanes (3 to 4 lane) approaching the intersection. Therefore, SimTraffic reports are provided in Appendix C to obtain the delays at intersections 1 and 2 shown in Table 3. The remaining study intersection worksheets are reports from Synchro.



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Existing Pedestrian & Bicycle Facilities

Exhibit 5

February 2020
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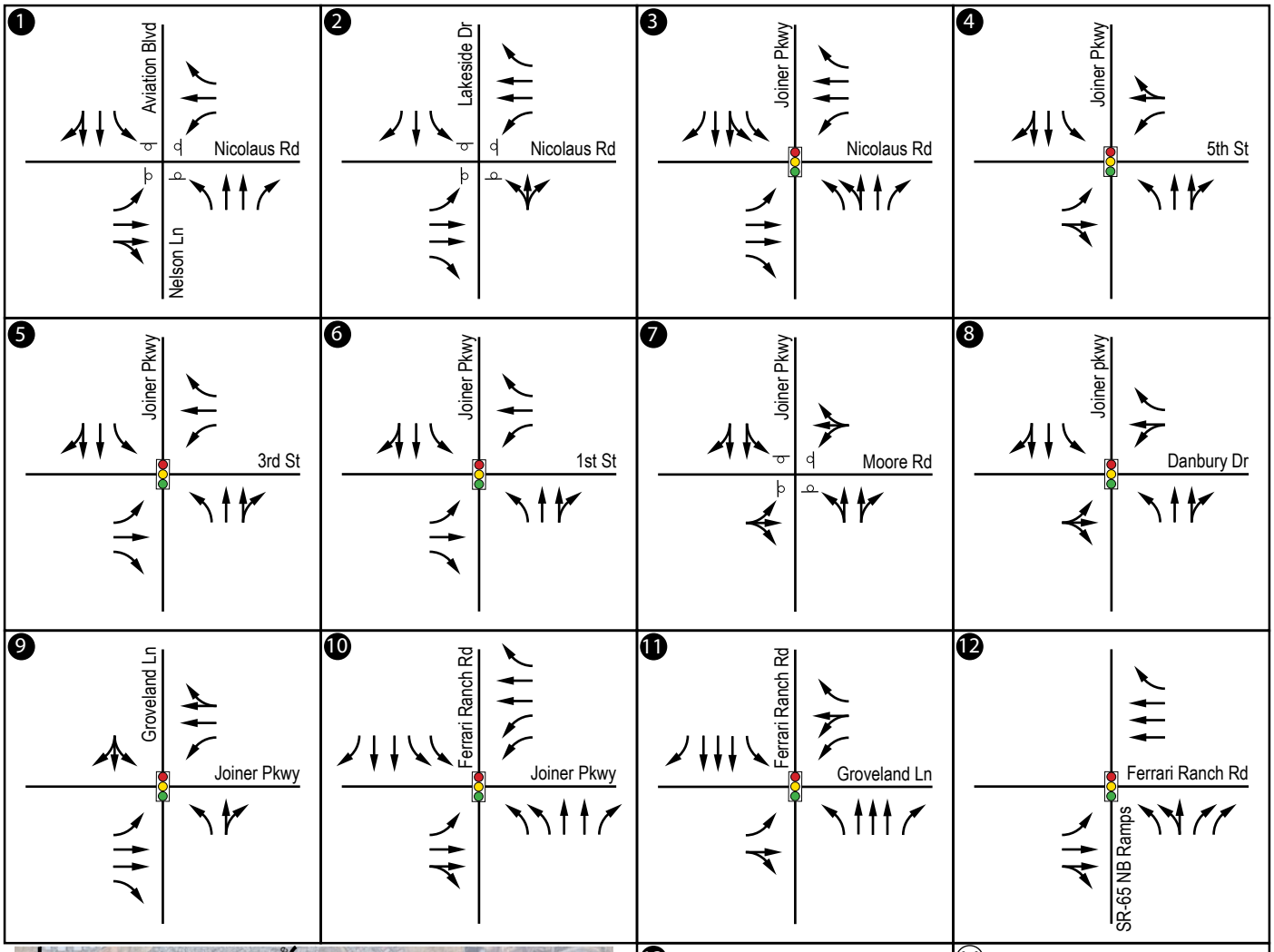

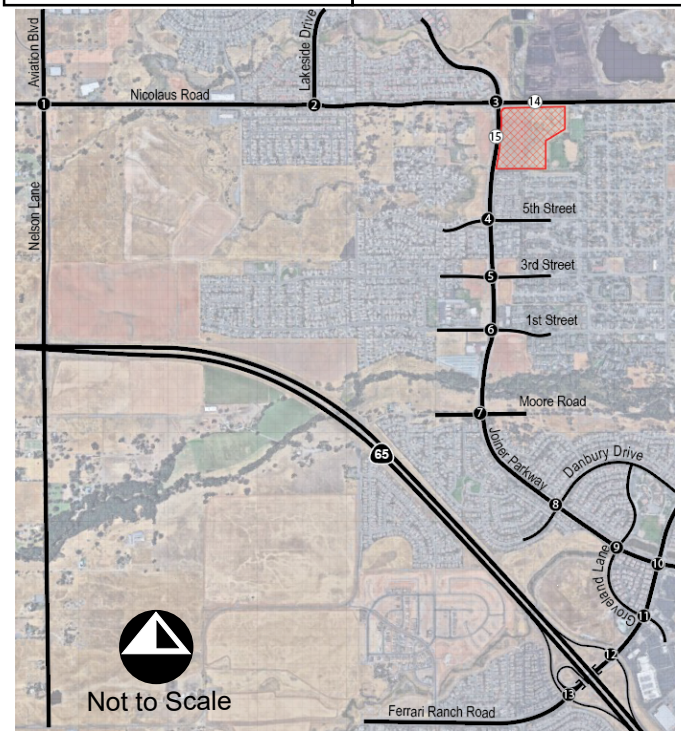

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Existing Intersection Lane Configurations

Exhibit 6

January 2020
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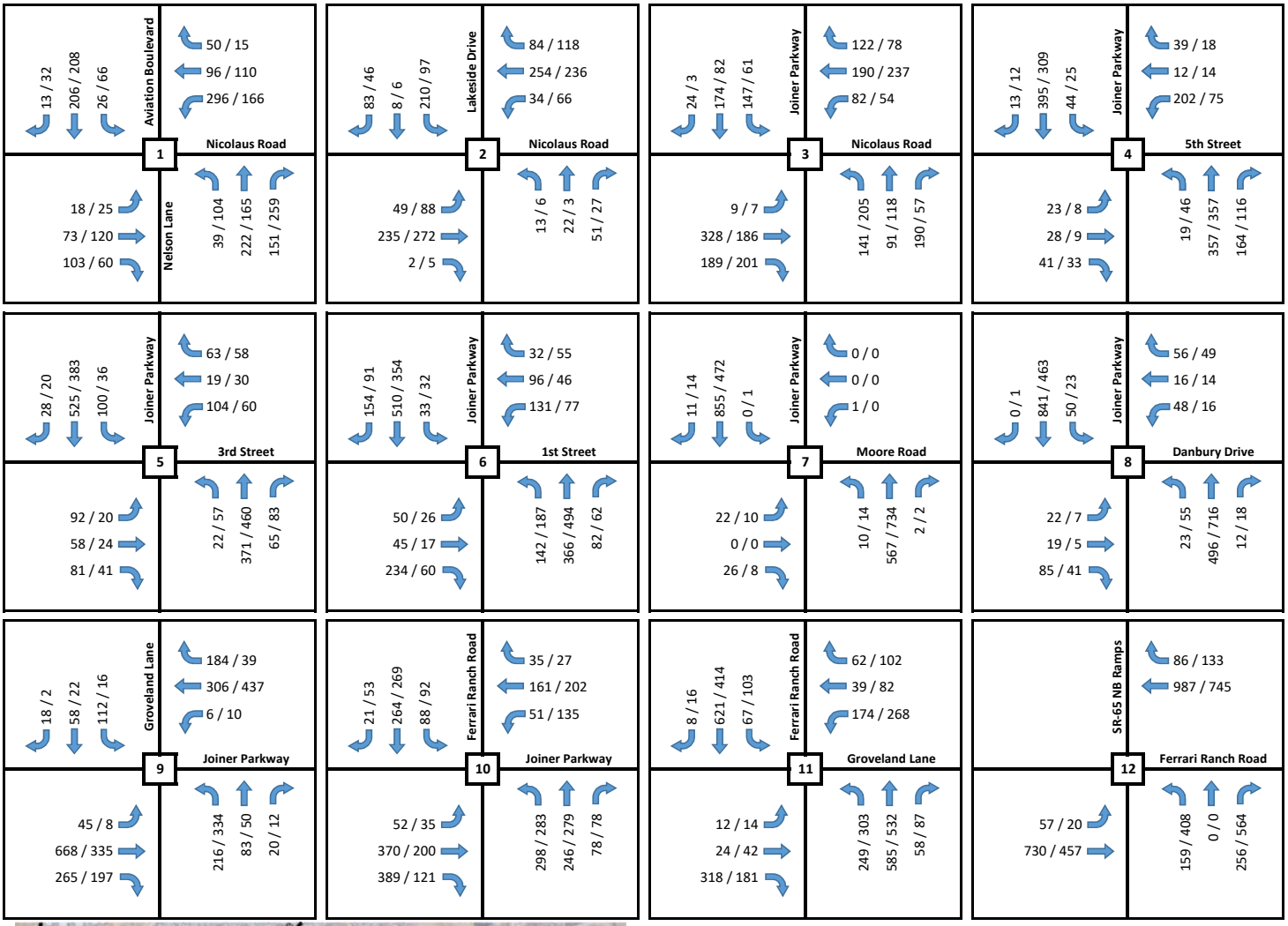

Notes:

XX / XX = AM / PM Peak Hour Volumes

XX,XXX = Daily Segment Volumes

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Existing Daily & AM/PM Peak Hour Volumes

Exhibit 7

TABLE 3. EXISTING AM/PM PEAK HOUR INTERSECTION LOS

Study Intersection		Traffic Control	Existing Conditions			
			AM		PM	
			Delay[1]	LOS	Delay[1]	LOS
1 -	Nicolaus Road / Nelson Lane	AWSC	12.1	B	10.4	B
2 -	Nicolaus Road / Lakeside Drive	AWSC	7.7	A	6.8	A
3 -	Joiner Parkway / Nicolaus Road	Signal	24.3	C	17.6	B
4 -	Joiner Parkway / 5th Street	Signal	20.5	C	12.4	B
5 -	Joiner Parkway / 3rd Street	Signal	17.2	B	13.8	B
6 -	Joiner Parkway / 1st Street	Signal	26.6	C	16.1	B
7 -	Joiner Parkway / Moore Road	AWSC	**34.9**	**D**	12.6	B
8 -	Joiner Parkway / Danbury Drive	Signal	17.7	B	14.4	B
9 -	Joiner Parkway / Groveland Lane	Signal	23.3	C	17.6	B
10-	Joiner Parkway / Ferrari Ranch Road	Signal	23.3	C	23.2	C
11-	Ferrari Ranch Road / Groveland Lane	Signal	**35.8**	**D**	**37.4**	**D**
12-	Ferrari Ranch Road / SR-65 Northbound Ramps	Signal	41.9	D	29.6	C
13-	Ferrari Ranch Road / SR-65 Southbound Ramps	Signal	5.3	A	6.0	A
14-	Nicolaus Road / Site Driveway #1	OWSC	Does Not Exist Without Project			
15-	Joiner Parkway / Site Driveway #2	OWSC	Does Not Exist Without Project			

Note: Deficient intersection operation indicated in **bold**.
[1]Average seconds of delay per vehicle.
AWSC = All-Way Stop Control LOS = Level of Service OWSC = One-Way Stop Control

As shown in **Table 3**, all study intersections are currently operating at an acceptable level of service (LOS C or better) for Existing conditions except for:

- Int. #7 - Joiner Parkway / Moore Road: LOS D in the AM peak hour
- Int. #11 - Ferrari Ranch Road/Groveland Lane: LOS D in the AM and PM peak hours

It may be noted that LOS "D" is considered acceptable intersection operations at Caltrans facilities such as Ferrari Ranch Road / SR-65 Northbound and Southbound Ramps. LOS "E" and "F" is considered deficient intersection operating conditions at Caltrans facilities.

2.5 EXISTING ROADWAY SEGMENT LOS

Table 4 summarizes existing conditions average daily traffic level of service for all study roadway segments. The LOS "E" daily volume capacity for each segment is calculated as a "per lane" capacity. As such, the roadway segment analysis table shows the total LOS "E" capacity and the corresponding volume to capacity (V/C) ratio and LOS for each of the study segments. As shown in **Table 4**, all study roadway segments are currently operating at an acceptable level of service (LOS C or better) under Existing conditions.

TABLE 4. EXISTING CONDITIONS ROADWAY SEGMENT LOS

Segment	Location	Classification	LOS E Capacity Per Lane	# of Lanes	Total LOS E Capacity	Existing Conditions		
						ADT	V/C	LOS
Nicolaus Road	Lakeside Drive to Joiner Parkway	Arterial – High Access Control	10,000	4	40,000	8,500	0.21	A
	Joiner Parkway to O Street	Arterial - Moderate Access Control	9,000	2	18,000	7,214	0.40	A
Joiner Parkway	Nicolaus Road to 5th Street	Arterial – High Access Control	10,000	4	40,000	7,854	0.20	A
	1st Street to Moore Road	Arterial - High Access Control	10,000	4	40,000	14,968	0.37	A
	Danbury Drive to Groveland Lane	Arterial – High Access Control	10,000	4	40,000	16,223	0.41	A
	Ferrari Ranch Road to Lincoln Blvd	Arterial - High Access Control	10,000	4	40,000	8,868	0.22	A
Ferrari Ranch Road	Joiner Parkway to Danbury Drive	Arterial - High Access Control	10,000	4	40,000	9,008	0.23	A
	SR-65 NB Ramps to Groveland Lane	Arterial – High Access Control	10,000	6	60,000	23,193	0.39	A

Note: Deficient roadway segment operations shown in **bold**.
ADT= Average Daily Traffic; LOS= Level of Service; V/C= Volume to Capacity Ratio

3 PROPOSED PROJECT

The project proposes to construct 199 single-family dwelling units encompassing 25.5 acres located on the southeast corner of Joiner Parkway and Nicolaus Road. Project Opening Day is expected to be Year 2021. The project site is vacant and undeveloped.

Exhibit 2 shows the proposed project site plan.

3.1 PROJECT FORECAST TRIP GENERATION

In order to calculate vehicle trips forecast to be generated by the proposed projects, the *Institute of Transportation Engineers (ITE) 10th Edition Trip Generation Manual* trip generation rates were utilized. **Table 5** summarizes the ITE trip generation rates used.

TABLE 5. ITE TRIP GENERATION RATES

Land Use	ITE Code[1]	Daily Trip Rate	AM Peak Hour Rate				PM Peak Hour Rate			
			Total	In	:	Out	Total	In	:	Out
Single Family Dwelling Unit	210	9.84/DU	0.73/DU	25%	:	75%	0.99/DU	63%	:	37%

[1] Source: ITE Trip Generation Manual, 10th Edition.

Table 6 summarizes the project trip generation using the rates shown in **Table 5**. As shown, the proposed project is forecast to generate approximately 1,958 daily trips with 146 AM peak hour trips (36 inbound and 110 outbound) and 197 PM peak hour trips (124 inbound and 73 outbound).

TABLE 6. PROPOSED PROJECT TRIP GENERATION

Land Use	Intensity	Daily Trips	AM Peak Hour Trips				PM Peak Hour Trips			
			Total	In	:	Out	Total	In	:	Out
Single Family Dwelling Unit	199 DU	1,958	146	36	:	110	197	124	:	73

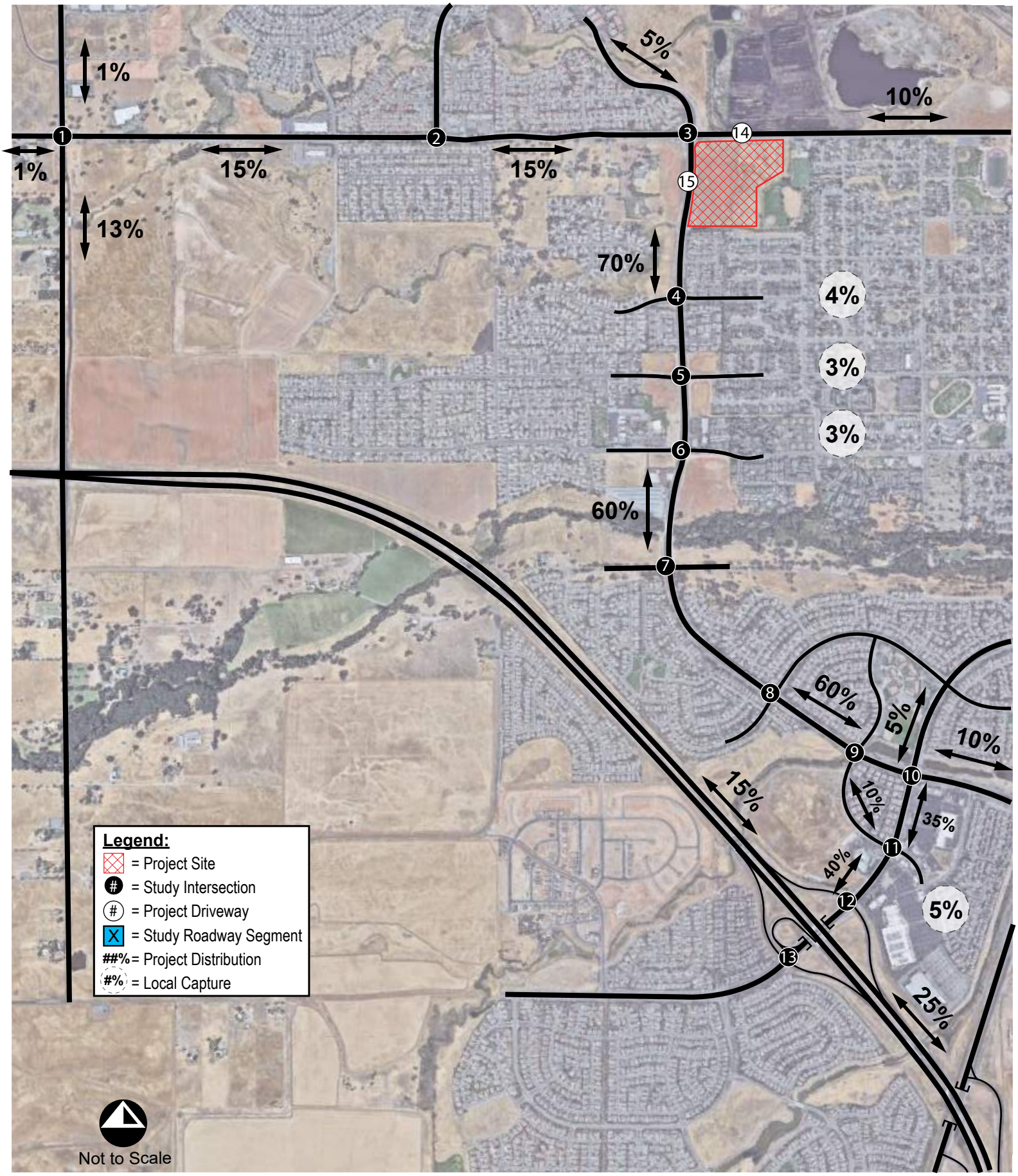
DU = Dwelling Unit

3.2 TRIP DISTRIBUTION AND TRIP ASSIGNMENT OF PROPOSED PROJECT

Exhibit 8 shows the forecast trip percent distribution within the study area. Project traffic was distributed on the roadway network based on existing travel patterns, complementary land uses (employment, retail and schools) within the study area and discussions with City staff. As shown in Exhibit 7, project traffic is anticipated to distribute:

- 70% to and from the south on Joiner Parkway;
- 5% to and from the north on Joiner Parkway;
- 10% to and from the east on Nicolaus Road; and
- 15% to and from the west on Nicolaus Road.

Exhibit 9 shows the corresponding forecast assignment of daily and peak hour project-generated trips using the trip percent distribution shown in **Exhibit 7**.



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Project Distribution

Exhibit 8

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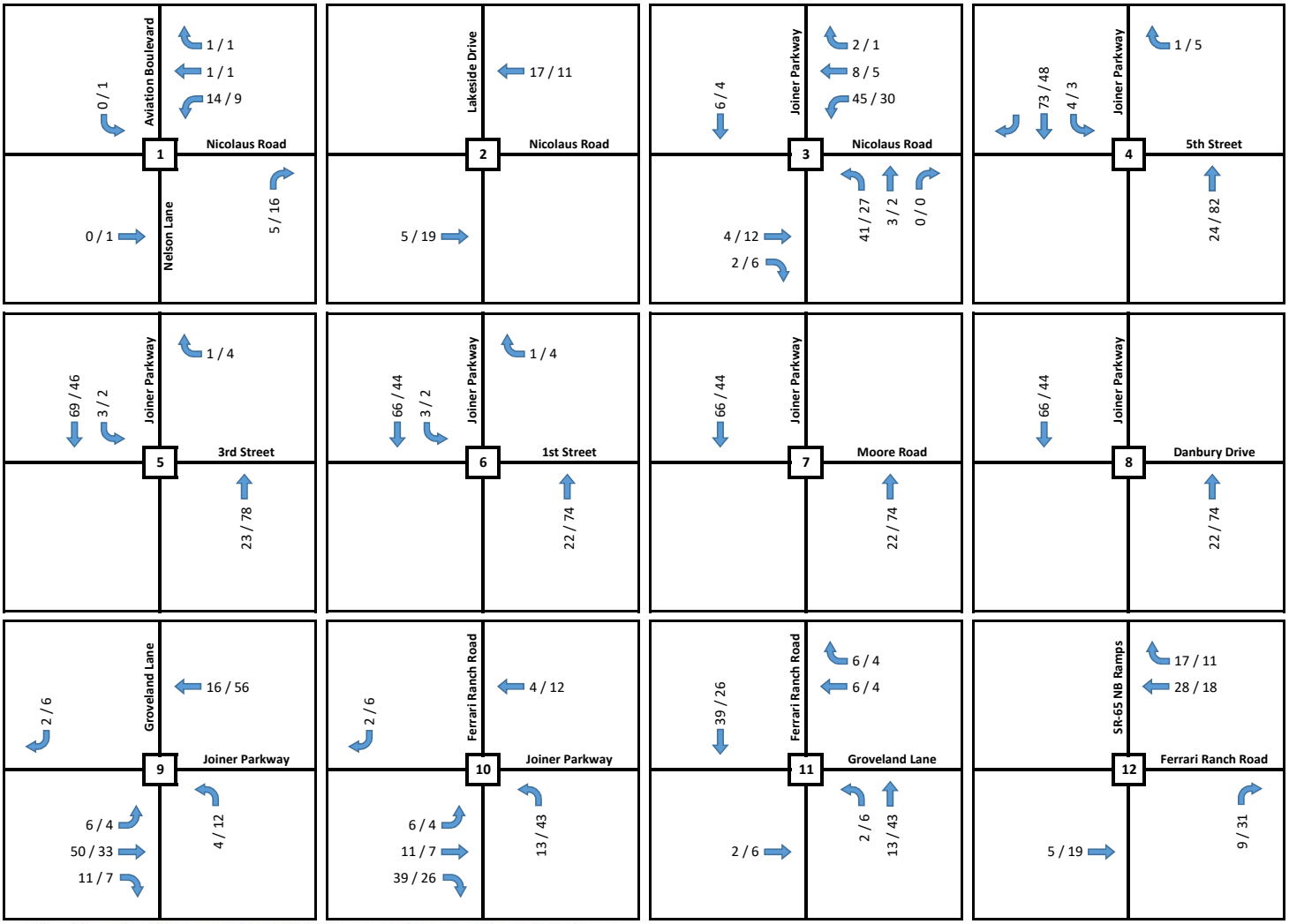

Notes:

XX / XX = AM / PM Peak Hour Volumes

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Project Only Daily & AM/PM Peak Hour Volumes

Exhibit 9

4 EXISTING PLUS PROJECT

4.1 EXISTING PLUS PROJECT TRAFFIC VOLUMES

Existing Plus Project traffic volumes are derived by adding trips forecast to be generated by the proposed project to existing traffic volumes.

Exhibit 10 shows the forecast Existing Plus Project daily and peak hour volumes.

4.2 EXISTING PLUS PROJECT PEAK HOUR STUDY INTERSECTION LOS

Table 7 summarizes Existing Plus Project AM and PM peak hour level of service for all study intersections. Detailed analysis sheets are contained in **Appendix D**.

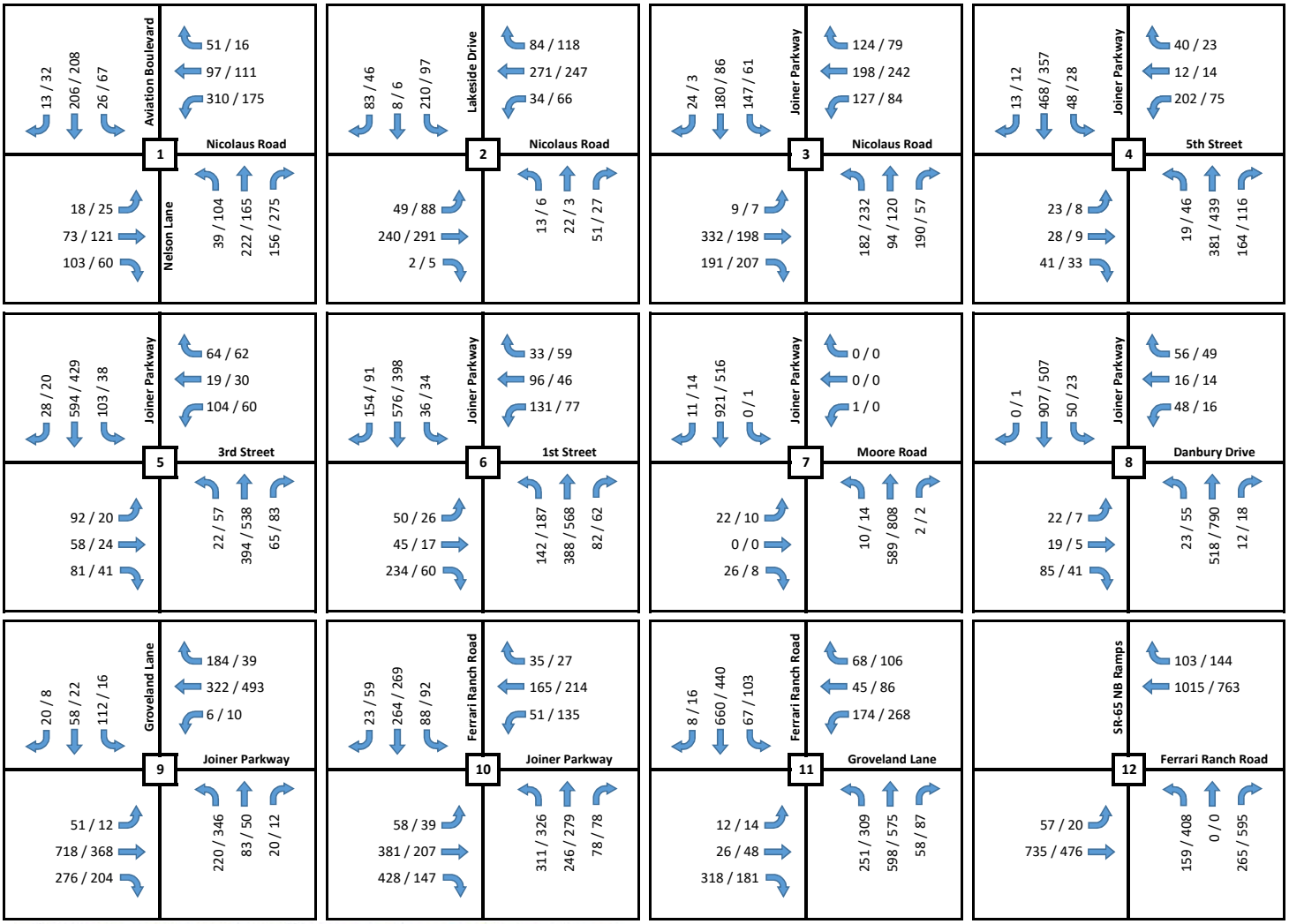
TABLE 7. EXISTING PLUS PROJECT AM/PM PEAK HOUR INTERSECTION LOS

Study Intersection	Existing Conditions				Existing Plus Project Conditions				Change in Delay (sec.)		Significant Impact?	
	AM		PM		AM		PM					
	Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	AM	PM	AM	PM
1 Nicolaus Road/Nelson Lane	12.1	B	10.4	B	12.7	B	10.7	B	0.6	0.3	No	No
2 Nicolaus Road/Lakeside Drive	7.7	A	6.8	A	7.7	A	6.9	A	0.0	0.1	No	No
3 Joiner Parkway/Nicolaus Road	24.3	C	17.6	B	27.7	C	18.3	B	3.4	0.7	No	No
4 Joiner Parkway/5th Street	20.5	C	12.4	B	20.9	C	12.4	B	0.4	0.0	No	No
5 Joiner Parkway/3rd Street	17.2	B	13.8	B	17.7	B	13.8	B	0.5	0.0	No	No
6 Joiner Parkway/1st Street	26.6	C	16.1	B	27.9	C	16.2	B	1.3	0.1	No	No
7 Joiner Parkway/Moore Road	**34.9**	**D**	12.6	B	**47.0**	**E**	13.8	B	12.1	1.2	No	No
8 Joiner Parkway/Danbury Drive	17.7	B	14.4	B	18.2	B	14.7	B	0.5	0.3	No	No
9 Joiner Parkway/Groveland Lane	23.3	C	17.6	B	24.0	C	18.4	B	0.7	0.8	No	No
10 Joiner Parkway/Ferrari Ranch Rd	23.3	C	23.2	C	23.6	C	23.6	C	0.3	0.4	No	No
11 Ferrari Ranch Rd/Groveland Lane	**35.8**	**D**	**37.4**	**D**	**36.3**	**D**	**38.9**	**D**	0.5	1.5	No	No
12 Ferrari Ranch Rd/SR-65 NB Ramps	41.9	D	29.6	C	45.7	D	29.7	C	3.8	0.1	No	No
13 Ferrari Ranch Rd/SR-65 SB Ramps	5.3	A	6.0	A	5.4	A	6.2	A	0.1	0.2	No	No
14 Nicolaus Road/Site Driveway #1	Does Not Exist				1.6	A	1.1	A	1.6	1.1	No	No
15 Joiner Parkway/Site Driveway #2	Does Not Exist				0.5	A	0.4	A	0.5	0.4	No	No

Note: Deficient intersection operation indicated in **bold**.
[1]Seconds of delay per vehicle.
LOS = level of service.

As shown in **Table 7**, all study intersections are forecast to operate at an acceptable level of service (LOS D or better) during the peak hour with the addition of project-related traffic to existing traffic volumes except for the following study intersections:

- Int. #7 – Joiner Parkway / Moore Road: LOS E in the AM Peak Hour
- Int. #11 – Ferrari Ranch Road / Groveland Lane: LOS D in the AM & PM Peak Hour



Notes:

XX / XX = AM / PM Peak Hour Volumes

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Existing Plus Project Only Daily & AM/PM Peak Hour Volumes

Exhibit 10

At the all-way stop controlled intersection of Joiner Parkway / Moore Road, the operations are deficient (LOS D & E) in the AM peak hour without and with project traffic and exceeds the 2.5 second delay threshold. However, project-related traffic does not result in a significant impact at this location since a signal warrant is not met. Refer to Section 1.2.1 of this report and **Appendix J** for further detail on signal warrant analysis. Therefore, project traffic at this intersection is considered less-than-significant and no mitigation is required.

At the signalized intersection of Ferrari Ranch Road / Groveland Lane, intersection operations are deficient in both the AM and PM peak hour. However, the change in delay is 0.5 and 1.5 seconds for the AM and PM respectively which falls below the 4.0 second threshold of significance. Therefore, project traffic at this intersection is considered less-than-significant and no mitigation is required.

4.3 EXISTING PLUS PROJECT ROADWAY SEGMENT LOS

Table 8 summarizes the roadway segment level of service for the Existing Plus Project condition.

TABLE 8. EXISTING PLUS PROJECT ROADWAY SEGMENT LOS

Segment	Location	Total LOS E Capacity	Existing			Existing Plus Project			Δ V/C	Project ADT	Significant Direct Impact?
			ADT	V/C	LOS	ADT	V/C	LOS			
Nicolaus Road	Lakeside Drive to Joiner Parkway	40,000	8,500	0.21	A	8,794	0.22	A	0.007	294	No
	Joiner Parkway to O Street	18,000	7,214	0.40	A	8,193	0.46	A	0.054	979	No
Joiner Parkway	Nicolaus Road to 5th Street	40,000	7,854	0.20	A	9,283	0.23	A	0.036	1429	No
	1st Street to Moore Road	40,000	14,968	0.37	A	16,143	0.40	A	0.029	1175	No
	Danbury Drive to Groveland Lane	40,000	16,223	0.41	A	17,398	0.43	A	0.029	1175	No
	Ferrari Ranch Road to Lincoln Blvd	40,000	8,868	0.22	A	9,064	0.23	A	0.005	196	No
Ferrari Ranch Road	Joiner Parkway to Danbury Drive	40,000	9,008	0.23	A	9,106	0.23	A	0.002	98	No
	SR-65 NB Ramps to Groveland Lane	60,000	23,193	0.39	A	23,976	0.40	A	0.013	783	No

Note: Deficient roadway segment operations shown in **bold**.
LOS= Level of Service; V/C= Volume to Capacity Ratio; Δ= Difference

As shown in **Table 8**, all study roadway segments are currently operating at an acceptable level of service (LOS C or better) for Existing Plus Project conditions. Therefore, no mitigation measures are necessary or required.

5 EXISTING PLUS APPROVED/PENDING PROJECTS WITHOUT PROJECT CONDITIONS

5.1 EXISTING PLUS APPROVED/PENDING PROJECTS WITHOUT PROJECT TRAFFIC VOLUMES

According to the City's Development Project Map, the traffic analysis assumes three approved or pending projects would contribute traffic to the study area. These projects include Fullerton Ranch (approved), Independence (approved) and Lincoln Crossing Village 11 (under construction). These three projects were reviewed and approved by City staff to include in the Existing Plus Approved/Pending Project analysis scenario. Worksheets summarizing the methodology for developing the baseline volumes and information on approved/pending projects is provided in **Appendix E**.

Traffic volumes from these three projects were extracted from traffic studies, EIRs, or other documents and added to existing traffic volumes. Traffic generated by the Lincoln Crossing Village 11 project was manually distributed to the study intersections based on existing travel patterns and complementary land uses such as employment, retail and schools since the documents prepared for this project are part of a larger Specific Plan and considered outdated. **Table 9** provides a project description of the three approved/pending projects and the trip generation from these projects.

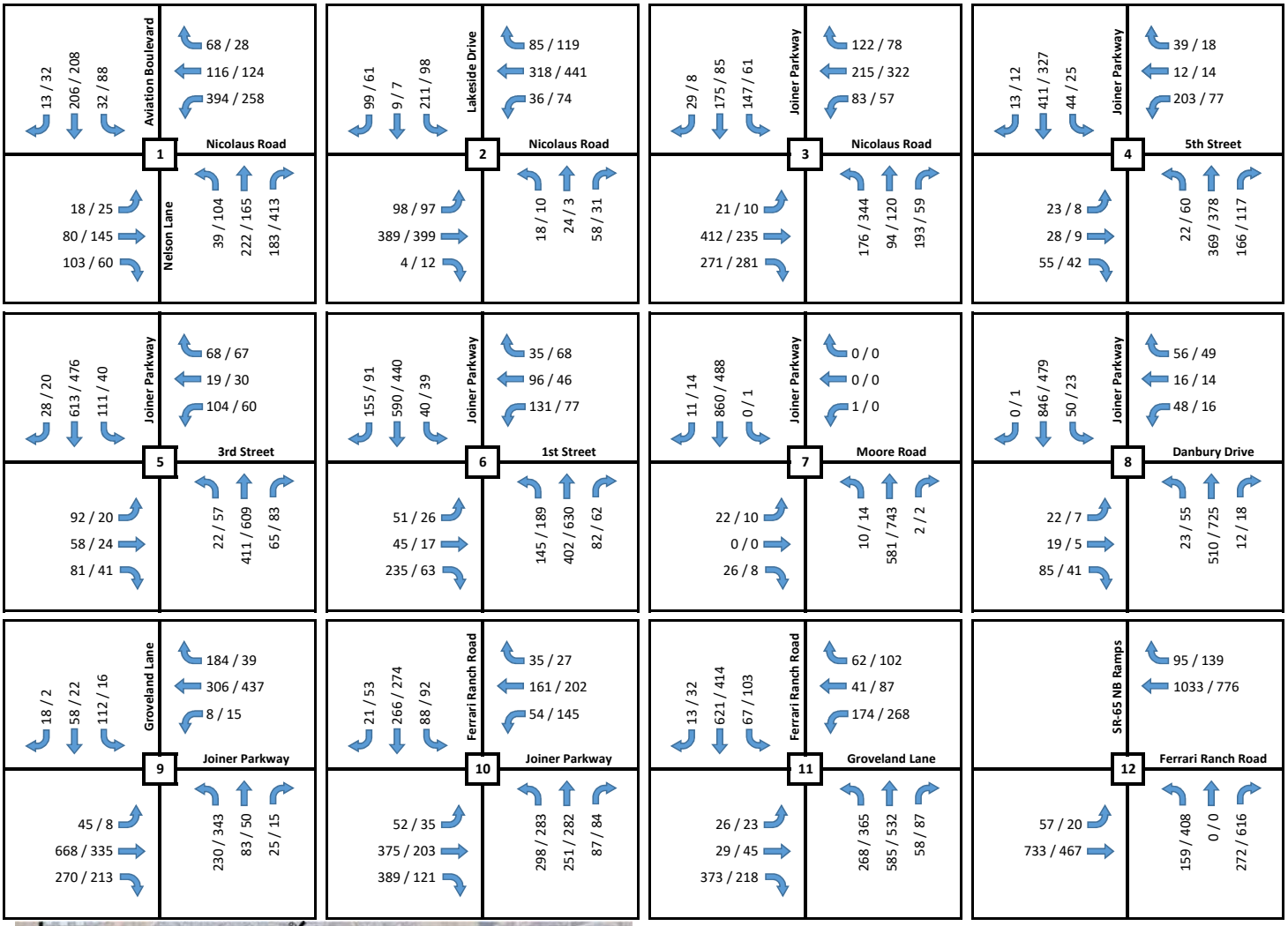
TABLE 9. APPROVED & PENDING PROJECTS TRIP GENERATION TABLE

Project	Jurisdiction	Land Use	Intensity	ADT	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
1 Independence	City of Lincoln	Single Family Residential	575 DU	5,475	431	108	323	576	362	213
		Multi-Family Residential	54 DU	359	28	6	22	34	22	12
		Sports Fields	2 Soccer Fields	70	0	0	0	35	25	10
		Total Vehicle Trips		**5,904**	**459**	**114**	**345**	**645**	**409**	**235**
2 Fullerton Ranch	City of Lincoln	Single Family Residential	81 DU	771	61	15	46	81	51	30
3 Lincoln Crossing Village 11	City of Lincoln	Single Family Residential	166 DU	1,657	123	31	92	165	104	61
Total Cumulative Project Trips				**8,332**	**643**	**160**	**483**	**891**	**564**	**326**

DU = Dwelling Unit

As shown, the three approved/pending projects would generate approximately 8,332 daily trips with 643 AM peak hour trips and 891 PM peak hour trips.

Exhibit 11 shows the Existing Plus Approved/Pending Projects Without Project daily and peak hour volumes.



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Existing Plus Approved/Pending Projects Without Project Daily & AM/PM Peak Hour Volumes

Exhibit 11

5.2 EXISTING PLUS APPROVED/PENDING PROJECTS WITHOUT PROJECT PEAK HOUR STUDY INTERSECTION LOS

Table 10 summarizes Existing Plus Approved/Pending Projects Without Project AM and PM peak hour level of service for all study intersections. Detailed analysis sheets are contained in **Appendix F**.

TABLE 10. EXISTING PLUS APPROVED/PENDING PROJECTS WITHOUT PROJECT AM/PM PEAK HOUR INTERSECTION LOS

	Study Intersection	Traffic Control	Existing Plus Approved/Pending Projects Conditions			
			AM		PM	
			Delay[1]	LOS	Delay[1]	LOS
1	Nicolaus Road / Nelson Lane	AWSC	**26.8**	**D**	16.0	C
2	Nicolaus Road / Lakeside Drive	AWSC	9.4	A	8.3	A
3	Joiner Parkway / Nicolaus Road	Signal	27.6	C	19.3	B
4	Joiner Parkway / 5th Street	Signal	20.9	C	12.7	B
5	Joiner Parkway / 3rd Street	Signal	18.0	B	13.9	B
6	Joiner Parkway / 1st Street	Signal	28.6	C	16.4	B
7	Joiner Parkway / Moore Road	AWSC	**36.3**	**E**	12.8	B
8	Joiner Parkway / Danbury Drive	Signal	17.8	B	14.4	B
9	Joiner Parkway / Groveland Lane	Signal	24.1	C	18.0	B
10	Joiner Parkway / Ferrari Ranch Road	Signal	23.3	C	23.3	C
11	Ferrari Ranch Road / Groveland Lane	Signal	**46.4**	**D**	**61.8**	**E**
12	Ferrari Ranch Road / SR-65 NB Ramps	Signal	48.5	D	29.8	C
13	Ferrari Ranch Road / SR-65 SB Ramps	Signal	5.4	A	6.1	A
14	Nicolaus Road / Site Driveway #1	OWSC	Does Not Exist Without Project			
15	Joiner Parkway / Site Driveway #2	OWSC	Does Not Exist Without Project			

Note: Deficient intersection operation indicated in **bold**.
[1]Average seconds of delay per vehicle.
AWSC = All-Way Stop Control; LOS = Level of Service: OWSC = One-Way Stop Control

As shown in **Table 10**, all study intersections are forecast to operate at an acceptable level of service (LOS C or better) during the peak hours except for the following study intersections:

- Int. #1 – Nicolaus Road / Nelson Lane: LOS D in the AM Peak Hour
- Int. #7 – Joiner Parkway / Moore Road: LOS E in the AM Peak Hour
- Int. #11 – Ferrari Ranch Road / Groveland Lane: LOS D in the AM & E in the PM Peak Hour

Intersections #14 and #15 are project driveways and do not exist without the proposed Joiner Ranch East project. It may be noted that LOS "D" is considered acceptable intersection operations at Caltrans facilities such as Ferrari Ranch Road / SR-65 Northbound and Southbound Ramps. LOS "E" and "F" is considered deficient intersection operating conditions at Caltrans facilities.

5.3 EXISTING PLUS APPROVED/PENDING PROJECTS WITHOUT PROJECT ROADWAY SEGMENT LOS

Table 11 summarizes Existing Plus Approved/Pending Projects Without Project conditions roadway segment operations.

TABLE 11. EXISTING PLUS APPROVED/PENDING PROJECTS WITHOUT PROJECT ROADWAY SEGMENT LOS

Segment	Location	Classification	LOS E Capacity Per Lane	# of Lanes	Total LOS E Capacity	Existing Plus Approved/Pending Projects		
						ADT	V/C	LOS
Nicolaus Road	Lakeside Drive to Joiner Parkway	Arterial - High Access Control	10,000	4	40,000	11,836	0.30	A
	Joiner Parkway to O Street	Arterial - Moderate Access Control	9,000	2	18,000	8,669	0.48	A
Joiner Parkway	Nicolaus Road to 5th Street	Arterial - High Access Control	10,000	4	40,000	10,008	0.25	A
	1st Street to Moore Road	Arterial – High Access Control	10,000	4	40,000	17,129	0.43	A
	Danbury Drive to Groveland Lane	Arterial - High Access Control	10,000	4	40,000	18,384	0.46	A
	Ferrari Ranch Road to Lincoln Blvd	Arterial - High Access Control	10,000	4	40,000	9,489	0.24	A
Ferrari Ranch Road	Joiner Parkway to Danbury Drive	Arterial - High Access Control	10,000	4	40,000	9,425	0.24	A
	SR-65 NB Ramps to Groveland Lane	Arterial - High Access Control	10,000	6	60,000	25,062	0.42	A

Note: Deficient roadway segment operations shown in **bold**.
ADT= Average Daily Traffic; LOS= Level of Service; V/C= Volume to Capacity Ratio

As shown in **Table 11**, all study roadway segments operate at an acceptable level of service (LOS C or better) for Existing Plus Approved/Pending Projects Without Project conditions.

6 EXISTING PLUS APPROVED/PENDING PROJECTS PLUS PROJECT CONDITIONS

6.1 EXISTING PLUS APPROVED/PENDING PROJECTS PLUS PROJECT TRAFFIC VOLUMES

Existing Plus Approved/Pending Projects Plus Project traffic volumes are derived by adding trips forecast to be generated by the proposed project to Existing Plus Approved/Pending Projects Without Project traffic volumes.

Exhibit 12 shows the Existing Plus Approved/Pending Projects Plus Project daily and peak hour volumes.

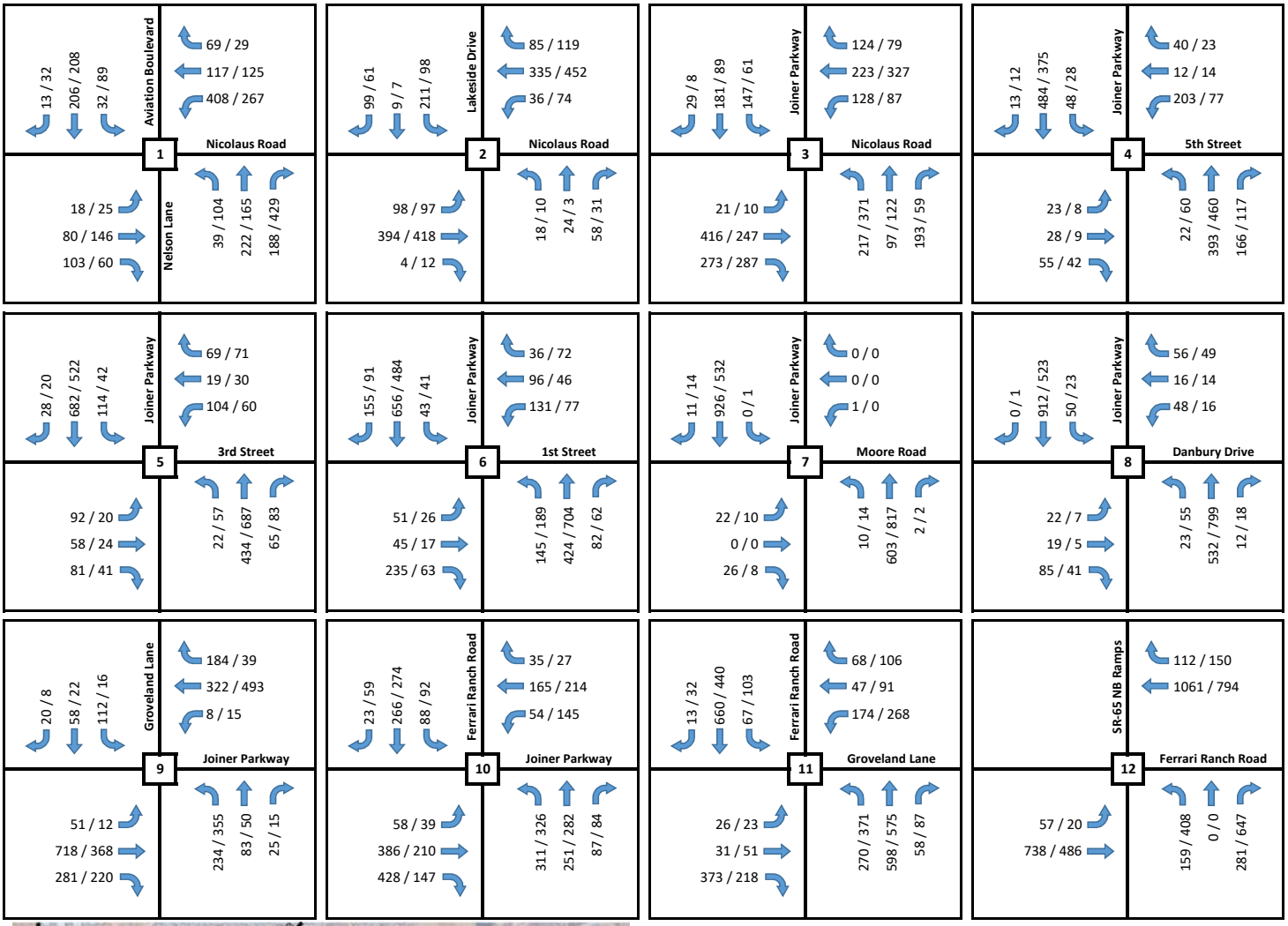
6.2 EXISTING PLUS APPROVED/PENDING PROJECTS PLUS PROJECT PEAK HOUR STUDY INTERSECTION LOS

Table 12 summarizes Existing Plus Approved/Pending Projects Plus Project AM and PM peak hour level of service for all study intersections. Detailed analysis sheets are contained in **Appendix G**.

TABLE 12. EXISTING PLUS APPROVED/PENDING PROJECTS PLUS PROJECT AM/PM PEAK HOUR INTERSECTION LOS

	Study Intersection	Existing Plus Approved/ Pending Projects Conditions				Existing Plus Approved/ Pending Projects Plus Project Conditions				Change in Delay (sec.)		Significant Impact?	
		AM		PM		AM		PM					
		Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	AM	PM	AM	PM
1	Nicolaus Road / Nelson Lane	**26.8**	**D**	16.0	C	**37.4**	**E**	15.1	C	10.6	-0.9	No	No
2	Nicolaus Road / Lakeside Drive	9.4	A	8.3	A	9.5	A	8.2	A	0.1	-0.1	No	No
3	Joiner Parkway / Nicolaus Road	27.6	C	19.3	B	32.3	C	20.4	C	4.7	1.1	No	No
4	Joiner Parkway / 5th Street	20.9	C	12.7	B	21.6	C	12.8	B	0.7	0.1	No	No
5	Joiner Parkway / 3rd Street	18.0	B	13.9	B	18.5	B	13.9	B	0.5	0.0	No	No
6	Joiner Parkway / 1st Street	28.6	C	16.4	B	30.1	C	16.6	B	1.5	0.2	No	No
7	Joiner Parkway / Moore Road	**36.3**	**E**	12.8	B	**48.6**	**E**	14.1	B	12.3	1.3	No	No
8	Joiner Parkway / Danbury Drive	17.8	B	14.4	B	18.2	B	14.7	B	0.4	0.3	No	No
9	Joiner Parkway / Groveland Lane	24.1	C	18.0	B	24.9	C	18.8	B	0.8	0.8	No	No
10	Joiner Parkway / Ferrari Ranch Rd	23.3	C	23.3	C	23.7	C	23.7	C	0.4	0.4	No	No
11	Ferrari Ranch Rd / Groveland Lane	**46.4**	**D**	**61.8**	**E**	**46.9**	**D**	**63.0**	**E**	0.5	1.2	No	No
12	Ferrari Ranch Rd / SR-65 NB Ramps	48.5	D	29.8	C	53.8	D	29.9	C	5.3	0.1	No	No
13	Ferrari Ranch Rd / SR-65 SB Ramps	5.4	A	6.1	A	5.5	A	6.3	A	0.1	0.2	No	No
14	Nicolaus Road / Site Driveway #1	Does Not Exist				1.6	A	1.1	A	1.6	1.1	No	No
15	Joiner Parkway / Site Driveway #2	Does Not Exist				0.5	A	0.4	A	0.5	0.4	No	No

Note: Deficient intersection operation indicated in **bold**.
[1]Seconds of delay per vehicle.
LOS = level of service



Notes:

XX / XX = AM / PM Peak Hour Volumes

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Existing Plus Approved/Pending Projects Plus Project Daily & AM/PM Peak Hour Volumes

Exhibit 12

As shown in **Table 12**, all study intersections are forecast to operate at an acceptable level of service (LOS C or better) with the addition of project traffic during the peak hours except for the following intersections:

- Int. #1 - Nicolaus Road / Nelson Lane — LOS E in the AM Peak Hour
- Int. # 7 – Joiner Parkway / Moore Road — LOS E in the AM Peak Hour
- Int. # 11 – Ferrari Ranch Road / Groveland Lane — LOS D in AM & LOS E in PM Peak Hour

At the all-way stop controlled intersection of Nicolaus Road / Nelson Lane, intersection operations are deficient in the AM peak hour without and with project traffic and the change in delay exceeds the 2.5 second significance threshold. However, project-related traffic does not result in a significant impact at this location since a signal warrant is not met. Refer to Section 1.2.1 of this report and **Appendix J** for further detail on signal warrant analysis. Therefore, project traffic at this intersection is considered less-than-significant and no mitigation is required.

At the all-way stop controlled intersection of Joiner Parkway / Moore Road, intersection operations are deficient in the AM peak hour without and with project traffic and the change in delay exceeds the 2.5 second significance threshold. However, project-related traffic does not result in a significant impact at this location since a signal warrant is not met. Refer to Section 1.2.1 of this report and **Appendix J** for further detail on signal warrant analysis. Therefore, project traffic at this intersection is considered less-than-significant and no mitigation is required.

At the signalized intersection of Ferrari Ranch Road / Groveland Lane, intersection operations are deficient in both the AM and PM peak hour. However, the change in delay of 0.5 and 1.2 seconds in the AM and PM peaks respectively are less than the 4.0 second threshold of significance. Therefore, project traffic at this intersection is considered less-than-significant and no mitigation is required.

6.3 EXISTING PLUS APPROVED/PENDING PROJECTS PLUS PROJECT ROADWAY SEGMENT LOS

Table 13 summarizes Existing Plus Approved/Pending Projects Plus Project roadway segment operations.

TABLE 13. EXISTING PLUS APPROVED/PENDING PROJECTS PLUS PROJECT ROADWAY SEGMENT LOS

Segment	Location	Total LOS E Capacity	Existing Plus Approved/ Pending Projects			Existing Plus Approved/ Pending Projects Plus Project			Δ V/C	Project ADT	Significant Impact?
			ADT	V/C	LOS	ADT	V/C	LOS			
Nicolaus Road	Lakeside Drive to Joiner Parkway	40,000	11,836	0.30	A	12,130	0.30	A	0.007	294	No
	Joiner Parkway to O Street	18,000	8,669	0.48	A	9,648	0.54	A	0.054	979	No
Joiner Parkway	Nicolaus Road to 5th Street	40,000	10,008	0.25	A	11,437	0.29	A	0.036	1,429	No
	1st Street to Moore Road	40,000	17,129	0.43	A	18,304	0.46	A	0.029	1,175	No
	Danbury Drive to Groveland Lane	40,000	18,384	0.46	A	19,559	0.49	A	0.029	1,175	No
	Ferrari Ranch Rd to Lincoln Blvd	40,000	9,489	0.24	A	9,685	0.24	A	0.005	196	No
Ferrari Ranch Road	Joiner Parkway to Danbury Drive	40,000	9,425	0.24	A	9,523	0.24	A	0.002	98	No
	SR-65 NB Ramps to Groveland Ln	60,000	25,062	0.42	A	25,845	0.43	A	0.013	783	No

Note: Deficient roadway segment operations shown in **bold**.
LOS= Level of Service; V/C= Volume to Capacity Ratio; Δ= Difference

As shown in **Table 13**, all study roadway segments are forecast to operate at an acceptable level of service (LOS C or better) for Existing Plus Approved/Pending Projects Plus Project conditions. Therefore, there are no significant impacts as a result of the project. Thus, mitigation is not required.

7 CUMULATIVE YEAR 2040 WITHOUT PROJECT CONDITIONS

7.1 CUMULATIVE YEAR 2040 WITHOUT PROJECT TRAFFIC VOLUMES

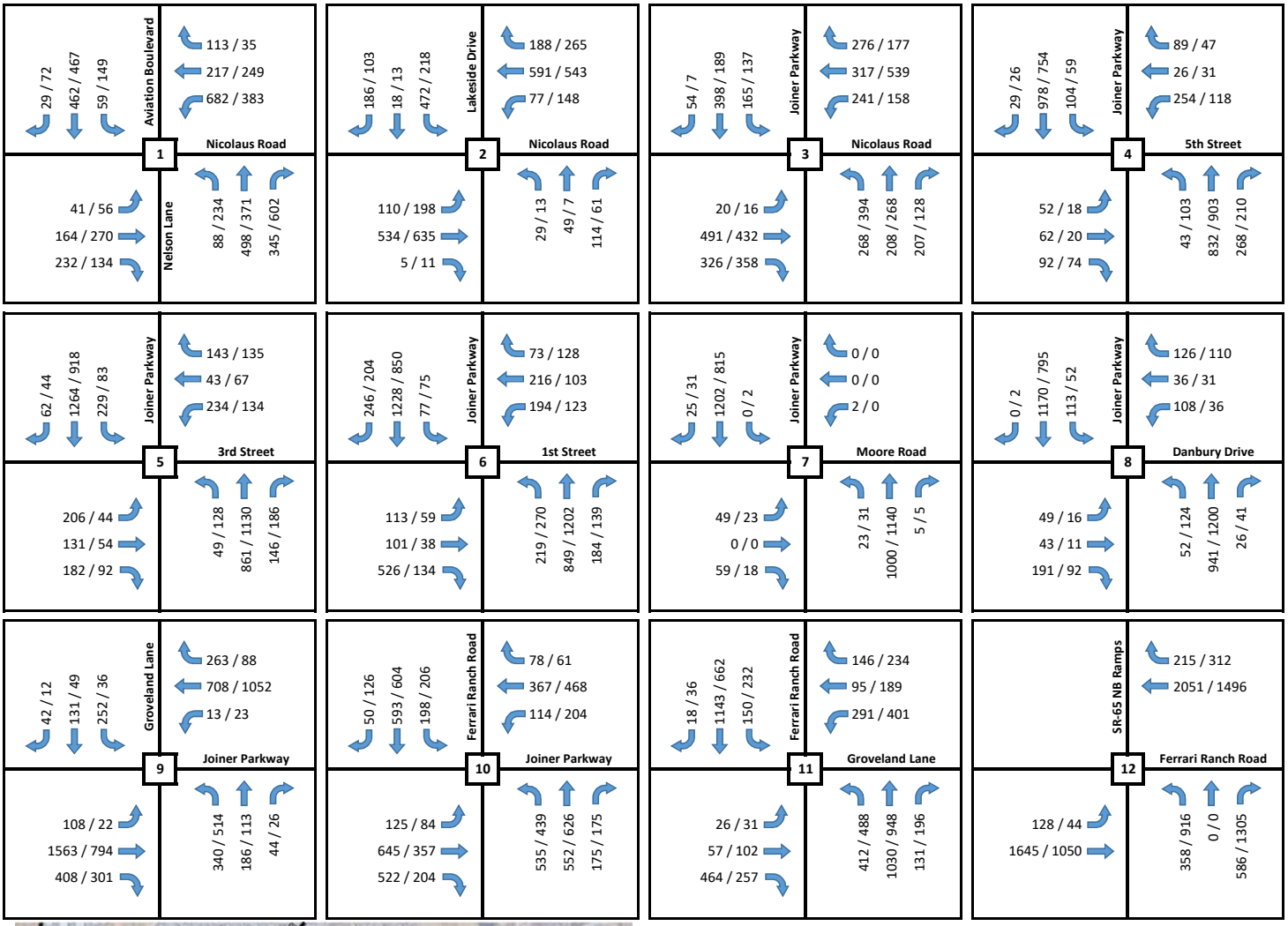
Through coordination with City staff, the Year 2030 Sacramento Area Council of Governments (SACOG) travel model was provided by DKS Associates in February 2020. For the purpose of this analysis, the 2030 SACOG travel model was used to develop the Year 2040 peak hour and daily traffic volumes within the project study area. Traffic growth within the project's study area is attributed to future planned development within the area and is forecast to have a growth rate of 9.68% per year for nine years (project buildout in year 2021 to year 2030). To determine traffic growth in the area from the model year 2030 to year 2040, the average population growth rate in the City of Lincoln was used since forecast traffic growth to year 2040 is not provided in the model. The average population growth rate over the last eight years was calculated to be 1.35% per year from 2011 to 2019 (refer to http://worldpopulationreview.com/us-cities/lincoln-ca-population/). To be conservative, a 2% per year growth rate for a 10-year period was applied above the model Year 2030 traffic volumes which included project traffic to obtain the Cumulative Year 2040 Plus Project traffic volumes. Future volumes were reviewed to determine the reasonableness of growth within the study area.

Year 2040 was selected as the cumulative year to be consistent with the City's General Plan. Daily traffic volumes for the Cumulative Year 2040 Without Project condition were derived from the 2030 SACOG travel model. First, the daily traffic volumes from the Year 2030 SACOG travel model were extracted directly from the model and then a 2% growth rate per year was applied to the 2030 volumes for 10 years (2030 to 2040) to obtain the Cumulative Year 2040 Plus Project volumes similar to how the peak hour volumes were calculated. Daily traffic volumes generated by Joiner Ranch East project were subtracted from the Cumulative Year 2040 Plus Project daily volumes to obtain the Cumulative Year 2040 Without Project daily traffic volumes.

It should be noted that the SACOG model assumes three single family dwelling units, 181,100 square feet of retail and 67,500 square feet of office within the traffic analysis zone where the Joiner Ranch East project is located. This translates to 7,500 vehicles per day using ITE trip generation rates. The Joiner Ranch East project with 199 single family dwelling units is expected to generate 1,958 vehicles per day (5,542 less daily trips than what's assumed in the SACOG model). To provide a conservative analysis, only traffic volumes associated with the proposed Joiner Ranch East project were extracted to determine the no project condition. **Exhibit 13** shows the Cumulative Year 2040 Without Project AM and PM peak hour volumes at study intersections.

7.2 CUMULATIVE YEAR 2040 ROADWAY NETWORK

The Cumulative Year 2040 Without Project condition assumed planned roadway improvements such as the signalization of Nicolaus Road / Nelson Lane and signalization of Nicolaus Road / Lakeside Drive. These improvements are planned as part of the Independence at Lincoln development and SUD-B Northeast Quadrant Specific Plan under Cumulative conditions. Therefore, this analysis assumes these improvements will be constructed by others prior to year 2040.



Notes:

XX / XX = AM / PM Peak Hour Volumes

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Cumulative Year 2040 Without Project Daily & AM/PM Peak Hour Volumes

Exhibit 13

7.3 CUMULATIVE YEAR 2040 WITHOUT PROJECT PEAK HOUR STUDY INTERSECTION LOS

Table 14 summarizes Cumulative Year 2040 Without Project AM and PM peak hour level of service for all study intersections. Detailed analysis sheets are contained in **Appendix H**.

TABLE 14. CUMULATIVE YEAR 2040 WITHOUT PROJECT AM/PM PEAK HOUR INTERSECTION LOS

	Study Intersection	Traffic Control	Cumulative Year 2040 Without Project			
			AM		PM	
			Delay[1]	LOS	Delay[1]	LOS
1	Nicolaus Road / Nelson Lane	Signal	**43.8**	**D**	**65.1**	**E**
2	Nicolaus Road / Lakeside Drive	Signal	31.0	C	22.8	C
3	Joiner Parkway / Nicolaus Road	Signal	**63.3**	**E**	29.2	C
4	Joiner Parkway / 5th Street	Signal	23.7	C	16.6	B
5	Joiner Parkway / 3rd Street	Signal	33.7	C	22.4	C
6	Joiner Parkway / 1st Street	Signal	**78.0**	**E**	23.5	C
7	Joiner Parkway / Moore Road	AWSC	**119.8**	**F**	**48.5**	**E**
8	Joiner Parkway / Danbury Drive	Signal	30.2	C	21.3	C
9	Joiner Parkway / Groveland Lane	Signal	**92.2**	**F**	**37.1**	**D**
10	Joiner Parkway / Ferrari Ranch Rd	Signal	30.6	C	26.7	C
11	Ferrari Ranch Rd / Groveland Lane	Signal	**50.7**	**D**	**51.4**	**D**
12	Ferrari Ranch Rd / SR-65 NB Ramps	Signal	49.5	D	**65.4**	**E**
13	Ferrari Ranch Rd / SR-65 SB Ramps	Signal	7.9	A	7.3	A
14	Nicolaus Road / Site Driveway #1	OWSC	Does Not Exist Without Project			
15	Joiner Parkway / Site Driveway #2	OWSC	Does Not Exist Without Project			

Note: Deficient intersection operation indicated in **bold**.
[1]Seconds of delay per vehicle.
LOS = level of service; AWSC = All-Way Stop Control; OWSC = One-Way Stop Control

As shown in **Table 14**, all study intersections are forecast to operate at an acceptable level of service (LOS C or better) during the peak hours except for:

- Int. #1 – Nicolaus Road / Nelson Lane — LOS D in the AM & LOS E in the PM Peak Hour
- Int. #3 – Joiner Parkway / Nicolaus Road — LOS E in the AM Peak Hour
- Int. #6 – Joiner Parkway / 1st Street — LOS E in the AM Peak Hour
- Int. #7 – Joiner Parkway / Moore Road — LOS F in the AM & LOS E in the PM Peak Hour
- Int. #9 – Joiner Parkway / Groveland Lane — LOS F in the AM & LOS D in the PM Peak Hour
- Int. #11 – Ferrari Ranch Rd / Groveland Lane — LOS D in the AM & PM Peak Hour

7.4 CUMULATIVE YEAR 2040 WITHOUT PROJECT ROADWAY SEGMENT LOS

Table 15 summarizes the Cumulative Year 2040 Without Project conditions average daily traffic levels of service for all study roadway segments.

TABLE 15. CUMULATIVE YEAR 2040 WITHOUT PROJECT ROADWAY SEGMENT LOS

Segment	Location	Classification	LOS E Capacity	# of Lanes	Total LOS E Capacity	Cumulative Year 2040		
						ADT	V/C	LOS
Nicolaus Road	Lakeside Drive to Joiner Parkway	Arterial - High Access Control	10,000	4	40,000	33,906	0.85	**D**
	Joiner Parkway to O Street	Arterial - Moderate Access Control	9,000	2	18,000	15,581	0.87	**D**
Joiner Parkway	Nicolaus Road to 5th Street	Arterial - High Access Control	10,000	4	40,000	26,171	0.65	B
	1st Street to Moore Road	Arterial - High Access Control	10,000	4	40,000	36,745	0.92	**E**
	Danbury Drive to Groveland Lane	Arterial - High Access Control	10,000	4	40,000	37,345	0.93	**E**
	Ferrari Ranch Rd to Lincoln Blvd	Arterial - High Access Control	10,000	4	40,000	27,764	0.69	B
Ferrari Ranch Road	Joiner Parkway to Danbury Drive	Arterial - High Access Control	10,000	4	40,000	17,902	0.45	A
	SR-65 NB Ramps to Groveland Ln	Arterial - High Access Control	10,000	6	60,000	57,297	0.95	**E**

Note: Deficient roadway segment operations shown in **bold**.
LOS= Level of Service; V/C= Volume to Capacity Ratio

As shown in **Table 15**, three of the study roadway segments are forecast to operate at an acceptable level of service (LOS C or better) for Cumulative Year 2040 Without Project conditions. The remaining five roadway segments in the study area are forecast to operate at a deficient level of service (D, E or F).

8 CUMULATIVE YEAR 2040 PLUS PROJECT CONDITION

8.1 CUMULATIVE YEAR 2040 PLUS PROJECT TRAFFIC VOLUMES

Cumulative Year 2040 Plus Project traffic volumes are based on traffic volumes from the Year 2030 SACOG travel model and population growth to estimate Year 2040 traffic volumes as discussed in Section 7.1 of this report. **Exhibit 14** shows the Cumulative Year 2040 Plus Project daily and peak hour volumes.

8.2 CUMULATIVE YEAR 2040 PLUS PROJECT PEAK HOUR STUDY INTERSECTION LOS

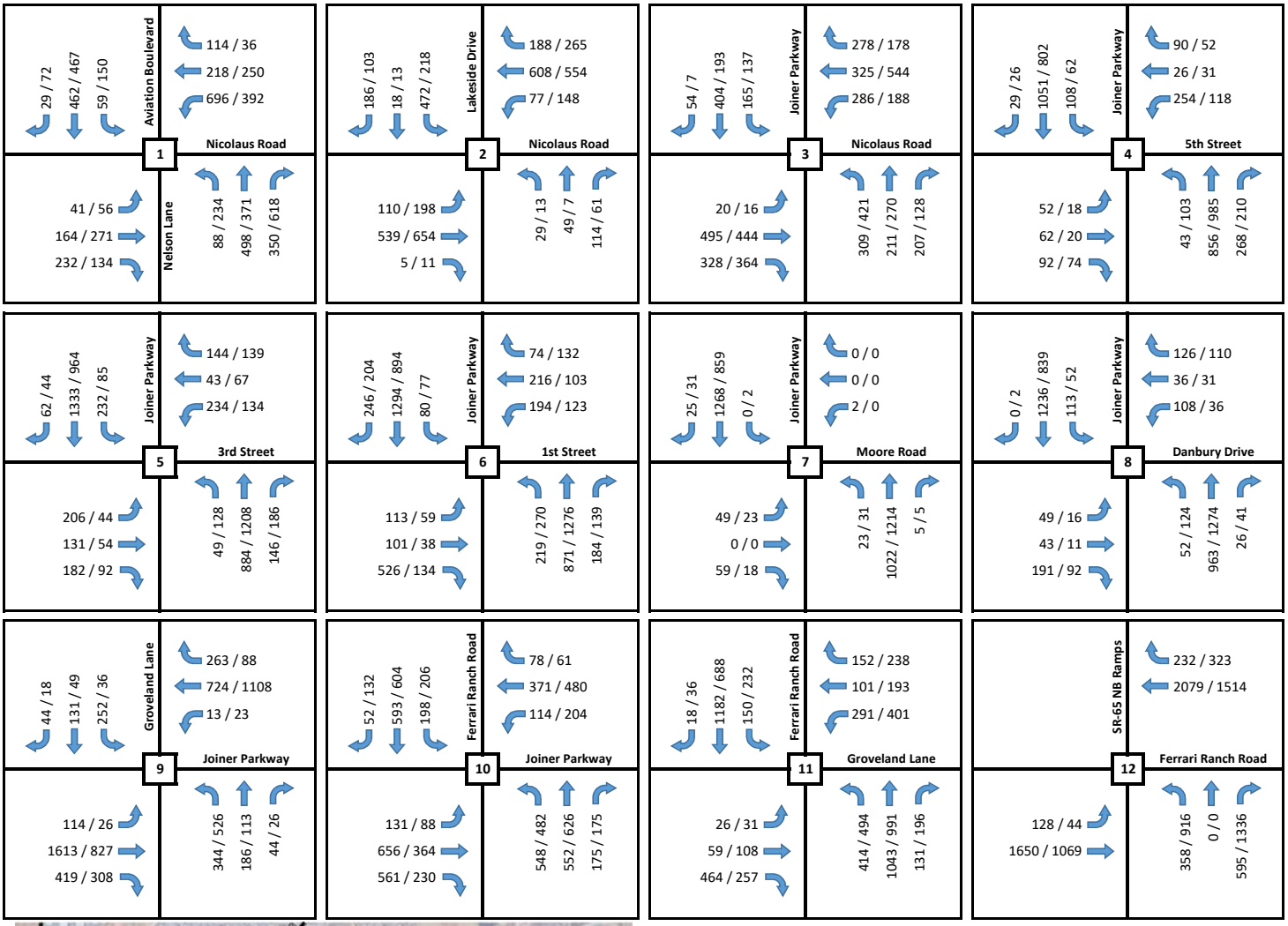
Table 16 summarizes Cumulative Year 2040 Plus Project AM and PM peak hour level of service for all study intersections. Detailed analysis sheets are contained in **Appendix I**.

TABLE 16. CUMULATIVE YEAR 2040 PLUS PROJECT AM/PM PEAK HOUR INTERSECTION LOS

	Study Intersection	Cumulative Year 2040 Conditions				Cumulative Year 2040 Plus Project Conditions				Change in Delay (sec.)		Significant Impact?	
		AM		PM		AM		PM					
		Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	AM	PM	AM	PM
1	Nicolaus Road / Nelson Lane	**43.8**	**D**	**65.1**	**E**	**45.1**	**D**	**65.9**	**E**	1.3	0.8	No	No
2	Nicolaus Road / Lakeside Drive	31.0	C	22.8	C	32.7	C	22.8	C	1.7	0.0	No	No
3	Joiner Parkway / Nicolaus Road	**63.3**	**E**	29.2	C	**64.8**	**E**	33.7	C	1.5	4.5	No	No
4	Joiner Parkway / 5th Street	23.7	C	16.6	B	24.5	C	16.5	B	0.8	-0.1	No	No
5	Joiner Parkway / 3rd Street	33.7	C	22.4	C	34.4	C	23.2	C	0.7	0.8	No	No
6	Joiner Parkway / 1st Street	**78.0**	**E**	23.5	C	**81.1**	**F**	24.2	C	3.1	0.7	No	No
7	Joiner Parkway / Moore Road	**119.8**	**F**	**48.5**	**E**	**139.4**	**F**	**65.2**	**F**	19.6	16.7	**Yes**	No
8	Joiner Parkway / Danbury Drive	30.2	C	21.3	C	31.4	C	22.2	C	1.2	0.9	No	No
9	Joiner Parkway / Groveland Lane	**92.2**	**F**	**37.1**	**D**	**95.6**	**F**	**40.1**	**D**	3.4	3.0	No	No
10	Joiner Parkway / Ferrari Ranch Rd	30.6	C	26.7	C	31.5	C	27.5	C	0.9	0.8	No	No
11	Ferrari Ranch Rd / Groveland Lane	**50.7**	**D**	**51.4**	**D**	**52.1**	**D**	**52.8**	**D**	1.4	1.4	No	No
12	Ferrari Ranch Rd / SR-65 NB Ramps	49.5	D	**65.4**	**E**	51.1	D	**68.2**	**E**	1.6	2.8	No	No
13	Ferrari Ranch Rd / SR-65 SB Ramps	7.9	D	7.3	A	8.1	A	7.6	A	0.2	0.3	No	No
14	Nicolaus Road / Site Driveway #1	Does Not Exist				24.9	C	20.0	C	24.9	20.0	No	No
15	Joiner Parkway / Site Driveway #2	Does Not Exist				12.6	B	11.8	B	12.6	11.8	No	No

Note: Deficient intersection operation indicated in **bold**.
[1]Seconds of delay per vehicle.
LOS = level of service

As shown in **Table 16**, all study intersections are forecast to operate at an acceptable level of service (LOS C or better) during the peak hours expect for six study intersections. The all-way stop controlled intersection of Joiner Parkway / Moore Road is forecast to be significantly impacted by the project. The change in delay is greater than 4.0 seconds and a signal is warranted in the AM peak hour. Refer to **Appendix J** for the signal warrant analysis. Recommended mitigation for the project is to contribute a fair share towards a traffic signal at the Joiner Parkway/Moore Road intersection.



Notes:

XX / XX = AM / PM Peak Hour Volumes

Michael Baker INTERNATIONAL

Cumulative Year 2040 Plus Project
Daily & AM/PM Peak Hour Volumes

Exhibit 14

8.3 CUMULATIVE YEAR 2040 PLUS PROJECT ROADWAY SEGMENT LOS

Table 17 summarizes Cumulative Year 2040 Plus Project conditions roadway segment operations.

TABLE 17. CUMULATIVE YEAR 2040 PLUS PROJECT ROADWAY SEGMENT LOS

Segment	Location	Total LOS E Capacity	Cumulative Year 2040			Cumulative Year 2040 Plus Project			Δ V/C	Project ADT	Significant Impact?
			ADT	V/C	LOS	ADT	V/C	LOS			
Nicolaus Road	Lakeside Drive to Joiner Parkway	40,000	33,906	0.85	**D**	34,200	0.86	**D**	0.007	294	No
	Joiner Parkway to O Street	18,000	15,581	0.87	**D**	15,560	0.92	**E**	**0.054**	**979**	**Yes**
Joiner Parkway	Nicolaus Road to 5th Street	40,000	26,171	0.65	B	27,600	0.69	B	0.036	1,429	No
	1st Street to Moore Road	40,000	36,745	0.92	**E**	37,920	0.95	**E**	0.029	1,175	No
	Danbury Drive to Groveland Lane	40,000	37,345	0.93	**E**	38,520	0.96	**E**	0.029	1,175	No
	Ferrari Ranch Rd to Lincoln Blvd	40,000	27,764	0.69	B	27,960	0.70	B	0.005	196	No
Ferrari Ranch Road	Joiner Parkway to Danbury Drive	40,000	17,902	0.45	A	18,000	0.45	A	0.002	98	No
	SR-65 NB Ramps to Groveland Ln	60,000	57,297	0.95	**E**	58,080	0.97	**E**	0.013	783	No

Note: Deficient roadway segment operations shown in **bold**.
ADT= Average Daily Traffic; LOS= Level of Service; V/C= Volume to Capacity Ratio

As shown in **Table 17**, three of the study roadway segments are forecast to operate at an acceptable level of service (LOS C or better) for Cumulative Year 2040 Plus Project conditions. The remaining five roadway segments in the study area are forecast to operate at a deficient level of service (D, E or F).

According to the significance criteria, Nicolaus Road from Joiner Parkway to O Street is significantly impacted by the project. The change in v/c ratio for this segment exceeds the 0.05 significance threshold and the project ADT is more than 100 vehicles per day. The impacted segment on Nicolaus Road includes the project frontage, which is approximately 1,150 feet. The project plans to widen Nicolaus Road from the existing 40-foot pavement width to match the 70 feet curb-to-curb width immediately east of the project site (30-foot widening). The new roadway would include one travel lane in each direction and a center two-way left-turn lane which will increase roadway capacity and access to/from the project site. With three travel lanes on Nicolaus Road from Joiner Parkway to O Street, the total LOS E capacity would increase from 18,000 to 27,000 vehicles per day (9,000 x 3 lanes). With a Cumulative Year 2040 Plus Project daily volume of 15,560, the LOS on this segment would be LOS B (v/c = 15,560 / 27,000 = 0.58). Therefore, these improvements are expected to reduce the level of impact to less than significant.

9 PROJECT ACCESS, CIRCULATION & VMT

The project proposes to provide two points of vehicular access via Joiner Parkway and Nicolaus Road. At the Joiner Parkway stop-controlled access, the project will provide a left-turn in, right-turn in, and right-turn out. Access to the project via Nicolaus Road is proposed to be a full access stop-controlled driveway. The traffic analysis includes both access points which are anticipated to operate at acceptable levels of service (LOS C or better). In addition to the level of service analysis, the sight distance and the determination of a left-turn lane is evaluated at the project access point on Nicolaus Road. The southbound left-turn pocket on Joiner Parkway providing access into the project has already been constructed within the existing center raised median. However, the left-turn lane needs to be re-striped since the turn lane is currently striped to prohibit motorists from using the turn lane at this time. The raised median along Joiner Parkway at the project access prohibits project traffic from a westbound left out of the driveway onto Joiner Parkway to travel southbound. Therefore, some of the project traffic is expected to turn right onto Joiner Parkway and then make a U-turn at the signalized intersection of Joiner Parkway/Nicolaus Road. These U-turns have been included in the level of service analysis and are not expected to negatively impact the operations of the intersection. A queuing analysis is included in this section showing the northbound left-turn queues based on the different study scenarios with project traffic.

9.1 SIGHT DISTANCE

For the proposed project access on Nicolaus Road, minimum corner sight distance shall be in conformance with the *American Association of State Highway and Transportation Officials* (AASHTO) 6th Edition Standards. The posted speed limit on Nicolaus Road is 35 MPH.

These guidelines state that specific areas between a driver's eye and an approaching vehicle's path of travel (known as clear sight triangles) must be clear of obstructions that may block a driver's view. A height of 3.5 feet is used for both the driver's height and the object height. The sight triangles are based on the roadway design speed and the time gap for minor road vehicles to enter the major road and vice versa. For the purposes of these calculations, the design speed is assumed to be the same as the posted speed limit. The posted speed on Nicolaus Road is 35 MPH. The distance from the edge of the major-road travel way to the vertex of the clear sight distance must be a minimum of 10 feet plus the width of the shoulder of the major road for a total minimum of 15 feet. For the purposes of this analysis, 15 feet from the travel way to the location of the driver's eye is used. These sight triangles must be kept free of visual obstructions (i.e. monuments, landscaping, berms, etc.). In addition, any tree canopy within the sight triangle should also be maintained at a level no less than 10 feet above the roadway at all times.

Based on AASHTO standards, the required stopping sight distance for vehicles stopping, turning right or left from the project driveway onto Nicolaus Road is 250 feet. The available sight distance from the project driveway to the east is approximately 500 feet where the signal at Joiner Parkway is located. Looking west on Nicolaus Road, the available sight distance exceeds 500 feet. Therefore, the available sight distance is greater than the minimum sight distance and drivers exiting onto Nicolaus Road will have adequate visibility at the project driveway.

9.2 LEFT TURN LANE EVALUATION

A dedicated left-turn lane was evaluated in the westbound approach on Nicolaus Road for vehicles turning left into the project. The AASHTO standards provide guidelines for the installation of left-turn lanes in Chapter 9.7.3 (Design Treatments for Left-Turn Maneuvers). Table 9-23 in the AASHTO standards is presented in **Table 18** which presents the need for a left-turn lane based on the volume of traffic on the mainline road and relative percentage of traffic that turns left.

The need for the left turn lane is based on the AM peak hour where the volume of inbound traffic is highest. Under Existing Plus Approved/Pending Projects Plus Project conditions, four westbound left turns enter the project site on Nicolaus Road. The number of northbound left and right turning vehicles during the AM peak hour exiting the site is forecast to be 66 vehicles (11 turning right and 55 turning left). Therefore, 6% (4/66) of the vehicles turn left into the project site. There are 668 eastbound through vehicles in the AM peak hour opposing the advancing volume. As shown in Table 18, for the volume of eastbound traffic (668 vehicles/hour), the advancing volume would need to be in the range of 330 to 410 vehicles/hour at 40 MPH design speed to justify a separate westbound left-turn lane for traffic entering the project site. The anticipated volume (66 vehicles/hour) falls well outside that range. Therefore, a dedicated left-turn lane in the westbound approach on Nicolaus Road at the project access would not be needed using AASHTO's criteria. It may also be noted the project may be required to construct a center two-way-left-turn lane along the project frontage which would provide a separate left-turn lane in the westbound approach into the project from Nicolaus Road.

TABLE 18. LEFT TURN LANE ASSESSMENT

Opposing Volume (veh/hr)	Advancing Volume (veh/hr)			
	5% Left Turns	10% Left Turns	20% Left Turns	30% Left Turns
40-mph Operating Speed				
800	330	240	180	160
668	66 (6%)			
600	410	305	225	200
400	510	380	275	245
200	640	470	350	305
100	720	515	390	340

Source: A Policy on Geometric Design of Highway and Streets, AASHTO, Chapter 9.
Existing Plus Approved/Pending Projects Plus Project Volumes shown in **red**.

9.3 QUEUING EVALUATION

A queuing analysis was conducted at the intersection of Joiner Parkway / Nicolaus Road where the addition of project-related traffic at specific turn movements could potentially impact intersection operations. The queuing analysis focused on the northbound and westbound left-turn lanes where project traffic would be highest at Joiner Parkway / Nicolaus Road. Synchro was used to report the 95th percentile queue length in feet which is summarized in **Table 19**. The 95th percentile queue length value indicates that during the peak hour, a queue of this length of less would occur on 95 percent of the signal cycles.

TABLE 19 – INTERSECTION QUEUING ANALYSIS

Movement	No. Lanes	Storage Length Per Lane (ft)	Peak Hour Volume		95th % Queue (ft) [1]		Adverse Effect? [2]
			AM	PM	AM	PM	
EXISTING CONDITIONS							
Joiner Parkway / Nicolaus Road							
WBL	1	130	82	54	102	53	No
NBL	1.5	180	141	205	90	86	No
EXISTING PLUS PROJECT CONDITIONS							
Joiner Parkway / Nicolaus Road							
WBL	1	130	127	84	**195**	76	**Yes**
NBL	1.5	180	182	232	104	94	No
EXISTING PLUS APPROVED/PENDING PROJECTS PLUS PROJECT CONDITIONS							
Joiner Parkway / Nicolaus Road							
WBL	1	130	128	87	**231**	91	**Yes**
NBL	1.5	180	217	371	135	151	No

[1] Synchro reports 95th percentile queue in feet.

[2] For locations that exceed the available storage, does the project increase the queue by more than 25 feet (one vehicle-length)?

As shown in Table 19, the westbound left-turn 95th percentile queue is reported to be 231 feet with a current storage length of 130 feet. It is recommended the project extend the left-turn storage bay length from 130 feet to 230 feet (additional 100 feet) to accommodate additional project-related vehicles turning left in the westbound approach at Joiner Parkway / Nicolaus Road. **Appendix J** includes the queuing worksheets.

9.4 WEAVING ACROSS JOINER PARKWAY

Motorists weaving across one lane of northbound traffic on Joiner Parkway to access the number one left-turn lane to make a U-turn at the signalized intersection of Joiner Parkway / Nicolaus Road was considered. From the project access on Joiner Parkway to the beginning of the dual left-turn lane is approximately 300 feet. The posted speed limit on Joiner Parkway is 40 MPH. According to Figure 2-24 (Acceleration of Passenger Cars, Level Conditions) in the AASHTO standards, a motorist exiting the project site onto Joiner Parkway can accelerate to a speed of 35 MPH within a distance of 300 feet to enter the number one left-turn lane and then slow to a stop if there is no queue in the left turn lanes. However, if the vehicles queued in both of the left-turn lanes fill both storage bays, then a motorist exiting the project site to make a U-turn at the signal would most likely need to wait for the turn lanes to clear before entering onto Joiner Parkway to access the number one left-turn lane. The speed differential is 5 MPH and there would be gaps in northbound traffic based on the signal downstream at 5th Street. Therefore, the available weaving distance is considered adequate.

9.5 VEHICLE MILES TRAVELED (VMT)

In December 2018, new California Environmental Quality Act (CEQA) guidelines were approved that shift traffic analysis from delay and operations to VMT when evaluating transportation impacts under CEQA. This change in methodology is a result of Senate Bill 743 (SB743), which was signed into law in September 2013. As part of the development of the new CEQA guidelines, the Governor's Office of Planning and Research (OPR) prepared a *Technical Advisory on Evaluating Transportation Impacts in CEQA (Technical Advisory).* The final version of the Technical Advisory is dated December 2018 and provides guidance for local jurisdictions in developing methodologies and thresholds for evaluating VMT. The *Technical Advisory* provides VMT metrics for residential, retail and employment. For residential projects such as Joiner Ranch East, the *Technical Advisory* recommends establishing the VMT threshold at 85% or less of an adopted VMT threshold. At the time this report was prepared, the City of Lincoln or Placer County have not adopted VMT thresholds or guidelines. Agencies must fully implement the new CEQA guidelines for transportation by June 2020. It is anticipated the City of Lincoln or Placer County will release their own VTM thresholds and guidelines or adopt the VMT thresholds outlined in OPR's *Technical Advisory* in advance of the June 2020 deadline. For purposes of this analysis, OPR's thresholds and guidance for determining a significant VMT impact was used.

As stated in OPR's *Technical Advisory*, the threshold for determining a VMT impact is as follows:

> *"If a project average is lower than either 85% of the regional average or 85% average for the City or community in which the project is located, the VMT impacts of the project can be presumed less than significant."*

VMT per Capita maps are provided in Sacramento Area Council of Government's (SACOG) 2020 Metropolitan Transportation Plan / Sustainable Communities Strategy (MTP/SCS). The SACOG 2020 MTP/SCS illustrates the VMT generation across the region based on land use patterns in 2016 and 2040. Throughout the region, areas are color coded based on the VMT per capita relative to the regional average VMT. For example, blue and green areas represent the areas that tend to generate low daily VMT per person while orange and red areas show places that tend to rely more on driving for daily activities i.e. higher VMT per person. According to the VMT maps, the project site is located within an area that is currently and in the future expected to be 100% to 115% above the regional average VMT per capita. Refer to **Appendix J** for the VMT maps. This map indicates the project site is not located within a VMT efficient area. Since there is no high quality transit near the site, it is also not in a transit priority area. Therefore, it is reasonable to assume the proposed residential project in the City of Lincoln falls above the 85% threshold as recommended by OPR. Thus, the project will most likely have a significant VMT impact that will require mitigation.

For the project to reduce VMT-related impacts, recommended mitigation would be for the project to implement Transportation Demand Management (TDM) strategies. The California Air Pollution Control Officers Association (CAPCOA) report may be used to determine a wide range of TDM measures that could offset the project's VMT impacts. The following TDM measures have been identified to offset potential VMT impacts related to the proposed project:

- Provide Class II bike lanes along the project frontage to encourage an alternative travel mode.

- Provide pedestrian network improvements such as sidewalks and crosswalks within the project site and along the project frontage connecting to existing pedestrian facilities to encourage people to walk instead of drive.

- Provide traffic calming measures within the project site to encourage people to walk or bike instead of using a vehicle. Traffic calming measures may include marked crosswalks, curb extensions, speed tables, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.

10 FINDINGS AND RECOMMENDATIONS

The proposed Joiner Ranch project is forecast to generate approximately 1,958 new daily trips which includes approximately 146 AM (36 inbound and 110 outbound) peak hour trips and 197 PM (124 inbound and 73 outbound) peak hour trips. Below is a summary of the analysis results and recommended mitigation measures.

Level of Service Analysis Results

Existing Conditions:

The results of the Existing conditions analysis show that all study intersections currently operate at acceptable levels of service (LOS C or better) except for the following locations:

- Joiner Parkway / Moore Road (LOS D in the AM Peak Hour)
- Ferrari Ranch Road / Groveland Lane (LOS D in the AM & PM Peak Hours)

The roadway segment analysis shows that all study segments currently operate at acceptable levels of service (LOS C or better).

Existing Plus Project Conditions:

With the addition of project related traffic, all study intersections continue to operate at acceptable levels of service for the Existing Plus Project conditions with the exception of the following locations:

- Joiner Parkway / Moore Road (LOS E in the AM Peak Hour)
- Ferrari Ranch Road / Groveland Lane (LOS D in the AM & PM Peak Hours)

Of the locations operating deficiently, no direct significant impacts are expected to occur according to the significance criteria for study intersections. Therefore, no mitigation is required.

The roadway segment analysis shows that all study roadway segments operate at acceptable levels of service (LOS C or better) under Existing Plus Project Conditions. Therefore, no significant impacts are identified and no mitigation is required.

Existing Plus Approved/Pending Projects Without Project Conditions:

The results of the Existing Plus Approved/Pending Projects Without Project analysis show that all study intersections operate at acceptable levels of service (LOS C or better) except for the following locations:

- Nicolaus Road / Nelson Lane (LOS D in the AM Peak Hour)
- Joiner Parkway / Moore Road (LOS E in the AM Peak Hour)
- Ferrari Ranch Road / Groveland Lane (LOS D in the AM Peak Hour & LOS E in the PM Peak Hour)

The roadway segment analysis shows that all study segments operate at acceptable levels of service (LOS C or better) under Existing Plus Approved/Pending Projects Without Project conditions.

Existing Plus Approved/Pending Projects Plus Project Conditions:

With the addition of project related traffic, all study intersections continue to operate at acceptable levels of service (LOS C or better) for the Existing Plus Approved/Pending Projects Plus Project conditions except for the following locations:

- Nicolaus Road / Nelson Lane (LOS E in the AM Peak Hour)
- Joiner Parkway / Moore Road (LOS E in the AM Peak Hour)
- Ferrari Ranch Road / Groveland Lane (LOS D in the AM Peak Hour & LOS E in the PM Peak Hour)

Of the locations operating deficiently, no significant impacts are expected to occur according to the significance criteria for study intersections. Therefore, no mitigation is required.

The roadway segment analysis shows that all study roadway segments operate at acceptable levels of service (LOS C or better) under Existing Plus Approved/Pending Projects Plus Project Conditions. Therefore, no significant impacts are identified and no mitigation is required.

Cumulative Year 2040 Without Project Conditions:

The results of the Cumulative Year 2040 Without Project analysis show that all study intersections are forecast to operate at acceptable levels of service (LOS C or better) except for the following locations:

- Nicolaus Road / Nelson Lane (LOS D in the AM Peak Hour & LOS E in the PM Peak Hour)
- Joiner Parkway / Nicolaus Road (LOS E in the AM Peak Hour)
- Joiner Parkway / 1st Street (LOS E in the AM Peak Hour)
- Joiner Parkway / Moore Road (LOS F in the AM Peak Hour & LOS E in the PM Peak Hour)
- Joiner Parkway / Groveland Lane (LOS F in the AM Peak Hour & LOS D in the PM Peak Hour)
- Ferrari Ranch Road / Groveland Lane (LOS D in the AM and PM Peak Hours)

The roadway segment analysis shows that six out of eight study segments currently operate at deficient levels of service (LOS D or worse) under Cumulative Year 2040 Without Project conditions which include the following locations:

- Nicolaus Road from Lakeside Drive to Joiner Parkway (LOS D)
- Nicolaus Road from Joiner Parkway to O Street (LOS D)
- Joiner Parkway from 1st Street to Moore Road (LOS E)
- Joiner Parkway from Danbury Drive to Groveland Lane (LOS E)
- Ferrari Ranch Road from Joiner Parkway to Danbury Drive (LOS F)
- Ferrari Ranch Road from SR-65 NB Ramps to Groveland Lane (LOS E)

Cumulative Year 2040 Plus Project Conditions:

With the addition of project related traffic, all study intersections continue to operate at acceptable levels of service (LOS C or better) for the Cumulative Year 2040 Plus Project conditions except for the following locations:

- Nicolaus Road / Nelson Lane (LOS D in the AM Peak Hour & LOS E in the PM Peak Hour)
- Joiner Parkway / Nicolaus Road (LOS E in the AM Peak Hour)
- Joiner Parkway / 1st Street (LOS F in the AM Peak Hour)
- Joiner Parkway / Moore Road (LOS F in the AM & PM Peak Hour)
- Joiner Parkway / Groveland Lane (LOS F in the AM Peak Hour & LOS D in the PM Peak Hour)

- Ferrari Ranch Road / Groveland Lane (LOS D in the AM and PM Peak Hours)

Of the locations operating deficiently, one of the six is forecast to result in a significant impact according to the significance criteria and would require mitigation. The mitigation measure shown in Table ES-1 has been identified to achieve acceptable levels of service and fully mitigate project forecast significant impact at the study intersection for Cumulative Year 2040 Plus Project conditions.

> **Joiner Parkway / Moore Road Mitigation Measure:** The project applicant will contribute its fair share cost toward installation of a traffic signal at the Joiner Parkway / Moore Road intersection within the existing right-of-way. The City of Lincoln's Public Facilities Element (PFE) has already identified the need for signalization at this intersection (# 71 in PFE Map). Thus, mitigation proposed is consistent with the project's qualifying for funding in the PFE. Table ES-1 shows the improved level of service at Joiner Parkway / Moore Road with the installation of a traffic signal.

The roadway segment analysis shows that six out of eight study segments currently operate at deficient levels of service (LOS D or worse) under Cumulative Year 2040 Plus Project conditions which include the following locations:

- Nicolaus Road from Lakeside Drive to Joiner Parkway (LOS D)
- Nicolaus Road from Joiner Parkway to O Street (LOS E)
- Joiner Parkway from 1st Street to Moore Road (LOS E)
- Joiner Parkway from Danbury Drive to Groveland Lane (LOS E)
- Ferrari Ranch Road from Joiner Parkway to Danbury Drive (LOS F)
- Ferrari Ranch Road from SR-65 NB Ramps to Groveland Lane (LOS E)

Of the locations operating deficiently, one of the eight study roadway segments is forecast to result in a cumulative significant impact according to the significance criteria and would require mitigation.

> **Nicolaus Road from Joiner Parkway to O Street Mitigation Measure:** The project plans to widen Nicolaus Road on the south side along the project frontage (approximately 1,150 feet). The widening would consist of adding approximately 30 feet to the existing 40-foot pavement width to match the existing curb-to-curb width of 70 feet immediately east of the project site. This new section of roadway would include one travel lane in each direction with a center two-way left-turn lane (3 total lanes) which will increase roadway capacity from 18,000 to 27,000 vehicles per day. In addition, the center two-way left-turn lane would allow for westbound left-turn movements into the project site. As shown in Table ES-1, this mitigation would improve the level of service to an acceptable level (LOS C) and fully mitigate the project forecast significant impact at the study segment under Cumulative Year 2040 Plus Project conditions.

Vehicle Miles Traveled (VMT) Summary:

This report evaluates potential VMT impacts as it relates to the proposed project. VMT per capita maps were used to determine if the project is located within a low or high VMT per capita area compared to the average VMT per capita in the Sacramento region. According to the VMT maps, the project site is located within an area that is expected to generate 100% to 115% of the regional average VMT per capita. This map indicates the project site is not located within a VMT efficient area. As there is not high-quality transit within ¼ mile of the site, the project is also not included in a transit priority area. Based on

screening criteria established by OPR, the project would likely be subject to a CEQA VMT analysis. Since the VMT per capita maps show the project site to be in an area where VMT is currently 100% to 115% of the regional average, it is reasonable to assume the proposed residential project in the City of Lincoln falls above the 85% threshold and will most likely have a significant VMT impact that will require mitigation.

For the project to reduce VMT-related impacts, recommended mitigation would be for the project to implement Transportation Demand Management (TDM) strategies. The California Air Pollution Control Officers Association (CAPCOA) report may be used to determine a wide range of TDM measures that could offset the project's VMT impacts. The following TDM measures have been identified to offset potential VMT impacts related to the proposed project:

- Provide Class II bike lanes along the project frontage to encourage an alternative travel mode.

- Provide pedestrian network improvements such as sidewalks and crosswalks within the project site and along the project frontage connecting to existing pedestrian facilities to encourage people to walk instead of drive.

- Provide traffic calming measures within the project site to encourage people to walk or bike instead of using a vehicle. Traffic calming measures may include marked crosswalks, curb extensions, speed tables, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.

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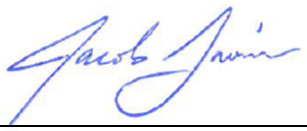
Appendix A:
TIA Scoping Agreement

Traffic Impact Study Scoping Agreement
Project Location: Southeast corner of Joiner Parkway/Nicolaus Road, Lincoln, CA

Project Location:	Southeast corner of Joiner Parkway/Nicolaus Road, Lincoln, California
Project Description:	Construct 199 Single-Family Dwelling Units on 25.5 Acres.
Project Opening Year:	2021
Location:	Project is located along the south side of Nicolaus Road and along the east side of Joiner Parkway.

	Engineer	**Applicant**
Company:	Michael Baker International	Joiner Limited Partnership
Name:	Jacob Swim	Jim Joiner
Address:	5050 Avenida Encinas	2055 Nicolaus Road
City, State, Zip Code:	Carlsbad, CA 92008	Lincoln, CA 95648
Phone #:	(858) 810-1444	(916) 786-7806
Fax #:	(760) 476-9198	N/A
Email:	Jacob.swim@mbakerintl.com	Jjoiner@surewest.net

By:		**Reviewed By:**	
Print Name:	Jacob Swim, TE	**Print Name:**	
Transportation Engineer	12/12/2019	**Traffic Division Representative**	

Traffic Impact Study Scoping Agreement
Project Location: Southeast corner of Joiner Parkway/Nicolaus Road, Lincoln, CA

1. Project Description

The project is proposed at the southeast corner of Joiner Parkway and Nicolaus Road. The project proposes the development of 199 single-family dwelling units on 25.5 acres. The project site is currently vacant and undeveloped.

Exhibit 1 (attached) shows the proposed project plans. All exhibits are attached at the end of this document.

2. Trip Credit

The following table details any trip credits applied to the trip generation analysis.

Item	Condition	Credit Applied?
Existing Active Land Use	Land is currently undeveloped and vacant.	No
Internal Trip Reduction	Does not apply.	No
Pass-by Trip Reduction	Does not apply.	No

3. Trip Generation

Trip generation analysis was conducted for the weekday daily, AM Peak Hour, and PM Peak Hour time periods. The *ITE Trip Generation Manual*, 10th Edition published in 2017, was the primary source of the project trip generation rates.

See **Table 2** for the trip generation rates and **Table 3** for the project trip summary.

Table 2: Trip Generation Rates

Land Use	ITE Code [1]	Daily Trip Rate	AM Peak Hour Rate		PM Peak Hour Rate	
			Total	In : Out	Total	In : Out
Single Family Dwelling Unit	210	9.839 /DU	0.73 /DU	25% : 75%	0.99 /DU	63% : 37%

[1] Source: ITE Trip Generation Manual, 10th Edition. Rates shown are based on fitted curve equation.

Table 3: Estimated Number of Project Trips

Land Use	Intensity	Daily Trips	AM Peak Hour Trips		PM Peak Hour Trips	
			Total	In : Out	Total	In : Out
Single Family Dwelling Unit	199 DU	1958	146	36 : 110	197	124 : 73

Notes:
DU = Dwelling Unit

4. Traffic Distribution

The trip distribution was determined based upon the location of the project relative to the area transportation network and surrounding land uses.

The trip distribution is graphically shown in **Exhibit 2**.

5. Study Intersections

Study intersections were identified as those where the proposed project will add 50 or more trips during either the weekday AM Peak Hour or PM Peak Hour. The study shall include the intersections listed below and shown in **Exhibit 3**.

ID	Study Intersection	Signalized?	Jurisdiction
1	Nicolaus Road / Nelson Lane	No	City of Lincoln
2	Nicolaus Road / Lakeside Drive	No	City of Lincoln
3	Joiner Parkway / Nicolaus Road	Yes	City of Lincoln
4	Joiner Parkway / 5th Street	Yes	City of Lincoln
5	Joiner Parkway / 3rd Street	Yes	City of Lincoln
6	Joiner Parkway / 1st Street	Yes	City of Lincoln
7	Joiner Parkway / Moore Road	No	City of Lincoln
8	Joiner Parkway / Danbury Drive	Yes	City of Lincoln
9	Joiner Parkway / Groveland Lane	Yes	City of Lincoln
10	Joiner Parkway / Ferrari Ranch Road	Yes	City of Lincoln
11	Ferrari Ranch Road / Groveland Lane	Yes	City of Lincoln
12	Ferrari Ranch Road / SR-65 Northbound Ramps	Yes	Caltrans
13	Ferrari Ranch Road / SR-65 Southbound Ramps	Yes	Caltrans
14	Site Driveway #1 / Nicolaus Road	No	City of Lincoln
15	Site Driveway #2 / Joiner Parkway	No	City of Lincoln

6. Freeway Segment Analysis

The proposed project is projected to add approximately 22 (15% of 146) AM peak hour trips onto SR-65 north of Ferrari Ranch Road and 49 (25% of 197) PM peak hour trips onto SR-65 south of Ferrari Ranch Road. Therefore, the traffic study will not include a freeway segment analysis on SR-65 since the project is projected to add less than 150 (two-way) peak hour trips to the highway system.

7. Analysis Scenarios

The analysis scenarios are as follows:

1. Existing
2. Existing + Project
3. Existing + Approved/Pending Projects
4. Existing + Approved/Pending Projects + Proposed Project
5. Cumulative (Year 2036) ← City requested Year 2040 be analyzed.
6. Cumulative (Year 2036) + Proposed Project

8. Project Phasing

The project is proposed to be constructed in one phase.

9. Cumulative Projects

Coordination will be conducted with City of Lincoln staff to identify the list of cumulative projects for consideration as part of this analysis.

10. Traffic Counts

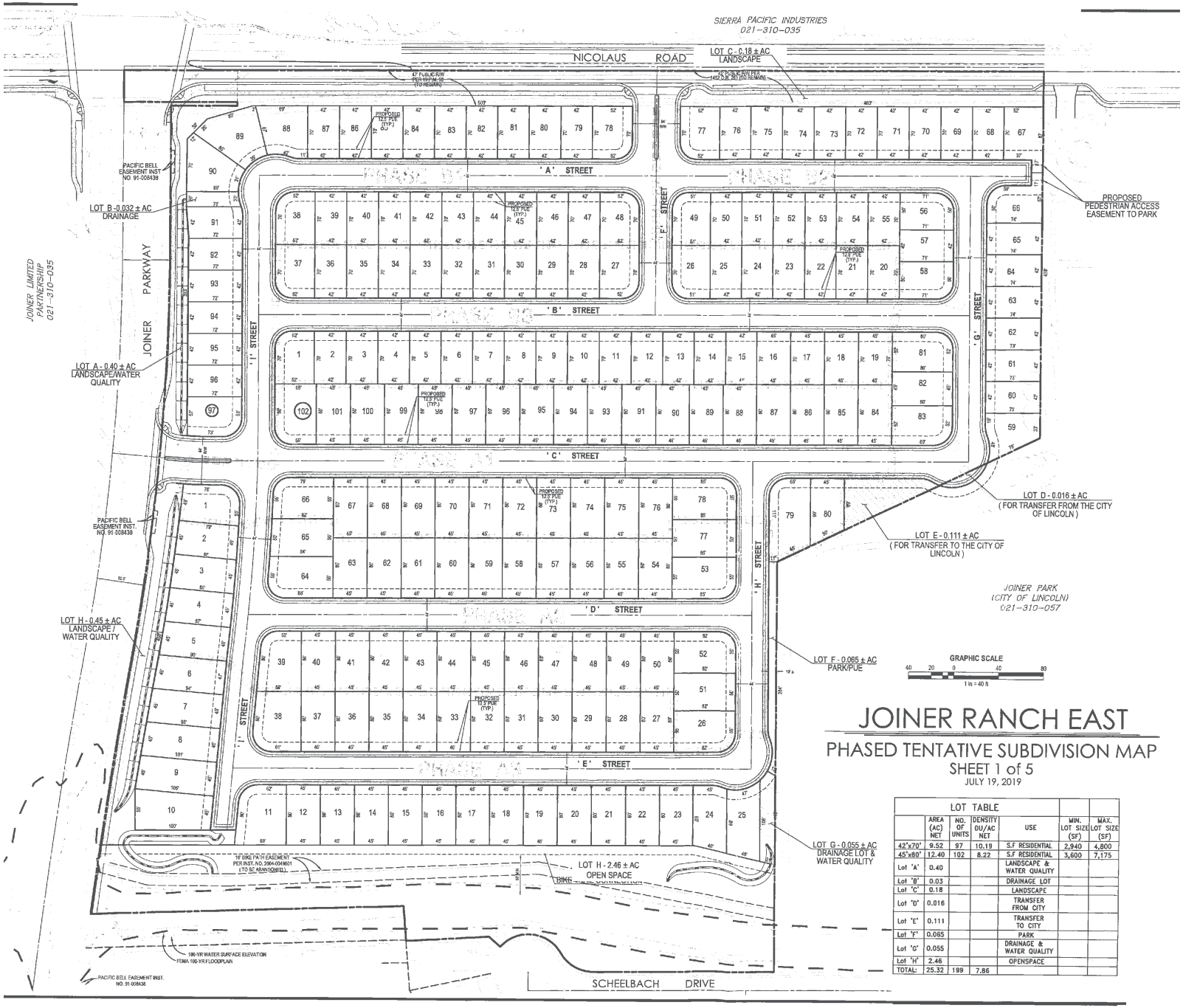
1) Traffic count guidelines:
   a. Must be taken on Tuesdays, Wednesdays or Thursdays.
   b. Must exclude holidays.
   c. Must be taken on days of good weather, and avoid atypical conditions (e.g., road construction, detours, or major traffic incidents).
   d. Traffic counts will be conducted while local schools are in session.
   e. Count time periods:
      - 7:00 AM to 9:00 AM
      - 4:00 PM to 6:00 PM

11. Roadway Segment Analysis

Segment analysis will be conducted for all study scenarios with roadway classifications consistent with the City's General Plan.

12. Study Guidelines & Methodologies

1) Michael Baker International will work with the City of Lincoln to prepare the Traffic Study according to the City's guidelines and procedures.
2) Analysis of stop-controlled and signalized intersections will be conducted using Highway Capacity Manual, 6th edition output from Synchro.



JOINER RANCH EAST

PHASED TENTATIVE SUBDIVISION MAP

SHEET 1 of 5

JULY 19, 2019

LOT TABLE						
	AREA (AC) NET	NO. OF UNITS	DENSITY DU/AC NET	USE	MIN. LOT SIZE (SF)	MAX. LOT SIZE (SF)
42'x70'	9.52	97	10.19	S.F RESIDENTIAL	2,940	4,800
45'x80'	12.40	102	8.22	S.F RESIDENTIAL	3,600	7,175
Lot 'A'	0.40			LANDSCAPE & WATER QUALITY		
Lot 'B'	0.03			DRAINAGE LOT		
Lot 'C'	0.18			LANDSCAPE		
Lot 'D'	0.016			TRANSFER FROM CITY		
Lot 'E'	0.111			TRANSFER TO CITY		
Lot 'F'	0.065			PARK		
Lot 'G'	0.055			DRAINAGE & WATER QUALITY		
Lot 'H'	2.46			OPENSPACE		
TOTAL:	25.32	199	7.86			

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November 2019

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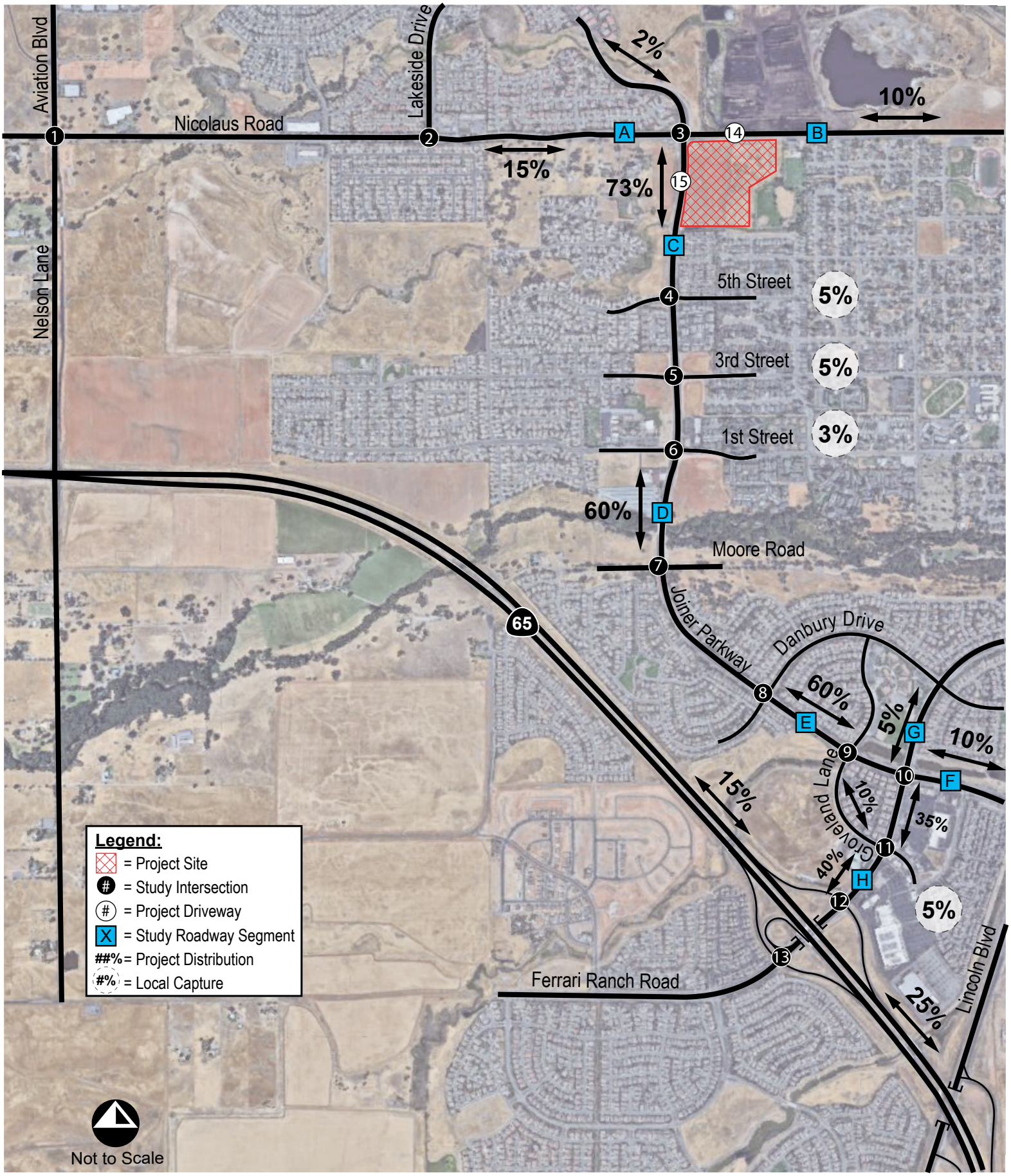
Project Site Plan

Exhibit 1



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Project Distribution

Exhibit 2

December 2019
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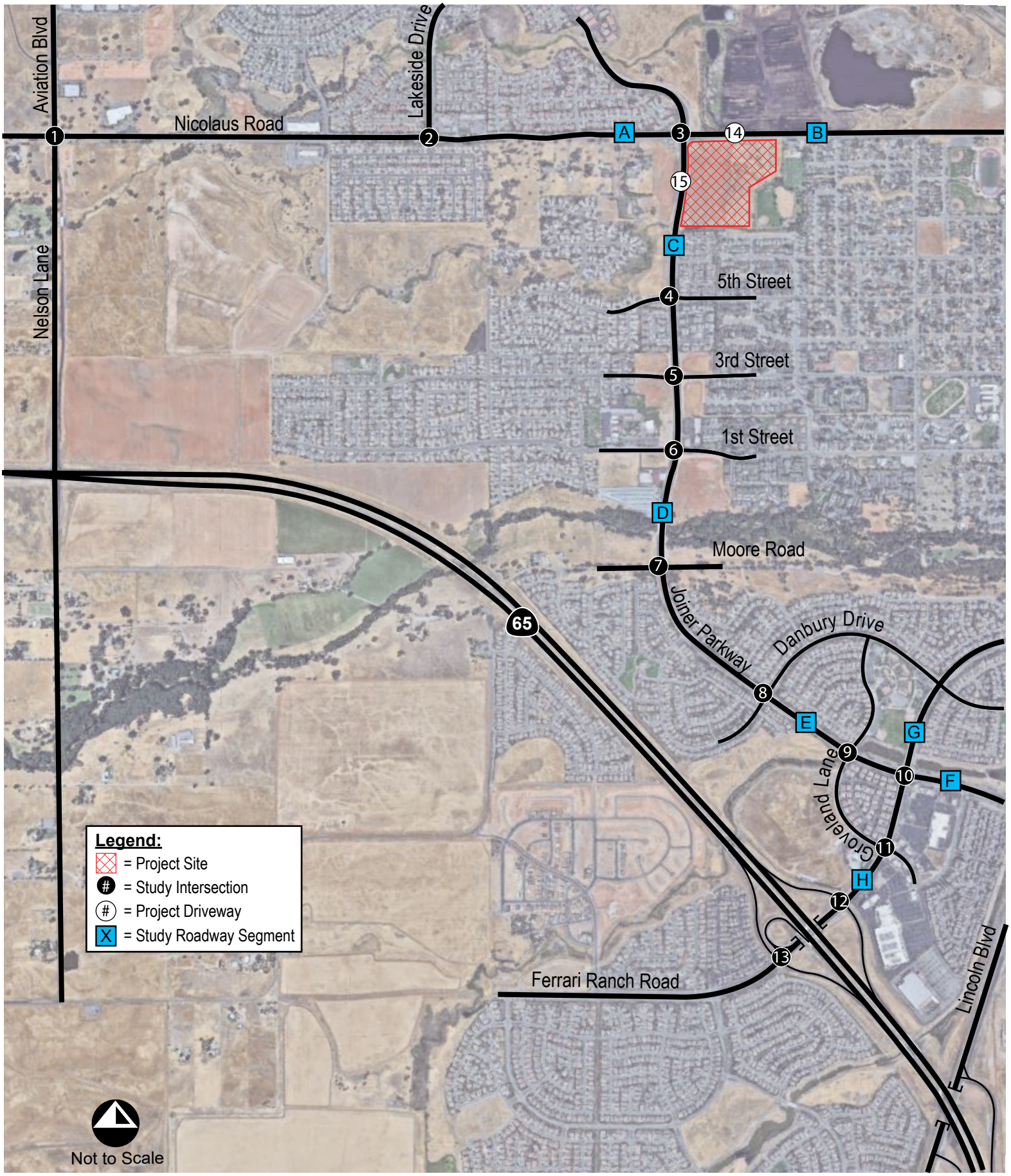

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Project Study Area

Exhibit 3

December 2019
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Appendix B: Traffic Count Data & Signal Timing Sheets

Prepared by National Data & Surveying Services

Nelson Ln & Nicolaus Rd

Peak Hour Turning Movement Count

ID: 19-07478-013
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 04:15 PM - 05:15 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

Nelson Ln — SOUTHBOUND

AM	13	206	26	0	289	AM
NOON	0	0	0	0	0	NOON
PM	32	208	66	0	205	PM
	0.5	1.5	1	0		

Nicolaus Rd — EASTBOUND

AM	NOON	PM		
149	0	246		
1	0	0	0	
17	0	25	1	
73	0	120	1.5	
103	0	60	0.5	
AM	NOON	PM		

Nicolaus Rd — WESTBOUND

	PM	NOON	AM
1	15	0	50
1	110	0	96
1	160	0	294
0	6	0	2
	451	0	252
	PM	NOON	AM

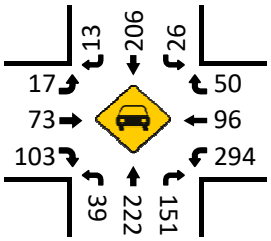
CONTROL: 4-Way Stop

TEV	1293	0	1330
	AM	NOON	PM
PHF	0.94		0.91

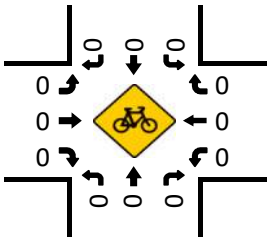
Nelson Ln — NORTHBOUND

	0	1	2	1		
PM	428	0	104	165	259	PM
NOON	0	0	0	0	0	NOON
AM	603	0	39	222	151	AM

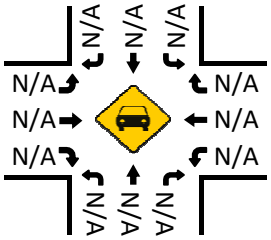
Total Vehicles (AM)



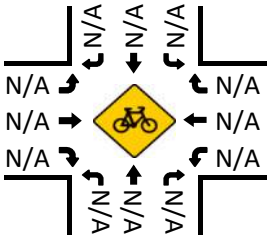
Bikes (AM)



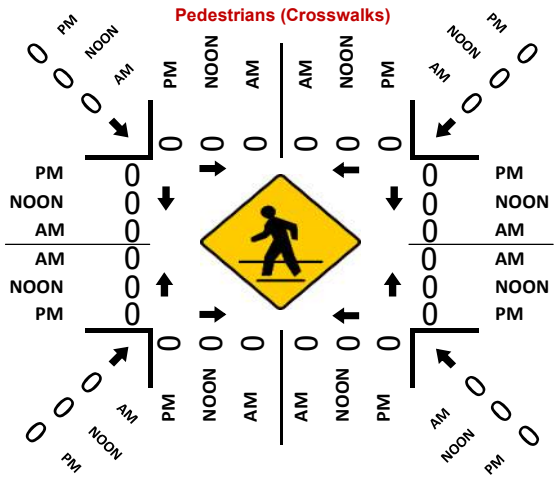
Total Vehicles (NOON)



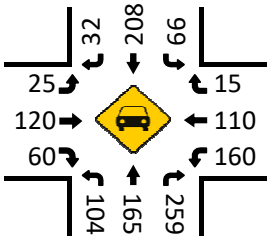
Bikes (NOON)



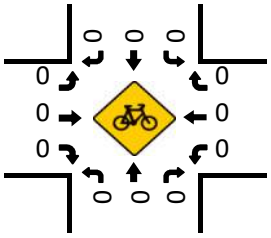
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Lakeside Dr & Nicolaus Rd

Peak Hour Turning Movement Count

ID: 19-07478-012
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 04:15 PM - 05:15 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

Lakeside Dr — SOUTHBOUND

AM	83	8	209	1	155	AM
NOON	0	0	0	0	0	NOON
PM	46	6	96	1	210	PM

Nicolaus Rd — EASTBOUND

AM	NOON	PM		
351	0	287	⇦	
1	0	0	↶	0
48	0	88	↱	1
235	0	272	→	2
2	0	5	↳	1
AM	NOON	PM		

Nicolaus Rd — WESTBOUND

PM	NOON	AM		
				1
118	0	84	↰	2
236	0	254	←	1
45	0	28	↲	0
21	0	6	↶	
416	0	501	⇨	
PM	NOON	AM		

Lakeside Dr — NORTHBOUND

PM	57	1	5	3	27	PM
NOON	0	0	0	0	0	NOON
AM	38	0	13	22	51	AM

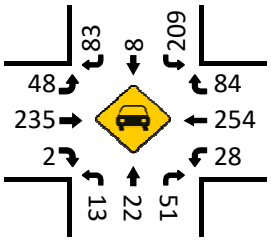
	0	0	1	0
⇩	↶	↰	↑	↱

CONTROL

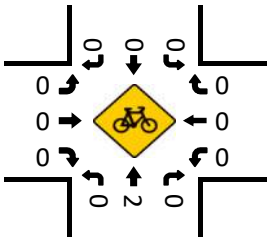
4-Way Stop

TEV	1045	0	970
	AM	NOON	PM
PHF	0.84		0.89

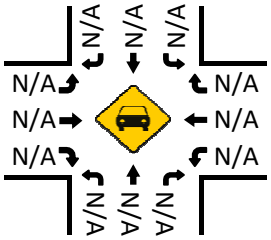
Total Vehicles (AM)



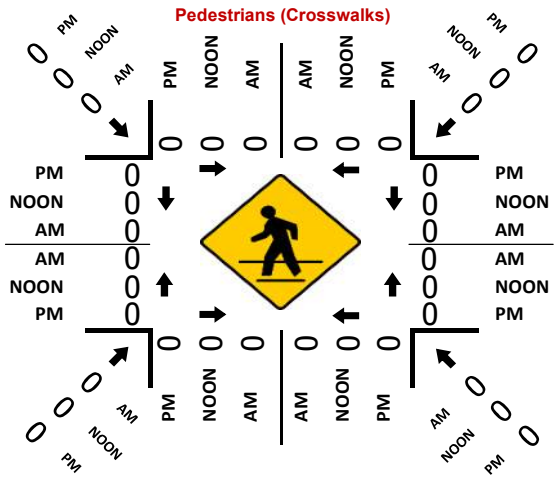
Bikes (AM)



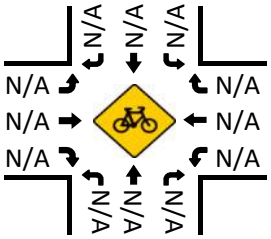
Total Vehicles (NOON)



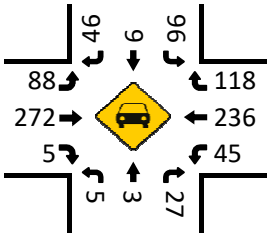
Pedestrians (Crosswalks)



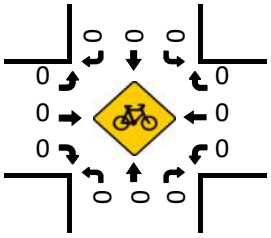
Bikes (NOON)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Joiner Pkwy & Nicolaus Rd

Peak Hour Turning Movement Count

ID: 19-07478-001
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 04:15 PM - 05:15 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

SOUTHBOUND (Joiner Pkwy)

AM	24	174	146	1	222	AM
NOON	0	0	0	0	0	NOON
PM	3	82	61	0	202	PM
	1	1.5	1.5	0		

EASTBOUND (Nicolaus Rd)

AM	NOON	PM		
354	0	444		
1	0	1	0	
8	0	6	1	
328	0	186	2	
189	0	201	1	
AM	NOON	PM		

WESTBOUND (Nicolaus Rd)

PM	NOON	AM		
78	0	122	1	
237	0	190	2	
54	0	82	1	
0	0	0	0	
304	0	664		
PM	NOON	AM		

CONTROL

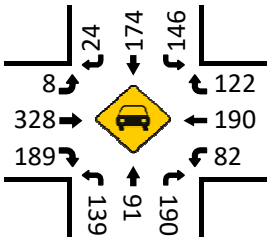
Signalized

TEV	1687	0	1289
	AM	NOON	PM
PHF	0.76		0.96

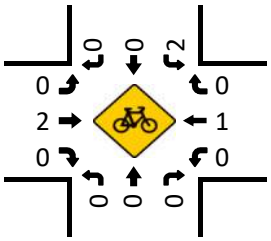
NORTHBOUND (Joiner Pkwy)

PM	339	2	203	118	57	PM
NOON	0	0	0	0	0	NOON
AM	447	2	139	91	190	AM
		0	1.5	1.5	1	

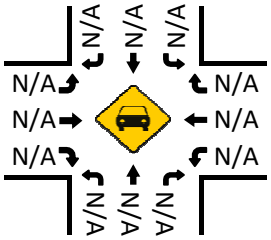
Total Vehicles (AM)



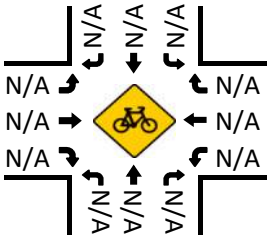
Bikes (AM)



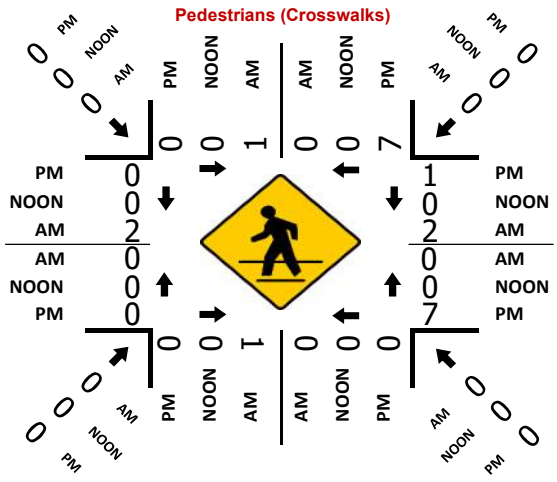
Total Vehicles (Noon)



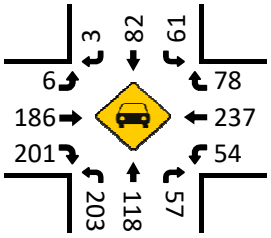
Bikes (NOON)



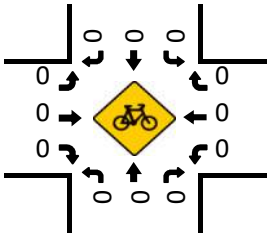
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Joiner Pkwy & 5th St

Peak Hour Turning Movement Count

ID: 19-07478-002
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 04:30 PM - 05:30 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

SOUTHBOUND (Joiner Pkwy)

AM	13	395	44	0	419	AM
NOON	0	0	0	0	0	NOON
PM	12	309	25	0	383	PM

EASTBOUND (5th St)

AM	NOON	PM		
33	0	62	⇦	
0	0	0	↶	0
23	0	8	↱	1
28	0	9	→	1
41	0	33	↷	0
AM	NOON	PM		

WESTBOUND (5th St)

PM	NOON	AM		
18	0	39	↷	0.5
14	0	12	←	0.5
75	0	202	↰	1
0	0	0	↶	0
150	0	236	⇨	
PM	NOON	AM		

NORTHBOUND (Joiner Pkwy)

PM	427	10	36	357	116	PM
NOON	0	0	0	0	0	NOON
AM	649	11	8	357	164	AM

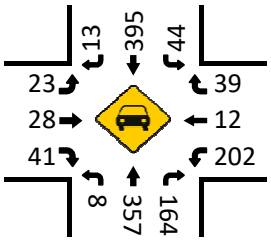
CONTROL

Signalized

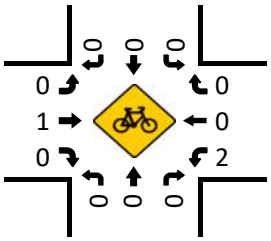
TEV	1337	0	1022
	AM	NOON	PM
PHF	0.72		0.96

Turning movements at the intersection: 0 (EB left), 2 (EB through), 1 (EB right), 0 (EB U); 0.5 (WB U), 0.5 (WB left), 1 (WB through), 0 (WB right); 0 (NB left), 1 (NB through), 2 (NB right), 0 (NB U).

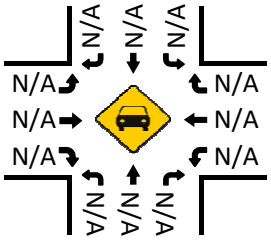
Total Vehicles (AM)



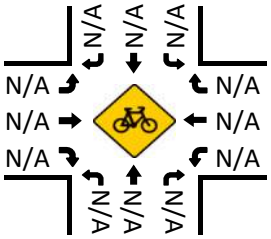
Bikes (AM)



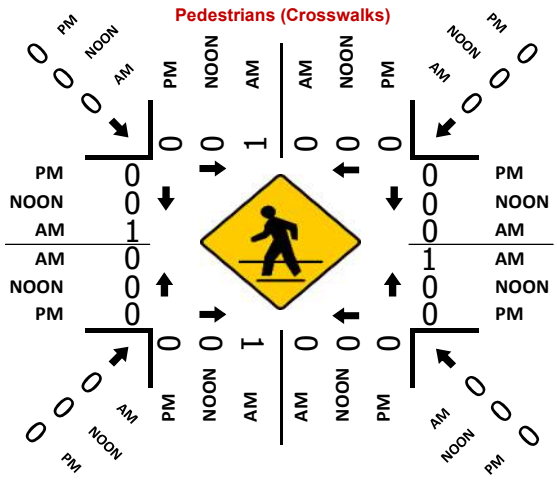
Total Vehicles (NOON)



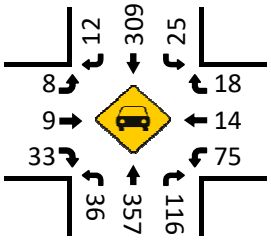
Bikes (NOON)



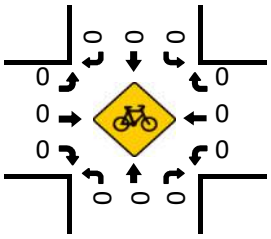
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Joiner Pkwy & 3rd St

Peak Hour Turning Movement Count

ID: 19-07478-003
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 04:30 PM - 05:30 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

SOUTHBOUND (Joiner Pkwy)

AM	28	525	99	1	527	AM
NOON	0	0	0	0	0	NOON
PM	20	383	36	0	538	PM

EASTBOUND (3rd St)

AM	NOON	PM		
66	0	107		
0	0	0	0	
92	0	20	1	
58	0	24	1	
81	0	41	1	

WESTBOUND (3rd St)

PM	NOON	AM	
58	0	63	1
30	0	19	1
60	0	104	1
0	0	0	0
143	0	222	

NORTHBOUND (Joiner Pkwy)

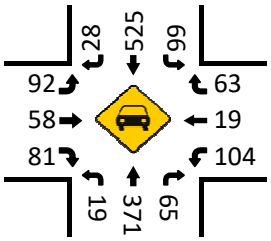
PM	484	0	57	460	83	PM
NOON	0	0	0	0	0	NOON
AM	713	3	19	371	65	AM

CONTROL

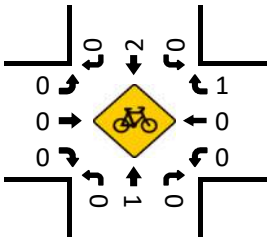
Signalized

TEV	1528	0	1272
	AM	NOON	PM
PHF	0.77		0.95

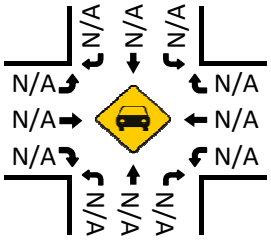
Total Vehicles (AM)



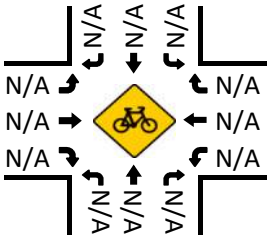
Bikes (AM)



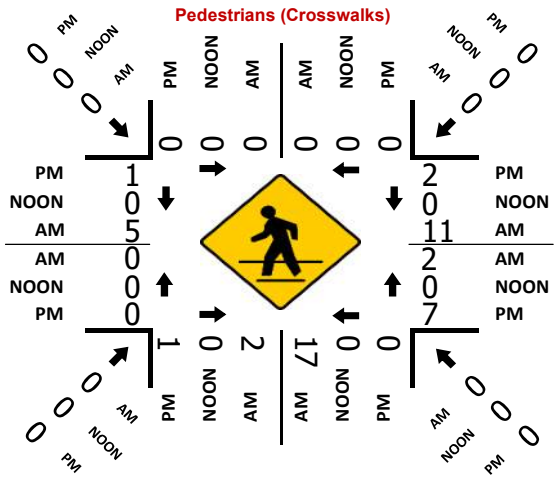
Total Vehicles (Noon)



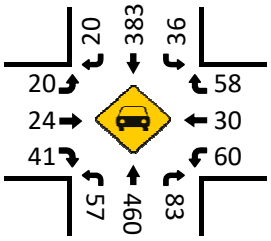
Bikes (NOON)



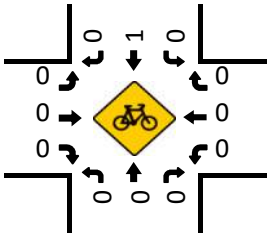
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Joiner Pkwy & 1st St

Peak Hour Turning Movement Count

ID: 19-07478-004
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

SOUTHBOUND (Joiner Pkwy)

AM	154	510	33	0	448	AM
NOON	0	0	0	0	0	NOON
PM	91	354	32	0	575	PM

EASTBOUND (1st St)

AM	NOON	PM		
390	0	323		
0	0	0	0	
50	0	26	1	
45	0	17	1	
234	0	60	1	

WESTBOUND (1st St)

PM	NOON	AM		
55	0	32	1	
46	0	96	1	
77	0	131	1	
0	0	0	0	
111	0	160		

NORTHBOUND (Joiner Pkwy)

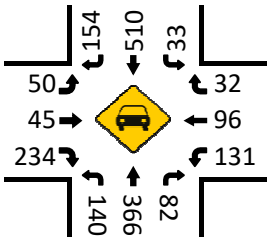
PM	492	1	186	494	62	PM
NOON	0	0	0	0	0	NOON
AM	877	2	140	366	82	AM

CONTROL

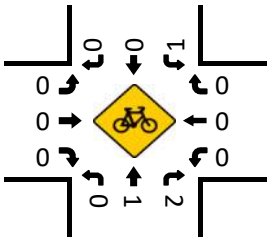
Signalized

TEV	1875 AM	0 NOON	1501 PM
PHF	0.78		0.96

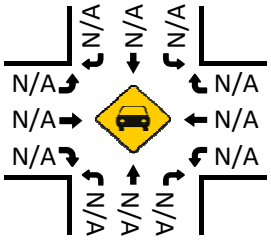
Total Vehicles (AM)



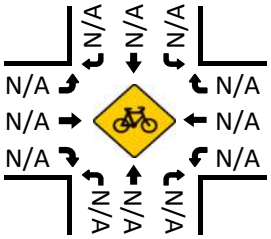
Bikes (AM)



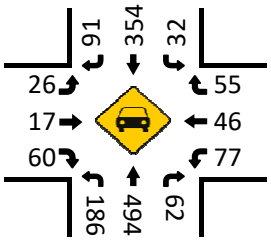
Total Vehicles (Noon)



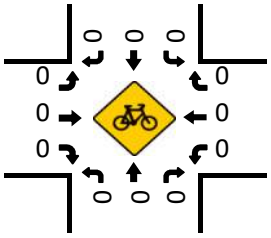
Bikes (NOON)



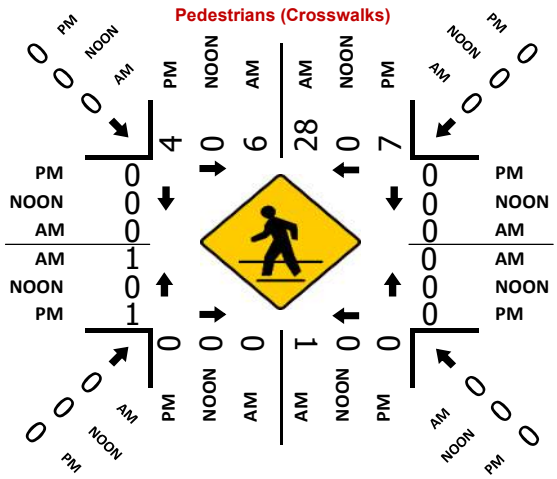
Total Vehicles (PM)



Bikes (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Joiner Pkwy & Moore Rd

Peak Hour Turning Movement Count

ID: 19-07478-005
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

SOUTHBOUND — Joiner Pkwy

AM	11	855	0	0	589	AM
NOON	0	0	0	0	0	NOON
PM	14	472	0	1	745	PM

EASTBOUND — Moore Rd

AM	NOON	PM		
20	0	28		
0	0	0	0	
22	0	10	0	
0	0	0	1	
26	0	8	0	

WESTBOUND — Moore Rd

			PM	NOON	AM
		0.3	0	0	0
		0.3	0	0	0
		0.3	0	0	1
		0	0	0	0
			2	0	2

NORTHBOUND — Joiner Pkwy

PM	480	0	14	734	2	PM
NOON	0	0	0	0	0	NOON
AM	883	1	9	567	2	AM

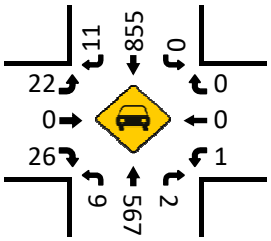
	0.5	1	0.5	0
0				
0.5				
1				
0.5				

CONTROL

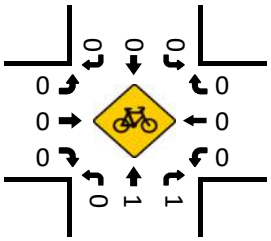
4- Way Stop

TEV	1494	0	1255
	AM	NOON	PM
PHF	0.85		0.98

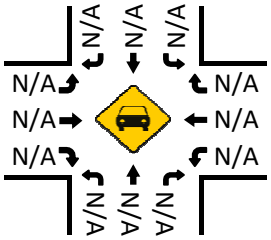
Total Vehicles (AM)



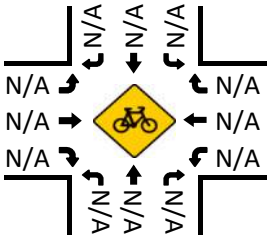
Bikes (AM)



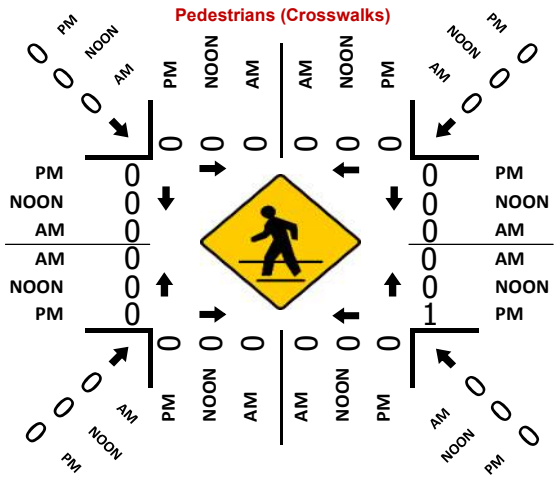
Total Vehicles (Noon)



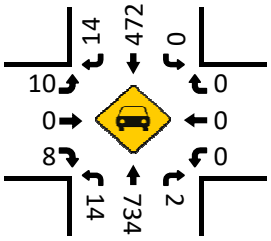
Bikes (NOON)



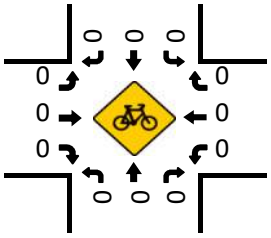
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Joiner Pkwy & Danbury Dr

Peak Hour Turning Movement Count

ID: 19-07478-006
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

Joiner Pkwy — SOUTHBOUND

AM	0	841	50	0	574	AM
NOON	0	0	0	0	0	NOON
PM	1	463	20	3	775	PM
	0.5	1.5	1	0		

Danbury Dr — EASTBOUND

AM	NOON	PM	
38	0	69	
0	0	0	0
22	0	7	0.3
19	0	5	0.3
85	0	41	0.3
AM	NOON	PM	

CONTROL

Signalized

TEV	1668	0	1408
	AM	NOON	PM
PHF	0.85		0.94

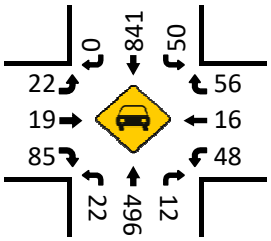
Danbury Dr — WESTBOUND

PM	NOON	AM	
49	0	56	1
14	0	16	0.5
16	0	48	0.5
0	0	0	0
43	0	81	
PM	NOON	AM	

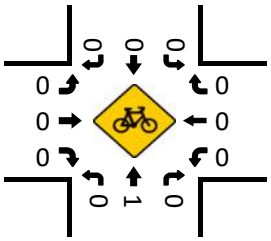
	0	1	1.5	0.5		
PM	521	1	54	716	18	PM
NOON	0	0	0	0	0	NOON
AM	975	1	22	496	12	AM

Joiner Pkwy — NORTHBOUND

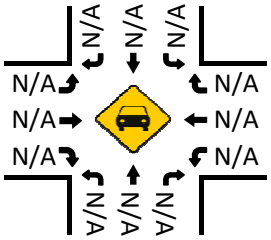
Total Vehicles (AM)



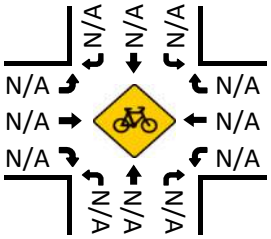
Bikes (AM)



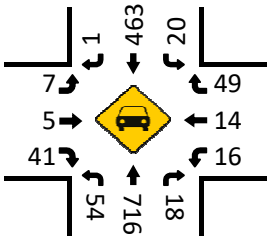
Total Vehicles (Noon)



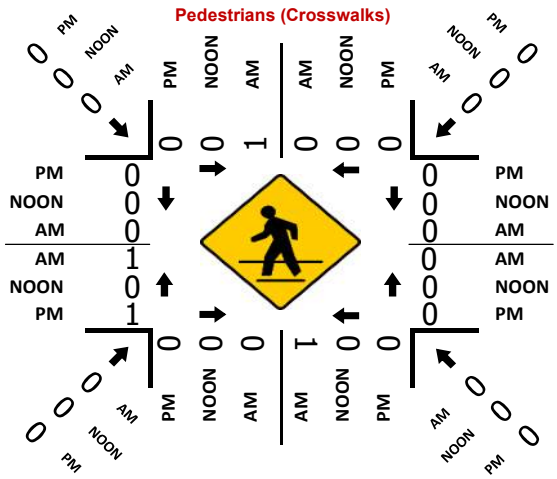
Bikes (NOON)



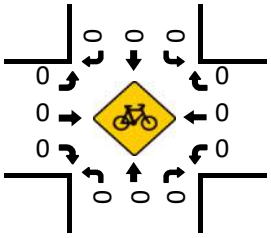
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Joiner Pkwy & Groveland Ln

Peak Hour Turning Movement Count

ID: 19-07478-007
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 04:00 PM - 05:00 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

SOUTHBOUND (Joiner Pkwy)

AM	265	668	45	0	540	AM
NOON	0	0	0	0	0	NOON
PM	197	335	7	1	774	PM

EASTBOUND (Groveland Ln)

AM	NOON	PM		
328	0	226		
0	0	0	0	
216	0	334	1	
83	0	50	1	
20	0	12	0	
AM	NOON	PM		

WESTBOUND (Groveland Ln)

PM	NOON	AM		
2	0	18	0.3	
22	0	58	0.3	
16	0	112	0.3	
0	0	0	0	
96	0	312		
PM	NOON	AM		

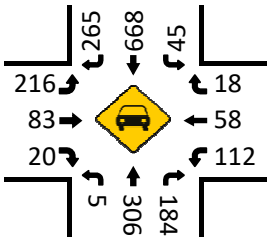
NORTHBOUND (Joiner Pkwy)

PM	366	3	7	437	39	PM
NOON	0	0	0	0	0	NOON
AM	801	1	5	306	184	AM

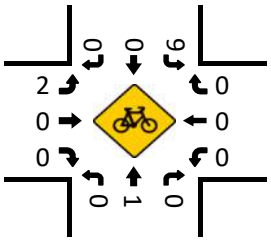
	0	1	1.5	0.5

CONTROL			
Signalized			
TEV	1981	0	1462
	AM	NOON	PM
PHF	0.82		0.95

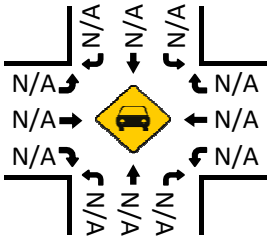
Total Vehicles (AM)



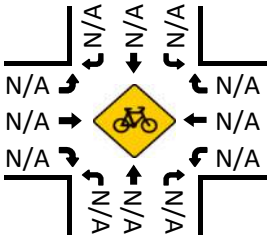
Bikes (AM)



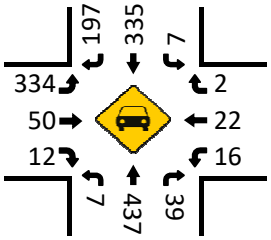
Total Vehicles (Noon)



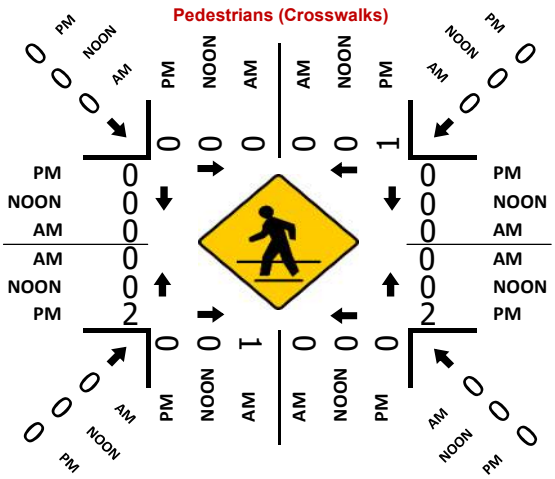
Bikes (NOON)



Total Vehicles (PM)



Pedestrians (Crosswalks)


PM
NOON
AM
0
0
0
0
0
1
0
0
0
0
0
0

Prepared by National Data & Surveying Services

Joiner Pkwy & Ferrari Ranch Rd

Peak Hour Turning Movement Count

ID: 19-07478-008
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS		COUNT PERIODS
07:30 AM - 08:30 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:30 PM - 05:30 PM	PM	04:00 PM - 06:00 PM

Joiner Pkwy — SOUTHBOUND

AM	389	370	52	0	480	AM
NOON	0	0	0	0	0	NOON
PM	121	200	34	1	537	PM
	1	2	1	0		

Ferrari Ranch Rd — EASTBOUND

AM	NOON	PM	
703	0	526	
0	0	2	0
298	0	281	2
246	0	279	2
78	0	78	1
AM	NOON	PM	

Ferrari Ranch Rd — WESTBOUND

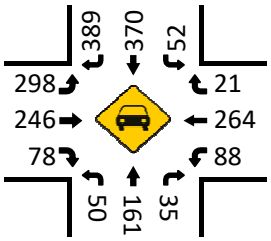
	PM	NOON	AM
1	53	0	21
2	269	0	264
2	92	0	88
0	0	0	0
	340	0	333
	PM	NOON	AM

CONTROL			
Signalized			
TEV	2053	0	1774
	AM	NOON	PM
PHF	0.80		0.94

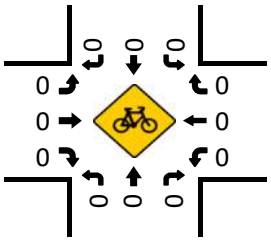
Joiner Pkwy — NORTHBOUND

	0	2	2	1		
PM	371	1	134	202	27	PM
NOON	0	0	0	0	0	NOON
AM	537	1	50	161	35	AM

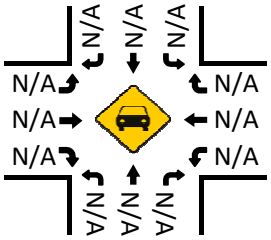
Total Vehicles (AM)



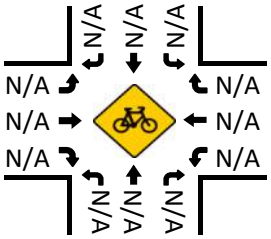
Bikes (AM)



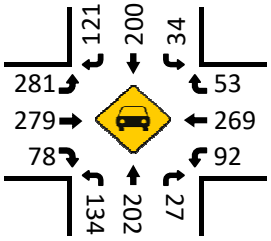
Total Vehicles (NOON)



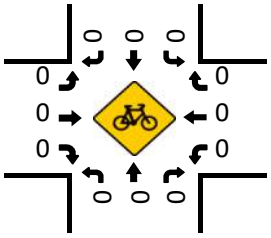
Bikes (NOON)



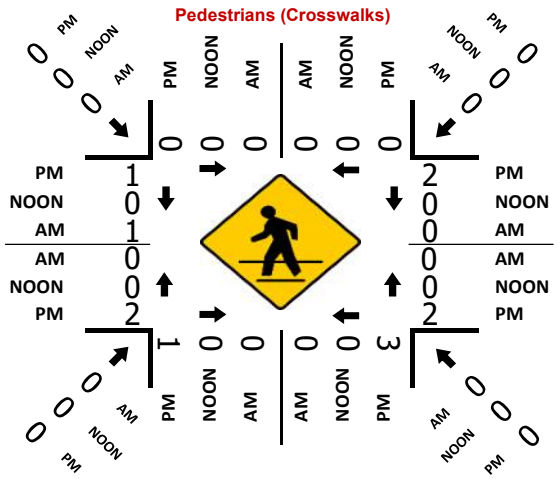
Total Vehicles (PM)



Bikes (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Groveland Ln & Ferrari Ranch Rd

Peak Hour Turning Movement Count

ID: 19-07478-009
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	NONE
PM	04:30 PM - 05:30 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Groveland Ln — SOUTHBOUND

AM	318	24	12	0	288	AM
NOON	0	0	0	0	0	NOON
PM	181	42	14	0	375	PM

Ferrari Ranch Rd — EASTBOUND

AM	NOON	PM		
1121	0	889	⇦	
8	0	26	↶	0
241	0	277	↱	1
585	0	532	→	3
58	0	87	↴	1
AM	NOON	PM		

Ferrari Ranch Rd — WESTBOUND

PM	NOON	AM		
16	0	8	↰	1
414	0	621	←	3
91	0	57	↲	2
12	0	10	↶	0
660	0	669	⇨	
PM	NOON	AM		

Groveland Ln — NORTHBOUND

PM	220	0	268	82	102	PM
NOON	0	0	0	0	0	NOON
AM	139	0	174	39	62	AM

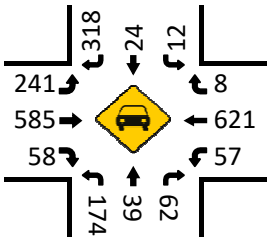
	0	1	1	0
	0	1.5	0.5	1

CONTROL

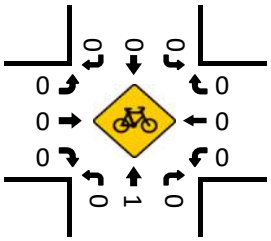
Signalized

TEV	2217 AM	0 NOON	2144 PM
PHF	0.86		0.97

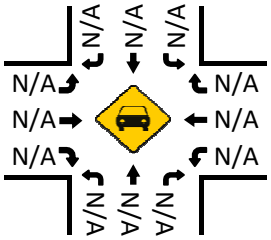
Total Vehicles (AM)



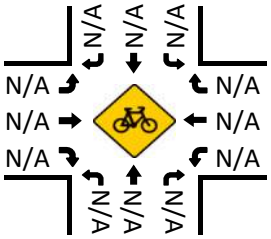
Bikes (AM)



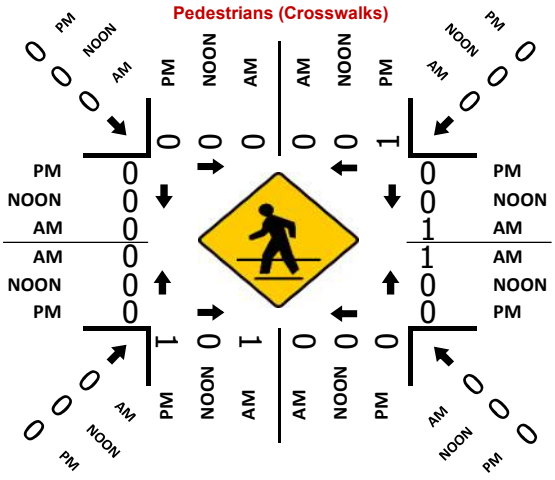
Total Vehicles (Noon)



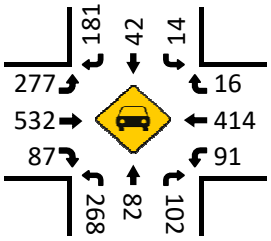
Bikes (NOON)



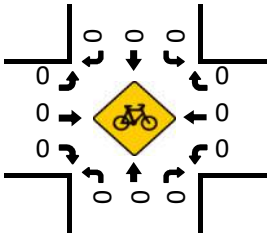
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

CA-65 NB Ramp & Ferrari Ranch Rd

Peak Hour Turning Movement Count

ID: 19-07478-010
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS		COUNT PERIODS
07:15 AM - 08:15 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:45 PM - 05:45 PM	PM	04:00 PM - 06:00 PM

CA-65 NB Ramp — SOUTHBOUND

AM	0	0	0	0	141	AM
NOON	0	0	0	0	0	NOON
PM	0	0	0	0	153	PM
	0	0	0	0		

Ferrari Ranch Rd — EASTBOUND

AM	NOON	PM	
1148	0	1153	⇦
2	0	0	0
55	0	20	1
730	0	457	2
0	0	0	0
AM	NOON	PM	

Ferrari Ranch Rd — WESTBOUND

	PM	NOON	AM
1	133	0	86
3	745	0	987
0	0	0	0
0	0	0	0
⇨	1021	0	986
	PM	NOON	AM

CONTROL

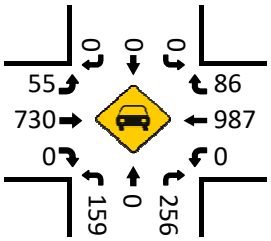
Signalized

	AM	NOON	PM
TEV	2275	0	2327
PHF	0.85		0.96

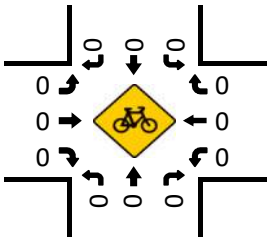
NORTHBOUND — CA-65 NB Ramp

		0	1.5	0.5	2	
PM	0	0	408	0	564	PM
NOON	0	0	0	0	0	NOON
AM	0	0	159	0	256	AM

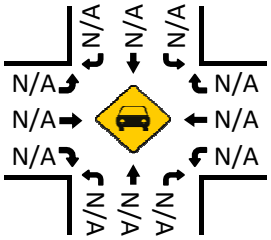
Total Vehicles (AM)



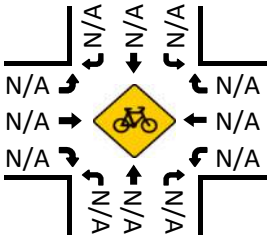
Bikes (AM)



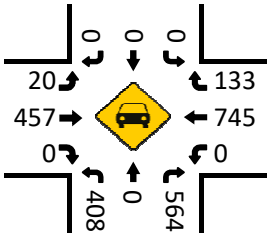
Total Vehicles (Noon)



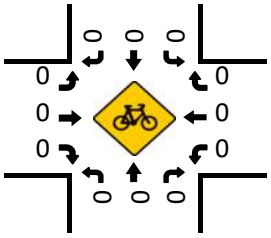
Bikes (NOON)



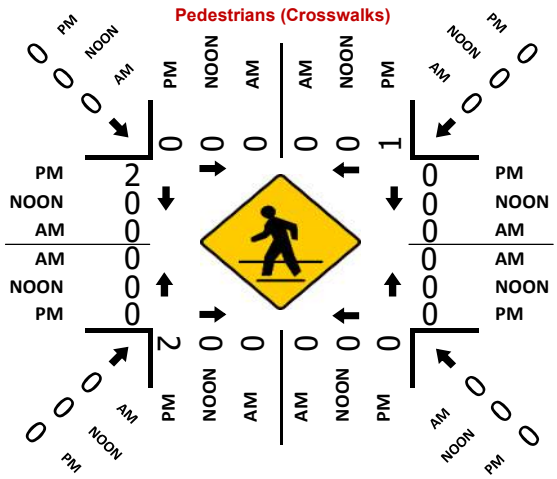
Total Vehicles (PM)



Bikes (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

CA-65 SB Ramp & Ferrari Ranch Rd

Peak Hour Turning Movement Count

ID: 19-07478-011
City: Lincoln

Day: Wednesday
Date: 12/11/2019

PEAK HOURS

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 05:00 PM - 06:00 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

CA-65 SB Ramp — SOUTHBOUND

AM	17	0	77	0	664	AM
NOON	0	0	0	0	0	NOON
PM	50	0	111	0	314	PM

EASTBOUND — Ferrari Ranch Rd

AM	NOON	PM	
494	0	885	
0	0	0	0
0	0	0	0
710	0	371	1.5
670	0	254	0.5

WESTBOUND — Ferrari Ranch Rd

PM	NOON	AM	
314	0	664	1
835	0	477	3
0	0	0	0
0	0	0	0
482	0	787	

1 0.5 0.5 0

0 0 0 0

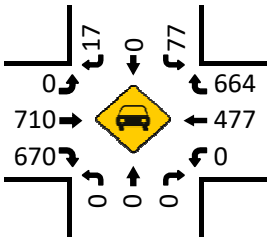
NORTHBOUND — CA-65 SB Ramp

PM	254	0	0	0	0	PM
NOON	0	0	0	0	0	NOON
AM	670	0	0	0	0	AM

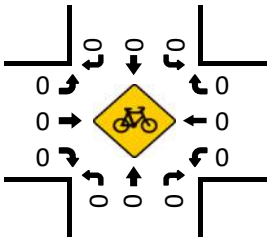
CONTROL: Signalized

TEV	2615	0	1935
	AM	NOON	PM
PHF	0.89		0.97

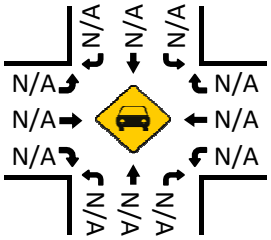
Total Vehicles (AM)



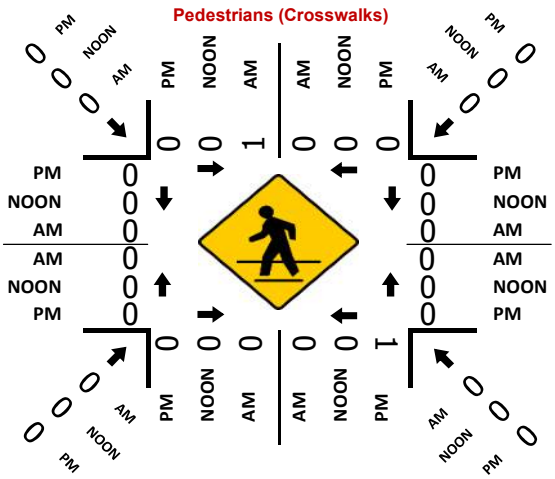
Bikes (AM)



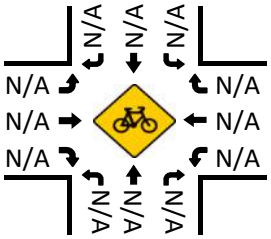
Total Vehicles (NOON)



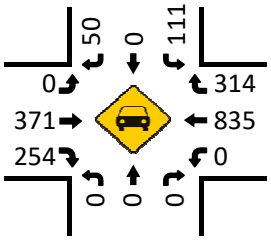
Pedestrians (Crosswalks)



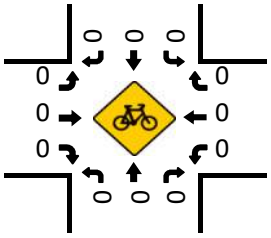
Bikes (NOON)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

VOLUME

Nicolaus Rd Bet. Foskett Ranch Dr & Joiner Pkwy

Day: Wednesday
Date: 12/11/2019

City: Lincoln
Project #: CA19_7479_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,236	4,264	8,500

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			5		1		6		12:00			73		63		136	
00:15			4		3		7		12:15			55		58		113	
00:30			2		0		2		12:30			66		62		128	
00:45			1	12	2	6	3	18	12:45			45	239	81	264	126	503
01:00			1		0		1		13:00			65		58		123	
01:15			0		2		2		13:15			76		70		146	
01:30			2		3		5		13:30			52		48		100	
01:45			1	4	7	12	8	16	13:45			58	251	57	233	115	484
02:00			2		0		2		14:00			55		54		109	
02:15			0		1		1		14:15			67		53		120	
02:30			2		6		8		14:30			71		63		134	
02:45			2	6	7	14	9	20	14:45			89	282	121	291	210	573
03:00			0		0		0		15:00			112		130		242	
03:15			2		8		10		15:15			86		146		232	
03:30			4		13		17		15:30			83		95		178	
03:45			3	9	16	37	19	46	15:45			89	370	73	444	162	814
04:00			3		8		11		16:00			87		76		163	
04:15			3		8		11		16:15			88		110		198	
04:30			10		5		15		16:30			107		118		225	
04:45			11	27	17	38	28	65	16:45			108	390	102	406	210	796
05:00			17		13		30		17:00			88		113		201	
05:15			24		22		46		17:15			83		106		189	
05:30			25		34		59		17:30			93		73		166	
05:45			19	85	33	102	52	187	17:45			74	338	67	359	141	697
06:00			26		30		56		18:00			77		82		159	
06:15			42		37		79		18:15			75		70		145	
06:30			51		31		82		18:30			70		72		142	
06:45			43	162	53	151	96	313	18:45			55	277	50	274	105	551
07:00			67		43		110		19:00			50		69		119	
07:15			97		54		151		19:15			38		42		80	
07:30			192		82		274		19:30			42		50		92	
07:45			157	513	117	296	274	809	19:45			20	150	39	200	59	350
08:00			65		105		170		20:00			29		40		69	
08:15			60		52		112		20:15			24		46		70	
08:30			58		41		99		20:30			21		46		67	
08:45			51	234	40	238	91	472	20:45			24	98	30	162	54	260
09:00			47		33		80		21:00			29		29		58	
09:15			53		44		97		21:15			19		20		39	
09:30			53		37		90		21:30			12		14		26	
09:45			41	194	54	168	95	362	21:45			11	71	17	80	28	151
10:00			43		45		88		22:00			22		16		38	
10:15			41		49		90		22:15			17		12		29	
10:30			33		40		73		22:30			10		11		21	
10:45			69	186	52	186	121	372	22:45			8	57	6	45	14	102
11:00			65		67		132		23:00			4		6		10	
11:15			56		65		121		23:15			8		4		12	
11:30			53		55		108		23:30			9		2		11	
11:45			78	252	50	237	128	489	23:45			8	29	9	21	17	50
TOTALS				1684		1485		3169	TOTALS				2552		2779		5331
SPLIT %				53.1%		46.9%		37.3%	SPLIT %				47.9%		52.1%		62.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,236	4,264	8,500

AM Peak Hour			07:00	07:15	07:15	PM Peak Hour			16:15	14:45	14:45
AM Pk Volume			513	358	869	PM Pk Volume			391	492	862
Pk Hr Factor			0.668	0.765	0.793	Pk Hr Factor			0.905	0.842	0.890
7 - 9 Volume	0	0	747	534	1281	4 - 6 Volume	0	0	728	765	1493
7 - 9 Peak Hour			07:00	07:15	07:15	4 - 6 Peak Hour			16:15	16:15	16:15
7 - 9 Pk Volume	0	0	513	358	869	4 - 6 Pk Volume	0	0	391	443	834
Pk Hr Factor	0.000	0.000	0.668	0.765	0.793	Pk Hr Factor	0.000	0.000	0.905	0.939	0.927

Prepared by National Data & Surveying Services

VOLUME

Nicolaus Rd Bet. Joiner Pkwy & O St

Day: Tuesday
Date: 12/17/2019

City: Lincoln
Project #: CA19_7479_002-B

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,564	3,650	7,214

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			5		4		9		12:00			70		55		125	
00:15			6		3		9		12:15			114		67		181	
00:30			2		0		2		12:30			107		170		277	
00:45			1	14	2	9	3	23	12:45			73	364	165	457	238	821
01:00			0		1		1		13:00			62		62		124	
01:15			0		1		1		13:15			47		61		108	
01:30			1		3		4		13:30			55		68		123	
01:45			1	2	4	9	5	11	13:45			65	229	74	265	139	494
02:00			4		2		6		14:00			55		77		132	
02:15			2		1		3		14:15			52		61		113	
02:30			3		3		6		14:30			53		60		113	
02:45			1	10	1	7	2	17	14:45			54	214	51	249	105	463
03:00			2		1		3		15:00			45		61		106	
03:15			0		4		4		15:15			59		66		125	
03:30			4		6		10		15:30			57		78		135	
03:45			2	8	6	17	8	25	15:45			52	213	53	258	105	471
04:00			2		4		6		16:00			67		53		120	
04:15			2		7		9		16:15			65		69		134	
04:30			7		1		8		16:30			51		59		110	
04:45			11	22	10	22	21	44	16:45			74	257	90	271	164	528
05:00			8		8		16		17:00			65		97		162	
05:15			12		12		24		17:15			57		91		148	
05:30			15		16		31		17:30			38		60		98	
05:45			25	60	11	47	36	107	17:45			51	211	66	314	117	525
06:00			17		16		33		18:00			49		58		107	
06:15			36		22		58		18:15			46		64		110	
06:30			41		23		64		18:30			51		47		98	
06:45			37	131	39	100	76	231	18:45			45	191	51	220	96	411
07:00			66		33		99		19:00			27		50		77	
07:15			148		46		194		19:15			24		35		59	
07:30			242		105		347		19:30			26		24		50	
07:45			197	653	174	358	371	1011	19:45			17	94	40	149	57	243
08:00			80		88		168		20:00			20		38		58	
08:15			74		55		129		20:15			22		35		57	
08:30			54		30		84		20:30			17		24		41	
08:45			36	244	24	197	60	441	20:45			23	82	19	116	42	198
09:00			30		21		51		21:00			21		30		51	
09:15			39		27		66		21:15			10		16		26	
09:30			37		27		64		21:30			13		20		33	
09:45			36	142	29	104	65	246	21:45			9	53	19	85	28	138
10:00			40		41		81		22:00			9		10		19	
10:15			36		38		74		22:15			8		14		22	
10:30			28		36		64		22:30			5		9		14	
10:45			31	135	52	167	83	302	22:45			5	27	9	42	14	69
11:00			48		31		79		23:00			3		6		9	
11:15			59		39		98		23:15			4		3		7	
11:30			48		39		87		23:30			1		5		6	
11:45			41	196	60	169	101	365	23:45			4	12	4	18	8	30
TOTALS				1617		1206		2823	TOTALS				1947		2444		4391
SPLIT %				57.3%		42.7%		39.1%	SPLIT %				44.3%		55.7%		60.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,564	3,650	7,214

AM Peak Hour			07:15	07:30	07:15	PM Peak Hour			12:00	12:15	12:00
AM Pk Volume			667	422	1080	PM Pk Volume			364	464	821
Pk Hr Factor			0.689	0.606	0.728	Pk Hr Factor			0.798	0.682	0.741
7 - 9 Volume	0	0	897	555	1452	4 - 6 Volume	0	0	468	585	1053
7 - 9 Peak Hour			07:15	07:30	07:15	4 - 6 Peak Hour			16:00	16:45	16:30
7 - 9 Pk Volume	0	0	667	422	1080	4 - 6 Pk Volume	0	0	257	338	584
Pk Hr Factor	0.000	0.000	0.689	0.606	0.728	Pk Hr Factor	0.000	0.000	0.868	0.871	0.890

Prepared by National Data & Surveying Services

VOLUME

Joiner Pkwy Bet. Project Dwy & 5th St

Day: Wednesday
Date: 12/11/2019

City: Lincoln
Project #: CA19_7479_003

DAILY TOTALS	NB	SB	EB	WB	Total
	4,017	3,837	0	0	7,854

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	2		3				5		12:00	50		51				101	
00:15	3		3				6		12:15	66		50				116	
00:30	4		1				5		12:30	54		49				103	
00:45	2	11	1	8			3	19	12:45	57	227	38	188			95	415
01:00	1		1				2		13:00	46		51				97	
01:15	3		0				3		13:15	66		55				121	
01:30	2		1				3		13:30	42		71				113	
01:45	6	12	1	3			7	15	13:45	51	205	63	240			114	445
02:00	3		2				5		14:00	56		63				119	
02:15	0		0				0		14:15	63		68				131	
02:30	3		2				5		14:30	76		65				141	
02:45	5	11	0	4			5	15	14:45	108	303	88	284			196	587
03:00	0		1				1		15:00	110		138				248	
03:15	4		2				6		15:15	83		87				170	
03:30	10		5				15		15:30	77		91				168	
03:45	16	30	5	13			21	43	15:45	75	345	84	400			159	745
04:00	9		4				13		16:00	68		80				148	
04:15	4		4				8		16:15	97		69				166	
04:30	6		8				14		16:30	100		80				180	
04:45	13	32	6	22			19	54	16:45	92	357	101	330			193	687
05:00	13		18				31		17:00	94		89				183	
05:15	14		20				34		17:15	88		84				172	
05:30	18		15				33		17:30	84		72				156	
05:45	19	64	24	77			43	141	17:45	78	344	56	301			134	645
06:00	19		17				36		18:00	76		66				142	
06:15	20		32				52		18:15	94		58				152	
06:30	21		30				51		18:30	73		47				120	
06:45	37	97	33	112			70	209	18:45	61	304	46	217			107	521
07:00	39		38				77		19:00	71		47				118	
07:15	71		81				152		19:15	49		35				84	
07:30	137		134				271		19:30	48		29				77	
07:45	139	386	121	374			260	760	19:45	51	219	25	136			76	355
08:00	83		112				195		20:00	30		31				61	
08:15	49		56				105		20:15	42		30				72	
08:30	35		46				81		20:30	33		33				66	
08:45	39	206	50	264			89	470	20:45	31	136	31	125			62	261
09:00	32		40				72		21:00	37		34				71	
09:15	47		44				91		21:15	30		15				45	
09:30	43		48				91		21:30	14		16				30	
09:45	31	153	50	182			81	335	21:45	15	96	12	77			27	173
10:00	35		42				77		22:00	14		18				32	
10:15	42		34				76		22:15	14		8				22	
10:30	38		43				81		22:30	10		9				19	
10:45	58	173	61	180			119	353	22:45	7	45	8	43			15	88
11:00	43		73				116		23:00	8		8				16	
11:15	55		54				109		23:15	16		12				28	
11:30	66		41				107		23:30	5		7				12	
11:45	62	226	56	224			118	450	23:45	6	35	6	33			12	68
TOTALS		1401		1463				2864	TOTALS		2616		2374				4990
SPLIT %		48.9%		51.1%				36.5%	SPLIT %		52.4%		47.6%				63.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	4,017	3,837	0	0	7,854

AM Peak Hour	07:15	07:15			07:15	PM Peak Hour	16:15	14:45			14:45
AM Pk Volume	430	448			878	PM Pk Volume	383	404			782
Pk Hr Factor	0.773	0.836			0.810	Pk Hr Factor	0.958	0.732			0.788
7 - 9 Volume	592	638	0	0	1230	4 - 6 Volume	701	631	0	0	1332
7 - 9 Peak Hour	07:15	07:15			07:15	4 - 6 Peak Hour	16:15	16:30			16:30
7 - 9 Pk Volume	430	448	0	0	878	4 - 6 Pk Volume	383	354	0	0	728
Pk Hr Factor	0.773	0.836	0.000	0.000	0.810	Pk Hr Factor	0.958	0.876	0.000	0.000	0.943

Prepared by National Data & Surveying Services

VOLUME

Joiner Pkwy Bet. 1st St & Moore Rd

Day: Wednesday
Date: 12/11/2019

City: Lincoln
Project #: CA19_7479_004

DAILY TOTALS	NB	SB	EB	WB	Total
	7,440	7,528	0	0	14,968

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	11		9						20		12:00	98		99						197	
00:15	17		5						22		12:15	111		88						199	
00:30	13		5						18		12:30	89		97						186	
00:45	4	45	6	25					10	70	12:45	95	393	93	377					188	770
01:00	7		4						11		13:00	91		98						189	
01:15	5		5						10		13:15	127		87						214	
01:30	5		5						10		13:30	116		110						226	
01:45	6	23	3	17					9	40	13:45	110	444	120	415					230	859
02:00	3		3						6		14:00	146		93						239	
02:15	5		1						6		14:15	147		98						245	
02:30	2		4						6		14:30	177		117						294	
02:45	3	13	4	12					7	25	14:45	185	655	196	504					381	1159
03:00	6		6						12		15:00	173		217						390	
03:15	5		5						10		15:15	149		256						405	
03:30	6		10						16		15:30	173		137						310	
03:45	3	20	22	43					25	63	15:45	188	683	145	755					333	1438
04:00	11		18						29		16:00	168		126						294	
04:15	1		16						17		16:15	163		124						287	
04:30	3		27						30		16:30	174		129						303	
04:45	6	21	26	87					32	108	16:45	176	681	129	508					305	1189
05:00	8		46						54		17:00	179		126						305	
05:15	8		49						57		17:15	194		118						312	
05:30	15		78						93		17:30	191		111						302	
05:45	11	42	85	258					96	300	17:45	173	737	80	435					253	1172
06:00	20		63						83		18:00	165		83						248	
06:15	13		115						128		18:15	172		73						245	
06:30	25		105						130		18:30	156		94						250	
06:45	31	89	110	393					141	482	18:45	110	603	140	390					250	993
07:00	41		118						159		19:00	104		116						220	
07:15	110		155						265		19:15	100		64						164	
07:30	190		183						373		19:30	102		74						176	
07:45	172	513	233	689					405	1202	19:45	104	410	49	303					153	713
08:00	125		283						408		20:00	71		52						123	
08:15	63		175						238		20:15	79		58						137	
08:30	51		120						171		20:30	85		53						138	
08:45	64	303	98	676					162	979	20:45	69	304	44	207					113	511
09:00	48		85						133		21:00	89		42						131	
09:15	63		98						161		21:15	72		31						103	
09:30	58		98						156		21:30	59		26						85	
09:45	62	231	99	380					161	611	21:45	58	278	19	118					77	396
10:00	54		82						136		22:00	58		17						75	
10:15	64		79						143		22:15	38		16						54	
10:30	68		91						159		22:30	44		18						62	
10:45	78	264	105	357					183	621	22:45	34	174	18	69					52	243
11:00	100		113						213		23:00	22		11						33	
11:15	108		131						239		23:15	24		16						40	
11:30	109		119						228		23:30	22		10						32	
11:45	111	428	102	465					213	893	23:45	18	86	8	45					26	131
TOTALS		1992		3402						**5394**	**TOTALS**	7468	5448	7440	4126						**9574**
SPLIT %		36.9%		63.1%						**36.0%**	**SPLIT %**		56.9%		43.1%						**64.0%**

DAILY TOTALS	NB	SB	EB	WB	Total
	7,440	7,528	0	0	14,968

AM Peak Hour	07:15	07:30			**07:15**	**PM Peak Hour**	16:45	14:45			**14:45**
AM Pk Volume	597	874			**1451**	**PM Pk Volume**	740	806			**1486**
Pk Hr Factor	0.786	0.772			**0.889**	**Pk Hr Factor**	0.954	0.787			**0.917**
7 - 9 Volume	816	1365	0	0	**2181**	**4 - 6 Volume**	1418	943	0	0	**2361**
7 - 9 Peak Hour	07:15	07:30			**07:15**	**4 - 6 Peak Hour**	16:45	16:00			**16:30**
7 - 9 Pk Volume	597	874	0	0	**1451**	**4 - 6 Pk Volume**	740	508	0	0	**1225**
Pk Hr Factor	0.786	0.772	0.000	0.000	**0.889**	**Pk Hr Factor**	0.954	0.984	0.000	0.000	**0.982**

Prepared by National Data & Surveying Services

VOLUME

Joiner Pkwy Bet. Danbury Dr & Groveland Ln

Day: Wednesday
Date: 12/11/2019

City: Lincoln
Project #: CA19_7479_005

DAILY TOTALS	NB	SB	EB	WB	Total
	7,916	8,307	0	0	16,223

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	12		12				24		12:00	91		96				187	
00:15	19		5				24		12:15	99		99				198	
00:30	14		7				21		12:30	103		116				219	
00:45	3	48	6	30			9	78	12:45	109	402	111	422			220	824
01:00	7		5				12		13:00	100		100				200	
01:15	5		5				10		13:15	120		106				226	
01:30	4		6				10		13:30	116		121				237	
01:45	8	24	3	19			11	43	13:45	118	454	130	457			248	911
02:00	2		9				11		14:00	159		121				280	
02:15	5		0				5		14:15	149		115				264	
02:30	2		6				8		14:30	179		126				305	
02:45	3	12	5	20			8	32	14:45	209	696	212	574			421	1270
03:00	7		7				14		15:00	184		176				360	
03:15	6		6				12		15:15	164		226				390	
03:30	5		14				19		15:30	181		136				317	
03:45	1	19	25	52			26	71	15:45	195	724	153	691			348	1415
04:00	8		21				29		16:00	177		133				310	
04:15	2		25				27		16:15	180		125				305	
04:30	1		31				32		16:30	188		133				321	
04:45	9	20	36	113			45	133	16:45	202	747	143	534			345	1281
05:00	10		57				67		17:00	175		124				299	
05:15	10		51				61		17:15	201		134				335	
05:30	14		82				96		17:30	215		119				334	
05:45	12	46	98	288			110	334	17:45	175	766	88	465			263	1231
06:00	22		93				115		18:00	177		103				280	
06:15	18		131				149		18:15	171		92				263	
06:30	26		127				153		18:30	177		86				263	
06:45	32	98	138	489			170	587	18:45	131	656	115	396			246	1052
07:00	50		145				195		19:00	109		141				250	
07:15	97		200				297		19:15	119		73				192	
07:30	165		232				397		19:30	137		73				210	
07:45	162	474	244	821			406	1295	19:45	109	474	61	348			170	822
08:00	123		291				414		20:00	93		54				147	
08:15	78		205				283		20:15	100		58				158	
08:30	62		132				194		20:30	95		53				148	
08:45	63	326	122	750			185	1076	20:45	80	368	51	216			131	584
09:00	59		108				167		21:00	94		46				140	
09:15	64		103				167		21:15	84		42				126	
09:30	66		117				183		21:30	71		29				100	
09:45	67	256	116	444			183	700	21:45	62	311	21	138			83	449
10:00	56		98				154		22:00	54		17				71	
10:15	70		91				161		22:15	50		17				67	
10:30	76		98				174		22:30	47		18				65	
10:45	69	271	113	400			182	671	22:45	42	193	22	74			64	267
11:00	103		119				222		23:00	25		12				37	
11:15	116		145				261		23:15	27		16				43	
11:30	105		129				234		23:30	27		15				42	
11:45	107	431	120	513			227	944	23:45	21	100	10	53			31	153
TOTALS		2025		3939				5964	TOTALS		5891		4368				10259
SPLIT %		34.0%		66.0%				36.8%	SPLIT %		57.4%		42.6%				63.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	7,916	8,307	0	0	16,223

AM Peak Hour	07:15	07:30					07:15		PM Peak Hour	16:45	14:45					14:45		
AM Pk Volume	547	972					1514		PM Pk Volume	793	750					1488		
Pk Hr Factor	0.829	0.835					0.914		Pk Hr Factor	0.922	0.830					0.884		
7 - 9 Volume	800	1571	0	0			2371		4 - 6 Volume	1513	999	0	0			2512		
7 - 9 Peak Hour	07:15	07:30					07:15		4 - 6 Peak Hour	16:45	16:00					16:45		
7 - 9 Pk Volume	547	972	0	0			1514		4 - 6 Pk Volume	793	534	0	0			1313		
Pk Hr Factor	0.829	0.835	0.000	0.000			0.914		Pk Hr Factor	0.922	0.934	0.000	0.000			0.951		

Prepared by National Data & Surveying Services

VOLUME

Joiner Pkwy Bet. Ferrari Ranch Rd & Lincoln Blvd

Day: Wednesday
Date: 12/11/2019

City: Lincoln
Project #: CA19_7479_006

DAILY TOTALS	NB	SB	EB	WB	Total
	3,530	5,338	0	0	8,868

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	5		5				10		12:00	49		76				125	
00:15	4		1				5		12:15	59		96				155	
00:30	3		2				5		12:30	50		97				147	
00:45	0	12	0	8			0	20	12:45	46	204	78	347			124	551
01:00	0		0				0		13:00	54		86				140	
01:15	0		2				2		13:15	60		68				128	
01:30	1		3				4		13:30	49		87				136	
01:45	2	3	0	5			2	8	13:45	56	219	114	355			170	574
02:00	1		1				2		14:00	54		86				140	
02:15	0		1				1		14:15	63		119				182	
02:30	1		0				1		14:30	67		111				178	
02:45	0	2	4	6			4	8	14:45	112	296	204	520			316	816
03:00	1		1				2		15:00	109		103				212	
03:15	0		3				3		15:15	77		157				234	
03:30	3		11				14		15:30	79		116				195	
03:45	2	6	11	26			13	32	15:45	80	345	141	517			221	862
04:00	1		8				9		16:00	86		93				179	
04:15	2		7				9		16:15	72		108				180	
04:30	0		11				11		16:30	95		89				184	
04:45	1	4	18	44			19	48	16:45	83	336	116	406			199	742
05:00	3		12				15		17:00	90		91				181	
05:15	5		12				17		17:15	103		93				196	
05:30	4		12				16		17:30	99		92				191	
05:45	7	19	37	73			44	92	17:45	88	380	90	366			178	746
06:00	8		23				31		18:00	80		55				135	
06:15	6		31				37		18:15	69		64				133	
06:30	10		38				48		18:30	57		67				124	
06:45	13	37	52	144			65	181	18:45	63	269	62	248			125	517
07:00	13		43				56		19:00	52		85				137	
07:15	36		104				140		19:15	48		54				102	
07:30	61		140				201		19:30	75		43				118	
07:45	82	192	131	418			213	610	19:45	45	220	39	221			84	441
08:00	64		137				201		20:00	31		39				70	
08:15	45		110				155		20:15	43		38				81	
08:30	33		74				107		20:30	45		42				87	
08:45	38	180	77	398			115	578	20:45	28	147	34	153			62	300
09:00	30		59				89		21:00	36		21				57	
09:15	36		82				118		21:15	26		24				50	
09:30	27		63				90		21:30	25		7				32	
09:45	35	128	72	276			107	404	21:45	24	111	18	70			42	181
10:00	38		58				96		22:00	21		7				28	
10:15	32		80				112		22:15	16		13				29	
10:30	36		67				103		22:30	9		13				22	
10:45	48	154	104	309			152	463	22:45	7	53	9	42			16	95
11:00	48		87				135		23:00	10		7				17	
11:15	56		110				166		23:15	10		8				18	
11:30	35		80				115		23:30	4		10				14	
11:45	43	182	80	357			123	539	23:45	7	31	4	29			11	60
TOTALS		919		2064				2983	TOTALS		2611		3274				5885
SPLIT %		30.8%		69.2%				33.6%	SPLIT %		44.4%		55.6%				66.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	3,530	5,338	0	0	8,868

AM Peak Hour	07:30		07:30					07:30	PM Peak Hour	17:00		14:45					14:45
AM Pk Volume	252		518					770	PM Pk Volume	380		580					957
Pk Hr Factor	0.768		0.925					0.904	Pk Hr Factor	0.922		0.711					0.757
7 - 9 Volume	372		816		0	0		1188	4 - 6 Volume	716		772		0	0		1488
7 - 9 Peak Hour	07:30		07:30					07:30	4 - 6 Peak Hour	17:00		16:00					16:45
7 - 9 Pk Volume	252		518		0	0		770	4 - 6 Pk Volume	380		406		0	0		767
Pk Hr Factor	0.768		0.925		0.000	0.000		0.904	Pk Hr Factor	0.922		0.875		0.000	0.000		0.964

Prepared by National Data & Surveying Services

VOLUME

Ferrari Ranch Rd Bet. Joiner Pkwy & Danbury Dr

Day: Wednesday
Date: 12/11/2019

City: Lincoln
Project #: CA19_7479_007

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,181	4,827	9,008

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			2		7		9		12:00			80		89		169	
00:15			5		2		7		12:15			91		79		170	
00:30			2		2		4		12:30			69		76		145	
00:45			3	12	1	12	4	24	12:45			81	321	82	326	163	647
01:00			5		1		6		13:00			74		85		159	
01:15			3		1		4		13:15			71		81		152	
01:30			1		5		6		13:30			75		80		155	
01:45			1	10	2	9	3	19	13:45			55	275	101	347	156	622
02:00			5		0		5		14:00			81		76		157	
02:15			0		2		2		14:15			84		87		171	
02:30			1		1		2		14:30			87		82		169	
02:45			2	8	1	4	3	12	14:45			90	342	149	394	239	736
03:00			2		1		3		15:00			80		102		182	
03:15			1		6		7		15:15			88		143		231	
03:30			3		1		4		15:30			109		108		217	
03:45			1	7	3	11	4	18	15:45			97	374	113	466	210	840
04:00			1		2		3		16:00			91		100		191	
04:15			4		1		5		16:15			69		100		169	
04:30			4		2		6		16:30			103		102		205	
04:45			5	14	9	14	14	28	16:45			87	350	100	402	187	752
05:00			6		7		13		17:00			75		120		195	
05:15			7		4		11		17:15			78		96		174	
05:30			8		9		17		17:30			91		117		208	
05:45			11	32	17	37	28	69	17:45			74	318	92	425	166	743
06:00			15		15		30		18:00			70		105		175	
06:15			21		15		36		18:15			80		91		171	
06:30			13		24		37		18:30			65		84		149	
06:45			21	70	31	85	52	155	18:45			48	263	63	343	111	606
07:00			36		43		79		19:00			58		63		121	
07:15			68		44		112		19:15			48		72		120	
07:30			91		65		156		19:30			41		30		71	
07:45			103	298	94	246	197	544	19:45			42	189	31	196	73	385
08:00			85		146		231		20:00			39		45		84	
08:15			52		65		117		20:15			33		41		74	
08:30			65		49		114		20:30			41		29		70	
08:45			54	256	49	309	103	565	20:45			21	134	30	145	51	279
09:00			56		55		111		21:00			29		24		53	
09:15			56		60		116		21:15			17		22		39	
09:30			43		47		90		21:30			25		14		39	
09:45			45	200	52	214	97	414	21:45			18	89	16	76	34	165
10:00			47		66		113		22:00			11		19		30	
10:15			53		70		123		22:15			15		18		33	
10:30			65		75		140		22:30			11		13		24	
10:45			62	227	70	281	132	508	22:45			10	47	10	60	20	107
11:00			95		78		173		23:00			13		8		21	
11:15			72		115		187		23:15			7		6		13	
11:30			70		111		181		23:30			2		8		10	
11:45			79	316	90	394	169	710	23:45			7	29	9	31	16	60
TOTALS				1450		1616		3066	TOTALS				2731		3211		5942
SPLIT %				47.3%		52.7%		34.0%	SPLIT %				46.0%		54.0%		66.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,181	4,827	9,008

AM Peak Hour			07:15	11:15	11:00	PM Peak Hour			15:15	14:45	14:45
AM Pk Volume			347	405	710	PM Pk Volume			385	502	869
Pk Hr Factor			0.842	0.880	0.949	Pk Hr Factor			0.883	0.842	0.909
7 - 9 Volume	0	0	554	555	1109	4 - 6 Volume	0	0	668	827	1495
7 - 9 Peak Hour			07:15	07:30	07:30	4 - 6 Peak Hour			16:00	16:45	16:45
7 - 9 Pk Volume	0	0	347	370	701	4 - 6 Pk Volume	0	0	350	433	764
Pk Hr Factor	0.000	0.000	0.842	0.634	0.759	Pk Hr Factor	0.000	0.000	0.850	0.902	0.918

Prepared by National Data & Surveying Services

VOLUME

Ferrari Ranch Bet. CA 65 NB Ramp & Groveland Ln

Day: Wednesday
Date: 12/11/2019

City: Lincoln
Project #: CA19_7479_008

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	11,124	12,069	23,193

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			11		15		26		12:00			153		183		336	
00:15			13		16		29		12:15			149		181		330	
00:30			11		8		19		12:30			138		178		316	
00:45			9	44	11	50	20	94	12:45			173	613	146	688	319	1301
01:00			11		13		24		13:00			148		183		331	
01:15			14		3		17		13:15			155		154		309	
01:30			7		9		16		13:30			153		168		321	
01:45			6	38	16	41	22	79	13:45			145	601	184	689	329	1290
02:00			6		3		9		14:00			193		164		357	
02:15			4		8		12		14:15			200		140		340	
02:30			12		1		13		14:30			225		156		381	
02:45			8	30	5	17	13	47	14:45			200	818	293	753	493	1571
03:00			5		7		12		15:00			238		282		520	
03:15			3		5		8		15:15			236		279		515	
03:30			11		17		28		15:30			262		198		460	
03:45			8	27	25	54	33	81	15:45			252	988	235	994	487	1982
04:00			11		19		30		16:00			242		201		443	
04:15			13		30		43		16:15			250		201		451	
04:30			13		34		47		16:30			276		200		476	
04:45			14	51	50	133	64	184	16:45			296	1064	225	827	521	1891
05:00			17		48		65		17:00			199		246		445	
05:15			18		73		91		17:15			249		220		469	
05:30			25		91		116		17:30			260		193		453	
05:45			37	97	99	311	136	408	17:45			253	961	217	876	470	1837
06:00			45		133		178		18:00			238		214		452	
06:15			64		174		238		18:15			278		174		452	
06:30			81		176		257		18:30			225		161		386	
06:45			80	270	150	633	230	903	18:45			192	933	173	722	365	1655
07:00			106		197		303		19:00			144		156		300	
07:15			205		206		411		19:15			119		149		268	
07:30			286		218		504		19:30			109		145		254	
07:45			330	927	271	892	601	1819	19:45			94	466	114	564	208	1030
08:00			226		364		590		20:00			88		122		210	
08:15			126		238		364		20:15			103		92		195	
08:30			126		210		336		20:30			95		99		194	
08:45			132	610	176	988	308	1598	20:45			72	358	92	405	164	763
09:00			132		139		271		21:00			85		80		165	
09:15			134		159		293		21:15			78		74		152	
09:30			121		154		275		21:30			64		54		118	
09:45			108	495	142	594	250	1089	21:45			57	284	58	266	115	550
10:00			119		141		260		22:00			40		45		85	
10:15			138		163		301		22:15			54		44		98	
10:30			127		162		289		22:30			53		33		86	
10:45			145	529	158	624	303	1153	22:45			39	186	33	155	72	341
11:00			190		159		349		23:00			19		25		44	
11:15			151		197		348		23:15			31		18		49	
11:30			135		188		323		23:30			23		24		47	
11:45			165	641	167	711	332	1352	23:45			20	93	15	82	35	175
TOTALS				3759		5048		8807	TOTALS				7365		7021		14386
SPLIT %				42.7%		57.3%		38.0%	SPLIT %				51.2%		48.8%		62.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	11,124	12,069	23,193

AM Peak Hour			07:15	07:30	07:15	PM Peak Hour		16:00	14:45	14:45
AM Pk Volume			1047	1091	2106	PM Pk Volume		1064	1052	1988
Pk Hr Factor			0.793	0.749	0.876	Pk Hr Factor		0.899	0.898	0.956
7 - 9 Volume	0	0	1537	1880	3417	4 - 6 Volume	0	2025	1703	3728
7 - 9 Peak Hour			07:15	07:30	07:15	4 - 6 Peak Hour		16:00	16:30	16:30
7 - 9 Pk Volume	0	0	1047	1091	2106	4 - 6 Pk Volume	0	1064	891	1911
Pk Hr Factor	0.000	0.000	0.793	0.749	0.876	Pk Hr Factor	0.000	0.899	0.905	0.917

SIGNAL TIMING SHEETS

8-25-16 DJ

Joiner Parkway / Nicolaw Road

PHASE BANK #1 <C+0+F=1>

	PHASE 1	2	3	4	5	6	7	8
0	WALK		10		10		10	
1	DON'T WALK		27		32		27	
2	MIN INITIAL		8	4	6		8	4
3	TYPE 3 LIMIT							
4	ADD PER VEH		2.0		1.2		2.0	
5	VEH EXT		4.0	2.0	3.5		4.0	2.0
6	MAX GAP		5	2	5		5	2
7	MIN GAP		2	2	2		2	2
8	MAX LIMIT		43	12	48		43	12
9	MAXIMUM 2							
A	ADV / DLY WALK							
B	MIN PED CLEAR							
C	COND SRV MIN							
D	REDUCE EVERY		1.0		1.0		1.0	
E	YELLOW		4.3	3.5	4.3		4.3	3.5
F	RED CLEAR		1.0	1.0	1.0		1.0	1.0

		9	A	B	C	D
0						
1	PHASE 1					
2	PHASE 2					
3	PHASE 3					
4	PHASE 4					
5	PHASE 5					
6	PHASE 6					
7	PHASE 7					
8	PHASE 8					

MAX INITIAL - ALT WALK - ALT FLH DW - ALT INITIAL - ALT EXTEN -

ALL RED START: (F/1+C+0) = 5.0

RED REVERT: (F/1+0+F) = 5.0

		E
	RR1 DLY	
	RR1 CLR	
	EVA DLY	
	EVA CLR	
	EVB DLY	
	EVB CLR	
	EVC DLY	
	EVC CLR	
	EVD DLY	
	EVD CLR	
	RR2 DLY	
	RR2 CLR	
	EV CLR	
	EV DLY	
	RR CLR	
	RR DLY	

<C+0+F=1>

		Column F PHASES 1 2 3 4 5 6 7 8
0	PERMIT	X X X X
1	RED LOCK	
2	YELLOW LOCK	
3	VEH MIN CALL	X
4	PED RECALL	
5	PEDESTRIANS	
6	REST IN WALK	
7	PED REST	
8	DOUBLE ENTRY	
9	VEH MAX CALL	
A	SOFT RECALL	
B	MAXIMUM 2	
C	COND SERVICE	
D	MAN CONT CALL	
E	YELLOW START	X
F	FIRST PHASES	X

FLASH TO PREEMPT
1 = EVA 5 = RR1
2 = EVB 6 = RR2
3 = EVC 7 = SE1
4 = EVD 8 = SE2

EXTRA 1
1 = TSC Type 1
2 = NEMA Ext. Coord
3 = Daylight Savings
4 = EV Advance
5 = Expanded Status Reporting
6 = International Ped
7 = Clear Outputs During FLASH
8 = Split Ring

EXTRA 2
1 = AWS On During Phase Inits
2 = LMU Installed

IC SELECT
2 = 2 Way Modem
3 = 7 Wire Slave
4 = Flash / Free
5 = Simplex Master
7 = 7 Wire Master
8 = Offset Interrupter

		Column E PHASES / BITS 1 2 3 4 5 6 7 8
0	EXCLUSIVE	X X
1	RR1 CLEAR	
2	RR2 CLEAR	
3	RR2 LTD SRV	
4	PROT / PERM	
5	FLH TO PREMT	
6	FLASH ENTRY	
7	DSABL MIN YEL	
8	DSABL OVP YEL	
9	OVP FLH YEL	
A	BM VEH A	X
B	BM VEH B	X X
C	BM VEH C	X
D	BM VEH D	X X
E	EXTRA 1	X X
F	IC SELECT	X X

<C+0+E=125>

		Column F PHASES / BITS 1 2 3 4 5 6 7 8
0		
1	EXT PERMIT 1	
2	EXT PERMIT 2	
3	EXCLU PED	
4		
5	PED 2P OUT	
6	PED 6P OUT	
7	PED 4P OUT	
8	PED 8P OUT	
9	FLH YELLOW	
A		
B		
C		
D		
E	RESTRICTED	
F	EXTRA 2	

COORDINATION <C+0+C=1>

		PLAN NUMBER 1	2	3	4	5	6	7	8	9
0	CYCLE									
1	FORCE 1									
2	FORCE 2									
3	FORCE 3									
4	FORCE 4									
5	FORCE 5									
6	FORCE 6									
7	FORCE 7									
8	FORCE 8									
9	RING OFFSET									
A	OFFSET 1									
B	OFFSET 2									
C	OFFSET 3									
D	END PERM 1									
E	HOLD RELEASE									
F	ZONE OFFSET									

		Column E 1 2 3 4 5 6 7 8
0		
1	SYNC 1	
2	SYNC 2	
3	SYNC 3	
4	SYNC 4	
5	SYNC 5	
6	SYNC 6	
7	SYNC 7	
8	SYNC 8	
9	SYNC 9	
A	NEMA SYNC	
B	NEMA HOLD	
C		
D		
E	COOR XTRA	
F		

<C+0+C=1>

		Column F 1 2 3 4 5 6 7 8
0	LAG FREE	
1	LAG PLAN 1	
2	LAG PLAN 2	
3	LAG PLAN 3	
4	LAG PLAN 4	
5	LAG PLAN 5	
6	LAG PLAN 6	
7	LAG PLAN 7	
8	LAG PLAN 8	
9	LAG PLAN 9	
A	EXT. LAG	
B		
C		
D		

COOR XTRA
1 = Programmed Walk Time For Sync Phases

	Column 2 COORD MINIMUM
1	
2	
3	
4	
5	
6	
7	
8	

<C+0+C=5>

COMM ADDRESS: (C/0+0+0) = _____

ZONE NUMBER: (C/0+0+1) = _____

AREA NUMBER: (C/0+0+2) = _____

AREA ADDRESS: (C/0+0+3) = _____

TRANSITION TYPE: (C/5+1+9) = _____

LAG HOLD PHASES: (C/5+1+A) = _____

7-WIRE SYNC TIME: (C/5+1+C) = _____

TRANSITION TYPE
0.X = Shortway
1.X = Dwell
X.1 thru X.4 = Number of cycles when Lengthing

BI Tran Systems, Inc.
510 Bercut Dr., Sacramento, Calif. 95814
916/441-0260

Traffic Signal Program 233

Timing Sheet # 1 (of 6)

(Revised 09/93)

Joiner & Fifth St — No Timing offset present

①	②	③	④	⑤	⑥	⑦	⑧
0-0	10	0	10	0	10	0	10
1-	17	0	25	0	17	0	25
2-4	5	4	6	4	5	4	6
3-0	20	0	20	0	20	0	20
4-0	1.2	0	1.2	0	1.2	0	1.2
5-2.0	3.5	2.0	3.5	2.0	3.5	2.0	3.5
6-2.0	5.0	2.0	5.0	2.0	5.0	2.0	5.0
7-2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
8-15	45	25	45	15	45	25	45
9-30	50	30	40	30	50	30	40
A-0	0	0	0	0	0	0	0
B-7	7	7	7	7	7	7	7
C-10	10	10	10	10	10	10	10
D-1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
E-3.5	4.3	3.5	3.5	3.5	4.3	3.5	3.5
F 1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

THIRD STREET & JOINER PARKWAY

F9E0E

F9E9E

EF52

PHASE BANK #1 <C+0+F=1>

	PHASE 1	2	3	4	5	6	7	8
0 WALK		10		10		10		
1 DON'T WALK		17		25		17		
2 MIN INITIAL	4	5	4	6	4	5	4	6
3 TYPE 3 LIMIT		20		20		20		20
4 ADD PER VEH		1.2		1.2		1.2		1.2
5 VEH EXT	2.0	3.5	2.0	3.5	2.0	3.5	2.0	3.5
6 MAX GAP	2	5	2	5	2	5	2	5
7 MIN GAP	2	2	2	2	2	2	2	2
8 MAX LIMIT	20	30	20	25	20	30	20	25
9 MAXIMUM 2	30	50	30	40	30	50	30	40
A ADV/DLY WALK								
B MIN PED CLEAR	7	7	7	7	7	7	7	7
C COND SRV MIN	10	10	10	10	10	10	10	10
D REDUCE EVERY		1.0		1.0		1.0		1.0
E YELLOW	3.5	4.3	3.5	4.3	3.5	4.3	3.5	4.3
F RED CLEAR	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

	9	A	B	C	D
0					
1 PHASE 1					
2 PHASE 2					
3 PHASE 3					
4 PHASE 4					
5 PHASE 5					
6 PHASE 6					
7 PHASE 7					
8 PHASE 8					

MAX INITIAL - ALT WALK - ALT FLH DW - ALT INITIAL - ALT EXTEN -

ALL RED START: (F/1+C+0) = 5.0

RED REVERT: (F/1+0+F) = 5.0

	E
RR1 DLY	
RR1 CLR	
EVA DLY	
EVA CLR	
EVB DLY	
EVB CLR	
EVC DLY	
EVC CLR	
EVD DLY	
EVD CLR	
RR2 DLY	
RR2 CLR	
EV CLR	
EV DLY	
RR CLR	
RR DLY	

Column F — PHASES

	1	2	3	4	5	6	7	8
0 PERMIT	X	X	X	X	X	X	X	X
1 RED LOCK								
2 YELLOW LOCK								
3 VEH MIN CALL	X				X			
4 PED RECALL								
5 PEDESTRIANS								
6 REST IN WALK								
7 RED REST								
8 DOUBLE ENTRY								
9 VEH MAX CALL								
A SOFT RECALL								
B MAXIMUM 2								
C COND SERVICE								
D MAN CONT CALL								
E YELLOW START				X				X
F FIRST PHASES	X				X			

<C+0+F=1>

FLASH TO PREEMPT
1 = EVA 5 = RR1
2 = EVB 6 = RR2
3 = EVC 7 = SE1
4 = EVD 8 = SE2

EXTRA 1
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Daylight Savings
4 = EV Advance
5 = Expanded Status Reporting
6 = International Ped
7 = Clear Outputs During FLASH
8 = Split Ring

EXTRA 2
1 = AWS On During Phase Initial
2 = LMU Installed

IC SELECT
2 = 2 Way Modem
3 = 7 Wire Slave
4 = Flash / Free
5 = Simplex Master
7 = 7 Wire Master
8 = Offset Interrupter

Column E — PHASES / BITS

	1	2	3	4	5	6	7	8
0 EXCLUSIVE								
1 RR1 CLEAR								
2 RR2 CLEAR								
3 RR2 LTD SRV								
4 FRCT / PERM								
5 FLH TO PREMT								
6 FLASH ENTRY								
7 DSABL MIN YEL								
8 DSABL OVP YEL								
9 OVP FLH YEL								
A EM VEH A								
B EM VEH B								
C EM VEH C								
D EM VEH D								
E EXTRA 1								
F IC SELECT								

Column F — PHASES / BITS

	1	2	3	4	5	6	7	8
0								
1 EXT PERMIT 1								
2 EXT PERMIT 2								
3 EXCLU PED								
4								
5 PED 2P OUT	X							
6 PED 6P OUT					X			
7 PED 4P OUT					X			
8 PED 8P OUT								
9 FLH YELLOW								
A								
B								
C								
D								
E RESTRICTED								
F EXTRA 2								

<C+0+E=125>

COORDINATION <C+0+C=1>

	PLAN NUMBER 1	2	3	4	5	6	7	8	9
0 CYCLE	105	105							
1 FORCE 1	71	68							
2 FORCE 2									
3 FORCE 3	11	14							
4 FORCE 4	51	55							
5 FORCE 5	61	72							
6 FORCE 6									
7 FORCE 7	11	11							
8 FORCE 8	51	55							
9 RING OFFSET									
A OFFSET 1	5	104							
B OFFSET 2									
C OFFSET 3									
END PERM 1	15	15							
HOLD RELEASE	255	255							
ZONE OFFSET									

Column E

	1	2	3	4	5	6	7	8
0								
1 SYNC 1	X			X				
2 SYNC 2	X			X				
3 SYNC 3	X			X				
4 SYNC 4	X			X				
5 SYNC 5	X			X				
6 SYNC 6	X			X				
7 SYNC 7	X			X				
8 SYNC 8	X			X				
9 SYNC 9	X			X				
A NEMA SYNC								
B NEMA HOLD								
C								
D								
E COOR XTRA								
F								

<C+0+C=1>

Column F

	1	2	3	4	5	6	7	8
0 LAG FREE	X	X	X	X	X	X	X	X
1 LAG PLAN 1	X	X		X	X			X
2 LAG PLAN 2	X	X	X	X	X	X	X	X
3 LAG PLAN 3	X			X	X			X
4 LAG PLAN 4	X			X	X			X
5 LAG PLAN 5	X			X	X			X
6 LAG PLAN 6	X			X	X			X
7 LAG PLAN 7	X			X	X			X
8 LAG PLAN 8	X			X	X			X
9 LAG PLAN 9	X			X	X			X
A EXT. LAG								
B								
C								
D								

COOR XTRA
1 = Programmed Walk Time For Sync Phases

Column 2 — COORD MINIMUM

1	
2	
3	
4	
5	
6	
7	
8	

<C+0+C=5>

TRANSITION TYPE
0.X = Shortway
1.X = Dwell
X.1 thru X.4 = Number of cycles when Lengthing

COMM ADDRESS: (C/0+0+0) = 1

ZONE NUMBER: (C/0+0+1) = _____

AREA NUMBER: (C/0+0+2) = _____

AREA ADDRESS: (C/0+0+3) = _____

TRANSITION TYPE: (C/5+1+9) = _____

LAG HOLD PHASES: (C/5+1+A) = _____

7-WIRE SYNC TIME: (C/5+1+C) = _____

BI Tran Systems, Inc.
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916 | 441-0260

Traffic Signal Program 233

Timing Sheet #1 (of 6)

(Revised 09/93)

MAX 9167732015 FEHR & PEERS

2005 THU 11:27 FAX 9167732015 FEHR & PEERS

FIRST STREET & JOINER PARKWAY

10-26-07

PHASE BANK #1 <C+0+F=1>

	PHASE 1	2	3	4	5	6	7	8
0 WALK		10		10		10		10
1 DON'T WALK		20		29		20		29
2 MIN INITIAL	4	5	4	6	4	5	4	6
3 TYPE 3 LIMIT		20		20		18		20
4 ADD PER VEH		1.2		1.2		1.2		1.2
5 VEH EXT	2.0	3.5	2.0	3.5	2.0	3.5	2.0	3.5
6 MAX GAP	2	5	2	5	2	5	2	5
7 MIN GAP	2	2	2	2	2	2	2	2
8 MAX LIMIT	15	45	15	45	15	45	15	45
9 MAXIMUM 2	30	50	30	50	30	50	30	50
A ADV/DLY WALK								
B MIN PED CLEAR	7	7	7	7	7	7	7	7
C COND SRV MIN	10	10	10	10	10	10	10	10
D REDUCE EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
E YELLOW	3.5	4.3	3.5	3.5	3.5	4.3	3.5	3.5
F RED CLEAR	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

	9	A	B	C	D
0					
1 PHASE 1					
2 PHASE 2					
3 PHASE 3					
4 PHASE 4					
5 PHASE 5					
6 PHASE 6					
7 PHASE 7					
8 PHASE 8					

MAX INITIAL - ALT WALK - ALT FLH D/W - ALT INITIAL - ALT EXTEN -

ALL RED START: (F/1+C+0) = 5.0

RED REVERT: (F/1+0+F) = 5.0

E		Column F PHASES 1 2 3 4 5 6 7 8
RR1 DLY	0 PERMIT	X X X X X X X X
RR1 CLR	1 RED LOCK	
EVA DLY 6	2 YELLOW LOCK	
EVA CLR	3 VEH MIN CALL	X X
EVB DLY	4 PED RECALL	
EVB CLR	5 PEDESTRIANS	
EVC DLY	6 REST IN WALK	
EVC CLR	7 RED REST	
EVD DLY	8 DOUBLE ENTRY	
EVD CLR	9 VEH MAX CALL	
RR2 DLY	A SOFT RECALL	
RR2 CLR	B MAXIMUM 2	
EV CLR	C COND SERVICE	
EV DLY	D MAN CONT CALL	
RR CLR	E YELLOW START	X X
RR DLY	F FIRST PHASE/B	X X

<C+0+F=1>

FLASH TO PREEMPT
1 = EV A 5 = RR 1
2 = EV B 6 = RR 2
3 = EV C 7 = BE 1
4 = EV D 8 = BE 2

EXTRA 1
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Daylight Savings
4 = EV Advance
5 = Expanded Status Reporting
6 = International Ped
7 = Clear Outputs During FLASH
8 = Split Ring

EXTRA 2
1 = AWS On During Phase Initial
2 = LMU Installed

IC SELECT
2 = 2 Way Modem
3 = 7 Wire Slave
4 = Flash / Free
6 = Simplex Master
7 = 7 Wire Master
8 = Offset Interrupter

Column E PHASES / BITS	1 2 3 4 5 6 7 8	Column F PHASES / BITS	1 2 3 4 5 6 7 8
0 EXCLUSIVE		0	
1 RR1 CLEAR		1 EXT PERMIT 1	
2 RR2 CLEAR		2 EXT PERMIT 2	
3 RR2 LTD SRV		3 EXCLU PED	
4 PROT / PERM		4	
5 FLH TO PREMT		5 PED 2P OUT	X
6 FLASH ENTRY		6 PED 6P OUT	X
7 DSABL MIN YEL		7 PED 4P OUT	X
8 DSABL OVP YEL		8 PED 8P OUT	X
9 OVP FLH YEL		9 FLH YELLOW	
A EM VEH A	X X	A	
B EM VEH B	X X	B	
C EM VEH C	X X	C	
D EM VEH D	X X	D	
E EXTRA 1		E RESTRICTED	
F IC SELECT		F EXTRA 2	

<C+0+E=125>

COORDINATION <C+0+C=1>

	PLAN NUMBER 1	2	3	4	5	6	7	8	9
0 CYCLE	105	105							
1 FORCE 1	70	65							
2 FORCE 2									
3 FORCE 3	17	11							
4 FORCE 4	60	55							
5 FORCE 5	70	69							
6 FORCE 6									
7 FORCE 7	17	12							
8 FORCE 8	60	55							
9 RING OFFSET									
A OFFSET 1	0	0							
B OFFSET 2									
C OFFSET 3									
D END PERM 1	15	15							
E HOLD RELEASE	255	255							
F ZONE OFFSET									

Column E	1 2 3 4 5 6 7 8
0	
1 SYNC 1	X X
2 SYNC 2	X X
3 SYNC 3	
4 SYNC 4	
5 SYNC 5	
6 SYNC 6	
7 SYNC 7	
8 SYNC 8	
9 SYNC 9	
A NEMA SYNC	
B NEMA HOLD	
C	
D	
E COOR XTRA	
F	

<C+0+C=1>

Column F	1 2 3 4 5 6 7 8
0 LAG FREE	X X X X
1 LAG PLAN 1	X X X X
2 LAG PLAN 2	X X X X
3 LAG PLAN 3	
4 LAG PLAN 4	
5 LAG PLAN 5	
6 LAG PLAN 6	
7 LAG PLAN 7	
8 LAG PLAN 8	
9 LAG PLAN 9	
A EXT. LAG	
B	
C	
D	

COOR XTRA
1 = Programmed Walk Time For Sync Phases

Column 2 COORD MINIMUM	
1	
2	
3	
4	
5	
6	
7	
8	

<C+0+C=5>

TRANSITION TYPE
0.X = Shortway
1.X = Dwell
X.1 thru X.4 = Number of cycles when Lengthing

COMM ADDRESS: (C/0+0+0) = _____

ZONE NUMBER: (C/0+0+1) = _____

AREA NUMBER: (C/0+0+2) = _____

AREA ADDRESS: (C/0+0+3) = _____

TRANSITION TYPE: (C/5+1+9) = _____

LAG HOLD PHASES: (C/5+1+A) = _____

7-WIRE SYNC TIME: (C/5+1+C) = _____

BI Tran Systems, Inc.
510 Bercut Dr., Sacramento, Calif. 95814
916/441-0260

Traffic Signal Program 233

Timing Sheet #1 (of 6)

(Revised 09/93)

Joiner @ Danbury / Downing Cir

PHASE TIMING

KEYSTROKES: F+PHASE+INTERVAL

INTERVAL		PHASE 1	2	3	4	5	6	7	8
WALK	0		4	4	4		4		
FLASH D/W	1		25	30	30		25		
MIN GREEN	2	7	15	7	7	7	15		
TYPE 3 DET	3								
ADD/VEH	4		1.2		1.2		1.2		
VEH EXTEN *	5	2	3	2	2	2	3		
MAX GAP *	6	2	3	2	2	2	3		
MIN GAP *	7	2	3	2	2	2	3		
MAX EXTEN	8	10	30	20	20	10	30		
MAX 2	9	30	70	30	70	30	90		
	A								
CALLTO PHASE	B								
REDUCE BY	C	.1	.1	.1	.1	.1	.1		
REDUCE EVERY	D	1.0	1.0	1.0	1.0	1.0	1.0		
YELLOW	E	3.5	4.5	4.0	4.0	3.5	4.5		
RED CLEAR	F	1	1	1	1	1	1		

PREEMPT		
	E	
RR1 DELAY		0
RR1 CLEAR		1
EVA DELAY		2
EVA CLEAR		3
EVB DELAY		4
EVB CLEAR		5
EVC DELAY		6
EVC CLEAR		7
EVD DELAY		8
EVD CLEAR		9
RR2 DELAY		A
RR2 CLEAR		B
EV CLR TMR		C
EV DLY TMR		D
RR CLR TMR		E
RR DLY TMR		F

MAX INITIAL (F-0-E) = 20

RED REVERT (F-0-F) = 5.0

ALL RED START (F-C-0) = 5.0

* MUST BE SAME FOR NON-DENSITY OPERATION

PHASE FUNCTION FLAGS

KEYSTROKES: F+F+FUNCTION#

FUNCTION		PHASE 1	2	3	4	5	6	7	8
PERMIT	0	X	X	X	X	X	X		
RED LOCK	1								
YELLOW LOCK	2								
VEH RECALL	3		X				X		
PED RECALL	4								
PEDS	5								
REST IN WALK	6								
RED REST	7								
DOUBLE ENTRY	8								
MAX RECALL	9								
SOFT RECALL	A								
MAX 2	B								
COND SERVE	C								
RESERVED	D								
STARTUP	E	X							
FIRST PHASES	F		X				X		

OVERLAP TIMING

KEYSTROKE: F+ COLOR CODE+OVERLAP

	9 GREEN	C YELLO	D RED
OVERLAP A			
OVERLAP B			
OVERLAP C			
OVERLAP D			

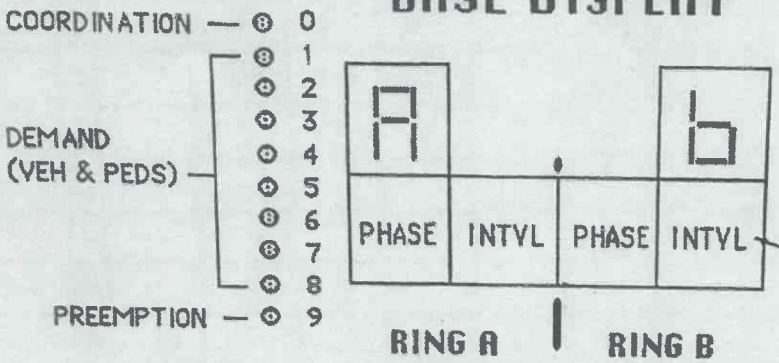
INTERSECTION: JOINER PKWY at DANBURY DR.

by: R YOUNG Date: 11/29/04

PROGRAM **200SA**

VERSION 1.F
OCT. 1991

BASE DISPLAY



INTERVALS

0 - WALK
1 - FLASH DONT WALK
2 - MINIMUM GREEN
3 -
4 - VARIABLE INITIAL
5 - EXTENSION
6 -
7 - REDUCED GAP
8 - RED REST
9 - PREEMPTION
A - STOP TIME
B - RED REVERT
C - GAP TERMINATION
D - MAX TERMINATION
E - FORCEOFF
F - RED CLEARANCE

1	2	3	4	RING A
5	6	7	8	RING B

PHASES

OVERLAP LOAD SWITCH ASSIGNMENT D-O-

OVERLAP A		(0-8)
OVERLAP B		(0-8)
OVERLAP C		(0-8)
OVERLAP D		(0-8)

bAdE EPROM ERROR, SEE C-E-D
WATCHDOG STOPS IF F-C-F = 0

bAdA TURN STOPTIME SW ON THEN OF
TO REINITIALIZE

CONFIGURATION DATA

NOTE: "E" KEY ENABLED (F-9-E ≠ 0)

KEYSTROKES: E+E+INTERVAL

INTERVAL	PHASE 1	2	3	4	5	6	7	8
0 EXCLU PH			X	X				
1 RR1 GRN CL								
2 RR2 GRN CL								
3 RR2 LTD								
4 PROT/PERM								
5 OLA GOMIT								
6 OLB GOMIT								
7 OLC GOMIT								
8 OLD GOMIT								
9 OV FL YEL					▒	▒	▒	▒
A EMVEH A		X			X			
B EMVEH B			X					
C EMVEH C	X					X		
D EMVEH D			X					
E EXTRA	X							
F IC SELECT		X						

EXTRA (E+E+E)

1-TBC TYPE 1
3-DAYLIGHT SAV
4-EV ADVANCE
5-RESERVED
6-SPECIAL EVENT
7-PRETIMED
8-SPLIT RING

IC SELECT (E+E+F)

2-DUPLEX LOCAL
3-7 WIRE IN
4-FLH/FREE
6-SIMPLEX MASTER
7-7 WIRE OUT
8-OFFSET INTERRUPTER

ASSIGN5 (E+F+F)

1-RT OVERLAP
2-TOD OUTPUTS
3-STEADY EV BEACON
4-FLASH EV BEACON
5-RESERVED
6-PHASES 3 & 7 PED
7-ADVANCE WARNING BEACON
8-SPECIAL EVENT

KEYSTROKES: E+F+INTERVAL

INTERVAL	PHASE 1	2	3	4	5	6	7	8
0								
1 RR OLAP A								
2 RR OLAP B								
3 RR OLAP C								
4 RR OLAP D								
5 PED2P		X			X			
6 PED6P	X					X		
7 PED4P					X			
8 PED8P				X				
9 FLH YELO								
A OVERLAP A								
B OVERLAP B								
C OVERLAP C								
D OVERLAP D								
E RESTRICT								
F ASSIGN5								

BI TRAN SYSTEMS, INC.

INTERSECTION: JONER PKWY at GROVELAND LN.

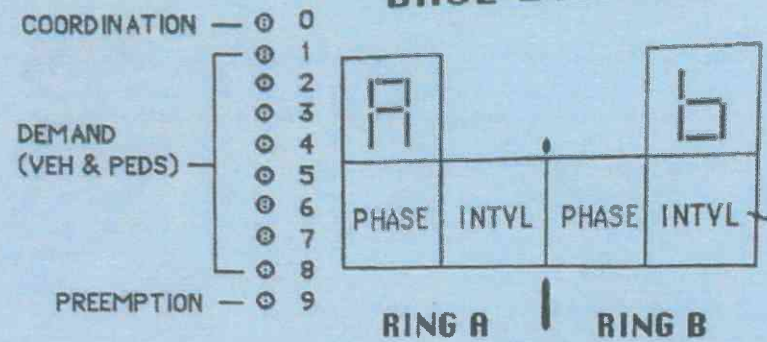
by: R. YOUNG Date: 11/29/04

PROGRAM **200SA**

VERSION 1.F
OCT. 1991

Need ped adjusted on D2

BASE DISPLAY



1	2	3	4	RING A
5	6	7	8	RING B

PHASES

INTERVALS

0 - WALK
1 - FLASH DONT WALK
2 - MINIMUM GREEN
3 -
4 - VARIABLE INITIAL
5 - EXTENSION
6 -
7 - REDUCED GAP
8 - RED REST
9 - PREEMPTION
A - STOP TIME
B - RED REVERT
C - GAP TERMINATION
D - MAX TERMINATION
E - FORCEOFF
F - RED CLEARANCE

OVERLAP LOAD SWITCH ASSIGNMENT D-0-

OVERLAP A		(0-8)
OVERLAP B		(0-8)
OVERLAP C		(0-8)
OVERLAP D		(0-8)

bAdE	EPROM ERROR, SEE C-E-D WATCHDOG STOPS IF F-C-F = 0
bAdA	TURN STOPTIME SW ON THEN OFF TO REINITIALIZE

CONFIGURATION DATA

NOTE: "E" KEY ENABLED (F-9-E ≠ 0)

KEYSTROKES: E+E+INTERVAL

INTERVAL	PHASE 1	2	3	4	5	6	7	8
0 EXCLU PH			X	X				
1 RR1 GRN CL								
2 RR2 GRN CL								
3 RR2 LTD								
4 PROT/PERM								
5 OLA GOMIT								
6 OLB GOMIT								
7 OLC GOMIT								
8 OLD GOMIT								
9 OV FL YEL					▒	▒	▒	▒
A EMVEH A		X			X			
B EMVEH B			X					
C EMVEH C	X					X		
D EMVEH D			X					
E EXTRA								
F IC SELECT			X					

EXTRA (E+E+E)

1-TBC TYPE 1
3-DAYLIGHT SAV
4-EV ADVANCE
5-RESERVED
6-SPECIAL EVENT
7-PRETIMED
8-SPLIT RING

IC SELECT (E+E+F)

2-DUPLEX LOCAL
3-7 WIRE IN
4-FLH/FREE
6-SIMPLEX MASTER
7-7 WIRE OUT
8-OFFSET INTERRUPTER

KEYSTROKES: E+F+INTERVAL

INTERVAL	PHASE 1	2	3	4	5	6	7	8
0								
1 RR OLAP A								
2 RR OLAP B								
3 RR OLAP C								
4 RR OLAP D								
5 PED2P		X						
6 PED6P								
7 PED4P					X			X
8 PED8P				X				
9 FLH YELO				X				
A OVERLAP A								
B OVERLAP B								
C OVERLAP C								
D OVERLAP D								
E RESTRICT								
F ASSIGN5								

ASSIGN5 (E+F+F)

1-RT OVERLAP
2-TOD OUTPUTS
3-STEADY EV BEACON
4-FLASH EV BEACON
5-RESERVED
6-PHASES 3 & 7 PED
7-ADVANCE WARNING BEACON
8-SPECIAL EVENT

BI TRAN SYSTEMS, INC.

Joiner Pkwy & Groveland

VERSION 1.F
OCT. 1991

KEYSTROKES: F+PHASE+INTERVAL

INTERVAL		PHASE 1	2	3	4	5	6	7	8
WALK	0		7	7	7		4		
FLASH D/W	1		22	27	29		25		
MIN GREEN	2	7	15	7	7	7	15		
TYPE 3 DET	3								
ADD/VEH	4		1.2		1.2		1.2		
VEH EXTEN *	5	2	3	2	3.5	2	3		
MAX GAP *	6	2	3	2	5	2	3		
MIN GAP *	7	2	3	2	2	2	3		
MAX EXTEN	8	10	30	20	40	10	30		
MAX 2	9	30	70	30	70	30	70		
	A								
CALLTO PHASE	B								
REDUCE BY	C	.1	.1	.1	.1	.1	.1		
REDUCE EVERY	D	1.0	1.0	1.0	1.0	1.0	1.0		
YELLOW	E	3.5	4.5	4.0	4.0	3.5	4.5		
RED CLEAR	F	1	1	1	1	1	1		

PREEMPT		
	E	
RR1 DELAY		0
RR1 CLEAR		1
EVA DELAY		2
EVA CLEAR		3
EVB DELAY		4
EVB CLEAR		5
EVC DELAY		6
EVC CLEAR		7
EVD DELAY		8
EVD CLEAR		9
RR2 DELAY		A
RR2 CLEAR		B
EV CLR TMR		C
EV DLY TMR		D
RR CLR TMR		E
RR DLY TMR		F

MAX INITIAL (F-0-E) = 20

* MUST BE SAME FOR NON-DENSITY OPERATION

RED REVERT (F-0-F) = 5.0
ALL RED START (F-C-0) = 5.0

PHASE FUNCTION FLAGS

KEYSTROKES: F+F+FUNCTION#

		PHASE 1	2	3	4	5	6	7	8
PERMIT	0	X	X	X	X	X	X		
RED LOCK.	1			X					
YELLOW LOCK	2			X					
VEH RECALL	3		X				X		
PED RECALL	4								
PEDS	5		X	X	X		X		
REST IN WALK	6								
RED REST	7	X			X	X	X		
DOUBLE ENTRY	8								
MAX RECALL	9								
SOFT RECALL	A								
MAX 2	B								
COND SERVE	C								
MAN CONT RECALL	D								
STARTUP	E	X							
FIRST PHASES	F		X				X		

Ok Red & yellow lock 7-3-18 Per city

OVERLAP TIMING

KEYSTROKE: F+ COLOR CODE+OVERLAP

	9 GREEN	C YELLO	D RED
OVERLAP A			
OVERLAP B			
OVERLAP C			
OVERLAP D			

BI TRAN SYSTEMS, INC.

Joiner @ Tenaru Ranch

PHASE TIMING

KEYSTROKES: F+PHASE+INTERVAL

INTERVAL		PHASE 1	2	3	4	5	6	7	8	PREEMPT	E	
WALK	0		5		5		5		5	RR1 DELAY		0
FLASH D/W	1		22		22		22		22	RR1 CLEAR		1
MIN GREEN	2	10	15	7	15	7	15	7	15	EVA DELAY		2
TYPE 3 DET	3									EVA CLEAR		3
ADD/VEH	4		1.2		1.2		1.2		1.2	EVB DELAY		4
VEH EXTEN *	5	3	3	3	3	3	3	3	3	EVB CLEAR		5
MAX GAP *	6	3	3	3	3	3	3	3	3	EVC DELAY		6
MIN GAP *	7	3	3	3	3	3	3	3	3	EVC CLEAR		7
MAX EXTEN	8	15	20	25	20	15	20	15	20	EVD DELAY		8
MAX 2	9	30	70	30	70	30	70	30	70	EVD CLEAR		9
	A									RR2 DELAY		A
CALLTO PHASE	B									RR2 CLEAR		B
REDUCE BY	C	.1	.1	.1	.1	.1	.1	.1	.1	EV CLR TMR		C
REDUCE EVERY	D	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	EV DLY TMR		D
YELLOW	E	3.5	4.5	3.5	4.5	3.5	4.5	3.5	4.5	RR CLR TMR		E
RED CLEAR	F	1	1	1	1	1	1	1	1	RR DLY TMR		F

MAX INITIAL (F-0-E) = 20

RED REVERT (F-0-F) = 5

ALL RED START (F-C-0) = 5

* MUST BE SAME FOR NON-DENSITY OPERATION

PHASE FUNCTION FLAGS

KEYSTROKES: F+F+FUNCTION#

FUNCTION		PHASE 1	2	3	4	5	6	7	8
PERMIT	0	X	X	X	X	X	X	X	X
RED LOCK	1	X							
YELLOW LOCK	2	X							
VEH RECALL	3		X				X		
PED RECALL	4								
PEDS	5								
REST IN WALK	6								
RED REST	7								
DOUBLE ENTRY	8								
MAX RECALL	9								
SOFT RECALL	A								
MAX 2	B								
COND SERVE	C								
RESERVED	D								
STARTUP	E	X							
FIRST PHASES	F		X				X		

OVERLAP TIMING

KEYSTROKE: F+ COLOR CODE+OVERLAP

	9 GREEN	C YELLO	D RED
OVERLAP A			
OVERLAP B			
OVERLAP C			
OVERLAP D			

Joiner PKWY & Ferrari Ranch

DETECTOR TIMING

DESCRIPTION	C1 PIN	DET NO.	332 INPUT FILE SLOT	DELAY 1/10 SEC		CARRYOVER 1/10 SEC	
	56	14	111	D-1-0	10	D-3-0	
	39	1	212U	D-1-1	10	D-3-1	
	43	5	212L	D-1-2	10	D-3-2	
	63	21	213U	D-1-3	10	D-3-3	
	76	25	213L	D-1-4	10	D-3-4	
	47	9	214	D-1-5	10	D-3-5	
	58	16	315	D-1-6	10	D-3-6	
	41	3	416U	D-1-7		D-3-7	
	45	7	416L	D-1-8		D-3-8	
	65	23	417U	D-1-9	10	D-3-9	
	78	27	417L	D-1-A	10	D-3-A	
	49	11	418	D-1-B		D-3-B	
	60	18	119U	D-1-C	10	D-3-C	
	62	20	319L	D-1-D	10	D-3-D	
	55	13	5J1	D-2-0	10	D-4-0	
	40	2	6J2U	D-2-1		D-4-1	
	44	6	6J2L	D-2-2		D-4-2	
	64	22	6J3U	D-2-3	10	D-4-3	
	77	26	6J3L	D-2-4	10	D-4-4	
	48	10	6J4	D-2-5		D-4-5	
	57	15	7J5	D-2-6	10	D-4-6	
	42	4	8J6U	D-2-7	10	D-4-7	
	46	8	8J6L	D-2-8	10	D-4-8	
	66	24	8J7U	D-2-9	10	D-4-9	
	79	28	8J7L	D-2-A	10	D-4-A	
	50	12	8J8	D-2-B	10	D-4-B	
	59	17	5J9U	D-2-C	10	D-4-C	
	61	19	7J9L	D-2-D	10	D-4-D	

PHASE 7
FILE J
SLOT 9
LOWER

ACTIVE DETECTOR ASSIGNMENTS

CALL/ACTIVE LIGHTS

	1	2	3	4	5	6	7	8
DET #	1	2	3	4	5	6	7	8
D-E-A								
DET #	9	10	11	12				
D-E-B								
DET #	13	14	15	16	17	18	19	20
D-E-C								
DET #					21	22	23	24
D-E-D								
DET #								
D-E-E								
DET #		25	26	27	28			
D-E-F								

DETECTOR MONITOR

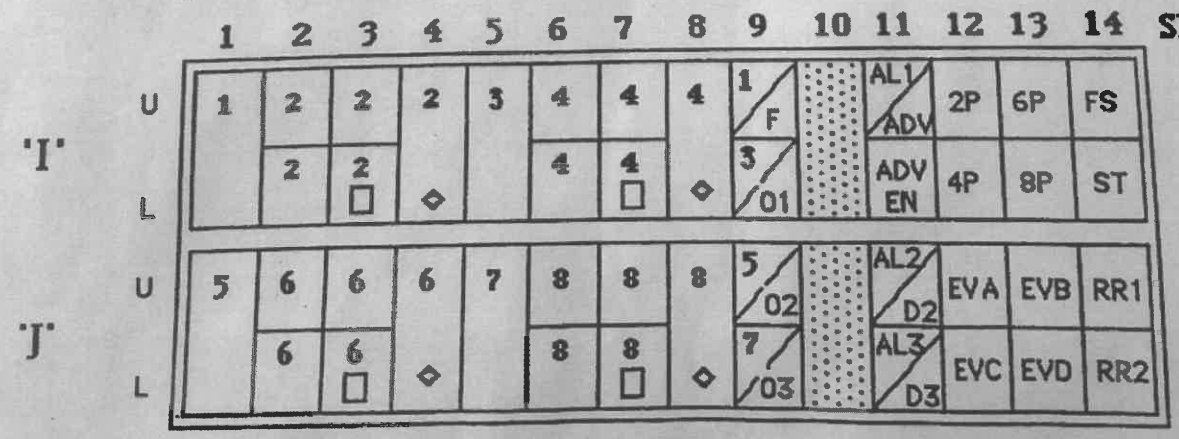
MAXIMUM ON TIME(D-A-E)

DETON _____, MINUTES

MAXIMUM OFF TIME(D-A-F)

DETOFF _____, MINUTES

332 cabinet INPUT FILE LAYOUT



□ - EXTENSION, COUNT
□ - EXTENSION
◇ - CALL DETECTOR
D2 - DIAL 2

ADV - ADVANCE
EN - ENABLE
F - FLASH/FREE
ST - STOP TIME

FS - FLASH SENSE
2P - 2 PED
RR1 - RAILROAD 1
EVA - EMERG VEH A

AL1 - ALARM 1
01 - OFFSET 1

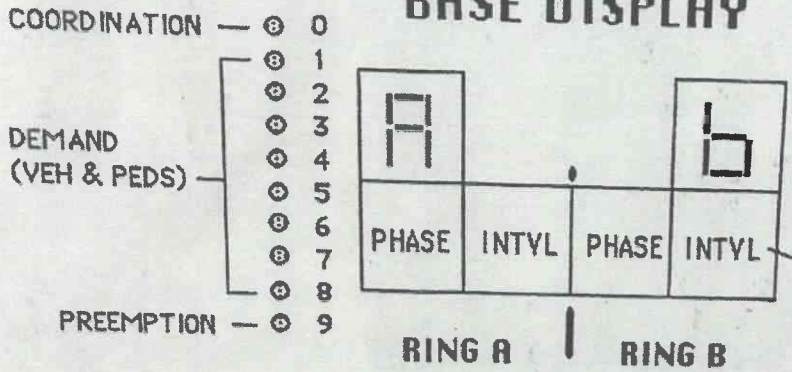
INTERSECTION: JOINER PKWY at FERRARI RANCH

by: R. YOUNG Date: 4-1-05

PROGRAM **200SA**

VERSION 1.F
OCT. 1991

BASE DISPLAY



1	2	3	4	RING A
5	6	7	8	RING B

PHASES

INTERVALS

0 - WALK
1 - FLASH DONT WALK
2 - MINIMUM GREEN
3 -
4 - VARIABLE INITIAL
5 - EXTENSION
6 -
7 - REDUCED GAP
8 - RED REST
9 - PREEMPTION
A - STOP TIME
B - RED REVERT
C - GAP TERMINATION
D - MAX TERMINATION
E - FORCEOFF
F - RED CLEARANCE

OVERLAP LOAD SWITCH ASSIGNMENT D-O-

OVERLAP A		(0-8)
OVERLAP B		(0-8)
OVERLAP C		(0-8)
OVERLAP D		(0-8)

bAdE EPROM ERROR, SEE C-E-D
WATCHDOG STOPS IF F-C-F = 0

bAdA TURN STOPTIME SW ON THEN OFF TO REINITIALIZE

CONFIGURATION DATA

NOTE: "E" KEY ENABLED (F-9-E ≠ 0)

KEYSTROKES: E+E+INTERVAL

INTERVAL	PHASE 1	2	3	4	5	6	7	8
0 EXCLU PH								
1 RR1 GRN CL								
2 RR2 GRN CL								
3 RR2 LTD								
4 PROT/PERM								
5 OLA GOMIT								
6 OLB GOMIT								
7 OLC GOMIT								
8 OLD GOMIT								
9 OV FL YEL					▒	▒	▒	▒
A EMVEH A		X			X			
B EMVEH B				X			X	
C EMVEH C	X					X		
D EMVEH D			X					X
E EXTRA	X							
F IC SELECT		X						

EXTRA (E+E+E)

1-TBC TYPE 1
3-DAYLIGHT SAV
4-EV ADVANCE
5-RESERVED
6-SPECIAL EVENT
7-PRETIMED
8-SPLIT RING

IC SELECT (E+E+F)

2-DUPLEX LOCAL
3-7 WIRE IN
4-FLH/FREE
6-SIMPLEX MASTER
7-7 WIRE OUT
8-OFFSET INTERRUPTER

KEYSTROKES: E+F+INTERVAL

INTERVAL	PHASE 1	2	3	4	5	6	7	8
0								
1 RR OLAP A								
2 RR OLAP B								
3 RR OLAP C								
4 RR OLAP D								
5 PED2P		X						
6 PED6P						X		
7 PED4P				X				
8 PED8P								X
9 FLH YELO								
A OVERLAP A								
B OVERLAP B								
C OVERLAP C								
D OVERLAP D								
E RESTRICT								
F ASSIGN5								

ASSIGN5 (E+F+F)

1-RT OVERLAP
2-TOD OUTPUTS
3-STEADY EV BEACON
4-FLASH EV BEACON
5-RESERVED
6-PHASES 3 & 7 PED
7-ADVANCE WARNING BEACON
8-SPECIAL EVENT

BI TRAN SYSTEMS, INC.

Turn On Date: 11/2/04 By: RGY

Notes:

FERRARI RANCH / GROVELAND
Intersection Name

☐ Additional Special Timing Required
If box is checked, see additional timing sheets.

PHASE BANK 1

	PHASE 1	2	3	4	5	6	7	8
WALK		4		4		4		
DON'T WALK		22		32		20		
MIN INITIAL	7	15		10	7	15		10
TYPE 3 LIMIT								
ADD PER VEH		1.2		1.2	1.2	1.2		1.2
VEH EXTEN *	2	3		3	2	3		3
MAX GAP *	.5	5.0		5.0	2.5	5.0		5.0
MIN GAP *	.5	2.0		2.0	2.5	2.0		2.0
MAX LIMIT	22	40		40	17	40		40
MAXIMUM 2	30	70		70	30	70		70
FALL TO PHASE								
REDUCE BY	.1	.1		.1	.1	.1		.1
REDUCE EVERY	1.0	1.0		1.0	1.0	1.0		1.0
YELLOW	3.5	4.6		3.5	3.5	4.6		3.5
RED CLEAR	.1	1		1	1	1		1

<F PAGE>

* = Must Be The Same For Non-Coinsidy Operation

PREEMPT

		E
0	PRE1 DLY	
1	PRE1 CLR	
2	EVA DLY	
3	EVA CLR	
4	EVB DLY	
5	EVB CLR	
6	EVC DLY	
7	EVC CLR	
8	EVD DLY	
9	EVD CLR	
A	PRE2 DLY	
B	PRE2 CLR	
C	EV CLR	
D	EV DLY	
E	PRE CLR	
F	PRE DLY	

<F PAGE>

PHASE FUNCTION FLAGS

Column F

		PHASES 1	2	3	4	5	6	7	8
0	PERMIT	X	X		X	X	X		X
1	RED LOCK								
2	YELLOW LOCK								
3	VEH MIN CALL	X				X			
4	PED RECALL								
5	PEDESTRIANS	X			X	X			
6	REST IN WALK								
7	RED REST								
8	DOUBLE ENTRY								
9	VEH MAX CALL								
A	SOFT RECALL								
B	MAXIMUM 2	X							
C	COND SERVICE								
D	MAN CONT CALL								
E	YELLOW START					X			X
F	FIRST PHASES	X			X				

<F PAGE>

al Plan Select:
(C+A+1) = _____
AUTO = 0
PLAN = 1-8
FREE = 14
FLASH = 15

Offset Select:
(C+8+1) = _____
AUTO = 0
OFFSET A = 1
OFFSET B = 2
OFFSET C = 3

ALL RED START:
(F+C+0) = _____
RED REVERT:
(F+0+F) = _____
MAX INITIAL:
(F+0+E) = _____

COMM ADDRESS:
(C+0+0) = _____

ADVANCE WARNING SIGNS

SIGN #1
Phase Number:
(F+C+1) = _____
Time Before Yellow:
(F+C+3) = _____
Alternating Outputs:
Loadswitch = PED 2 & 4 YELLOW
(ASSIGNS = BIT 7)

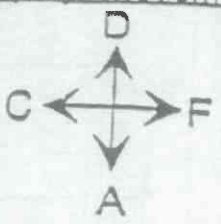
SIGN #2
Phase Number:
(F+D+1) = _____
Time Before Yellow:
(F+D+3) = _____
Alternating Outputs:
Loadswitch = PED 6 & 8 YELLOW
(ASSIGNS = BIT 7)

FERRARI RANCH & GROVELAND

Controller Intervals

0 = Walk
1 = FDW
2 = Min. Green
3 =
4 = Var. Initial
5 = Extension
6 =
7 = Reduce Gap
8 = Red Rest
9 = Preemption
A = Stop Time
B = Red Revert
C = Gap Termination
D = Max. Termination
E = Forceoff Termination
F = Red Clearance

Display Movement



Interval Timer Display

Ring A = F + A + Interval Row
Ring B = F + B + Interval Row

Display Locations

Master Plan = C + A + 2
Current Plan = C + A + 3
TOD Plan = C + A + 5

Master Cycle = C + A + 0
Ring A Cycle = C + B + 0
Ring B Cycle = C + D + 0

MIN Cycle = C + A + E
MAX Cycle = C + B + E

Current Calculated Cycle Length = C + B + F

Phase Hold = C + F + D
Phase Next = C + F + E
Force Off = C + F + F

Last Power Failure :
(HR-MIN-DOW) = 8 + 4
(DOM-YR-MONTH) = 8 + 5
Last Cabinet Flash :
(HR-MIN-DOW) = 8 + 6
(DOM-YR-MONTH) = 8 + 7
Power Fail Counts :
(Long Failures) = F + 0 + C
(Short Failures) = F + 0 + D
Current Time :
(HR-MIN-DOW) = 8 + 0
(DOM-YR-MONTH) = 8 + 1
(MIN-SEC-1/10 SEC) = 8 + F

CONTROLLER CONFIGURATION FLAGS

Column E — PHASES

		1	2	3	4	5	6	7	8
0	EXCLUSIVE				X				X
1	RR 1 CLEAR								
2	RR 2 CLEAR								
3	RR 2 LTD SRV								
4	PROT / PERM								
5	OLAP A - G OMIT								
6	OLAP B - G OMIT								
7	OLAP C - G OMIT								
8	OLAP D - G OMIT								
9	OLAP FLH YEL								
A	EM VEH A			X		X			
B	EM VEH B				X				
C	EM VEH C	X				X			
D	EM VEH D								X
E	EXTRA	X							
F	IC SELECT	X							

< E PAGE >

Column F — PHASES

		1	2	3	4	5	6	7	8
0									
1	RR OLAP A								
2	RR OLAP B								
3	RR OLAP C								
4	RR OLAP D								
5	PED - 2 P	X							
6	PED - 6 P						X		
7	PED - 4 P							X	
8	PED - 8 P								
9	FLH YELLOW								
A	OVERLAP A								
B	OVERLAP B								
C	OVERLAP C								
D	OVERLAP D								
E	RESTRICTED								
F	ASSIGN 5								

< E PAGE >

E Page Enable :
F + 9 + E = Not Zero

SYSTEM DETECTORS

Column 0 — DET NUMBER

0		
1	SYS DET #1	
2	SYS DET #2	
3	SYS DET #3	
4	SYS DET #4	
5	SYS DET #5	
6	SYS DET #6	
7	SYS DET #7	
8	SYS DET #8	

< D PAGE >

Controller Configuration Flags

EXTRA
1 = TBC Type 1
2 = NEMA External Coord.
3 = Auto Daylight Savings
4 = EV Preempt Advance
5 =
6 = Special Event
7 = Preempt Operation
8 = Split Ring Operation

IC SELECT
2 = 2 Way Modem
3 = 7 Wire Slave
4 = Flash / Free
6 = Simplex Master
7 = 7 Wire Master
8 = Offset Interrupter

ASSIGN5 (Ped Yellows)
1 = Right Turn Overlap
2 = TOD Outputs
3 = Steady EV Beacon
4 = Flash EV Beacon
5 = Reserved
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 = Special Event Outputs

BI Tran Systems, Inc.
510 Beam Dr., Sacramento, Calif. 95814
916 / 441-0260
Traffic Signal Program 200
"QuicForm" Timing Card
(Revised 4/92)

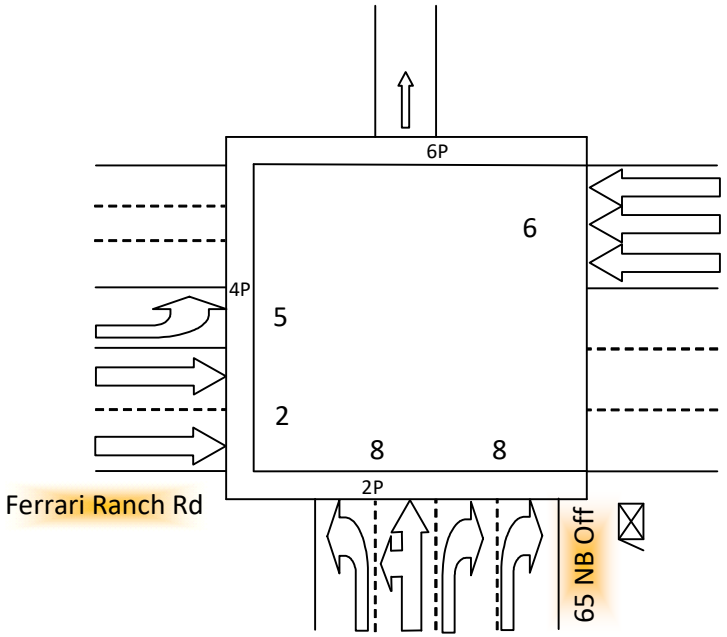
Location: Pla 65 @ Ferrari Ranch (NB)
System: **District:**
Master At: **I/C:**

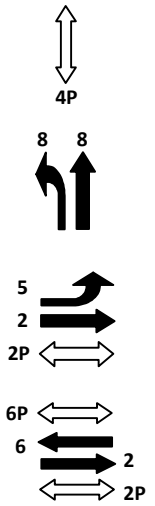
Designed By: 03-3338U1
Installed By: DH
Service Info: 0319065R013357

Timing Change: **Date Start:** **Date End:** **Designed:** **Installed:**

			FLASH
PHASE	1)		[ ]
	2)	NB Ferrari Ranch	[ ]
	3)		[ ]
	4)	*Pedestrian Only	[ ]
	5)	LT from NB Ferrari to NB 65 On Ramp	[ ]
	6)	SB Ferrari Ranch	[ ]
	7)		[ ]
	8)	LT/Thru/Rt from NB 65 Off Ramp	[ ]
OVERLAP	A)		[ ]
	B)		[ ]
	C)		[ ]
	D)		[ ]
	E)		[ ]
	F)		[ ]

Intersection Layout





Comments and Notes:
2012-10-07 OTO TSCP 2.17 ***Restrict 4 & 8*** D.Hamamoto,T.Kelly,M.Blanchard
2017-05-01 Change lag 4 to 3 due to crosswalk not serving, new yellow DH
2018-10-12 Upgraded to TSCP 2.21 Build 7A

RAM Checksum

Page 2: 6BAA	Page 8: 85AF
Page 3: BB38	Page 9: D2FD
Page 4: 2B2E	Page 10: D7C1
Page 5: 191A	Page 11: FDAC
Page 6: 191A	Page 12: D68F
Page 7: 4035	Page 13: 86F7

CONFIGURATION PHASE FLAGS

Cabinet
332
Configuration
CALTRANS

Phases (2-1-1-1)	
Permitted	. 2 . 4 5 6 . 8
Restricted	. . . 4 . . . 8

Phase Recalls (2-1-1-2)	
Vehicle Min	. 2 . . . 6 . .
Vehicle Max	. . . . .
Pedestrian	. . . . .
Bicycle	. . . . .

Phase Locks (2-1-1-3)	
Red	. . . . 5 . . .
Yellow	. . . . .
Force/Max	. . . . .

Phase Features (2-1-1-4)	
Double Entry	. . . . .
Rest In Walk	. . . . .
Rest In Red	. . . . .
Walk 2	. . . . .
Max Green 2	. . . . .
Max Green 3	. . . . .

Startup (2-1-1-5)	
First Green Phases	. 2 . . . 6 . .
Yellow Start Phases	. . . . .
Vehicle Calls	. 2 . . 5 6 . 8
Pedestrian Calls	. 2 . 4 . 6 . .
Yellow Start Overlaps	. . . . .
Startup All-Red	6.0

Call To Phase (2-1-2-1)		Omit On Green	
1	. . . . .	1	. . . . .
2	. . . . .	2	. . . . .
3	. . . . .	3	. . . . .
4	. . . . .	4	. . . . .
5	. . . . .	5	. . . . .
6	. . . . .	6	. . . . .
7	. . . . .	7	. . . . .
8	. . . . .	8	. . . . .

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	. . . . .
Yellow Flash Overlap	. . . . .
Flash In Red Phases	. . . . .
Flash In Red Overlap	. . . . .

Special Operation (2-1-2-3)	
Single Exit Phase	. . . . .
Driveway Signal Phases	. . . . .
Driveway Signal Overlaps	. . . . .
Leading Ped Phases	. . . . .

Protected Permissive (2-1-2-4)	
Protected Permissive	. . . . .

Pedestrian (2-1-3)	
P1	. . . . .
P2	. 2 . . . . .
P3	. . . . .
P4	. . . 4 . . . .
P5	. . . . .
P6	. . . . . 6 . .
P7	. . . . .
P8	. . . . .

Overlap (2-1-4)				
Overlap	Parent	Omit	No Start	Not
A	. . . . .	. . . . .	. . . . .	. . . . .
B	. . . . .	. . . . .	. . . . .	. . . . .
C	. . . . .	. . . . .	. . . . .	. . . . .
D	. . . . .	. . . . .	. . . . .	. . . . .
E	. . . . .	. . . . .	. . . . .	. . . . .
F	. . . . .	. . . . .	. . . . .	. . . . .

PHASE TIMING

Phase (2-2)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 1 ---	0	7	0	7	0	7	0	10
Flash Don't Walk	0	21	0	20	0	10	0	10
Minimum Green	0	10	0	10	7	10	0	7
Det Limit	0	10	0	10	10	10	0	10
Max Initial	0	0	0	10	10	0	0	0
Max Green 1	0	40	0	50	20	40	0	30
Max Green 2	0	50	0	50	50	50	0	50
Max Green 3	0	50	0	50	50	50	0	50
Extension	0.0	2.0	0.0	5.0	2.0	2.0	0.0	2.0
Maximum Gap	0.0	3.0	0.0	5.0	2.0	3.0	0.0	2.0
Minimum Gap	0.0	2.0	0.0	5.0	2.0	2.0	0.0	2.0
Add Per Vehicle	0.0	0.0	0.0	1.0	2.0	0.0	0.0	0.0
Reduce Gap By	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
Reduce Every	0.0	1.0	0.0	1.0	1.0	1.0	0.0	1.0
Yellow	3.0	4.4	3.0	3.0	3.7	4.4	3.0	4.4
All-Red	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0

Ped/Bike (2-3)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	8	0	0	0	8	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A	B	C	D	E	F
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert

Red Revert (2-5)	
Time	5.0
All-Red Sec/Min (2-6)	
All-Red Sec/Min:	OFF

Max 2 Extension

Max/Gap Out (2-7)	
Max Cnt	0
Gap Cnt	0

Local Plan 1...9 (7-1) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 1	Green Factor			. . . . .											
Plan 2	Green Factor			. . . . .											
Plan 3	Green Factor			. . . . .											
Plan 4	Green Factor			. . . . .											
Plan 5	Green Factor			. . . . .											
Plan 6	Green Factor			. . . . .											
Plan 7	Green Factor			. . . . .											
Plan 8	Green Factor			. . . . .											
Plan 9	Green Factor			. . . . .											

Master Timer Sync (7-A)	
Enable in Plans	
1-9	. . . . .
11-19	. . . . .
21-29	. . . . .

Master Sub Master	
Input	
Output	

FREE PLAN PHASE FLAGS

(7-E) Free	
Lag	Omit
. 2 3 . . 6 . 8	. . . . .
Veh Min	Veh Max
. . . . .	. . . . .
Ped	Bike
. . . . .	. . . . .
Cond	Cond Grn
. . . . .	10

Local Plan 1...9 (7-1) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 1	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Plan 2	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Plan 3	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Plan 4	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Plan 5	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Plan 6	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Plan 7	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Plan 8	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Plan 9	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .

MANUAL COMMANDS

Manual Plan (4-1)	
Plan	OffSet
	A

Plan: 1-9
15 or 254 = Flash
14 or 255 = Free
Offset A, B, or C

Special Function Override (4-2)			
#	Control	#	Control
1	NORMAL	3	NORMAL
2	NORMAL	4	NORMAL

Detector Reset	(4-3)
Local Manual (4-4)	OFF

Local Plan 11...19 (7-2) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 11	Green Factor			.....											
Plan 12	Green Factor			.....											
Plan 13	Green Factor			.....											
Plan 14	Green Factor			.....											
Plan 15	Green Factor			.....											
Plan 16	Green Factor			.....											
Plan 17	Green Factor			.....											
Plan 18	Green Factor			.....											
Plan 19	Green Factor			.....											

Local Plan 11...19 (7-2) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 11	.....	.....	.....	.....	.....	.....	.....	.....
Plan 12	.....	.....	.....	.....	.....	.....	.....	.....
Plan 13	.....	.....	.....	.....	.....	.....	.....	.....
Plan 14	.....	.....	.....	.....	.....	.....	.....	.....
Plan 15	.....	.....	.....	.....	.....	.....	.....	.....
Plan 16	.....	.....	.....	.....	.....	.....	.....	.....
Plan 17	.....	.....	.....	.....	.....	.....	.....	.....
Plan 18	.....	.....	.....	.....	.....	.....	.....	.....
Plan 19	.....	.....	.....	.....	.....	.....	.....	.....

Local Plan 21...29 (7-3) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 21	Green Factor			.....											
Plan 22	Green Factor			.....											
Plan 23	Green Factor			.....											
Plan 24	Green Factor			.....											
Plan 25	Green Factor			.....											
Plan 26	Green Factor			.....											
Plan 27	Green Factor			.....											
Plan 28	Green Factor			.....											
Plan 29	Green Factor			.....											

Local Plan 21...29 (7-3) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 21	.....	.....	.....	.....	.....	.....	.....	.....
Plan 22	.....	.....	.....	.....	.....	.....	.....	.....
Plan 23	.....	.....	.....	.....	.....	.....	.....	.....
Plan 24	.....	.....	.....	.....	.....	.....	.....	.....
Plan 25	.....	.....	.....	.....	.....	.....	.....	.....
Plan 26	.....	.....	.....	.....	.....	.....	.....	.....
Plan 27	.....	.....	.....	.....	.....	.....	.....	.....
Plan 28	.....	.....	.....	.....	.....	.....	.....	.....
Plan 29	.....	.....	.....	.....	.....	.....	.....	.....

DETECTORS

Detector Attributes (5-1)				Slot	Detector Configuration (5-2)				
Det	Type	Phases	Lock		Det	Delay	Extend	Recall	Port
1	COUNT+CALL+EXTEND	1	NO	I1U	1			10	3.2
2	COUNT+CALL+EXTEND	1	NO	I1L	2			10	7.2
3	COUNT+CALL+EXTEND	. 2	NO	I2U	3		2.0	10	1.1
4	COUNT+CALL+EXTEND	. 2	NO	I2L	4		2.0	10	1.5
5	BICYCLE	. 2	NO	I3U	5			10	4.5
6	CALL+EXTEND	. 2	NO	I3L	6		1.5	10	6.2
7	LIMITED	. 2	NO	I4U	7			10	2.1
8	COUNT+CALL+EXTEND	. 2	NO	I4L	8			10	7.4
9	COUNT+CALL+EXTEND	. . 3	NO	I5U	9			10	3.4
10	COUNT+CALL+EXTEND	. . 3	NO	I5L	10			10	7.6
11	COUNT+CALL+EXTEND	. . . 4 . . .	NO	I6U	11			10	1.3
12	COUNT+CALL+EXTEND	. . . 4 . . .	NO	I6L	12			10	1.7
13	COUNT+CALL+EXTEND	. . . 4 . . .	NO	I7U	13			10	4.7
14	CALL+EXTEND	. . . 4 . . .	NO	I7L	14			10	6.4
15	LIMITED	. . . 4 . . .	NO	I8U	15			10	2.3
16	COUNT+CALL+EXTEND	. . . 4 . . .	NO	I8L	16			10	7.8
17	COUNT+CALL+EXTEND	1	NO	I9U	17			10	3.6
18	COUNT+CALL+EXTEND	. . 3	NO	I9L	18			10	3.8
19	COUNT+CALL+EXTEND	. 2	NO	I10U	19			10	4.1
20	COUNT+CALL+EXTEND	. . . 4 . . .	NO	I10L	20			10	4.2
21	COUNT+CALL+EXTEND	. . . . 5 . . .	NO	J1U	21	3		10	3.1
22	COUNT+CALL+EXTEND	. . . . 5 . . .	NO	J1L	22	3		10	7.1
23	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J2U	23		2.0	10	1.2
24	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J2L	24		2.0	10	1.6
25	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J3U	25		2.0	10	4.6
26	LIMITED	. . . . . 6 . .	NO	J3L	26			10	6.3
27	LIMITED	. . . . . 6 . .	NO	J4U	27			10	2.2
28	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J4L	28			10	7.3
29	COUNT+CALL+EXTEND	. . . . . 7 .	NO	J5U	29		2.0	10	3.3
30	COUNT+CALL+EXTEND	. . . . . 7 .	NO	J5L	30		2.0	10	7.5
31	COUNT+CALL+EXTEND	 8	NO	J6U	31	2	1.0	10	1.4
32	COUNT+CALL+EXTEND	 8	NO	J6L	32	2	1.0	10	1.8
33	COUNT+CALL+EXTEND	 8	NO	J7U	33	10		10	4.8
34	CALL+EXTEND	 8	NO	J7L	34	20		10	6.5
35	LIMITED	 8	RED	J8U	35	3		10	2.4
36	LIMITED	 8	RED	J8L	36	3		10	7.7
37	COUNT+CALL+EXTEND	. . . . 5 . . .	NO	J9U	37		1.0	10	3.5
38	COUNT+CALL+EXTEND	. . . . . 7 .	NO	J9L	38			10	3.7
39	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J10U	39			10	4.3
40	COUNT+CALL+EXTEND	 8	NO	J10L	40			10	4.4
41	PEDESTRIAN	. 2	NO	I12U	41			10	5.1
42	PEDESTRIAN	. . . 4 . . .	NO	I12L	42			10	5.3
43	PEDESTRIAN	. . . . . 6 . .	NO	I13U	43			10	5.2
44	PEDESTRIAN	 8	NO	I13L	44			10	5.4

Failure Times(5-3)	Minutes
Maximum On Time	
Fail Reset Time	

Failure Override (5-4)	
Detectors 1-8	. . . . .
Detectors 9-16	. . . . .
Detectors17-24	. . . . .
Detectors 25-32	. . . . .
Detectors 33-40	. . . . .
Detectors 41-44	. . . . .

System Detector Assignment (5-5)

Sys Det	1	2	3	4	5	6	7	8
Det Nu								
Sys Det	9	10	11	12	13	14	15	16
Det Nu								

CIC Operation (5-6-1)

Enable in Plans	. . . . .

CIC Values (5-6-2)	Volume	Occupancy	Demand
Smoothing	0.66	0.66	0.66
Multiplier	4.0	0.33	
Exponent	0.50	1.00	

Detector-to-Phase Assignment (5-6-3)

Sys Det	1	2	3	4	5	6	7	8
Phase								
Sys Det	9	10	11	12	13	14	15	16
Phase								

Input File Port-Bit Assignments

332 Cabinet - For Reference Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-	3.2	1.1	4.5	2.1	3.4	1.3	4.7	2.3	3.6	4.1	6.6	5.1	5.2	6.7
	7.2	1.5	6.2	7.4	7.6	1.7	6.4	7.8	3.8	4.2	2.7	5.3	5.4	6.8
J-	3.1	1.2	4.6	2.2	3.3	1.4	4.8	2.4	3.5	4.3	2.8	5.5	5.6	2.5
	7.1	1.6	6.3	7.3	7.5	1.8	6.5	7.7	3.7	4.4	6.1	5.7	5.8	2.6

TOD SCHEDULE

Table 1 (8-2-1)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 2 (8-2-2)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 3 (8-2-3)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 4 (8-2-4)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 5 (8-2-5)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 6 (8-2-6)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

WEEKDAY ASSIGNMENT

Weekday Table Assignments (8-2-7)						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	1	1	1	2	2

HOLIDAY TABLES

Floating Holiday Table (8-2-8)

#	Mnth	Week	DOW	Table
1			.....	
2			.....	
3			.....	
4			.....	
5			.....	
6			.....	
7			.....	
8			.....	
9			.....	
10			.....	
11			.....	
12			.....	
13			.....	
14			.....	
15			.....	
16			.....	

Fixed Holiday Table (8-2-9)

#	Mnth	Day	DOW	Table
1			.....	
2			.....	
3			.....	
4			.....	
5			.....	
6			.....	
7			.....	
8			.....	
9			.....	
10			.....	
11			.....	
12			.....	
13			.....	
14			.....	
15			.....	
16			.....	

Solar Clock Data (8-4)

North Latitude	34
West Longitude	118
Local Time Zone	8

Sabbatical Clock (8-5)

Hebrew	Ped Recall
Sabbath	.....
Holiday	.....

Daylight Saving (8-6)

Enabled	YES

TOD FUNCTIONS

TOD Functions (8-3)

#	Start	End	DOW	Action	Phases
1			.....		.....
2			.....		.....
3			.....		.....
4			.....		.....
5			.....		.....
6			.....		.....
7			.....		.....
8			.....		.....
9			.....		.....
10			.....		.....
11			.....		.....
12			.....		.....
13			.....		.....
14			.....		.....
15			.....		.....
16			.....		.....

Action Codes:

0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11. Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
27. Traffic Actuated Max 2
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting

100+Action Code = Phases removed

200+Action Code = Phases replaced

COMMUNICATIONS

C2 (6-1-1)	
Address	1
Protocol	AB3418
Access Level	0
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

C20 (6-1-2)	
Address	
Protocol	AB3418
Access Level	0
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

C21 (6-1-3)	
Address	
Protocol	AB3418
Access Level	0
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

Access Levels:

0-Full Access
1-Status Only
2-Status, Set Pattern, Time
3-Status, Set Pattern, Time, Manual Plan
4-Reserved
5-Full Access with No Set Pattern
6-Full Access with No Set Time
7-Full Access with No Set Pattern, Manual Plan
8-Full Access with No Set Time, Pattern, Manual Plan

SOFT LOGIC

Soft Logic (6-2)

#	Data	OP	Data	OP	Data	OP	Data
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

*Refer to User's Manual for Data and OP Codes

CALLBACK NUMBERS

Callback Numbers (6-3...3)	
Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

NETWORK

Network (6-4)	
Address	
Protocol	AB3418
Port	27000
Type	STATIC
Central Access	0
Field Access	0

IP Address	0	.	0	.	0	.	0
Netmask	255	.	255	.	255	.	0
Broadcast	0	.	0	.	0	.	255
Gateway	0	.	0	.	0	.	254

RAILROAD PREEMPTION

RR 1

(3-1-1)	Timing	Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
Delay		Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
Clear 1	10	. 2 . . 5 . . .	. . . . .	. . . . .	. . . . .	. . . . .	. 2 . 4 . 6 . 8	. . . . .	. . . . .	. . . . .
Clear 2		. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Clear 3		. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Hold		. . . . .	. . . . .	1 2 3 4 5 6 7 8	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	A B C D E F
Exit										
Min Grn										
Ped Clr										

Exit Parameters (3-1-5)			
Phase Green	Overlap Green	Vehicle Call	Ped Call
. . . . .	. . . . .	1 2 3 4 5 6 7 8	. 2 . 4 . 6 . 8

Configuration (3-1-6)			
Primary Port	Secondary Port	Latching	Power-Up
2.5	0.0	YES	FLASHING

RR 2

(3-2-1)	Timing	Phase Flags (3-2-2)			Pedestrian Flags (3-2-3)			Overlap Flags (3-2-4)		
Delay		Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
Clear 1	10	. . . 4 . . 7 .	. . . . .	. . . . .	. . . . .	. . . . .	. 2 . 4 . 6 . 8	. . . . .	. . . . .	. . . . .
Clear 2		. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Clear 3		. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Hold		1 2 3 . . 6 . .	. . . . .	. . . . .	. 2 . . . 6 . .	. . . . .	. . . 4 . . . 8	. . . . .	. . . . .	. . . . .
Exit										
Min Grn										
Ped Clr										

Exit Parameters (3-2-5)			
Phase Green	Overlap Green	Vehicle Call	Ped Call
. . . . .	. . . . .	. . . 4 . . 7 .	. . . . .

Configuration (3-2-6)			
Primary Port	Secondary Port	Latching	Power-up
2.6	0.0	YES	DARK

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	30	. 2 . . 5 . . .	. . . . .

Port	Latching	Phase Termination
5.5	NO	ADVANCE

EVB (3-B)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	30	. . . 4 . . 7 .	. . . . .

Port	Latching	Phase Termination
5.6	NO	ADVANCE

EVC (3-C)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	30	1 . . . . 6 . .	. . . . .

Port	Latching	Phase Termination
5.7	NO	ADVANCE

EVD (3-D)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	30	. . 3 8	. . . . .

Port	Latching	Phase Termination
5.8	NO	ADVANCE

INPUTS

		7 Wire I/C (2-1-5-1)			
		Input	Port	Input	Port
Enable	NO	R1	3.8	Free	3.6
Max ON		R2	3.5	D2	2.8
Max OFF		R3	3.7	D3	6.1

Manual Control (2-1-5-2)	
Input	Port
Manual Advance	
Advance Enable	

Cabinet Status (2-1-5-3)	
Input	Port
Flash Bus	
Door Ajar	
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	
2	
3	
4	

Battery Backup (2-1-5-5)	
Port	Operation
2.7	FLASHING

Y-Coordination (2-1-5-6)	
Port C	Port D
6.1	2.8

OUTPUTS

Loadswitch Assignments (2-1-6)							+
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:

0 Unused (no output)
1-8 Vehicle 1-8
9-14 Overlap A-F
21-28 Ped 1-8
41-47 Special Functions
41 Protected Permissive Flashing Phase 1
43 Protected Permissive Flashing Phase 3
45 Protected Permissive Flashing Phase 5
47 Protected Permissive Flashing Phase 7
51-57 Special Functions
71-72 Seven Wire I/C

+ middle output of loadswitches 3 and 6 Channel 9 and 10

TRANSIT PRIORITY

Local Plans (3-E) 1...9 11...19		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor											
Plan 2	Green Factor											
Plan 3	Green Factor											
Plan 4	Green Factor											
Plan 5	Green Factor											
Plan 6	Green Factor											
Plan 7	Green Factor											
Plan 8	Green Factor											
Plan 9	Green Factor											
Plan 11	Green Factor											
Plan 12	Green Factor											
Plan 13	Green Factor											
Plan 14	Green Factor											
Plan 15	Green Factor											
Plan 16	Green Factor											
Plan 17	Green Factor											
Plan 18	Green Factor											
Plan 19	Green Factor											

Transit Priority Configuration (3-E-A)				Indicator Output	
Enable in Plans		Input	Type	Stop	Go
Plan 1-9	. . . . .	0.0	OPT	0	0
Plan 11-19	. . . . .	0.0	OPT	0	0

Queue Jump (3-E-B)	
Grn Hold	Hold Phase
	. . . . .
	. . . . .

Free Plans (3-E-E)	
Max Grn Hold	Hold Phase
	. . . . .

Access Utilities (9-5)	
Password	***
Timeout	30

YELLOW YIELD COORDINATION

					Force-Offs											
Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	Coord	Lag	Min Recall	Restricted
Plan C													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . . .	. . . . .
Plan D													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . . .	. . . . .

TRUCK PRIORITY

Truck Priority (3-F)	Passage	CarryOver	Clearance	Next Priority	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output
					. . . . .	0.0	0.0	0.0	0	0.0	0

Location: Pla 65 @ Ferrari Ranch (SB) **Designed By:** SFP 03-3338U4

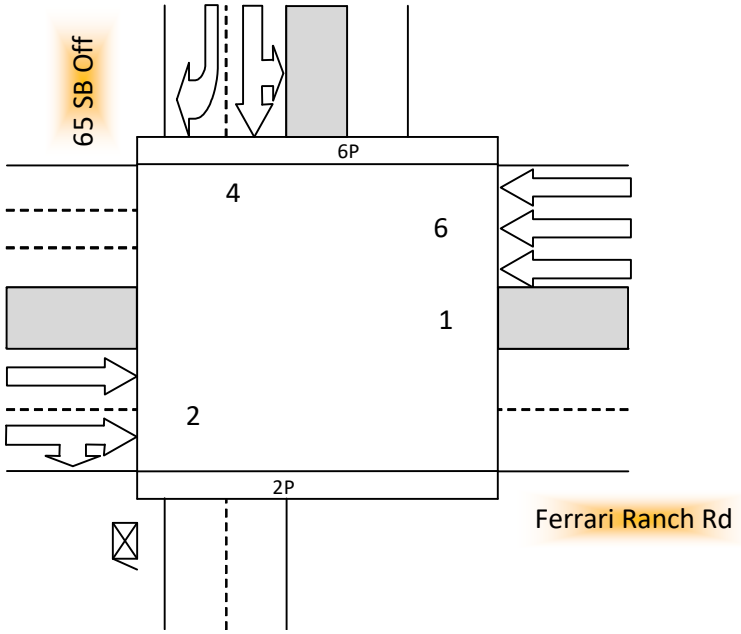
System: **District:** **Installed By:** DH

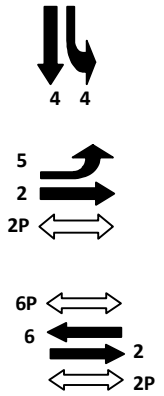
Master At: **I/C:** **Service Info:**

Timing Change: **Date Start:** **Date End:** **Designed:** **Installed:**

			FLASH
PHASE	1)		[ ]
	2)	NB Ferrari Ranch	[ ]
	3)		[ ]
	4)	EB Off from SB 65	[ ]
	5)		[ ]
	6)	SB Ferrari Ranch	[ ]
	7)		[ ]
	8)		[ ]
OVERLAP	A)		[ ]
	B)		[ ]
	C)		[ ]
	D)		[ ]
	E)		[ ]
	F)		[ ]

Intersection Layout





Comments and Notes:
2012-10-07 OTO TSCP 2.17 D.Hamamoto,T.Kelly,M.Blanchard
2018-10-12 Upgrade to TSCP 2.21 Build 7A DH

RAM Checksum

Page 2: DE62	Page 8: 85AF
Page 3: 66EB	Page 9: D2FD
Page 4: 0BF4	Page 10: 3DC3
Page 5: 191A	Page 11: FDAC
Page 6: 191A	Page 12: D68F
Page 7: 8096	Page 13: 86F7

CONFIGURATION PHASE FLAGS

Cabinet
332
Configuration
CALTRANS

Phases (2-1-1-1)	
Permitted	. 2 . 4 . 6 . .
Restricted	. . . . .

Phase Recalls (2-1-1-2)	
Vehicle Min	. 2 . . . 6 . .
Vehicle Max	. . . . .
Pedestrian	. . . . .
Bicycle	. . . . .

Phase Locks (2-1-1-3)	
Red	. . . . .
Yellow	. . . . .
Force/Max	. . . . .

Phase Features (2-1-1-4)	
Double Entry	. . . . .
Rest In Walk	. . . . .
Rest In Red	. . . . .
Walk 2	. . . . .
Max Green 2	. . . . .
Max Green 3	. . . . .

Startup (2-1-1-5)	
First Green Phases	. 2 . . . 6 . .
Yellow Start Phases	. . . . .
Vehicle Calls	. 2 . 4 . 6 . .
Pedestrian Calls	. 2 . . . 6 . .
Yellow Start Overlaps	. . . . .
Startup All-Red	6.0

Call To Phase (2-1-2-1)		Omit On Green	
1	. . . . .	1	. . . . .
2	. . . . .	2	. . . . .
3	. . . . .	3	. . . . .
4	. . . . .	4	. . . . .
5	. . . . .	5	. . . . .
6	. . . . .	6	. . . . .
7	. . . . .	7	. . . . .
8	. . . . .	8	. . . . .

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	. . . . .
Yellow Flash Overlap	. . . . .
Flash In Red Phases	. . . . .
Flash In Red Overlap	. . . . .

Special Operation (2-1-2-3)	
Single Exit Phase	. . . . .
Driveway Signal Phases	. . . . .
Driveway Signal Overlaps	. . . . .
Leading Ped Phases	. . . . .

Protected Permissive (2-1-2-4)	
Protected Permissive	. . . . .

Pedestrian (2-1-3)	
P1	. . . . .
P2	. 2 . . . . .
P3	. . . . .
P4	. . . . .
P5	. . . . .
P6	. . . . . 6 . .
P7	. . . . .
P8	. . . . .

Overlap (2-1-4)				
Overlap	Parent	Omit	No Start	Not
A	. . . . .	. . . . .	. . . . .	. . . . .
B	. . . . .	. . . . .	. . . . .	. . . . .
C	. . . . .	. . . . .	. . . . .	. . . . .
D	. . . . .	. . . . .	. . . . .	. . . . .
E	. . . . .	. . . . .	. . . . .	. . . . .
F	. . . . .	. . . . .	. . . . .	. . . . .

PHASE TIMING

Phase (2-2)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 1 ---	0	7	0	0	0	7	0	0
Flash Don't Walk	0	18	0	0	0	25	0	0
Minimum Green	0	8	0	8	0	8	0	0
Det Limit	0	10	0	10	0	10	0	0
Max Initial	0	0	0	0	0	0	0	0
Max Green 1	0	40	0	30	0	40	0	0
Max Green 2	0	50	0	50	0	50	0	0
Max Green 3	0	50	0	50	0	50	0	0
Extension	0.0	2.0	0.0	2.0	0.0	2.0	0.0	0.0
Maximum Gap	0.0	2.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Gap	0.0	2.0	0.0	2.0	0.0	2.0	0.0	0.0
Add Per Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce Gap By	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce Every	0.0	1.0	0.0	1.0	0.0	1.0	0.0	0.0
Yellow	3.0	4.4	3.0	3.7	3.0	4.4	3.0	3.0
All-Red	0.0	1.0	0.0	1.0	0.0	1.0	0.0	0.0

Ped/Bike (2-3)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A	B	C	D	E	F
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert

Red Revert (2-5)	
Time	5.0
All-Red Sec/Min (2-6)	
All-Red Sec/Min:	OFF

Max 2 Extension

Max/Gap Out (2-7)	
Max Cnt	0
Gap Cnt	0

Local Plan 1...9 (7-1) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 1	Green Factor			.....											
Plan 2	Green Factor			.....											
Plan 3	Green Factor			.....											
Plan 4	Green Factor			.....											
Plan 5	Green Factor			.....											
Plan 6	Green Factor			.....											
Plan 7	Green Factor			.....											
Plan 8	Green Factor			.....											
Plan 9	Green Factor			.....											

Master Timer Sync (7-A)	
Enable in Plans	
1-9	.....
11-19	.....
21-29	.....

Master Sub Master	
Input	
Output	

FREE PLAN PHASE FLAGS

(7-E) Free	
Lag	Omit
. 2 . 4 . 6 . 8	.....
Veh Min	Veh Max
.....	.....
Ped	Bike
.....	.....
Cond	Cond Grn
.....	10

Local Plan 1...9 (7-1) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 1	.....	.....	.....	.....	.....	.....	.....	.....
Plan 2	.....	.....	.....	.....	.....	.....	.....	.....
Plan 3	.....	.....	.....	.....	.....	.....	.....	.....
Plan 4	.....	.....	.....	.....	.....	.....	.....	.....
Plan 5	.....	.....	.....	.....	.....	.....	.....	.....
Plan 6	.....	.....	.....	.....	.....	.....	.....	.....
Plan 7	.....	.....	.....	.....	.....	.....	.....	.....
Plan 8	.....	.....	.....	.....	.....	.....	.....	.....
Plan 9	.....	.....	.....	.....	.....	.....	.....	.....

MANUAL COMMANDS

Manual Plan (4-1)	
Plan	OffSet
	A

Plan: 1-9
15 or 254 = Flash
14 or 255 = Free
Offset A, B, or C

Special Function Override (4-2)			
#	Control	#	Control
1	NORMAL	3	NORMAL
2	NORMAL	4	NORMAL

Detector Reset	(4-3)
Local Manual (4-4)	OFF

Local Plan 11...19 (7-2) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 11	Green Factor			.....											
Plan 12	Green Factor			.....											
Plan 13	Green Factor			.....											
Plan 14	Green Factor			.....											
Plan 15	Green Factor			.....											
Plan 16	Green Factor			.....											
Plan 17	Green Factor			.....											
Plan 18	Green Factor			.....											
Plan 19	Green Factor			.....											

Local Plan 11...19 (7-2) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 11	.....	.....	.....	.....	.....	.....	.....	.....
Plan 12	.....	.....	.....	.....	.....	.....	.....	.....
Plan 13	.....	.....	.....	.....	.....	.....	.....	.....
Plan 14	.....	.....	.....	.....	.....	.....	.....	.....
Plan 15	.....	.....	.....	.....	.....	.....	.....	.....
Plan 16	.....	.....	.....	.....	.....	.....	.....	.....
Plan 17	.....	.....	.....	.....	.....	.....	.....	.....
Plan 18	.....	.....	.....	.....	.....	.....	.....	.....
Plan 19	.....	.....	.....	.....	.....	.....	.....	.....

Local Plan 21...29 (7-3) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 21	Green Factor			.....											
Plan 22	Green Factor			.....											
Plan 23	Green Factor			.....											
Plan 24	Green Factor			.....											
Plan 25	Green Factor			.....											
Plan 26	Green Factor			.....											
Plan 27	Green Factor			.....											
Plan 28	Green Factor			.....											
Plan 29	Green Factor			.....											

Local Plan 21...29 (7-3) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 21	.....	.....	.....	.....	.....	.....	.....	.....
Plan 22	.....	.....	.....	.....	.....	.....	.....	.....
Plan 23	.....	.....	.....	.....	.....	.....	.....	.....
Plan 24	.....	.....	.....	.....	.....	.....	.....	.....
Plan 25	.....	.....	.....	.....	.....	.....	.....	.....
Plan 26	.....	.....	.....	.....	.....	.....	.....	.....
Plan 27	.....	.....	.....	.....	.....	.....	.....	.....
Plan 28	.....	.....	.....	.....	.....	.....	.....	.....
Plan 29	.....	.....	.....	.....	.....	.....	.....	.....

DETECTORS

Detector Attributes (5-1)

Det	Type	Phases	Lock	Slot
1	COUNT+CALL+EXTEND	1	NO	I1U
2	COUNT+CALL+EXTEND	1	NO	I1L
3	COUNT+CALL+EXTEND	. 2	NO	I2U
4	COUNT+CALL+EXTEND	. 2	NO	I2L
5	LIMITED	. 2	NO	I3U
6	CALL+EXTEND	. 2	NO	I3L
7	LIMITED	. 2	NO	I4U
8	COUNT+CALL+EXTEND	. 2	NO	I4L
9	COUNT+CALL+EXTEND	. . 3	NO	I5U
10	COUNT+CALL+EXTEND	. . 3	NO	I5L
11	COUNT+CALL+EXTEND	. . . 4 . . .	RED	I6U
12	COUNT+CALL+EXTEND	. . . 4 . . .	NO	I6L
13	COUNT+CALL+EXTEND	. . . 4 . . .	NO	I7U
14	CALL+EXTEND	. . . 4 . . .	NO	I7L
15	CALL+EXTEND	. . . 4 . . .	NO	I8U
16	COUNT+CALL+EXTEND	. . . 4 . . .	NO	I8L
17	COUNT+CALL+EXTEND	1	NO	I9U
18	COUNT+CALL+EXTEND	. . 3	NO	I9L
19	COUNT+CALL+EXTEND	. 2	NO	I10U
20	COUNT+CALL+EXTEND	. . . 4 . . .	NO	I10L
21	COUNT+CALL+EXTEND	. . . . 5 . .	NO	J1U
22	COUNT+CALL+EXTEND	. . . . 5 . .	NO	J1L
23	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J2U
24	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J2L
25	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J3U
26	CALL+EXTEND	. . . . . 6 . .	NO	J3L
27	LIMITED	. . . . . 6 . .	NO	J4U
28	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J4L
29	COUNT+CALL+EXTEND	. . . . . 7 .	NO	J5U
30	COUNT+CALL+EXTEND	. . . . . 7 .	NO	J5L
31	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J6U
32	COUNT+CALL+EXTEND	 8	NO	J6L
33	COUNT+CALL+EXTEND	 8	NO	J7U
34	CALL+EXTEND	 8	NO	J7L
35	LIMITED	 8	NO	J8U
36	COUNT+CALL+EXTEND	 8	NO	J8L
37	COUNT+CALL+EXTEND	. . . . 5 . .	NO	J9U
38	COUNT+CALL+EXTEND	. . . . . 7 .	NO	J9L
39	COUNT+CALL+EXTEND	. . . . . 6 . .	NO	J10U
40	COUNT+CALL+EXTEND	 8	NO	J10L
41	PEDESTRIAN	. 2	NO	I12U
42	PEDESTRIAN	. . . 4 . . .	NO	I12L
43	PEDESTRIAN	. . . . . 6 . .	NO	I13U
44	PEDESTRIAN	 8	NO	I13L

Detector Configuration (5-2)

Det	Delay	Extend	Recall	Port
1			10	3.2
2			10	7.2
3		2.0	10	1.1
4		2.0	10	1.5
5			10	4.5
6			10	6.2
7			10	2.1
8			10	7.4
9			10	3.4
10			10	7.6
11		2.0	10	1.3
12	2	2.0	10	1.7
13	15		10	4.7
14			10	6.4
15	3		10	2.3
16			10	7.8
17			10	3.6
18			10	3.8
19			10	4.1
20			10	4.2
21			10	3.1
22			10	7.1
23		2.0	10	1.2
24			10	1.6
25			10	4.6
26		2.0	10	6.3
27			10	2.2
28			10	7.3
29			10	3.3
30			10	7.5
31		2.0	10	1.4
32			10	1.8
33			10	4.8
34			10	6.5
35			10	2.4
36			10	7.7
37			10	3.5
38			10	3.7
39			10	4.3
40			10	4.4
41			10	5.1
42			10	5.3
43			10	5.2
44			10	5.4

Failure Times(5-3)	Minutes
Maximum On Time	
Fail Reset Time	

Failure Override (5-4)

Detectors 1-8	. . . . .
Detectors 9-16	. . . . .
Detectors17-24	. . . . .
Detectors 25-32	. . . . .
Detectors 33-40	. . . . .
Detectors 41-44	. . . . .

System Detector Assignment (5-5)

Sys Det	1	2	3	4	5	6	7	8
Det Nu								
Sys Det	9	10	11	12	13	14	15	16
Det Nu								

CIC Operation (5-6-1)

Enable in Plans	. . . . .

CIC Values (5-6-2)	Volume	Occupancy	Demand
Smoothing	0.66	0.66	0.66
Multiplier	4.0	0.33	
Exponent	0.50	1.00	

Detector-to-Phase Assignment (5-6-3)

Sys Det	1	2	3	4	5	6	7	8
Phase								
Sys Det	9	10	11	12	13	14	15	16
Phase								

Input File Port-Bit Assignments

332 Cabinet - For Reference Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-	3.2	1.1	4.5	2.1	3.4	1.3	4.7	2.3	3.6	4.1	6.6	5.1	5.2	6.7
	7.2	1.5	6.2	7.4	7.6	1.7	6.4	7.8	3.8	4.2	2.7	5.3	5.4	6.8
J-	3.1	1.2	4.6	2.2	3.3	1.4	4.8	2.4	3.5	4.3	2.8	5.5	5.6	2.5
	7.1	1.6	6.3	7.3	7.5	1.8	6.5	7.7	3.7	4.4	6.1	5.7	5.8	2.6

TOD SCHEDULE

Table 1 (8-2-1)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 2 (8-2-2)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 3 (8-2-3)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 4 (8-2-4)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 5 (8-2-5)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 6 (8-2-6)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

WEEKDAY ASSIGNMENT

Weekday Table Assignments (8-2-7)						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	1	1	1	2	2

HOLIDAY TABLES

Floating Holiday Table (8-2-8)

#	Mnth	Week	DOW	Table
1			.....	
2			.....	
3			.....	
4			.....	
5			.....	
6			.....	
7			.....	
8			.....	
9			.....	
10			.....	
11			.....	
12			.....	
13			.....	
14			.....	
15			.....	
16			.....	

Fixed Holiday Table (8-2-9)

#	Mnth	Day	DOW	Table
1			.....	
2			.....	
3			.....	
4			.....	
5			.....	
6			.....	
7			.....	
8			.....	
9			.....	
10			.....	
11			.....	
12			.....	
13			.....	
14			.....	
15			.....	
16			.....	

Solar Clock Data (8-4)

North Latitude	34
West Longitude	118
Local Time Zone	8

Sabbatical Clock (8-5)

Hebrew	Ped Recall
Sabbath	.....
Holiday	.....

Daylight Saving (8-6)

Enabled	YES

TOD FUNCTIONS

TOD Functions (8-3)

#	Start	End	DOW	Action	Phases
1			.....		.....
2			.....		.....
3			.....		.....
4			.....		.....
5			.....		.....
6			.....		.....
7			.....		.....
8			.....		.....
9			.....		.....
10			.....		.....
11			.....		.....
12			.....		.....
13			.....		.....
14			.....		.....
15			.....		.....
16			.....		.....

Action Codes:

0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11. Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
27. Traffic Actuated Max 2
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting

100+Action Code = Phases removed

200+Action Code = Phases replaced

COMMUNICATIONS

C2 (6-1-1)	
Address	2
Protocol	AB3418
Access Level	0
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

C20 (6-1-2)	
Address	
Protocol	AB3418
Access Level	0
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

C21 (6-1-3)	
Address	
Protocol	AB3418
Access Level	0
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

Access Levels:

0-Full Access
1-Status Only
2-Status, Set Pattern, Time
3-Status, Set Pattern, Time, Manual Plan
4-Reserved
5-Full Access with No Set Pattern
6-Full Access with No Set Time
7-Full Access with No Set Pattern, Manual Plan
8-Full Access with No Set Time, Pattern, Manual Plan

SOFT LOGIC

Soft Logic (6-2)

#	Data	OP	Data	OP	Data	OP	Data
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

*Refer to User's Manual for Data and OP Codes

CALLBACK NUMBERS

Callback Numbers (6-3...3)	
Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

NETWORK

Network (6-4)	
Address	
Protocol	AB3418
Port	27000
Type	STATIC
Central Access	0
Field Access	0

IP Address	0	.	0	.	0	.	0
Netmask	255	.	255	.	255	.	0
Broadcast	0	.	0	.	0	.	255
Gateway	0	.	0	.	0	.	254

RAILROAD PREEMPTION

RR 1

(3-1-1)	Timing	Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
Delay		Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
Clear 1	10	. 2 . . 5 . . .	. . . . .	. . . . .	. . . . .	. . . . .	. 2 . 4 . 6 . 8	. . . . .	. . . . .	. . . . .
Clear 2		. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Clear 3		. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Hold		. . . . .	. . . . .	1 2 3 4 5 6 7 8	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	A B C D E F
Exit										
Min Grn										
Ped Clr										

Exit Parameters (3-1-5)			
Phase Green	Overlap Green	Vehicle Call	Ped Call
. . . . .	. . . . .	1 2 3 4 5 6 7 8	. 2 . 4 . 6 . 8

Configuration (3-1-6)			
Primary Port	Secondary Port	Latching	Power-Up
2.5	0.0	YES	FLASHING

RR 2

(3-2-1)	Timing	Phase Flags (3-2-2)			Pedestrian Flags (3-2-3)			Overlap Flags (3-2-4)		
Delay		Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
Clear 1	10	. . . 4 . . 7 .	. . . . .	. . . . .	. . . . .	. . . . .	. 2 . 4 . 6 . 8	. . . . .	. . . . .	. . . . .
Clear 2		. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Clear 3		. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Hold		1 2 3 . . 6 . .	. . . . .	. . . . .	. 2 . . . 6 . .	. . . . .	. . . 4 . . . 8	. . . . .	. . . . .	. . . . .
Exit										
Min Grn										
Ped Clr										

Exit Parameters (3-2-5)			
Phase Green	Overlap Green	Vehicle Call	Ped Call
. . . . .	. . . . .	. . . 4 . . 7 .	. . . . .

Configuration (3-2-6)			
Primary Port	Secondary Port	Latching	Power-up
2.6	0.0	YES	DARK

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	30	. 2 . . 5 . . .	. . . . .

Port	Latching	Phase Termination
5.5	NO	ADVANCE

EVB (3-B)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	30	. . . 4 . . 7 .	. . . . .

Port	Latching	Phase Termination
5.6	NO	ADVANCE

EVC (3-C)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	30	1 . . . . 6 . .	. . . . .

Port	Latching	Phase Termination
5.7	NO	ADVANCE

EVD (3-D)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	30	. . 3 8	. . . . .

Port	Latching	Phase Termination
5.8	NO	ADVANCE

INPUTS

		7 Wire I/C (2-1-5-1)			
		Input	Port	Input	Port
Enable	NO	R1	3.8	Free	3.6
Max ON		R2	3.5	D2	2.8
Max OFF		R3	3.7	D3	6.1

Manual Control (2-1-5-2)	
Input	Port
Manual Advance	
Advance Enable	

Cabinet Status (2-1-5-3)	
Input	Port
Flash Bus	
Door Ajar	
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	
2	
3	
4	

Battery Backup (2-1-5-5)	
Port	Operation
2.7	FLASHING

Y-Coordination (2-1-5-6)	
Port C	Port D
6.1	2.8

OUTPUTS

Loadswitch Assignments (2-1-6)							+
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:

0 Unused (no output)
1-8 Vehicle 1-8
9-14 Overlap A-F
21-28 Ped 1-8
41-47 Special Functions
41 Protected Permissive Flashing Phase 1
43 Protected Permissive Flashing Phase 3
45 Protected Permissive Flashing Phase 5
47 Protected Permissive Flashing Phase 7
51-57 Special Functions
71-72 Seven Wire I/C

+ middle output of loadswitches 3 and 6 Channel 9 and 10

TRANSIT PRIORITY

Local Plans (3-E) 1...9 11...19		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor											
Plan 2	Green Factor											
Plan 3	Green Factor											
Plan 4	Green Factor											
Plan 5	Green Factor											
Plan 6	Green Factor											
Plan 7	Green Factor											
Plan 8	Green Factor											
Plan 9	Green Factor											
Plan 11	Green Factor											
Plan 12	Green Factor											
Plan 13	Green Factor											
Plan 14	Green Factor											
Plan 15	Green Factor											
Plan 16	Green Factor											
Plan 17	Green Factor											
Plan 18	Green Factor											
Plan 19	Green Factor											

Transit Priority Configuration (3-E-A)				Indicator Output	
Enable in Plans		Input	Type	Stop	Go
Plan 1-9	. . . . .	0.0	OPT	0	0
Plan 11-19	. . . . .	0.0	OPT	0	0

Queue Jump (3-E-B)	
Grn Hold	Hold Phase
	. . . . .
	. . . . .

Free Plans (3-E-E)	
Max Grn Hold	Hold Phase
	. . . . .

Access Utilities (9-5)	
Password	***
Timeout	30

YELLOW YIELD COORDINATION

					Force-Offs											
Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	Coord	Lag	Min Recall	Restricted
Plan C													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . . .	. . . . .
Plan D													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . . .	. . . . .

TRUCK PRIORITY

Truck Priority (3-F)	Passage	CarryOver	Clearance	Next Priority	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output
					. . . . .	0.0	0.0	0.0	0	0.0	0

Michael Baker
INTERNATIONAL

Appendix C: Existing Synchro Worksheets

1: Nelson Ln & Nicolaus Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.1	0.2	3.6
Total Del/Veh (s)	7.4	10.0	4.3	21.8	15.5	5.0	8.4	9.1	4.1	7.4	14.0	4.7

1: Nelson Ln & Nicolaus Rd Performance by movement

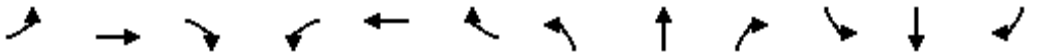
Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	12.1

2: Lakeside Dr & Nicolaus Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.2	0.2	3.6
Total Del/Veh (s)	6.3	10.9	2.9	6.3	9.4	3.0	5.3	6.8	3.2	8.0	8.1	2.8

2: Lakeside Dr & Nicolaus Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	7.7



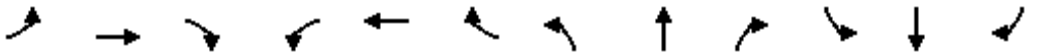
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	328	189	82	190	122	141	91	190	147	174	24
Future Volume (veh/h)	9	328	189	82	190	122	141	91	190	147	174	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	432	249	108	250	161	186	120	250	141	302	32
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	21	851	379	138	1084	484	799	420	356	281	591	250
Arrive On Green	0.01	0.24	0.24	0.08	0.31	0.31	0.22	0.22	0.22	0.16	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3563	1870	1585	1781	3741	1585
Grp Volume(v), veh/h	12	432	249	108	250	161	186	120	250	141	302	32
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.5	7.1	9.6	4.0	3.6	5.3	2.9	3.6	9.9	4.9	5.0	1.2
Cycle Q Clear(g_c), s	0.5	7.1	9.6	4.0	3.6	5.3	2.9	3.6	9.9	4.9	5.0	1.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	21	851	379	138	1084	484	799	420	356	281	591	250
V/C Ratio(X)	0.56	0.51	0.66	0.78	0.23	0.33	0.23	0.29	0.70	0.50	0.51	0.13
Avail Cap(c_a), veh/h	131	2200	981	223	2384	1063	1949	1023	867	972	2041	865
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.3	22.3	23.3	30.7	17.6	18.2	21.5	21.8	24.2	26.1	26.2	24.5
Incr Delay (d2), s/veh	8.4	0.6	2.3	3.6	0.1	0.5	0.2	0.5	3.6	2.0	1.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.8	3.5	1.8	1.4	1.9	1.1	1.5	3.8	2.1	2.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.8	22.9	25.6	34.3	17.7	18.7	21.7	22.3	27.8	28.1	27.1	24.9
LnGrp LOS	D	C	C	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h		693			519			556			475	
Approach Delay, s/veh		24.2			21.5			24.6			27.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.5	9.8	21.5		16.0	5.3	26.0				
Change Period (Y+Rc), s		5.3	4.5	5.3		5.3	4.5	5.3				
Max Green Setting (Gmax), s		37.1	8.5	42.0		37.0	5.0	45.5				
Max Q Clear Time (g_c+I1), s		11.9	6.0	11.6		7.0	2.5	7.3				
Green Ext Time (p_c), s		3.4	0.0	4.6		3.7	0.0	2.7				

Intersection Summary	
HCM 6th Ctrl Delay	24.3
HCM 6th LOS	C

Notes

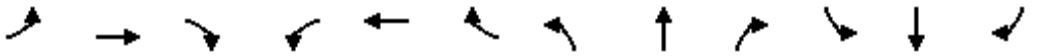
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	28	41	202	12	39	19	357	164	44	395	13
Future Volume (veh/h)	23	28	41	202	12	39	19	357	164	44	395	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	32	39	57	281	17	54	26	496	228	61	549	18
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	52	80	117	319	105	334	44	931	415	83	1010	450
Arrive On Green	0.03	0.12	0.12	0.18	0.27	0.27	0.02	0.26	0.26	0.05	0.28	0.28
Sat Flow, veh/h	1781	686	1003	1781	394	1251	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	32	0	96	281	0	71	26	496	228	61	549	18
Grp Sat Flow(s),veh/h/ln	1781	0	1690	1781	0	1645	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.8	0.0	2.5	7.3	0.0	1.6	0.7	5.7	5.9	1.6	6.2	0.4
Cycle Q Clear(g_c), s	0.8	0.0	2.5	7.3	0.0	1.6	0.7	5.7	5.9	1.6	6.2	0.4
Prop In Lane	1.00		0.59	1.00		0.76	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	52	0	198	319	0	439	44	931	415	83	1010	450
V/C Ratio(X)	0.62	0.00	0.49	0.88	0.00	0.16	0.60	0.53	0.55	0.74	0.54	0.04
Avail Cap(c_a), veh/h	225	0	1244	319	0	1298	187	2071	924	187	2071	924
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.8	0.0	19.6	19.0	0.0	13.3	23.0	15.0	15.1	22.4	14.4	12.3
Incr Delay (d2), s/veh	4.4	0.0	2.2	23.1	0.0	0.2	4.8	0.6	1.4	4.7	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	1.0	4.8	0.0	0.5	0.3	1.9	2.0	0.7	2.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	0.0	21.9	42.1	0.0	13.6	27.7	15.6	16.5	27.0	15.0	12.4
LnGrp LOS	C	A	C	D	A	B	C	B	B	C	B	B
Approach Vol, veh/h		128			352			750			628	
Approach Delay, s/veh		23.2			36.4			16.3			16.1	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	17.8	13.0	10.1	5.7	18.8	5.9	17.2
Change Period (Y+Rc), s	4.5	5.3	4.5	4.5	4.5	5.3	4.5	4.5
Max Green Setting (Gmax), s	5.0	27.7	8.5	35.0	5.0	27.7	6.0	37.5
Max Q Clear Time (g_c+I1), s	3.6	7.9	9.3	4.5	2.7	8.2	2.8	3.6
Green Ext Time (p_c), s	0.0	4.6	0.0	0.7	0.0	4.0	0.0	0.5

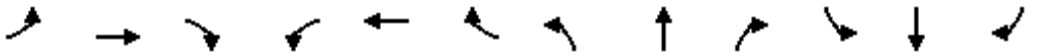
Intersection Summary	
HCM 6th Ctrl Delay	20.5
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	58	81	104	19	63	22	371	65	100	525	28
Future Volume (veh/h)	92	58	81	104	19	63	22	371	65	100	525	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	119	75	105	135	25	82	29	482	84	130	682	36
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	244	207	173	263	223	48	892	398	166	1128	503
Arrive On Green	0.09	0.13	0.13	0.10	0.14	0.14	0.03	0.25	0.25	0.09	0.32	0.32
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	119	75	105	135	25	82	29	482	84	130	682	36
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.0	1.7	2.8	3.4	0.5	2.1	0.7	5.4	1.9	3.3	7.4	0.7
Cycle Q Clear(g_c), s	3.0	1.7	2.8	3.4	0.5	2.1	0.7	5.4	1.9	3.3	7.4	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	154	244	207	173	263	223	48	892	398	166	1128	503
V/C Ratio(X)	0.77	0.31	0.51	0.78	0.09	0.37	0.60	0.54	0.21	0.78	0.60	0.07
Avail Cap(c_a), veh/h	502	1431	1212	253	1169	991	226	2128	949	253	2182	973
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	18.0	18.5	20.2	17.1	17.8	22.0	14.8	13.6	20.3	13.2	10.9
Incr Delay (d2), s/veh	3.1	0.9	2.3	5.0	0.2	1.2	4.5	0.6	0.3	3.9	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.7	1.1	1.5	0.2	0.8	0.3	1.9	0.6	1.3	2.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.5	18.9	20.9	25.2	17.3	19.0	26.5	15.5	13.9	24.2	13.8	11.0
LnGrp LOS	C	B	C	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		299			242			595			848	
Approach Delay, s/veh		21.4			22.3			15.8			15.3	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	16.8	8.9	11.3	5.7	19.8	8.5	11.7
Change Period (Y+Rc), s	4.5	5.3	4.5	5.3	4.5	5.3	4.5	5.3
Max Green Setting (Gmax), s	6.5	27.4	6.5	35.0	5.8	28.1	12.9	28.6
Max Q Clear Time (g_c+I1), s	5.3	7.4	5.4	4.8	2.7	9.4	5.0	4.1
Green Ext Time (p_c), s	0.0	4.1	0.0	1.0	0.0	5.1	0.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	17.2
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	45	234	131	96	32	142	366	82	33	510	154
Future Volume (veh/h)	50	45	234	131	96	32	142	366	82	33	510	154
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	58	300	168	123	41	182	469	105	42	654	197
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	82	433	367	207	564	478	222	1289	575	56	958	427
Arrive On Green	0.05	0.23	0.23	0.12	0.30	0.30	0.12	0.36	0.36	0.03	0.27	0.27
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	64	58	300	168	123	41	182	469	105	42	654	197
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.6	1.8	13.0	6.7	3.6	1.3	7.2	7.0	3.3	1.7	12.0	7.5
Cycle Q Clear(g_c), s	2.6	1.8	13.0	6.7	3.6	1.3	7.2	7.0	3.3	1.7	12.0	7.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	82	433	367	207	564	478	222	1289	575	56	958	427
V/C Ratio(X)	0.78	0.13	0.82	0.81	0.22	0.09	0.82	0.36	0.18	0.75	0.68	0.46
Avail Cap(c_a), veh/h	233	1003	850	257	1029	872	277	1706	761	167	1486	663
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	22.2	26.5	31.4	19.0	18.2	31.0	17.0	15.8	34.9	23.8	22.2
Incr Delay (d2), s/veh	5.9	0.2	5.4	11.9	0.2	0.1	11.9	0.2	0.2	7.2	1.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.8	5.3	3.5	1.5	0.5	3.6	2.6	1.2	0.8	4.9	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.3	22.3	31.9	43.3	19.2	18.3	43.0	17.2	16.0	42.2	24.8	23.1
LnGrp LOS	D	C	C	D	B	B	D	B	B	D	C	C
Approach Vol, veh/h		422			332			756			893	
Approach Delay, s/veh		31.9			31.3			23.3			25.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	31.7	12.9	21.3	13.6	24.9	7.8	26.4
Change Period (Y+Rc), s	4.5	5.3	4.5	4.5	4.5	5.3	4.5	4.5
Max Green Setting (Gmax), s	6.8	34.9	10.5	39.0	11.3	30.4	9.5	40.0
Max Q Clear Time (g_c+I1), s	3.7	9.0	8.7	15.0	9.2	14.0	4.6	5.6
Green Ext Time (p_c), s	0.0	4.1	0.0	1.8	0.1	5.6	0.0	1.1

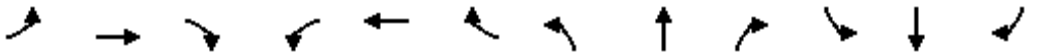
Intersection Summary	
HCM 6th Ctrl Delay	26.6
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	34.9
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	0	26	1	0	0	10	567	2	0	855	11
Future Vol, veh/h	22	0	26	1	0	0	10	567	2	0	855	11
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	0	31	1	0	0	12	667	2	0	1006	13
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.4	10.4	15.7	49.2
HCM LOS	B	B	C	E

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	3%	0%	46%	100%	0%	0%
Vol Thru, %	97%	99%	0%	0%	100%	96%
Vol Right, %	0%	1%	54%	0%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	294	286	48	1	570	296
LT Vol	10	0	22	1	0	0
Through Vol	284	284	0	0	570	285
RT Vol	0	2	26	0	0	11
Lane Flow Rate	345	336	56	1	671	348
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.558	0.54	0.103	0.002	1.034	0.535
Departure Headway (Hd)	5.977	5.955	6.67	7.361	5.552	5.526
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	608	608	540	489	657	658
Service Time	3.677	3.655	4.67	5.361	3.252	3.226
HCM Lane V/C Ratio	0.567	0.553	0.104	0.002	1.021	0.529
HCM Control Delay	16	15.4	10.4	10.4	67.3	14.4
HCM Lane LOS	C	C	B	B	F	B
HCM 95th-tile Q	3.4	3.2	0.3	0	17.3	3.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	19	85	48	16	56	23	496	12	50	841	0
Future Volume (veh/h)	22	19	85	48	16	56	23	496	12	50	841	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	22	100	56	19	66	27	584	14	59	989	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	35	29	134	148	50	174	76	1220	29	133	1335	0
Arrive On Green	0.12	0.12	0.12	0.11	0.11	0.11	0.04	0.34	0.34	0.07	0.38	0.00
Sat Flow, veh/h	291	246	1118	1346	457	1585	1781	3547	85	1781	3647	0
Grp Volume(v), veh/h	148	0	0	75	0	66	27	292	306	59	989	0
Grp Sat Flow(s),veh/h/ln	1655	0	0	1803	0	1585	1781	1777	1855	1781	1777	0
Q Serve(g_s), s	4.9	0.0	0.0	2.2	0.0	2.2	0.8	7.3	7.4	1.8	13.7	0.0
Cycle Q Clear(g_c), s	4.9	0.0	0.0	2.2	0.0	2.2	0.8	7.3	7.4	1.8	13.7	0.0
Prop In Lane	0.18		0.68	0.75		1.00	1.00		0.05	1.00		0.00
Lane Grp Cap(c), veh/h	198	0	0	198	0	174	76	611	638	133	1335	0
V/C Ratio(X)	0.75	0.00	0.00	0.38	0.00	0.38	0.35	0.48	0.48	0.44	0.74	0.00
Avail Cap(c_a), veh/h	990	0	0	1079	0	948	219	938	979	219	1876	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.2	0.0	0.0	23.5	0.0	23.5	26.4	14.6	14.6	25.2	15.3	0.0
Incr Delay (d2), s/veh	2.1	0.0	0.0	0.4	0.0	0.5	1.0	0.6	0.6	0.9	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.0	0.9	0.0	0.8	0.3	2.5	2.7	0.7	4.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	0.0	0.0	23.9	0.0	24.0	27.5	15.2	15.2	26.0	16.3	0.0
LnGrp LOS	C	A	A	C	A	C	C	B	B	C	B	A
Approach Vol, veh/h		148			141			625			1048	
Approach Delay, s/veh		26.3			24.0			15.7			16.9	
Approach LOS		C			C			B			B	

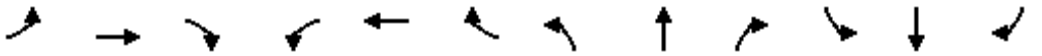
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.7	25.0		11.8	6.9	26.8		11.2				
Change Period (Y+Rc), s	4.5	5.5		5.0	4.5	5.5		5.0				
Max Green Setting (Gmax), s	7.0	30.0		34.0	7.0	30.0		34.0				
Max Q Clear Time (g_c+I1), s	3.8	9.4		6.9	2.8	15.7		4.2				
Green Ext Time (p_c), s	0.0	3.3		0.6	0.0	5.7		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		17.7	
HCM 6th LOS		B	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	668	265	6	306	184	216	83	20	112	58	18
Future Volume (veh/h)	45	668	265	6	306	184	216	83	20	112	58	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	815	323	7	373	224	263	101	24	137	71	22
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	1151	514	23	579	343	353	290	69	175	91	28
Arrive On Green	0.07	0.32	0.32	0.01	0.27	0.27	0.20	0.20	0.20	0.16	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	1781	2148	1270	1781	1461	347	1064	551	171
Grp Volume(v), veh/h	55	815	323	7	308	289	263	0	125	230	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1642	1781	0	1808	1786	0	0
Q Serve(g_s), s	2.0	13.4	11.5	0.3	10.2	10.4	9.3	0.0	4.0	8.2	0.0	0.0
Cycle Q Clear(g_c), s	2.0	13.4	11.5	0.3	10.2	10.4	9.3	0.0	4.0	8.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.77	1.00		0.19	0.60		0.10
Lane Grp Cap(c), veh/h	120	1151	514	23	479	443	353	0	358	295	0	0
V/C Ratio(X)	0.46	0.71	0.63	0.31	0.64	0.65	0.74	0.00	0.35	0.78	0.00	0.00
Avail Cap(c_a), veh/h	190	1760	785	187	877	810	962	0	977	911	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.9	19.8	19.1	32.6	21.5	21.6	25.1	0.0	23.0	26.7	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.8	1.3	2.8	1.4	1.6	3.8	0.0	0.7	1.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	5.0	3.9	0.1	4.0	3.8	4.1	0.0	1.7	3.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.0	20.6	20.4	35.4	22.9	23.2	28.9	0.0	23.7	28.4	0.0	0.0
LnGrp LOS	C	C	C	D	C	C	C	A	C	C	A	A
Approach Vol, veh/h		1193			604			388			230	
Approach Delay, s/veh		21.0			23.2			27.2			28.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.0	23.5		18.2	5.4	27.1		16.0				
Change Period (Y+Rc), s	4.5	5.5		5.0	4.5	5.5		5.0				
Max Green Setting (Gmax), s	7.1	32.9		36.0	7.0	33.0		34.0				
Max Q Clear Time (g_c+I1), s	4.0	12.4		11.3	2.3	15.4		10.2				
Green Ext Time (p_c), s	0.0	3.4		2.0	0.0	6.2		0.9				

Intersection Summary			
HCM 6th Ctrl Delay		23.3	
HCM 6th LOS		C	



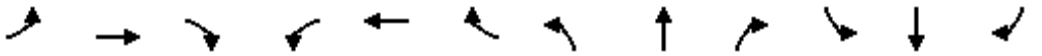
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	370	389	51	161	35	298	246	78	88	264	21
Future Volume (veh/h)	52	370	389	51	161	35	298	246	78	88	264	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	65	462	0	64	201	0	372	308	0	110	330	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	133	825		255	822		533	1039		322	822	
Arrive On Green	0.07	0.23	0.00	0.07	0.23	0.00	0.15	0.29	0.00	0.09	0.23	0.00
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	65	462	0	64	201	0	372	308	0	110	330	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	2.3	7.4	0.0	1.1	3.0	0.0	6.6	4.4	0.0	1.9	5.1	0.0
Cycle Q Clear(g_c), s	2.3	7.4	0.0	1.1	3.0	0.0	6.6	4.4	0.0	1.9	5.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	133	825		255	822		533	1039		322	822	
V/C Ratio(X)	0.49	0.56		0.25	0.24		0.70	0.30		0.34	0.40	
Avail Cap(c_a), veh/h	192	1480		373	1480		720	1864		373	1508	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.8	22.0	0.0	28.3	20.3	0.0	26.0	17.8	0.0	27.5	21.1	0.0
Incr Delay (d2), s/veh	2.8	0.6	0.0	0.5	0.2	0.0	1.9	0.2	0.0	0.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	2.8	0.0	0.4	1.1	0.0	2.6	1.6	0.0	0.8	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.6	22.6	0.0	28.8	20.4	0.0	27.9	17.9	0.0	28.2	21.4	0.0
LnGrp LOS	C	C		C	C		C	B		C	C	
Approach Vol, veh/h		527	A		265	A		680	A		440	A
Approach Delay, s/veh		23.7			22.5			23.4			23.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.5	20.5	9.3	20.5	10.5	24.5	9.3	20.5
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	13.5	27.5	7.0	27.0	7.0	34.0	7.0	27.0
Max Q Clear Time (g_c+I1), s	8.6	7.1	4.3	5.0	3.9	6.4	3.1	9.4
Green Ext Time (p_c), s	0.6	1.9	0.0	1.0	0.1	1.9	0.0	2.6

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



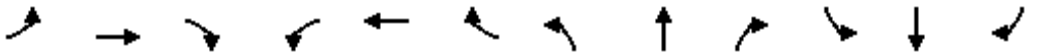
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	24	318	174	39	62	249	585	58	67	621	8
Future Volume (veh/h)	12	24	318	174	39	62	249	585	58	67	621	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	14	28	370	234	0	72	290	680	67	78	722	9
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	606	645	576	581	0	576	229	1532	476	298	1315	408
Arrive On Green	0.36	0.36	0.36	0.36	0.00	0.36	0.13	0.30	0.30	0.09	0.26	0.26
Sat Flow, veh/h	1328	1777	1585	1973	0	1585	1781	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	14	28	370	234	0	72	290	680	67	78	722	9
Grp Sat Flow(s),veh/h/ln	1328	1777	1585	987	0	1585	1781	1702	1585	1728	1702	1585
Q Serve(g_s), s	0.4	0.6	11.3	6.5	0.0	1.8	7.5	6.3	1.8	1.2	7.1	0.2
Cycle Q Clear(g_c), s	0.4	0.6	11.3	17.8	0.0	1.8	7.5	6.3	1.8	1.2	7.1	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	606	645	576	581	0	576	229	1532	476	298	1315	408
V/C Ratio(X)	0.02	0.04	0.64	0.40	0.00	0.13	1.26	0.44	0.14	0.26	0.55	0.02
Avail Cap(c_a), veh/h	944	1098	979	1084	0	979	229	2401	745	415	2357	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.9	12.0	15.4	22.8	0.0	12.4	25.4	16.5	14.9	24.9	18.7	16.2
Incr Delay (d2), s/veh	0.0	0.0	1.2	0.5	0.0	0.1	149.1	0.2	0.1	0.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	3.9	1.5	0.0	0.6	12.3	2.1	0.6	0.5	2.5	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.0	12.0	16.6	23.3	0.0	12.5	174.5	16.7	15.0	25.1	19.1	16.2
LnGrp LOS	B	B	B	C	A	B	F	B	B	C	B	B
Approach Vol, veh/h		412			306			1037			809	
Approach Delay, s/veh		16.1			20.7			60.7			19.6	
Approach LOS		B			C			E			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	20.6		25.7	9.5	23.1		25.7				
Change Period (Y+Rc), s	4.5	5.6		4.5	4.5	5.6		4.5				
Max Green Setting (Gmax), s	7.5	26.9		36.0	7.0	27.4		36.0				
Max Q Clear Time (g_c+I1), s	9.5	9.1		19.8	3.2	8.3		13.3				
Green Ext Time (p_c), s	0.0	4.4		1.4	0.0	4.5		2.9				

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

Notes

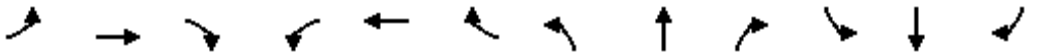
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	730	0	0	987	86	159	0	256	0	0	0
Future Volume (vph)	57	730	0	0	987	86	159	0	256	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4			5.4	5.4	5.4	5.4	5.4			
Lane Util. Factor	1.00	0.95			0.91	1.00	0.95	0.95	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			5085	1583	1681	1681	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	1770	3539			5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	67	859	0	0	1161	101	187	0	301	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	89	0	0	264	0	0	0
Lane Group Flow (vph)	67	859	0	0	1161	12	93	94	37	0	0	0
Turn Type	Prot	NA			NA	custom	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases						8	8		8			
Actuated Green, G (s)	5.4	27.7			17.6	9.7	9.7	9.7	9.7			
Effective Green, g (s)	5.4	27.7			17.6	9.7	9.7	9.7	9.7			
Actuated g/C Ratio	0.07	0.35			0.22	0.12	0.12	0.12	0.12			
Clearance Time (s)	4.7	5.4			5.4	5.4	5.4	5.4	5.4			
Vehicle Extension (s)	2.0	2.0			3.0	2.0	2.0	2.0	2.0			
Lane Grp Cap (vph)	121	1250			1141	195	207	207	344			
v/s Ratio Prot	0.04	c0.24			c0.23							
v/s Ratio Perm						0.01	0.06	0.06	0.01			
v/c Ratio	0.55	0.69			1.02	0.06	0.45	0.45	0.11			
Uniform Delay, d1	35.3	21.7			30.4	30.3	31.9	31.9	30.5			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	3.1	1.3			31.1	0.1	0.6	0.6	0.1			
Delay (s)	38.4	22.9			61.5	30.4	32.4	32.5	30.6			
Level of Service	D	C			E	C	C	C	C			
Approach Delay (s)		24.0			59.0			31.3			0.0	
Approach LOS		C			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	41.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	78.4	Sum of lost time (s)	18.5
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	710	670	0	477	664	0	0	0	77	0	17
Future Volume (veh/h)	0	710	670	0	477	664	0	0	0	77	0	17
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1945	1870	0	1870	1870				1870	1870	1870
Adj Flow Rate, veh/h	0	1152	517	0	536	0				87	0	19
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	0	2	2				2	2	2
Cap, veh/h	0	2016	821	0	2646					276	0	245
Arrive On Green	0.00	0.52	0.52	0.00	0.52	0.00				0.15	0.00	0.15
Sat Flow, veh/h	0	3890	1585	0	5274	1585				1781	0	1585
Grp Volume(v), veh/h	0	1152	517	0	536	0				87	0	19
Grp Sat Flow(s),veh/h/ln	0	1945	1585	0	1702	1585				1781	0	1585
Q Serve(g_s), s	0.0	6.3	7.2	0.0	1.7	0.0				1.3	0.0	0.3
Cycle Q Clear(g_c), s	0.0	6.3	7.2	0.0	1.7	0.0				1.3	0.0	0.3
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2016	821	0	2646					276	0	245
V/C Ratio(X)	0.00	0.57	0.63	0.00	0.20					0.32	0.00	0.08
Avail Cap(c_a), veh/h	0	4045	1648	0	5309					1027	0	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	5.1	5.3	0.0	4.0	0.0				11.6	0.0	11.2
Incr Delay (d2), s/veh	0.0	0.1	0.3	0.0	0.0	0.0				0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.7	0.7	0.0	0.2	0.0				0.4	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.2	5.6	0.0	4.0	0.0				11.8	0.0	11.2
LnGrp LOS	A	A	A	A	A					B	A	B
Approach Vol, veh/h		1669			536	A					106	
Approach Delay, s/veh		5.3			4.0						11.7	
Approach LOS		A			A						B	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		21.4		9.5		21.4						
Change Period (Y+Rc), s		5.4		* 4.7		5.4						
Max Green Setting (Gmax), s		32.1		* 18		32.1						
Max Q Clear Time (g_c+I1), s		9.2		3.3		3.7						
Green Ext Time (p_c), s		6.8		0.2		2.3						

Intersection Summary												
HCM 6th Ctrl Delay			5.3									
HCM 6th LOS			A									

Notes

User approved volume balancing among the lanes for turning movement.

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

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	665	0	0	394	0	0
Future Vol, veh/h	665	0	0	394	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	723	0	0	428	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	723	0	1151	723
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	428	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	879	-	219	426
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	657	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	879	-	219	426
Mov Cap-2 Maneuver	-	-	-	-	219	-
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	657	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	879	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	422	0	0	445
Future Vol, veh/h	0	0	422	0	0	445
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	459	0	0	484

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	701	230	0	0	459	0
Stage 1	459	-	-	-	-	-
Stage 2	242	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	373	772	-	-	1098	-
Stage 1	603	-	-	-	-	-
Stage 2	776	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	373	772	-	-	1098	-
Mov Cap-2 Maneuver	373	-	-	-	-	-
Stage 1	603	-	-	-	-	-
Stage 2	776	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1098	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

1: Nelson Ln & Nicolaus Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	3.6
Total Del/Veh (s)	7.7	10.5	4.1	16.5	16.1	5.6	9.7	8.8	4.8	7.5	15.0	4.9

1: Nelson Ln & Nicolaus Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	10.4

2: Lakeside Dr & Nicolaus Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	3.9
Total Del/Veh (s)	6.5	8.9	4.0	5.2	7.6	3.0	4.6	7.4	2.8	5.9	8.6	2.4

2: Lakeside Dr & Nicolaus Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	6.8

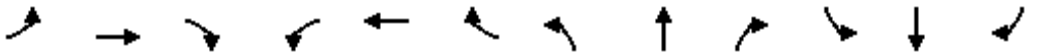
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	186	201	54	237	78	205	118	57	61	82	3
Future Volume (veh/h)	7	186	201	54	237	78	205	118	57	61	82	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	7	194	209	56	247	81	214	123	59	50	105	3
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	13	753	336	78	883	394	599	314	267	262	551	233
Arrive On Green	0.01	0.21	0.21	0.04	0.25	0.25	0.17	0.17	0.17	0.15	0.15	0.15
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3563	1870	1585	1781	3741	1585
Grp Volume(v), veh/h	7	194	209	56	247	81	214	123	59	50	105	3
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.2	2.2	5.7	1.5	2.7	1.9	2.5	2.8	1.5	1.2	1.2	0.1
Cycle Q Clear(g_c), s	0.2	2.2	5.7	1.5	2.7	1.9	2.5	2.8	1.5	1.2	1.2	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	13	753	336	78	883	394	599	314	267	262	551	233
V/C Ratio(X)	0.53	0.26	0.62	0.72	0.28	0.21	0.36	0.39	0.22	0.19	0.19	0.01
Avail Cap(c_a), veh/h	187	3137	1399	318	3398	1516	2778	1458	1236	1385	2909	1233
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	15.6	17.0	22.4	14.4	14.2	17.5	17.6	17.1	17.8	17.8	17.3
Incr Delay (d2), s/veh	11.6	0.2	2.3	4.5	0.2	0.3	0.5	1.1	0.6	0.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.7	1.9	0.6	0.9	0.6	0.9	1.1	0.5	0.5	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.2	15.8	19.3	26.9	14.7	14.5	18.0	18.7	17.7	18.3	18.0	17.4
LnGrp LOS	D	B	B	C	B	B	B	B	B	B	B	B
Approach Vol, veh/h		410			384			396			158	
Approach Delay, s/veh		17.9			16.4			18.2			18.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.3	6.6	15.4		12.3	4.9	17.1				
Change Period (Y+Rc), s		5.3	4.5	5.3		5.3	4.5	5.3				
Max Green Setting (Gmax), s		37.1	8.5	42.0		37.0	5.0	45.5				
Max Q Clear Time (g_c+I1), s		4.8	3.5	7.7		3.2	2.2	4.7				
Green Ext Time (p_c), s		2.5	0.0	2.4		1.1	0.0	2.3				

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Notes

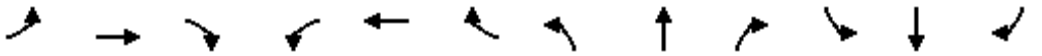
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	9	33	75	14	18	46	357	116	25	309	12
Future Volume (veh/h)	8	9	33	75	14	18	46	357	116	25	309	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	9	34	78	15	19	48	372	121	26	322	12
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	15	34	127	110	114	144	77	875	390	46	814	363
Arrive On Green	0.01	0.10	0.10	0.06	0.15	0.15	0.04	0.25	0.25	0.03	0.23	0.23
Sat Flow, veh/h	1781	343	1295	1781	750	950	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	8	0	43	78	0	34	48	372	121	26	322	12
Grp Sat Flow(s),veh/h/ln	1781	0	1637	1781	0	1699	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.1	0.0	0.8	1.4	0.0	0.6	0.9	2.9	2.1	0.5	2.5	0.2
Cycle Q Clear(g_c), s	0.1	0.0	0.8	1.4	0.0	0.6	0.9	2.9	2.1	0.5	2.5	0.2
Prop In Lane	1.00		0.79	1.00		0.56	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	15	0	161	110	0	258	77	875	390	46	814	363
V/C Ratio(X)	0.52	0.00	0.27	0.71	0.00	0.13	0.62	0.42	0.31	0.57	0.40	0.03
Avail Cap(c_a), veh/h	269	0	1731	403	0	1925	296	3080	1374	269	3027	1350
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.3	0.0	13.8	15.2	0.0	12.2	15.6	10.5	10.2	15.9	10.8	9.9
Incr Delay (d2), s/veh	10.0	0.0	1.1	3.1	0.0	0.3	3.1	0.4	0.5	4.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.3	0.6	0.0	0.2	0.3	0.8	0.6	0.2	0.7	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	0.0	14.9	18.3	0.0	12.4	18.7	10.9	10.7	20.0	11.2	10.0
LnGrp LOS	C	A	B	B	A	B	B	B	B	C	B	A
Approach Vol, veh/h		51			112			541			360	
Approach Delay, s/veh		16.7			16.5			11.5			11.8	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.4	13.5	6.5	7.8	5.9	12.9	4.8	9.5
Change Period (Y+Rc), s	4.5	5.3	4.5	4.5	4.5	5.3	4.5	4.5
Max Green Setting (Gmax), s	5.0	28.7	7.5	35.0	5.5	28.2	5.0	37.5
Max Q Clear Time (g_c+I1), s	2.5	4.9	3.4	2.8	2.9	4.5	2.1	2.6
Green Ext Time (p_c), s	0.0	3.2	0.0	0.2	0.0	2.3	0.0	0.2

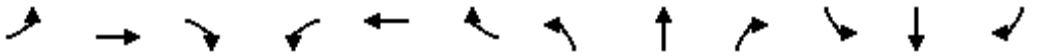
Intersection Summary	
HCM 6th Ctrl Delay	12.4
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	24	41	60	30	58	57	460	83	36	383	20
Future Volume (veh/h)	20	24	41	60	30	58	57	460	83	36	383	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	21	25	43	63	32	61	60	484	87	38	403	21
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	37	249	211	91	305	259	88	975	435	62	923	412
Arrive On Green	0.02	0.13	0.13	0.05	0.16	0.16	0.05	0.27	0.27	0.03	0.26	0.26
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	21	25	43	63	32	61	60	484	87	38	403	21
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.5	0.5	0.9	1.3	0.6	1.3	1.3	4.4	1.6	0.8	3.7	0.4
Cycle Q Clear(g_c), s	0.5	0.5	0.9	1.3	0.6	1.3	1.3	4.4	1.6	0.8	3.7	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	37	249	211	91	305	259	88	975	435	62	923	412
V/C Ratio(X)	0.56	0.10	0.20	0.70	0.10	0.24	0.69	0.50	0.20	0.62	0.44	0.05
Avail Cap(c_a), veh/h	249	1693	1435	299	1746	1480	299	2537	1132	290	2518	1123
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.8	14.7	14.9	18.1	13.8	14.1	18.1	11.8	10.8	18.4	11.9	10.7
Incr Delay (d2), s/veh	4.9	0.2	0.6	3.5	0.2	0.6	3.5	0.5	0.3	3.7	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.2	0.3	0.6	0.2	0.4	0.5	1.4	0.5	0.3	1.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.7	14.9	15.5	21.6	14.0	14.6	21.6	12.3	11.0	22.1	12.3	10.8
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		89			156			631			462	
Approach Delay, s/veh		17.3			17.3			13.0			13.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.8	15.9	6.5	10.5	6.4	15.3	5.3	11.6
Change Period (Y+Rc), s	4.5	5.3	4.5	5.3	4.5	5.3	4.5	5.3
Max Green Setting (Gmax), s	6.3	27.6	6.5	35.0	6.5	27.4	5.4	36.1
Max Q Clear Time (g_c+I1), s	2.8	6.4	3.3	2.9	3.3	5.7	2.5	3.3
Green Ext Time (p_c), s	0.0	4.2	0.0	0.3	0.0	3.0	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	13.8
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	17	60	77	46	55	187	494	62	32	354	91
Future Volume (veh/h)	26	17	60	77	46	55	187	494	62	32	354	91
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	18	62	80	48	57	195	515	65	33	369	95
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	46	247	209	103	307	260	246	1163	519	54	781	348
Arrive On Green	0.03	0.13	0.13	0.06	0.16	0.16	0.14	0.33	0.33	0.03	0.22	0.22
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	27	18	62	80	48	57	195	515	65	33	369	95
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.6	0.4	1.5	1.8	0.9	1.3	4.4	4.7	1.2	0.8	3.8	2.1
Cycle Q Clear(g_c), s	0.6	0.4	1.5	1.8	0.9	1.3	4.4	4.7	1.2	0.8	3.8	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	46	247	209	103	307	260	246	1163	519	54	781	348
V/C Ratio(X)	0.59	0.07	0.30	0.77	0.16	0.22	0.79	0.44	0.13	0.61	0.47	0.27
Avail Cap(c_a), veh/h	214	1755	1488	214	1755	1488	279	2745	1224	219	2626	1171
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	15.8	16.3	19.3	14.9	15.1	17.3	11.0	9.8	19.9	14.1	13.5
Incr Delay (d2), s/veh	4.4	0.1	0.9	4.6	0.3	0.5	11.3	0.3	0.1	4.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	0.5	0.8	0.4	0.4	2.2	1.4	0.4	0.3	1.3	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.4	16.0	17.2	23.9	15.2	15.6	28.6	11.3	9.9	23.9	14.7	14.0
LnGrp LOS	C	B	B	C	B	B	C	B	A	C	B	B
Approach Vol, veh/h		107			185			775			497	
Approach Delay, s/veh		18.8			19.1			15.6			15.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.8	18.9	6.9	10.0	10.2	14.4	5.6	11.3
Change Period (Y+Rc), s	4.5	5.3	4.5	4.5	4.5	5.3	4.5	4.5
Max Green Setting (Gmax), s	5.1	32.1	5.0	39.0	6.5	30.7	5.0	39.0
Max Q Clear Time (g_c+I1), s	2.8	6.7	3.8	3.5	6.4	5.8	2.6	3.3
Green Ext Time (p_c), s	0.0	4.3	0.0	0.4	0.0	3.4	0.0	0.6

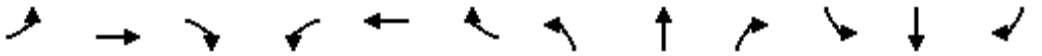
Intersection Summary	
HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	8	0	0	0	14	734	2	1	472	14
Future Vol, veh/h	10	0	8	0	0	0	14	734	2	1	472	14
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	0	8	0	0	0	14	749	2	1	482	14
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	9.3	0	13.6	11.1
HCM LOS	A	-	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	56%	0%	0%	0%
Vol Thru, %	96%	99%	0%	100%	100%	94%
Vol Right, %	0%	1%	44%	0%	0%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	381	369	18	0	237	250
LT Vol	14	0	10	0	1	0
Through Vol	367	367	0	0	236	236
RT Vol	0	2	8	0	0	14
Lane Flow Rate	389	377	18	0	242	255
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.546	0.527	0.031	0	0.357	0.374
Departure Headway (Hd)	5.057	5.034	6.059	6.27	5.317	5.276
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	711	715	587	0	675	681
Service Time	2.796	2.774	4.131	4.35	3.063	3.021
HCM Lane V/C Ratio	0.547	0.527	0.031	0	0.359	0.374
HCM Control Delay	13.8	13.3	9.3	9.4	11	11.2
HCM Lane LOS	B	B	A	N	B	B
HCM 95th-tile Q	3.3	3.1	0.1	0	1.6	1.7



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	5	41	16	14	49	55	716	18	23	463	1
Future Volume (veh/h)	7	5	41	16	14	49	55	716	18	23	463	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	7	5	44	17	15	52	59	762	19	24	493	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	16	11	99	96	85	157	142	1271	32	71	1160	2
Arrive On Green	0.08	0.08	0.08	0.10	0.10	0.10	0.08	0.36	0.36	0.04	0.32	0.32
Sat Flow, veh/h	204	146	1280	968	854	1585	1781	3543	88	1781	3638	7
Grp Volume(v), veh/h	56	0	0	32	0	52	59	382	399	24	241	253
Grp Sat Flow(s),veh/h/ln	1630	0	0	1822	0	1585	1781	1777	1854	1781	1777	1869
Q Serve(g_s), s	1.5	0.0	0.0	0.8	0.0	1.4	1.5	8.3	8.3	0.6	5.0	5.0
Cycle Q Clear(g_c), s	1.5	0.0	0.0	0.8	0.0	1.4	1.5	8.3	8.3	0.6	5.0	5.0
Prop In Lane	0.12		0.79	0.53		1.00	1.00		0.05	1.00		0.00
Lane Grp Cap(c), veh/h	126	0	0	181	0	157	142	637	665	71	566	596
V/C Ratio(X)	0.45	0.00	0.00	0.18	0.00	0.33	0.41	0.60	0.60	0.34	0.43	0.43
Avail Cap(c_a), veh/h	1177	0	0	1316	0	1145	269	1133	1182	265	1129	1187
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.8	0.0	0.0	19.4	0.0	19.7	20.6	12.3	12.3	22.0	12.6	12.6
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.2	0.0	0.5	0.7	0.9	0.9	1.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	0.3	0.0	0.5	0.6	2.6	2.7	0.2	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.7	0.0	0.0	19.6	0.0	20.2	21.3	13.2	13.2	23.0	13.1	13.1
LnGrp LOS	C	A	A	B	A	C	C	B	B	C	B	B
Approach Vol, veh/h		56			84			840			518	
Approach Delay, s/veh		21.7			20.0			13.8			13.6	
Approach LOS		C			B			B			B	

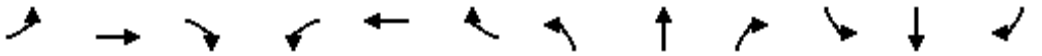
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	22.4		8.6	8.3	20.5		9.7				
Change Period (Y+Rc), s	4.5	5.5		5.0	4.5	5.5		5.0				
Max Green Setting (Gmax), s	7.0	30.0		34.0	7.1	29.9		34.0				
Max Q Clear Time (g_c+I1), s	2.6	10.3		3.5	3.5	7.0		3.4				
Green Ext Time (p_c), s	0.0	4.5		0.2	0.0	2.7		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		14.4	
HCM 6th LOS		B	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	335	197	10	437	39	334	50	12	16	22	2
Future Volume (veh/h)	8	335	197	10	437	39	334	50	12	16	22	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	353	207	11	460	41	352	53	13	17	23	2
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	26	1008	450	35	953	85	458	373	92	45	61	5
Arrive On Green	0.01	0.28	0.28	0.02	0.29	0.29	0.26	0.26	0.26	0.06	0.06	0.06
Sat Flow, veh/h	1781	3554	1585	1781	3301	293	1781	1451	356	736	996	87
Grp Volume(v), veh/h	8	353	207	11	247	254	352	0	66	42	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1818	1781	0	1806	1818	0	0
Q Serve(g_s), s	0.2	4.2	5.7	0.3	6.1	6.1	9.7	0.0	1.5	1.2	0.0	0.0
Cycle Q Clear(g_c), s	0.2	4.2	5.7	0.3	6.1	6.1	9.7	0.0	1.5	1.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.16	1.00		0.20	0.40		0.05
Lane Grp Cap(c), veh/h	26	1008	450	35	513	525	458	0	465	111	0	0
V/C Ratio(X)	0.31	0.35	0.46	0.31	0.48	0.48	0.77	0.00	0.14	0.38	0.00	0.00
Avail Cap(c_a), veh/h	236	2084	929	236	1042	1066	1280	0	1298	1169	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	25.8	15.1	15.6	25.6	15.5	15.5	18.2	0.0	15.1	23.9	0.0	0.0
Incr Delay (d2), s/veh	2.4	0.2	0.7	1.9	0.7	0.7	3.3	0.0	0.2	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.4	1.8	0.1	2.1	2.2	4.0	0.0	0.6	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	15.3	16.3	27.4	16.2	16.2	21.5	0.0	15.3	24.7	0.0	0.0
LnGrp LOS	C	B	B	C	B	B	C	A	B	C	A	A
Approach Vol, veh/h		568			512			418			42	
Approach Delay, s/veh		15.8			16.5			20.5			24.7	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	20.8		18.6	5.5	20.5		8.2				
Change Period (Y+Rc), s	4.5	5.5		5.0	4.5	5.5		5.0				
Max Green Setting (Gmax), s	7.0	31.0		38.0	7.0	31.0		34.0				
Max Q Clear Time (g_c+I1), s	2.2	8.1		11.7	2.3	7.7		3.2				
Green Ext Time (p_c), s	0.0	2.8		2.0	0.0	2.8		0.1				

Intersection Summary												
HCM 6th Ctrl Delay			17.6									
HCM 6th LOS			B									



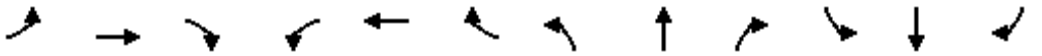
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	200	121	135	202	27	283	279	78	92	269	53
Future Volume (veh/h)	35	200	121	135	202	27	283	279	78	92	269	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	213	0	144	215	0	301	297	0	98	286	0
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	93	802		338	965		518	1022		304	802	
Arrive On Green	0.05	0.23	0.00	0.10	0.27	0.00	0.15	0.29	0.00	0.09	0.23	0.00
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	37	213	0	144	215	0	301	297	0	98	286	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	1.3	3.3	0.0	2.6	3.1	0.0	5.4	4.3	0.0	1.8	4.5	0.0
Cycle Q Clear(g_c), s	1.3	3.3	0.0	2.6	3.1	0.0	5.4	4.3	0.0	1.8	4.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	93	802		338	965		518	1022		304	802	
V/C Ratio(X)	0.40	0.27		0.43	0.22		0.58	0.29		0.32	0.36	
Avail Cap(c_a), veh/h	188	1444		390	1470		650	1791		364	1497	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.5	21.2	0.0	28.2	18.8	0.0	26.3	18.4	0.0	28.4	21.7	0.0
Incr Delay (d2), s/veh	2.7	0.2	0.0	0.8	0.1	0.0	1.0	0.2	0.0	0.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.3	0.0	1.0	1.1	0.0	2.1	1.6	0.0	0.7	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.2	21.4	0.0	29.1	18.9	0.0	27.3	18.6	0.0	29.1	21.9	0.0
LnGrp LOS	C	C		C	B		C	B		C	C	
Approach Vol, veh/h		250	A		359	A		598	A		384	A
Approach Delay, s/veh		23.1			23.0			23.0			23.8	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.5	20.5	8.0	23.5	10.4	24.6	11.0	20.5
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	12.5	28.0	7.0	27.5	7.0	33.5	7.5	27.0
Max Q Clear Time (g_c+I1), s	7.4	6.5	3.3	5.1	3.8	6.3	4.6	5.3
Green Ext Time (p_c), s	0.5	1.6	0.0	1.1	0.1	1.8	0.1	1.2

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



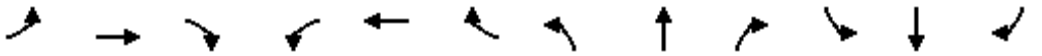
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	42	181	268	82	102	303	532	87	103	414	16
Future Volume (veh/h)	14	42	181	268	82	102	303	532	87	103	414	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	14	43	187	180	219	105	312	548	90	106	427	16
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	371	562	501	391	591	501	246	1592	494	356	1412	438
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.14	0.31	0.31	0.10	0.28	0.28
Sat Flow, veh/h	1056	1777	1585	1151	1870	1585	1781	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	14	43	187	180	219	105	312	548	90	106	427	16
Grp Sat Flow(s),veh/h/ln	1056	1777	1585	1151	1870	1585	1781	1702	1585	1728	1702	1585
Q Serve(g_s), s	0.6	0.9	5.0	7.8	4.9	2.6	7.5	4.5	2.2	1.5	3.6	0.4
Cycle Q Clear(g_c), s	5.5	0.9	5.0	12.8	4.9	2.6	7.5	4.5	2.2	1.5	3.6	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	371	562	501	391	591	501	246	1592	494	356	1412	438
V/C Ratio(X)	0.04	0.08	0.37	0.46	0.37	0.21	1.27	0.34	0.18	0.30	0.30	0.04
Avail Cap(c_a), veh/h	738	1179	1052	791	1241	1052	246	2579	801	446	2532	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.5	13.0	14.4	19.3	14.4	13.6	23.4	14.4	13.6	22.5	15.5	14.3
Incr Delay (d2), s/veh	0.0	0.1	0.5	0.8	0.4	0.2	148.3	0.1	0.2	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	1.7	2.0	2.0	0.9	12.9	1.5	0.7	0.6	1.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.5	13.1	14.8	20.2	14.8	13.8	171.6	14.5	13.8	22.7	15.6	14.4
LnGrp LOS	B	B	B	C	B	B	F	B	B	C	B	B
Approach Vol, veh/h		244			504			950			549	
Approach Delay, s/veh		14.6			16.5			66.1			16.9	
Approach LOS		B			B			E			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	20.6		21.7	10.1	22.5		21.7				
Change Period (Y+Rc), s	4.5	5.6		4.5	4.5	5.6		4.5				
Max Green Setting (Gmax), s	7.5	26.9		36.0	7.0	27.4		36.0				
Max Q Clear Time (g_c+I1), s	9.5	5.6		14.8	3.5	6.5		7.5				
Green Ext Time (p_c), s	0.0	2.7		2.4	0.0	3.7		1.6				

Intersection Summary			
HCM 6th Ctrl Delay		37.4	
HCM 6th LOS		D	

Notes

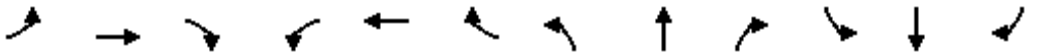
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	457	0	0	745	133	408	0	564	0	0	0
Future Volume (vph)	20	457	0	0	745	133	408	0	564	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4			5.4	5.4	5.4	5.4	5.4			
Lane Util. Factor	1.00	0.95			0.91	1.00	0.95	0.95	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			5085	1583	1681	1681	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	1770	3539			5085	1583	1681	1681	2787			
Peak-hour factor, PHF	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)	21	476	0	0	776	139	425	0	588	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	113	0	0	477	0	0	0
Lane Group Flow (vph)	21	476	0	0	776	26	212	213	111	0	0	0
Turn Type	Prot	NA			NA	custom	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases						8	8		8			
Actuated Green, G (s)	2.4	23.4			16.3	15.1	15.1	15.1	15.1			
Effective Green, g (s)	2.4	23.4			16.3	15.1	15.1	15.1	15.1			
Actuated g/C Ratio	0.03	0.29			0.20	0.19	0.19	0.19	0.19			
Clearance Time (s)	4.7	5.4			5.4	5.4	5.4	5.4	5.4			
Vehicle Extension (s)	2.0	2.0			3.0	2.0	2.0	2.0	2.0			
Lane Grp Cap (vph)	53	1036			1037	299	317	317	526			
v/s Ratio Prot	0.01	c0.13			c0.15							
v/s Ratio Perm						0.02	0.13	0.13	0.04			
v/c Ratio	0.40	0.46			0.75	0.09	0.67	0.67	0.21			
Uniform Delay, d1	38.0	23.1			29.9	26.7	30.1	30.1	27.4			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	1.8	0.1			3.0	0.0	4.1	4.4	0.1			
Delay (s)	39.8	23.2			32.9	26.8	34.2	34.5	27.4			
Level of Service	D	C			C	C	C	C	C			
Approach Delay (s)		23.9			31.9			30.3			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	79.9	Sum of lost time (s)	18.5
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	371	254	0	835	314	0	0	0	111	0	50
Future Volume (veh/h)	0	371	254	0	835	314	0	0	0	111	0	50
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1945	1870	0	1870	1870				1870	1870	1870
Adj Flow Rate, veh/h	0	453	215	0	861	0				114	0	52
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	2	2	0	2	2				2	2	2
Cap, veh/h	0	1440	587	0	1890					393	0	349
Arrive On Green	0.00	0.37	0.37	0.00	0.37	0.00				0.22	0.00	0.22
Sat Flow, veh/h	0	3890	1585	0	5274	1585				1781	0	1585
Grp Volume(v), veh/h	0	453	215	0	861	0				114	0	52
Grp Sat Flow(s),veh/h/ln	0	1945	1585	0	1702	1585				1781	0	1585
Q Serve(g_s), s	0.0	2.0	2.4	0.0	3.2	0.0				1.3	0.0	0.7
Cycle Q Clear(g_c), s	0.0	2.0	2.4	0.0	3.2	0.0				1.3	0.0	0.7
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1440	587	0	1890					393	0	349
V/C Ratio(X)	0.00	0.31	0.37	0.00	0.46					0.29	0.00	0.15
Avail Cap(c_a), veh/h	0	5064	2063	0	6646					1286	0	1144
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	5.5	5.7	0.0	5.9	0.0				8.0	0.0	7.7
Incr Delay (d2), s/veh	0.0	0.0	0.1	0.0	0.1	0.0				0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.3	0.0	0.4	0.0				0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.6	5.8	0.0	5.9	0.0				8.2	0.0	7.8
LnGrp LOS	A	A	A	A	A					A	A	A
Approach Vol, veh/h		668			861	A					166	
Approach Delay, s/veh		5.7			5.9						8.1	
Approach LOS		A			A						A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		14.5		10.1		14.5						
Change Period (Y+Rc), s		5.4		* 4.7		5.4						
Max Green Setting (Gmax), s		32.1		* 18		32.1						
Max Q Clear Time (g_c+I1), s		4.4		3.3		5.2						
Green Ext Time (p_c), s		2.2		0.4		4.0						

Intersection Summary	
HCM 6th Ctrl Delay	6.0
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

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

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	304	0	0	369	0	0
Future Vol, veh/h	304	0	0	369	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	330	0	0	401	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	330	0	731	330
Stage 1	-	-	-	-	330	-
Stage 2	-	-	-	-	401	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1229	-	389	712
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	676	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1229	-	389	712
Mov Cap-2 Maneuver	-	-	-	-	389	-
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	676	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1229	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	380	0	0	337
Future Vol, veh/h	0	0	380	0	0	337
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	413	0	0	366

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	596	207	0	0	413	0
Stage 1	413	-	-	-	-	-
Stage 2	183	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	435	799	-	-	1142	-
Stage 1	636	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	435	799	-	-	1142	-
Mov Cap-2 Maneuver	435	-	-	-	-	-
Stage 1	636	-	-	-	-	-
Stage 2	830	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1142	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Michael Baker
INTERNATIONAL

Appendix D: Existing Plus Project Synchro Worksheets

1: Nelson Ln & Nicolaus Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.2	3.6
Total Del/Veh (s)	7.0	10.6	4.2	23.5	16.5	5.0	9.1	9.4	4.1	6.9	14.2	4.7

1: Nelson Ln & Nicolaus Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	12.7

2: Lakeside Dr & Nicolaus Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.0	0.6	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	3.6
Total Del/Veh (s)	6.5	10.9	5.8	5.9	8.9	3.1	5.2	7.3	3.4	7.8	8.3	2.9

2: Lakeside Dr & Nicolaus Rd Performance by movement

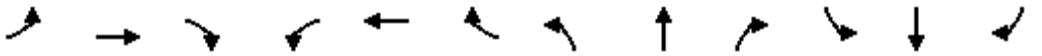
Movement	All
Denied Del/Veh (s)	0.3
Total Del/Veh (s)	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	9	332	191	127	198	124	32	150	94	190	147	180
Future Volume (veh/h)	9	332	191	127	198	124	32	150	94	190	147	180
Number	7	4	14	3	8	18		5	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	12	437	251	167	261	163		197	124	250	143	307
Adj No. of Lanes	1	2	1	1	2	1		2	1	1	1	2
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
Percent Heavy Veh, %	2	2	2	2	2	2		2	2	2	2	2
Cap, veh/h	21	829	371	204	1195	535		780	410	348	273	573
Arrive On Green	0.01	0.23	0.23	0.12	0.34	0.34		0.22	0.22	0.22	0.15	0.15
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583		3548	1863	1583	1774	3725
Grp Volume(v), veh/h	12	437	251	167	261	163		197	124	250	143	307
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583		1774	1863	1583	1774	1863
Q Serve(g_s), s	0.5	8.0	10.6	6.8	3.9	5.6		3.4	4.1	10.8	5.5	5.6
Cycle Q Clear(g_c), s	0.5	8.0	10.6	6.8	3.9	5.6		3.4	4.1	10.8	5.5	5.6
Prop In Lane	1.00		1.00	1.00		1.00		1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	21	829	371	204	1195	535		780	410	348	273	573
V/C Ratio(X)	0.57	0.53	0.68	0.82	0.22	0.30		0.25	0.30	0.72	0.52	0.54
Avail Cap(c_a), veh/h	120	2016	902	205	2184	977		1785	937	797	890	1870
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.2	24.7	25.7	31.9	17.5	18.0		23.8	24.0	26.6	28.7	28.8
Incr Delay (d2), s/veh	8.8	0.6	2.6	20.8	0.1	0.4		0.2	0.6	3.9	2.2	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.0	4.9	4.5	1.9	2.5		1.7	2.2	5.1	2.8	2.9
LnGrp Delay(d),s/veh	45.1	25.3	28.3	52.7	17.6	18.4		24.0	24.6	30.6	30.9	29.9
LnGrp LOS	D	C	C	D	B	B		C	C	C	C	C
Approach Vol, veh/h		700			591				571			482
Approach Delay, s/veh		26.7			27.7				27.0			30.0
Approach LOS		C			C				C			C

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		21.5	13.0	22.6		16.6	5.4	30.2
Change Period (Y+Rc), s		5.3	4.5	5.3		5.3	4.5	5.3
Max Green Setting (Gmax), s		37.1	8.5	42.0		37.0	5.0	45.5
Max Q Clear Time (g_c+I1), s		12.8	8.8	12.6		7.6	2.5	7.6
Green Ext Time (p_c), s		3.4	0.0	4.6		3.7	0.0	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	27.7
HCM 2010 LOS	C

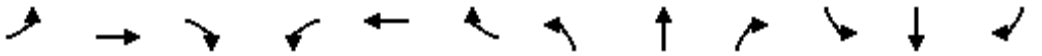
Notes



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	28	41	202	12	40	19	381	164	48	468	13
Future Volume (veh/h)	23	28	41	202	12	40	19	381	164	48	468	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	32	39	57	281	17	56	26	529	228	67	650	18
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	51	79	116	313	100	331	43	964	430	87	1052	469
Arrive On Green	0.03	0.12	0.12	0.18	0.26	0.26	0.02	0.27	0.27	0.05	0.30	0.30
Sat Flow, veh/h	1781	686	1003	1781	383	1261	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	32	0	96	281	0	73	26	529	228	67	650	18
Grp Sat Flow(s),veh/h/ln	1781	0	1690	1781	0	1643	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.9	0.0	2.6	7.5	0.0	1.7	0.7	6.2	5.9	1.8	7.6	0.4
Cycle Q Clear(g_c), s	0.9	0.0	2.6	7.5	0.0	1.7	0.7	6.2	5.9	1.8	7.6	0.4
Prop In Lane	1.00		0.59	1.00		0.77	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	51	0	195	313	0	431	43	964	430	87	1052	469
V/C Ratio(X)	0.62	0.00	0.49	0.90	0.00	0.17	0.60	0.55	0.53	0.77	0.62	0.04
Avail Cap(c_a), veh/h	221	0	1222	313	0	1273	184	2034	907	184	2034	907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	0.0	20.1	19.5	0.0	13.8	23.4	15.1	15.0	22.7	14.7	12.1
Incr Delay (d2), s/veh	4.5	0.0	2.3	26.3	0.0	0.2	4.8	0.6	1.2	5.2	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	1.1	5.1	0.0	0.6	0.3	2.1	2.0	0.8	2.5	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	0.0	22.4	45.8	0.0	14.0	28.2	15.7	16.2	27.9	15.4	12.2
LnGrp LOS	C	A	C	D	A	B	C	B	B	C	B	B
Approach Vol, veh/h		128			354			783			735	
Approach Delay, s/veh		23.7			39.2			16.3			16.5	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	18.4	13.0	10.1	5.7	19.6	5.9	17.2
Change Period (Y+Rc), s	4.5	5.3	4.5	4.5	4.5	5.3	4.5	4.5
Max Green Setting (Gmax), s	5.0	27.7	8.5	35.0	5.0	27.7	6.0	37.5
Max Q Clear Time (g_c+I1), s	3.8	8.2	9.5	4.6	2.7	9.6	2.9	3.7
Green Ext Time (p_c), s	0.0	4.8	0.0	0.7	0.0	4.7	0.0	0.5

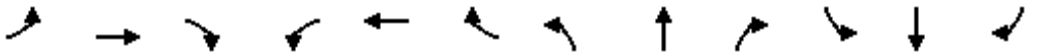
Intersection Summary	
HCM 6th Ctrl Delay	20.9
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	58	81	104	19	64	22	394	65	103	594	28
Future Volume (veh/h)	92	58	81	104	19	64	22	394	65	103	594	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	119	75	105	135	25	83	29	512	84	134	771	36
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	233	198	173	253	214	48	969	432	171	1216	542
Arrive On Green	0.09	0.12	0.12	0.10	0.14	0.14	0.03	0.27	0.27	0.10	0.34	0.34
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	119	75	105	135	25	83	29	512	84	134	771	36
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.1	1.8	3.0	3.5	0.6	2.3	0.8	5.9	1.9	3.5	8.7	0.7
Cycle Q Clear(g_c), s	3.1	1.8	3.0	3.5	0.6	2.3	0.8	5.9	1.9	3.5	8.7	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	154	233	198	173	253	214	48	969	432	171	1216	542
V/C Ratio(X)	0.77	0.32	0.53	0.78	0.10	0.39	0.61	0.53	0.19	0.78	0.63	0.07
Avail Cap(c_a), veh/h	480	1367	1159	242	1117	947	216	2034	907	242	2086	930
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.4	19.1	19.6	21.1	18.1	18.9	23.0	14.8	13.4	21.1	13.2	10.6
Incr Delay (d2), s/veh	3.1	0.9	2.7	6.6	0.2	1.4	4.6	0.5	0.3	6.4	0.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.8	1.2	1.7	0.2	0.9	0.4	2.1	0.7	1.6	2.8	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.5	20.1	22.3	27.7	18.4	20.3	27.6	15.3	13.6	27.5	13.9	10.7
LnGrp LOS	C	C	C	C	B	C	C	B	B	C	B	B
Approach Vol, veh/h		299			243			625			941	
Approach Delay, s/veh		22.6			24.2			15.7			15.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.1	18.4	9.1	11.3	5.8	21.7	8.6	11.8
Change Period (Y+Rc), s	4.5	5.3	4.5	5.3	4.5	5.3	4.5	5.3
Max Green Setting (Gmax), s	6.5	27.4	6.5	35.0	5.8	28.1	12.9	28.6
Max Q Clear Time (g_c+I1), s	5.5	7.9	5.5	5.0	2.8	10.7	5.1	4.3
Green Ext Time (p_c), s	0.0	4.3	0.0	1.0	0.0	5.7	0.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	17.7
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	45	234	131	96	33	142	388	82	36	576	154
Future Volume (veh/h)	50	45	234	131	96	33	142	388	82	36	576	154
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	58	300	168	123	42	182	497	105	46	738	197
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	82	428	363	205	558	472	220	1346	600	58	1022	456
Arrive On Green	0.05	0.23	0.23	0.12	0.30	0.30	0.12	0.38	0.38	0.03	0.29	0.29
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	64	58	300	168	123	42	182	497	105	46	738	197
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.7	1.9	13.8	7.1	3.8	1.5	7.7	7.8	3.4	2.0	14.4	7.8
Cycle Q Clear(g_c), s	2.7	1.9	13.8	7.1	3.8	1.5	7.7	7.8	3.4	2.0	14.4	7.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	82	428	363	205	558	472	220	1346	600	58	1022	456
V/C Ratio(X)	0.78	0.14	0.83	0.82	0.22	0.09	0.83	0.37	0.17	0.79	0.72	0.43
Avail Cap(c_a), veh/h	220	948	804	243	973	824	262	1613	719	157	1405	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	23.6	28.2	33.2	20.3	19.5	32.9	17.2	15.9	36.9	24.6	22.3
Incr Delay (d2), s/veh	5.9	0.2	5.8	14.4	0.2	0.1	14.4	0.2	0.2	8.8	1.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.8	5.7	3.8	1.7	0.5	4.0	2.9	1.2	1.0	5.9	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	23.8	34.0	47.7	20.5	19.6	47.3	17.5	16.1	45.7	26.0	23.1
LnGrp LOS	D	C	C	D	C	B	D	B	B	D	C	C
Approach Vol, veh/h		422			333			784			981	
Approach Delay, s/veh		33.8			34.1			24.2			26.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	34.4	13.4	22.1	14.0	27.4	8.0	27.4
Change Period (Y+Rc), s	4.5	5.3	4.5	4.5	4.5	5.3	4.5	4.5
Max Green Setting (Gmax), s	6.8	34.9	10.5	39.0	11.3	30.4	9.5	40.0
Max Q Clear Time (g_c+I1), s	4.0	9.8	9.1	15.8	9.7	16.4	4.7	5.8
Green Ext Time (p_c), s	0.0	4.3	0.0	1.8	0.0	5.8	0.0	1.1

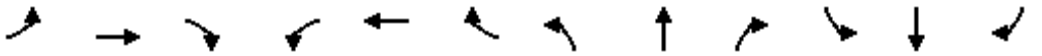
Intersection Summary	
HCM 6th Ctrl Delay	27.9
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	47
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	0	26	1	0	0	10	589	2	0	921	11
Future Vol, veh/h	22	0	26	1	0	0	10	589	2	0	921	11
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	0	31	1	0	0	12	693	2	0	1084	13
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.5	10.5	16.7	68.5
HCM LOS	B	B	C	F

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	3%	0%	46%	100%	0%	0%
Vol Thru, %	97%	99%	0%	0%	100%	97%
Vol Right, %	0%	1%	54%	0%	0%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	305	297	48	1	614	318
LT Vol	10	0	22	1	0	0
Through Vol	295	295	0	0	614	307
RT Vol	0	2	26	0	0	11
Lane Flow Rate	358	349	56	1	722	374
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.583	0.566	0.102	0.002	1.123	0.579
Departure Headway (Hd)	6.102	6.081	6.75	7.447	5.595	5.57
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	595	596	534	483	657	651
Service Time	3.802	3.781	4.75	5.447	3.295	3.27
HCM Lane V/C Ratio	0.602	0.586	0.105	0.002	1.099	0.575
HCM Control Delay	17	16.4	10.5	10.5	95.9	15.6
HCM Lane LOS	C	C	B	B	F	C
HCM 95th-tile Q	3.7	3.5	0.3	0	22.1	3.7



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	19	85	48	16	56	23	518	12	50	907	0
Future Volume (veh/h)	22	19	85	48	16	56	23	518	12	50	907	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	22	100	56	19	66	27	609	14	59	1067	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	35	29	133	144	49	170	76	1281	29	131	1393	0
Arrive On Green	0.12	0.12	0.12	0.11	0.11	0.11	0.04	0.36	0.36	0.07	0.39	0.00
Sat Flow, veh/h	291	246	1118	1346	457	1585	1781	3551	82	1781	3647	0
Grp Volume(v), veh/h	148	0	0	75	0	66	27	305	318	59	1067	0
Grp Sat Flow(s),veh/h/ln	1655	0	0	1803	0	1585	1781	1777	1856	1781	1777	0
Q Serve(g_s), s	5.1	0.0	0.0	2.3	0.0	2.3	0.9	7.8	7.8	1.9	15.4	0.0
Cycle Q Clear(g_c), s	5.1	0.0	0.0	2.3	0.0	2.3	0.9	7.8	7.8	1.9	15.4	0.0
Prop In Lane	0.18		0.68	0.75		1.00	1.00		0.04	1.00		0.00
Lane Grp Cap(c), veh/h	197	0	0	193	0	170	76	641	670	131	1393	0
V/C Ratio(X)	0.75	0.00	0.00	0.39	0.00	0.39	0.36	0.48	0.48	0.45	0.77	0.00
Avail Cap(c_a), veh/h	955	0	0	1040	0	915	212	905	945	212	1809	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.1	0.0	0.0	24.5	0.0	24.5	27.4	14.5	14.5	26.2	15.6	0.0
Incr Delay (d2), s/veh	2.2	0.0	0.0	0.5	0.0	0.5	1.1	0.5	0.5	0.9	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.0	0.9	0.0	0.8	0.4	2.7	2.8	0.8	5.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	0.0	0.0	25.0	0.0	25.1	28.5	15.1	15.1	27.1	17.1	0.0
LnGrp LOS	C	A	A	C	A	C	C	B	B	C	B	A
Approach Vol, veh/h		148			141			650			1126	
Approach Delay, s/veh		27.3			25.0			15.6			17.6	
Approach LOS		C			C			B			B	

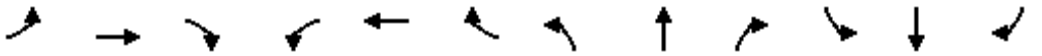
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.8	26.8		12.0	7.0	28.6		11.3				
Change Period (Y+Rc), s	4.5	5.5		5.0	4.5	5.5		5.0				
Max Green Setting (Gmax), s	7.0	30.0		34.0	7.0	30.0		34.0				
Max Q Clear Time (g_c+I1), s	3.9	9.8		7.1	2.9	17.4		4.3				
Green Ext Time (p_c), s	0.0	3.4		0.6	0.0	5.7		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		18.2	
HCM 6th LOS		B	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	718	276	6	322	184	220	83	20	112	58	20
Future Volume (veh/h)	51	718	276	6	322	184	220	83	20	112	58	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	62	876	337	7	393	224	268	101	24	137	71	24
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	1197	534	23	612	345	354	290	69	174	90	30
Arrive On Green	0.07	0.34	0.34	0.01	0.28	0.28	0.20	0.20	0.20	0.16	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	1781	2192	1233	1781	1461	347	1054	546	185
Grp Volume(v), veh/h	62	876	337	7	318	299	268	0	125	232	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1648	1781	0	1808	1784	0	0
Q Serve(g_s), s	2.3	15.1	12.5	0.3	10.9	11.2	9.9	0.0	4.2	8.7	0.0	0.0
Cycle Q Clear(g_c), s	2.3	15.1	12.5	0.3	10.9	11.2	9.9	0.0	4.2	8.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.75	1.00		0.19	0.59		0.10
Lane Grp Cap(c), veh/h	125	1197	534	23	496	460	354	0	359	294	0	0
V/C Ratio(X)	0.50	0.73	0.63	0.31	0.64	0.65	0.76	0.00	0.35	0.79	0.00	0.00
Avail Cap(c_a), veh/h	181	1681	750	179	838	777	919	0	933	870	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	31.2	20.4	19.5	34.1	22.1	22.1	26.3	0.0	24.0	28.0	0.0	0.0
Incr Delay (d2), s/veh	1.1	1.0	1.2	2.8	1.4	1.6	4.0	0.0	0.7	1.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	5.7	4.2	0.1	4.3	4.1	4.4	0.0	1.8	3.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.4	21.4	20.7	36.9	23.4	23.7	30.3	0.0	24.7	29.8	0.0	0.0
LnGrp LOS	C	C	C	D	C	C	C	A	C	C	A	A
Approach Vol, veh/h		1275			624			393			232	
Approach Delay, s/veh		21.7			23.7			28.6			29.8	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	25.0		18.9	5.4	29.0		16.5				
Change Period (Y+Rc), s	4.5	5.5		5.0	4.5	5.5		5.0				
Max Green Setting (Gmax), s	7.1	32.9		36.0	7.0	33.0		34.0				
Max Q Clear Time (g_c+I1), s	4.3	13.2		11.9	2.3	17.1		10.7				
Green Ext Time (p_c), s	0.0	3.5		2.0	0.0	6.4		0.9				

Intersection Summary			
HCM 6th Ctrl Delay		24.0	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	381	428	51	165	35	311	246	78	88	264	23
Future Volume (veh/h)	58	381	428	51	165	35	311	246	78	88	264	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	72	476	0	64	206	0	389	308	0	110	330	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	139	835		255	819		530	1035		321	819	
Arrive On Green	0.08	0.24	0.00	0.07	0.23	0.00	0.15	0.29	0.00	0.09	0.23	0.00
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	72	476	0	64	206	0	389	308	0	110	330	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	2.5	7.7	0.0	1.1	3.1	0.0	7.0	4.4	0.0	1.9	5.1	0.0
Cycle Q Clear(g_c), s	2.5	7.7	0.0	1.1	3.1	0.0	7.0	4.4	0.0	1.9	5.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	139	835		255	819		530	1035		321	819	
V/C Ratio(X)	0.52	0.57		0.25	0.25		0.73	0.30		0.34	0.40	
Avail Cap(c_a), veh/h	192	1474		372	1474		717	1856		372	1501	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.8	22.0	0.0	28.4	20.5	0.0	26.3	17.9	0.0	27.7	21.2	0.0
Incr Delay (d2), s/veh	2.9	0.6	0.0	0.5	0.2	0.0	2.6	0.2	0.0	0.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.0	0.0	0.4	1.1	0.0	2.8	1.6	0.0	0.8	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	22.6	0.0	29.0	20.6	0.0	28.9	18.1	0.0	28.3	21.6	0.0
LnGrp LOS	C	C		C	C		C	B		C	C	
Approach Vol, veh/h		548	A		270	A		697	A		440	A
Approach Delay, s/veh		23.8			22.6			24.1			23.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.5	20.5	9.6	20.5	10.5	24.4	9.3	20.8
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	13.5	27.5	7.0	27.0	7.0	34.0	7.0	27.0
Max Q Clear Time (g_c+I1), s	9.0	7.1	4.5	5.1	3.9	6.4	3.1	9.7
Green Ext Time (p_c), s	0.6	1.9	0.0	1.1	0.1	1.9	0.0	2.7

Intersection Summary	
HCM 6th Ctrl Delay	23.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

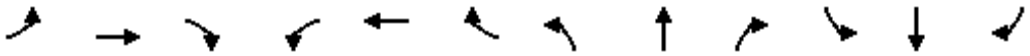
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	26	318	174	45	68	251	598	58	67	660	8
Future Volume (veh/h)	12	26	318	174	45	68	251	598	58	67	660	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	14	30	370	127	157	79	292	695	67	78	767	9
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	483	663	591	301	698	591	226	1505	467	295	1295	402
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.13	0.29	0.29	0.09	0.25	0.25
Sat Flow, veh/h	1144	1777	1585	985	1870	1585	1781	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	14	30	370	127	157	79	292	695	67	78	767	9
Grp Sat Flow(s),veh/h/ln	1144	1777	1585	985	1870	1585	1781	1702	1585	1728	1702	1585
Q Serve(g_s), s	0.5	0.6	11.3	7.2	3.4	1.9	7.5	6.6	1.8	1.2	7.8	0.3
Cycle Q Clear(g_c), s	3.9	0.6	11.3	18.5	3.4	1.9	7.5	6.6	1.8	1.2	7.8	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	483	663	591	301	698	591	226	1505	467	295	1295	402
V/C Ratio(X)	0.03	0.05	0.63	0.42	0.23	0.13	1.29	0.46	0.14	0.26	0.59	0.02
Avail Cap(c_a), veh/h	752	1081	964	533	1138	964	226	2365	734	409	2322	721
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.0	11.8	15.2	22.7	12.7	12.2	25.8	17.0	15.4	25.3	19.4	16.6
Incr Delay (d2), s/veh	0.0	0.0	1.1	0.9	0.2	0.1	160.8	0.2	0.1	0.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	3.9	1.6	1.3	0.7	12.9	2.2	0.6	0.5	2.7	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.1	11.9	16.3	23.7	12.9	12.3	186.6	17.2	15.5	25.5	19.8	16.6
LnGrp LOS	B	B	B	C	B	B	F	B	B	C	B	B
Approach Vol, veh/h		414			363			1054			854	
Approach Delay, s/veh		15.9			16.5			64.1			20.3	
Approach LOS		B			B			E			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	20.6		26.6	9.6	23.0		26.6				
Change Period (Y+Rc), s	4.5	5.6		4.5	4.5	5.6		4.5				
Max Green Setting (Gmax), s	7.5	26.9		36.0	7.0	27.4		36.0				
Max Q Clear Time (g_c+I1), s	9.5	9.8		20.5	3.2	8.6		13.3				
Green Ext Time (p_c), s	0.0	4.7		1.6	0.0	4.5		2.9				

Intersection Summary			
HCM 6th Ctrl Delay		36.3	
HCM 6th LOS		D	

Notes

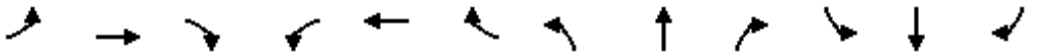
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	735	0	0	1015	103	159	0	256	0	0	0
Future Volume (vph)	57	735	0	0	1015	103	159	0	256	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.4			5.4	5.4	5.4	5.4	5.4			
Lane Util. Factor	1.00	0.95			0.91	1.00	0.95	0.95	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1770	3539			5085	1583	1681	1681	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	1770	3539			5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	67	865	0	0	1194	121	187	0	301	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	106	0	0	264	0	0	0
Lane Group Flow (vph)	67	865	0	0	1194	15	93	94	37	0	0	0
Turn Type	Prot	NA			NA	custom	Perm	NA	Perm			
Protected Phases	5	2			6			8				
Permitted Phases						8	8		8			
Actuated Green, G (s)	5.4	27.7			17.6	9.7	9.7	9.7	9.7			
Effective Green, g (s)	5.4	27.7			17.6	9.7	9.7	9.7	9.7			
Actuated g/C Ratio	0.07	0.35			0.22	0.12	0.12	0.12	0.12			
Clearance Time (s)	4.7	5.4			5.4	5.4	5.4	5.4	5.4			
Vehicle Extension (s)	2.0	2.0			3.0	2.0	2.0	2.0	2.0			
Lane Grp Cap (vph)	121	1250			1141	195	207	207	344			
v/s Ratio Prot	0.04	c0.24			c0.23							
v/s Ratio Perm						0.01	0.06	0.06	0.01			
v/c Ratio	0.55	0.69			1.05	0.08	0.45	0.45	0.11			
Uniform Delay, d1	35.3	21.7			30.4	30.4	31.9	31.9	30.5			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	3.1	1.4			39.6	0.1	0.6	0.6	0.1			
Delay (s)	38.4	23.1			70.0	30.5	32.4	32.5	30.6			
Level of Service	D	C			E	C	C	C	C			
Approach Delay (s)		24.2			66.4			31.3			0.0	
Approach LOS		C			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	45.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	78.4	Sum of lost time (s)	18.5
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	710	670	0	477	692	0	0	0	82	0	17
Future Volume (veh/h)	0	710	670	0	477	692	0	0	0	82	0	17
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1945	1870	0	1870	1870				1870	1870	1870
Adj Flow Rate, veh/h	0	1152	517	0	536	0				92	0	19
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	0	2	2				2	2	2
Cap, veh/h	0	2010	819	0	2638					283	0	251
Arrive On Green	0.00	0.52	0.52	0.00	0.52	0.00				0.16	0.00	0.16
Sat Flow, veh/h	0	3890	1585	0	5274	1585				1781	0	1585
Grp Volume(v), veh/h	0	1152	517	0	536	0				92	0	19
Grp Sat Flow(s),veh/h/ln	0	1945	1585	0	1702	1585				1781	0	1585
Q Serve(g_s), s	0.0	6.3	7.3	0.0	1.8	0.0				1.4	0.0	0.3
Cycle Q Clear(g_c), s	0.0	6.3	7.3	0.0	1.8	0.0				1.4	0.0	0.3
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2010	819	0	2638					283	0	251
V/C Ratio(X)	0.00	0.57	0.63	0.00	0.20					0.33	0.00	0.08
Avail Cap(c_a), veh/h	0	4015	1636	0	5270					1019	0	907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	5.2	5.4	0.0	4.1	0.0				11.6	0.0	11.1
Incr Delay (d2), s/veh	0.0	0.1	0.3	0.0	0.0	0.0				0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.7	0.7	0.0	0.2	0.0				0.4	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.3	5.7	0.0	4.1	0.0				11.9	0.0	11.2
LnGrp LOS	A	A	A	A	A					B	A	B
Approach Vol, veh/h		1669			536	A					111	
Approach Delay, s/veh		5.4			4.1						11.7	
Approach LOS		A			A						B	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		21.5		9.6		21.5						
Change Period (Y+Rc), s		5.4		* 4.7		5.4						
Max Green Setting (Gmax), s		32.1		* 18		32.1						
Max Q Clear Time (g_c+I1), s		9.3		3.4		3.8						
Green Ext Time (p_c), s		6.8		0.2		2.3						

Intersection Summary												
HCM 6th Ctrl Delay			5.4									
HCM 6th LOS			A									

Notes

User approved volume balancing among the lanes for turning movement.

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

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	665	4	4	394	55	11
Future Vol, veh/h	665	4	4	394	55	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	723	4	4	428	60	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	727	0	1159	723
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	436	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	876	-	216	426
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	652	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	876	-	215	426
Mov Cap-2 Maneuver	-	-	-	-	215	-
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	648	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	27
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	234	-	-	876	-
HCM Lane V/C Ratio	0.307	-	-	0.005	-
HCM Control Delay (s)	27	-	-	9.1	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	44	422	25	4	522
Future Vol, veh/h	0	44	422	25	4	522
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	48	459	27	4	567

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	751	230	0	0	486	0
Stage 1	459	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	347	772	-	-	1073	-
Stage 1	603	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	346	772	-	-	1073	-
Mov Cap-2 Maneuver	346	-	-	-	-	-
Stage 1	603	-	-	-	-	-
Stage 2	729	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	772	1073	-
HCM Lane V/C Ratio	-	-	0.062	0.004	-
HCM Control Delay (s)	-	-	10	8.4	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

1: Nelson Ln & Nicolaus Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	3.7
Total Del/Veh (s)	7.4	10.4	4.1	18.3	16.3	5.6	10.0	8.8	5.0	7.8	15.3	5.1

1: Nelson Ln & Nicolaus Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	10.7

2: Lakeside Dr & Nicolaus Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	3.9
Total Del/Veh (s)	7.0	9.2	4.4	5.5	7.3	3.1	4.4	6.4	2.9	6.4	8.2	2.3

2: Lakeside Dr & Nicolaus Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	6.9