TRAFFIC IMPACT STUDY FOR THE PHASE V DEVELOPMENT FOR THE ARROYO GRANDE OIL FIELD

SAN LUIS OBISPO COUNTY, CALIFORNIA

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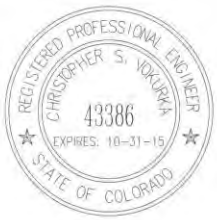

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TRAFFIC IMPACT STUDY
FREEPORT-MCMORAN OIL AND GAS (FM O&G) PHASE V DEVELOPMENT PROJECT FOR THE ARROYO GRANDE OIL FIELD

San Luis Obispo County, California

CHAPTER 1 – INTRODUCTION

This Traffic Impact Study (TIS) was prepared to assess the traffic impacts associated with the Phase V Development for the Arroyo Grande Oil Field in unincorporated San Luis Obispo County and operated by Freeport-McMoRan Oil & Gas (FM O&G) (Figure 1). The Phase V Development Project for the Arroyo Grande Oil Field occupies 1,480 acres, and is located on both sides of Price Canyon Road in the general vicinity of its intersection with Ormonde Road.

There is one main access to the field, Gate 1, on the west side of Price Canyon Road at its intersection with Ormonde Road; all personnel and visitors must sign in and out at the office trailers which are accessed via this gate (Figure 2). There is one other major entrance to the oil field on the along Price Canyon Road, Gates 2/3, which is located north of Gate 1/Ormonde. There is also an additional access driveway to the portion of the oil field to the east of Price Canyon Road that is accessible from Ormonde Road. This access is not used on a regular basis.

The City of Pismo Beach is approximately three miles to the southwest of the site, and the City of San Luis Obispo is located approximately seven miles to the northwest of this oil field (Figure 1). This study evaluates the impacts of the proposed development on site accesses, nearby intersection operations as well as the closest segments of US Highway 101.

Freeport-McMoRan Oil & Gas (FM O&G) (formerly Plains Exploration and Production Company [PXP]) proposes to expand its existing operations at the 1,480-acre Arroyo Grande Oil Field (AGOF) through a Phase V Development Plan. The proposed project, to commence following the completion of Phase IV development of the AGOF (Conditional Use Permit [CUP] D010386D), includes the following principal activities over a period of approximately ten (10) years:

- *Addition of 8 new well pads (with access roads) and modification of 33 existing well pads;*
- *Drilling of approximately 450 wells (approximately 45 per year);*
- *An increase in production of marketable quality crude oil;*
- *Abandonment of wells no longer capable of production or operation;*
- *Installation of three 85 million British thermal units per hour (MMBtu/hr) steam generators;*
- *Installation of additional production and steam lines to support Phase V production, including two areas that would involve jack and boring underneath the Union Pacific Railroad (UPRR) and Price Canyon Road;*
- *Expansion of the existing electrical power system/lines; and*
- *Replacement of one existing pipe bridge over Pismo Creek (near existing well pad Signal 113A; herein referred to as the Northern Pipe Bridge).*

The Project study area for the analysis of traffic impacts includes two signalized intersections and four unsignalized intersections as follows (Figure 3):

1. *Price Street at Price Canyon Road (also known as Hinds Avenue at this intersection);*
2. *US 101 Southbound Off-Ramp at Price Canyon Road*
3. *Bello Street at Price Canyon Road*
4. *Gate 1 (Intersection of Price Canyon Road and Ormonde Road)*
5. *Gate 2 at Price Canyon Road*
6. *State Route 227 (SR 227) at Price Canyon Road*

The Price Street at Price Canyon Road and SR 227 at Price Canyon Road intersections are signalized. The US 101 Southbound Off-Ramp is controlled by a stop sign at the intersection of the ramp with Price Canyon Road. The remainder of these intersections are two-way stop-controlled intersections, where stop signs exist only on the minor street approaches.

In addition to the six intersections analyzed, the two freeway segments analyzed include (Figure 3):

7. *US 101 North of Oak Park Boulevard*
8. *US 101 South of Mattie Road.*

CHAPTER 2 – METHODS

Scenarios

The scenarios that were analyzed for this study include:

- *Existing Traffic Conditions (2013)*
- *Existing Conditions Plus Project Traffic*
- *Existing Conditions Plus Approved/Not Built Traffic*
- *Existing Conditions Plus Approved/Not Built Background and Project Traffic*
- *2035 Cumulative Conditions without the Project*
- *2035 Cumulative Conditions Plus Project Traffic*

The 2035 WITHOUT the Project and 2035 WITH the Project scenarios reflect cumulative conditions analysis as required by CEQA.

Analysis Time Periods

According to *Traffic Impact Analyses for Site Development* (ITE, 2006), "the peak periods [of the adjacent street and highway system] are generally the weekday morning (7-9 a.m.) and evening (4-6 p.m.) peak hours, although local area characteristics occasionally result in other peaks (e.g., at major shopping or recreational centers)." The peak hours analyzed in this study were:

- 7:00 to 9:00 AM
- 4:00 to 6:00 PM

Traffic Counts

According to the *Guide for the Preparation of Traffic Impact Studies* (Caltrans 2002), one of the common rules for counting vehicular traffic is:

> "Vehicle counts should be conducted on Tuesdays, Wednesdays, or Thursdays during weeks not containing a holiday and conducted in favorable weather conditions."

Traffic counts for the Project were conducted on one of these mid-week days on May 15, 16, 29, 30 and July 11, 2013 depending on the intersection. Refer to Appendix B for traffic count data obtained on these dates and locations.

Traffic Model

San Luis Obispo Council of Governments' Year 2035 Average Daily Traffic regional build out model was requested to investigate the future demands on the greater roadway system. The Model was used in this study to develop the following traffic data sets:

- 2035 No Project background traffic volumes
- 2035 With Project total traffic volumes

Copies of the Model data as provided by San Luis Obispo Council of Governments are included in Appendix G.

Intersection Analysis and Volume Adjustments

Intersection heavy vehicle percentages were developed from the existing traffic counts. These percentages were adjusted from intersection to intersection. These percentages were then used in all scenarios. Refer to Appendix B for intersection specific percentages.

Level of Service

The Level of Service (LOS) analysis performed as part of this study conforms to the practices of *The Highway Capacity Manual, 2010*. The software package used to perform this analysis is Highway Capacity Software 2010™ (V 6.5), which includes LOS modules for signalized intersections, unsignalized intersections, and freeway segments.

For signalized intersections, this program allows for optimization of signals to provide for the greatest reduction in overall intersection delay. The signal optimization process can result in different signal cycle lengths for both the AM and PM peak hours of a given scenario and across all scenarios. The changing of the signal cycle length somewhat reflects the agency process whereby the agency will adjust intersection signal cycle lengths for differing traffic conditions based on current count data.

For analysis purposes, the *2010 Highway Capacity Manual* defines six levels of service. The six levels are given letter designations ranging from "A" to "F," with "A" representing the best operating conditions and "F" the worst. Quantifiable measures of Level of Service for signalized and unsignalized intersections are "average control delay" or the delay a vehicle experiences at the intersection including initial acceleration delay, queue move-up time, stopped delay, and final acceleration delay. For road segments, the quantifiable measure of level of service is the volume-to-capacity ratio.

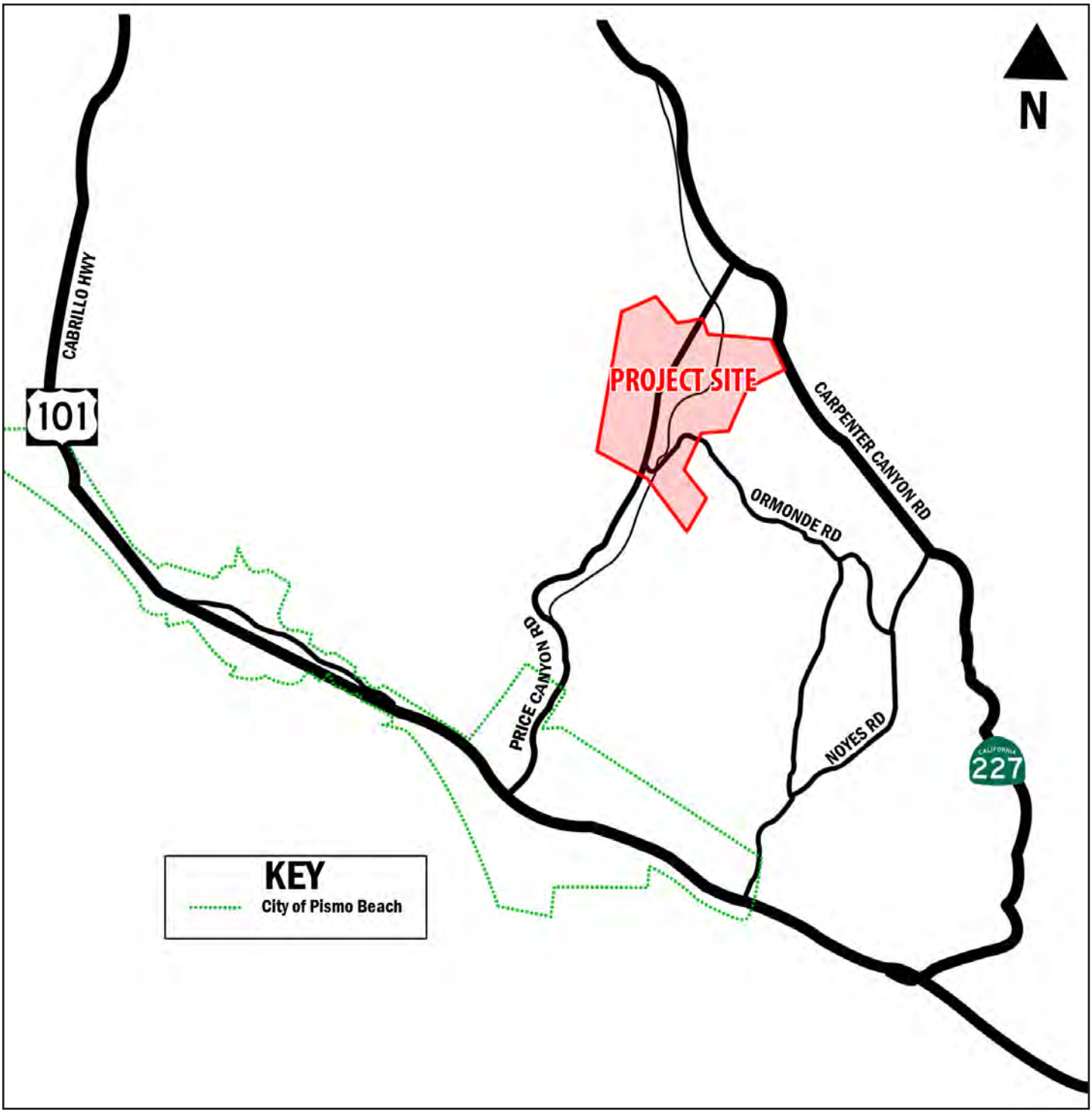

FIGURE 1 - VICINITY MAP

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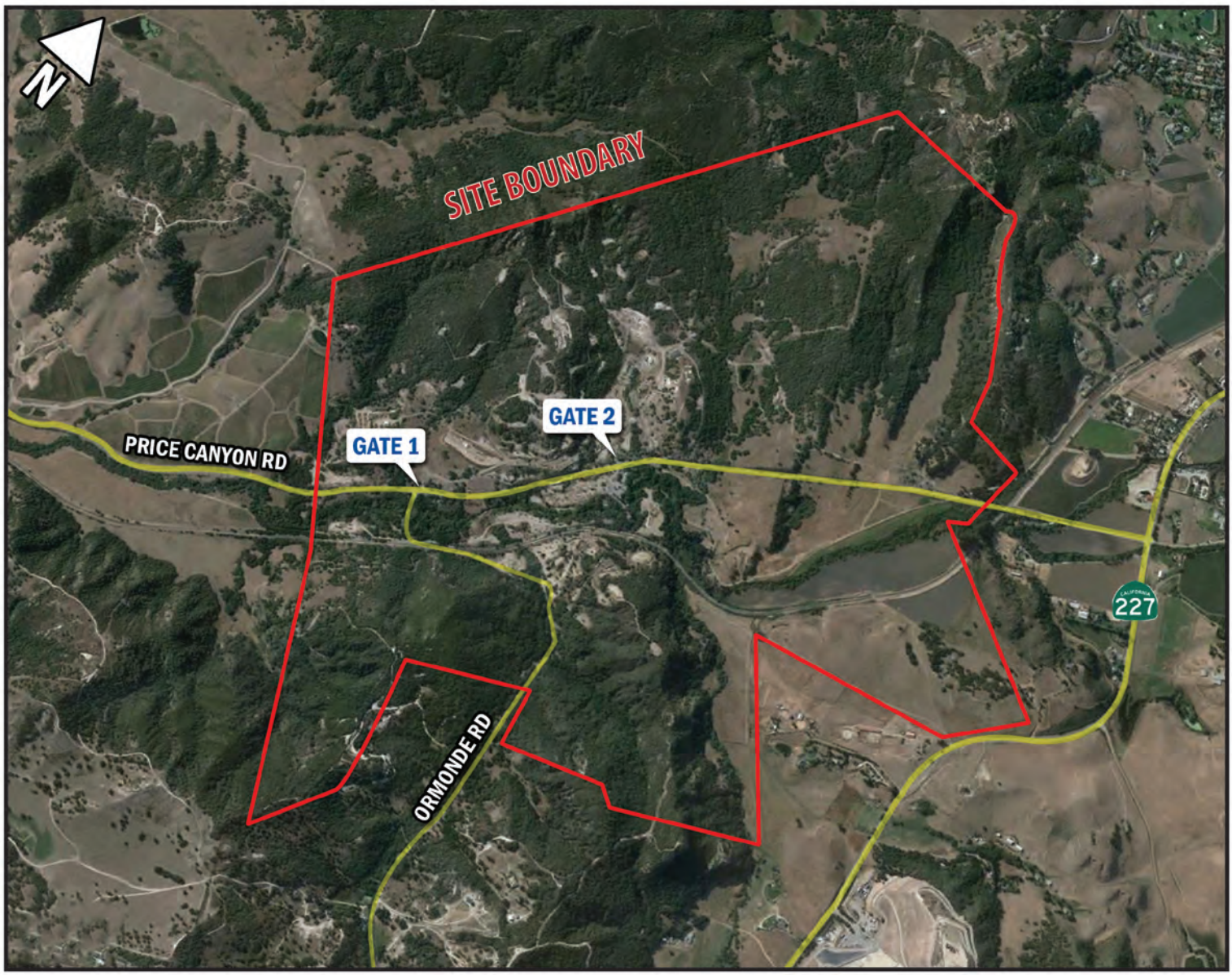

FIGURE 2 - SITE MAP

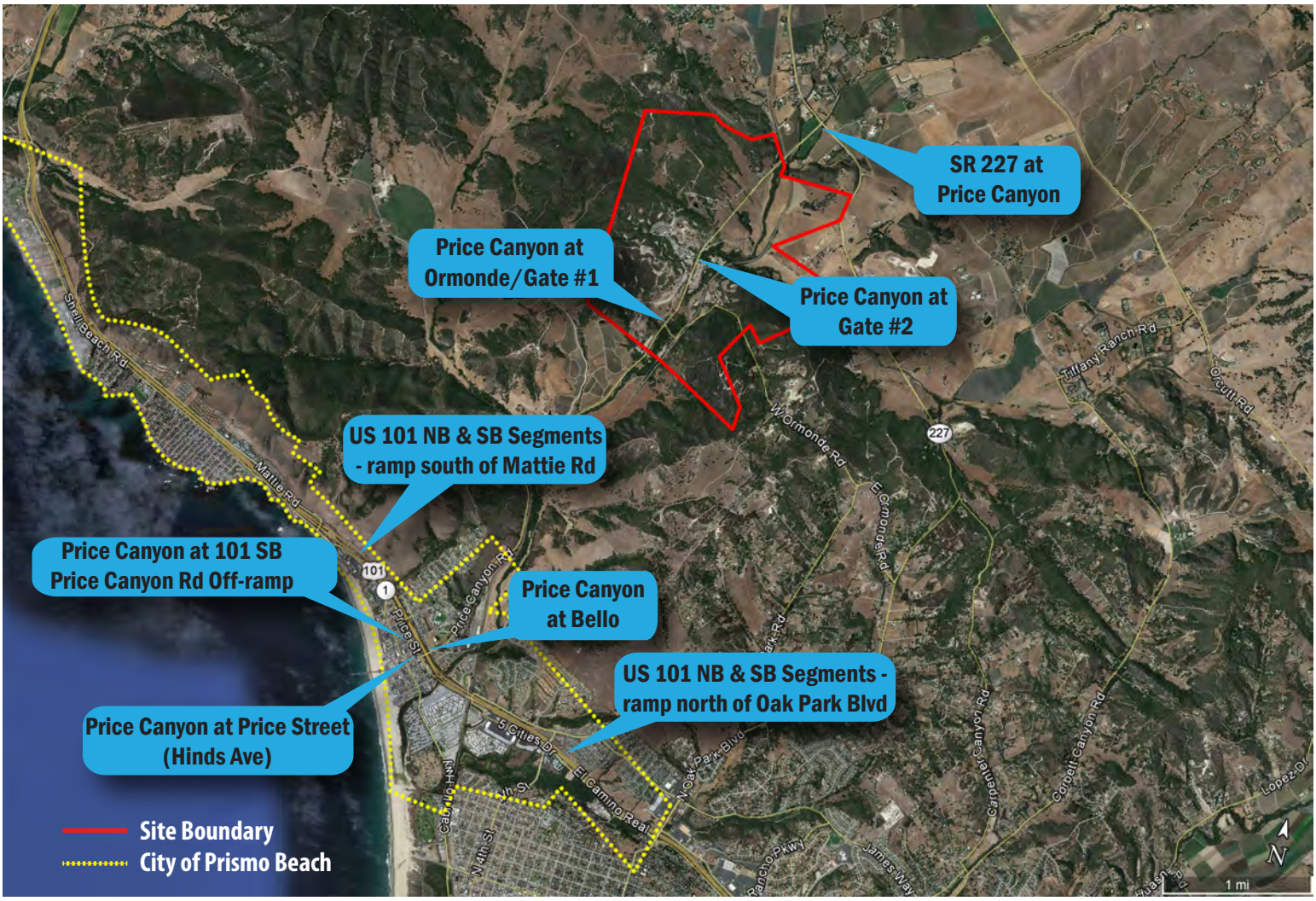

FIGURE 3 - STUDY LOCATIONS

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Control delay for two-way stop-controlled intersections is only computed for the minor street movements and major street left turn movements only, as theoretically the through movements on the major street experience no delay. Since there is no aggregation of delay for these intersections, there is no intersection level of service as a whole, only levels of service for the individual minor movements. The minor movements generally consist of separate lefts on the major street approaches and all movements on both minor street approaches.

Table 1 below shows the six levels of service and their corresponding ranges of average control delay for both signalized and unsignalized intersections according to the *Highway Capacity Manual 2010*. It also contains a brief traffic flow description for signalized intersections for each level of service category. The level of service diagrams provided throughout the report show the levels of service for the study intersections. The levels of service shown for signalized intersections are representative of the overall level of service for that intersection. For stop-controlled intersections, the level of service shown is the level of service for the specific movements as opposed to the overall intersection level of service.

TABLE 1 **INTERSECTION LEVEL OF SERVICE DESCRIPTION**			**Intersections[1]**	
			Signalized	**Unsignalized**
Level of Service	**Conditions**	**Signalized Intersection Description**	**Delay (second/ vehicle)**	**Delay (seconds/ vehicle)**
"A"	Free Flow	*Users experience very low delay. Progression is favorable and most vehicles do not stop at all.*	≤10.0	≤10.0
"B"	Stable Operations	*Vehicles travel with good progression. Some vehicles stop, causing slight delay.*	>10.0 – 20.0	>10.0 – 15.0
"C"	Stable Operations	*Higher delays result from fair progression. A significant number of vehicles stop, although many continue to pass through the intersection without stopping.*	>20.0 to 35.0	>15.0 – 25.0
"D"	Approaching Unstable	*Congestion is noticeable. Progression is unfavorable, with more vehicles stopping rather than passing through the intersection.*	>35.0 – 55.0	>25.0 – 35.0
"E"	Unstable Operations	*Traffic volumes are at capacity. Users experience poor progression and long delays.*	>55.0 – 80.0	>35.0 – 50.0
"F"	Forced Flow	*Intersection's capacity is oversaturated, causing poor progression and unusually long delays.*	>80.0	>50.0

Source: Highway Capacity Manual 2010,, Transportation Research Board.
[1] Unsignalized intersections include two-way stop controlled intersections and all way stop controlled intersections. Control delay (reported as seconds per vehicle) is quantifiable measure of effectiveness for both signalized and unsignalized intersections, and, according to the 2010 Highway Capacity Manual, page 16-1, includes initial acceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Per the *Highway Capacity Manual 2010,* freeway level of service is based on the density of traffic on the roadway. **Table 2** shows the criteria for freeway LOS based on Passenger Cars/Mile/Lane. In addition to the raw volume of traffic, factors such as the number of travel lanes, the theoretical free-flow speed of traffic on the freeway, and the percentage of trucks and other heavy vehicles all contribute to the calculation of density. The passenger car equivalent for trucks and recreational vehicles varies by terrain, but under generally level conditions, such as US 101 in this area, large trucks are equivalent to 1.5 passenger cars and recreational vehicles are equivalent to 1.2 cars.

Table 2
Freeway Level Of Service Description

Level of Service	Conditions	Signalized Intersection Description	Density Passenger cars/mile/lane
"A"	Free Flow	*Operation of each vehicle is not greatly influenced by others. Speeds are not affected by flow.*	≤11
"B"	Stable	*Drivers begin to respond to the existence of other vehicles in the traffic stream. Operation is still at free-flow speed.*	>11 – 18
"C"	Stable Operations	*The presence of other vehicles begins to restrict maneuverability within the traffic stream. Operations remain at free-flow speed, but course adjustment to find gaps is needed.*	>18 to 26
"D"	Nearing Unstable	*Maneuvering within the traffic stream is quite difficult. Average speed begins to decline with increasing flows.*	>26 – 35
"E"	Unstable Operations	*Operation in the vicinity of capacity. Any perturbation caused by lane-changing or merging maneuvers will create a shockwave in the traffic stream.*	>35-45
"F"	Forced Flow	*Operation within the queue that forms upstream of a breakdown point. Stop and go traffic.*	>45

CHAPTER 3 – EXISTING ENVIRONMENTAL SETTING

Roadways

The Price Canyon Road corridor, to which the project site takes access from, generally travels from the south to the north. However, Price Canyon Road connects two CalTrans facilities, US 101 and SR 227 that also travel south to north in a regional context but locally travel in a southeast to northwest fashion. Under this analysis, these State facilities will be referenced as east to west roadways to provide consistency with the local orientation of the remaining roadway network.

Table 3 lists the study intersections and their associated intersection control.

Table 3: Existing Intersection Control

Intersection	Control Type
1.Price Street at Price Canyon Road(Hinds Ave)	Traffic Signal
2.US 101 Eastbound (Southbound) Ramp at Price Canyon Rd	Eastbound Stop Control
3. Bello Street at Price Canyon Road	East-West Two-Way Stop Control
4. Ormonde Road (Gate 1) at Price Canyon Road	East-West Two-Way Stop Control
5. Gate 2 at Price Canyon Road	East-West Two-Way Stop Control
6. SR 227 at Price Canyon Road (Twin Creeks Way)	Traffic Signal
7. US 101 East (South) of Mattie Road	Freeway Segment
8. US 101 West (north) of /Oak Park Boulevard	Freeway Segment

Price Canyon Road: Price Canyon Road is a two-lane, generally north-south arterial roadway that connects Price Street and the commercial core of Pismo Beach to State Route (SR) 227. The speed limit of Price Canyon Road has a posted speed limit of 40 mph east of Bello Street, increasing to 55 mph 0.5 miles north of Bello Street. South of Price Street this roadway becomes a northbound one-way roadway and is known as Hinds Avenue. North of SR 227, Price Canyon Road is known as Twin Creeks Way.

Price Street: Price Street is a four-lane, east-west roadway with a posted speed limit of 30 mph in the vicinity of Price Canyon Road. In addition to being an arterial roadway that serves the commercial core of Pismo Beach, Price Street also serves as a frontage road for US 101, starting as a westbound off-ramp and eastbound on-ramp east of the Price Canyon Road intersection.

US 101: US 101 is generally four-lane freeway facility that serves the coastal regions of California. From the local context it is an east-west facility, but on a regional but from a regional and statewide perspective it is a north-south highway. Access to the highway in the study area is largely completed via partial interchanges. In addition to the eastbound (southbound) off-ramp to Price Canyon Road; Price Street, Wadsworth Avenue, and Bello Street all have partial interchange access with US 101 with this freeway in this area.

Bello Street: Bello Street is a two-lane east-west collector that provides a connection between Price Canyon Road and the areas of Pismo Beach north of US 101. Bello Street also provides a connection to US 101 with an on-ramp to westbound (northbound) traffic. Bello Street has a posted speed limit of 25 mph west of Price Canyon Road.

Ormonde Road: Ormonde Road is a two-lane roadway that connects Price Canyon Road to Noyes Road. This narrow, largely rural roadway has no posted speed limit in the vicinity of Price Canyon Road.

State Route 227: SR 227 is a two-lane, locally east-west (regionally north-south) route that connects the Cities of San Luis Obispo and Arroyo Grande. The combination of SR 227 and Price Canyon Road form an alternative route to US 101 between San Luis Obispo and Pismo Beach.

Transit

The Regional Transit Authority, Route 10, travels along US 101 but does not stop within the study area. The nearest stop is at the Pismo Beach Premium Outlets.

Bicycle Facilities

Figure 4 illustrates the existing bicycle facilities in the area of the project. Price Canyon Road currently has marked and striped 8-foot-wide bike lanes on the shoulders of both directions of travel between Lemoore Avenue and Ormonde Road. South of Lemoore, the striped bike lanes continue south until the vicinity of Bello Street with a lesser, varying width of travel. SR 227 is considered to have bike lanes due to the wide paved shoulder on the facility; however, the route is not signed or striped as such.

In addition to dedicated and striped bike lanes, there are several other facilities identified by the *San Luis Obispo Bike Map* (SLOCOG, 2010). These facilities fall into one of two categories, Suggested Routes and Recreational Routes. Suggested Routes do not add any special facilities or privileges to riders, and typically are used to connect higher level bike facilities. The County Bike Map has indentified Price Canyon Road east of the marked bike lanes to Hinds Avenue, Price Street and Bello Street north of Price Canyon Road as Suggested Routes.

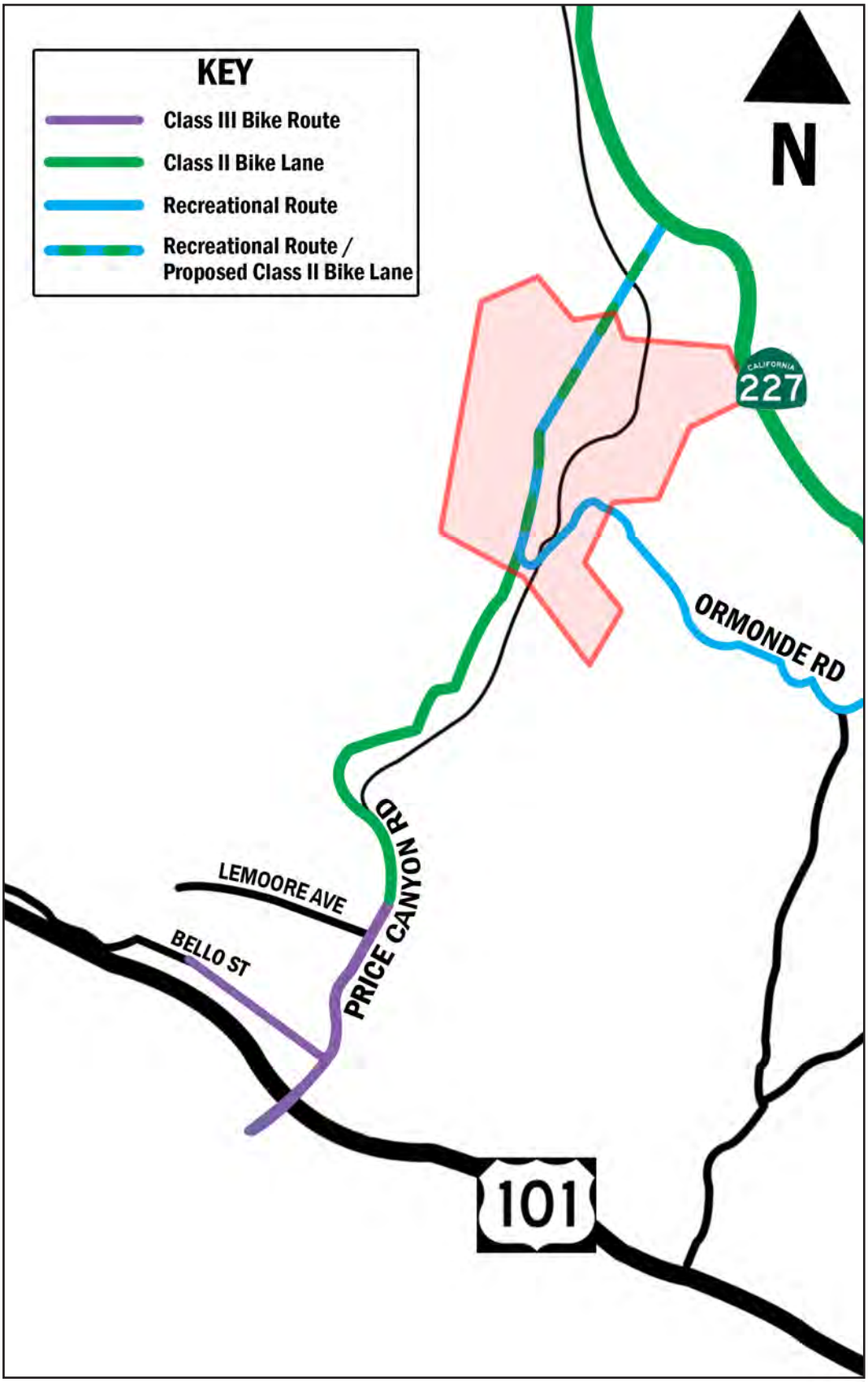

FIGURE 4 - EXISTING BICYCLE FACILITIES

Recreational Routes are similar to Suggested Routes, except while Suggested Routes are generally intended for commuting and other place to place travel, Recreational Routes focus on rural areas where any destination is often secondary in nature. The County Bike Map indentifies Price Canyon Road north of Ormonde Road, as well as and Ormonde Road itself, as Recreational Routes.

The County is in the process of adding bike lanes in both directions from their current termination at Ormonde Road north to SR 227.

Pedestrian Facilities

Currently, due to the rural nature of the area, only highly limited and disconnected pedestrian facilities exist along State Route 227, Ormonde Road, or Price Canyon Road north of Bello Street. Within the City of Pismo Beach and south of Bello Street, Price Canyon Road, Price Street, and Hinds Avenue have a largely complete sidewalk network.

CHAPTER 4 – REGULATORY SETTING

County of San Luis Obispo

The County of San Luis Obispo has adopted as a policy the following Level of Service standards for roads and intersections being evaluated:

> *Rural Areas: Level of Service C is acceptable; Level of Service D is not.*
> *Urban areas: Level of Service D is acceptable; Level of Service E is not.*

As the immediate vicinity of the Phase V Development Project for the Arroyo Grande Oil Field is rural in nature, the stated policy is that the Level of Service in rural areas should be maintained at "C" or better. This applies to the intersections of Gate 1/Ormonde and Gates 2/3 with Price Canyon Road.

The second guidance which was consulted was the San Luis Obispo Traffic Impact Policies document prepared by the Department of Public Works. This guidance document provides specific language for the cumulative conditions predicted in this study. Specifically, the County states:

> *"If a road or intersection has unacceptable LOS under any scenario before the addition of project traffic, adding project traffic to the facility will be a cumulative impact. The TIS should identify necessary measures to bring all roads and intersections to acceptable LOS. For cumulative impacts, it is anticipated that these mitigations will already be identified through the County's ongoing transportation planning efforts. Where these measures have been incorporated into the Capital Improvement Program (CIP) of a community Circulation Study, and a mitigation fee established, payment of this fee is the appropriate mitigation of the identified cumulative impacts.*
>
> *On those occasions where the facilities projected to experience a cumulative impact are not incorporated into a County CIP, additional evaluation will be needed to determine the appropriate mitigation. One possible outcome might be for the project developer to fund the additional analysis (a new Circulation Study) which will form the basis for establishment of a new mitigation fee for the area. These additional study costs will be eligible for "credit" against the amount of the fee to be established for the subject development project. Another alternative is for the TIS to define an "equivalent substitute mitigation measure." This will necessitate the following steps:*

1. *Determine the necessary measures (capital improvements) to bring all roads and intersections into compliance with the County's policy for acceptable LOS.*
2. *Estimate the cost of all improvements identified above.*
3. *Calculate the subject project's "fair share" of the total cost of improvements. The determination of a project's "share" of future improvements should not be based on total traffic, but rather on that portion of future traffic volumes above the acceptable LOS threshold. Following is a table which depicts the approach that shall be used:*

Facility	Future Pk Hr Traffic Volumes (1)	LOS D/E threshold* volume (2)	Future traffic exceeds by: (3)	Project Traffic (4)	Project "Fair Share" (5)
This column shall list each road and/or intersection being considered	This column shall provide volume data for each entry.	This column shall report the applicable LOS threshold, from the Highway Capacity Manual.	(3) = (1) - (2)	This column shall provide the volume of traffic on each facility generated by the project.	(5) = (4) / (3)

4. *Identify one or more improvements from the list whose (combined) value is approximately equal to the project's share.*
5. *The improvement(s) identified shall be the "equivalent substitute mitigation measure" and shall be constructed by the developer as a condition of approval of the subject project."*

California Department of Transportation (Caltrans)

Per its *Guidelines for the Preparation of Traffic Impact Studies, 2002*, "Caltrans endeavors to maintain a target LOS at the transition between LOS 'C' and LOS 'D' on State Highway facilities. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State Highway facility is operating at less than the appropriate target LOS, the existing measures of effectiveness should be maintained." This standard will apply to the intersection of SR 227 at Price Canyon Road, as well as the intersection of Price Canyon Road and the southbound US 101 off-ramp and the intersection of Price Street and Price Canyon Road/Hinds Avenue.

Caltrans acknowledges existing and future congestion concerns on the mainline of US 101, stating in the *Transportation Concept Report for US Route 101 in Caltrans District 5, 2001*, "In the case of Route 101, challenging traffic conditions suggest that LOS D or better will be a more realistic target for much of its course through San Luis Obispo County."

The California Department of Transportation (Caltrans) has developed the "Guide for the Preparation of Traffic Impact Studies" which is intend to provide a starting point and a consistent basis in which Caltrans evaluates traffic impacts to State highway facilities. Caltrans reviews federal, State, and local agency development projects, and land use change proposals for their potential impact to State highway facilities. Where the traffic evaluation establishes traffic conditions will result in levels of service that fall below the Caltrans target, the traffic study should provide the nexus between a project and the traffic impacts to State highway facilities. The traffic study should also establish the rough proportionality between the mitigation measures and the traffic impacts. One method for establishing the rough proportionality or a project proponent's equitable responsibility for a project's impacts is provided in the following formula:

Percent Equitable Share = Peak Hour Project Volume / (Year 2035 Volume – (Existing + Approved Project Volume))

City of Pismo Beach

The City of Pismo Beach has adopted a standard stating that local streets should be designed to operate at Level C or better during peak hours. This would apply only to the intersection of Bello Street and Price Canyon Road.

The following Table 4 provides the applicable jurisdiction and Level of Service threshold for each study location:

Table 4: Study Location Jurisdiction and Impact Thresholds

Intersection	Jurisdiction	LOS Threshold
1.Price Street at Price Canyon Road(Hinds Ave)	Caltrans	C/D
2.US 101 Eastbound (Southbound) Ramp at Price Canyon Road	CalTrans	C/D
3. Bello Street at Price Canyon Road	Pismo Beach	C
4. Gate 1/Ormonde Road at Price Canyon Road	SLO County	C
5. Gate 2/3 at Price Canyon Road	SLO County	C
6. SR 227 at Price Canyon Road (Twin Creeks Way)	CalTrans	C/D
7. US 101 East (South) of Mattie Road	CalTrans	D
8. SR 227 at Price Canyon Road (Twin Creeks Way)	CalTrans	D

CHAPTER 5 – EXISTING CONDITIONS

The Existing intersection lane configurations (as shown on Figure 5) and existing peak hour traffic volumes (as shown on Figure 6) were analyzed for existing levels of service. Table 5 shows the existing Levels of Service or the study intersections respectively. Shaded and **bolded** entries indicate conditions that currently operate below the target or adopted level of service standard as per Chapter 4. Refer to Table 17 for a comparison of the various traffic scenarios assessed as part of this study. Existing intersection levels of service calculations are included in Appendix C.

Table 5: **Existing Level of Service Conditions**		**Level of Service** (Delay in Seconds)	
		AM	**PM**
1. Price Street and Price Canyon Road (Hinds Avenue) *Signalized*	Intersection	B (19)	C (26)
2. SB US 101 Ramp and Price Canyon Road	**Eastbound**	**D (29)**	C (17)
One-Way Southbound Stop Control			
3. Bello Street and Price Canyon Road	Northbound Left	A (8)	A (9)
Two-Way North-South Stop Control	Southbound Left	A (9)	A (8)
	Westbound	**F (61)**	**D (27)**
	Eastbound	B (14)	C (15)
4. Ormonde Rd/Gate #1 and Price Canyon Road	Northbound	A (8)	A (9)
Two-Way North-South Stop Control	Southbound	A (9)	A (8)
	Westbound	B (14)	C (17)
	Eastbound	C (20)	B (13)
5. Gate #2 and Price Canyon Road *Two-Way North-South Stop Control*	Northbound	A (8)	A (9)
	Southbound	A (9)	A (8)
	Westbound	C (16)	C (16)
	Eastbound	B (10)	B (14)
6. SR 227 and Price Canyon Road *Signalized*	Intersection	B (14)	A (9)

Two intersection approaches within the study area are currently experiencing substandard conditions during morning peak hour. The first is the left movement from the US 101 eastbound off-ramp to Price Canyon Road. While the delay at this intersection is considered undesirable, the maximum typical (95th Percentile) queue is estimated to only be 1.01 vehicles, which does not interfere with mainline US 101 traffic. The second intersection operating below the City of Pismo Beach Standard is Bello Street. At this location during both the AM and PM peak hours, the westbound through-left movement is operating below the City's level of service standard of "D", while the remaining movements are operating well above the standard. The remaining intersections are currently operating at or above the appropriate level of service standards.

Table 6: **Existing Freeway Level of Service Conditions**		**Level of Service** *(passenger cars/mile/lane)*	
		AM	**PM**
7. US 101 East (South) of Mattie Road	Westbound	C (20)	B (13)
	Eastbound	B (12)	C (24)
8. US 101 West (North) of Oak Park Blvd	Westbound	D (29)	C (20)
	Eastbound	B (14)	**E (38)**

Table 6 above shows the estimated LOS and lane density of two segments of US 101 north and south of Price Canyon Road. As shown**,** one segment, the southbound traffic north of Oak Park Boulevard, is currently experiencing substandard conditions during the evening peak hour per CalTrans expectations for this freeway. All other segments of traffic appear to be operating adequately.

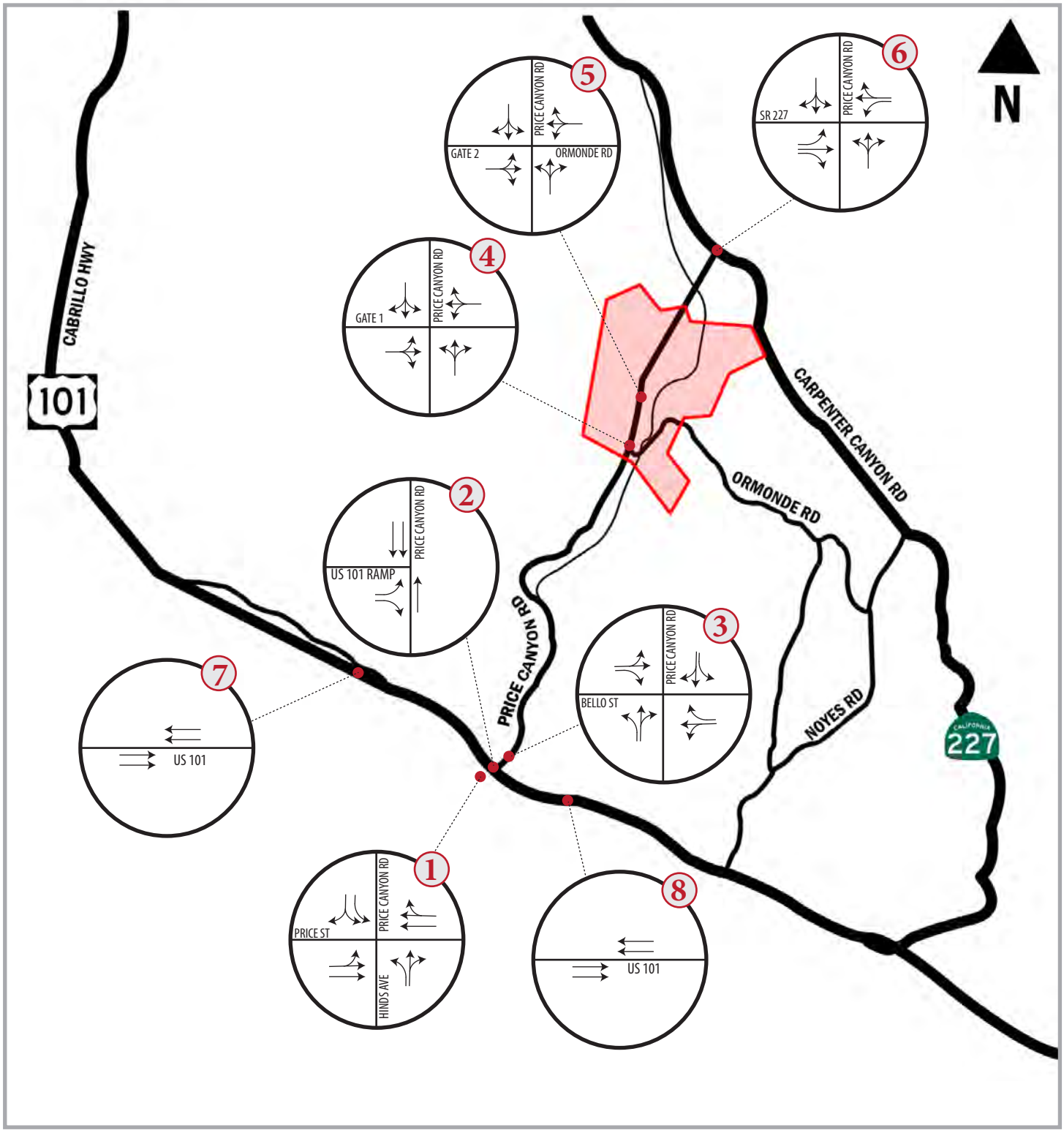

FIGURE 5 - EXISTING LANE CONFIGURATIONS

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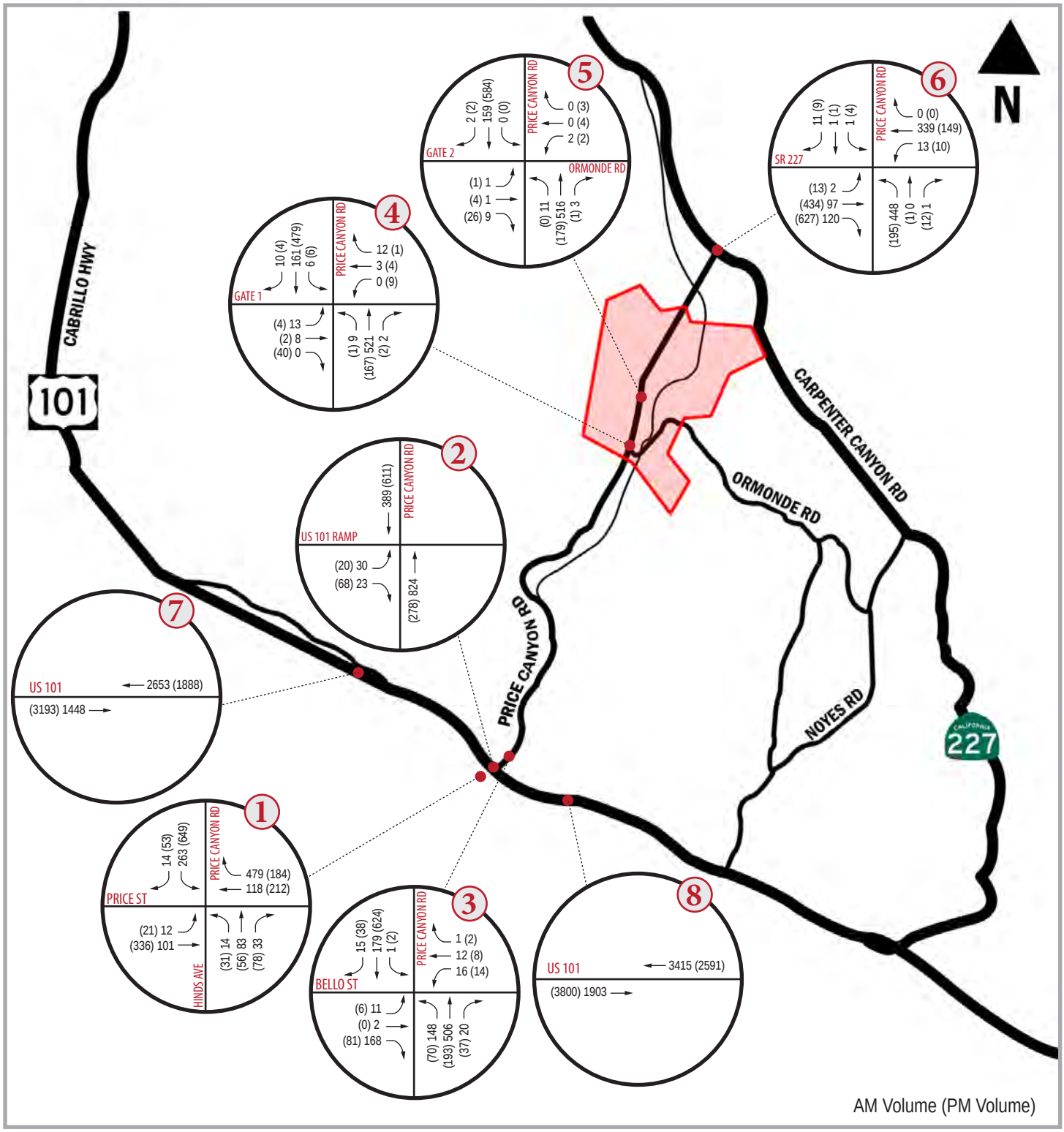

FIGURE 6 - EXISTING TRAFFIC VOLUMES

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CHAPTER 6 – FM O & G PROJECT TRIP GENERATION AND DISTRIBUTION

Project Trip Generation

There are three traffic volume components to the proposed additional development. The first, and primary additional component to peak hour traffic, is the arrival and departure of operations staff, deliveries and visitors. The second component, also related to the operation of the facility, is the additional oil tanker traffic expected to occur as a result of increased production. The final part is the additional traffic associated with construction activities as part of the construction of well pads, drilling activities, well hookups, and steam generator installation.

The Project trip generation has been calculated using data supplied by the Applicant. The trip generation for the Project includes new trips generated to and from the site along Price Canyon Road. The following summarizes the expected additional new one-way trips to be added as a result of the Project:

Operations Staff, Deliveries and Visitors

12 additional daily trips associated with operations staff
10 additional daily trips for operations contractors
8 additional trips for production or workover staff
30 additional operations staff related trips

Oil Shipping Operations

114 additional truck trips per day for the delivery of recovered oil

Construction Activities

96 additional daily trips for well drilling and solids disposal
96 additional construction related trips

This trip generation assumes a worst case scenario of 240 additional trips per day from the project. Actual volumes may be lower as construction activities are expected to be staggered throughout the year.

Oil deliveries would continue to occur during non-peak hours. The following is a summary of expected peak hour trips through Year 2025 while construction activities are occurring:

AM Peak Hour

6 additional peak hour trips associated with additional operations staff
5 additional peak hour trips associated with additional operations contractors
11 additional trips

PM Peak Hour

6 additional peak hour trips associated with additional operations staff
5 additional peak hour trips associated with additional operations contractors
19 additional trips for drilling staff
30 additional operations trips

Under Year 2035 conditions drilling construction activities are expected to be concluded. Under these conditions the PM Peak Hour conditions are anticipated to consist of:

PM Peak Hour

6 additional peak hour trips associated with additional operations staff
5 additional peak hour trips associated with additional operations contractors
11 additional trips

Project Trip Distribution

The existing peak hour traffic using the site exhibits an approximate 35/65 north/south distribution coming to or from Price Canyon Road. As the Phase V Development Project for the Arroyo Grande Oil Field is largely an expansion of existing activities, it was assumed that the additional trips generated by the project will be consistent with the existing activity at the site accesses. As the majority of new trips are commuter based in nature, it was assumed that the distribution of new peak hour trips will follow the existing patterns of the existing intersection counts.

None of the additional oil shipping trips will occur during the two analyzed peak hours. As all the oil deliveries are expected to be made to facilities in Santa Maria, these trips are all expected to travel to or from the site on Price Canyon Road south of the site, utilizing the Price Street interchange to access US 101.

CHAPTER 7 – EXISTING TRAFFIC + FM O&G PROJECT CONDITIONS

To assess the impact that proposed project would have on the surrounding roadway system independent of other development, a scenario consisting of the Existing Traffic + Project conditions was created. The addition of the expected additional peak hour trips to existing conditions can be seen in Figure 7.

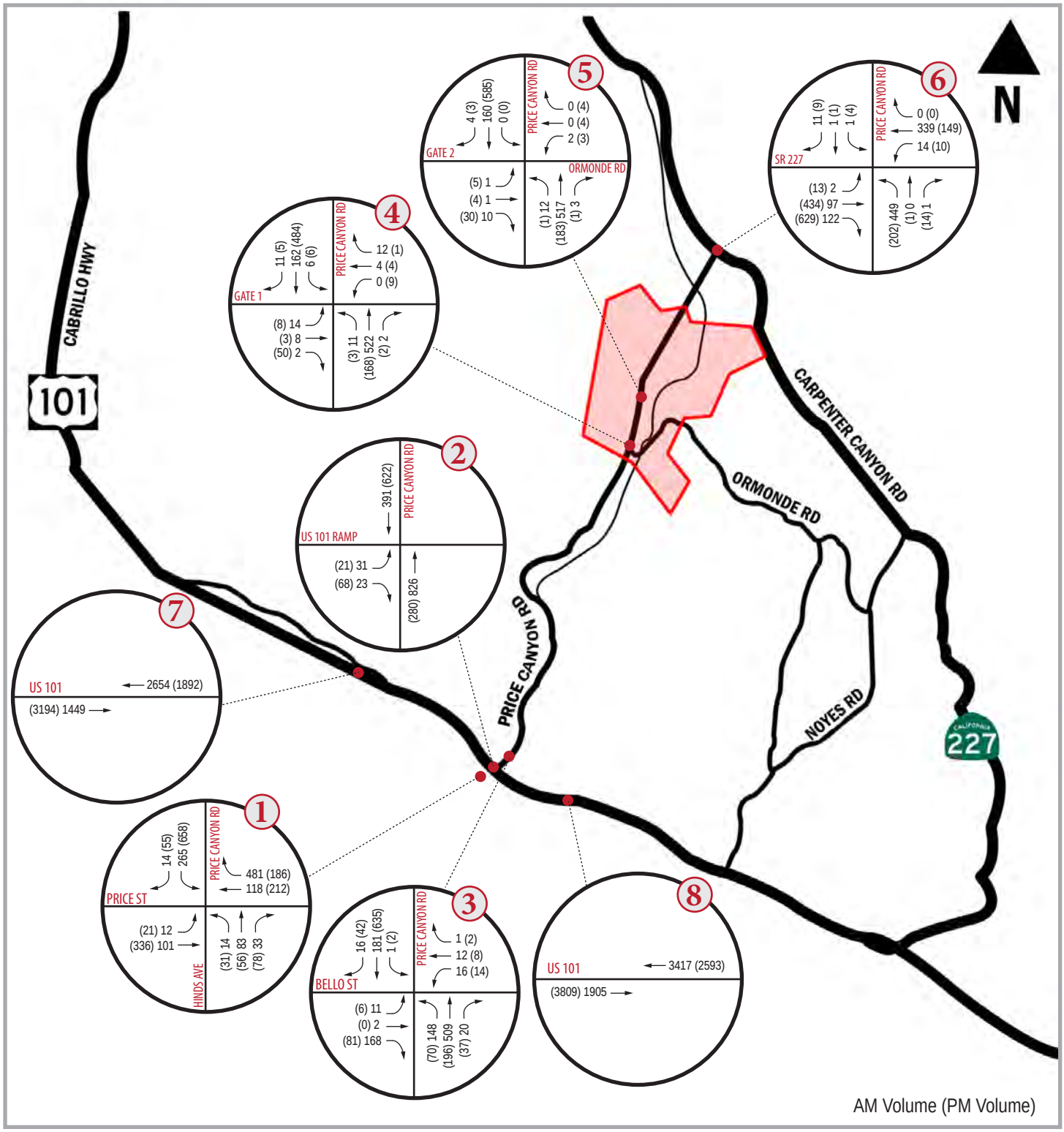

FIGURE 7 - EXISTING + FM O&G PROJECT TRAFFIC VOLUMES

C2 consult

Table 7 shows the resulting estimates in peak hour Level of Service with the traffic from Phase V added to the existing traffic volumes.

Table 7: Existing Traffic + FM O&G Project Study Intersection LOS Conditions		**Level of Service** (Delay in Seconds)	
		AM	**PM**
1. Price Street and Price Canyon Road (Hinds Avenue) *Signalized*	Intersection	B (19)	C (26)
2. SB US 101 Ramp and Price Canyon Road *One-Way Southbound Stop Control*	**Eastbound**	**D (29)**	C (17)
3. Bello Street and Price Canyon Road *Two-Way North-South Stop Control*	Northbound Left	A (8)	A (9)
	Southbound Left	A (9)	A (8)
	Westbound	**F (62)**	**D (28)**
	Eastbound	B (14)	C (16)
4. Ormonde Rd/Gate #1 and Price Canyon Road *Two-Way North-South Stop Control*	Northbound	A (8)	A (9)
	Southbound	A (9)	A (8)
	Westbound	B (14)	C (17)
	Eastbound	C (20)	B (14)
5. Gate #2 and Price Canyon Road *Two-Way North-South Stop Control*	Northbound	A (8)	A (9)
	Southbound	A (9)	A (8)
	Westbound	C (17)	C (16)
	Eastbound	B (10)	C (15)
6. SR 227 and Price Canyon Road *Signalized*	Intersection	B (14)	A (10)

Again, shaded and **bolded** entries indicate conditions that operate below the target or adopted level of service standard. As under the existing traffic conditions, the addition of the FM O & G traffic shows the westbound through-left movement of Bello Street and eastbound ramp of US 101 are projected to continue to experience below target or standard conditions. With the small amount of traffic generated by Phase V these levels of service remain unchanged from the current baseline conditions. Table 8 assesses the estimated impact of project-generated traffic on the adjacent freeway sections during the evening peak hour.

Table 8: Existing + FM O&G Project Freeway Level of Service Conditions		**Level of Service** *(passenger cars/mile/lane)*	
		AM	**PM**
7. US 101 East (South) of Mattie Road	Westbound	C (20)	B (13)
	Eastbound	B (12)	C (24)
8. US 101 West (North) of Oak Park Blvd	Westbound	D (29)	C (20)
	Eastbound	B (14)	**E (38)**

With traffic from the FM O&G project, the southbound direction of US 101 north of Oak Park Boulevard is expected to continue to operate at substandard density of 38 passenger cars/mile/lane (Level of Service E). Given the small amount of project traffic that will pass through this freeway segment, this remains unchanged from the existing conditions.

CHAPTER 8 – Existing Traffic + Approved/Not Built Projects

In addition to the traffic conditions currently being experienced at the subject intersections, there are several other approved or currently planned projects in the vicinity of the project site that may have a significant impact on Level of Service conditions in the area. The impact studies of two projects, the Spanish Springs Development and the Cold Canyon Landfill Expansion were consulted to account for their potential impacts.

In addition to the impacts of these projects, the impacts of several smaller projects located along the SR 227 corridor were also factored into this cumulative scenario. As all these projects are along the SR 227 corridor north of Price Canyon Road, one-quarter of the estimated traffic from these projects was assumed to utilize Price Canyon Road. Figure 8 shows the estimated volumes resulting from the addition of cumulative traffic to existing traffic.

Existing + Approved/Not built Projects Level of Service

The Existing intersection lane configurations (as shown on Figure 5) and Existing + Approved peak hour traffic volumes (as shown on Figure 8) were analyzed for Existing + Approved/Not Built levels of service. Table 9 shows the Existing + Approved/Not Built levels of service for the study intersections respectively. The Existing + Approved/Not Built intersection levels of service calculations are also included in Appendix E.

Table 9: **Existing + Approved/Not Built Study Intersection LOS Conditions**		**Level of Service** (Delay in Seconds)	
		AM	**PM**
1. Price St and Price Canyon Road (Hinds Avenue) *Signalized*	Intersection	B (20)	C (32)
2. SB US 101 Ramp and Price Canyon Road	**Eastbound**	**F (69)**	**D (30)**
One-Way Southbound Stop Control			
3. Bello Street and Price Canyon Road	Northbound Left	A (8)	A (9)
Two-Way North-South Stop Control	Southbound Left	A (9)	A (8)
	Westbound	**F (98)**	**E (36)**
	Eastbound	C (19)	C (18)
4. Ormonde Rd/Gate 1 and Price Canyon Road	Northbound	A (8)	A (9)
Two-Way North-South Stop Control	Southbound	A (9)	A (8)
	Westbound	C (16)	C (23)
	Eastbound	**D (26)**	C (15)
5. Gate 2 and Price Canyon Road	Northbound	A (8)	A (10)
Two-Way North-South Stop Control	Southbound	A (9)	A (8)
	Westbound	C (20)	C (20)
	Eastbound	B (11)	C (17)
6. SR 227 and Price Canyon Road *Signalized*	Intersection	B (16)	B (11)

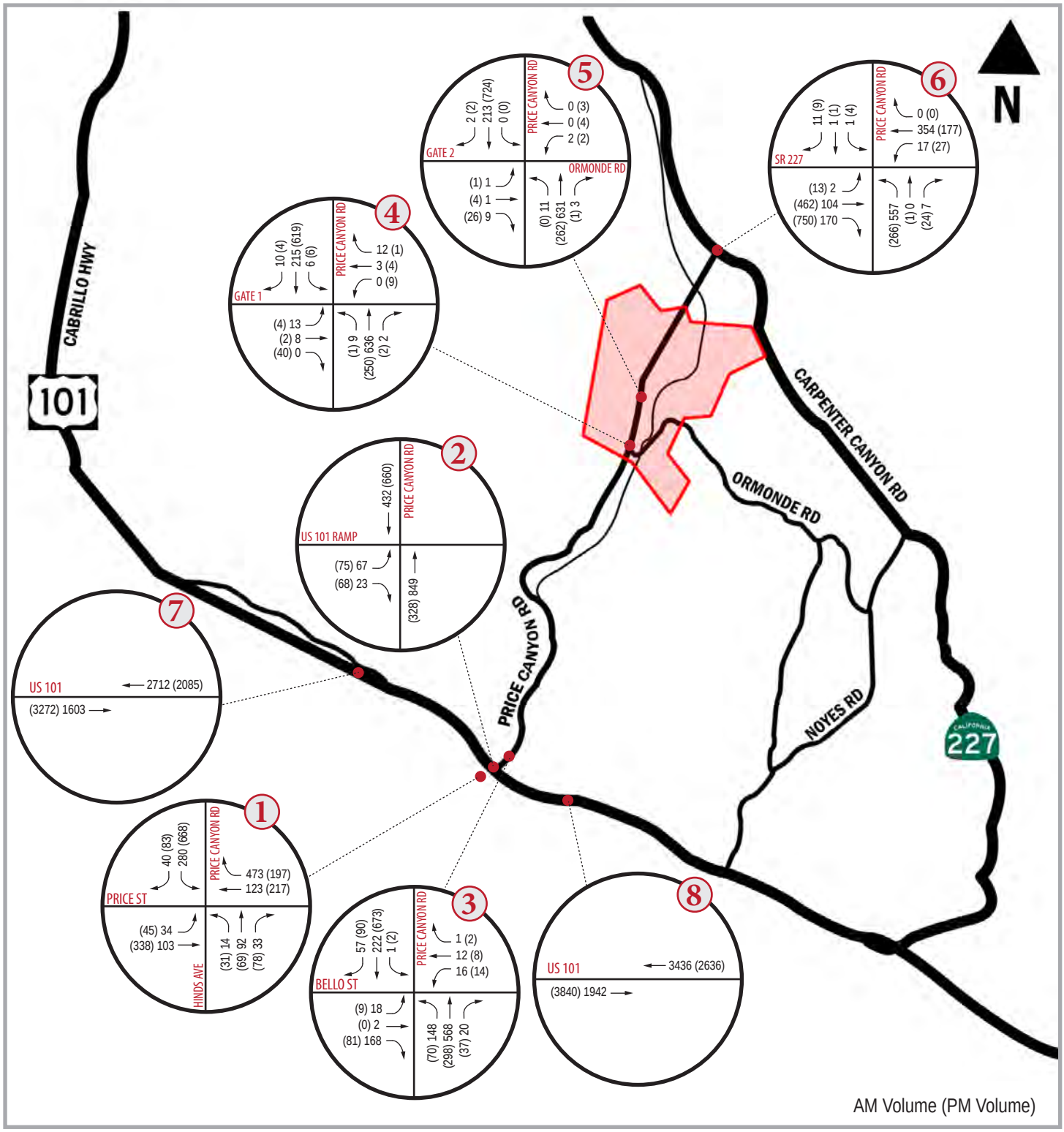

FIGURE 8 - EXISTING + APPROVED PROJECT VOLUMES

C2 consult

Shaded and **bolded** entries indicate conditions that are forecasted (without Phase V Project traffic) to operate below the target or adopted level of service standard. As can be seen in Table 9, the intersections of the US 101 southbound off-ramp at Price Canyon Road and the westbound through-left movement connecting Bello Street to Price Canyon Road are expected to continue to operate below the appropriate level of service standard following the addition of the approved/not built projects' traffic to the existing intersection volumes. In addition, the southbound through-left movement of the Ormonde Road/Gate #1 at Price Canyon Road would also be expected to become substandard following the addition of this traffic. This approach, which is a project site access, would not be expected to gain any additional traffic under Existing + Approved/Not Built conditions, and any degradation can be directly attributed to the additional through traffic expected on Price Canyon Road under Existing + Approved/Not Built conditions.

Table 10 below shows the estimated LOS and density of the two segments of US 101 north and south of Price Canyon Road. As can be seen in Table 9, the same one segment, southbound traffic north of Oak Park Boulevard, would continue to experience substandard conditions under the Existing + Approved/Not Built scenario during the evening peak hour. All other segments of traffic would be expected to operate adequately.

Table 10: **Existing + Approved/Not Built Freeway LOS Conditions**		**Level of Service** *(passenger cars /mile/lane)*	
		AM	**PM**
7. US 101 East (South) of Mattie Road	Westbound	C (21)	B (15)
	Eastbound	B (13)	C (25)
8. US 101 West (North) of Oak Park Blvd	Westbound	D (30)	C (20)
	Eastbound	B (15)	**E (38)**

CHAPTER 9 - EXISTING TRAFFIC + APPROVED/NOT BUILT PROJECTS TRAFFIC + FM O&G PROJECT GENERATED TRAFFIC SCENARIO

This scenario was developed by taking the existing traffic volumes adding the effects of the other approved/not built projects in the area as well as those new trips anticipated by the Phase V Project itself. The resulting volumes can be seen in Figure 9.

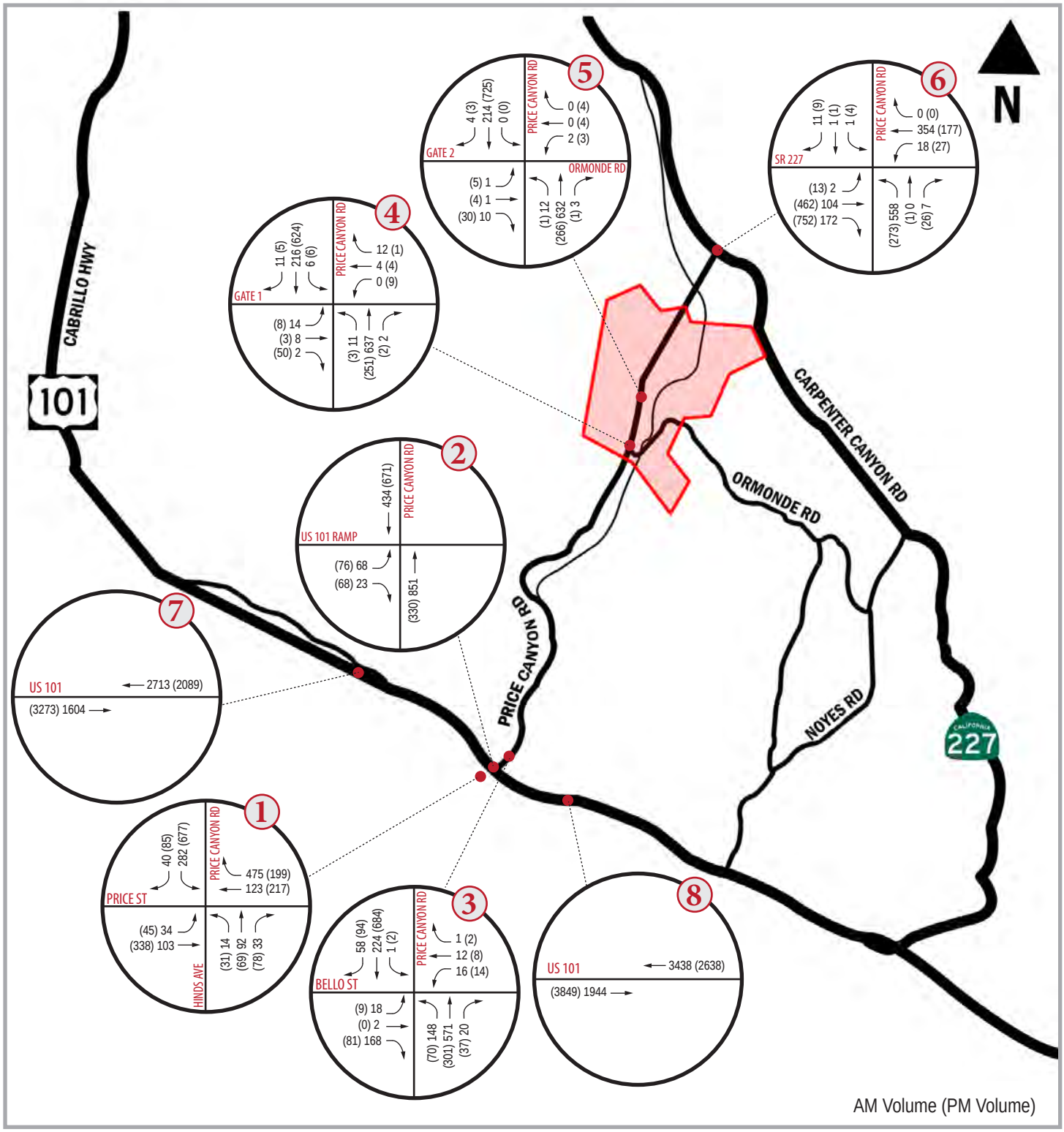

FIGURE 9 - EXISTING + APPROVED + PROJECT VOLUMES

C2 consult

Existing Traffic + Approved/Not Built Projects PLUS Phase V Project Level of Service

Table 11 shows the Existing Traffic + Approved/Not Built Projects PLUS Phase V Project levels of service analysis for the study intersections. Calculations of levels of service are included in Appendix F.

Table 11: Existing + Approved/Not Built + Phase V Project LOS Conditions		**Level of Service** (Delay in Seconds)	
		AM	**PM**
1. Price St and Price Canyon Road (Hinds Avenue) *Signalized*	Intersection	B (20)	C (33)
2. SB US 101 Ramp and Price Canyon Road *One-Way Southbound Stop Control*	**Eastbound**	**F (72)** +3	**D (31)** +1
3. Bello Street and Price Canyon Road *Two-Way North-South Stop Control*	Northbound Left	A (8)	A (9)
	Southbound Left	A (9)	A (8)
	Westbound	**F (100)** +2	**E (37)** +1
	Eastbound	C (19)	C (18)
4. Ormonde Rd/Gate 1 and Price Canyon Road *Two-Way North-South Stop Control*	Northbound	A (8)	A (9)
	Southbound	A (9)	A (8)
	Westbound	C (16)	C (24)
	Eastbound	**D (26)** +0	C (17)
5. Gate 2 and Price Canyon Road *Two-Way North-South Stop Control*	Northbound	A (8)	A (10)
	Southbound	A (9)	A (8)
	Westbound	C (20)	C (21)
	Eastbound	B (11)	C (19)
6. SR 227 and Price Canyon Road *Signalized*	Intersection	B (16)	B (11)

Shaded and **bolded** entries indicate conditions that are projected to operate below the target or adopted level of service standard. As can be seen in Table 11, the same three intersections are projected to continue to operate at substandard levels of service under Existing + Approved/Not Built PLUS Phase V Project conditions. In comparison to Table 9, the average delay at these three locations are not projected to rise appreciably as a result of the addition of Phase V Project traffic. The projected increase in vehicle delay as a result of the Phase V trips is show in Table 11 as a (+) number next to the delay.

The approaches operating below LOS standards, i.e., the stop-controlled approach of the eastbound US 101 off-ramp, the westbound approach of Bello at Price Canyon Road and the eastbound Gate 1 site access are expected to experience no more than three seconds of additional average delay. The site access in particular would be expected to experience no measurable increase in delay. As a result, the impacts of Phase V Project generated traffic are not projected to result in a substantial effect on these intersections.

Table 12 provides the estimated conditions on the subject segments of US 101 north and south of the Price Canyon Road corridor:

Table 12: Existing + Approved/Not Built + Phase V Project Freeway LOS Conditions		**Level of Service** *(passenger cars /mile/lane)*	
		AM	**PM**
7. US 101 East (South) of Mattie Road	Westbound	C (21)	B (15)
	Eastbound	B (13)	C (25)
8. US 101 West (North) of Oak Park Blvd	Westbound	D (30)	C (20)
	Eastbound	B (15)	**E (38)** +0

Under the projected Existing + Approved/Not Built PLUS Phase V conditions, the southbound US 101 North of Oak Park Blvd is projected to continue to operate below the Caltrans level of service target with the traffic from the FM O&G added. However, this represents no change from the baseline conditions as well as the projected conditions with the Cumulative Project's traffic added to the freeway segment. The projected increase in vehicle delay as a result of the Phase V trips is shown in Table 12 as a (+) number next to the delay.

CHAPTER 10 – 2035 CONDITIONS WITHOUT PHASE V

As per the *Traffic Impact Study Policies* of San Luis Obispo County, Year 2035 model average daily traffic roadway link volumes (Appendix G) as provided by San Luis Obispo Council of Governments (SLOCOG) were utilized in this process. It was assumed that the roadway link volumes provided would have peak hour percentages and peak hour directional distributions similar to those currently experienced at each location. These projected peak hour link volumes were then utilized to create turning movements consistent with both a given intersection's location and expected traffic growth.

No roadway lane capacity improvements were assumed under these conditions (Figure 10), as neither the County of San Luis Obispo nor the City of Pismo Beach list any improvements to the Price Canyon Road corridor during the Fiscal Year 2012/2013 ten-year Capital Improvement Program horizon. The assumed Year 2035 baseline condition peak hour volumes (Figure 11) were applied to these roadway conditions to determine an estimate of Level or Service (Table 13).

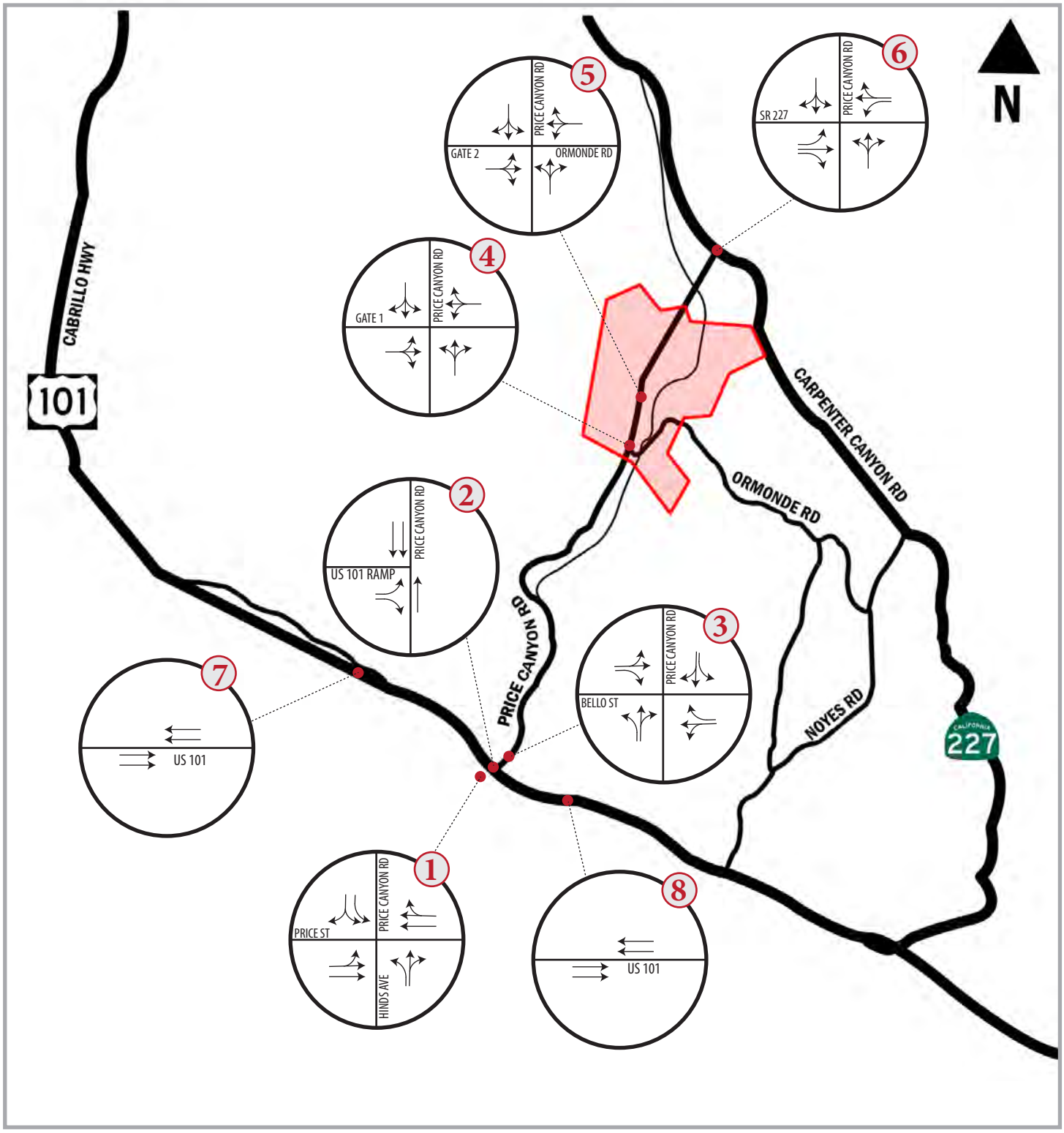

FIGURE 10 - 2035 LANE CONFIGURATIONS

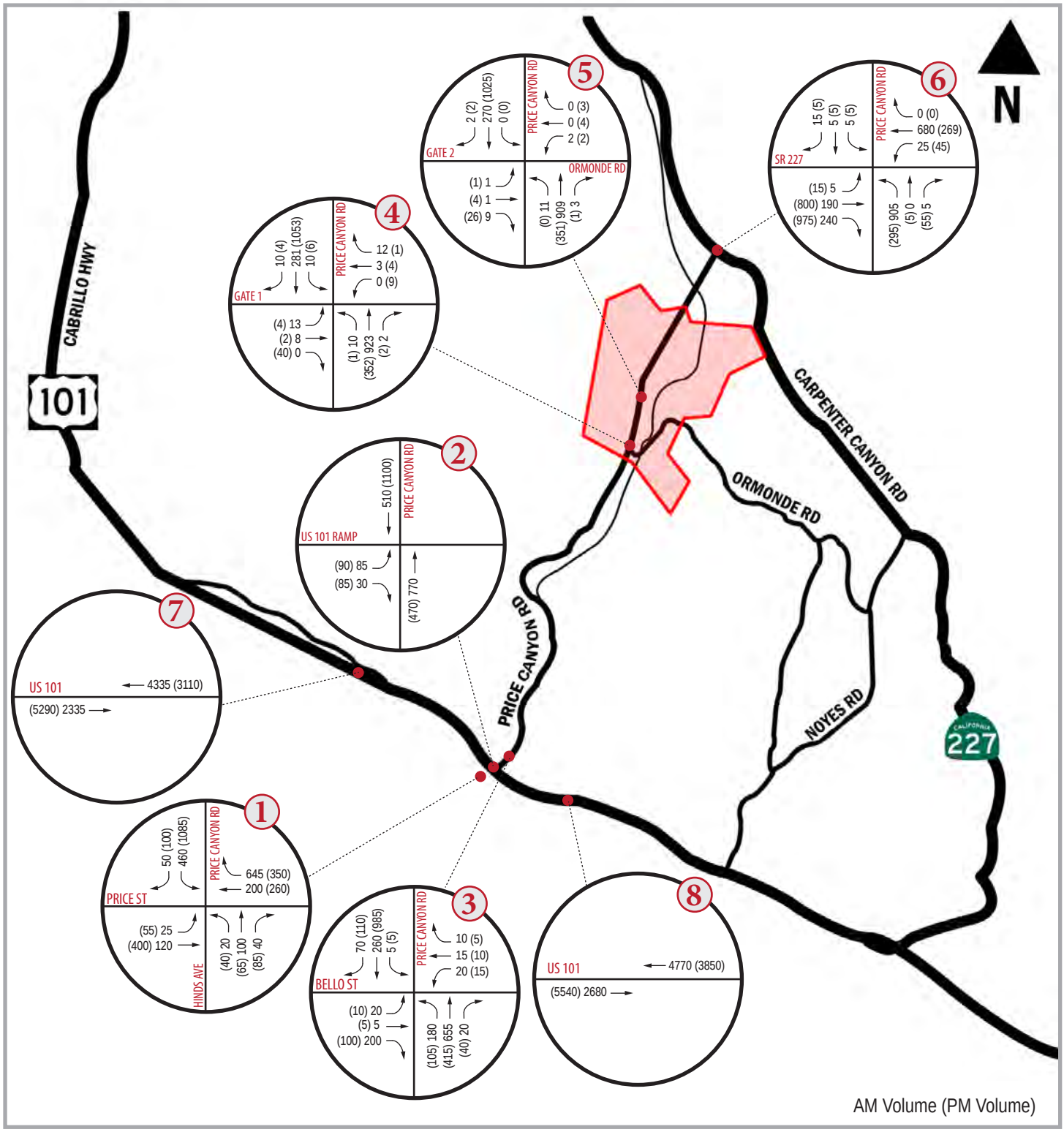

FIGURE 11 - CUMULATIVE VOLUMES

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Table 13: **Year 2035 Cumulative Conditions WITHOUT Phase V**		**Level of Service** (Delay in Seconds)	
		AM	**PM**
1. Price St and Price Canyon Road (Hinds Avenue) *Signalized*	**Intersection**	**D (44)**	**F (151)**
2. SB US 101 Ramp and Price Canyon Road	**Eastbound**	**F (109)**	**F (717)**
One-Way Southbound Stop Control			
3. Bello Street and Price Canyon Road	Northbound Left	A (9)	B (11)
Two-Way North-South Stop Control	Southbound Left	A (10)	A (8)
	Westbound	**F (500)**	**F (170)**
	Eastbound	**E (40)**	**E (36)**
4. Ormonde Rd (Gate 1) and Price Canyon Road	Northbound	A (8)	B (11)
Two-Way North-South Stop Control	Southbound	B (11)	A (8)
	Westbound	C (24)	**F (62)**
	Eastbound	**F (56)**	**D (30)**
5. Gate 2 and Price Canyon Road	Northbound	A (8)	B (11)
Two-Way North-South Stop Control	Southbound	B (10)	A (8)
	Westbound	**D (32)**	**E (35)**
	Eastbound	B (14)	**D (27)**
6. SR 227 and Price Canyon Road *Signalized*	**Intersection**	**F (168)**	C (21)

As can be seen in Table 13, the Price Canyon Road corridor is expected to experience significant increases in delay in the future, with every intersection examined anticipated to experience Levels of Service falling below the target or adopted standards during one or both peak hour periods (shaded and **bolded** entries indicate conditions that are projected to operate below the target or adopted level of service standard). The primary cause of this appears to be an increase in commuter traffic between Pismo Beach and San Luis Obispo. This increase in regional traffic will reduce the available gaps in the Price Canyon Road traffic stream and restrict the ability of side street traffic to enter. Table 14 shows the projected conditions on US 101. The freeway segments are also projected to reflect this overall growth in regional traffic and commuter patterns. As shown below all four segments are projected to experience low levels of service in the future.

Table 14: **Year 2035 Cumulative Freeway LOS Conditions**		**Level of Service** *(passenger cars /mile/lane)*	
		AM	**PM**
7. US 101 West (North) of Mattie Road	**Westbound**	**F (45)**	C (23)
	Eastbound	C (19)	**F (70)**
8. US 101 East (South) of Oak Park Blvd	**Westbound**	**F (61)**	D (35)
	Eastbound	C (21)	**F (156)**

The following Figure 12 provides the estimated Year 2035 traffic volumes with the addition of Project generated traffic. Under this analysis the construction of wells and well pads is expected to be complete, resulting in less evening peak hour traffic than what is expected under short-term conditions.

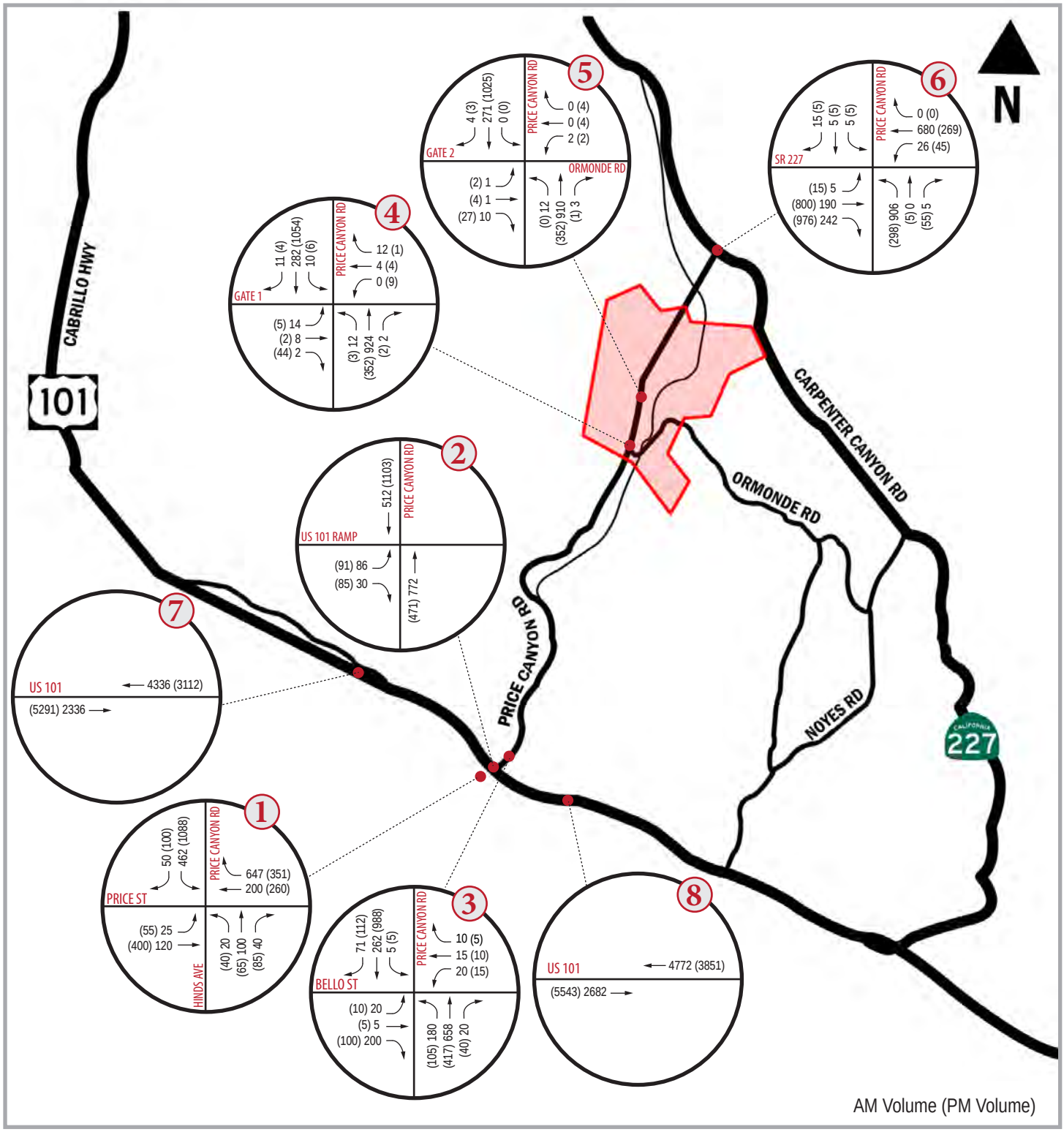

FIGURE 12 - CUMULATIVE + PROJECT VOLUMES

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Table 15 shows the effect that the addition of project generated traffic would have the Price Canyon Road corridor during the evening peak hour:

Table 15: **Year 2035 WITH FM O&G Project Conditions**		**Level of Service** (Delay in Seconds)	
		AM	**PM**
1. Price St and Price Canyon Road (Hinds Avenue) *Signalized*	**Intersection**	**D (45)**	**F (152)**
2. SB US 101 Ramp and Price Canyon Road	Eastbound	**F (115)** +6	**F (735)** +18
One-Way Southbound Stop Control			
3. Bello Street and Price Canyon Road	Northbound Left	A (9)	B (11)
Two-Way North-South Stop Control	Southbound Left	A (10)	A (8)
	Westbound	**F (535)** +35	**F (186)** +16
	Eastbound	**E (41)** +1	**E (37)** +1
4. Ormonde Rd (Gate 1) and Price Canyon Road	Northbound	A (8)	B (11)
Two-Way North-South Stop Control	Southbound	B (11)	A (8)
	Westbound	**D (25)** +1	**F (65)** +3
	Eastbound	**F (57)** +1	**D (31)** +1
5. Gate 2 and Price Canyon Road	Northbound	A (8)	B (11)
Two-Way North-South Stop Control	Southbound	B (10)	A (8)
	Westbound	**D (33)** +1	**D (33)** +2
	Eastbound	B (13)	**D (29)**
6. SR 227 and Price Canyon Road *Signalized*	**Intersection**	**F (168)** +0	C (22)

The additional traffic from FM O&G will have a limited impact on the 2035 operations, with increases in delay in a ranging between +0 seconds per vehicle at the intersection of Price Canyon and SR 227 up to +35 seconds for the westbound approach of Bello Street at Price Canyon Road. At each of these locations, the projected level of service in the baseline condition is not significantly increased by the traffic from the FM O&G project. The projected increase in vehicle delay as a result of the Phase V trips is show in Table 15 as a (+) number next to the delay.

Table 16: **Year 2035 with Project Traffic Freeway Level of Service Conditions**		**Level of Service** *(passenger cars /mile/lane)*	
		AM	**PM**
7. US 101 West (North) of Mattie Road	**Westbound**	**F (45)** +0	C (23)
	Eastbound	C (19)	**F (70)** +0
8. US 101 East (South) of Oak Park Blvd	**Westbound**	**F (61)** +0	D (35)
	Eastbound	C (21)	**F (156)** +0

Table 16 shows the Level of Service that results from the addition of project-generated traffic to the two freeway segments in question:

As can be seen in Table 16, the expected peak-hour effect of the Phase V Development Project for the Arroyo Grande Field is minimal, with the increases in traffic insufficient to increase the passenger car density of the highway. The projected increase in vehicle delay as a result of the Phase V trips is show in Table 16 as a (+) number next to the delay.

CHAPTER 11 - GEOMETRIC ASSESSMENT

As part of the study, the County of San Luis Obispo requested an assessment of the need and feasibility of the introduction of left turn lanes into the FM O&G gates along Price Canyon Road. This request is made in conjunction with a widening project the County is currently evaluating between SR 227 and the City of Pismo Beach. As part of this assessment two components were evaluated; the need for left turn lanes and the geometric potential for those lanes.

In addition to the County's request, Caltrans requested that the turn movement geometry at the intersection of Price Canyon Road/Hinds Avenue at Price Street be evaluated. This involved the development of truck turning templates and applying those to critical movements at this location.

Opposing volume (veh/h)	Advancing volume (veh/h) 5% left turns	10% left turns	20% left turns	30% left turns
40-mph operating speed				
800	330	240	180	160
600	410	305	225	200
400	510	380	275	245
200	640	470	350	305
100	720	515	390	340
50-mph operating speed				
800	280	210	165	135
600	350	260	195	170
400	430	320	240	210
200	550	400	300	270
100	615	445	335	295
60-mph operating speed				
800	230	170	125	115
600	290	210	160	140
400	365	270	200	175
200	450	330	250	215
100	505	370	275	240

Left Turn Lane Analysis at Gates 1/Ormonde Road and Gates 2/3

San Luis Obispo County Department of Public Works & Transportation's *2011 Public Improvement Standards*, Section 3.2.1, reads, "The need for provision of left-turn channelization shall be determined by use of NCHRP graphs or AASHTO warrant table." The American Association of State Highway Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets, 2004* (a.k.a The Green Book), Exhibit 9-75 from this reference (shown below) contains the criteria that would trigger the need for a left turn lane, and it is based upon the operating speed along the roadway, the percentage of advancing traffic that would make a left turn, and the volume of opposing traffic. Given that The posted speed limit on Price Canyon Road in the vicinity of Gates 1 and 2 is 55 mph, however, the more conservative operating speed is 60 mph. **Table 18** shows the anticipated Existing + Approved/Not Built + Project opposing and advancing traffic volumes at Gates 1 and 2, and the anticipated percentage of traffic turning left (based upon existing traffic count data).

Table 17:
Left Turn Warrant Analysis under Existing + Approved/Not Built + Project Scenario

Movement	Opposing Volume (vph)		Advancing Volume (vph)		Left Turns (vph)		Left Turn Percentage		Trigger Met
	AM	PM	AM	PM	AM	PM	AM	PM	
Gate 1 - EB Left	231	629	647	253	9	1	1.4%	0.4%	No
Gate 2 - EB Left	215	726	645	263	11	0	1.7%	0.0%	No
Gate 2 - WB Left	645	263	215	726	0	0	0.0%	0.0%	No

Notes: vph vehicles per hour

As can be seen in **Table 9**, anticipated turning volumes never approach 5% of advancing volumes at any location or period of analysis. This means that the criteria for left turn lanes are not projected to be met under the Existing + Cumulative + Project scenario. As advancing volumes are expected to only increase under Year 2035 conditions, the percentage of turning vehicles is only expected to drop in the future, and these criteria will continue to not be met in the future.

Sight Distance Evaluation at Gate 1 and Gates 2/3

Visibility from Gate 1 and Gates 2/3 is restricted by vegetation, terrain and the limits of the curve radii. This can be especially difficult for vehicles attempting to enter the traffic stream of Price Canyon Road from both Gates, as well as from Ormonde Road, where the sight distance may be more in line with a speed of 35 mph.

While of the overall volume of traffic along Price Canyon Road in the vicinity of the Gates is not significant, the peak hour volumes show high directional volumes. High traffic volumes were observed in the morning commuting from Pismo Beach to San Luis Obispo, this flow reversing in the afternoon peak hour. Existing two-way peak hour volumes of nearly 800 vehicles per hour were observed and limit the number and length of the gaps needed to enter or exit the road.

The posted speed limit for Price Canyon is 55 miles per hour; however field observations suggest that actual speeds may well exceed this figure. Evaluation of the existing curve radii adjacent to the site suggest the current design speed may be substantially higher than 55 mph, which contributes to the high observed speeds. Coupled with the high directional peak hour volumes, this condition adds to the difficulties of vehicles entering or exiting Price Canyon Road.

The existing peak hour traffic counts reveal that the number of turning vehicles entering or exiting Price Canyon Road at the Gates is relatively small. However, the combination of higher speeds, limited sight distance and high directional volumes make these movements difficult. Field observations suggest that entering vehicles are challenged to find available gaps in the traffic stream, and at both Gate 1 and at Gates 2/3, the use of road shoulders to pass vehicles waiting in the through lane to make left turns was observed.

It is recommended that FM O&G work with the County as part of the County design process for the widening of Price Canyon Road to improve the access at Gate 1/Ormonde Road and at Gates 2/3. This should include improving the sight distance, investigating the potential for speed zoning the segment, and the introduction of left turn lanes at the gates. Through a cooperative effort, the County and FM O&G could provide for improved access and enhanced mobility through this critical segment.

As an interim action item, FM O&G should work in concert with the County to clear as much vegetation from the edge of the roadway and Gate areas. The goal is to provide as much sight distance as is possible for vehicles on both Price Canyon and at Ormonde/Gate #1 and Gate #2. This may necessitate removal of vegetation within the County easement and within the FM O&G property.

Price Canyon at Price Street/Hinds Avenue

The intersection of Price Canyon Road at Price Street/Hinds Avenue was constructed as part of the development of the US 101 Freeway project in the 1960's. As part of that design, the freeway ramps were split to provide for southbound off and on-ramps to this intersection as well as a northbound off-ramp. Commercial development can be found on all four corners of the intersections with buildings constructed at the edge of the right-of-way.

As part of this study, Caltrans requested a geometric review of the intersection for the path of travel for typical trucks turning at this intersection. This evaluation is not associated with the FM O&G Project, but pre-dates the proposed project and as stated above is the result of design compromises necessitated in the original freeway design some 50+ years ago.

This diagram shows path of travel estimates for two critical movements at the intersection. The movement from Price Canyon Road to southbound Price Street shows a significant encroachment on the northbound through lane on Price Street. While this movement is restricted, it can be made as the northbound limit bar is positioned to assist by pulling waiting vehicle away from the intersection.

In addition, the northbound right turn from Price Street to Price Canyon Road is significantly restricted. This is due to the narrow departure lane for eastbound traffic on Price Canyon Road. This situation is further complicated by the close proximity of the abutment for the Price Canyon Road structure over the US 101 Freeway.

It should be noted, that these are hypothetical diagrams based on typical truck turning templates. Many situations find that trucks can maneuver at a much higher level than the templates would suggest. Therefore, these diagrams should be considered schematic and used to assess potential geometric concerns.

It is recommended that as development takes place on the northeast corner of the intersection, that consideration be given to reconfiguring the curb return at this location. This would assist with the northbound to eastbound right turn movements at this location. Again, this situation pre-dates the FM O&G project and should be considered as a location specific and long range remediation and ***not*** part of the FM O&G project review.

CHAPTER 12 – IMPACT ANALYSIS

Summary of Level of Service Conditions

Table 17 summarizes the conditions to be expected as part of this study. Shaded and bolded entries are considered significant. Shaded and **bolded** entries indicate conditions that are projected to operate below the target or adopted level of service standard.

Table 18:
Summary of Level of Service

Intersections		**Level of Service** *(Delay in Sec.)*					
		Existing		**Existing+Phase V Project**		**Existing +Approved/Not Built**	
		AM	**PM**	**AM**	**PM**	**AM**	**PM**
Price St and Price Cyn Rd (Hinds) *Signalized*	Intersection	B (19)	C (26)	B (19)	C (26)	B (20)	C (32)
SB US 101 Ramp and Price Cyn	**Eastbound**	**D (29)**	C (17)	**D (29)**	C (17)	**F (69)**	**D (30)**
One-Way SB Stop Control							
Bello Street and Price Canyon	Northbound Left	A (8)	A (9)	A (8)	A (9)	A (8)	A (9)
Two-Way N-S Stop Control	Southbound Left	A (9)	A (8)	A (9)	A (8)	A (9)	A (8)
	Westbound	**F (61)**	**D (27)**	**F (62)**	**D (28)**	**F (98)**	**E (36)**
	Eastbound	B (14)	C (15)	B (14)	C (16)	C (19)	C (18)
Ormonde/Gate #1 and Price Cyn	Northbound	A (8)	A (9)	A (8)	A (9)	A (8)	A (9)
Two-Way N-S Stop Control	Southbound	A (9)	A (8)	A (9)	A (8)	A (9)	A (8)
	Westbound	B (14)	C (17)	B (14)	C (17)	C (16)	C (23)
	Eastbound	C (20)	B (13)	C (20)	B (14)	**D (26)**	C (15)
Gate #2 and Price Canyon Rd	Northbound	A (8)	A (9)	A (8)	A (9)	A (8)	A (10)
Two-Way N-S Stop Control	Southbound	A (9)	A (8)	A (9)	A (8)	A (9)	A (8)
	Westbound	C (16)	C (16)	C (17)	C (16)	C (20)	C (20)
	Eastbound	B (10)	B (14)	B (10)	C (15)	B (11)	C (17)
SR 227 and Price Canyon Rd *Signalized*	Intersection	B (14)	A (9)	B (14)	A (10)	B (16)	B (11)
Freeway segments		**Level of Service** (passenger cars/mile/lane)					
		AM	**PM**	**AM**	**PM**	**AM**	**PM**
US 101 East (South) of Mattie Rd	Westbound	C (20)	B (13)	C (20)	B (13)	C (21)	B (15)
	Eastbound	B (12)	C (24)	B (12)	C (24)	B (13)	C (25)
US 101 West (North) of Oak Park Blvd	Westbound	D (29)	C (20)	D (29)	C (20)	D (30)	C (20)
	Eastbound	B (14)	**E (38)**	B (14)	**E (38)**	B (15)	**E (38)**

Table 18 (Continued):
Summary of Level of Service

Intersections		Level of Service (Delay in Sec.)					
		Existing+Approved/ Not Built+ Phase V Project		2035 Cumulative		2035 Cummulative PLUS Phase V Project	
		AM	PM	AM	PM	AM	PM
Price St and Price Cyn Rd (Hinds) *Signalized*	**Intersection**	B (20)	C (33)	**D (44)**	**F (151)**	**D (45)**	**F (152)**
SB US 101 Ramp and Price Cyn	**Eastbound**	**F (72)**	**D (31)**	**F (109)**	**F (717)**	**F (115)**	**F (735)**
One-Way SB Stop Control							
Bello Street and Price Canyon	Northbound Left	A (8)	A (9)	A (9)	B (11)	A (9)	B (11)
Two-Way N-S Stop Control	Southbound Left	A (9)	A (8)	A (10)	A (8)	A (10)	A (8)
	Westbound	**F (100)**	**E (37)**	**F (500)**	**F (170)**	**F (535)**	**F (186)**
	Eastbound	C (19)	C (18)	**E (40)**	**E (36)**	**E (41)**	**E (37)**
Ormonde/Gate #1 and Price Cyn	Northbound	A (8)	A (9)	A (8)	B (11)	A (8)	B (11)
Two-Way N-S Stop Control	Southbound	A (9)	A (8)	B (11)	A (8)	B (11)	A (8)
	Westbound	C (16)	C (24)	C (24)	**F (62)**	**D (25)**	**F (65)**
	Eastbound	**D (26)**	C (17)	**F (56)**	**D (30)**	**F (57)**	**D (31)**
Gate #2/3 and Price Canyon Rd	Northbound	A (8)	A (10)	A (8)	B (11)	A (8)	B (11)
Two-Way N-S Stop Control	Southbound	A (9)	A (8)	B (10)	A (8)	B (10)	A (8)
	Westbound	C (20)	C (21)	**D (32)**	**E (35)**	**D (33)**	**D (33)**
	Eastbound	B (11)	C (19)	B (14)	**D (27)**	B (13)	**D (29)**
SR 227 and Price Canyon Rd *Signalized*	**Intersection**	B (16)	B (11)	**F (168)**	C (21)	**F (168)**	C (22)
Freeway segments		Level of Service (passenger cars/mile/lane)					
		AM	PM	AM	PM	AM	PM
US 101 East (South) of Mattie Road	**Westbound**	C (21)	B (15)	**F (45)**	C (23)	**F (45)**	C (23)
	Eastbound	B (13)	C (25)	C (19)	**F (70)**	C (19)	**F (70)**
US 101 West (North) of Oak Park Blvd	**Westbound**	D (30)	C (20)	**F (61)**	D (35)	**F (61)**	D (35)
	Eastbound	B (15)	**E (38)**	C (21)	**F (156)**	C (21)	**F (156)**

Project Specific Impacts
The following discusses the project specific impacts resulting from the FM O & G Phase V Project.

Price Street at Price Canyon Road: This intersection currently operates above the target level of service established by Caltrans. Under all three near-term scenarios (existing + Phase V, existing + approved projects/not yet built and existing + approved projects/not yet built plus Phase V) this intersection is projected to continue to operate above the Caltrans level of service target.

Therefore, impacts would be less than significant and no Phase V Project mitigation is required.

US 101 Southbound Ramps and Price Canyon Road: This eastbound one-way stop-controlled intersection currently operates below the Caltrans' target Level of Service of "C/D', with the off-ramp currently operating at Level of Service "D" during the morning peak hour. The other movements at this intersection currently operate above the target in the AM peak hour. This intersection currently operates satisfactorily during the evening peak hour.

With trips from the Phase V Project added to the existing traffic volumes the level of service at this location are projected to remain unchanged. Only 1 second of vehicle delay is expected to be added as a result of the Phase V Project trips.

Under the existing traffic + approved but not yet built PLUS the FM O&G Project scenario, Phase V is projected to add no more than 1 trip to the stop-controlled approach of this intersection during any peak hour assessed. The FM O&G Project is not projected to substantially degrade the level of service at this intersection. With Phase V traffic added it is projected to continue to operate at the same levels of service as currently seen with only +3 vehicle seconds added in the morning peak hour and +1 second added in the afternoon peak hour.

Therefore, impacts would be less than significant and no Phase V Project mitigation is required.

Bello Street at Price Canyon Road: The westbound approach (Bello) of this east-west two-way stop-controlled intersection is currently operating at Level of Service "F" during the morning peak hour and "D" during the evening peak hour. This is not meeting the City of Pismo Beach's desire for Level of Service "C". The existing traffic volumes do not currently meet the peak hour traffic signal warrant.

The addition of FM O&G Project generated traffic would be expected to add 5-18 peak hour trips to the uncontrolled movements of Price Canyon Road, adding one second of average delay to the westbound approach. Therefore, the FM O&G project is not expected to substantially degrade the level of service at this intersection under the existing traffic + FM O & G Project scenario.

The addition of existing traffic + approved but not yet built traffic to this intersection is however, is projected to substantially increase the vehicle delay for the westbound approach in both the morning and afternoon peak hours. The only viable option to mitigate conditions at this intersection would be signalization. However, the intersection is projected to not meet the peak hour traffic signal warrant under this scenario.

Under the existing traffic + approved but not yet built PLUS the FM O&G Project scenario, Phase V is projected to add no more than 18 PM peak hour trips to the intersection.. The FM O&G Project is not projected to substantially degrade the level of service at this intersection. With Phase V traffic added it is projected to continue to operate at the same levels of service as currently seen with only +2 vehicle seconds added in the morning peak hour and +1 second added in the afternoon peak hour. The intersection is projected to not meet the peak hour traffic signal warrant under this scenario.

Therefore, the FM O & G project is not expected to substantially degrade level of service at this intersection and impacts would be less than significant and no Phase V Project mitigation is required.

Gate 1/Ormonde Road at Price Canyon Road: This location is currently operating above the County's level of service standard and is projected to continue to operate at this level with the traffic from Phase V added.

With the development of the existing traffic + approved but not yet built projects the eastbound level of service in the AM peak hour is projected to drop below the County's standard. This is due to the increase in trips passing the Gate/Ormonde intersection along Price Canyon Road.

The addition of the FM O&G trips to the existing traffic + approved but not yet built traffic results in no substantial change in the projected level of service. The AM peak hour is projected to see no increase in the level of service or the average vehicle delay with the added Phase V trips.

Therefore, impacts would be less than significant and no Phase V Project mitigation is required.

Gate 2/3 at Price Canyon Road: This intersection currently operates above the target level of service established by the County of San Luis Obispo. Under all three near-term scenarios this intersection is projected to continue to operate above the County level of service target.

Therefore, impacts would be less than significant and no Phase V Project mitigation is required.

SR 227 at Price Canyon Road: This intersection currently operates above the target level of service established by Caltrans. Under all three near-term scenarios (existing + Phase V, existing + approved projects/not yet built and existing + approved projects/not yet built plus Phase V) this intersection is projected to continue to operate above the Caltrans level of service target.

Therefore, impacts would be less than significant and no Phase V Project mitigation is required.

US 101 Mainline: During the current evening peak hour eastbound US 101 north of Oak Park Boulevard is currently experiencing Level of Service "E" conditions, lower than the D target call for by Caltrans. Both Regional and Caltrans long range plans and policies call for limited capacity enhancement along this segment of the freeway. Specifically, the *2010 Regional Transportation Plan-Preliminary Sustainable Communities Strategy* prepared by the San Luis Obispo Council of Governments does not anticipate that US 101 will be expanded to six-lanes in the study area. However, FM O&G Project generated traffic is expected to add only 9 additional trips in the southbound direction and 2 trips in the northbound direction at this location during the PM peak hour.

Therefore, impacts would be less than significant and no Phase V Project mitigation is required.

Cumulative Impacts (Year 2035 Conditions)

They are based on the SLOCOG Regional Traffic Model 2035 traffic projections and reflect overall growth in regional traffic in South County and commuter trips between San Luis Obispo and Pismo Beach. They show the need for additional capacity on US 101 and SR 227 along with Price Canyon Road in order to maintain target or adopted level of service standards. However, with the exception of the addition of bike lanes along Price Canyon Road, no capacity enhancing projects have been identified or funded by the County of San Luis Obispo, the City of Pismo Beach or Caltrans at this juncture.

Price Street at Price Canyon Road: This signalized intersection is expected to function below the Caltrans target of Level of Service "C/D" during both peak hours in 2035. This condition is projected to occur with or without FM O&G Project generated traffic, which is projected to only add 1 second of vehicle delay to this location in both the AM and PM peak hours. The key movement, especially during the evening peak hour, appears to be the southbound left turning vehicles from Price Canyon Road to Price Street.

This additional traffic from the Phase V project will not substantially change the future cumulative levels of service, however, while small in total, Phase V project traffic volume, the incremental portion is considered "cumulatively considerable' based on the interpret ion of the County of San Luis Obispo Traffic Impact Policy.

This intersection in conjunction with the US 101 Southbound off-ramp warrants a substantial evaluation to determine the feasibility for long-range traffic operational improvements. Given the limited space available for enhancing capacity in this area, a more substantial assessment, such as a Caltrans project study report, would provide added details on the feasibility, if any, for some level of operational improvement at these locations.

Utilizing the CalTrans' *Guide for the Preparation of Traffic Impact Studies* Equation for the Equitable Share Responsibility:

Percent Equitable Share = Peak Hour Project Volume / (Year 2035 Volume – (Existing + Approved Project Volume))

The FM O&G Project traffic would yield a 0.56% share. Because this is a long-range issue the result of regional growth in traffic and the improvements are not associated with impacts from the FM O&G Project, payment of this proportional share toward this feasibility study should be deemed full mitigation for this location.

US 101 Southbound Ramps and Price Canyon Road: This intersection is projected to see the off-ramp traffic deteriorate to a substandard Level of Service under the Year 2035 conditions with or without FM O&G Project generated traffic as a result of increased through traffic on Price Canyon Road. The key movement is to be the eastbound left turning vehicles from the ramp to northbound Price Canyon Road.

This intersection in conjunction with the Price Street at Price Canyon Road intersection warrants a substantial evaluation to determine the feasibility for long-range traffic operational improvements. Given the limited space available for enhancing capacity in this area, a more substantial assessment, such as a Caltrans project study report, would provide added details on the feasibility, if any, for some level of operational improvement at these locations.

This additional traffic from the Phase V project will not substantially change the future cumulative levels of service, however, while small in total, Phase V project traffic volume, the incremental portion is considered "cumulatively considerable' based on the interpret ion of the County of San Luis Obispo Traffic Impact Policy.

The FM O&G Project traffic would yield a 0.81% pro-rated share. Because this is a long-range issue the result of regional growth in traffic and the improvements are not associated with impacts from the FM O&G Project, FM O&G shall pay this proportional share toward this feasibility study, should be deemed full mitigation for this location.

Assuming the cost of this interchange feasibility study is $500,000 and using the higher value of FM O&G's pro-rated share of traffic in the vicinity of the interchange (0.81%), FM O & G will be responsible for the payment of $4,050 to Caltrans or SLOCOG for the preparation of this interchange feasibility study. This study would address both the Price Street at Price Canyon Road and the US 101 Southbound Ramps and Price Canyon Road intersections.

Bello Street at Price Canyon Road: This intersection is projected to see selected movements deteriorate to a substandard Level of Service under the Year 2035 conditions with or without FM O&G Project generated traffic as a result of increased through traffic on Price Canyon Road. Both the east and westbound movements are projected to see levels of service below the City's standard. With the increase in regional traffic at this intersection, the peak hour traffic signal warrant is projected to meet. Given the projected sub-standard level of service it is recommended that this intersection be signalized in the future. Timing of this signal installation should be determined by the City of Pismo Beach after an engineering study is completed and fully supports the installation of a traffic signal. The FM O&G Project would yield a 1.33% share assuming the Spanish Springs development has been approved.

This additional traffic from the Phase V project will not substantially change the future cumulative levels of service, however, while small in total, Phase V project traffic volume, the incremental portion is considered "cumulatively considerable' based on the interpret ion of the County of San Luis Obispo Traffic Impact Policy.

Assuming the cost of the future traffic signal is $842,000 and using the value of FM O&G's pro-rated share of 1.33%, FM O & G will be responsible for the payment of $11,199 to the City of Pismo Beach for the future installation of this traffic signal. It is anticipated that the traffic signal will be installed at a future date when one or more of the State Traffic Signal Warrants are met.

Gate 1/Ormonde at Price Canyon Road: This intersection is projected to see selected movements deteriorate to a substandard Level of Service under the Year 2035 conditions with or without FM O&G Project generated traffic as a result of increased through traffic on Price Canyon Road. The substandard movements are however limited to the traffic exiting both Gate 1 and Ormonde Road entering onto Price Canyon Road. Given the limited Gate volumes, the projected traffic would not meet the peak hour traffic signal warrant. Further, the 95th percentile queues on Gate #1 or on Ormonde Road at this intersection are expected to be less than one vehicle in length.

Therefore, the Phase V Project's contribution to the cumulative impacts would be less than considerable and no mitigation measures are recommended at this location.

Gate 2/3 at Price Canyon Road: This intersection is projected to see selected movements deteriorate to a substandard Level of Service under the Year 2035 conditions with or without FM O&G Project generated traffic as a result of increased through traffic on Price Canyon Road. The substandard movements however are limited to the traffic exiting the Gates entering onto Price Canyon Road. Given the limited Gate volumes, the projected traffic would not meet the peak hour traffic signal warrant. Further, the 95th percentile queues on Gate #2 and Gate #3 are expected to be less than one vehicle in length.

Therefore, the Phase V Project's contribution to the cumulative impacts would be less than considerable and no mitigation measures are recommended at this location.

SR 227 and Price Canyon Road: This signalized intersection is expected to experience substandard conditions under Year 2035 morning peak hour conditions. Therefore, any Phase V Project additions would be considered considerable contribution to the cumulative impacts. The single northbound

Price Canyon Road approach lane should be expanded to a three lane cross section (two dedicated left turn lanes and through-right lane) to accommodate Year 2035 traffic volumes. This would also require the construction of a second receiving lane on SR227 to accommodate the second northbound left turn lane.

The FM O&G Project's equitable share during the morning peak hour would be approximately 0.54%. Assuming the cost of these improvements are $875,000 and using the value of FM O&G's pro-rated share of 0.54%, FM O & G will be responsible for the payment of $4,725 to Caltrans for the future addition of an additional northbound left turn lane on Price Canyon Road.

US 101 Mainline: In 2035 the segments of US 101 east and west of Price Canyon Road are projected to operate below the Caltrans target with and without the FM O&G Project traffic. Regional and Caltrans long range plans and policies call for limited capacity enhancement along this segment of the freeway. Specifically, the *2010 Regional Transportation Plan-Preliminary Sustainable Communities Strategy* prepared by the San Luis Obispo Council of Governments does not anticipate that US 101 will be expanded to six-lanes in the study area. As such no feasible mitigations are currently available for this condition.

FM O&G Project generated traffic is expected to add only 9 additional trips in the southbound direction and 2 trips in the northbound direction at this location during the PM peak hour.

Therefore, no Phase V Project mitigation is required of this project .

APPENDIX A
REFERENCES

This report was prepared using information taken from the following sources:

Public Improvement Standards, *San Luis Obispo County Department of Public Works & Transportation*, 2011.

2010 Highway Capacity Manual (HCM 2010), *Transportation Research Board*, 2010.

HCS 2010 (V6.5), *McTrans*, 2013.

San Luis Obispo Bike Map, *San Luis Obispo Council of Governments*, 2010.

Regional Transportation Plan-Preliminary Sustainable Communities Strategy, *San Luis Obispo Council of Governments, 2010*

Guide for the Preparation of Traffic Impact Studies, *State of California Department of Transportation, December*, 2002.

Traffic Impact Analysis for Site Development, A Recommended Practice, *Institute of Transportation Engineers, Transportation Planners Council Task Force on Traffic Access/Impact Studies*, 2006.

Trip Generation, 9th Edition, Volume 2, *Institute of Transportation Engineers*, 2012.

A Policy on Geometric Design of Highways and Streets, *American Association of State Highway Transportation Officials*, 2004.

APPENDIX B
EXISTING TRAFFIC COUNTS

Intersection: Price Street @ Price Canyon Road/Hinds Street
Date: 7/11/2013
Day: Thursday
Notes: Slight overcast with no precipation in AM, Clear in PM. PM Counts Taken 4:00-7:30

	Price St			*Price St*			*Hinds St*			*Price Canyon Rd*		
AM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7:15		28	155	5	16		2	30	6	69		7
7:30		30	132	1	21		2	25	13	46		3
7:45		26	80	3	37		4	15	4	64		1
8:00		34	112	3	27		6	13	10	84		3
8:15		38	62	4	31		5	9	11	70		11
8:30		42	50	4	34		6	11	12	63		5
8:45		30	47		33		6	8	9	63		1
Count Total	*0*	*228*	*638*	*20*	*199*	*0*	*31*	*111*	*65*	*459*	*0*	*31*
Peak Hour Total	***0***	***118***	***479***	***12***	***101***	***0***	***14***	***83***	***33***	***263***	***0***	***14***
PHF	***0.878145***											
% Trucks	***0.6%***											

	Price St			*Price St*			*Hinds St*			*Price Canyon Rd*		
PM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
4:00												
4:15												
4:30		50	53	5	78		13	18	20	195		20
4:45		50	47	6	97		13	17	25	216		17
5:00		53	54	6	72		8	10	19	169		14
5:15		58	41	6	76		6	18	22	145		6
5:30		51	42	3	91		4	11	12	119		16
5:45		53	42	2	92		11	17	21	146		7
6:00												
6:15												
6:30												
6:45												
7:00												
7:15												
Count Total	*0*	*315*	*279*	*28*	*506*	*0*	*55*	*91*	*119*	*990*	*0*	*80*
Peak Hour Total	***0***	***212***	***184***	***21***	***336***	***0***	***31***	***56***	***78***	***649***	***0***	***53***
PHF	***0.829918***											
% Trucks	***0.2%***											

Intersection: South Bound Off Ramp @ Price Canyon Road
Date: 5/15/2013 (PM), 5/16/2013 (AM)
Day: Wednesday,Thursday
Notes: Slight overcast with no precipation in AM, Clear in PM. PM Counts Taken 4:00-7:30

	Off Ramp						*Price Canyon Rd*			*Price Canyon Rd*		
AM Peak Hour	SBL		SBR					EBT			WBT	
7:00												
7:15	5		8					248			78	
7:30	11		1					142			75	
7:45	3		4					224			119	
8:00	11		10					210			117	
8:15	3		10					123			74	
8:30	8		10					108			71	
8:45	2		2					32			21	
Count Total	*43*	*0*	*45*	*0*	*0*	*0*	*0*	*1087*	*0*	*0*	*555*	*0*
Peak Hour Total	***30***	***0***	***23***	***0***	***0***	***0***	***0***	***824***	***0***	***0***	***389***	***0***
PHF	***0.904286***											
% Trucks	***0.3%***											

	Off Ramp						*Price Canyon Rd*			*Price Canyon Rd*		
PM Peak Hour	SBL		SBR					EBT			WBT	
4:00												
4:15												
4:30	3		8					24			89	
4:45	5		9					34			100	
5:00	4		10					32			112	
5:15	4		6					37			102	
5:30	6		18					74			179	
5:45	6		19					89			165	
6:00	3		17					56			122	
6:15	5		14					59			145	
6:30	2		13					34			72	
6:45	2		5					22			50	
7:00												
7:15												
Count Total	*40*	*0*	*119*	*0*	*0*	*0*	*0*	*461*	*0*	*0*	*1136*	*0*
Peak Hour Total	***20***	***0***	***68***	***0***	***0***	***0***	***0***	***278***	***0***	***0***	***611***	***0***
PHF	***0.875448***											
% Trucks	***5.6%***											

Intersection: Bello Street @ Price Canyon Road
Date: 5/15/2013 (PM), 5/16/2013 (AM)
Day: Wednesday,Thursday
Notes: Slight overcast with no precipitation in AM, Clear in PM. PM Counts Taken 4:00-7:30

	Bello St			*Bello St*			*Price Canyon Rd*			*Price Canyon Rd*		
AM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7:00	2			1		5	4	81	8		38	6
7:15	3	5		3	1	29	35	103	9	1	45	2
7:30	5	1		4		53	53	155	3		41	2
7:45	1	2	1	4	1	80	54	151	3		55	6
8:00	7	4				6	6	97	5		38	5
8:15	4	5		2	2	14	8	94	1		42	3
8:30	3	3	1	5		22	7	108	3		45	3
8:45	1			1		16	6	50	2		20	3
Count Total	*26*	*20*	*2*	*20*	*4*	*225*	*173*	*839*	*34*	*1*	*324*	*30*
Peak Hour Total	***16***	***12***	***1***	***11***	***2***	***168***	***148***	***506***	***20***	***1***	***179***	***15***
PHF	***0.753492***											
% Trucks	***0.4%***											

	Bello St			*Bello St*			*Price Canyon Rd*			*Price Canyon Rd*		
PM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
4:00												
4:15	1			4	1	22	1	52	9		123	12
4:30	4	4				14	22	44	9	2	121	3
4:45	2	2	1			16	20	62	9		159	12
5:00	4		1	2		22	20	47	7	2	153	10
5:15	3	3				17	16	38	10		168	9
5:30	5	3		4		26	14	46	11		144	7
5:45	3	1		1		19	26	31	4		88	7
6:00	2	0	0	4	0	20	22	27	3	0	83	10
6:15	2	0	0	1	1	34	25	29	4	1	83	9
6:30	2	3	0	1	1	34	21	37	10	1	51	3
6:45	3	0	0	1	1	29	16	28	6	1	43	1
7:00	2	0	0	1	0	34	11	24	5	1	57	1
7:15	1	1	0	1	0	20	9	13	4	1	27	0
Count Total	*34*	*17*	*2*	*20*	*4*	*307*	*223*	*478*	*91*	*9*	*1300*	*84*
Peak Hour Total	***14***	***8***	***2***	***6***	***0***	***81***	***70***	***193***	***37***	***2***	***624***	***38***
PHF	***0.949647***											
% Trucks	***1.3%***											

Intersection: Ormonde Road (Gate #1) @ Price Canyon Road
Date: 5/15/2013 (PM), 5/16/2013 (AM)
Day: Wednesday,Thursday
Notes: Slight overcast with no precipitation in AM, Clear in PM. PM Counts Taken 4:00-7:30

	Omonde Road			*Gate 1*			*Price Canyon Rd*			*Price Canyon Rd*		
AM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7:00		1	1	2		2	3	93			51	2
7:15			1	4	7	1		89	1	1	27	1
7:30		1	2	4	3		1	144	2	1	33	3
7:45		1	5	5	3		4	163			46	1
8:00		1	4		1		1	114		3	39	2
8:15			1	4	1		3	100		2	43	4
8:30		3	1	3	3	1	4	89		1	38	1
8:45		6	3	1	1	2	3	77			37	2
Count Total	*0*	*13*	*18*	*23*	*19*	*6*	*19*	*869*	*3*	*8*	*314*	*16*
Peak Hour Total	***0***	***3***	***12***	***13***	***8***	***0***	***9***	***521***	***2***	***6***	***161***	***10***
PHF	***0.816886***											
% Trucks	***1.1%***											

	Omonde Road			*Gate 1*			*Price Canyon Rd*			*Price Canyon Rd*		
PM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
4:00												
4:15												
4:30	1	1	2		1			1		6	120	4
4:45					2	3	1	22	1		76	
5:00	3	4		3	1	22	1	53			91	2
5:15				1	1	13		36			127	
5:30	6					5		39	1	3	146	2
5:45			1					39	1	3	115	
6:00	3					7		31		1	87	1
6:15			1	2				23	1	2	88	
6:30						1		25		2	68	1
6:45	1							33		1	57	
7:00	3		2					51	3	1	96	
7:15						2	1	22	1	1	44	1
Count Total	*17*	*5*	*6*	*6*	*5*	*53*	*3*	*375*	*8*	*20*	*1115*	*11*
Peak Hour Total	***9***	***4***	***1***	***4***	***2***	***40***	***1***	***167***	***2***	***6***	***479***	***4***
PHF	***0.889851***											
% Trucks	***1.8%***											

Intersection: Ormonde Road (Gate #1) @ Price Canyon Road
Date: 9/17/2013 (PM), 9/18/2013 (AM)
Day: Tuesday, Wednesday
Notes: Clear weather

	Omonde Road			*Gate 1*			*Price Canyon Rd*			*Price Canyon Rd*		
AM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
6:00							5	54	1		13	2
6:15				2	1		8	50			12	3
6:30					2	1	10	74	1		13	2
6:45	1	1	4	1	2		16	105	1		130	5
7:00	1		1		4		6	81		1	88	5
7:15		1	1		3		2	76	3	1	27	1
7:30		3	2	2	7	1	1	94	1	1	35	
7:45		5	5		2		1	129	1		35	
8:00	1	4	3	3	7	3	16	145	1	2	33	
8:15	1	3	10		6			87			38	
8:30	1	8	6		4			141		2	57	
8:45	2	3	1	1	5		4	121	1	6	56	1
Count Total	*7*	*28*	*33*	*9*	*43*	*5*	*69*	*1157*	*10*	*13*	*537*	*19*
Peak Hour Total	***5***	***18***	***20***	***4***	***22***	***3***	***20***	***494***	***2***	***10***	***184***	***1***
PHF	***0.893836***											
% Trucks	***1.9%***											

	Omonde Road			*Gate 1*			*Price Canyon Rd*			*Price Canyon Rd*		
PM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
4:00	3	1	1			3	1	39	2	2	142	1
4:15	2	1		2				41	2	1	97	2
4:30		3	1	1	1	3		36		3	97	1
4:45	2	2		1	1	3		39	1		138	1
5:00	3	3	3	2		20		38	1	2	162	
5:15			3			2		45		4	161	
5:30	2	1	1					33			173	
5:45	2		1	1				45	2	4	122	1
Count Total	*14*	*11*	*10*	*7*	*2*	*31*	*1*	*316*	*8*	*16*	*1092*	*6*
Peak Hour Total	***5***	***8***	***7***	***4***	***2***	***28***	***0***	***158***	***2***	***9***	***558***	***2***
PHF	***0.904915***											
% Trucks	***1.2%***											

Intersection: Gate #2 @ Price Canyon Road
Date: 5/15/2013 (PM), 5/16/2013 (AM)
Day: Wednesday,Thursday
Notes: Slight overcast with no precipation in AM, Clear in PM. PM Counts Taken 4:00-7:30

	Gate 3			*Gate 2*			*Price Canyon Rd*			*Price Canyon Rd*		
AM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7:00							3	88	1		46	
7:15		1				4	5	91			30	
7:30						1	6	139			34	1
7:45					1	1	2	179	1		5	
8:00	1					3		99	1		79	1
8:15	1			1		4	3	99	1		41	
8:30			2	1	1	1	5	95			43	
8:45	2	1		1			3	83	1		35	1
Count Total	*4*	*2*	*2*	*3*	*2*	*14*	*27*	*873*	*5*	*0*	*313*	*3*
Peak Hour Total	***2***	***0***	***0***	***1***	***1***	***9***	***11***	***516***	***3***	***0***	***159***	***2***
PHF	***0.931217***											
% Trucks	***1.8%***											

	Gate 3			*Gate 2*			*Price Canyon Rd*			*Price Canyon Rd*		
PM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
4:00												
4:15					2			21			22	
4:30					1	4		36			153	
4:45	1	2	2	1	3	6		48	1		99	2
5:00	1	1	1			1		46			163	
5:15		1				15		49			169	
5:30	2	1			2			39	1		114	
5:45						2		26			75	
6:00							1	24			93	
6:15		1				4	1	25			60	
6:30								34			63	
6:45							1	31			44	
7:00								21			47	
7:15						3		28			46	
Count Total	*4*	*6*	*3*	*1*	*8*	*35*	*3*	*428*	*2*	*0*	*1148*	*2*
Peak Hour Total	***2***	***4***	***3***	***1***	***4***	***26***	***0***	***179***	***1***	***0***	***584***	***2***
PHF	***0.861111***											
% Trucks	***1.1%***											

Intersection: Gates 2 and 3 @ Price Canyon Road
Date: 9/17/2013 (PM), 9/18/2013 (AM)
Day: Tuesday, Wednesday
Notes: Clear weather

	Gate 3			*Gate 2*			*Price Canyon Rd*			*Price Canyon Rd*		
AM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
6:00							1	57			34	
6:15	2					2		59			12	1
6:30	1	1				1		60			10	
6:45		3				1	1	140	2		41	
7:00	4	5	4				2	133			41	
7:15						1	2	102			31	1
7:30					1	2	2	104	1		40	
7:45	2				3		1	164			44	
8:00		2	1		1		1	189	4		38	
8:15		1				1	1	122		1	40	
8:30	2	2					2	113			54	
8:45		1	2	1	1		1	85	2	1	47	
Count Total	*11*	*15*	*7*	*1*	*6*	*8*	*14*	*1328*	*9*	*2*	*432*	*2*
Peak Hour Total	***6***	***5***	***4***	***0***	***4***	***3***	***7***	***503***	***1***	***0***	***156***	***1***
PHF	***0.811441***											
% Trucks	***2.3%***											

	Gate 3			*Gate 2*			*Price Canyon Rd*			*Price Canyon Rd*		
PM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
4:00	1			1	1	2	1	39	2		121	
4:15	2		1			1		52	2		117	1
4:30	1		1			2		51	2		155	
4:45	1	2	1					56			136	
5:00	1	3	1		1			66			230	
5:15								44			123	
5:30		1			1	1		41			196	
5:45					1		1	49	1		140	
Count Total	*6*	*6*	*4*	*1*	*4*	*6*	*2*	*398*	*7*	*0*	*1218*	*1*
Peak Hour Total	***3***	***5***	***3***	***0***	***1***	***2***	***0***	***217***	***2***	***0***	***644***	***0***
PHF	***0.749172***											
% Trucks	***2.7%***											

Intersection: SR 227 @ Price Canyon Road
Date: 7/11/2013 (PM), 5/16/2013 (AM)
Day: Thursday
Notes: Slight overcast with no precipitation in AM, Clear in PM. PM Counts Taken 4:00-7:30

	227			*227*			*Price Canyon Rd*			*Twin Creeks Way*		
AM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7:00	1	49			20	53	111		1	1		
7:15	2	38			20	39	82	1			1	5
7:30	1	60		3	20	26	84		2			
7:45	3	110		1	30	39	155					2
8:00	7	79			18	14	121		1			3
8:15		66		1	17	32	84			1	1	4
8:30	3	84			32	35	88					2
8:45	4	73		1	39	45	92		3	1	1	3
Count Total	*21*	*559*	*0*	*6*	*196*	*283*	*817*	*1*	*7*	*3*	*3*	*19*
Peak Hour Total	***13***	***339***	***0***	***2***	***97***	***120***	***448***	***0***	***1***	***1***	***1***	***11***
PHF	***0.759559***											
% Trucks	***1.8%***											

	227			*227*			*Price Canyon Rd*			*Twin Creeks Way*		
PM Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
4:00												
4:15	2	14		1	16	27	11					1
4:30		30	2	7	79	114	35	2	1	1	1	
4:45	3	44		5	122	212	63	1	2	4	1	2
5:00	1	41		4	113	147	41		1			4
5:15	2	34		4	118	163	43		3			
5:30	4	30			81	105	48		6			3
5:45	1	34	1	3	82	105	43		3		1	2
6:00												
6:15												
6:30												
6:45												
7:00												
7:15												
Count Total	*13*	*227*	*3*	*24*	*611*	*873*	*284*	*3*	*16*	*5*	*3*	*12*
Peak Hour Total	***10***	***149***	***0***	***13***	***434***	***627***	***195***	***1***	***12***	***4***	***1***	***9***
PHF	***0.792484***											
% Trucks	***0.8%***											

Intersection: US 101 North of Oak Park Blvd
Date: 5/16/2013 (AM), 5/29/2013 (PM)
Day: Thursday, Wednesday
Notes: PM Counts Taken 4:00-7:30

	Northbound US 101		
AM Peak Hour	All Vehicles	Heavy Veh.	% Heavy Veh.
7:00	329	1	0.3%
7:15	580	29	5.0%
7:30	846	33	3.9%
7:45	719	26	3.6%
8:00	641	27	4.2%
8:15	719	26	3.6%
8:30	574	20	3.5%
8:45	375	14	3.7%
Count Total	*4783*	*176*	3.5%
Peak Hour Total	***2653***	***87***	***4.2%***
Peak Hour Factor	***0.92***		

	Southbound US 101		
AM Peak Hour	All Vehicles	Heavy Veh.	% Heavy Veh.
7:00	269	37	13.8%
7:15	333	18	5.4%
7:30	365	26	7.1%
7:45	380	28	7.4%
8:00	315	47	14.9%
8:15	329	31	9.4%
8:30	424	43	10.1%
8:45	407	39	9.6%
Count Total	*2822*	*269*	9.7%
Peak Hour Total	***1448***	***160***	***8.7%***
Peak Hour Factor	***0.87***		

	Northbound US 101		
PM Peak Hour	All Vehicles	Heavy Veh.	% Heavy Veh.
4:00			
4:15	337	11	3.3%
4:30	485	16	3.3%
4:45	466	25	5.4%
5:00	489	30	6.1%
5:15	448	19	4.2%
5:30	442	15	3.4%
5:45	427	21	4.9%
6:00			
6:15			
6:30			
6:45			
7:00			
7:15			
Count Total	*3094*	*137*	4.4%
Peak Hour Total	***1888***	***90***	***4.8%***
Peak Hour Factor	***0.97***		

	Southbound US 101		
PM Peak Hour	All Vehicles	Heavy Veh.	% Heavy Veh.
4:00			
4:15	808	17	2.1%
4:30	808	21	2.6%
4:45	781	13	1.7%
5:00	848	14	1.7%
5:15	787	10	1.3%
5:30	777	23	3.0%
5:45	707	12	1.7%
6:00	606	10	1.7%
6:15	578	16	2.8%
6:30	476	10	2.1%
6:45	433	13	3.0%
7:00	392	12	3.1%
7:15	336	13	3.9%
Count Total	*8337*	*184*	2.3%
Peak Hour Total	***3193***	***133***	***2.0%***
Peak Hour Factor	***0.96***		

Intersection: US 101 North of Oak Park Blvd
Date: 5/16/2013 (AM), 5/29/2013 (PM)
Day: Thursday, Wednesday
Notes: PM Counts Taken 4:00-7:30

	Northbound US 101		
AM Peak Hour	All Vehicles	Heavy Veh.	% Heavy Veh.
7:00	329	1	0.3%
7:15	580	29	5.0%
7:30	846	33	3.9%
7:45	719	26	3.6%
8:00	641	27	4.2%
8:15	719	26	3.6%
8:30	574	20	3.5%
8:45	375	14	3.7%
Count Total	*4783*	*176*	3.5%
Peak Hour Total	***2653***	***87***	***4.2%***
Peak Hour Factor	***0.92***		

	Southbound US 101		
AM Peak Hour	All Vehicles	Heavy Veh.	% Heavy Veh.
7:00	269	37	13.8%
7:15	333	18	5.4%
7:30	365	26	7.1%
7:45	380	28	7.4%
8:00	315	47	14.9%
8:15	329	31	9.4%
8:30	424	43	10.1%
8:45	407	39	9.6%
Count Total	*2822*	*269*	9.7%
Peak Hour Total	***1448***	***160***	***8.7%***
Peak Hour Factor	***0.87***		

	Northbound US 101		
PM Peak Hour	All Vehicles	Heavy Veh.	% Heavy Veh.
4:00			
4:15	337	11	3.3%
4:30	485	16	3.3%
4:45	466	25	5.4%
5:00	489	30	6.1%
5:15	448	19	4.2%
5:30	442	15	3.4%
5:45	427	21	4.9%
6:00			
6:15			
6:30			
6:45			
7:00			
7:15			
Count Total	*3094*	*137*	4.4%
Peak Hour Total	***1888***	***90***	***4.8%***
Peak Hour Factor	***0.97***		

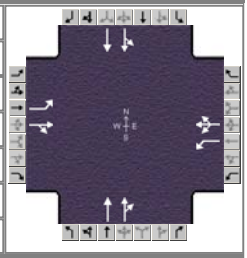
	Southbound US 101		
PM Peak Hour	All Vehicles	Heavy Veh.	% Heavy Veh.
4:00			
4:15	808	17	2.1%
4:30	808	21	2.6%
4:45	781	13	1.7%
5:00	848	14	1.7%
5:15	787	10	1.3%
5:30	777	23	3.0%
5:45	707	12	1.7%
6:00	606	10	1.7%
6:15	578	16	2.8%
6:30	476	10	2.1%
6:45	433	13	3.0%
7:00	392	12	3.1%
7:15	336	13	3.9%
Count Total	*8337*	*184*	2.3%
Peak Hour Total	***3193***	***133***	***2.0%***
Peak Hour Factor	***0.96***		

APPENDIX C

EXISTING LEVEL OF SERVICE CALCULATIONS

HCS 2010 Signalized Intersection Results Summary

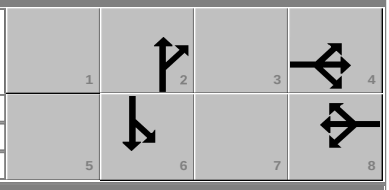
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.88
Intersection	Price St @ Price Cyn/Hinds	Analysis Year	2013	Analysis Period	1> 7:00
File Name	hinds.xus				
Project Description	Existing AM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	14	83	33	263	0	14		118	479	12	101	

Signal Information			
Cycle, s	59.1	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	23.1	9.1	11.9	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		14.1		16.9		28.1		28.1
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.1		3.3		3.3
Queue Clearance Time (g_s), s		6.0		11.5		20.7		21.2
Green Extension Time (g_e), s		0.2		0.4		1.9		1.9
Phase Call Probability		0.91		0.99		1.00		1.00
Max Out Probability		0.00		0.01		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	16	132		299	299			134	544	36	92	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1790		1792	1792			1881	1594	501	1712	
Queue Service Time (g_s), s	0.4	4.0		9.5	9.5			3.3	18.7	0.5	2.0	
Cycle Queue Clearance Time (g_c), s	0.4	4.0		9.5	9.5			3.3	18.7	19.2	2.0	
Green Ratio (*g/C*)	0.15	0.15		0.20	0.20			0.39	0.39	0.39	0.39	
Capacity (*c*), veh/h	277	276		360	360			735	623	280	669	
Volume-to-Capacity Ratio (*X*)	0.057	0.477		0.830	0.830			0.182	0.873	0.129	0.138	
Available Capacity (c_a), veh/h	999	998		606	606			3974	3368	2203	3385	
Back of Queue (*Q*), veh/ln (50th percentile)	0.2	1.6		3.8	3.8			1.0	6.0	0.3	0.7	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	21.3	22.8		22.7	22.7			11.8	16.7	13.3	11.6	
Incremental Delay (d_2), s/veh	0.0	0.5		1.9	1.9			0.0	1.6	0.1	0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	21.4	23.3		24.6	24.6			11.9	18.2	13.3	11.6	
Level of Service (LOS)	C	C		C	C			B	B	B	B	
Approach Delay, s/veh / LOS	23.1	C		24.3	C		17.0	B		12.1	B	
Intersection Delay, s/veh / LOS	19.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.7	A	1.0	A	1.0	A	0.6	A

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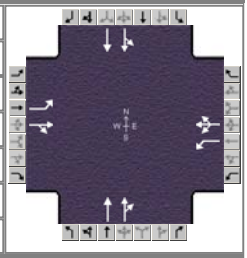
HCS 2010 Signalized Intersection Results Summary

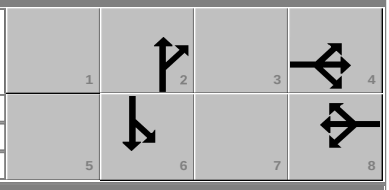
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.83
Intersection	Price St @ Price Cyn/Hinds	Analysis Year	2013	Analysis Period	1> 7:00
File Name	hinds pm.xus				
Project Description	Existing PM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	31	56	78	649	0	53		212	184	21	336	

Signal Information			
Cycle, s	77.4	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	16.4	9.9	36.1	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		14.9		41.1		21.4		21.4
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.2		3.1		3.1		3.1
Queue Clearance Time (g_s), s		9.1		33.9		14.2		14.8
Green Extension Time (g_e), s		0.3		2.0		1.8		1.8
Phase Call Probability		0.99		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	37	161		782	782			253	224	186	244	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1703		1792	1792			1881	1597	1250	1712	
Queue Service Time (g_s), s	1.4	7.1		31.9	31.9			12.2	10.0	0.6	11.5	
Cycle Queue Clearance Time (g_c), s	1.4	7.1		31.9	31.9			12.2	10.0	12.8	11.5	
Green Ratio (*g/C*)	0.13	0.13		0.47	0.47			0.21	0.21	0.21	0.21	
Capacity (*c*), veh/h	230	218		839	839			395	335	315	360	
Volume-to-Capacity Ratio (*X*)	0.163	0.740		0.932	0.932			0.641	0.667	0.589	0.680	
Available Capacity (c_a), veh/h	671	637		1688	1688			4590	3895	3968	4154	
Back of Queue (*Q*), veh/ln (50th percentile)	0.6	2.9		12.1	12.1			4.1	3.7	2.9	4.0	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	30.1	32.5		19.4	19.4			27.9	28.1	27.0	28.2	
Incremental Delay (d_2), s/veh	0.1	1.9		2.2	2.2			0.7	0.9	0.7	0.8	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	30.2	34.4		21.6	21.6			28.6	29.0	27.6	29.0	
Level of Service (LOS)	C	C		C	C			C	C	C	C	
Approach Delay, s/veh / LOS	33.6	C		20.9	C		28.8	C		28.4	C	
Intersection Delay, s/veh / LOS	25.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.8	A	1.9	A	0.9	A	0.8	A

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*US 101 Ramp @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *US 101 Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*824*	*0*	*0*	*389*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*915*	*0*	*0*	*432*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*			*30*		*23*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.90*	*0.95*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*33*	*0*	*25*
Percent Heavy Vehicles	*0*	*1*	*1*	*0*	*1*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration	*LT*			*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*	*LT*			*L*		*R*
v (veh/h)	*0*	*0*				*33*		*25*
C (m) (veh/h)	*1138*	*754*				*129*		*628*
v/c	*0.00*	*0.00*				*0.26*		*0.04*
95% queue length	*0.00*	*0.00*				*1.01*		*0.12*
Control Delay (s/veh)	*8.2*	*9.8*				*42.4*		*11.0*
LOS	*A*	*A*				*E*		*B*
Approach Delay (s/veh)	--	--				*28.9*		
Approach LOS	--	--				*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*US 101 Ramp @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing PM*

East/West Street: *Price Canyon Rd* | North/South Street: *US 101 Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*278*	*0*	*0*	*611*	*0*
Peak-Hour Factor, PHF	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*
Hourly Flow Rate, HFR (veh/h)	*0*	*315*	*0*	*0*	*694*	*0*
Percent Heavy Vehicles	*6*	--	--	*6*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*			*20*		*68*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.88*	*0.95*	*0.88*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*22*	*0*	*77*
Percent Heavy Vehicles	*6*	*1*	*1*	*6*	*1*	*6*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration	*LT*			*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*	*LT*			*L*		*R*
v (veh/h)	*0*	*0*				*22*		*77*
C (m) (veh/h)	*883*	*1223*				*215*		*436*
v/c	*0.00*	*0.00*				*0.10*		*0.18*
95% queue length	*0.00*	*0.00*				*0.34*		*0.64*
Control Delay (s/veh)	*9.1*	*7.9*				*23.7*		*15.0*
LOS	*A*	*A*				*C*		*C*
Approach Delay (s/veh)	--	--				*16.9*		
Approach LOS	--	--				*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Bello St @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		

Project Description *Existing AM*

East/West Street: *Price Canyon Rd* North/South Street: *Bello Street*

Intersection Orientation: *East-West* Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*148*	*506*	*20*	*1*	*179*	*15*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*197*	*674*	*26*	*1*	*238*	*20*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*16*	*12*	*1*	*11*	*2*	*168*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*21*	*16*	*1*	*14*	*2*	*224*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*LT*		*R*	*LT*		*R*
v (veh/h)	*197*	*1*	*37*		*1*	*16*		*224*
C (m) (veh/h)	*1335*	*922*	*99*		*449*	*108*		*793*
v/c	*0.15*	*0.00*	*0.37*		*0.00*	*0.15*		*0.28*
95% queue length	*0.52*	*0.00*	*1.70*		*0.01*	*0.52*		*1.18*
Control Delay (s/veh)	*8.2*	*8.9*	*62.7*		*13.0*	*44.1*		*11.3*
LOS	*A*	*A*	*F*		*B*	*E*		*B*
Approach Delay (s/veh)	--	--	*61.4*			*13.5*		
Approach LOS	--	--	*F*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Bello St @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description *Existing Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Bello Street*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*70*	*193*	*37*	*2*	*624*	*38*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*73*	*203*	*38*	*2*	*656*	*40*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*14*	*8*	*2*	*6*	*0*	*81*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*14*	*8*	*2*	*6*	*0*	*85*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*LT*		*R*	*LT*		*R*
v (veh/h)	*73*	*2*	*22*		*2*	*6*		*85*
C (m) (veh/h)	*936*	*1375*	*175*		*820*	*187*		*455*
v/c	*0.08*	*0.00*	*0.13*		*0.00*	*0.03*		*0.19*
95% queue length	*0.25*	*0.00*	*0.43*		*0.01*	*0.10*		*0.69*
Control Delay (s/veh)	*9.2*	*7.6*	*28.5*		*9.4*	*24.9*		*14.7*
LOS	*A*	*A*	*D*		*A*	*C*		*B*
Approach Delay (s/veh)	--	--	*26.9*			*15.4*		
Approach LOS	--	--	*D*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*Ormonde Rd @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Ormonde Rd*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*9*	*521*	*2*	*6*	*161*	*10*
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
Hourly Flow Rate, HFR (veh/h)	*10*	*635*	*2*	*7*	*196*	*12*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*3*	*12*	*13*	*8*	*0*
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
Hourly Flow Rate, HFR (veh/h)	*0*	*3*	*14*	*15*	*9*	*0*
Percent Heavy Vehicles	*1*	*0*	*0*	*1*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*10*	*7*		*17*			*24*	
C (m) (veh/h)	*1383*	*953*		*430*			*265*	
v/c	*0.01*	*0.01*		*0.04*			*0.09*	
95% queue length	*0.02*	*0.02*		*0.12*			*0.30*	
Control Delay (s/veh)	*7.6*	*8.8*		*13.7*			*19.9*	
LOS	*A*	*A*		*B*			*C*	
Approach Delay (s/veh)	--	--	*13.7*			*19.9*		
Approach LOS	--	--	*B*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*Ormonde Rd @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Ormonde Rd*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*1*	*167*	*2*	*6*	*479*	*4*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*1*	*187*	*2*	*6*	*538*	*4*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*9*	*4*	*1*	*4*	*2*	*40*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*10*	*4*	*1*	*4*	*2*	*44*
Percent Heavy Vehicles	*2*	*0*	*0*	*2*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*1*	*6*		*15*			*50*	
C (m) (veh/h)	*1030*	*1387*		*318*			*507*	
v/c	*0.00*	*0.00*		*0.05*			*0.10*	
95% queue length	*0.00*	*0.01*		*0.15*			*0.33*	
Control Delay (s/veh)	*8.5*	*7.6*		*16.9*			*12.9*	
LOS	*A*	*A*		*C*			*B*	
Approach Delay (s/veh)	--	--	*16.9*			*12.9*		
Approach LOS	--	--	*C*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Gate 2 @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		

Project Description *Existing Volumes*

East/West Street: *Price Canyon Rd*	North/South Street: *Arroyo Field Gate 2*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*11*	*516*	*3*	*0*	*159*	*2*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*11*	*554*	*3*	*0*	*170*	*2*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*0*	*0*	*1*	*1*	*9*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*2*	*0*	*0*	*1*	*1*	*9*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*11*	*0*		*2*			*11*	
C (m) (veh/h)	*1407*	*1016*		*319*			*673*	
v/c	*0.01*	*0.00*		*0.01*			*0.02*	
95% queue length	*0.02*	*0.00*		*0.02*			*0.05*	
Control Delay (s/veh)	*7.6*	*8.5*		*16.4*			*10.4*	
LOS	*A*	*A*		*C*			*B*	
Approach Delay (s/veh)	--	--	*16.4*			*10.4*		
Approach LOS	--	--	*C*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Gate 2 @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description *Existing Volumes*

East/West Street: *Price Canyon Rd*	North/South Street: *Arroyo Field Gate 2*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*179*	*1*	*0*	*584*	*2*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*0*	*208*	*1*	*0*	*679*	*2*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*4*	*3*	*1*	*4*	*26*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*2*	*4*	*3*	*1*	*4*	*30*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*0*	*0*		*9*			*35*	
C (m) (veh/h)	*918*	*1369*		*345*			*416*	
v/c	*0.00*	*0.00*		*0.03*			*0.08*	
95% queue length	*0.00*	*0.00*		*0.08*			*0.28*	
Control Delay (s/veh)	*8.9*	*7.6*		*15.7*			*14.4*	
LOS	*A*	*A*		*C*			*B*	
Approach Delay (s/veh)	--	--	*15.7*			*14.4*		
Approach LOS	--	--	*C*			*B*		

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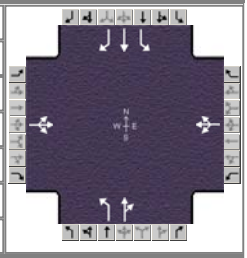
HCS 2010 Signalized Intersection Results Summary

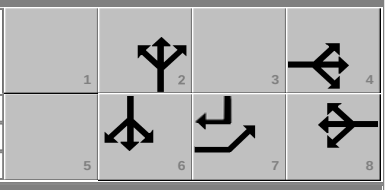
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.76
Intersection	SR 227 @ Price Cyn Rd	Analysis Year	2013	Analysis Period	1> 7:00
File Name	227.xus				
Project Description	Existing AM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	448	0	1	1	1	11	13	339	0	2	97	120

Signal Information			
Cycle, s	48.3	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	14.1	18.2	1.1	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		12.0		12.0		6.0		5.0
Phase Duration, s		23.2		6.1		19.1		19.1
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.3		3.1		3.1
Queue Clearance Time (g_s), s		16.7		2.5		12.6		12.6
Green Extension Time (g_e), s		1.3		0.0		1.3		1.2
Phase Call Probability		1.00		0.21		1.00		1.00
Max Out Probability		0.00		0.00		0.03		0.06

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		591			17		17	0		3	128	158
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1809			1643		1283	0		959	1900	1610
Queue Service Time (g_s), s		14.7			0.5		0.5	0.0		0.1	2.5	1.7
Cycle Queue Clearance Time (g_c), s		14.7			0.5		2.6	0.0		10.6	2.5	1.7
Green Ratio (*g/C*)		0.38			0.02		0.29			0.29	0.29	0.67
Capacity (*c*), veh/h		685			36		467			221	555	1080
Volume-to-Capacity Ratio (*X*)		0.863			0.473		0.037	0.000		0.012	0.230	0.146
Available Capacity (c_a), veh/h		9082			505		723			373	856	1335
Back of Queue (*Q*), veh/ln (50th percentile)		4.9			0.2		0.1			0.0	0.9	0.2
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.02	0.00		0.01	0.00	0.04
Uniform Delay (d_1), s/veh		14.0			23.6		14.0			20.8	13.1	2.9
Incremental Delay (d_2), s/veh		1.3			3.5		0.0	0.0		0.0	0.1	0.0
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh		15.3			27.1		14.0			20.9	13.2	3.0
Level of Service (LOS)		B			C		B			C	B	A
Approach Delay, s/veh / LOS	15.3	B		27.1	C		16.9	B		7.6	A	
Intersection Delay, s/veh / LOS	14.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.4	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	1.5	A	0.5	A	1.3	A	1.0	A

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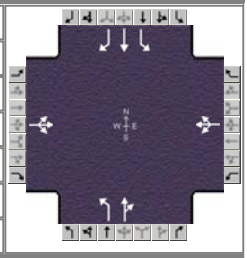
HCS 2010 Signalized Intersection Results Summary

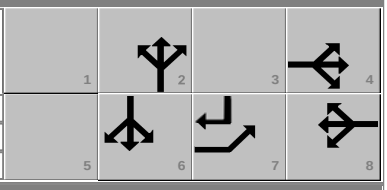
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.79
Intersection	SR 227 @ Price Cyn Rd	Analysis Year	2013	Analysis Period	1> 7:00
File Name	227 pm.xus				
Project Description	Existing PM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	195	1	12	4	1	9	10	149	0	13	434	627

Signal Information			
Cycle, s	46.5	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	21.8	8.7	1.0	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		12.0		12.0		6.0		5.0
Phase Duration, s		13.7		6.0		26.8		26.8
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.3		3.2		3.2
Queue Clearance Time (g_s), s		8.5		2.5		12.6		17.6
Green Extension Time (g_e), s		0.5		0.0		4.2		4.2
Phase Call Probability		0.97		0.21		1.00		1.00
Max Out Probability		0.00		0.00		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		263			18		13	0		16	549	794
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1797			1681		872	0		1214	1900	1610
Queue Service Time (g_s), s		6.5			0.5		0.5	0.0		0.4	10.1	15.6
Cycle Queue Clearance Time (g_c), s		6.5			0.5		10.6	0.0		3.0	10.1	15.6
Green Ratio (*g/C*)		0.19			0.02		0.47			0.47	0.47	0.66
Capacity (*c*), veh/h		337			37		375			655	890	1056
Volume-to-Capacity Ratio (*X*)		0.781			0.473		0.034	0.000		0.025	0.617	0.751
Available Capacity (c_a), veh/h		1079			541		1742			3054	4646	4239
Back of Queue (*Q*), veh/ln (50th percentile)		2.4			0.2		0.1			0.1	3.0	2.2
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.01	0.00		0.03	0.00	0.37
Uniform Delay (d_1), s/veh		18.0			22.5		13.2			8.2	9.3	5.4
Incremental Delay (d_2), s/veh		1.5			3.4		0.0	0.0		0.0	0.3	0.4
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh		19.5			25.9		13.2			8.2	9.5	5.9
Level of Service (LOS)		B			C		B			A	A	A
Approach Delay, s/veh / LOS	19.5	B		25.9	C		7.7	A		7.4	A	
Intersection Delay, s/veh / LOS	9.3						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.4	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.9	A	0.5	A	0.8	A	2.7	B

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/16/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2013*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2653*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1471*	pc/h/ln
S	*72.5*	mph
D = v_p / S	*20.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2013*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1888*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*998*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*13.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/30/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2013*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1448*	veh/h	Peak-Hour Factor, PHF	*0.87*	
AADT		veh/day	%Trucks and Buses, P_T	*9*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*870*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*11.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2013*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3193*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1680*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*24.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/16/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2013*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3415*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1916*	pc/h/ln
S	*65.7*	mph
D = v_p / S	*29.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2013*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2591*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1422*	pc/h/ln
S	*73.0*	mph
D = v_p / S	*19.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/30/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2013*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1903*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1073*	pc/h/ln
S	*74.9*	mph
D = v_p / S	*14.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2013*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3800*	veh/h	Peak-Hour Factor, PHF	*0.87*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2206*	pc/h/ln
S	*58.9*	mph
D = v_p / S	*37.5*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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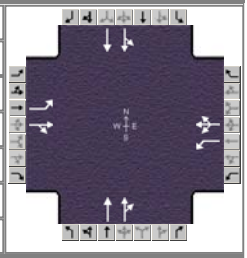
APPENDIX D

EXISTING + FM O&G PROJECT LEVEL OF SERVICE CALCULATIONS

HCS 2010 Signalized Intersection Results Summary

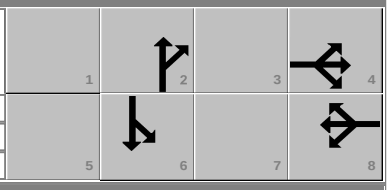
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.88
Intersection	Price St @ Price Cyn/Hinds	Analysis Year	2013	Analysis Period	1> 7:00
File Name	hinds.xus				
Project Description	Existing + Project AM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	14	83	33	265	0	14		118	481	12	101	

Signal Information			
Cycle, s	59.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	23.3	9.1	12.0	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		14.1		17.0		28.3		28.3
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.1		3.3		3.3
Queue Clearance Time (g_s), s		6.0		11.6		20.9		21.4
Green Extension Time (g_e), s		0.2		0.4		1.9		1.9
Phase Call Probability		0.91		0.99		1.00		1.00
Max Out Probability		0.00		0.02		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	16	132		301	301			134	547	36	93	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1790		1792	1792			1881	1594	492	1712	
Queue Service Time (g_s), s	0.5	4.0		9.6	9.6			3.3	18.9	0.5	2.0	
Cycle Queue Clearance Time (g_c), s	0.5	4.0		9.6	9.6			3.3	18.9	19.4	2.0	
Green Ratio (*g/C*)	0.15	0.15		0.20	0.20			0.39	0.39	0.39	0.39	
Capacity (*c*), veh/h	275	275		362	362			738	625	277	671	
Volume-to-Capacity Ratio (*X*)	0.058	0.479		0.832	0.832			0.182	0.874	0.129	0.138	
Available Capacity (c_a), veh/h	993	992		602	602			3950	3347	2175	3364	
Back of Queue (*Q*), veh/ln (50th percentile)	0.2	1.6		3.9	3.9			1.0	6.0	0.3	0.7	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	21.5	23.0		22.8	22.8			11.8	16.7	13.3	11.6	
Incremental Delay (d_2), s/veh	0.0	0.5		1.9	1.9			0.0	1.6	0.1	0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	21.5	23.5		24.7	24.7			11.9	18.3	13.4	11.7	
Level of Service (LOS)	C	C		C	C			B	B	B	B	
Approach Delay, s/veh / LOS	23.3	C		24.4	C		17.0	B		12.1	B	
Intersection Delay, s/veh / LOS	19.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.7	A	1.0	A	1.0	A	0.6	A

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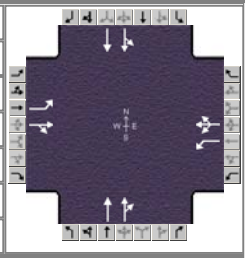
HCS 2010 Signalized Intersection Results Summary

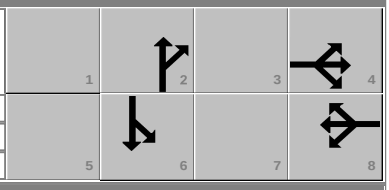
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.83
Intersection	Price St @ Price Cyn/Hinds	Analysis Year	2013	Analysis Period	1> 7:00
File Name	hinds pm.xus				
Project Description	Existing + Project PM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	31	56	78	658	0	55		212	186	21	336	

Signal Information			
Cycle, s	78.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	16.5	9.9	37.1	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		14.9		42.1		21.5		21.5
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.2		3.1		3.1		3.1
Queue Clearance Time (g_s), s		9.2		34.8		14.2		14.8
Green Extension Time (g_e), s		0.3		2.1		1.8		1.8
Phase Call Probability		0.99		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	37	161		793	793			255	225	186	244	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1703		1792	1792			1881	1595	1250	1712	
Queue Service Time (g_s), s	1.5	7.2		32.8	32.8			12.2	10.2	0.6	11.5	
Cycle Queue Clearance Time (g_c), s	1.5	7.2		32.8	32.8			12.2	10.2	12.8	11.5	
Green Ratio (*g/C*)	0.13	0.13		0.47	0.47			0.21	0.21	0.21	0.21	
Capacity (*c*), veh/h	227	215		850	850			391	332	312	356	
Volume-to-Capacity Ratio (*X*)	0.165	0.749		0.932	0.932			0.651	0.677	0.595	0.686	
Available Capacity (c_a), veh/h	638	606		1664	1664			4522	3834	3908	4094	
Back of Queue (*Q*), veh/ln (50th percentile)	0.6	3.0		12.4	12.4			4.3	3.8	3.0	4.1	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	30.6	33.1		19.5	19.5			28.5	28.7	27.5	28.8	
Incremental Delay (d_2), s/veh	0.1	2.0		2.2	2.2			0.7	0.9	0.7	0.9	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	30.8	35.1		21.6	21.6			29.2	29.6	28.2	29.6	
Level of Service (LOS)	C	D		C	C			C	C	C	C	
Approach Delay, s/veh / LOS	34.3	C		20.8	C		29.4	C		29.0	C	
Intersection Delay, s/veh / LOS	26.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.8	A	1.9	A	0.9	A	0.8	A

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*US 101 Ramp @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing + Proj Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *US 101 Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*826*	*0*	*0*	*391*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*917*	*0*	*0*	*434*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*			*31*		*23*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.90*	*0.95*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*34*	*0*	*25*
Percent Heavy Vehicles	*0*	*1*	*1*	*0*	*1*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration	*LT*			*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*	*LT*			*L*		*R*
v (veh/h)	*0*	*0*				*34*		*25*
C (m) (veh/h)	*1136*	*752*				*129*		*626*
v/c	*0.00*	*0.00*				*0.26*		*0.04*
95% queue length	*0.00*	*0.00*				*1.05*		*0.12*
Control Delay (s/veh)	*8.2*	*9.8*				*42.8*		*11.0*
LOS	*A*	*A*				*E*		*B*
Approach Delay (s/veh)	--	--				*29.3*		
Approach LOS	--	--				*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*US 101 Ramp @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing + Proj Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *US 101 Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*280*	*0*	*0*	*622*	*0*
Peak-Hour Factor, PHF	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*
Hourly Flow Rate, HFR (veh/h)	*0*	*318*	*0*	*0*	*706*	*0*
Percent Heavy Vehicles	*6*	--	--	*6*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*			*21*		*68*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.88*	*0.95*	*0.88*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*23*	*0*	*77*
Percent Heavy Vehicles	*6*	*1*	*1*	*6*	*1*	*6*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration	*LT*			*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*	*LT*			*L*		*R*
v (veh/h)	*0*	*0*				*23*		*77*
C (m) (veh/h)	*874*	*1220*				*210*		*429*
v/c	*0.00*	*0.00*				*0.11*		*0.18*
95% queue length	*0.00*	*0.00*				*0.37*		*0.65*
Control Delay (s/veh)	*9.1*	*8.0*				*24.2*		*15.2*
LOS	*A*	*A*				*C*		*C*
Approach Delay (s/veh)	--	--				*17.3*		
Approach LOS	--	--				*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Bello St @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		

Project Description *Existing + Proj Traffic Volumes*

East/West Street: *Price Canyon Rd* North/South Street: *Bello Street*

Intersection Orientation: *East-West* Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*148*	*509*	*20*	*1*	*181*	*16*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*197*	*678*	*26*	*1*	*241*	*21*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*16*	*12*	*1*	*11*	*2*	*168*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*21*	*16*	*1*	*14*	*2*	*224*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*LT*		*R*	*LT*		*R*
v (veh/h)	*197*	*1*	*37*		*1*	*16*		*224*
C (m) (veh/h)	*1331*	*919*	*98*		*446*	*107*		*789*
v/c	*0.15*	*0.00*	*0.38*		*0.00*	*0.15*		*0.28*
95% queue length	*0.52*	*0.00*	*1.72*		*0.01*	*0.52*		*1.18*
Control Delay (s/veh)	*8.2*	*8.9*	*63.6*		*13.1*	*44.5*		*11.4*
LOS	*A*	*A*	*F*		*B*	*E*		*B*
Approach Delay (s/veh)	--	--	*62.3*			*13.6*		
Approach LOS	--	--	*F*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Bello St @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description *Existing + Proj Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Bello Street*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*70*	*196*	*37*	*2*	*635*	*42*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*73*	*206*	*38*	*2*	*668*	*44*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*14*	*8*	*2*	*6*	*0*	*81*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*14*	*8*	*2*	*6*	*0*	*85*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*LT*		*R*	*LT*		*R*
v (veh/h)	*73*	*2*	*22*		*2*	*6*		*85*
C (m) (veh/h)	*927*	*1371*	*170*		*817*	*182*		*447*
v/c	*0.08*	*0.00*	*0.13*		*0.00*	*0.03*		*0.19*
95% queue length	*0.26*	*0.00*	*0.44*		*0.01*	*0.10*		*0.70*
Control Delay (s/veh)	*9.2*	*7.6*	*29.3*		*9.4*	*25.5*		*14.9*
LOS	*A*	*A*	*D*		*A*	*D*		*B*
Approach Delay (s/veh)	--	--	*27.7*			*15.6*		
Approach LOS	--	--	*D*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*Ormonde Rd @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing + Proj Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Ormonde Rd*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*11*	*522*	*2*	*6*	*162*	*11*
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
Hourly Flow Rate, HFR (veh/h)	*13*	*636*	*2*	*7*	*197*	*13*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*4*	*12*	*14*	*8*	*2*
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
Hourly Flow Rate, HFR (veh/h)	*0*	*4*	*14*	*17*	*9*	*2*
Percent Heavy Vehicles	*1*	*0*	*0*	*1*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*13*	*7*		*18*			*28*	
C (m) (veh/h)	*1382*	*952*		*416*			*273*	
v/c	*0.01*	*0.01*		*0.04*			*0.10*	
95% queue length	*0.03*	*0.02*		*0.14*			*0.34*	
Control Delay (s/veh)	*7.6*	*8.8*		*14.0*			*19.7*	
LOS	*A*	*A*		*B*			*C*	
Approach Delay (s/veh)	--	--	*14.0*			*19.7*		
Approach LOS	--	--	*B*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*Ormonde Rd @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing + Proj Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Ormonde Rd*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*3*	*168*	*2*	*6*	*484*	*5*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*3*	*188*	*2*	*6*	*543*	*5*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*9*	*4*	*1*	*8*	*3*	*50*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*10*	*4*	*1*	*8*	*3*	*56*
Percent Heavy Vehicles	*2*	*0*	*0*	*2*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*3*	*6*		*15*			*67*	
C (m) (veh/h)	*1026*	*1386*		*305*			*487*	
v/c	*0.00*	*0.00*		*0.05*			*0.14*	
95% queue length	*0.01*	*0.01*		*0.16*			*0.48*	
Control Delay (s/veh)	*8.5*	*7.6*		*17.4*			*13.6*	
LOS	*A*	*A*		*C*			*B*	
Approach Delay (s/veh)	--	--	*17.4*			*13.6*		
Approach LOS	--	--	*C*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Gate 2 @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		

Project Description *Existing + Proj Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Arroyo Field Gate 2*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*12*	*517*	*3*	*0*	*160*	*4*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*12*	*555*	*3*	*0*	*172*	*4*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*0*	*0*	*1*	*1*	*10*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*2*	*0*	*0*	*1*	*1*	*10*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*12*	*0*		*2*			*12*	
C (m) (veh/h)	*1405*	*1015*		*315*			*682*	
v/c	*0.01*	*0.00*		*0.01*			*0.02*	
95% queue length	*0.03*	*0.00*		*0.02*			*0.05*	
Control Delay (s/veh)	*7.6*	*8.5*		*16.5*			*10.4*	
LOS	*A*	*A*		*C*			*B*	
Approach Delay (s/veh)	--	--	*16.5*			*10.4*		
Approach LOS	--	--	*C*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Gate 2 @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description *Existing + Proj Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Arroyo Field Gate 2*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*1*	*183*	*1*	*0*	*585*	*3*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*1*	*212*	*1*	*0*	*680*	*3*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*3*	*4*	*4*	*5*	*4*	*30*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*3*	*4*	*4*	*5*	*4*	*34*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*1*	*0*		*11*			*43*	
C (m) (veh/h)	*917*	*1364*		*345*			*395*	
v/c	*0.00*	*0.00*		*0.03*			*0.11*	
95% queue length	*0.00*	*0.00*		*0.10*			*0.37*	
Control Delay (s/veh)	*8.9*	*7.6*		*15.8*			*15.2*	
LOS	*A*	*A*		*C*			*C*	
Approach Delay (s/veh)	--	--	*15.8*			*15.2*		
Approach LOS	--	--	*C*			*C*		

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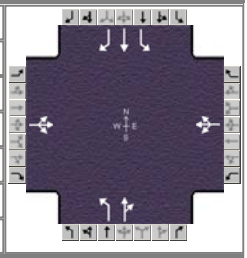
HCS 2010 Signalized Intersection Results Summary

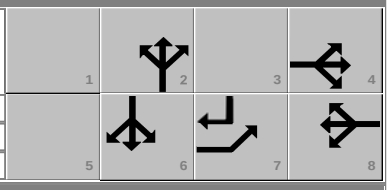
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.76
Intersection	SR 227 @ Price Cyn Rd	Analysis Year	2013	Analysis Period	1> 7:00
File Name	227.xus				
Project Description	Existing + Project AM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	449	0	1	1	1	11	14	339	0	2	97	122

Signal Information			
Cycle, s	48.0	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	13.9	18.1	1.0	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		12.0		12.0		6.0		5.0
Phase Duration, s		23.1		6.0		18.9		18.9
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.3		3.1		3.1
Queue Clearance Time (g_s), s		16.6		2.5		12.5		12.6
Green Extension Time (g_e), s		1.3		0.0		1.3		0.8
Phase Call Probability		1.00		0.20		1.00		1.00
Max Out Probability		0.00		0.00		0.02		0.56

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		592			17		18	0		3	128	161
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1809			1643		1283	0		959	1900	1610
Queue Service Time (g_s), s		14.6			0.5		0.5	0.0		0.1	2.5	1.8
Cycle Queue Clearance Time (g_c), s		14.6			0.5		2.8	0.0		10.6	2.5	1.8
Green Ratio (*g/C*)		0.38			0.02		0.29			0.29	0.29	0.67
Capacity (*c*), veh/h		682			36		462			220	552	1075
Volume-to-Capacity Ratio (*X*)		0.868			0.479		0.040	0.000		0.012	0.231	0.149
Available Capacity (c_a), veh/h		3710			511		727			279	669	1174
Back of Queue (*Q*), veh/ln (50th percentile)		4.9			0.2		0.1			0.0	0.9	0.2
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.02	0.00		0.01	0.00	0.04
Uniform Delay (d_1), s/veh		13.9			23.3		14.0			20.8	13.0	3.0
Incremental Delay (d_2), s/veh		1.4			3.7		0.0	0.0		0.0	0.1	0.0
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh		15.3			27.0		14.0			20.8	13.1	3.0
Level of Service (LOS)		B			C		B			C	B	A
Approach Delay, s/veh / LOS	15.3	B		27.0	C		16.8	B		7.6	A	
Intersection Delay, s/veh / LOS	14.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.4	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	1.5	A	0.5	A	1.3	A	1.0	A

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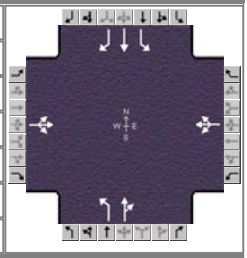
HCS 2010 Signalized Intersection Results Summary

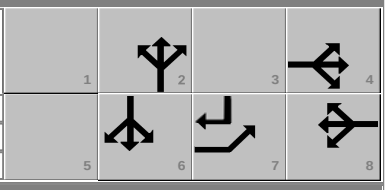
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.79
Intersection	SR 227 @ Price Cyn Rd	Analysis Year	2013	Analysis Period	1> 7:00
File Name	227 pm.xus				
Project Description	Existing + Project PM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	202	1	14	4	1	9	10	149	0	13	434	629

Signal Information			
Cycle, s	47.1	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	21.9	9.1	1.0	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		12.0		12.0		6.0		5.0
Phase Duration, s		14.1		6.0		26.9		26.9
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.3		3.2		3.2
Queue Clearance Time (g_s), s		8.9		2.5		12.8		17.7
Green Extension Time (g_e), s		0.5		0.0		4.2		4.2
Phase Call Probability		0.97		0.21		1.00		1.00
Max Out Probability		0.00		0.00		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		275			18		13	0		16	549	796
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1796			1681		872	0		1214	1900	1610
Queue Service Time (g_s), s		6.9			0.5		0.5	0.0		0.4	10.3	15.7
Cycle Queue Clearance Time (g_c), s		6.9			0.5		10.8	0.0		3.0	10.3	15.7
Green Ratio (*g/C*)		0.19			0.02		0.47			0.47	0.47	0.66
Capacity (*c*), veh/h		349			37		369			649	884	1062
Volume-to-Capacity Ratio (*X*)		0.787			0.473		0.034	0.000		0.025	0.621	0.749
Available Capacity (c_a), veh/h		1065			534		1718			3016	4590	4203
Back of Queue (*Q*), veh/ln (50th percentile)		2.6			0.2		0.1			0.1	3.1	2.2
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.01	0.00		0.03	0.00	0.37
Uniform Delay (d_1), s/veh		18.1			22.8		13.5			8.3	9.5	5.4
Incremental Delay (d_2), s/veh		1.5			3.4		0.0	0.0		0.0	0.3	0.4
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh		19.6			26.2		13.5			8.4	9.8	5.8
Level of Service (LOS)		B			C		B			A	A	A
Approach Delay, s/veh / LOS	19.6	B		26.2	C		7.9	A		7.4	A	
Intersection Delay, s/veh / LOS	9.5						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.4	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.9	A	0.5	A	0.8	A	2.7	B

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/16/2013*	Jurisdiction	
Analysis Time Period	*Ex + Proj AM Peak Hour*	Analysis Year	*2013*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2654*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1471*	pc/h/ln
S	*72.5*	mph
D = v_p / S	*20.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*Ex + Proj PM Peak Hour*	Analysis Year	*2013*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1892*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1000*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*13.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CSV*
Agency or Company	*C2 Consult*
Date Performed	*5/30/2013*
Analysis Time Period	*Ex + Proj AM Peak Hour*

Site Information

Highway/Direction of Travel	*US 101 SB*
From/To	
Jurisdiction	
Analysis Year	*2013*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1449*	veh/h	Peak-Hour Factor, PHF	*0.87*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*870*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*11.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*Ex + Proj PM Peak Hour*	Analysis Year	*2013*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3194*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1680*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*24.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/16/2013*	Jurisdiction	
Analysis Time Period	*Exist + Proj AM Peak Hour*	Analysis Year	*2013*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3417*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1917*	pc/h/ln
S	*65.7*	mph
D = v_p / S	*29.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*Exist + Proj PM Peak Hour*	Analysis Year	*2013*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2593*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1423*	pc/h/ln
S	*73.0*	mph
D = v_p / S	*19.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/30/2013*	Jurisdiction	
Analysis Time Period	*Exist + Proj AM Peak Hour*	Analysis Year	*2013*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1905*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1074*	pc/h/ln
S	*74.9*	mph
D = v_p / S	*14.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*Exist + Proj PM Peak Hour*	Analysis Year	*2013*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3809*	veh/h	Peak-Hour Factor, PHF	*0.87*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2211*	pc/h/ln
S	*58.8*	mph
D = v_p / S	*37.6*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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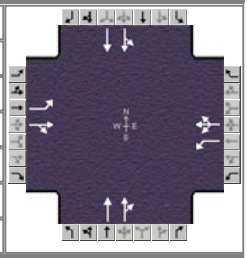
APPENDIX E

EXISTING + APPROVED/NOT BUILT PROJECTS LEVEL OF SERVICE CALCULATIONS

HCS 2010 Signalized Intersection Results Summary

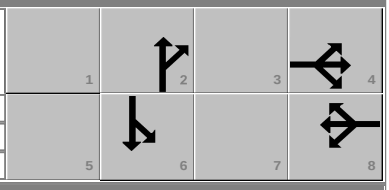
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.88
Intersection	Price St @ Price Cyn/Hinds	Analysis Year	2013	Analysis Period	1> 7:00
File Name	hinds.xus				
Project Description	Existing Plus Culmulative AM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	14	92	33	280	0	40		123	473	34	103	

Signal Information			
Cycle, s	60.3	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	23.1	9.3	12.9	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		14.3		17.9		28.1		28.1
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.2		3.3		3.3
Queue Clearance Time (g_s), s		6.4		12.2		21.0		24.0
Green Extension Time (g_e), s		0.1		0.7		2.0		0.0
Phase Call Probability		0.93		1.00		1.00		1.00
Max Out Probability		0.58		0.00		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	16	142		318	318			140	538	39	117	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1796		1792	1792			1881	1594	137	1712	
Queue Service Time (g_s), s	0.5	4.4		10.2	10.2			3.8	19.0	3.0	5.6	
Cycle Queue Clearance Time (g_c), s	0.5	4.4		10.2	10.2			3.8	19.0	22.0	5.6	
Green Ratio (*g/C*)	0.15	0.15		0.21	0.21			0.38	0.38	0.38	0.38	
Capacity (*c*), veh/h	276	277		385	385			720	610	172	655	
Volume-to-Capacity Ratio (*X*)	0.058	0.513		0.826	0.826			0.194	0.881	0.225	0.179	
Available Capacity (c_a), veh/h	297	297		1098	1098			2710	2296	172	655	
Back of Queue (*Q*), veh/ln (50th percentile)	0.2	1.8		4.1	4.1			1.1	6.2	0.5	0.9	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	21.8	23.5		22.6	22.6			12.4	17.4	27.6	12.4	
Incremental Delay (d_2), s/veh	0.0	0.5		1.7	1.7			0.0	1.7	0.2	0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	21.8	24.0		24.4	24.4			12.5	19.1	27.8	12.4	
Level of Service (LOS)	C	C		C	C			B	B	C	B	
Approach Delay, s/veh / LOS	23.8	C		23.7	C		17.7	B		16.2	B	
Intersection Delay, s/veh / LOS	19.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.7	A	1.1	A	1.0	A	0.6	A

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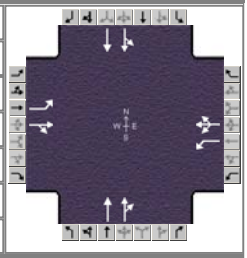
HCS 2010 Signalized Intersection Results Summary

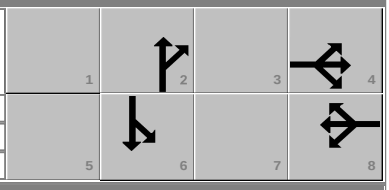
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.83
Intersection	Price St @ Price Cyn/Hinds	Analysis Year	2013	Analysis Period	1> 7:00
File Name	hinds pm.xus				
Project Description	Existing Plus Culmulative PM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	31	69	78	668	0	83		217	197	45	338	

Signal Information			
Cycle, s	96.3	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	23.4	12.0	45.8	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		17.0		50.8		28.4		28.4
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.2		3.1		3.2		3.2
Queue Clearance Time (g_s), s		11.7		43.4		15.9		21.3
Green Extension Time (g_e), s		0.3		2.2		2.0		2.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.01		0.00		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	37	177		805	805			261	237	175	286	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1717		1792	1792			1881	1594	942	1712	
Queue Service Time (g_s), s	1.8	9.7		41.4	41.4			13.9	12.8	5.6	14.1	
Cycle Queue Clearance Time (g_c), s	1.8	9.7		41.4	41.4			13.9	12.8	19.3	14.1	
Green Ratio (*g/C*)	0.13	0.13		0.48	0.48			0.24	0.24	0.24	0.24	
Capacity (*c*), veh/h	224	215		853	853			458	388	278	417	
Volume-to-Capacity Ratio (*X*)	0.166	0.823		0.943	0.943			0.571	0.612	0.630	0.687	
Available Capacity (c_a), veh/h	370	355		1480	1480			3672	3112	2672	3324	
Back of Queue (*Q*), veh/ln (50th percentile)	0.8	4.2		17.2	17.2			5.3	4.9	4.0	6.0	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	37.8	41.3		24.1	24.1			32.2	32.6	34.6	33.3	
Incremental Delay (d_2), s/veh	0.1	3.0		4.7	4.7			0.4	0.6	0.9	0.8	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	38.0	44.3		28.8	28.8			32.6	33.1	35.4	34.0	
Level of Service (LOS)	D	D		C	C			C	C	D	C	
Approach Delay, s/veh / LOS	43.2	D		27.2	C		32.9	C		34.6	C	
Intersection Delay, s/veh / LOS	31.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.8	A	2.0	A	0.9	A	0.9	A

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*US 101 Ramp @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing Plus Culmulative Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *US 101 Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*849*	*0*	*0*	*432*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*943*	*0*	*0*	*480*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*			*67*		*23*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.90*	*0.95*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*74*	*0*	*25*
Percent Heavy Vehicles	*0*	*1*	*1*	*0*	*1*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration	*LT*			*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*	*LT*			*L*		*R*
v (veh/h)	*0*	*0*				*74*		*25*
C (m) (veh/h)	*1093*	*736*				*115*		*590*
v/c	*0.00*	*0.00*				*0.64*		*0.04*
95% queue length	*0.00*	*0.00*				*4.45*		*0.13*
Control Delay (s/veh)	*8.3*	*9.9*				*88.6*		*11.4*
LOS	*A*	*A*				*F*		*B*
Approach Delay (s/veh)	--	--				*69.1*		
Approach LOS	--	--				*F*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*US 101 Ramp @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing Plus Cumulative Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *US 101 Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*328*	*0*	*0*	*660*	*0*
Peak-Hour Factor, PHF	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*
Hourly Flow Rate, HFR (veh/h)	*0*	*372*	*0*	*0*	*750*	*0*
Percent Heavy Vehicles	*6*	--	--	*6*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*			*75*		*68*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.88*	*0.95*	*0.88*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*85*	*0*	*77*
Percent Heavy Vehicles	*6*	*1*	*1*	*6*	*1*	*6*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration	*LT*			*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*	*LT*			*L*		*R*
v (veh/h)	*0*	*0*				*85*		*77*
C (m) (veh/h)	*841*	*1165*				*180*		*405*
v/c	*0.00*	*0.00*				*0.47*		*0.19*
95% queue length	*0.00*	*0.00*				*2.55*		*0.70*
Control Delay (s/veh)	*9.3*	*8.1*				*42.6*		*16.0*
LOS	*A*	*A*				*E*		*C*
Approach Delay (s/veh)	--	--				*29.9*		
Approach LOS	--	--				*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Bello St @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		

Project Description *Existing Plus Cumulative Traffic Volumes*

East/West Street: *Price Canyon Rd* North/South Street: *Bello Street*

Intersection Orientation: *East-West* Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*148*	*568*	*20*	*1*	*222*	*57*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*197*	*757*	*26*	*1*	*296*	*76*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*16*	*12*	*1*	*18*	*2*	*168*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*21*	*16*	*1*	*24*	*2*	*224*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*LT*		*R*	*LT*		*R*
v (veh/h)	*197*	*1*	*37*		*1*	*26*		*224*
C (m) (veh/h)	*1271*	*858*	*74*		*402*	*80*		*710*
v/c	*0.15*	*0.00*	*0.50*		*0.00*	*0.32*		*0.32*
95% queue length	*0.55*	*0.00*	*2.63*		*0.01*	*1.37*		*1.37*
Control Delay (s/veh)	*8.4*	*9.2*	*99.9*		*14.0*	*71.3*		*12.4*
LOS	*A*	*A*	*F*		*B*	*F*		*B*
Approach Delay (s/veh)	--	--	*97.7*			*18.5*		
Approach LOS	--	--	*F*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Bello St @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description *Existing Plus Cumulative Traffic Volumes*

East/West Street: *Price Canyon Rd* North/South Street: *Bello Street*

Intersection Orientation: *North-South* Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*14*	*8*	*2*	*9*	*0*	*81*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*14*	*8*	*2*	*9*	*0*	*85*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*70*	*298*	*37*	*2*	*673*	*90*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*73*	*313*	*38*	*2*	*708*	*94*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*	*L*		*TR*	*L*		*TR*
v (veh/h)	*14*	*9*	*2*		*802*	*73*		*351*
C (m) (veh/h)	*1630*	*1619*	*473*		*850*	*138*		*849*
v/c	*0.01*	*0.01*	*0.00*		*0.94*	*0.53*		*0.41*
95% queue length	*0.03*	*0.02*	*0.01*		*24.70*	*3.08*		*2.10*
Control Delay (s/veh)	*7.2*	*7.2*	*12.6*		*57.3*	*59.4*		*12.2*
LOS	*A*	*A*	*B*		*F*	*F*		*B*
Approach Delay (s/veh)	--	--	*57.2*			*20.3*		
Approach LOS	--	--	*F*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*Ormonde Rd @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing Plus Cumulative Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Ormonde Rd*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*9*	*636*	*2*	*6*	*215*	*10*
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
Hourly Flow Rate, HFR (veh/h)	*10*	*775*	*2*	*7*	*262*	*12*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*3*	*12*	*13*	*8*	*0*
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
Hourly Flow Rate, HFR (veh/h)	*0*	*3*	*14*	*15*	*9*	*0*
Percent Heavy Vehicles	*1*	*0*	*0*	*1*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*10*	*7*		*17*			*24*	
C (m) (veh/h)	*1308*	*845*		*349*			*194*	
v/c	*0.01*	*0.01*		*0.05*			*0.12*	
95% queue length	*0.02*	*0.03*		*0.15*			*0.42*	
Control Delay (s/veh)	*7.8*	*9.3*		*15.8*			*26.2*	
LOS	*A*	*A*		*C*			*D*	
Approach Delay (s/veh)	--	--	*15.8*			*26.2*		
Approach LOS	--	--	*C*			*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*Ormonde Rd @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing Plus Cumulative Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Ormonde Rd*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*1*	*250*	*2*	*6*	*619*	*4*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*1*	*280*	*2*	*6*	*695*	*4*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*9*	*4*	*1*	*4*	*2*	*40*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*10*	*4*	*1*	*4*	*2*	*44*
Percent Heavy Vehicles	*2*	*0*	*0*	*2*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*1*	*6*		*15*			*50*	
C (m) (veh/h)	*901*	*1283*		*216*			*398*	
v/c	*0.00*	*0.00*		*0.07*			*0.13*	
95% queue length	*0.00*	*0.01*		*0.22*			*0.43*	
Control Delay (s/veh)	*9.0*	*7.8*		*22.9*			*15.3*	
LOS	*A*	*A*		*C*			*C*	
Approach Delay (s/veh)	--	--	*22.9*			*15.3*		
Approach LOS	--	--	*C*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Gate 2 @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		

Project Description *Existing Plus Cumulative Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Arroyo Field Gate 2*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*11*	*631*	*3*	*0*	*213*	*2*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*11*	*678*	*3*	*0*	*229*	*2*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*0*	*0*	*1*	*1*	*9*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*2*	*0*	*0*	*1*	*1*	*9*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*11*	*0*		*2*			*11*	
C (m) (veh/h)	*1339*	*914*		*239*			*578*	
v/c	*0.01*	*0.00*		*0.01*			*0.02*	
95% queue length	*0.02*	*0.00*		*0.03*			*0.06*	
Control Delay (s/veh)	*7.7*	*8.9*		*20.2*			*11.3*	
LOS	*A*	*A*		*C*			*B*	
Approach Delay (s/veh)	--	--	*20.2*			*11.3*		
Approach LOS	--	--	*C*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Gate 2 @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description *Existing Plus Cumulative Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Arroyo Field Gate 2*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*262*	*1*	*0*	*724*	*2*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*0*	*304*	*1*	*0*	*841*	*2*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*4*	*3*	*1*	*4*	*26*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*2*	*4*	*3*	*1*	*4*	*30*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*0*	*0*		*9*			*35*	
C (m) (veh/h)	*799*	*1263*		*243*			*325*	
v/c	*0.00*	*0.00*		*0.04*			*0.11*	
95% queue length	*0.00*	*0.00*		*0.12*			*0.36*	
Control Delay (s/veh)	*9.5*	*7.9*		*20.4*			*17.4*	
LOS	*A*	*A*		*C*			*C*	
Approach Delay (s/veh)	--	--	*20.4*			*17.4*		
Approach LOS	--	--	*C*			*C*		

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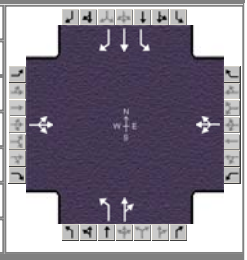
HCS 2010 Signalized Intersection Results Summary

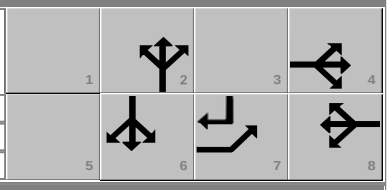
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.79
Intersection		Analysis Year	2013	Analysis Period	1> 7:00
File Name	227.xus				
Project Description	Existing Plus Cumulative AM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	557	0	7	1	1	11	17	354	0	2	104	170

Signal Information			
Cycle, s	59.0	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	17.0	25.8	1.2	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		12.0		12.0		6.0		5.0
Phase Duration, s		30.8		6.2		22.0		22.0
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.3		3.1		3.1
Queue Clearance Time (g_s), s		23.8		2.6		15.1		15.2
Green Extension Time (g_e), s		1.6		0.0		1.6		1.6
Phase Call Probability		1.00		0.24		1.00		1.00
Max Out Probability		0.00		0.01		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		714			16		22	0		3	132	215
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1807			1643		1278	0		957	1900	1610
Queue Service Time (g_s), s		21.8			0.6		0.8	0.0		0.1	3.2	2.5
Cycle Queue Clearance Time (g_c), s		21.8			0.6		3.6	0.0		13.2	3.2	2.5
Green Ratio (*g/C*)		0.44			0.02		0.29			0.29	0.29	0.73
Capacity (*c*), veh/h		792			34		430			188	549	1171
Volume-to-Capacity Ratio (*X*)		0.901			0.484		0.050	0.000		0.013	0.240	0.184
Available Capacity (c_a), veh/h		1548			221		3969			2789	5713	5548
Back of Queue (*Q*), veh/ln (50th percentile)		7.7			0.3		0.2			0.0	1.2	0.3
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.03	0.00		0.01	0.00	0.06
Uniform Delay (d_1), s/veh		15.5			28.8		17.4			25.8	16.2	2.6
Incremental Delay (d_2), s/veh		1.6			3.9		0.0	0.0		0.0	0.1	0.0
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh		17.1			32.8		17.4			25.8	16.3	2.6
Level of Service (LOS)		B			C		B			C	B	A
Approach Delay, s/veh / LOS	17.1	B		32.8	C		20.7	C		7.9	A	
Intersection Delay, s/veh / LOS	16.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.5	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	1.7	A	0.5	A	1.3	A	1.1	A

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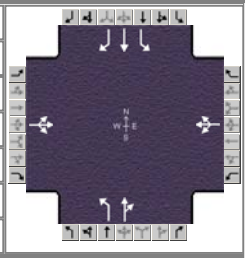
HCS 2010 Signalized Intersection Results Summary

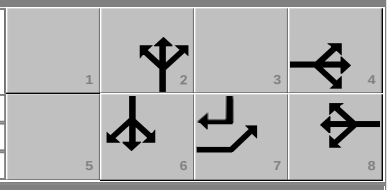
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.79
Intersection		Analysis Year	2013	Analysis Period	1> 7:00
File Name	227 pm.xus				
Project Description	Existing Plus Cumulative PM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	266	1	24	4	1	9	27	177	0	13	462	750

Signal Information			
Cycle, s	61.5	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	30.3	14.8	1.3	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		12.0		12.0		6.0		5.0
Phase Duration, s		19.8		6.3		35.3		35.3
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.3		3.3		3.3
Queue Clearance Time (g_s), s		14.1		2.6		17.8		25.4
Green Extension Time (g_e), s		0.7		0.0		1.3		4.9
Phase Call Probability		1.00		0.26		1.00		1.00
Max Out Probability		0.00		0.84		1.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		368			18		34	0		16	585	949
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1792			1681		844	0		1175	1900	1610
Queue Service Time (g_s), s		12.1			0.6		1.9	0.0		0.5	13.9	23.4
Cycle Queue Clearance Time (g_c), s		12.1			0.6		15.8	0.0		4.6	13.9	23.4
Green Ratio (*g/C*)		0.24			0.02		0.49			0.49	0.49	0.74
Capacity (*c*), veh/h		433			36		342			618	937	1183
Volume-to-Capacity Ratio (*X*)		0.851			0.492		0.100	0.000		0.027	0.624	0.802
Available Capacity (c_a), veh/h		2474			164		342			2215	3519	3371
Back of Queue (*Q*), veh/ln (50th percentile)		4.8			0.3		0.3			0.1	4.7	3.5
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.04	0.00		0.04	0.00	0.58
Uniform Delay (d_1), s/veh		22.3			29.8		17.2			10.3	11.4	5.3
Incremental Delay (d_2), s/veh		1.9			3.8		0.0	0.0		0.0	0.3	0.5
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh		24.1			33.6		17.3			10.3	11.7	5.8
Level of Service (LOS)		C			C		B			B	B	A
Approach Delay, s/veh / LOS	24.1	C		33.6	C		10.1	B		8.0	A	
Intersection Delay, s/veh / LOS	11.2						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.5	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	1.1	A	0.5	A	0.9	A	3.0	C

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/16/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2013 Existing + Cumulative*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2712*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1503*	pc/h/ln
S	*72.2*	mph
D = v_p / S	*20.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2013 Existing + Cumulative*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2085*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1102*	pc/h/ln
S	*74.9*	mph
D = v_p / S	*14.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
S - Speed
V - Hourly volume
D - Density
v_p - Flow rate
FFS - Free-flow speed
LOS - Level of service
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/30/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2013 Existing + Cumulative*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1603*	veh/h	Peak-Hour Factor, PHF	*0.87*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*963*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*12.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2013 Existing + Cumulative*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3272*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1721*	pc/h/ln
S	*69.2*	mph
D = v_p / S	*24.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/16/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2013 Existing + Cumulative*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3436*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1928*	pc/h/ln
S	*65.5*	mph
D = v_p / S	*29.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2013 Existing + Cumulative*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2636*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1447*	pc/h/ln
S	*72.8*	mph
D = v_p / S	*19.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/30/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2013 Existing + Cumulative*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1942*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1095*	pc/h/ln
S	*74.9*	mph
D = v_p / S	*14.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
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BFFS - Base free-flow speed
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Factor Location

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E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2013 Existing + Cumulative*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3840*	veh/h	Peak-Hour Factor, PHF	*0.87*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2229*	pc/h/ln
S	*58.3*	mph
D = v_p / S	*38.2*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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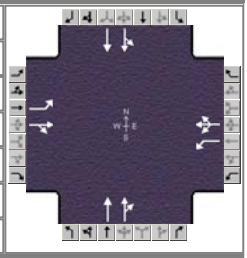
APPENDIX F

EXISTING + APPROVED/NOT BUILT + FM O&G PROJECT LEVEL OF SERVICE CALCULATIONS

HCS 2010 Signalized Intersection Results Summary

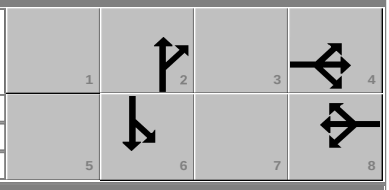
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.88
Intersection	Price St @ Price Cyn/Hinds	Analysis Year	2013	Analysis Period	1> 7:00
File Name	hinds.xus				
Project Description	Existing + App + Proj AM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	14	92	33	282	0	40		123	475	34	103	

Signal Information			
Cycle, s	60.6	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	23.2	9.3	13.1	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		14.3		18.1		28.2		28.2
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.2		3.3		3.3
Queue Clearance Time (g_s), s		6.4		12.4		21.2		24.2
Green Extension Time (g_e), s		0.1		0.7		2.0		0.0
Phase Call Probability		0.93		1.00		1.00		1.00
Max Out Probability		0.59		0.00		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	16	142		320	320			140	540	39	117	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1796		1792	1792			1881	1594	135	1712	
Queue Service Time (g_s), s	0.5	4.4		10.4	10.4			3.8	19.2	3.0	5.6	
Cycle Queue Clearance Time (g_c), s	0.5	4.4		10.4	10.4			3.8	19.2	22.2	5.6	
Green Ratio (*g/C*)	0.15	0.15		0.22	0.22			0.38	0.38	0.38	0.38	
Capacity (*c*), veh/h	275	276		387	387			721	611	170	656	
Volume-to-Capacity Ratio (*X*)	0.058	0.515		0.828	0.828			0.194	0.883	0.227	0.178	
Available Capacity (c_a), veh/h	295	296		1092	1092			2696	2284	170	656	
Back of Queue (*Q*), veh/ln (50th percentile)	0.2	1.8		4.1	4.1			1.1	6.2	0.5	0.9	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	21.9	23.6		22.7	22.7			12.5	17.4	27.8	12.4	
Incremental Delay (d_2), s/veh	0.0	0.6		1.8	1.8			0.0	1.7	0.2	0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	22.0	24.2		24.5	24.5			12.5	19.2	28.0	12.4	
Level of Service (LOS)	C	C		C	C			B	B	C	B	
Approach Delay, s/veh / LOS	24.0	C		23.8	C		17.8	B		16.3	B	
Intersection Delay, s/veh / LOS	20.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.7	A	1.1	A	1.0	A	0.6	A

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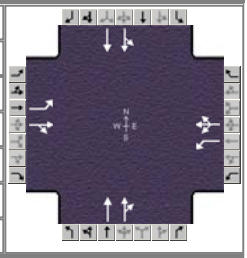
HCS 2010 Signalized Intersection Results Summary

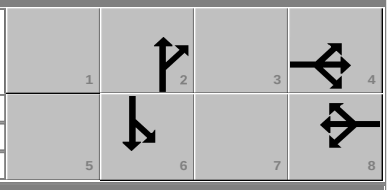
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.83
Intersection	Price St @ Price Cyn/Hinds	Analysis Year	2013	Analysis Period	1> 7:00
File Name	hinds pm.xus				
Project Description	Existing + App + Proj PM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	31	69	78	677	0	85		217	199	45	338	

Signal Information			
Cycle, s	99.4	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	24.1	12.4	47.9	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		17.4		52.9		29.1		29.1
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.2		3.1		3.2		3.2
Queue Clearance Time (g_s), s		12.1		45.3		16.1		21.9
Green Extension Time (g_e), s		0.3		2.2		2.0		2.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	37	177		816	816			261	240	176	286	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1717		1792	1792			1881	1594	949	1712	
Queue Service Time (g_s), s	1.9	10.1		43.3	43.3			14.1	13.4	6.0	14.3	
Cycle Queue Clearance Time (g_c), s	1.9	10.1		43.3	43.3			14.1	13.4	19.9	14.3	
Green Ratio (*g/C*)	0.12	0.12		0.48	0.48			0.24	0.24	0.24	0.24	
Capacity (*c*), veh/h	224	215		864	864			457	387	277	416	
Volume-to-Capacity Ratio (*X*)	0.167	0.825		0.944	0.944			0.572	0.619	0.634	0.687	
Available Capacity (c_a), veh/h	376	360		1449	1449			3551	3010	2582	3215	
Back of Queue (*Q*), veh/ln (50th percentile)	0.8	4.4		18.3	18.3			5.5	5.1	4.1	6.2	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	39.1	42.7		24.6	24.6			33.3	33.8	35.9	34.4	
Incremental Delay (d_2), s/veh	0.1	3.1		5.6	5.6			0.4	0.6	0.9	0.8	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	39.3	45.8		30.2	30.2			33.7	34.4	36.8	35.2	
Level of Service (LOS)	D	D		C	C			C	C	D	D	
Approach Delay, s/veh / LOS	44.7	D		28.5	C		34.0	C		35.8	D	
Intersection Delay, s/veh / LOS	33.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.8	A	2.0	B	0.9	A	0.9	A

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*US 101 Ramp @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing + Approved + Project Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *US 101 Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*851*	*0*	*0*	*434*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*945*	*0*	*0*	*482*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*			*68*		*23*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.90*	*0.95*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*75*	*0*	*25*
Percent Heavy Vehicles	*0*	*1*	*1*	*0*	*1*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration	*LT*			*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*	*LT*			*L*		*R*
v (veh/h)	*0*	*0*				*75*		*25*
C (m) (veh/h)	*1091*	*734*				*114*		*588*
v/c	*0.00*	*0.00*				*0.66*		*0.04*
95% queue length	*0.00*	*0.00*				*4.66*		*0.13*
Control Delay (s/veh)	*8.3*	*9.9*				*92.3*		*11.4*
LOS	*A*	*A*				*F*		*B*
Approach Delay (s/veh)	--	--				*72.1*		
Approach LOS	--	--				*F*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*US 101 Ramp @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing + Approved + Project Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *US 101 Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*330*	*0*	*0*	*671*	*0*
Peak-Hour Factor, PHF	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*
Hourly Flow Rate, HFR (veh/h)	*0*	*375*	*0*	*0*	*762*	*0*
Percent Heavy Vehicles	*6*	--	--	*6*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*			*76*		*68*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.88*	*0.95*	*0.88*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*86*	*0*	*77*
Percent Heavy Vehicles	*6*	*1*	*1*	*6*	*1*	*6*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration	*LT*			*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*	*LT*			*L*		*R*
v (veh/h)	*0*	*0*				*86*		*77*
C (m) (veh/h)	*833*	*1162*				*176*		*398*
v/c	*0.00*	*0.00*				*0.49*		*0.19*
95% queue length	*0.00*	*0.00*				*2.70*		*0.72*
Control Delay (s/veh)	*9.3*	*8.1*				*44.6*		*16.2*
LOS	*A*	*A*				*E*		*C*
Approach Delay (s/veh)	--	--				*31.2*		
Approach LOS	--	--				*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Bello St @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		

Project Description	*Existing + Approved + Project Traffic Volumes*
East/West Street: *Price Canyon Rd*	North/South Street: *Bello Street*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*148*	*571*	*20*	*1*	*224*	*58*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*197*	*761*	*26*	*1*	*298*	*77*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*16*	*12*	*1*	*18*	*2*	*168*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*21*	*16*	*1*	*24*	*2*	*224*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*LT*		*R*	*LT*		*R*
v (veh/h)	*197*	*1*	*37*		*1*	*26*		*224*
C (m) (veh/h)	*1269*	*856*	*73*		*400*	*79*		*708*
v/c	*0.16*	*0.00*	*0.51*		*0.00*	*0.33*		*0.32*
95% queue length	*0.55*	*0.00*	*2.68*		*0.01*	*1.40*		*1.38*
Control Delay (s/veh)	*8.4*	*9.2*	*102.4*		*14.0*	*72.5*		*12.4*
LOS	*A*	*A*	*F*		*B*	*F*		*B*
Approach Delay (s/veh)	--	--	*100.1*			*18.7*		
Approach LOS	--	--	*F*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Bello St @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description	*Existing + Approved + Project Traffic Volumes*
East/West Street: *Price Canyon Rd*	North/South Street: *Bello Street*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*70*	*301*	*37*	*2*	*684*	*94*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*73*	*316*	*38*	*2*	*720*	*98*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*14*	*8*	*2*	*9*	*0*	*81*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*14*	*8*	*2*	*9*	*0*	*85*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*LT*		*R*	*LT*		*R*
v (veh/h)	*73*	*2*	*22*		*2*	*9*		*85*
C (m) (veh/h)	*886*	*1250*	*126*		*709*	*133*		*403*
v/c	*0.08*	*0.00*	*0.17*		*0.00*	*0.07*		*0.21*
95% queue length	*0.27*	*0.00*	*0.63*		*0.01*	*0.22*		*0.80*
Control Delay (s/veh)	*9.4*	*7.9*	*39.6*		*10.1*	*34.0*		*16.3*
LOS	*A*	*A*	*E*		*B*	*D*		*C*
Approach Delay (s/veh)	--	--	*37.1*			*18.0*		
Approach LOS	--	--	*E*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*Ormonde Rd @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing + Approved + Project Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Ormonde Rd*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*11*	*637*	*2*	*6*	*216*	*11*
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
Hourly Flow Rate, HFR (veh/h)	*13*	*776*	*2*	*7*	*263*	*13*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*4*	*12*	*14*	*8*	*2*
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
Hourly Flow Rate, HFR (veh/h)	*0*	*4*	*14*	*17*	*9*	*2*
Percent Heavy Vehicles	*1*	*0*	*0*	*1*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*13*	*7*		*18*			*28*	
C (m) (veh/h)	*1307*	*845*		*335*			*200*	
v/c	*0.01*	*0.01*		*0.05*			*0.14*	
95% queue length	*0.03*	*0.03*		*0.17*			*0.49*	
Control Delay (s/veh)	*7.8*	*9.3*		*16.4*			*25.9*	
LOS	*A*	*A*		*C*			*D*	
Approach Delay (s/veh)	--	--	*16.4*			*25.9*		
Approach LOS	--	--	*C*			*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*Ormonde Rd @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *Existing + Approved + Project Traffic Volumes*

East/West Street: *Price Canyon Rd* | North/South Street: *Ormonde Rd*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*3*	*251*	*2*	*6*	*624*	*5*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*3*	*282*	*2*	*6*	*701*	*5*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*9*	*4*	*1*	*8*	*3*	*50*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*10*	*4*	*1*	*8*	*3*	*56*
Percent Heavy Vehicles	*2*	*0*	*0*	*2*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*3*	*6*		*15*			*67*	
C (m) (veh/h)	*896*	*1280*		*204*			*378*	
v/c	*0.00*	*0.00*		*0.07*			*0.18*	
95% queue length	*0.01*	*0.01*		*0.24*			*0.64*	
Control Delay (s/veh)	*9.0*	*7.8*		*24.0*			*16.6*	
LOS	*A*	*A*		*C*			*C*	
Approach Delay (s/veh)	--	--	*24.0*			*16.6*		
Approach LOS	--	--	*C*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Gate 2 @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		

Project Description *Existing + Approved + Project Traffic Volumes*	
East/West Street: *Price Canyon Rd*	North/South Street: *Arroyo Field Gate 2*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*12*	*632*	*3*	*0*	*214*	*4*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*12*	*679*	*3*	*0*	*230*	*4*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*0*	*0*	*1*	*1*	*10*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*2*	*0*	*0*	*1*	*1*	*10*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*12*	*0*		*2*			*12*	
C (m) (veh/h)	*1338*	*913*		*237*			*590*	
v/c	*0.01*	*0.00*		*0.01*			*0.02*	
95% queue length	*0.03*	*0.00*		*0.03*			*0.06*	
Control Delay (s/veh)	*7.7*	*8.9*		*20.3*			*11.2*	
LOS	*A*	*A*		*C*			*B*	
Approach Delay (s/veh)	--	--	*20.3*			*11.2*		
Approach LOS	--	--	*C*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Gate 2 @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description *Existing + Approved + Project Traffic Volumes*	
East/West Street: *Price Canyon Rd*	North/South Street: *Arroyo Field Gate 2*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*1*	*266*	*1*	*0*	*725*	*3*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*1*	*309*	*1*	*0*	*843*	*3*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*3*	*4*	*4*	*5*	*4*	*30*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*3*	*4*	*4*	*5*	*4*	*34*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*1*	*0*		*11*			*43*	
C (m) (veh/h)	*797*	*1257*		*242*			*301*	
v/c	*0.00*	*0.00*		*0.05*			*0.14*	
95% queue length	*0.00*	*0.00*		*0.14*			*0.50*	
Control Delay (s/veh)	*9.5*	*7.9*		*20.6*			*19.0*	
LOS	*A*	*A*		*C*			*C*	
Approach Delay (s/veh)	--	--	*20.6*			*19.0*		
Approach LOS	--	--	*C*			*C*		

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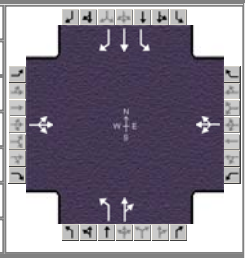
HCS 2010 Signalized Intersection Results Summary

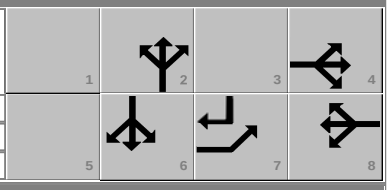
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.79
Intersection		Analysis Year	2013	Analysis Period	1> 7:00
File Name	227.xus				
Project Description	Existing + App + Proj AM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	558	0	7	1	1	11	18	354	0	2	104	172

Signal Information			
Cycle, s	59.1	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	17.0	25.8	1.2	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		12.0		12.0		6.0		5.0
Phase Duration, s		30.8		6.2		22.0		22.0
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.3		3.1		3.1
Queue Clearance Time (g_s), s		23.9		2.6		15.1		15.2
Green Extension Time (g_e), s		1.6		0.0		1.6		1.6
Phase Call Probability		1.00		0.24		1.00		1.00
Max Out Probability		0.00		0.01		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		715			16		23	0		3	132	218
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1807			1643		1278	0		957	1900	1610
Queue Service Time (g_s), s		21.9			0.6		0.8	0.0		0.1	3.2	2.5
Cycle Queue Clearance Time (g_c), s		21.9			0.6		3.6	0.0		13.2	3.2	2.5
Green Ratio (*g/C*)		0.44			0.02		0.29			0.29	0.29	0.73
Capacity (*c*), veh/h		793			34		430			187	549	1172
Volume-to-Capacity Ratio (*X*)		0.902			0.485		0.053	0.000		0.014	0.240	0.186
Available Capacity (c_a), veh/h		1546			221		3964			2785	5707	5543
Back of Queue (*Q*), veh/ln (50th percentile)		7.7			0.3		0.2			0.0	1.2	0.4
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.03	0.00		0.01	0.00	0.06
Uniform Delay (d_1), s/veh		15.5			28.9		17.4			25.9	16.2	2.6
Incremental Delay (d_2), s/veh		1.6			3.9		0.0	0.0		0.0	0.1	0.0
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh		17.2			32.8		17.5			25.9	16.3	2.6
Level of Service (LOS)		B			C		B			C	B	A
Approach Delay, s/veh / LOS	17.2	B		32.8	C		20.7	C		7.9	A	
Intersection Delay, s/veh / LOS	16.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.5	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	1.7	A	0.5	A	1.3	A	1.1	A

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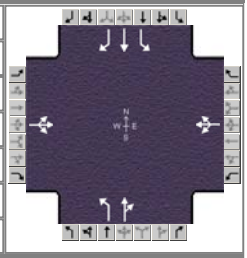
HCS 2010 Signalized Intersection Results Summary

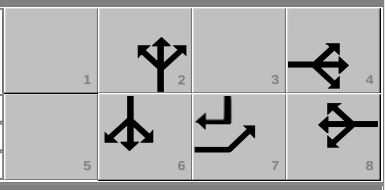
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.79
Intersection		Analysis Year	2013	Analysis Period	1> 7:00
File Name	227 pm.xus				
Project Description	Existing + App + Proj PM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	273	1	26	4	1	9	27	177	0	13	462	752

Signal Information			
Cycle, s	62.3	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	30.5	15.4	1.3	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		12.0		12.0		6.0		5.0
Phase Duration, s		20.4		6.3		35.5		35.5
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.3		3.3		3.3
Queue Clearance Time (g_s), s		14.6		2.6		18.1		25.6
Green Extension Time (g_e), s		0.8		0.0		1.1		4.9
Phase Call Probability		1.00		0.26		1.00		1.00
Max Out Probability		0.00		0.85		1.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		380			18		34	0		16	585	952
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1791			1681		844	0		1175	1900	1610
Queue Service Time (g_s), s		12.6			0.6		1.9	0.0		0.5	14.1	23.6
Cycle Queue Clearance Time (g_c), s		12.6			0.6		16.1	0.0		4.7	14.1	23.6
Green Ratio (*g/C*)		0.25			0.02		0.49			0.49	0.49	0.74
Capacity (*c*), veh/h		444			36		337			613	932	1188
Volume-to-Capacity Ratio (*X*)		0.856			0.493		0.101	0.000		0.027	0.628	0.801
Available Capacity (c_a), veh/h		2442			162		337			2186	3475	3344
Back of Queue (*Q*), veh/ln (50th percentile)		5.0			0.3		0.3			0.1	4.9	3.4
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.04	0.00		0.04	0.00	0.57
Uniform Delay (d_1), s/veh		22.4			30.2		17.7			10.5	11.7	5.2
Incremental Delay (d_2), s/veh		1.9			3.8		0.0	0.0		0.0	0.3	0.5
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh		24.3			34.0		17.7			10.5	12.0	5.7
Level of Service (LOS)		C			C		B			B	B	A
Approach Delay, s/veh / LOS	24.3	C		34.0	C		10.4	B		8.1	A	
Intersection Delay, s/veh / LOS	11.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.5	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	1.1	A	0.5	A	0.9	A	3.1	C

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/16/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2013 Existing + App + Project*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2713*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1504*	pc/h/ln
S	*72.2*	mph
D = v_p / S	*20.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2013 Existing + App + Project*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2089*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1104*	pc/h/ln
S	*74.9*	mph
D = v_p / S	*14.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/30/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2013 Existing + App + Project*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1604*	veh/h	Peak-Hour Factor, PHF	*0.87*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*963*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*12.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2013 Existing + App + Project*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3273*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1722*	pc/h/ln
S	*69.2*	mph
D = v_p / S	*24.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/16/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2013 Existing + App + Project*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3438*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1929*	pc/h/ln
S	*65.4*	mph
D = v_p / S	*29.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2013 Existing + App + Project*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2638*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1448*	pc/h/ln
S	*72.8*	mph
D = v_p / S	*19.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/30/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2013 Existing + App + Project*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1944*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1096*	pc/h/ln
S	*74.9*	mph
D = v_p / S	*14.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
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f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2013 Existing + App + Project*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3849*	veh/h	Peak-Hour Factor, PHF	*0.87*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2234*	pc/h/ln
S	*58.1*	mph
D = v_p / S	*38.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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APPENDIX G

2035 SLOCOG TRAFFIC MODEL DATA

Year 2035 Roadway Volume as Provided by San Luis Obispo Council of Governments
As received 9/9/2013

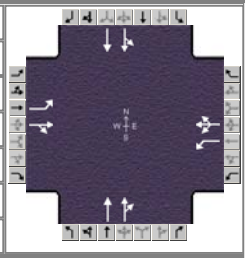
Roadway	location	Cross Street	RTM2010 daily	2010 Traffic Ops Book	2035 Daily
Price Cyn	s/o	Bello			12816
Price Cyn	n/o	Bello			12146
Price Cyn	s/o	227			11941
Price Cyn	n/o	Lemoore			13078
US 101 NB	s/o	Mattie Rd	37825	29000	42449
US 101 SB	s/o	Mattie Rd	34869	29000	38899
US 101 NB	s/o	Price Canyon Rd	36179	29500	39736
US 101 SB	s/o	Price Canyon Rd	30202	29500	33152
Price St	n/o	Price Canyon Rd			12005
Price St	s/o	Price Canyon Rd			22943
US 101 SB off Ramp	n/o	Price Canyon Rd			4468
Bello St	n/o	Price Canyon Rd			620
Ormonde	s/o	Price Canyon Rd			179
SR 227	n/o	Price Canyon Rd			20630
SR 227	s/o	Price Canyon Rd			8918

APPENDIX H

2035 WITHOUT THE FM O&G PROJECT LEVEL OF SERVICE CALCULATIONS

HCS 2010 Signalized Intersection Results Summary

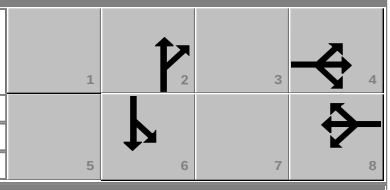
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.88
Intersection	Price St @ Price Cyn/Hinds	Analysis Year		Analysis Period	1> 7:00
File Name	hinds.xus				
Project Description	2035 Baseline AM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	20	100	40	460	0	50		200	645	25	120	

Signal Information			
Cycle, s	132.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	63.7	12.0	41.3	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		17.0		46.3		68.7		68.7
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.1		3.3		3.3
Queue Clearance Time (g_s), s		13.8		39.6		60.5		66.3
Green Extension Time (g_e), s		0.0		1.2		2.6		0.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		1.00		0.00		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	23	159		523	523			227	733	28	136	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1789		1792	1792			1881	1594	51	1712	
Queue Service Time (g_s), s	1.6	11.8		37.6	37.6			13.9	58.5	5.6	11.7	
Cycle Queue Clearance Time (g_c), s	1.6	11.8		37.6	37.6			13.9	58.5	64.3	11.7	
Green Ratio (*g/C*)	0.09	0.09		0.31	0.31			0.48	0.48	0.48	0.48	
Capacity (*c*), veh/h	162	161		562	562			910	771	79	828	
Volume-to-Capacity Ratio (*X*)	0.141	0.985		0.931	0.931			0.250	0.951	0.360	0.165	
Available Capacity (c_a), veh/h	162	161		1226	1226			2122	1798	79	828	
Back of Queue (*Q*), veh/ln (50th percentile)	0.7	8.3		16.9	16.9			4.1	22.3	1.0	2.4	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	55.8	60.4		44.3	44.3			20.2	32.8	64.0	19.3	
Incremental Delay (d_2), s/veh	0.1	66.2		3.1	3.1			0.1	3.2	1.0	0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	55.9	126.6		47.4	47.4			20.2	36.0	65.1	19.3	
Level of Service (LOS)	E	F		D	D			C	D	E	B	
Approach Delay, s/veh / LOS	117.8	F		45.9	D		32.3	C		27.2	C	
Intersection Delay, s/veh / LOS	44.3						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.8	C	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.8	A	1.4	A	1.3	A	0.6	A

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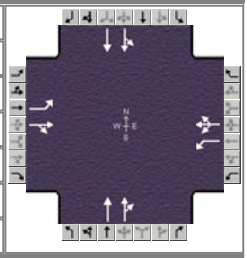
HCS 2010 Signalized Intersection Results Summary

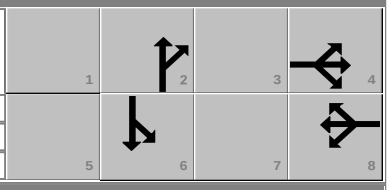
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.83
Intersection	Price St @ Price Cyn/Hinds	Analysis Year	2013	Analysis Period	1> 7:00
File Name	hinds pm.xus				
Project Description	2035 Baseline				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	40	65	85	1085	0	100		260	350	55	400	

Signal Information			
Cycle, s	190.6	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	53.2	22.4	100.0	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		27.4		105.0		58.2		58.2
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.2		3.1		3.3		3.3
Queue Clearance Time (g_s), s		21.9		102.0		51.4		55.2
Green Extension Time (g_e), s		0.4		0.0		1.7		0.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		1.00		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	48	181		1307	1307			313	422	66	482	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1707		1792	1792			1881	1594	52	1712	
Queue Service Time (g_s), s	4.6	19.9		100.0	100.0			22.0	49.4	3.8	44.0	
Cycle Queue Clearance Time (g_c), s	4.6	19.9		100.0	100.0			22.0	49.4	53.2	44.0	
Green Ratio (*g/C*)	0.12	0.12		0.52	0.52			0.28	0.28	0.28	0.28	
Capacity (*c*), veh/h	210	201		940	940			525	445	52	478	
Volume-to-Capacity Ratio (*X*)	0.229	0.901		1.391	1.391			0.597	0.948	1.267	1.009	
Available Capacity (c_a), veh/h	827	788		940	940			1362	1154	52	478	
Back of Queue (*Q*), veh/ln (50th percentile)	2.2	9.1		91.2	91.2			13.2	20.7	5.7	29.0	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	76.3	83.0		45.3	45.3			59.4	67.3	94.8	68.7	
Incremental Delay (d_2), s/veh	0.2	5.8		182.4	182.4			0.4	4.9	212.7	43.4	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	76.5	88.8		227.7	227.7			59.8	72.2	307.4	112.1	
Level of Service (LOS)	E	F		F	F			E	E	F	F	
Approach Delay, s/veh / LOS	86.2	F		210.4	F		66.9	E		135.7	F	
Intersection Delay, s/veh / LOS	150.9						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.8	C	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.9	A	2.8	C	1.1	A	0.9	A

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*US 101 Ramp @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *2035 Baseline*

East/West Street: *Price Canyon Rd* | North/South Street: *US 101 Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*770*	*0*	*0*	*510*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*855*	*0*	*0*	*566*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*			*85*		*30*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.90*	*0.95*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*94*	*0*	*33*
Percent Heavy Vehicles	*0*	*1*	*1*	*0*	*1*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration	*LT*			*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*	*LT*			*L*		*R*
v (veh/h)	*0*	*0*				*94*		*33*
C (m) (veh/h)	*1016*	*793*				*115*		*528*
v/c	*0.00*	*0.00*				*0.82*		*0.06*
95% queue length	*0.00*	*0.00*				*7.73*		*0.20*
Control Delay (s/veh)	*8.5*	*9.5*				*142.3*		*12.3*
LOS	*A*	*A*				*F*		*B*
Approach Delay (s/veh)	--	--				*108.5*		
Approach LOS	--	--				*F*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*US 101 Ramp @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *2035 Baseline*

East/West Street: *Price Canyon Rd* | North/South Street: *US 101 Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*470*	*0*	*0*	*1100*	*0*
Peak-Hour Factor, PHF	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*
Hourly Flow Rate, HFR (veh/h)	*0*	*534*	*0*	*0*	*1250*	*0*
Percent Heavy Vehicles	*6*	--	--	*6*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*			*90*		*85*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.88*	*0.95*	*0.88*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*102*	*0*	*96*
Percent Heavy Vehicles	*6*	*1*	*1*	*6*	*1*	*6*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration	*LT*			*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*	*LT*			*L*		*R*
v (veh/h)	*0*	*0*				*102*		*96*
C (m) (veh/h)	*543*	*1014*				*62*		*207*
v/c	*0.00*	*0.00*				*1.65*		*0.46*
95% queue length	*0.00*	*0.00*				*25.91*		*2.48*
Control Delay (s/veh)	*11.6*	*8.6*				*1357*		*37.2*
LOS	*B*	*A*				*F*		*E*
Approach Delay (s/veh)	--	--				*717.2*		
Approach LOS	--	--				*F*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Bello St @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		

Project Description *2035 Baseline*

East/West Street: *Price Canyon Rd* | North/South Street: *Bello Street*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*180*	*655*	*20*	*5*	*260*	*70*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*240*	*873*	*26*	*6*	*346*	*93*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*20*	*15*	*10*	*20*	*5*	*200*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*26*	*20*	*13*	*26*	*6*	*266*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*LT*		*R*	*LT*		*R*
v (veh/h)	*240*	*6*	*46*		*13*	*32*		*266*
C (m) (veh/h)	*1219*	*777*	*41*		*345*	*44*		*659*
v/c	*0.20*	*0.01*	*1.12*		*0.04*	*0.73*		*0.40*
95% queue length	*0.73*	*0.02*	*9.65*		*0.12*	*4.55*		*2.01*
Control Delay (s/veh)	*8.7*	*9.7*	*637.7*		*15.8*	*250.5*		*14.1*
LOS	*A*	*A*	*F*		*C*	*F*		*B*
Approach Delay (s/veh)	--	--	*500.7*			*39.5*		
Approach LOS	--	--	*F*			*E*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Bello St @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description *2035 Baseline*

East/West Street: *Price Canyon Rd* | North/South Street: *Bello Street*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*105*	*415*	*40*	*5*	*985*	*110*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*110*	*436*	*42*	*5*	*1036*	*115*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*15*	*10*	*5*	*10*	*5*	*100*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*15*	*10*	*5*	*10*	*5*	*105*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*LT*		*R*	*LT*		*R*
v (veh/h)	*110*	*5*	*25*		*5*	*15*		*105*
C (m) (veh/h)	*675*	*1129*	*42*		*606*	*55*		*261*
v/c	*0.16*	*0.00*	*0.60*		*0.01*	*0.27*		*0.40*
95% queue length	*0.58*	*0.01*	*3.20*		*0.02*	*1.07*		*1.97*
Control Delay (s/veh)	*11.4*	*8.2*	*200.3*		*11.0*	*94.6*		*28.0*
LOS	*B*	*A*	*F*		*B*	*F*		*D*
Approach Delay (s/veh)	--	--	*168.7*			*36.3*		
Approach LOS	--	--	*F*			*E*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*Ormonde Rd @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *2035 Baseline*

East/West Street: *Price Canyon Rd* | North/South Street: *Ormonde Rd*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*10*	*923*	*2*	*10*	*281*	*10*
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
Hourly Flow Rate, HFR (veh/h)	*12*	*1125*	*2*	*12*	*342*	*12*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*3*	*12*	*13*	*8*	*0*
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
Hourly Flow Rate, HFR (veh/h)	*0*	*3*	*14*	*15*	*9*	*0*
Percent Heavy Vehicles	*1*	*0*	*0*	*1*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*12*	*12*		*17*			*24*	
C (m) (veh/h)	*1223*	*625*		*208*			*94*	
v/c	*0.01*	*0.02*		*0.08*			*0.26*	
95% queue length	*0.03*	*0.06*		*0.27*			*1.00*	
Control Delay (s/veh)	*8.0*	*10.9*		*23.8*			*56.3*	
LOS	*A*	*B*		*C*			*F*	
Approach Delay (s/veh)	--	--	*23.8*			*56.3*		
Approach LOS	--	--	*C*			*F*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*Ormonde Rd @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *2035 Baseline*

East/West Street: *Price Canyon Rd* | North/South Street: *Ormonde Rd*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*1*	*352*	*2*	*6*	*1053*	*4*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*1*	*395*	*2*	*6*	*1183*	*4*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*9*	*4*	*1*	*4*	*2*	*40*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*10*	*4*	*1*	*4*	*2*	*44*
Percent Heavy Vehicles	*2*	*0*	*0*	*2*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*1*	*6*		*15*			*50*	
C (m) (veh/h)	*590*	*1164*		*78*			*194*	
v/c	*0.00*	*0.01*		*0.19*			*0.26*	
95% queue length	*0.01*	*0.02*		*0.70*			*1.03*	
Control Delay (s/veh)	*11.1*	*8.1*		*62.1*			*30.0*	
LOS	*B*	*A*		*F*			*D*	
Approach Delay (s/veh)	--	--	*62.1*			*30.0*		
Approach LOS	--	--	*F*			*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Gate 2 @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		

Project Description *2035 Baseline*

East/West Street: *Price Canyon Rd* | North/South Street: *Arroyo Field Gate 2*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*11*	*909*	*3*	*0*	*270*	*2*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*11*	*977*	*3*	*0*	*290*	*2*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*0*	*0*	*1*	*1*	*9*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*2*	*0*	*0*	*1*	*1*	*9*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*11*	*0*		*2*			*11*	
C (m) (veh/h)	*1272*	*706*		*135*			*431*	
v/c	*0.01*	*0.00*		*0.01*			*0.03*	
95% queue length	*0.03*	*0.00*		*0.05*			*0.08*	
Control Delay (s/veh)	*7.9*	*10.1*		*32.1*			*13.6*	
LOS	*A*	*B*		*D*			*B*	
Approach Delay (s/veh)	--	--	*32.1*			*13.6*		
Approach LOS	--	--	*D*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Gate 2 @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description *2035 Baseline*

East/West Street: *Price Canyon Rd* | North/South Street: *Arroyo Field Gate 2*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*351*	*1*	*0*	*1025*	*2*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*0*	*408*	*1*	*0*	*1191*	*2*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*4*	*3*	*1*	*4*	*26*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*2*	*4*	*3*	*1*	*4*	*30*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*0*	*0*		*9*			*35*	
C (m) (veh/h)	*590*	*1156*		*128*			*194*	
v/c	*0.00*	*0.00*		*0.07*			*0.18*	
95% queue length	*0.00*	*0.00*		*0.23*			*0.65*	
Control Delay (s/veh)	*11.1*	*8.1*		*35.2*			*27.6*	
LOS	*B*	*A*		*E*			*D*	
Approach Delay (s/veh)	--	--	*35.2*			*27.6*		
Approach LOS	--	--	*E*			*D*		

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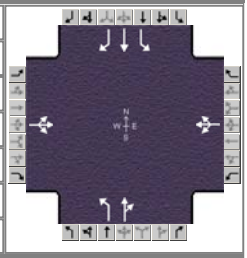
HCS 2010 Signalized Intersection Results Summary

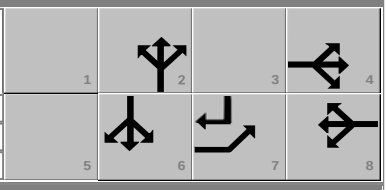
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.79
Intersection	SR 227 @ Price Canyon R	Analysis Year	2013	Analysis Period	1> 7:00
File Name	227.xus				
Project Description	2035 Baseline AM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	905	0	5	5	5	15	25	680	0	5	190	240

Signal Information			
Cycle, s	133.8	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	64.3	51.0	3.5	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		12.0		12.0		6.0		5.0
Phase Duration, s		56.0		8.5		69.3		69.3
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.3		3.1		3.1
Queue Clearance Time (g_s), s		53.0		4.5		59.5		60.9
Green Extension Time (g_e), s		0.0		0.0		3.5		3.5
Phase Call Probability		1.00		0.69		1.00		1.00
Max Out Probability		1.00		0.60		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		1152			32		32	0		6	241	304
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1808			1699		1158	0		652	1900	1610
Queue Service Time (g_s), s		51.0			2.5		2.2	0.0		1.2	10.1	4.3
Cycle Queue Clearance Time (g_c), s		51.0			2.5		12.5	0.0		58.9	10.1	4.3
Green Ratio (*g/C*)		0.38			0.03		0.48			0.48	0.48	0.86
Capacity (*c*), veh/h		690			44		521			86	913	1388
Volume-to-Capacity Ratio (*X*)		1.669			0.721		0.061	0.000		0.074	0.264	0.219
Available Capacity (c_a), veh/h		690			102		1542			646	2545	2771
Back of Queue (*Q*), veh/ln (50th percentile)		81.1			1.2		0.6			0.2	4.5	0.8
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.08	0.00		0.07	0.00	0.13
Uniform Delay (d_1), s/veh		41.3			64.6		24.4			61.1	20.7	1.6
Incremental Delay (d_2), s/veh		307.5			8.0		0.0	0.0		0.1	0.1	0.0
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh		348.8			72.6		24.4			61.2	20.7	1.6
Level of Service (LOS)		F			E		C			E	C	A
Approach Delay, s/veh / LOS	348.8	F		72.6	E		35.0	D		10.6	B	
Intersection Delay, s/veh / LOS	168.0						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.5	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	2.4	B	0.5	A	2.0	A	1.4	A

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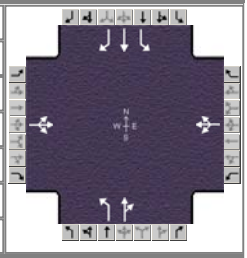
HCS 2010 Signalized Intersection Results Summary

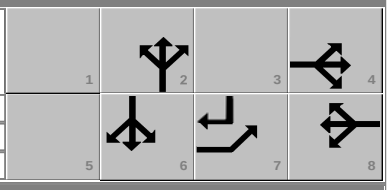
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.79
Intersection	SR 227 @ Price Canyon R	Analysis Year		Analysis Period	1> 7:00
File Name	227 pm.xus				
Project Description	2035 Baseline PM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	295	5	55	5	5	5	45	269	0	15	800	975

Signal Information			
Cycle, s	137.3	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	81.3	38.4	2.7	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		12.0		12.0		6.0		5.0
Phase Duration, s		43.4		7.7		86.3		86.3
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.2		3.2		3.3		3.3
Queue Clearance Time (g_s), s		36.3		3.5		82.2		67.3
Green Extension Time (g_e), s		0.9		0.0		0.0		11.8
Phase Call Probability		1.00		0.52		1.00		1.00
Max Out Probability		0.00		0.00		1.00		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		449			19		57	0		19	1013	1234
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1777			1765		565	0		1056	1900	1610
Queue Service Time (g_s), s		34.3			1.5		13.9	0.0		1.2	65.3	58.2
Cycle Queue Clearance Time (g_c), s		34.3			1.5		80.2	0.0		11.3	65.3	58.2
Green Ratio (*g/C*)		0.28			0.02		0.59			0.59	0.59	0.88
Capacity (*c*), veh/h		499			34		120			602	1127	1407
Volume-to-Capacity Ratio (*X*)		0.901			0.552		0.476	0.000		0.032	0.899	0.877
Available Capacity (c_a), veh/h		3208			151		120			1290	2363	2455
Back of Queue (*Q*), veh/ln (50th percentile)		15.4			0.7		2.0			0.3	28.1	9.9
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.25	0.00		0.10	0.00	1.65
Uniform Delay (d_1), s/veh		48.7			68.4		60.4			16.4	24.9	4.8
Incremental Delay (d_2), s/veh		2.5			5.0		1.1	0.0		0.0	1.1	0.8
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh		51.2			73.4		61.5			16.4	26.1	5.6
Level of Service (LOS)		D			E		E			B	C	A
Approach Delay, s/veh / LOS	51.2	D		73.4	E		21.0	C		14.8	B	
Intersection Delay, s/veh / LOS	21.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.5	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	1.2	A	0.5	A	1.1	A	4.2	D

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/16/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 Baseline*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4335*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2403*	pc/h/ln
S	*53.2*	mph
D = v_p / S	*45.2*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 Baseline*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3110*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1643*	pc/h/ln
S	*70.4*	mph
D = v_p / S	*23.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/30/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 Baseline*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2335*	veh/h	Peak-Hour Factor, PHF	*0.87*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1402*	pc/h/ln
S	*73.2*	mph
D = v_p / S	*19.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 Baseline*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5290*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2783*	pc/h/ln
S	*39.8*	mph
D = v_p / S	*69.9*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/16/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 Baseline*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4770*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2677*	pc/h/ln
S	*43.9*	mph
D = v_p / S	*61.0*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 Baseline*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3850*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2113*	pc/h/ln
S	*61.3*	mph
D = v_p / S	*34.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/30/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 Baseline*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2680*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1511*	pc/h/ln
S	*72.1*	mph
D = v_p / S	*21.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 Baseline*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5540*	veh/h	Peak-Hour Factor, PHF	*0.87*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*3216*	pc/h/ln
S	*20.6*	mph
D = v_p / S	*155.8*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

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f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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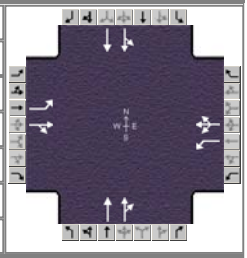
APPENDIX I

2035 WITH THE FM O&G PROJECT LEVEL OF SERVICE CALCULATIONS

HCS 2010 Signalized Intersection Results Summary

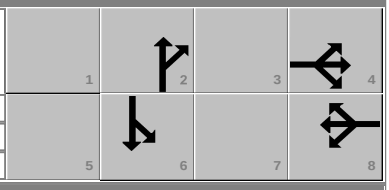
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.88
Intersection	Price St @ Price Cyn/Hinds	Analysis Year		Analysis Period	1> 7:00
File Name	hinds.xus				
Project Description	2035 with Project AM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	20	100	40	462	0	50		200	647	25	120	

Signal Information			
Cycle, s	133.4	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	64.6	12.0	41.9	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		17.0		46.9		69.6		69.6
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.1		3.3		3.3
Queue Clearance Time (g_s), s		14.0		40.2		61.3		67.2
Green Extension Time (g_e), s		0.0		1.2		2.6		0.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		1.00		0.00		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	23	159		525	525			227	735	28	136	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1789		1792	1792			1881	1594	51	1712	
Queue Service Time (g_s), s	1.6	12.0		38.2	38.2			13.9	59.3	5.6	11.7	
Cycle Queue Clearance Time (g_c), s	1.6	12.0		38.2	38.2			13.9	59.3	65.2	11.7	
Green Ratio (*g/C*)	0.09	0.09		0.31	0.31			0.48	0.48	0.48	0.48	
Capacity (*c*), veh/h	160	160		563	563			912	773	78	830	
Volume-to-Capacity Ratio (*X*)	0.142	0.997		0.932	0.932			0.249	0.951	0.364	0.164	
Available Capacity (c_a), veh/h	160	160		1212	1212			2098	1778	78	830	
Back of Queue (*Q*), veh/ln (50th percentile)	0.7	8.5		17.2	17.2			4.2	22.7	1.0	2.4	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	56.5	61.2		44.7	44.7			20.3	33.1	64.8	19.4	
Incremental Delay (d_2), s/veh	0.1	70.1		3.2	3.2			0.1	3.2	1.1	0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	56.7	131.4		47.9	47.9			20.4	36.3	65.9	19.4	
Level of Service (LOS)	E	F		D	D			C	D	E	B	
Approach Delay, s/veh / LOS	122.0	F		46.4	D		32.6	C		27.4	C	
Intersection Delay, s/veh / LOS	45.0						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.8	C	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.8	A	1.4	A	1.3	A	0.6	A

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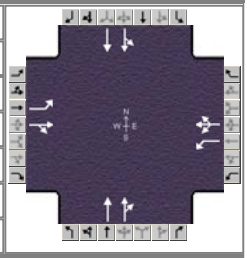
HCS 2010 Signalized Intersection Results Summary

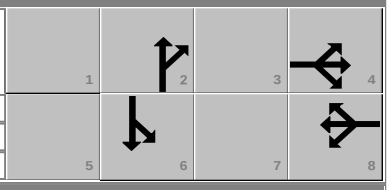
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.83
Intersection	Price St @ Price Cyn/Hinds	Analysis Year		Analysis Period	1> 7:00
File Name	hinds pm.xus				
Project Description	2035 with Project PM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	40	65	85	1088	0	100		260	351	55	400	

Signal Information			
Cycle, s	190.8	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	53.4	22.4	100.0	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		27.4		105.0		58.4		58.4
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.2		3.1		3.3		3.3
Queue Clearance Time (g_s), s		21.9		102.0		51.6		55.4
Green Extension Time (g_e), s		0.4		0.0		1.7		0.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		1.00		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	48	181		1311	1311			313	423	66	482	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1707		1792	1792			1881	1594	52	1712	
Queue Service Time (g_s), s	4.7	19.9		100.0	100.0			22.0	49.6	3.8	36.7	
Cycle Queue Clearance Time (g_c), s	4.7	19.9		100.0	100.0			22.0	49.6	53.4	36.7	
Green Ratio (*g/C*)	0.12	0.12		0.52	0.52			0.28	0.28	0.28	0.28	
Capacity (*c*), veh/h	210	200		939	939			526	446	52	479	
Volume-to-Capacity Ratio (*X*)	0.229	0.901		1.396	1.396			0.595	0.948	1.270	1.006	
Available Capacity (c_a), veh/h	826	787		939	939			1006	852	52	479	
Back of Queue (*Q*), veh/ln (50th percentile)	2.2	9.1		91.8	91.8			13.2	20.8	5.7	29.0	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	76.4	83.1		45.4	45.4			59.4	67.3	94.9	68.7	
Incremental Delay (d_2), s/veh	0.2	5.8		184.7	184.7			0.4	4.9	213.8	42.7	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	76.6	88.9		230.1	230.1			59.8	72.2	308.7	111.4	
Level of Service (LOS)	E	F		F	F			E	E	F	F	
Approach Delay, s/veh / LOS	86.3	F		212.7	F		66.9	E		135.2	F	
Intersection Delay, s/veh / LOS	152.0						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.8	C	2.3	B	2.3	B
Bicycle LOS Score / LOS	0.9	A	2.8	C	1.1	A	0.9	A

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*US 101 Ramp @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *2035 with Project Traffic*

East/West Street: *Price Canyon Rd* | North/South Street: *US 101 Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*772*	*0*	*0*	*512*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*857*	*0*	*0*	*568*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*			*86*		*30*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.90*	*0.95*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*95*	*0*	*33*
Percent Heavy Vehicles	*0*	*1*	*1*	*0*	*1*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration	*LT*			*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*	*LT*			*L*		*R*
v (veh/h)	*0*	*0*				*95*		*33*
C (m) (veh/h)	*1014*	*792*				*114*		*526*
v/c	*0.00*	*0.00*				*0.83*		*0.06*
95% queue length	*0.00*	*0.00*				*8.10*		*0.20*
Control Delay (s/veh)	*8.6*	*9.5*				*150.9*		*12.3*
LOS	*A*	*A*				*F*		*B*
Approach Delay (s/veh)	--	--				*115.2*		
Approach LOS	--	--				*F*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*US 101 Ramp @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *2035 with Project Traffic*

East/West Street: *Price Canyon Rd* | North/South Street: *US 101 Ramp*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*471*	*0*	*0*	*1103*	*0*
Peak-Hour Factor, PHF	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*
Hourly Flow Rate, HFR (veh/h)	*0*	*535*	*0*	*0*	*1253*	*0*
Percent Heavy Vehicles	*6*	--	--	*6*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*			*91*		*85*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.88*	*0.95*	*0.88*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*103*	*0*	*96*
Percent Heavy Vehicles	*6*	*1*	*1*	*6*	*1*	*6*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration	*LT*			*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*	*LT*			*L*		*R*
v (veh/h)	*0*	*0*				*103*		*96*
C (m) (veh/h)	*542*	*1013*				*62*		*206*
v/c	*0.00*	*0.00*				*1.66*		*0.47*
95% queue length	*0.00*	*0.00*				*26.36*		*2.50*
Control Delay (s/veh)	*11.6*	*8.6*				*1385*		*37.5*
LOS	*B*	*A*				*F*		*E*
Approach Delay (s/veh)	--	--	*734.8*					
Approach LOS	--	--	*F*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Bello St @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		

Project Description *2035 with Project Traffic*

East/West Street: *Price Canyon Rd*	North/South Street: *Bello Street*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*180*	*658*	*20*	*5*	*262*	*71*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*240*	*877*	*26*	*6*	*349*	*94*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*20*	*15*	*10*	*20*	*5*	*200*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR (veh/h)	*26*	*20*	*13*	*26*	*6*	*266*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*LT*		*R*	*LT*		*R*
v (veh/h)	*240*	*6*	*46*		*13*	*32*		*266*
C (m) (veh/h)	*1215*	*774*	*40*		*343*	*43*		*656*
v/c	*0.20*	*0.01*	*1.15*		*0.04*	*0.74*		*0.41*
95% queue length	*0.74*	*0.02*	*9.94*		*0.12*	*4.70*		*2.03*
Control Delay (s/veh)	*8.7*	*9.7*	*682.2*		*15.9*	*264.9*		*14.2*
LOS	*A*	*A*	*F*		*C*	*F*		*B*
Approach Delay (s/veh)	--	--	*535.4*			*41.1*		
Approach LOS	--	--	*F*			*E*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Bello St @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description *2035 with Project Traffic*

East/West Street: *Price Canyon Rd* | North/South Street: *Bello Street*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*105*	*417*	*40*	*5*	*988*	*112*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*110*	*438*	*42*	*5*	*1040*	*117*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*15*	*10*	*5*	*10*	*5*	*100*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*15*	*10*	*5*	*10*	*5*	*105*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*LT*		*R*	*LT*		*R*
v (veh/h)	*110*	*5*	*25*		*5*	*15*		*105*
C (m) (veh/h)	*672*	*1127*	*40*		*604*	*54*		*260*
v/c	*0.16*	*0.00*	*0.63*		*0.01*	*0.28*		*0.40*
95% queue length	*0.59*	*0.01*	*3.43*		*0.03*	*1.09*		*1.98*
Control Delay (s/veh)	*11.4*	*8.2*	*221.3*		*11.0*	*96.8*		*28.1*
LOS	*B*	*A*	*F*		*B*	*F*		*D*
Approach Delay (s/veh)	--	--	*186.3*			*36.7*		
Approach LOS	--	--	*F*			*E*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*Ormonde Rd @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *2035 with Project Traffic*

East/West Street: *Price Canyon Rd* | North/South Street: *Ormonde Rd*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*12*	*924*	*2*	*10*	*282*	*11*
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
Hourly Flow Rate, HFR (veh/h)	*14*	*1126*	*2*	*12*	*343*	*13*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*4*	*12*	*14*	*8*	*2*
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
Hourly Flow Rate, HFR (veh/h)	*0*	*4*	*14*	*17*	*9*	*2*
Percent Heavy Vehicles	*1*	*0*	*0*	*1*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*14*	*12*		*18*			*28*	
C (m) (veh/h)	*1222*	*624*		*197*			*97*	
v/c	*0.01*	*0.02*		*0.09*			*0.29*	
95% queue length	*0.03*	*0.06*		*0.30*			*1.18*	
Control Delay (s/veh)	*8.0*	*10.9*		*25.1*			*57.0*	
LOS	*A*	*B*		*D*			*F*	
Approach Delay (s/veh)	--	--	*25.1*			*57.0*		
Approach LOS	--	--	*D*			*F*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*CSV*
Agency/Co.	*C2 Consult*
Date Performed	*7/17/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*Ormonde Rd @ Price Canyon Rd*
Jurisdiction	
Analysis Year	*2013*

Project Description *2035 with Project Traffic*

East/West Street: *Price Canyon Rd* | North/South Street: *Ormonde Rd*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*3*	*352*	*2*	*6*	*1054*	*4*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*3*	*395*	*2*	*6*	*1184*	*4*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*9*	*4*	*1*	*5*	*2*	*44*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*10*	*4*	*1*	*5*	*2*	*49*
Percent Heavy Vehicles	*2*	*0*	*0*	*2*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*3*	*6*		*15*			*56*	
C (m) (veh/h)	*590*	*1164*		*75*			*192*	
v/c	*0.01*	*0.01*		*0.20*			*0.29*	
95% queue length	*0.02*	*0.02*		*0.73*			*1.21*	
Control Delay (s/veh)	*11.1*	*8.1*		*64.9*			*31.4*	
LOS	*B*	*A*		*F*			*D*	
Approach Delay (s/veh)	--	--	*64.9*			*31.4*		
Approach LOS	--	--	*F*			*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Gate 2 @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		

Project Description *2035 with Project Traffic*

East/West Street: *Price Canyon Rd* | North/South Street: *Arroyo Field Gate 2*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*12*	*910*	*3*	*0*	*271*	*4*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*12*	*978*	*3*	*0*	*291*	*4*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*0*	*0*	*1*	*1*	*10*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*2*	*0*	*0*	*1*	*1*	*10*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*12*	*0*		*2*			*12*	
C (m) (veh/h)	*1271*	*706*		*133*			*444*	
v/c	*0.01*	*0.00*		*0.02*			*0.03*	
95% queue length	*0.03*	*0.00*		*0.05*			*0.08*	
Control Delay (s/veh)	*7.9*	*10.1*		*32.5*			*13.3*	
LOS	*A*	*B*		*D*			*B*	
Approach Delay (s/veh)	--	--	*32.5*			*13.3*		
Approach LOS	--	--	*D*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*CSV*	Intersection	*Gate 2 @ Price Canyon Rd*
Agency/Co.	*C2 Consult*	Jurisdiction	
Date Performed	*7/17/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description *2035 with Project Traffic*

East/West Street: *Price Canyon Rd* | North/South Street: *Arroyo Field Gate 2*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*352*	*1*	*0*	*1025*	*3*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*0*	*409*	*1*	*0*	*1191*	*3*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*4*	*4*	*2*	*4*	*27*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*2*	*4*	*4*	*2*	*4*	*31*
Percent Heavy Vehicles	*1*	*1*	*1*	*1*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*0*	*0*		*10*			*37*	
C (m) (veh/h)	*590*	*1155*		*138*			*187*	
v/c	*0.00*	*0.00*		*0.07*			*0.20*	
95% queue length	*0.00*	*0.00*		*0.23*			*0.73*	
Control Delay (s/veh)	*11.1*	*8.1*		*33.1*			*29.0*	
LOS	*B*	*A*		*D*			*D*	
Approach Delay (s/veh)	--	--	*33.1*			*29.0*		
Approach LOS	--	--	*D*			*D*		

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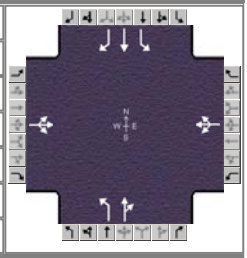
HCS 2010 Signalized Intersection Results Summary

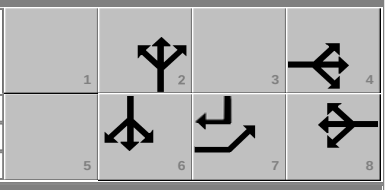
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.79
Intersection	SR 227 @ Price Canyon R	Analysis Year	2013	Analysis Period	1> 7:00
File Name	227.xus				
Project Description	2035 Baseline AM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	906	0	5	5	5	15	26	680	0	5	190	242

Signal Information			
Cycle, s	133.8	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	64.3	51.0	3.5	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		12.0		12.0		6.0		5.0
Phase Duration, s		56.0		8.5		69.3		69.3
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.3		3.1		3.1
Queue Clearance Time (g_s), s		53.0		4.5		59.5		60.9
Green Extension Time (g_e), s		0.0		0.0		3.5		3.5
Phase Call Probability		1.00		0.69		1.00		1.00
Max Out Probability		1.00		0.60		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		1153			32		33	0		6	241	306
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1808			1699		1158	0		652	1900	1610
Queue Service Time (g_s), s		51.0			2.5		2.3	0.0		1.2	10.1	4.3
Cycle Queue Clearance Time (g_c), s		51.0			2.5		12.6	0.0		58.9	10.1	4.3
Green Ratio (*g/C*)		0.38			0.03		0.48			0.48	0.48	0.86
Capacity (*c*), veh/h		690			44		521			86	913	1388
Volume-to-Capacity Ratio (*X*)		1.671			0.721		0.063	0.000		0.074	0.264	0.221
Available Capacity (c_a), veh/h		690			102		1542			646	2545	2771
Back of Queue (*Q*), veh/ln (50th percentile)		81.3			1.2		0.6			0.2	4.5	0.8
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.08	0.00		0.07	0.00	0.13
Uniform Delay (d_1), s/veh		41.3			64.6		24.4			61.1	20.7	1.6
Incremental Delay (d_2), s/veh		308.4			8.0		0.0	0.0		0.1	0.1	0.0
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh		349.7			72.6		24.5			61.2	20.7	1.6
Level of Service (LOS)		F			E		C			E	C	A
Approach Delay, s/veh / LOS	349.7	F		72.6	E		35.0	C		10.6	B	
Intersection Delay, s/veh / LOS	168.2						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.5	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	2.4	B	0.5	A	2.0	A	1.4	A

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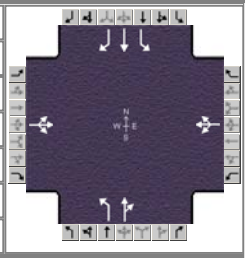
HCS 2010 Signalized Intersection Results Summary

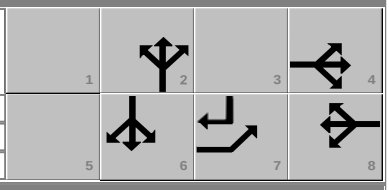
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.79
Intersection	SR 227 @ Price Canyon R	Analysis Year		Analysis Period	1> 7:00
File Name	227 pm.xus				
Project Description	2035 with Project PM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	298	5	55	5	5	5	45	269	0	15	800	976

Signal Information			
Cycle, s	139.0	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	82.2	39.1	2.7	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		12.0		12.0		6.0		5.0
Phase Duration, s		44.1		7.7		87.2		87.2
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.2		3.2		3.3		3.3
Queue Clearance Time (g_s), s		37.0		3.5		83.3		68.2
Green Extension Time (g_e), s		0.9		0.0		0.0		11.8
Phase Call Probability		1.00		0.53		1.00		1.00
Max Out Probability		0.00		0.00		1.00		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		453			19		57	0		19	1013	1235
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1777			1765		565	0		1056	1900	1610
Queue Service Time (g_s), s		35.0			1.5		14.0	0.0		1.2	66.2	58.6
Cycle Queue Clearance Time (g_c), s		35.0			1.5		81.3	0.0		11.4	66.2	58.6
Green Ratio (*g/C*)		0.28			0.02		0.59			0.59	0.59	0.88
Capacity (*c*), veh/h		502			34		118			601	1126	1409
Volume-to-Capacity Ratio (*X*)		0.902			0.554		0.481	0.000		0.032	0.900	0.877
Available Capacity (c_a), veh/h		3170			149		118			1273	2335	2434
Back of Queue (*Q*), veh/ln (50th percentile)		15.7			0.7		2.0			0.3	28.6	10.0
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.26	0.00		0.10	0.00	1.67
Uniform Delay (d_1), s/veh		49.2			69.2		61.3			16.6	25.3	4.8
Incremental Delay (d_2), s/veh		2.5			5.1		1.1	0.0		0.0	1.1	0.8
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh		51.7			74.3		62.5			16.7	26.4	5.6
Level of Service (LOS)		D			E		E			B	C	A
Approach Delay, s/veh / LOS	51.7	D		74.3	E		21.3	C		15.0	B	
Intersection Delay, s/veh / LOS	21.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.5	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	1.2	A	0.5	A	1.1	A	4.2	D

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/16/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 with Project*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4336*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2404*	pc/h/ln
S	*53.2*	mph
D = v_p / S	*45.2*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 with Project*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3112*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1644*	pc/h/ln
S	*70.4*	mph
D = v_p / S	*23.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/30/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 with Project*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2336*	veh/h	Peak-Hour Factor, PHF	*0.87*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1403*	pc/h/ln
S	*73.2*	mph
D = v_p / S	*19.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 with Project*

Project Description *South of Maddie Road*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5291*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2783*	pc/h/ln
S	*39.8*	mph
D = v_p / S	*69.9*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/16/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 with Project*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4772*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2678*	pc/h/ln
S	*43.8*	mph
D = v_p / S	*61.1*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 NB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 with Project*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3851*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2114*	pc/h/ln
S	*61.3*	mph
D = v_p / S	*34.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/30/2013*	Jurisdiction	
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 with Project*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2682*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1512*	pc/h/ln
S	*72.1*	mph
D = v_p / S	*21.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CSV*	Highway/Direction of Travel	*US 101 SB*
Agency or Company	*C2 Consult*	From/To	
Date Performed	*5/29/2013*	Jurisdiction	
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 with Project*

Project Description *North of Oak Park Blvd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5543*	veh/h	Peak-Hour Factor, PHF	*0.87*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.50*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.8*	mph
FFS	*73.6*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*3217*	pc/h/ln
S	*20.6*	mph
D = v_p / S	*156.2*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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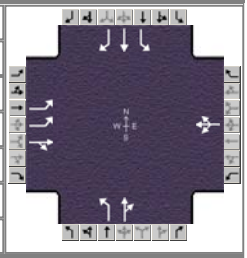
HCS 2010 Signalized Intersection Results Summary

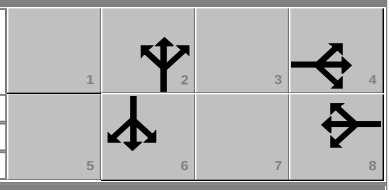
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.79
Intersection	SR 227 @ Price Canyon R	Analysis Year	2013	Analysis Period	1> 7:00
File Name	227.xus				
Project Description	2035 Baseline AM with improvements				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	905	0	5	5	5	15	25	680	0	5	190	240

Signal Information			
Cycle, s	118.8	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	57.2	43.3	3.3	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		12.0		6.0		5.0
Phase Duration, s		48.3		8.3		62.2		62.2
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.3		3.1		3.1
Queue Clearance Time (g_s), s		39.1		4.2		53.8		55.5
Green Extension Time (g_e), s		3.4		0.0		2.3		0.0
Phase Call Probability		1.00		0.65		1.00		1.00
Max Out Probability		0.00		0.00		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	1146	6			32		32	0		6	241	304
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1757	1610			1699		1158	0		652	1900	1610
Queue Service Time (g_s), s	37.1	0.3			2.2		2.0	0.0		1.1	9.1	14.5
Cycle Queue Clearance Time (g_c), s	37.1	0.3			2.2		9.8	0.0		53.5	9.1	14.5
Green Ratio (*g/C*)	0.36	0.36			0.03		0.48			0.48	0.48	0.48
Capacity (*c*), veh/h	1285	589			47		543			92	917	777
Volume-to-Capacity Ratio (*X*)	0.892	0.011			0.669		0.058	0.000		0.069	0.262	0.391
Available Capacity (c_a), veh/h	4798	2199			366		914			92	917	777
Back of Queue (*Q*), veh/ln (50th percentile)	15.6	0.1			1.0		0.5			0.2	3.9	5.4
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00			0.00		0.07	0.00		0.06	0.00	0.89
Uniform Delay (d_1), s/veh	36.1	24.4			58.2		21.0			55.2	18.5	19.9
Incremental Delay (d_2), s/veh	0.9	0.0			6.0		0.0	0.0		0.1	0.1	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	37.0	24.4			64.1		21.1			55.3	18.6	20.1
Level of Service (LOS)	D	C			E		C			E	B	C
Approach Delay, s/veh / LOS	36.9	D		64.1	E		34.2	C		19.8	B	
Intersection Delay, s/veh / LOS	32.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.9	C	2.1	B	2.4	B
Bicycle LOS Score / LOS	2.4	B	0.5	A	2.0	A	1.4	A

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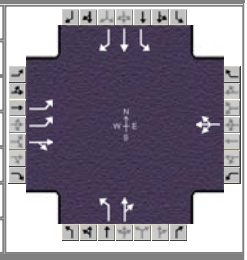
HCS 2010 Signalized Intersection Results Summary

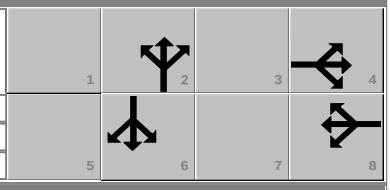
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/19/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.79
Intersection	SR 227 @ Price Canyon R	Analysis Year	2013	Analysis Period	1> 7:00
File Name	227.xus				
Project Description	2035 w Project AM with improvements				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	906	0	5	5	5	15	26	680	0	5	190	242

Signal Information			
Cycle, s	119.1	Reference Phase	6
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	57.3	43.4	3.3	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		12.0		6.0		5.0
Phase Duration, s		48.4		8.3		62.3		62.3
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.3		3.1		3.1
Queue Clearance Time (g_s), s		39.2		4.2		53.9		55.6
Green Extension Time (g_e), s		3.4		0.0		2.3		0.0
Phase Call Probability		1.00		0.66		1.00		1.00
Max Out Probability		0.00		0.00		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	1147	6			32		33	0		6	241	306
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1757	1610			1699		1158	0		652	1900	1610
Queue Service Time (g_s), s	37.2	0.3			2.2		2.1	0.0		1.1	9.1	14.7
Cycle Queue Clearance Time (g_c), s	37.2	0.3			2.2		9.9	0.0		53.6	9.1	14.7
Green Ratio (*g/C*)	0.36	0.36			0.03		0.48			0.48	0.48	0.48
Capacity (*c*), veh/h	1286	589			47		543			91	917	777
Volume-to-Capacity Ratio (*X*)	0.892	0.011			0.670		0.061	0.000		0.069	0.262	0.394
Available Capacity (c_a), veh/h	4789	2194			365		912			91	917	777
Back of Queue (*Q*), veh/ln (50th percentile)	15.7	0.1			1.0		0.6			0.2	3.9	5.4
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00			0.00		0.07	0.00		0.06	0.00	0.90
Uniform Delay (d_1), s/veh	36.1	24.4			58.3		21.1			55.3	18.6	20.0
Incremental Delay (d_2), s/veh	0.9	0.0			6.0		0.0	0.0		0.1	0.1	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	37.0	24.4			64.3		21.1			55.4	18.6	20.1
Level of Service (LOS)	D	C			E		C			E	B	C
Approach Delay, s/veh / LOS	37.0	D		64.3	E		34.3	C		19.9	B	
Intersection Delay, s/veh / LOS	32.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.9	C	2.1	B	2.4	B
Bicycle LOS Score / LOS	2.4	B	0.5	A	2.0	A	1.4	A

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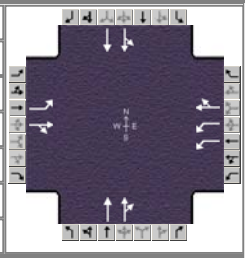
HCS 2010 Signalized Intersection Results Summary

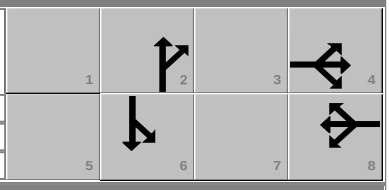
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.88
Intersection	Price St @ Price Cyn/Hinds	Analysis Year		Analysis Period	1> 7:00
File Name	hinds.xus				
Project Description	2035 Baseline AM with improvements				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	20	100	40	460	0	50		200	645	25	120	

Signal Information			
Cycle, s	78.6	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	38.9	9.8	14.9	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		14.8		19.9		43.9		43.9
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.1		3.3		3.3
Queue Clearance Time (g_s), s		8.8		13.3		35.9		39.6
Green Extension Time (g_e), s		0.1		1.4		2.6		0.0
Phase Call Probability		0.98		1.00		1.00		1.00
Max Out Probability		0.88		0.00		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	23	159		523	57			227	733	28	136	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1789		1740	1610			1881	1594	80	1712	
Queue Service Time (g_s), s	0.9	6.8		11.3	2.3			13.9	33.9	3.7	10.3	
Cycle Queue Clearance Time (g_c), s	0.9	6.8		11.3	2.3			13.9	33.9	37.6	10.3	
Green Ratio (*g/C*)	0.13	0.13		0.19	0.19			0.49	0.49	0.49	0.49	
Capacity (*c*), veh/h	223	223		662	306			933	790	131	848	
Volume-to-Capacity Ratio (*X*)	0.102	0.714		0.790	0.186			0.244	0.927	0.218	0.161	
Available Capacity (c_a), veh/h	272	271		4003	1853			2735	2318	131	848	
Back of Queue (*Q*), veh/ln (50th percentile)	0.4	3.1		4.6	0.9			2.1	11.3	0.5	1.2	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	30.7	33.3		30.5	26.9			11.4	18.6	36.1	10.9	
Incremental Delay (d_2), s/veh	0.1	4.7		0.8	0.1			0.0	2.2	0.3	0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	30.8	37.9		31.3	27.0			11.5	20.8	36.5	11.0	
Level of Service (LOS)	C	D		C	C			B	C	D	B	
Approach Delay, s/veh / LOS	37.0	D		30.9	C		18.6	B		15.4	B	
Intersection Delay, s/veh / LOS	23.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.4	B	2.2	B
Bicycle LOS Score / LOS	0.8	A	1.4	A	1.3	A	0.6	A

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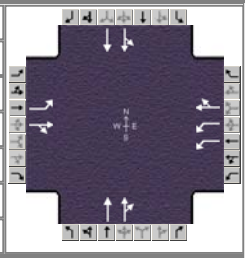
HCS 2010 Signalized Intersection Results Summary

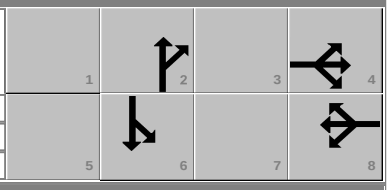
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.88
Intersection	Price St @ Price Cyn/Hinds	Analysis Year		Analysis Period	1> 7:00
File Name	hinds.xus				
Project Description	2035 Project AM with improvements				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	20	100	40	462	0	50		200	647	25	120	

Signal Information			
Cycle, s	79.1	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	39.2	9.8	15.0	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		14.8		20.0		44.2		44.2
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.1		3.1		3.3		3.3
Queue Clearance Time (g_s), s		8.8		13.4		36.3		40.0
Green Extension Time (g_e), s		0.1		1.4		2.6		0.0
Phase Call Probability		0.98		1.00		1.00		1.00
Max Out Probability		0.93		0.00		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	23	159		525	57			227	735	28	136	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1789		1740	1610			1881	1594	79	1712	
Queue Service Time (g_s), s	0.9	6.8		11.4	2.4			13.9	34.3	3.8	10.3	
Cycle Queue Clearance Time (g_c), s	0.9	6.8		11.4	2.4			13.9	34.3	38.0	10.3	
Green Ratio (*g/C*)	0.12	0.12		0.19	0.19			0.50	0.50	0.50	0.50	
Capacity (*c*), veh/h	222	222		663	307			935	792	130	851	
Volume-to-Capacity Ratio (*X*)	0.102	0.718		0.791	0.185			0.243	0.928	0.219	0.160	
Available Capacity (c_a), veh/h	270	270		3980	1842			2719	2304	130	851	
Back of Queue (*Q*), veh/ln (50th percentile)	0.4	3.1		4.6	0.9			2.1	11.4	0.5	1.2	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	30.9	33.5		30.7	27.0			11.4	18.7	36.4	10.9	
Incremental Delay (d_2), s/veh	0.1	4.9		0.8	0.1			0.0	2.2	0.3	0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	31.0	38.4		31.5	27.1			11.5	20.9	36.7	11.0	
Level of Service (LOS)	C	D		C	C			B	C	D	B	
Approach Delay, s/veh / LOS	37.5	D		31.1	C		18.7	B		15.4	B	
Intersection Delay, s/veh / LOS	24.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.4	B	2.2	B
Bicycle LOS Score / LOS	0.8	A	1.4	A	1.3	A	0.6	A

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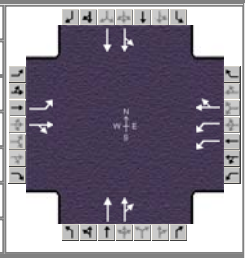
HCS 2010 Signalized Intersection Results Summary

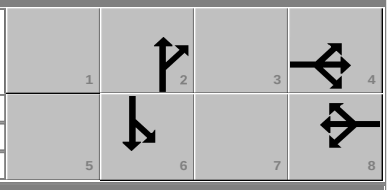
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.83
Intersection	Price St @ Price Cyn/Hinds	Analysis Year		Analysis Period	1> 7:00
File Name	hinds pm.xus				
Project Description	2035 Baseline PM with improvements				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	40	65	85	1085	0	100		260	350	55	400	

Signal Information			
Cycle, s	89.2	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	26.5	10.0	37.7	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		15.0		42.7		31.5		31.5
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.2		3.1		3.3		3.3
Queue Clearance Time (g_s), s		11.4		33.1		24.6		32.1
Green Extension Time (g_e), s		0.0		4.4		1.7		0.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		1.00		0.00		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	48	181		1307	120			313	422	98	450	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1707		1740	1610			1881	1594	205	1712	
Queue Service Time (g_s), s	2.2	9.4		31.1	4.2			18.4	22.6	4.0	30.1	
Cycle Queue Clearance Time (g_c), s	2.2	9.4		31.1	4.2			18.4	22.6	26.6	30.1	
Green Ratio (*g/C*)	0.11	0.11		0.42	0.42			0.30	0.30	0.30	0.30	
Capacity (*c*), veh/h	200	191		1473	682			560	474	128	509	
Volume-to-Capacity Ratio (*X*)	0.241	0.948		0.888	0.177			0.560	0.889	0.764	0.884	
Available Capacity (c_a), veh/h	200	191		3186	1474			1765	1495	128	509	
Back of Queue (*Q*), veh/ln (50th percentile)	1.0	6.5		11.9	1.5			5.5	8.6	2.9	11.1	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	36.3	39.5		23.9	16.1			26.5	30.0	38.5	30.0	
Incremental Delay (d_2), s/veh	0.2	49.8		0.8	0.0			0.3	2.3	21.4	16.2	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	36.5	89.3		24.6	16.1			26.8	32.4	59.9	46.1	
Level of Service (LOS)	D	F		C	B			C	C	E	D	
Approach Delay, s/veh / LOS	78.2	E		23.9	C		30.0	C		48.6	D	
Intersection Delay, s/veh / LOS	34.3						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.4	B	2.3	B
Bicycle LOS Score / LOS	0.9	A	2.8	C	1.1	A	0.9	A

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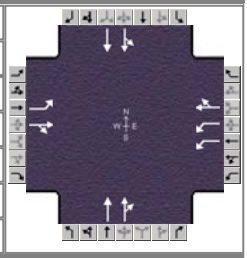
HCS 2010 Signalized Intersection Results Summary

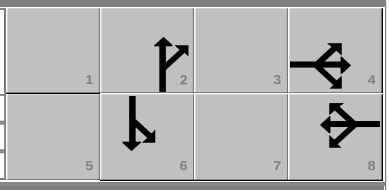
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	7/18/2013	Area Type	Other
Jurisdiction		Time Period		PHF	0.83
Intersection	Price St @ Price Cyn/Hinds	Analysis Year		Analysis Period	1> 7:00
File Name	hinds pm.xus				
Project Description	2035 Project PM with improvements				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	40	65	85	1088	0	100		260	351	55	400	

Signal Information			
Cycle, s	90.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	27.2	10.0	38.3	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	1.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		10.0		10.0		8.0		8.0
Phase Duration, s		15.0		43.3		32.2		32.2
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (*MAH*), s		3.2		3.1		3.3		3.3
Queue Clearance Time (g_s), s		11.6		33.6		24.9		35.3
Green Extension Time (g_e), s		0.0		4.5		2.2		0.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		1.00		0.00		0.00		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18		2	12	1	6	
Adjusted Flow Rate (*v*), veh/h	48	181		1311	120			313	423	99	450	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1792	1707		1740	1610			1881	1594	211	1712	
Queue Service Time (g_s), s	2.2	9.6		31.6	4.2			18.4	22.9	4.4	33.3	
Cycle Queue Clearance Time (g_c), s	2.2	9.6		31.6	4.2			18.4	22.9	27.3	33.3	
Green Ratio (*g/C*)	0.11	0.11		0.42	0.42			0.30	0.30	0.30	0.30	
Capacity (*c*), veh/h	197	188		1474	682			566	480	130	515	
Volume-to-Capacity Ratio (*X*)	0.244	0.961		0.889	0.177			0.553	0.881	0.759	0.873	
Available Capacity (c_a), veh/h	197	188		3143	1455			2114	1792	130	515	
Back of Queue (*Q*), veh/ln (50th percentile)	1.0	6.7		12.2	1.5			5.5	8.6	2.9	10.9	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	36.9	40.2		24.2	16.3			26.6	30.2	39.0	30.1	
Incremental Delay (d_2), s/veh	0.2	53.8		0.8	0.0			0.3	2.1	20.4	14.6	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Control Delay (*d*), s/veh	37.2	94.0		25.0	16.3			26.9	32.3	59.3	44.7	
Level of Service (LOS)	D	F		C	B			C	C	E	D	
Approach Delay, s/veh / LOS	82.0	F		24.2	C		30.0	C		47.3	D	
Intersection Delay, s/veh / LOS	34.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.4	B	2.3	B
Bicycle LOS Score / LOS	0.9	A	2.8	C	1.1	A	0.9	A

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