



---

## COMMUNITY DEVELOPMENT AGENCY LONG RANGE PLANNING DIVISION

### INTEROFFICE MEMORANDUM

---

Date: November 7, 2014

To: John Kahling, Deputy Director of Engineering

From: Katie Jackson and Natalie Porter, Long Range Planning

**Subject: Draft Traffic Operations Analysis for the Silva Valley Interchange Traffic Mitigation Project**

---

This memorandum summarizes the results of the traffic operations analysis for the Capital Improvement Program (CIP) Project #72141, Silva Valley Interchange Traffic Mitigation Project, in El Dorado Hills. When the Silva Valley Parkway interchange opens in 2016, traffic levels on Silva Valley Parkway are expected to increase significantly, resulting in poor traffic operations at two existing intersections on Silva Valley Parkway. The CIP project is designed to mitigate the impacts of the Silva Valley Parkway interchange on intersections between US Highway 50 (US 50) and Serrano Parkway. This memorandum contains the analysis methodology, existing conditions, existing plus Silva Valley Parkway Interchange analysis, and traffic operations results of three proposed alternatives.

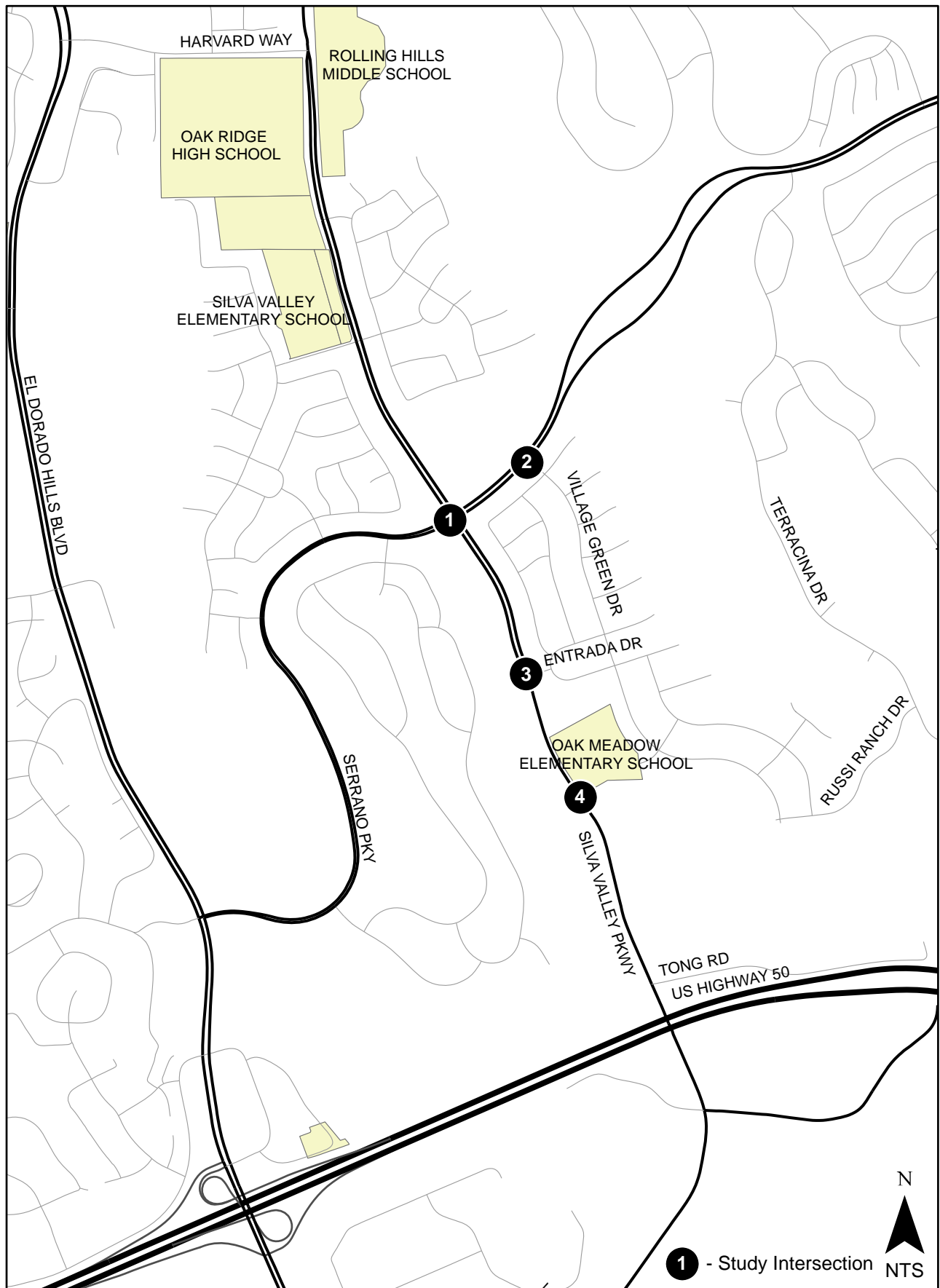
#### **Analysis Methodology**

This study analyzed the AM and PM peak hour traffic conditions at the following intersections:

1. Silva Valley Parkway/Serrano Parkway
2. Serrano Parkway/Village Green Drive
3. Silva Valley Parkway/Entrada Drive
4. Silva Valley Parkway/Oak Meadow Elementary School (OMES) Driveway

The study intersections are shown on Figure 1. Village Green Drive and Entrada Drive are private, gated access points to Serrano's Village A. The OMES driveway is a private driveway operated and maintained by the Buckeye Union School District. The study area was selected based on the potential mitigation options and their expected effect on traffic operations in the area. The Silva Valley Parkway interchange is expected to increase traffic on Silva Valley Parkway, which would likely exacerbate poor traffic operations at Entrada Drive and the OMES driveway. The other two intersections are included in this analysis because they may be affected by the mitigation.

The study intersections were analyzed using the procedures and methodologies contained in the *Highway Capacity Manual (HCM)* (Transportation Research Board, 2010). The analysis assigns a Level of Service (LOS) to each intersection to describe traffic operations. LOS is a qualitative measure of traffic operating conditions ranging from LOS A (the best) to LOS F (the worst). The grades are assigned based on the average duration of delay associated with a given traffic control device. In general, LOS A represents free-flow conditions with very little delay, while LOS F represents over-capacity conditions with long delays and queues.



**Figure 1: Study Area**

At signalized and all-way stop-controlled intersections, LOS is based on the average control delay for the entire intersection. At side-street stop-controlled intersections, the LOS is based on the delay reported for the worst turning movement (i.e. the turning movement with the highest delay). Table 1 displays the delay range associated with each LOS category for signalized and unsignalized intersections.

The HCM methodologies were applied using the micro-simulation software package, SimTraffic 9. Typical HCM methodology provides a calculation of LOS by accounting for traffic levels, peak hour factors, traffic signal timings, lane configurations, speed limits, and other inputs. In addition, micro-simulation analysis also accounts for turn pocket lengths, driver behavior, distance between intersections, vehicle platooning, and other traffic progression factors. SimTraffic does not take into account sight distance or vertical curvature. Also, this analysis does not take the on-site school vehicular capacity limitations into account.

<b>Table 1: Intersection Level of Service Criteria</b>			
<b>Level of Service</b>	<b>Average Control Delay (seconds/vehicle)</b>		<b>Description</b>
	<b>Signalized</b>	<b>Stop-Controlled</b>	
A	< 10.0	< 10.0	Very low delay. At signalized intersections, most vehicles do not stop.
B	10.0 to 20.0	10.0 to 15.0	Generally good progression of vehicles. Slight delays.
C	20.1 to 35.0	15.1 to 25.0	Fair progression. At signalized intersections, increased number of stopped vehicles.
D	35.1 to 55.0	25.1 to 35.0	Noticeable congestion. At signalized intersections, large portion of vehicles stopped.
E	55.1 to 80.0	35.1 to 50.0	Poor progression. High delays and frequent cycle failure.
F	> 80.0	> 50.0	Oversaturation. Forced flow. Extensive queuing.
Source: <i>Highway Capacity Manual</i> (Transportation Research Board, 2010)			

The LOS is evaluated against the 2004 General Plan Policy TC-Xd. Although the 2004 General Plan policies do not typically apply to private driveways, for the purposes of this study, all intersections will be evaluated against 2004 General Plan Policy TC-Xd. All of the study intersections are located within the El Dorado Hills Community Region, where LOS E is the minimum acceptable traffic operations level. Therefore, intersections that operate at LOS F are considered deficient.

In addition to LOS, the Silva Valley Parkway/Entrada Drive and Serrano Parkway/Village Green Drive intersections were evaluated to determine if either intersection meets the peak hour signal warrant. The *California Manual on Uniform Traffic Control Devices (MUTCD)* (Caltrans, 2012) contains nine traffic signal warrants, including the peak hour volume, four-hour volume, and eight-hour volume, and school crossing warrants. It is important to note that the MUTCD states that “the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.” Typically, multiple signal warrants are met before the installation of a traffic signal is considered.

The peak hour signal warrant compares the major street traffic levels to the minor street traffic levels to determine if the minor street traffic would experience excessive delays due to lack of gaps in the major street traffic flow.

## Existing Conditions

The AM and PM peak hour intersection LOS was analyzed for existing (2014) conditions. Traffic counts were collected during the AM peak period (approximately 6:30 AM to 9:00 AM) and PM peak period (approximately 3:45 PM to 6:00 PM) in April and September 2014. Traffic counts were also collected for the afternoon school peak period, however the AM and PM peak periods serve more traffic overall. At most study intersections, the peak hours were 7:15-8:15 AM and 5:00-6:00 PM. Traffic counts were also collected on Russi Ranch Drive and several intersections along Serrano Parkway to estimate the existing and potential future cut-through traffic using Russi Ranch Drive to access Silva Valley Parkway.

Field observations indicate that the Silva Valley Parkway/Entrada Drive intersection serves a significant amount of traffic associated with OMES. The gate at Entrada Drive is occasionally left open during the AM peak period, which allows parents to enter the neighborhood, park along Armsmere Circle, and walk their children to school via the school's back entrance through Allan Lindsey Park.

Additionally, motorists were observed traveling northbound on Silva Valley Parkway, turning right on Entrada Drive, making a U-turn around the gate keypad, and turning left to return southbound on Silva Valley Parkway. The combination of school and commute traffic leads to queuing at the intersection, which exceeds the available storage outside the gate. There is approximately 90 feet of storage space outside the gate, which can accommodate about 4 vehicles.

School traffic peaks immediately before and after the start of the school day (7:55 AM for Grades 1 through 5). At the Silva Valley Parkway/Entrada Drive intersection, a maximum queue of 10 vehicles was observed around 7:50 AM on the westbound approach. The remainder of the peak hour, the queue is 1-2 vehicles.

Table 2 displays the existing LOS results for the study intersections. As shown, three of the four intersections currently operate at LOS F during the AM peak hour. All study intersections operate at LOS C or better during the PM peak hour.

As previously discussed, the traffic operations at the Silva Valley Parkway/Entrada Drive and Silva Valley Parkway/OMES Driveway intersections are heavily impacted by school traffic. The Serrano Parkway/Village Green Drive intersection operates at LOS F due to long delays for the northbound left-turn and southbound through movements. While the total demand for these movements is relatively small, motorists must wait for the heavy eastbound and westbound traffic to clear before proceeding.

Table 2: Peak Hour Intersection Traffic Operations Existing 2014 Conditions					
Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
1. Silva Valley Parkway/Serrano Parkway	Signalized	35	C	29	C
2. Serrano Parkway/Village Green Drive	Side-Street Stop	<b>63</b>	<b>F</b>	11	B
3. Silva Valley Parkway/Entrada Drive	Side-Street Stop	<b>56</b>	<b>F</b>	22	C
4. Silva Valley Parkway/OMES Driveway	Side-Street Stop	<b>63</b>	<b>F</b>	24	C
Notes: Analysis is based on the methodology and procedures in the HCM (Transportation Research Board, 2010). Average delay is reported in seconds per vehicle. For signalized and all-way stop-controlled intersections, the LOS is based on the average control delay for all approaches. For side-street stop-controlled intersections, the LOS is based on the average control delay for the worst movement. <b>Bold text</b> indicates LOS F conditions.					

In addition to LOS, the Silva Valley Parkway/Entrada Drive and Serrano Parkway/Village Green Drive intersections were evaluated to determine if either location meets the peak hour signal warrant. The Silva Valley Parkway/Entrada Drive intersection meets the AM peak hour signal warrant. However the intersection does not meet the PM peak hour or the 4-hour signal warrant. This is common at intersections near schools. The Serrano Parkway/Village Green Drive intersection does not meet either the AM or PM peak hour signal warrant.

Field observations indicate that the gate at Entrada Drive is open for a substantial portion of the PM peak hour. Of the 35 minute observation period (5:00 – 5:35 PM), the gate opened 18 times and remained open for about 30 minutes total. Each time the gate opened, the first vehicle incurred about 12 seconds of delay on average. With each opening, an average of 10 vehicles were served with an average open time of 1 minute and 40 seconds.

### **Existing Plus Silva Valley Parkway Interchange**

Construction of the US 50/Silva Valley Parkway interchange is expected to be complete in 2016. This new connection is expected to serve a significant amount of traffic. Traffic will likely divert from the El Dorado Hills Boulevard interchange to use the new interchange. The El Dorado County Travel Demand Model (EDC TDM) was used to determine the effects on peak hour turning movement volumes.

The EDC TDM assigns traffic to the County's roadways according to the land use and roadway network inputs. Traffic is assigned based on the shortest travel path for each trip. The EDC TDM is validated and calibrated to the base year (2010) conditions. The model meets all peak hour, peak period, and daily validation criteria. The County has received letters from Caltrans and the Sacramento Area Council of Governments (SACOG) concurring that the EDC TDM conforms to the state-of-the-practice in travel demand modeling and is an appropriate tool for the County's long range planning purposes. The models' traffic forecasts are adjusted using the industry-standard difference method procedures.

The Silva Valley Parkway interchange was added into the base year EDC TDM. The average daily traffic (ADT) on Silva Valley Parkway is expected to increase from 9,700 (April 2013) to 21,000 ADT after the interchange is opened. Some motorists who usually travel westbound on Serrano Parkway to southbound El Dorado Hills Boulevard will divert to southbound Silva Valley Parkway. The turning movements for the westbound left-turn, eastbound right-turn, and southbound through movements at the Silva Valley Parkway/Serrano Parkway intersection are expected to increase in the AM peak hour. The reciprocal movements would increase in the PM peak hour.

The intersection LOS was evaluated at each study intersection assuming the Silva Valley Parkway interchange is open. This analysis does not assume any growth in land use, but instead evaluates how existing traffic would redistribute with the interchange in place. Table 3 displays the analysis results. The additional traffic on Silva Valley Parkway will exacerbate the LOS F conditions at three of the study intersections. The Silva Valley Parkway/Entrada Drive intersection may meet the AM and PM peak hour signal warrants under this scenario, but the Serrano Parkway/Village Green Drive intersection does not meet either intersection warrant.

### **Silva Valley Parkway/Serrano Parkway**

The operations analysis indicates that the Silva Valley Parkway/Serrano Parkway intersection would operate acceptably at LOS E during the AM peak hour with its current configuration. However, a review of the SimTraffic micro-simulation model indicated that the westbound left-turn queue would spill out of the pocket and block the Serrano Parkway/Village Green Drive intersection, as shown in Figure 2 below.

Certain movements would operate at LOS F, including the westbound left-turn, northbound left-turn, southbound left-turn, and southbound through movement. The long queues and delays would give drivers the perception that the intersection operates at LOS F.

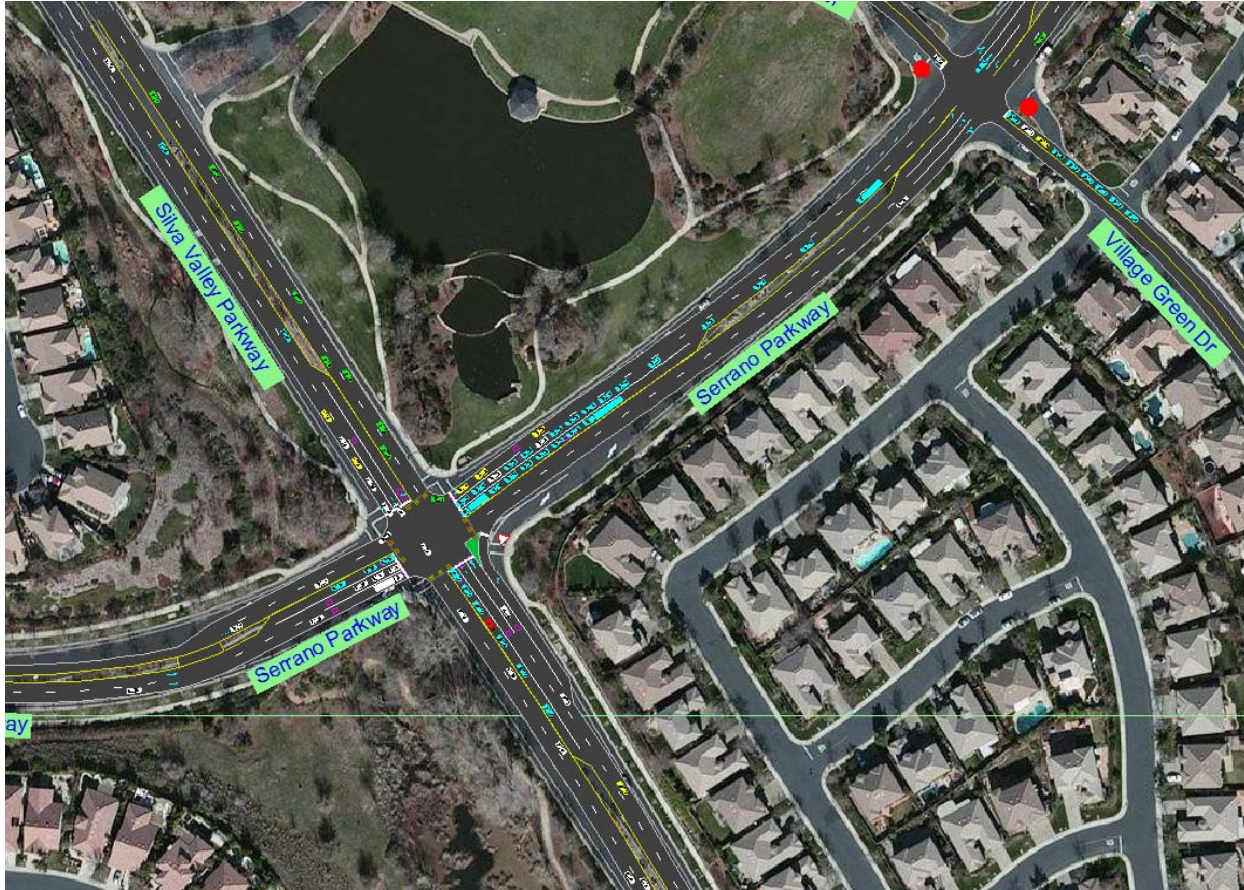
To address this condition, improvements could be constructed at this intersection. The SimTraffic model was rerun assuming the westbound approach to the Silva Valley Parkway/Serrano Parkway intersection is restriped to include an exclusive left-turn lane, a shared left/through lane, and a shared through/right-turn lane. This scenario also assumes the signal phasing is changed from protected left-turns to split phasing for the eastbound and westbound approaches.

The analysis results indicate that this configuration would result in LOS D at the Silva Valley Parkway/Serrano Parkway intersection and improved LOS at the other three intersections (compared to the current configuration). Figure 3 below shows the queue lengths are much shorter with the intersection improvements.

Table 3: Peak Hour Intersection Traffic Operations Existing Plus Silva Valley Parkway Interchange							
Intersection	Traffic Control	Existing Conditions (Delay/LOS)		Existing Plus Interchange – Current Configuration (Delay/LOS)		Existing Plus Interchange – with Improvements (Delay/LOS)	
		AM	PM	AM	PM	AM	PM
1. Silva Valley Parkway/Serrano Parkway	Signalized	35 / C	29 / C	65 / E	34 / C	38 / D	32 / C
2. Serrano Parkway/Village Green Drive	Side-Street Stop	<b>63 / F</b>	11 / B	<b>&gt;200 / F</b>	24 / C	<b>135 / F</b>	13 / B
3. Silva Valley Parkway/Entrada Drive	Side-Street Stop	<b>56 / F</b>	22 / C	<b>133 / F</b>	<b>140 / F</b>	<b>86 / F</b>	<b>127 / F</b>
4. Silva Valley Parkway/OMES Driveway	Side-Street Stop	<b>63 / F</b>	24 / C	<b>88 / F</b>	<b>73 / F</b>	<b>103 / F</b>	47 / E
Notes: Analysis is based on the methodology and procedures in the HCM (Transportation Research Board, 2010). Average delay is reported in seconds per vehicle. For signalized and all-way stop-controlled intersections, the LOS is based on the average control delay for all approaches. For side-street stop-controlled intersections, the LOS is based on the average control delay for the worst movement. <b>Bold text</b> indicates LOS F conditions.							



Figure 2: Existing Plus Interchange (Current Configuration) AM Peak Hour Traffic Operations



**Figure 3: Existing Plus Interchange (with Improvements) AM Peak Hour Traffic Operations**

### Project Alternatives

Even with improvements at the Silva Valley Parkway/Serrano Parkway intersection the other three study intersections would operate at LOS F during one or more peak hours. The following three alternatives were developed as potential mitigation options:

- Alternative 1 – install a traffic signal at Silva Valley Parkway/Entrada Drive.
- Alternative 2 – install a traffic signal at Silva Valley Parkway/Village Green Drive and ‘soft’ restriction of westbound (outbound) left-turns at Entrada Drive. Under the soft restriction, westbound left-turns would be prohibited during peak periods.
- Alternative 3 – install all-way stop-control at Village Green Drive and soft restriction of outbound left-turns at Entrada Drive.

All alternatives assume the Silva Valley Parkway interchange is open with the improvements discussed above at Silva Valley Parkway/Serrano Parkway. Additionally, all alternatives assume that outbound left-turns are prohibited at the OMES driveway. Motorists wishing to travel southbound on Silva Valley Parkway would be required to travel northbound to Serrano Parkway and make a U-turn at the intersection.

The traffic operations for each alternative are described below. Table 4 contains the LOS results for the AM and PM peak hours.



### Alternative 1

Alternative 1 is the installation of a traffic signal at Silva Valley Parkway/Entrada Drive. Installing a traffic signal would require reconstruction of the intersection and relocation of the existing gate. This analysis assumes the westbound approach would be reconstructed to include exclusive left- and right-turn pockets.

The installation of a traffic signal would increase the capacity of the intersection, which would draw traffic to this intersection. The increase in traffic would come from a redistribution of traffic within Village A and increased cut-through traffic from other villages. Traffic within Village A would likely shift from the Village Green Drive intersection to Entrada Drive because of the decrease in delay associated with the traffic signal and the shorter travel distance to the new interchange.

The level of cut-through traffic was analyzed based on the EDC TDM, the number of households in Villages C and E, topography, existing traffic counts, travel times, and travel distances. The data indicates traffic levels into and out of Village A at Entrada Drive could increase by as much as 160 vehicles in the AM peak hour. The most significant increase would occur on the westbound left-turn movement at Entrada Drive. The volume could increase from about 120 vehicles today to 250 vehicles under this alternative. Most of this increase in traffic would be attributed to cut-through traffic from Villages C and E.

The LOS results in Table 4 indicate all intersections would operate at LOS D or better with Alternative 1, except the Serrano Parkway/Village Green Drive intersection which would continue to operate at LOS F in the AM peak hour. The worst movements at this intersection under this alternative are the northbound and southbound through movements, which would not benefit from a traffic signal at Entrada Drive.

### Alternative 2

Alternative 2 includes the installation of a traffic signal at Serrano Parkway/Village Green Drive. The new traffic signal would be coordinated with the Silva Valley Parkway/Serrano Parkway intersection. Similar to Alternative 1, this improvement would require reconstruction of the intersection. Westbound left-turns at Entrada Drive would be prohibited during the AM and PM peak periods, but allowed during non-peak periods. The outbound left-turns would be restricted with signage at the intersection. This analysis assumes that all motorists obey the restriction during the peak hours.

Under this alternative, some of the westbound left-turn traffic from Entrada Drive is expected to divert to the Village Green Drive intersection, while other motorists would turn right out of Entrada Drive and make a U-turn at the Serrano Parkway/Silva Valley Parkway intersection. Cut-through traffic is not expected to increase in the peak periods with this alternative due to the restriction of outbound left-turns at Entrada Drive.

As shown in Table 4, all of the study intersections would operate at LOS D or better during the AM and PM peak hours.

### Alternative 3

Alternative 3 includes the installation of all-way stop-control at Serrano Parkway/Village Green Drive. Similar to Alternative 2, westbound left-turns would be restricted at Entrada Drive during the AM and PM peak periods, but allowed during non-peak periods. This analysis assumes that all motorists obey the restriction during the peak hours.

The traffic volumes for this alternative are expected to be about the same as Alternative 2. However, Alternative 3 results in slightly better traffic operations at the Serrano Parkway/Silva Valley Parkway intersection. The delay values decrease slightly, due to better signal operations. As shown in Table 4, all of the study intersections would operate at LOS D or better during the AM and PM peak hours.

Intersection	Existing Conditions (Delay/LOS)		Existing Plus Interchange with Improvements (Delay/LOS)		Alternative 1 – Signal at Entrada Drive (Delay/LOS)		Alternative 2– Signal at Village Green Drive (Delay/LOS)		Alternative 3– All-Way Stop at Village Green Drive (Delay/LOS)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1. Silva Valley Parkway/Serrano Parkway <sup>1</sup>	35 / C	29 / C	42 / D	32 / C	39 / D	32 / C	52 / D	40 / D	49 / D	36 / D
2. Serrano Parkway/Village Green Drive	<b>63 / F</b>	11 / B	<b>133 / F</b>	13 / B	<b>57 / F</b>	22 / C	14 / B	9 / A	20 / C	12 / B
3. Silva Valley Parkway/Entrada Drive	<b>56 / F</b>	22 / C	<b>114 / F</b>	<b>127 / F</b>	14 / B	10 / B	10 / B	11 / B	9 / A	14 / B
4. Silva Valley Parkway/OMES Driveway	<b>63 / F</b>	24 / C	<b>149 / F</b>	47 / E	9 / A	10 / B	10 / B	11 / B	13 / B	8 / A

Notes: Analysis is based on the methodology and procedures in the Highway Capacity Manual (Transportation Research Board, 2010). Average delay is reported in seconds per vehicle. For signalized and all-way stop-controlled intersections, the LOS is based on the average control delay for all approaches. For side-street stop-controlled intersections, the LOS is based on the average control delay for the worst movement. **Bold text** indicates LOS F conditions.  
<sup>1</sup>Analysis assumes the Silva Valley Parkway/Serrano Parkway intersection is improved to provide an exclusive left-turn lane, a shared left/through lane and a shared through/right turn lane on the westbound approach.

For Alternatives 2 and 3, it should be noted that the SimTraffic micro-simulation analysis does not account for sight distance or vertical curvature. Any improvements to the Village Green Drive intersection should be carefully designed to provide sufficient advance warning and sight distance to the back of the queue, especially in the westbound direction.

### Country Club Drive Extension

Country Club Drive is expected to be extended from its current terminus at Bass Lake Road to Silva Valley Parkway. A new signalized intersection would be constructed between the Silva Valley Parkway interchange and OMES. This would provide significant parallel capacity for US 50 and Serrano Parkway. The exact alignment and timing of the construction is uncertain at this point.

The extension would include a connection to Russi Ranch Drive, which would decrease the amount of cut-through traffic in Village A and reduce traffic levels at Entrada Drive. All of the alternatives described above were reanalyzed assuming the Country Club Drive extension is in place.

The EDC TDM was used to redistribute traffic with Country Club Drive in place. The forecasted volumes indicate that the improvements at Silva Valley Parkway/Serrano Parkway would not be needed to serve existing traffic levels if the extension is constructed. Therefore the analysis results for all alternatives assume the current intersection configuration. However, it should be noted that those improvements may be needed in the future with buildout of the 2004 General Plan land use.

Table 5 displays the LOS results. As shown, Country Club Drive would significantly improve traffic operations at most study intersections by decreasing the travel demand. However, the Entrada Drive and OMES driveway would still operate at LOS F during the peak hours without improvements. Westbound left-turn movements would still need to be restricted during peak hours.

Intersection	Existing Conditions (Delay/LOS)		Existing Plus Interchange – Current Configuration (Delay/LOS)		Alternative 1 – Signal at Entrada Drive (Delay/LOS)		Alternative 2– Signal at Village Green Drive (Delay/LOS)		Alternative 3– All-Way Stop at Village Green Drive (Delay/LOS)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1. Silva Valley Parkway/Serrano Parkway <sup>1</sup>	35 / C	29 / C	31 / C	26 / C	36 / D	29 / C	63 / E	52 / D	43 / D	35 / D
2. Serrano Parkway/Village Green Drive	<b>63 / F</b>	11 / B	21 / C	7 / A	26 / D	8 / A	15 / B	10 / A	12 / B	10 / A
3. Silva Valley Parkway/Entrada Drive	<b>56 / F</b>	22 / C	<b>52 / F</b>	<b>70 / F</b>	9 / A	8 / A	7 / A	12 / B	7 / A	9 / A
4. Silva Valley Parkway/OMES Driveway	<b>63 / F</b>	24 / C	<b>72 / F</b>	30 / D	9 / A	8 / A	9 / A	6 / A	8 / A	5 / A

Notes: Analysis is based on the methodology and procedures in the Highway Capacity Manual (Transportation Research Board, 2010). Average delay is reported in seconds per vehicle. For signalized and all-way stop-controlled intersections, the LOS is based on the average control delay for all approaches. For side-street stop-controlled intersections, the LOS is based on the average control delay for the worst movement. **Bold text** indicates LOS F conditions.  
<sup>1</sup>Analysis assumes the current configuration at the Silva Valley Parkway/Serrano Parkway intersection.

### Cumulative 2035 Conditions

The EDC TDM was used to generate traffic forecasts for Cumulative Year 2035 conditions. The model meets all peak hour, peak period, and daily validation criteria. The County has received letters from Caltrans and SACOG concurring that the EDC TDM conforms to the state-of-the-practice in travel demand modeling and is an appropriate tool for the County’s long range planning purposes. The models’ traffic forecasts are adjusted using the industry-standard difference method procedures.

The EDC TDM assigns traffic to the County’s roadways according to the land use and roadway network inputs. The Cumulative Year 2035 model assumes planned and approved land use developments within El Dorado County and eastern Sacramento County. The model does not include proposed, but not approved, land use developments. The roadway network includes projects from the County’s Capital Improvement Program (CIP).

Alternative 3 was evaluated using the Cumulative 2035 traffic forecasts to determine if the proposed improvements would be sufficient to accommodate expected traffic growth at the study intersections. Table 6 displays the AM and PM peak hour delay and LOS results. As shown, all intersections would continue to operate acceptably at LOS D or better. These results assume the Country Club Drive extension is in place and the Silva Valley Parkway/Serrano Parkway intersection is improved to provide an exclusive left-turn lane, a shared left/through lane and a shared through/right turn lane on the westbound approach.

Table 6: Peak Hour Intersection Traffic Operations Cumulative 2035 Conditions – Alternative 3 All-Way Stop-Control at Village Green Drive					
Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
1. Silva Valley Parkway/Serrano Parkway <sup>1</sup>	Signalized	51	D	46	D
2. Serrano Parkway/Village Green Drive	All-Way Stop	16	C	11	B
3. Silva Valley Parkway/Entrada Drive	Side-Street Stop	11	B	12	B
4. Silva Valley Parkway/OMES Driveway	Side-Street Stop	10	B	6	A
Notes: Analysis is based on the methodology and procedures in the HCM (Transportation Research Board, 2010). Average delay is reported in seconds per vehicle. For signalized and all-way stop-controlled intersections, the LOS is based on the average control delay for all approaches. For side-street stop-controlled intersections, the LOS is based on the average control delay for the worst movement. <b>Bold text</b> indicates LOS F conditions. <sup>1</sup> Analysis assumes the Silva Valley Parkway/Serrano Parkway intersection is improved to provide an exclusive left-turn lane, a shared left/through lane and a shared through/right turn lane on the westbound approach.					

## Conclusions

When the Silva Valley Parkway interchange opens to traffic in 2016, traffic patterns will shift and improvements will be needed to maintain acceptable operations at the study intersections. Each of the three alternatives has benefits and drawbacks from a traffic operations perspective.

Alternative 1 would allow westbound left-turns without restrictions, but would likely increase cut-through traffic through the residential neighborhood. Alternatives 2 and 3 may help reduce cut-through traffic, but would restrict left-turns out of Entrada Drive during peak hours and would introduce a new signal or stop sign on Serrano Parkway.

Alternative 3 was evaluated to determine if the proposed improvements would accommodate the growth in traffic anticipated by 2035. All study intersections were found to operate acceptably at LOS D or better during both peak hours with the all-way stop-control at Village Green Drive and soft restrictions of left-turns at Entrada Drive and the OMES driveway.

**Silva Valley Interchange Traffic Mitigation Project**  
**Technical Appendix**

# **Silva Valley Interchange Traffic Mitigation Project**

## **Technical Appendix**

### Existing Conditions

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.3
Total Del/Veh (s)	49.3	41.6	15.2	45.4	35.5	11.6	42.2	51.8	37.5	3.7	56.3	40.4
Vehicles Exited	31	50	34	110	104	80	8	26	58	62	54	101
Hourly Exit Rate	124	200	136	440	416	320	32	104	232	248	216	404
Input Volume	125	201	129	474	410	334	36	110	253	258	216	404
% of Volume	99	100	105	93	101	96	89	95	92	96	100	100
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.5	0.3
Total Del/Veh (s)	29.9	34.5
Vehicles Exited	68	786
Hourly Exit Rate	272	3144
Input Volume	265	3215
% of Volume	103	98
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	1.8	0.4	0.2	0.1	0.1	0.1	0.2
Total Del/Veh (s)	4.0	2.9	1.5	1.0	63.0	18.6	40.4	56.8	5.3
Vehicles Exited	157	8	1	284	20	1	2	1	474
Hourly Exit Rate	628	32	4	1136	80	4	8	4	1896
Input Volume	637	39	5	1130	87	6	13	4	1921
% of Volume	99	82	80	101	92	67	62	100	99
Denied Entry Before	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	56.1	30.0	1.1	0.1	6.9	5.8	10.1
Vehicles Exited	30	34	124	13	11	238	450
Hourly Exit Rate	120	136	496	52	44	952	1800
Input Volume	151	144	513	49	52	991	1900
% of Volume	79	94	97	106	85	96	95
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	2.0	3.5	0.0	0.0	0.6
Total Del/Veh (s)	62.7	42.4	1.8	0.8	5.5	1.2	8.3
Vehicles Exited	16	31	59	33	80	184	403
Hourly Exit Rate	64	124	236	132	320	736	1612
Input Volume	69	149	240	138	335	807	1738
% of Volume	93	83	98	96	96	91	93
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	41.9
Vehicles Exited	875
Hourly Exit Rate	3500
Input Volume	16278
% of Volume	22
Denied Entry Before	0
Denied Entry After	0



Queuing and Blocking Report  
Existing AM

10/14/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	B16	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	T	L	T	TR	UL	T	T	R	L
Maximum Queue (ft)	163	182	163	10	357	397	317	188	136	129	72	199
Average Queue (ft)	95	110	95	1	287	234	188	110	81	77	17	163
95th Queue (ft)	165	178	175	20	391	405	344	181	140	138	74	232
Link Distance (ft)		230	230	554		765	765		1547	1547		
Upstream Blk Time (%)		0	1									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	160				340			260			180	175
Storage Blk Time (%)	2	2			5	0				0	0	13
Queuing Penalty (veh)	2	3			11	0				0	0	26

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	366	345
Average Queue (ft)	213	228
95th Queue (ft)	376	358
Link Distance (ft)	685	685
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	8	
Queuing Penalty (veh)	17	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	EB	WB	NB	SB
Directions Served	TR	L	LTR	LTR
Maximum Queue (ft)	2	7	140	21
Average Queue (ft)	0	1	83	4
95th Queue (ft)	0	9	175	19
Link Distance (ft)	765		568	476
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		65		
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	WB	NB	SB
Directions Served	L	R	TR	L
Maximum Queue (ft)	299	56	4	32
Average Queue (ft)	158	49	1	16
95th Queue (ft)	320	63	9	42
Link Distance (ft)	727		295	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		25		90
Storage Blk Time (%)	67	15		
Queuing Penalty (veh)	97	22		

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	246	30	82
Average Queue (ft)	130	8	51
95th Queue (ft)	294	31	85
Link Distance (ft)	833		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		380	520
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Network Summary**

Network wide Queuing Penalty: 178
-----------------------------------

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	3.4	0.2
Total Del/Veh (s)	44.3	32.9	15.4	48.3	28.4	4.7		41.6	20.6	3.1	54.6	37.1
Vehicles Exited	15	90	33	53	56	39	0	80	88	28	16	55
Hourly Exit Rate	60	360	132	212	224	156	0	320	352	112	64	220
Input Volume	62	367	126	222	225	157	3	327	383	104	66	228
% of Volume	97	98	105	95	100	99	0	98	92	108	97	96
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.1
Total Del/Veh (s)	14.6	28.6
Vehicles Exited	63	616
Hourly Exit Rate	252	2464
Input Volume	244	2514
% of Volume	103	98
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	3.6	0.2	0.1	0.1	0.1	0.1
Total Del/Veh (s)	4.1	3.8	3.7	0.4	10.8	4.0	11.2	2.4
Vehicles Exited	124	8	2	142	4	2	1	283
Hourly Exit Rate	496	32	8	568	16	8	4	1132
Input Volume	504	34	12	580	23	8	2	1163
% of Volume	98	94	67	98	70	100	200	97
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	22.4	10.9	0.6	0.3	8.4	3.6	3.1
Vehicles Exited	17	11	186	35	11	127	387
Hourly Exit Rate	68	44	744	140	44	508	1548
Input Volume	71	43	773	140	51	528	1606
% of Volume	96	102	96	100	86	96	96
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	1.7	3.2	0.0	0.0	1.1
Total Del/Veh (s)	23.6	4.1	0.9	0.5	4.5	0.7	1.1
Vehicles Exited	4	1	220	8	4	140	377
Hourly Exit Rate	16	4	880	32	16	560	1508
Input Volume	18	9	904	34	21	578	1564
% of Volume	89	44	97	94	76	97	96
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	1	0	0	0	1

Total Network Performance

Denied Del/Veh (s)	0.8
Total Del/Veh (s)	29.8
Vehicles Exited	681
Hourly Exit Rate	2724
Input Volume	12505
% of Volume	22
Denied Entry Before	0
Denied Entry After	1

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	L	T	TR
Maximum Queue (ft)	111	191	189	227	190	143	273	210	150	120	169	206
Average Queue (ft)	51	139	121	152	112	57	205	95	92	58	111	119
95th Queue (ft)	115	207	200	235	194	133	300	236	157	116	179	241
Link Distance (ft)		221	221		765	765		1560	1560		684	684
Upstream Blk Time (%)		0	0									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	160			340			260			175		
Storage Blk Time (%)		4					5		0	0	1	
Queuing Penalty (veh)		2					10		0	0	0	

**Intersection: 2: Village Green Dr & Serrano Parkway**

Movement	WB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	12	37	16
Average Queue (ft)	2	21	3
95th Queue (ft)	15	47	16
Link Distance (ft)		568	476
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	65		
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	105	2	47
Average Queue (ft)	58	0	17
95th Queue (ft)	109	4	49
Link Distance (ft)	594	294	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			90
Storage Blk Time (%)			0
Queuing Penalty (veh)			0

---

Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School

---

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	38	2	26
Average Queue (ft)	18	0	10
95th Queue (ft)	43	5	33
Link Distance (ft)	918		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		380	520
Storage Blk Time (%)			
Queuing Penalty (veh)			

---

Network Summary

---

Network wide Queuing Penalty: 13

---

# **Silva Valley Interchange Traffic Mitigation Project**

## **Technical Appendix**

### Existing Plus Interchange Conditions

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	57.9	54.7	21.6	78.0	30.5	9.0	116.2	97.9	52.5	6.9	123.0	91.2
Vehicles Exited	24	28	24	189	20	71	8	29	90	87	49	130
Hourly Exit Rate	96	112	96	756	80	284	32	116	360	348	196	520
Input Volume	104	117	104	883	79	299	39	143	377	377	208	610
% of Volume	92	96	92	86	101	95	82	81	95	92	94	85
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.0	0.1
Total Del/Veh (s)	77.8	64.8
Vehicles Exited	44	793
Hourly Exit Rate	176	3172
Input Volume	221	3561
% of Volume	80	89
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	9.5	3.6	11.4	0.1	12.5	0.2	2.9
Total Del/Veh (s)	3.8	3.5	23.3	20.7	253.8	150.9	256.4	61.5	28.4
Vehicles Exited	154	9	2	286	11	1	1	2	466
Hourly Exit Rate	616	36	8	1144	44	4	4	8	1864
Input Volume	663	39	13	1169	91	6	13	6	2000
% of Volume	93	92	62	98	48	67	31	133	93
Denied Entry Before	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	3	1	0	0	0	4

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Del/Veh (s)	133.3	112.7	1.1	0.3	7.9	3.7	18.3
Vehicles Exited	34	27	198	18	5	345	627
Hourly Exit Rate	136	108	792	72	20	1380	2508
Input Volume	182	130	805	78	26	1610	2831
% of Volume	75	83	98	92	77	86	89
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0



4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.3	0.0	0.0	0.1
Total Del/Veh (s)	88.3	69.1	2.2	1.4	10.3	0.8	9.7
Vehicles Exited	16	35	142	35	73	306	607
Hourly Exit Rate	64	140	568	140	292	1224	2428
Input Volume	78	156	558	143	338	1455	2728
% of Volume	82	90	102	98	86	84	89
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	1.6
Total Del/Veh (s)	82.3
Vehicles Exited	896
Hourly Exit Rate	3584
Input Volume	21422
% of Volume	17
Denied Entry Before	0
Denied Entry After	4

Queuing and Blocking Report  
Existing Plus Interchange AM - Current Configuration

10/15/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	R	L	T
Maximum Queue (ft)	135	129	152	574	781	641	256	313	296	193	200	692
Average Queue (ft)	82	77	71	548	607	160	187	182	169	62	188	489
95th Queue (ft)	148	132	143	652	1085	531	294	342	294	207	234	817
Link Distance (ft)		230	230		765	765		1547	1547			1382
Upstream Blk Time (%)					18	0						
Queuing Penalty (veh)					114	0						
Storage Bay Dist (ft)	160			550			260			180	175	
Storage Blk Time (%)	1	0		39	0		12	0	5	0	37	39
Queuing Penalty (veh)	0	0		15	0		23	0	18	1	114	81

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	667
Average Queue (ft)	458
95th Queue (ft)	779
Link Distance (ft)	1382
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	WB	WB	WB	NB	SB
Directions Served	L	T	TR	LTR	LTR
Maximum Queue (ft)	37	517	251	414	28
Average Queue (ft)	9	261	62	233	8
95th Queue (ft)	41	731	327	472	31
Link Distance (ft)		698	698	568	476
Upstream Blk Time (%)		9	0	4	
Queuing Penalty (veh)		0	0	0	
Storage Bay Dist (ft)	65				
Storage Blk Time (%)		24			
Queuing Penalty (veh)		3			

Queuing and Blocking Report  
 Existing Plus Interchange AM - Current Configuration

10/15/2014

Intersection: 3: Silva Valley Parkway & Entrada Drive

Movement	WB	WB	B6	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	618	53	39	4	35
Average Queue (ft)	367	45	6	1	10
95th Queue (ft)	721	70	48	9	33
Link Distance (ft)	727		136	295	
Upstream Blk Time (%)	7		1		
Queuing Penalty (veh)	0		0		
Storage Bay Dist (ft)		25			90
Storage Blk Time (%)	89	16			
Queuing Penalty (veh)	116	29			

Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	384	32	148
Average Queue (ft)	199	10	77
95th Queue (ft)	427	33	146
Link Distance (ft)	833	822	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			520
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 516
-----------------------------------

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.2
Total Del/Veh (s)	50.1	45.0	8.9	46.2	26.7	4.0	100.8	53.2	26.2	4.8	65.4	55.5
Vehicles Exited	5	21	41	92	24	36	1	87	135	91	10	122
Hourly Exit Rate	20	84	164	368	96	144	4	348	540	364	40	488
Input Volume	22	89	167	378	101	144	6	361	556	378	44	500
% of Volume	91	94	98	97	95	100	67	96	97	96	91	98
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.1
Total Del/Veh (s)	24.5	33.9
Vehicles Exited	55	720
Hourly Exit Rate	220	2880
Input Volume	211	2957
% of Volume	104	97
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	3.2	0.3	0.1	0.1	0.1	0.2
Total Del/Veh (s)	3.4	2.8	2.8	0.5	11.7	5.8	24.2	2.1
Vehicles Exited	115	9	2	154	5	3	1	289
Hourly Exit Rate	460	36	8	616	20	12	4	1156
Input Volume	478	33	11	600	22	11	6	1161
% of Volume	96	109	73	103	91	109	67	100
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	4.8	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	139.4	129.7	2.4	2.2	13.9	3.6	9.6
Vehicles Exited	22	2	318	42	7	247	638
Hourly Exit Rate	88	8	1272	168	28	988	2552
Input Volume	111	11	1289	167	33	1018	2629
% of Volume	79	73	99	101	85	97	97
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.4	0.6	0.0	0.0	0.2
Total Del/Veh (s)	73.2	24.9	1.4	1.3	10.5	1.1	2.1
Vehicles Exited	6	3	356	7	5	265	642
Hourly Exit Rate	24	12	1424	28	20	1060	2568
Input Volume	22	11	1444	33	22	1106	2638
% of Volume	109	109	99	85	91	96	97
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	39.1
Vehicles Exited	808
Hourly Exit Rate	3232
Input Volume	13651
% of Volume	24
Denied Entry Before	0
Denied Entry After	0

Queuing and Blocking Report  
 Existing + Interchange PM - Current Configuration

10/14/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	R	L	T
Maximum Queue (ft)	46	115	111	321	166	73	282	443	209	32	179	418
Average Queue (ft)	20	56	55	244	80	38	229	240	113	7	65	291
95th Queue (ft)	49	122	117	357	234	70	322	551	274	64	162	472
Link Distance (ft)		214	214		765	765		1545	1545			685
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)		1		4			13	0	1	0		35
Queuing Penalty (veh)		0		2			36	2	3	0		15

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	265
Average Queue (ft)	164
95th Queue (ft)	278
Link Distance (ft)	685
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	WB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	17	40	22
Average Queue (ft)	4	21	5
95th Queue (ft)	18	49	22
Link Distance (ft)		568	476
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	65		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report  
 Existing + Interchange PM - Current Configuration

10/14/2014

Intersection: 3: Silva Valley Parkway & Entrada Drive

Movement	WB	WB	NB	SB
Directions Served	L	R	TR	L
Maximum Queue (ft)	294	48	9	45
Average Queue (ft)	164	10	2	19
95th Queue (ft)	319	41	12	48
Link Distance (ft)	610		1107	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		25		90
Storage Blk Time (%)	86	1		
Queuing Penalty (veh)	9	2		

Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	73	2	31
Average Queue (ft)	33	0	13
95th Queue (ft)	72	5	37
Link Distance (ft)	844	819	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			520
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Bend

Movement	WB
Directions Served	T
Maximum Queue (ft)	26
Average Queue (ft)	4
95th Queue (ft)	54
Link Distance (ft)	214
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 69

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.4
Total Del/Veh (s)	37.2	32.8	17.2	42.7	45.7	11.9	74.9	84.3	31.1	5.2	70.2	47.3
Vehicles Exited	25	28	27	200	21	71	8	32	89	87	52	147
Hourly Exit Rate	100	112	108	800	84	284	32	128	356	348	208	588
Input Volume	104	117	104	883	79	299	39	143	377	377	208	610
% of Volume	96	96	104	91	106	95	82	90	94	92	100	96
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.4	0.3
Total Del/Veh (s)	36.3	38.3
Vehicles Exited	55	842
Hourly Exit Rate	220	3368
Input Volume	221	3561
% of Volume	100	95
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	2.1	0.4	0.1	0.1	0.1	0.1	0.3
Total Del/Veh (s)	3.9	3.6	7.4	1.6	98.2	135.2	78.4	94.8	7.9
Vehicles Exited	157	9	2	284	17	2	4	1	476
Hourly Exit Rate	628	36	8	1136	68	8	16	4	1904
Input Volume	663	39	13	1169	91	6	13	6	2000
% of Volume	95	92	62	97	75	133	123	67	95
Denied Entry Before	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Del/Veh (s)	86.4	56.7	1.1	0.3	8.9	4.3	10.4
Vehicles Exited	34	26	194	18	6	372	650
Hourly Exit Rate	136	104	776	72	24	1488	2600
Input Volume	182	130	805	78	26	1610	2831
% of Volume	75	80	96	92	92	92	92
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0



4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.2	0.0	0.0	0.1
Total Del/Veh (s)	102.7	72.6	2.2	1.5	8.2	0.8	9.4
Vehicles Exited	13	35	137	35	73	329	622
Hourly Exit Rate	52	140	548	140	292	1316	2488
Input Volume	78	156	558	143	338	1455	2728
% of Volume	67	90	98	98	86	90	91
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	52.2
Vehicles Exited	936
Hourly Exit Rate	3744
Input Volume	19603
% of Volume	19
Denied Entry Before	0
Denied Entry After	3

Queuing and Blocking Report  
 Existing Plus Interchange AM - With Improvements

10/21/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	TR	UL	T	T	R	L	T
Maximum Queue (ft)	115	85	126	332	414	299	236	197	170	119	200	428
Average Queue (ft)	65	42	63	257	300	163	156	123	113	37	172	296
95th Queue (ft)	116	79	123	361	443	334	276	266	236	120	239	473
Link Distance (ft)		230	230		765	765		1547	1547			685
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)				2	4		10		1	0	18	21
Queuing Penalty (veh)				8	16		19		3	0	56	44

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	381
Average Queue (ft)	261
95th Queue (ft)	417
Link Distance (ft)	685
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	EB	WB	NB	SB
Directions Served	TR	L	LTR	LTR
Maximum Queue (ft)	2	23	178	21
Average Queue (ft)	0	5	113	5
95th Queue (ft)	5	24	282	22
Link Distance (ft)	765		568	410
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		65		
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Queuing and Blocking Report  
 Existing Plus Interchange AM - With Improvements

10/21/2014

Intersection: 3: Silva Valley Parkway & Entrada Drive

Movement	WB	WB	B6	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	227	52	330	11	30
Average Queue (ft)	176	46	135	1	15
95th Queue (ft)	283	67	398	10	38
Link Distance (ft)	150		563	295	
Upstream Blk Time (%)	62		4		
Queuing Penalty (veh)	0		0		
Storage Bay Dist (ft)		25			90
Storage Blk Time (%)	83	15			
Queuing Penalty (veh)	108	27			

Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School

Movement	WB	B8	NB	SB
Directions Served	LR	T	TR	L
Maximum Queue (ft)	299	46	31	109
Average Queue (ft)	193	16	6	66
95th Queue (ft)	398	94	25	105
Link Distance (ft)	354	135	967	
Upstream Blk Time (%)	13	8		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (ft)				520
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 280
-----------------------------------

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.2
Total Del/Veh (s)	32.9	38.9	9.4	35.7	38.4	9.3	63.2	66.1	22.9	6.3	55.1	43.6
Vehicles Exited	5	22	43	98	25	34	1	91	131	95	12	119
Hourly Exit Rate	20	88	172	392	100	136	4	364	524	380	48	476
Input Volume	22	89	167	378	101	144	6	361	556	378	44	500
% of Volume	91	99	103	104	99	94	67	101	94	101	109	95
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.1
Total Del/Veh (s)	29.2	32.3
Vehicles Exited	52	728
Hourly Exit Rate	208	2912
Input Volume	211	2957
% of Volume	99	98
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	3.3	0.3	0.2	0.1	0.1	0.2
Total Del/Veh (s)	3.5	2.7	1.8	0.5	12.8	6.7	9.9	2.1
Vehicles Exited	121	8	2	152	5	4	2	294
Hourly Exit Rate	484	32	8	608	20	16	8	1176
Input Volume	478	33	11	600	22	11	6	1161
% of Volume	101	97	73	101	91	145	133	101
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	4.8	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	126.8	113.2	2.5	2.3	16.3	3.5	8.4
Vehicles Exited	20	2	320	42	6	251	641
Hourly Exit Rate	80	8	1280	168	24	1004	2564
Input Volume	111	11	1289	167	33	1018	2629
% of Volume	72	73	99	101	73	99	98
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.4	0.5	0.0	0.0	0.2
Total Del/Veh (s)	46.6	12.2	1.5	0.9	8.9	0.9	1.7
Vehicles Exited	5	3	361	9	4	267	649
Hourly Exit Rate	20	12	1444	36	16	1068	2596
Input Volume	22	11	1444	33	22	1106	2638
% of Volume	91	109	100	109	73	97	98
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	36.9
Vehicles Exited	807
Hourly Exit Rate	3228
Input Volume	13651
% of Volume	24
Denied Entry Before	0
Denied Entry After	0

Queuing and Blocking Report  
Existing + Interchange PM - With Improvements

10/15/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	TR	UL	T	T	R	L	T
Maximum Queue (ft)	38	82	119	208	243	191	284	436	244	128	128	311
Average Queue (ft)	16	49	62	138	178	78	252	231	132	24	57	214
95th Queue (ft)	43	94	136	217	248	202	323	489	242	125	135	332
Link Distance (ft)		214	214		765	765		1542	1542			685
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)					0		26	0	1	0		18
Queuing Penalty (veh)					0		71	0	6	0		8

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	315
Average Queue (ft)	203
95th Queue (ft)	344
Link Distance (ft)	685
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	WB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	12	47	19
Average Queue (ft)	2	26	6
95th Queue (ft)	13	56	23
Link Distance (ft)		568	476
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	65		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report  
Existing + Interchange PM - With Improvements

10/15/2014

Intersection: 3: Silva Valley Parkway & Entrada Drive

Movement	WB	WB	NB	SB
Directions Served	L	R	TR	L
Maximum Queue (ft)	233	44	20	44
Average Queue (ft)	140	10	3	19
95th Queue (ft)	313	43	20	49
Link Distance (ft)	610		1107	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		25		90
Storage Blk Time (%)	77	2		
Queuing Penalty (veh)	8	2		

Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	52	83	31
Average Queue (ft)	23	0	14
95th Queue (ft)	56	0	38
Link Distance (ft)	844	819	
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			520
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Bend

Movement	WB
Directions Served	T
Maximum Queue (ft)	27
Average Queue (ft)	4
95th Queue (ft)	56
Link Distance (ft)	214
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 96
----------------------------------

**Silva Valley Interchange Traffic Mitigation Project**

**Technical Appendix**

Existing Plus Interchange Alternative 1



1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.3
Total Del/Veh (s)	37.7	41.5	14.0	40.9	41.1	15.7	71.0	78.6	34.2	8.2	64.7	46.2
Vehicles Exited	26	27	24	174	20	79	23	30	93	79	46	146
Hourly Exit Rate	104	108	96	696	80	316	92	120	372	316	184	584
Input Volume	104	117	104	740	79	299	117	143	377	338	208	610
% of Volume	100	92	92	94	101	106	79	84	99	93	88	96
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.4	0.2
Total Del/Veh (s)	35.1	38.7
Vehicles Exited	51	818
Hourly Exit Rate	204	3272
Input Volume	221	3457
% of Volume	92	95
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	2.8	0.4	0.1	0.3	0.1	0.1	0.2
Total Del/Veh (s)	3.9	3.0	4.2	1.1	31.3	52.2	17.9	57.2	3.6
Vehicles Exited	143	8	3	264	15	1	4	1	439
Hourly Exit Rate	572	32	12	1056	60	4	16	4	1756
Input Volume	624	39	13	1052	65	6	13	6	1818
% of Volume	92	82	92	100	92	67	123	67	97
Denied Entry Before	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.0	0.0	0.0
Total Del/Veh (s)	18.9	12.5	10.9	7.3	33.1	14.4	13.8
Vehicles Exited	85	35	195	29	6	352	702
Hourly Exit Rate	340	140	780	116	24	1408	2808
Input Volume	325	130	844	117	26	1546	2988
% of Volume	105	108	92	99	92	91	94
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.2	0.3	0.0	0.0	0.1
Total Del/Veh (s)	5.5	2.0	1.2	9.2	1.1	2.6
Vehicles Exited	57	132	35	78	356	658
Hourly Exit Rate	228	528	140	312	1424	2632
Input Volume	234	558	143	338	1532	2805
% of Volume	97	95	98	92	93	94
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	45.4
Vehicles Exited	961
Hourly Exit Rate	3844
Input Volume	19888
% of Volume	19
Denied Entry Before	0
Denied Entry After	0

Queuing and Blocking Report  
Existing Plus Interchange Scenario 1 AM

10/16/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	TR	UL	T	T	R	L	T
Maximum Queue (ft)	127	102	103	324	384	268	250	287	251	140	200	441
Average Queue (ft)	74	57	56	223	261	158	187	155	120	32	165	283
95th Queue (ft)	140	105	106	332	398	290	294	356	244	123	245	467
Link Distance (ft)		230	230		765	765		1547	1547			1253
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)	1			0	2		13		1	0	13	23
Queuing Penalty (veh)	0			1	7		24		3	0	40	47

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	395
Average Queue (ft)	259
95th Queue (ft)	420
Link Distance (ft)	1253
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	WB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	21	83	21
Average Queue (ft)	6	50	4
95th Queue (ft)	23	90	21
Link Distance (ft)		568	476
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	65		
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	TR	L	T	T
Maximum Queue (ft)	266	75	180	177	62	210	206
Average Queue (ft)	176	56	104	122	24	140	147
95th Queue (ft)	294	96	186	197	67	236	241
Link Distance (ft)	727		295	295		1547	1547
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50			90		
Storage Blk Time (%)	35	4			0	12	
Queuing Penalty (veh)	45	14			0	3	

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	97	34	122
Average Queue (ft)	57	9	72
95th Queue (ft)	101	33	122
Link Distance (ft)	834	828	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			520
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Network Summary**

Network wide Queuing Penalty: 184
-----------------------------------

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.2
Total Del/Veh (s)	32.4	38.2	13.1	36.7	39.0	7.4	40.4	47.6	24.5	8.8	62.5	47.0
Vehicles Exited	5	23	44	82	22	36	7	87	140	85	12	116
Hourly Exit Rate	20	92	176	328	88	144	28	348	560	340	48	464
Input Volume	22	89	167	344	102	144	28	361	557	333	44	500
% of Volume	91	103	105	95	86	100	100	96	101	102	109	93

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.1
Total Del/Veh (s)	36.4	31.9
Vehicles Exited	58	717
Hourly Exit Rate	232	2868
Input Volume	211	2902
% of Volume	110	99

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	3.5	0.2	0.1	0.1	0.1	0.2
Total Del/Veh (s)	3.5	3.2	2.9	0.4	14.8	6.4	21.6	2.1
Vehicles Exited	111	8	3	139	4	2	1	268
Hourly Exit Rate	444	32	12	556	16	8	4	1072
Input Volume	433	33	11	567	22	11	6	1083
% of Volume	103	97	109	98	73	73	67	99

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	20.9	10.8	10.2	7.8	29.5	7.2	9.8
Vehicles Exited	38	3	319	49	7	240	656
Hourly Exit Rate	152	12	1276	196	28	960	2624
Input Volume	144	11	1268	211	33	1006	2673
% of Volume	106	109	101	93	85	95	98

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.4	0.5	0.0	0.0	0.2
Total Del/Veh (s)	9.9	1.5	1.0	7.6	2.0	1.8
Vehicles Exited	8	358	9	5	272	652
Hourly Exit Rate	32	1432	36	20	1088	2608
Input Volume	33	1444	33	22	1128	2660
% of Volume	97	99	109	91	96	98

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	37.1
Vehicles Exited	814
Hourly Exit Rate	3256
Input Volume	13982
% of Volume	23

Queuing and Blocking Report  
Existing + Interchange Scenario 1 PM

10/16/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	TR	UL	T	T	R	L	T
Maximum Queue (ft)	39	104	131	189	237	167	279	384	216	114	175	334
Average Queue (ft)	17	55	69	132	168	63	224	180	135	31	70	229
95th Queue (ft)	45	107	147	208	245	154	313	389	232	145	173	353
Link Distance (ft)		228	228		764	764		1540	1540			957
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)		0			0		10	0	2	0		23
Queuing Penalty (veh)		0			0		29	0	7	0		10

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	326
Average Queue (ft)	226
95th Queue (ft)	366
Link Distance (ft)	957
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	WB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	18	39	18
Average Queue (ft)	5	23	4
95th Queue (ft)	20	50	19
Link Distance (ft)		568	476
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	65		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report  
Existing + Interchange Scenario 1 PM

10/16/2014

Intersection: 3: Silva Valley Parkway & Entrada Drive

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	TR	L	T	T
Maximum Queue (ft)	130	30	206	221	56	113	112
Average Queue (ft)	80	10	124	127	24	49	66
95th Queue (ft)	136	36	220	231	58	117	127
Link Distance (ft)	783		1099	1099		1540	1540
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50			90		
Storage Blk Time (%)	25	0			0	1	
Queuing Penalty (veh)	3	0			2	0	

Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	50	5	29
Average Queue (ft)	20	1	10
95th Queue (ft)	52	11	32
Link Distance (ft)	674	828	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			520
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 52
----------------------------------



# **Silva Valley Interchange Traffic Mitigation Project**

## **Technical Appendix**

### Existing Plus Interchange Alternative 2

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.3
Total Del/Veh (s)	49.7	45.2	20.2	56.2	44.5	18.3	90.3	93.3	30.9	5.1	80.2	75.2
Vehicles Exited	25	31	25	220	25	67	32	33	92	92	49	148
Hourly Exit Rate	100	124	100	880	100	268	128	132	368	368	196	592
Input Volume	104	117	104	1000	104	299	156	143	377	377	208	610
% of Volume	96	106	96	88	96	90	82	92	98	98	94	97
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.2
Total Del/Veh (s)	66.0	52.1
Vehicles Exited	53	892
Hourly Exit Rate	212	3568
Input Volume	221	3820
% of Volume	96	93
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	2.4	0.5	0.3	0.4	3.4	0.1	0.3
Total Del/Veh (s)	8.9	6.4	51.3	10.5	41.1	33.9	24.8	56.6	13.7
Vehicles Exited	165	10	3	293	49	1	4	1	526
Hourly Exit Rate	660	40	12	1172	196	4	16	4	2104
Input Volume	663	39	13	1195	208	6	13	6	2143
% of Volume	100	103	92	98	94	67	123	67	98
Denied Entry Before	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0
Total Del/Veh (s)	7.2	1.1	0.3	10.0	4.5	3.6
Vehicles Exited	40	216	17	5	412	690
Hourly Exit Rate	160	864	68	20	1648	2760
Input Volume	143	909	78	26	1845	3001
% of Volume	112	95	87	77	89	92
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.2	0.3	0.0	0.0	0.1
Total Del/Veh (s)	5.9	2.3	1.4	10.4	0.9	2.8
Vehicles Exited	66	128	41	76	335	646
Hourly Exit Rate	264	512	164	304	1340	2584
Input Volume	260	558	169	338	1506	2831
% of Volume	102	92	97	90	89	91
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	58.0
Vehicles Exited	939
Hourly Exit Rate	3756
Input Volume	20368
% of Volume	18
Denied Entry Before	0
Denied Entry After	0

Queuing and Blocking Report  
Existing Plus Interchange Scenario 2 AM

10/16/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	TR	UL	T	T	R	L	T
Maximum Queue (ft)	132	115	124	364	622	431	299	359	268	84	200	603
Average Queue (ft)	80	71	65	307	414	225	240	185	141	20	183	419
95th Queue (ft)	143	122	125	416	694	434	361	496	356	74	235	659
Link Distance (ft)		230	230		765	765		1554	1554			1161
Upstream Blk Time (%)					0							
Queuing Penalty (veh)					2							
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)	1	0		6	16		23		0		14	47
Queuing Penalty (veh)	1	0		31	80		44		1		42	97

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	548
Average Queue (ft)	388
95th Queue (ft)	614
Link Distance (ft)	1161
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	TR	L	T	TR	LT	R	LTR
Maximum Queue (ft)	113	131	48	296	238	232	44	16
Average Queue (ft)	55	74	17	170	88	154	13	4
95th Queue (ft)	122	138	53	321	231	248	45	20
Link Distance (ft)	765	765		694	694	568		476
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			65				25	
Storage Blk Time (%)	2		0	16		69	1	
Queuing Penalty (veh)	0		0	2		9	2	

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	SB
Directions Served	R	L
Maximum Queue (ft)	82	32
Average Queue (ft)	52	14
95th Queue (ft)	83	38
Link Distance (ft)	726	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		90
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	NB	NB	SB
Directions Served	R	T	TR	L
Maximum Queue (ft)	98	2	34	130
Average Queue (ft)	61	0	12	79
95th Queue (ft)	103	5	38	145
Link Distance (ft)	834	828	828	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				520
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Network Summary**

Network wide Queuing Penalty: 311
-----------------------------------

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.2
Total Del/Veh (s)	41.9	47.3	12.2	39.3	44.7	7.5	68.0	75.8	27.0	7.1	78.3	59.6
Vehicles Entered	6	21	39	117	23	39	12	84	138	101	13	130
Vehicles Exited	6	22	39	122	25	39	10	74	129	100	12	131
Hourly Exit Rate	24	88	156	488	100	156	40	296	516	400	48	524
Input Volume	22	89	167	467	100	144	50	361	556	378	44	500
% of Volume	109	99	93	104	100	108	80	82	93	106	109	105
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.1
Total Del/Veh (s)	47.8	40.0
Vehicles Entered	53	776
Vehicles Exited	55	764
Hourly Exit Rate	220	3056
Input Volume	211	3089
% of Volume	104	99
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	3.8	0.3	0.2	4.6	0.1	0.2
Total Del/Veh (s)	6.5	5.8	43.2	3.6	46.3	19.4	56.6	9.4
Vehicles Entered	125	8	2	152	25	2	1	315
Vehicles Exited	125	8	3	152	27	3	1	319
Hourly Exit Rate	500	32	12	608	108	12	4	1276
Input Volume	478	33	11	611	100	11	6	1250
% of Volume	105	97	109	100	108	109	67	102
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

**3: Silva Valley Parkway & Entrada Drive Performance by movement**

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	7.3	1.5	0.7	10.6	3.6	2.5
Vehicles Entered	8	328	41	8	294	679
Vehicles Exited	8	328	41	7	283	667
Hourly Exit Rate	32	1312	164	28	1132	2668
Input Volume	33	1312	167	33	1152	2697
% of Volume	97	100	98	85	98	99
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

**4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement**

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.4	0.5	0.0	0.0	0.2
Total Del/Veh (s)	8.9	1.3	1.1	11.4	0.6	1.2
Vehicles Entered	7	363	7	5	277	659
Vehicles Exited	8	362	7	5	276	658
Hourly Exit Rate	32	1448	28	20	1104	2632
Input Volume	33	1444	33	22	1128	2660
% of Volume	97	100	85	91	98	99
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

**Total Network Performance**

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	43.2
Vehicles Entered	830
Vehicles Exited	821
Hourly Exit Rate	3284
Input Volume	16822
% of Volume	20
Denied Entry Before	0
Denied Entry After	0

Queuing and Blocking Report  
Existing + Interchange Scenario 2 PM

10/15/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	TR	UL	T	T	R	L	T
Maximum Queue (ft)	48	102	121	243	272	198	325	457	313	174	167	386
Average Queue (ft)	18	54	64	167	201	77	286	294	171	41	91	304
95th Queue (ft)	49	106	125	250	278	188	381	577	329	166	208	443
Link Distance (ft)		228	228		765	765		1555	1555			1049
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)				0			31	0	3	0	0	37
Queuing Penalty (veh)				0			87	0	13	0	0	16

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	391
Average Queue (ft)	302
95th Queue (ft)	448
Link Distance (ft)	1049
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	TR	L	T	TR	LT	R	LTR
Maximum Queue (ft)	53	92	38	115	55	167	40	16
Average Queue (ft)	19	52	11	53	17	96	13	5
95th Queue (ft)	54	99	39	119	60	171	46	20
Link Distance (ft)	765	765		694	694	568		476
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			65				25	
Storage Blk Time (%)	0		0	3		60	1	
Queuing Penalty (veh)	0		0	0		7	1	



Queuing and Blocking Report  
Existing + Interchange Scenario 2 PM

10/15/2014

Intersection: 3: Silva Valley Parkway & Entrada Drive

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	49	9	39
Average Queue (ft)	22	1	17
95th Queue (ft)	53	8	44
Link Distance (ft)	551	347	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			90
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School

Movement	WB	SB
Directions Served	R	L
Maximum Queue (ft)	51	37
Average Queue (ft)	21	13
95th Queue (ft)	55	40
Link Distance (ft)	820	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		520
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 125
-----------------------------------

**Silva Valley Interchange Traffic Mitigation Project**

**Technical Appendix**

Existing Plus Interchange Alternative 3

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.3
Total Del/Veh (s)	55.6	47.3	25.9	48.2	45.8	18.8	98.2	94.8	31.4	5.6	74.0	69.8
Vehicles Exited	26	27	24	233	26	76	36	30	95	94	46	140
Hourly Exit Rate	104	108	96	932	104	304	144	120	380	376	184	560
Input Volume	104	117	104	1000	104	299	156	143	377	377	208	610
% of Volume	100	92	92	93	100	102	92	84	101	100	88	92
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.4	0.2
Total Del/Veh (s)	64.5	49.3
Vehicles Exited	47	900
Hourly Exit Rate	188	3600
Input Volume	221	3820
% of Volume	85	94
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	1.6	0.2	0.3	0.3	3.7	0.1	0.2
Total Del/Veh (s)	15.4	11.2	14.1	24.1	9.4	10.9	4.1	6.6	19.6
Vehicles Exited	156	9	3	296	51	2	4	1	522
Hourly Exit Rate	624	36	12	1184	204	8	16	4	2088
Input Volume	663	39	13	1195	208	6	13	6	2143
% of Volume	94	92	92	99	98	133	123	67	97
Denied Entry Before	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0
Total Del/Veh (s)	6.4	1.1	0.2	8.6	4.4	3.4
Vehicles Exited	38	232	16	6	425	717
Hourly Exit Rate	152	928	64	24	1700	2868
Input Volume	143	909	78	26	1845	3001
% of Volume	106	102	82	92	92	96
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.3	0.3	0.0	0.0	0.1
Total Del/Veh (s)	5.8	2.5	1.8	13.2	0.9	3.2
Vehicles Exited	67	142	47	78	341	675
Hourly Exit Rate	268	568	188	312	1364	2700
Input Volume	260	558	169	338	1506	2831
% of Volume	103	102	111	92	91	95
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	58.6
Vehicles Exited	961
Hourly Exit Rate	3844
Input Volume	20368
% of Volume	19
Denied Entry Before	0
Denied Entry After	0

Queuing and Blocking Report  
Existing Plus Interchange Scenario 3 AM

10/16/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	TR	UL	T	T	R	L	T
Maximum Queue (ft)	136	127	127	364	510	307	312	446	337	137	200	545
Average Queue (ft)	85	68	70	301	338	164	258	250	167	33	168	378
95th Queue (ft)	145	131	134	401	514	316	385	572	400	130	248	607
Link Distance (ft)		230	230		765	765		1554	1554			1161
Upstream Blk Time (%)					0							
Queuing Penalty (veh)					0							
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)	1	0		2	5		35	0	2	0	12	44
Queuing Penalty (veh)	0	0		9	27		65	0	6	0	38	91

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	506
Average Queue (ft)	349
95th Queue (ft)	571
Link Distance (ft)	1161
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	TR	L	T	TR	LT	R	LTR
Maximum Queue (ft)	96	107	74	262	246	107	43	21
Average Queue (ft)	65	73	22	172	156	66	16	3
95th Queue (ft)	105	107	78	275	257	113	49	18
Link Distance (ft)	765	765		1312	1312	568		476
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			65				25	
Storage Blk Time (%)	1			60		31	1	
Queuing Penalty (veh)	0			8		4	3	

Queuing and Blocking Report  
Existing Plus Interchange Scenario 3 AM

10/16/2014

Intersection: 3: Silva Valley Parkway & Entrada Drive

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	73	4	30
Average Queue (ft)	49	1	13
95th Queue (ft)	78	7	36
Link Distance (ft)	726	300	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			90
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School

Movement	WB	NB	NB	SB
Directions Served	R	T	TR	L
Maximum Queue (ft)	94	2	38	159
Average Queue (ft)	62	0	12	94
95th Queue (ft)	96	5	38	164
Link Distance (ft)	834	828	828	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				520
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 252
-----------------------------------

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.2
Total Del/Veh (s)	50.6	44.7	12.5	44.2	50.5	12.3	55.7	57.0	22.5	6.4	54.6	55.4
Vehicles Entered	5	22	43	113	26	36	12	93	132	95	10	124
Vehicles Exited	4	22	43	111	26	36	11	91	131	94	10	119
Hourly Exit Rate	16	88	172	444	104	144	44	364	524	376	40	476
Input Volume	22	89	167	467	100	144	50	361	556	378	44	500
% of Volume	73	99	103	95	104	100	88	101	94	99	91	95
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.1
Total Del/Veh (s)	40.7	36.4
Vehicles Entered	53	764
Vehicles Exited	50	748
Hourly Exit Rate	200	2992
Input Volume	211	3089
% of Volume	95	97
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	3.1	0.3	0.2	4.0	0.1	0.2
Total Del/Veh (s)	12.6	7.3	7.1	12.8	6.1	3.9	4.2	11.8
Vehicles Entered	117	9	3	151	25	3	1	309
Vehicles Exited	117	9	3	150	26	3	2	310
Hourly Exit Rate	468	36	12	600	104	12	8	1240
Input Volume	478	33	11	611	100	11	6	1250
% of Volume	98	109	109	98	104	109	133	99
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

**3: Silva Valley Parkway & Entrada Drive Performance by movement**

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.9	1.4	0.6	13.5	3.5	2.4
Vehicles Entered	8	327	40	7	278	660
Vehicles Exited	8	325	40	7	272	652
Hourly Exit Rate	32	1300	160	28	1088	2608
Input Volume	33	1312	167	33	1152	2697
% of Volume	97	99	96	85	94	97
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

**4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement**

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.4	0.4	0.0	0.0	0.2
Total Del/Veh (s)	7.3	1.4	0.9	8.2	0.6	1.2
Vehicles Entered	8	360	8	6	266	648
Vehicles Exited	8	359	8	5	266	646
Hourly Exit Rate	32	1436	32	20	1064	2584
Input Volume	33	1444	33	22	1128	2660
% of Volume	97	99	97	91	94	97
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

**Total Network Performance**

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	41.2
Vehicles Entered	823
Vehicles Exited	793
Hourly Exit Rate	3172
Input Volume	16822
% of Volume	19
Denied Entry Before	0
Denied Entry After	0



Queuing and Blocking Report  
Existing + Interchange Scenario 3 PM

10/16/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	TR	UL	T	T	R	L	T
Maximum Queue (ft)	50	100	132	246	267	207	329	456	284	134	175	380
Average Queue (ft)	15	54	71	172	196	93	275	223	136	26	56	247
95th Queue (ft)	49	111	142	244	272	217	382	495	288	132	156	372
Link Distance (ft)		228	228		765	765		1555	1555			1049
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)							24		1	0		30
Queuing Penalty (veh)							66		3	0		13

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	368
Average Queue (ft)	239
95th Queue (ft)	369
Link Distance (ft)	1049
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	TR	L	T	TR	LT	R	LTR
Maximum Queue (ft)	63	74	24	137	63	71	36	26
Average Queue (ft)	43	50	8	79	39	43	13	5
95th Queue (ft)	66	77	30	134	67	75	44	22
Link Distance (ft)	765	765		694	694	568		476
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			65				25	
Storage Blk Time (%)				10		11	1	
Queuing Penalty (veh)				1		1	1	

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	SB
Directions Served	R	L
Maximum Queue (ft)	52	37
Average Queue (ft)	24	18
95th Queue (ft)	57	44
Link Distance (ft)	551	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		90
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	50	11	37
Average Queue (ft)	25	2	14
95th Queue (ft)	55	12	40
Link Distance (ft)	820	828	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			520
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Network Summary**

Network wide Queuing Penalty: 86
----------------------------------

# **Silva Valley Interchange Traffic Mitigation Project**

## **Technical Appendix**

Existing Plus Interchange and Country Club Extension Conditions

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	33.8	32.4	9.7	30.6	23.5	7.5	78.2	72.9	27.2	4.4	54.8	36.9
Vehicles Exited	25	25	24	92	9	72	10	35	90	60	47	145
Hourly Exit Rate	100	100	96	368	36	288	40	140	360	240	188	580
Input Volume	104	104	91	377	39	286	39	156	390	260	195	623
% of Volume	96	96	105	98	92	101	103	90	92	92	96	93
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	28.8	31.1
Vehicles Exited	56	690
Hourly Exit Rate	224	2760
Input Volume	221	2885
% of Volume	101	96
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	3.5	0.3	0.2	0.2	0.1	0.1	0.2
Total Del/Veh (s)	3.5	2.4	3.2	0.6	16.9	16.6	6.4	20.5	3.3
Vehicles Exited	123	8	3	154	23	3	4	2	320
Hourly Exit Rate	492	32	12	616	92	12	16	8	1280
Input Volume	520	39	13	610	91	13	13	6	1305
% of Volume	95	82	92	101	101	92	123	133	98
Denied Entry Before	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Del/Veh (s)	52.2	31.5	1.1	0.2	7.2	3.7	8.8
Vehicles Exited	42	31	170	20	6	262	531
Hourly Exit Rate	168	124	680	80	24	1048	2124
Input Volume	182	130	714	78	26	1104	2234
% of Volume	92	95	95	103	92	95	95
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.2	0.0	0.0	0.1
Total Del/Veh (s)	71.9	48.0	1.9	1.3	8.7	0.6	8.9
Vehicles Exited	17	35	114	36	83	220	505
Hourly Exit Rate	68	140	456	144	332	880	2020
Input Volume	78	156	468	143	338	948	2131
% of Volume	87	90	97	101	98	93	95
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	37.8
Vehicles Exited	807
Hourly Exit Rate	3228
Input Volume	17540
% of Volume	18
Denied Entry Before	0
Denied Entry After	0

Queuing and Blocking Report  
 Existing Plus Interchange with Country Club Ext AM - Current Configuration

10/17/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	R	L	T
Maximum Queue (ft)	110	100	89	284	61	117	215	220	174	34	196	412
Average Queue (ft)	61	53	43	189	24	67	159	122	100	6	156	235
95th Queue (ft)	113	104	84	295	60	113	277	272	189	34	233	425
Link Distance (ft)		230	230		765	765		1547	1547			1382
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	160			550			260			180	175	
Storage Blk Time (%)	0	0					10		0		9	14
Queuing Penalty (veh)	0	0					20		0		29	27

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	382
Average Queue (ft)	212
95th Queue (ft)	381
Link Distance (ft)	1382
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	WB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	22	85	26
Average Queue (ft)	5	54	5
95th Queue (ft)	22	89	23
Link Distance (ft)		568	476
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	65		
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	WB	SB
Directions Served	L	R	L
Maximum Queue (ft)	289	54	41
Average Queue (ft)	180	48	14
95th Queue (ft)	357	63	43
Link Distance (ft)	727		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		25	90
Storage Blk Time (%)	70	16	
Queuing Penalty (veh)	91	29	

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	306	33	119
Average Queue (ft)	160	10	75
95th Queue (ft)	326	35	128
Link Distance (ft)	833	822	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			520
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Network Summary**

Network wide Queuing Penalty: 196
-----------------------------------

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.2
Total Del/Veh (s)	50.6	31.7	9.3	52.3	25.4	5.5	48.0	34.6	14.1	4.3	51.8	33.6
Vehicles Exited	5	34	44	46	25	33	1	87	143	29	11	126
Hourly Exit Rate	20	136	176	184	100	132	4	348	572	116	44	504
Input Volume	22	144	178	200	90	144	6	350	578	111	44	522
% of Volume	91	94	99	92	111	92	67	99	99	105	100	97
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.1
Total Del/Veh (s)	22.9	25.8
Vehicles Exited	54	638
Hourly Exit Rate	216	2552
Input Volume	211	2600
% of Volume	102	98
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	2.9	0.2	0.1	0.1	0.1	0.2
Total Del/Veh (s)	3.2	2.5	1.5	0.3	7.3	3.7	9.1	1.8
Vehicles Exited	65	8	4	101	5	3	2	188
Hourly Exit Rate	260	32	16	404	20	12	8	752
Input Volume	267	33	11	411	22	11	6	761
% of Volume	97	97	145	98	91	109	133	99
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.3	3.7	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	69.5	30.3	1.7	1.1	11.8	3.6	6.9
Vehicles Exited	32	3	261	39	8	212	555
Hourly Exit Rate	128	12	1044	156	32	848	2220
Input Volume	133	11	1033	167	33	873	2250
% of Volume	96	109	101	93	97	97	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0



4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.3	0.4	0.0	0.0	0.2
Total Del/Veh (s)	30.3	6.5	0.9	0.4	5.7	0.9	1.2
Vehicles Exited	4	3	298	7	6	238	556
Hourly Exit Rate	16	12	1192	28	24	952	2224
Input Volume	22	11	1189	33	22	983	2260
% of Volume	73	109	100	85	109	97	98
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	29.0
Vehicles Exited	721
Hourly Exit Rate	2884
Input Volume	11847
% of Volume	24
Denied Entry Before	0
Denied Entry After	0

Queuing and Blocking Report  
 Existing + Interchange with Country Club Ext PM - Current Configuration

10/17/2014

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	R	L	T
Maximum Queue (ft)	45	110	129	214	100	76	275	236	177	61	130	275
Average Queue (ft)	18	59	67	142	55	40	198	92	97	12	56	185
95th Queue (ft)	49	110	132	234	102	73	286	222	169	90	140	284
Link Distance (ft)		214	214		765	765		1545	1545			685
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)							3	0	1	0	0	12
Queuing Penalty (veh)							8	0	1	0	0	5

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	281
Average Queue (ft)	170
95th Queue (ft)	283
Link Distance (ft)	685
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	WB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	18	40	24
Average Queue (ft)	3	23	6
95th Queue (ft)	17	50	24
Link Distance (ft)		568	476
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	65		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report  
 Existing + Interchange with Country Club Ext PM - Current Configuration

10/17/2014

Intersection: 3: Silva Valley Parkway & Entrada Drive

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	209	47	2	16	52
Average Queue (ft)	122	14	0	2	20
95th Queue (ft)	262	50	5	11	50
Link Distance (ft)	610		1107	1107	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		25			90
Storage Blk Time (%)	72	2			
Queuing Penalty (veh)	8	3			

Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	46	34
Average Queue (ft)	19	12
95th Queue (ft)	47	38
Link Distance (ft)	844	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		520
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 26
----------------------------------

# **Silva Valley Interchange Traffic Mitigation Project**

## **Technical Appendix**

Existing Plus Interchange and Country Club Extension Alternative 1

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.4
Total Del/Veh (s)	38.4	38.8	9.7	50.1	30.3	7.1	43.1	42.9	27.5	6.3	57.7	48.8
Vehicles Exited	28	24	22	90	10	67	29	36	90	64	46	143
Hourly Exit Rate	112	96	88	360	40	268	116	144	360	256	184	572
Input Volume	104	104	91	377	39	286	117	156	391	260	195	623
% of Volume	108	92	97	95	103	94	99	92	92	98	94	92
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.3
Total Del/Veh (s)	37.5	35.8
Vehicles Exited	51	700
Hourly Exit Rate	204	2800
Input Volume	221	2964
% of Volume	92	94
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	2.6	0.3	0.2	0.2	0.2	0.1	0.2
Total Del/Veh (s)	3.6	3.3	4.2	0.6	19.8	26.4	11.5	17.3	3.8
Vehicles Exited	123	10	3	148	24	3	4	2	317
Hourly Exit Rate	492	40	12	592	96	12	16	8	1268
Input Volume	520	39	13	610	91	13	13	6	1305
% of Volume	95	103	92	97	105	92	123	133	97
Denied Entry Before	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	15.0	6.9	7.6	4.3	28.7	9.3	9.1
Vehicles Exited	42	31	193	20	7	276	569
Hourly Exit Rate	168	124	772	80	28	1104	2276
Input Volume	182	130	792	78	26	1183	2391
% of Volume	92	95	97	103	108	93	95
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.2	0.2	0.0	0.0	0.1
Total Del/Veh (s)	5.3	2.0	1.4	9.1	0.8	2.8
Vehicles Exited	57	117	37	76	237	524
Hourly Exit Rate	228	468	148	304	948	2096
Input Volume	234	468	143	338	1026	2209
% of Volume	97	100	103	90	92	95
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	40.3
Vehicles Exited	802
Hourly Exit Rate	3208
Input Volume	16191
% of Volume	20
Denied Entry Before	0
Denied Entry After	0

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	R	L	T
Maximum Queue (ft)	114	93	104	339	264	150	254	194	154	80	200	403
Average Queue (ft)	75	51	50	237	64	75	175	91	97	18	158	278
95th Queue (ft)	125	94	103	374	290	201	263	192	156	90	237	453
Link Distance (ft)		230	230		765	765		1547	1547			1253
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)	0			5			1		0	0	9	25
Queuing Penalty (veh)	0			1			3		1	0	28	50

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	SB
Directions Served	TR
Maximum Queue (ft)	379
Average Queue (ft)	260
95th Queue (ft)	424
Link Distance (ft)	1253
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Intersection: 2: Village Green Dr & Serrano Parkway**

Movement	WB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	20	100	21
Average Queue (ft)	5	56	5
95th Queue (ft)	22	96	23
Link Distance (ft)		568	476
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	65		
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	TR	L	T	T
Maximum Queue (ft)	129	75	139	152	56	156	151
Average Queue (ft)	82	55	88	83	25	78	88
95th Queue (ft)	141	89	153	149	59	152	154
Link Distance (ft)	727		295	295		1547	1547
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50			90		
Storage Blk Time (%)	18	3			0	3	
Queuing Penalty (veh)	23	6			2	1	

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	NB	NB	SB
Directions Served	R	T	TR	L
Maximum Queue (ft)	94	2	28	126
Average Queue (ft)	54	0	8	72
95th Queue (ft)	94	5	30	129
Link Distance (ft)	834	828	828	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				520
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Network Summary**

Network wide Queuing Penalty: 115
-----------------------------------



1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.2
Total Del/Veh (s)	41.9	34.0	14.2	48.3	29.5	5.9	53.4	46.2	19.2	6.2	48.6	35.0
Vehicles Exited	5	36	44	47	22	36	5	83	145	26	12	135
Hourly Exit Rate	20	144	176	188	88	144	20	332	580	104	48	540
Input Volume	22	144	178	200	90	144	28	350	579	111	44	522
% of Volume	91	100	99	94	98	100	71	95	100	94	109	103

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.1
Total Del/Veh (s)	24.9	29.4
Vehicles Exited	53	649
Hourly Exit Rate	212	2596
Input Volume	211	2623
% of Volume	100	99

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	3.1	0.2	0.1	0.1	0.1	0.1
Total Del/Veh (s)	3.5	3.0	3.0	0.3	5.9	3.5	7.9	1.9
Vehicles Exited	68	7	2	99	5	4	2	187
Hourly Exit Rate	272	28	8	396	20	16	8	748
Input Volume	267	33	11	411	22	11	6	761
% of Volume	102	85	73	96	91	145	133	98

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	20.2	9.3	7.3	4.5	26.8	6.9	7.9
Vehicles Exited	32	3	258	40	8	221	562
Hourly Exit Rate	128	12	1032	160	32	884	2248
Input Volume	133	11	1057	167	33	895	2296
% of Volume	96	109	98	96	97	99	98

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.3	0.5	0.1	0.0	0.2
Total Del/Veh (s)	4.8	1.0	0.7	8.4	1.8	1.5
Vehicles Exited	8	291	8	6	246	559
Hourly Exit Rate	32	1164	32	24	984	2236
Input Volume	33	1189	33	22	1007	2284
% of Volume	97	98	97	109	98	98

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	33.2
Vehicles Exited	735
Hourly Exit Rate	2940
Input Volume	12285
% of Volume	24

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	R	L	T
Maximum Queue (ft)	41	115	161	213	130	73	274	316	234	104	143	294
Average Queue (ft)	17	69	79	143	59	45	228	158	134	18	57	204
95th Queue (ft)	42	125	162	252	144	78	321	351	235	110	142	308
Link Distance (ft)		228	228		764	764		1540	1540			957
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)		0		0			10		1	0		15
Queuing Penalty (veh)		0		0			29		1	0		7

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	SB
Directions Served	TR
Maximum Queue (ft)	291
Average Queue (ft)	199
95th Queue (ft)	316
Link Distance (ft)	957
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Intersection: 2: Village Green Dr & Serrano Parkway**

Movement	WB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	17	38	19
Average Queue (ft)	3	21	6
95th Queue (ft)	17	48	25
Link Distance (ft)		568	476
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	65		
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	TR	L	T	T
Maximum Queue (ft)	116	45	160	150	67	91	119
Average Queue (ft)	73	13	91	76	29	38	61
95th Queue (ft)	125	49	169	154	69	96	122
Link Distance (ft)	783		1099	1099		1540	1540
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50			90		
Storage Blk Time (%)	19	0			0	1	
Queuing Penalty (veh)	2	0			0	0	

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	SB
Directions Served	R	L
Maximum Queue (ft)	40	39
Average Queue (ft)	21	17
95th Queue (ft)	46	46
Link Distance (ft)	674	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		520
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Network Summary**

Network wide Queuing Penalty: 39
----------------------------------

# **Silva Valley Interchange Traffic Mitigation Project**

## **Technical Appendix**

Existing Plus Interchange and Country Club Extension Alternative 2

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.4
Total Del/Veh (s)	57.3	39.3	10.1	73.9	26.1	9.5	92.6	99.9	38.0	5.0	102.7	94.5
Vehicles Exited	24	24	22	104	10	66	29	37	101	61	43	139
Hourly Exit Rate	96	96	88	416	40	264	116	148	404	244	172	556
Input Volume	104	104	91	442	39	286	143	156	390	260	195	623
% of Volume	92	92	97	94	103	92	81	95	104	94	88	89
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.4	0.3
Total Del/Veh (s)	85.0	63.2
Vehicles Exited	53	713
Hourly Exit Rate	212	2852
Input Volume	221	3054
% of Volume	96	93
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	3.1	0.3	0.2	0.3	3.8	0.1	0.2
Total Del/Veh (s)	11.5	8.1	80.2	5.2	49.4	44.9	24.3	68.2	15.1
Vehicles Exited	118	10	4	149	43	2	3	1	330
Hourly Exit Rate	472	40	16	596	172	8	12	4	1320
Input Volume	520	39	13	610	156	13	13	6	1370
% of Volume	91	103	123	98	110	62	92	67	96
Denied Entry Before	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.6	1.0	0.2	7.0	3.8	2.8
Vehicles Exited	38	196	21	6	284	545
Hourly Exit Rate	152	784	84	24	1136	2180
Input Volume	156	792	78	26	1273	2325
% of Volume	97	99	108	92	89	94
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.2	0.3	0.0	0.0	0.1
Total Del/Veh (s)	5.6	1.7	1.3	8.9	0.7	2.9
Vehicles Exited	60	117	34	78	204	493
Hourly Exit Rate	240	468	136	312	816	1972
Input Volume	234	468	143	338	936	2119
% of Volume	103	100	95	92	87	93
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	65.8
Vehicles Exited	763
Hourly Exit Rate	3052
Input Volume	15852
% of Volume	19
Denied Entry Before	0
Denied Entry After	0

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	R	L	T
Maximum Queue (ft)	115	104	103	358	441	238	316	438	333	144	200	759
Average Queue (ft)	77	59	52	326	232	104	268	242	184	44	178	503
95th Queue (ft)	130	123	103	406	697	292	377	521	405	174	241	816
Link Distance (ft)		230	230		765	765		1554	1554			1161
Upstream Blk Time (%)					1							
Queuing Penalty (veh)					3							
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)	1	0		21			32	0	2	0	19	53
Queuing Penalty (veh)	1	0		4			63	0	6	0	59	104

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	SB
Directions Served	TR
Maximum Queue (ft)	688
Average Queue (ft)	468
95th Queue (ft)	743
Link Distance (ft)	1161
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Intersection: 2: Village Green Dr & Serrano Parkway**

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	TR	L	T	TR	LT	R	LTR
Maximum Queue (ft)	140	156	47	106	92	253	39	18
Average Queue (ft)	69	82	16	50	35	148	11	4
95th Queue (ft)	147	165	42	106	88	246	39	17
Link Distance (ft)	765	765		694	694	568		476
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			65				25	
Storage Blk Time (%)	3		0	4		68	1	
Queuing Penalty (veh)	0		0	1		9	1	



**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	SB
Directions Served	R	L
Maximum Queue (ft)	72	28
Average Queue (ft)	46	11
95th Queue (ft)	72	34
Link Distance (ft)	726	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		90
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	98	26	152
Average Queue (ft)	59	6	77
95th Queue (ft)	106	27	150
Link Distance (ft)	834	828	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			520
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Network Summary**

Network wide Queuing Penalty: 251
-----------------------------------

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.2
Total Del/Veh (s)	52.1	32.8	10.8	167.4	33.4	5.9	66.9	68.4	20.9	5.2	66.3	54.0
Vehicles Entered	5	37	44	68	23	36	13	92	140	28	12	133
Vehicles Exited	5	38	44	57	24	35	12	82	138	27	11	134
Hourly Exit Rate	20	152	176	228	96	140	48	328	552	108	44	536
Input Volume	22	144	178	278	90	144	50	350	578	111	44	522
% of Volume	91	106	99	82	107	97	96	94	96	97	100	103
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.1
Total Del/Veh (s)	43.3	51.9
Vehicles Entered	52	683
Vehicles Exited	52	659
Hourly Exit Rate	208	2636
Input Volume	211	2722
% of Volume	99	97
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	4.6	0.2	0.2	3.9	0.1	0.2
Total Del/Veh (s)	4.5	3.6	43.9	3.6	45.8	20.6	66.8	10.4
Vehicles Entered	68	8	2	102	24	3	2	209
Vehicles Exited	68	8	2	102	24	3	2	209
Hourly Exit Rate	272	32	8	408	96	12	8	836
Input Volume	267	33	11	411	100	11	6	839
% of Volume	102	97	73	99	96	109	133	100
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

**3: Silva Valley Parkway & Entrada Drive Performance by movement**

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.8	1.0	0.6	12.0	4.0	2.5
Vehicles Entered	7	266	42	8	238	561
Vehicles Exited	7	265	43	8	236	559
Hourly Exit Rate	28	1060	172	32	944	2236
Input Volume	33	1057	167	33	995	2285
% of Volume	85	100	103	97	95	98
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

**4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement**

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.3	0.4	0.0	0.0	0.2
Total Del/Veh (s)	5.5	1.0	0.6	6.1	0.6	1.0
Vehicles Entered	8	301	8	6	228	551
Vehicles Exited	8	299	8	6	226	547
Hourly Exit Rate	32	1196	32	24	904	2188
Input Volume	33	1189	33	22	973	2250
% of Volume	97	101	97	109	93	97
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

**Total Network Performance**

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	52.6
Vehicles Entered	740
Vehicles Exited	713
Hourly Exit Rate	2852
Input Volume	14488
% of Volume	20
Denied Entry Before	0
Denied Entry After	0

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	R	L	T
Maximum Queue (ft)	53	111	126	365	608	528	328	470	219	81	198	342
Average Queue (ft)	23	67	72	334	333	190	282	270	140	14	78	276
95th Queue (ft)	57	121	139	419	749	561	383	568	236	100	195	373
Link Distance (ft)		228	228		765	765		1555	1555			1049
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)		0		53	0		31	0	1	0		36
Queuing Penalty (veh)		0		23	0		89	0	1	0		16

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	SB
Directions Served	TR
Maximum Queue (ft)	356
Average Queue (ft)	276
95th Queue (ft)	389
Link Distance (ft)	1049
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Intersection: 2: Village Green Dr & Serrano Parkway**

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	TR	L	T	TR	LT	R	LTR
Maximum Queue (ft)	19	51	36	80	50	158	41	29
Average Queue (ft)	3	20	10	31	16	99	14	9
95th Queue (ft)	20	53	34	82	53	183	47	32
Link Distance (ft)	765	765		694	694	568		476
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			65				25	
Storage Blk Time (%)			0	2		56	1	
Queuing Penalty (veh)			0	0		6	1	

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	SB
Directions Served	R	L
Maximum Queue (ft)	42	45
Average Queue (ft)	23	15
95th Queue (ft)	51	45
Link Distance (ft)	551	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		90
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	45	2	35
Average Queue (ft)	22	1	13
95th Queue (ft)	50	6	39
Link Distance (ft)	820	828	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			520
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Network Summary**

Network wide Queuing Penalty: 137
-----------------------------------

# **Silva Valley Interchange Traffic Mitigation Project**

## **Technical Appendix**

Existing Plus Interchange and Country Club Extension Alternative 3

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.4
Total Del/Veh (s)	42.4	38.2	12.7	45.8	40.0	12.2	73.4	73.4	27.6	4.3	71.2	58.9
Vehicles Exited	24	25	25	104	12	72	35	34	91	66	47	142
Hourly Exit Rate	96	100	100	416	48	288	140	136	364	264	188	568
Input Volume	104	104	91	429	39	286	156	156	390	260	195	623
% of Volume	92	96	110	97	123	101	90	87	93	102	96	91
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.3
Total Del/Veh (s)	46.6	42.8
Vehicles Exited	51	728
Hourly Exit Rate	204	2912
Input Volume	221	3054
% of Volume	92	95
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	2.8	0.3	0.2	0.3	3.8	0.1	0.2
Total Del/Veh (s)	13.4	9.1	7.3	12.2	6.8	6.9	4.3	6.5	11.8
Vehicles Exited	126	10	3	157	35	4	3	2	340
Hourly Exit Rate	504	40	12	628	140	16	12	8	1360
Input Volume	520	39	13	610	143	13	13	6	1357
% of Volume	97	103	92	103	98	123	92	133	100
Denied Entry Before	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	6.1	1.0	0.2	6.5	3.7	2.9
Vehicles Exited	43	194	20	6	297	560
Hourly Exit Rate	172	776	80	24	1188	2240
Input Volume	169	792	78	26	1273	2338
% of Volume	102	98	103	92	93	96
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.2	0.3	0.0	0.0	0.1
Total Del/Veh (s)	4.8	1.9	1.4	8.1	0.7	2.7
Vehicles Exited	61	112	38	79	217	507
Hourly Exit Rate	244	448	152	316	868	2028
Input Volume	234	468	143	338	936	2119
% of Volume	104	96	106	93	93	96
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	47.0
Vehicles Exited	788
Hourly Exit Rate	3152
Input Volume	15865
% of Volume	20
Denied Entry Before	0
Denied Entry After	0



Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	R	L	T
Maximum Queue (ft)	128	95	100	335	205	117	314	360	234	56	200	474
Average Queue (ft)	71	57	55	254	66	72	229	163	130	12	172	333
95th Queue (ft)	126	102	104	382	256	125	354	430	317	67	238	539
Link Distance (ft)		230	230		765	765		1554	1554			1161
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)	0			3	0		18	0	0		11	34
Queuing Penalty (veh)	0			1	0		35	0	1		34	67

Intersection: 1: Silva Valley Parkway & Serrano Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	424
Average Queue (ft)	306
95th Queue (ft)	506
Link Distance (ft)	1161
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Village Green Dr & Serrano Parkway

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	TR	L	T	TR	LT	R	LTR
Maximum Queue (ft)	78	85	30	106	86	82	38	26
Average Queue (ft)	52	63	9	68	51	50	13	6
95th Queue (ft)	81	88	31	125	87	86	45	26
Link Distance (ft)	765	765		1312	1312	568		476
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			65				25	
Storage Blk Time (%)	0			6		17	1	
Queuing Penalty (veh)	0			1		2	2	

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	82	5	32
Average Queue (ft)	53	1	10
95th Queue (ft)	84	7	33
Link Distance (ft)	726	300	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			90
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	NB	NB	SB
Directions Served	R	T	TR	L
Maximum Queue (ft)	80	3	37	124
Average Queue (ft)	51	0	10	71
95th Queue (ft)	82	5	35	124
Link Distance (ft)	834	828	828	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				520
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Network Summary**

Network wide Queuing Penalty: 143
-----------------------------------

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.2
Total Del/Veh (s)	46.3	32.9	11.8	84.1	34.1	9.2	50.0	52.5	16.8	4.1	50.3	41.0
Vehicles Entered	4	35	46	62	21	36	16	87	144	26	10	132
Vehicles Exited	4	36	45	56	20	36	16	84	142	27	10	128
Hourly Exit Rate	16	144	180	224	80	144	64	336	568	108	40	512
Input Volume	22	144	178	256	89	144	72	350	579	111	44	522
% of Volume	73	100	101	88	90	100	89	96	98	97	91	98
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.1
Total Del/Veh (s)	30.9	35.3
Vehicles Entered	56	675
Vehicles Exited	54	658
Hourly Exit Rate	216	2632
Input Volume	211	2722
% of Volume	102	97
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	4.0	0.2	0.2	4.7	0.1	0.3
Total Del/Veh (s)	12.1	5.7	7.1	10.1	4.9	3.7	4.9	9.9
Vehicles Entered	64	9	3	102	18	3	2	201
Vehicles Exited	65	8	3	101	18	3	2	200
Hourly Exit Rate	260	32	12	404	72	12	8	800
Input Volume	267	33	11	411	78	11	6	817
% of Volume	97	97	109	98	92	109	133	98
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

**3: Silva Valley Parkway & Entrada Drive Performance by movement**

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.2	1.0	0.5	9.3	3.5	2.2
Vehicles Entered	14	261	42	7	237	561
Vehicles Exited	14	261	42	7	237	561
Hourly Exit Rate	56	1044	168	28	948	2244
Input Volume	56	1057	167	33	996	2309
% of Volume	100	99	101	85	95	97
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

**4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement**

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.3	0.4	0.0	0.0	0.2
Total Del/Veh (s)	5.4	1.0	0.3	4.6	0.6	0.9
Vehicles Entered	7	295	7	5	232	546
Vehicles Exited	7	297	7	6	233	550
Hourly Exit Rate	28	1188	28	24	932	2200
Input Volume	33	1189	33	22	973	2250
% of Volume	85	100	85	109	96	98
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

**Total Network Performance**

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	37.8
Vehicles Entered	735
Vehicles Exited	714
Hourly Exit Rate	2856
Input Volume	14513
% of Volume	20
Denied Entry Before	0
Denied Entry After	0

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	R	L	T
Maximum Queue (ft)	38	105	143	297	205	122	316	363	247	20	182	287
Average Queue (ft)	15	64	76	216	92	57	254	194	120	3	56	214
95th Queue (ft)	42	110	144	367	297	168	365	449	227	43	153	307
Link Distance (ft)		228	228		765	765		1555	1555			1049
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)				8			19	0	0		0	19
Queuing Penalty (veh)				4			53	0	0		0	9

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	SB
Directions Served	TR
Maximum Queue (ft)	315
Average Queue (ft)	212
95th Queue (ft)	336
Link Distance (ft)	1049
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Intersection: 2: Village Green Dr & Serrano Parkway**

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	TR	L	T	TR	LT	R	LTR
Maximum Queue (ft)	55	62	27	73	60	52	39	22
Average Queue (ft)	36	43	9	46	36	35	12	6
95th Queue (ft)	54	65	32	74	60	61	41	24
Link Distance (ft)	765	765		694	694	568		476
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			65				25	
Storage Blk Time (%)				1		6	1	
Queuing Penalty (veh)				0		1	1	

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	52	5	40
Average Queue (ft)	33	1	17
95th Queue (ft)	55	7	44
Link Distance (ft)	551	347	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			90
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	44	6	32
Average Queue (ft)	21	1	12
95th Queue (ft)	49	12	35
Link Distance (ft)	820	828	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			520
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Network Summary**

Network wide Queuing Penalty: 68
----------------------------------

# **Silva Valley Interchange Traffic Mitigation Project**

## **Technical Appendix**

### **Cumulative 2035 Conditions - Alternative 3**

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.4
Total Del/Veh (s)	72.3	48.8	26.1	70.8	63.5	35.5	80.8	77.7	24.7	5.1	79.1	50.6
Vehicles Exited	30	30	32	165	36	65	27	37	115	66	53	192
Hourly Exit Rate	120	120	128	660	144	260	108	148	460	264	212	768
Input Volume	117	117	130	740	169	286	130	156	481	273	208	805
% of Volume	103	103	98	89	85	91	83	95	96	97	102	95
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.4	0.3
Total Del/Veh (s)	40.8	50.8
Vehicles Exited	57	905
Hourly Exit Rate	228	3620
Input Volume	234	3846
% of Volume	97	94
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	2.6	0.4	0.3	0.3	4.0	0.1	0.3
Total Del/Veh (s)	15.1	8.8	14.2	18.3	9.7	7.9	5.2	7.2	16.0
Vehicles Exited	136	11	9	245	43	3	7	2	456
Hourly Exit Rate	544	44	36	980	172	12	28	8	1824
Input Volume	559	39	39	1026	169	13	26	6	1877
% of Volume	97	113	92	96	102	92	108	133	97
Denied Entry Before	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0

3: Silva Valley Parkway & Entrada Drive Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.7	1.9	1.3	10.6	4.5	3.7
Vehicles Exited	32	222	38	15	402	709
Hourly Exit Rate	128	888	152	60	1608	2836
Input Volume	143	896	156	65	1741	3001
% of Volume	90	99	97	92	92	95
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0



**4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement**

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.2	0.3	0.0	0.0	0.1
Total Del/Veh (s)	6.1	2.3	1.9	10.3	0.4	2.6
Vehicles Exited	60	162	42	76	321	661
Hourly Exit Rate	240	648	168	304	1284	2644
Input Volume	234	649	169	338	1403	2793
% of Volume	103	100	99	90	92	95
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

**13: Silva Valley Parkway Performance by movement**

Movement	WBR	NBT	SBT	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0
Total Del/Veh (s)	6.2	1.0	1.2	1.4
Vehicles Exited	42	221	398	661
Hourly Exit Rate	168	884	1592	2644
Input Volume	169	884	1740	2793
% of Volume	99	100	91	95
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

**Total Network Performance**

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	55.8
Vehicles Exited	1001
Hourly Exit Rate	4004
Input Volume	20593
% of Volume	19
Denied Entry Before	0
Denied Entry After	0

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	TR	UL	T	T	R	L	T
Maximum Queue (ft)	156	171	162	350	499	426	302	334	213	132	200	524
Average Queue (ft)	106	83	96	292	340	246	232	167	121	25	181	396
95th Queue (ft)	188	196	161	414	551	456	350	372	213	115	246	586
Link Distance (ft)		230	230		765	765		1553	1553			1161
Upstream Blk Time (%)		2			0	0						
Queuing Penalty (veh)		0			1	0						
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)	9	1		6	11		21	0	1	0	20	33
Queuing Penalty (veh)	5	1		25	40		51	0	4	0	81	69

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	SB
Directions Served	TR
Maximum Queue (ft)	517
Average Queue (ft)	368
95th Queue (ft)	549
Link Distance (ft)	1161
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Intersection: 2: Village Green Dr & Serrano Parkway**

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	TR	L	T	TR	LT	R	LTR
Maximum Queue (ft)	89	94	75	201	176	105	46	27
Average Queue (ft)	60	69	33	123	97	62	25	6
95th Queue (ft)	92	100	85	212	181	109	58	24
Link Distance (ft)	765	765		678	678	568		355
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			65				25	
Storage Blk Time (%)	0		0	32		27	3	
Queuing Penalty (veh)	0		0	12		7	6	

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	60	9	45
Average Queue (ft)	40	1	27
95th Queue (ft)	68	10	55
Link Distance (ft)	145	815	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			90
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	86	31	131
Average Queue (ft)	59	12	84
95th Queue (ft)	94	35	137
Link Distance (ft)	837	1029	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			520
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 13: Silva Valley Parkway**

Movement	WB
Directions Served	R
Maximum Queue (ft)	88
Average Queue (ft)	53
95th Queue (ft)	89
Link Distance (ft)	176
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Network Summary**

Network wide Queuing Penalty: 303

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.2
Total Del/Veh (s)	34.9	38.2	18.5	38.6	40.1	17.3	74.7	76.3	23.1	5.6	72.3	72.3
Vehicles Entered	11	49	41	76	28	36	9	82	167	31	10	156
Vehicles Exited	11	49	40	76	29	36	8	76	162	30	10	143
Hourly Exit Rate	44	196	160	304	116	144	32	304	648	120	40	572
Input Volume	44	211	156	322	112	144	33	333	678	133	44	622
% of Volume	100	93	103	94	104	100	97	91	96	90	91	92
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Silva Valley Parkway & Serrano Parkway Performance by movement

Movement	SBR	All
Denied Del/Veh (s)	0.3	0.1
Total Del/Veh (s)	60.6	45.8
Vehicles Entered	52	748
Vehicles Exited	49	719
Hourly Exit Rate	196	2876
Input Volume	222	3054
% of Volume	88	94
Denied Entry Before	0	0
Denied Entry After	0	0

2: Village Green Dr & Serrano Parkway Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBT	All
Denied Del/Veh (s)	0.0	0.0	3.4	0.2	0.2	3.9	0.1	0.3
Total Del/Veh (s)	12.9	6.9	7.4	10.7	5.5	3.3	7.7	10.7
Vehicles Entered	83	7	5	122	18	6	1	242
Vehicles Exited	83	7	5	121	18	6	1	241
Hourly Exit Rate	332	28	20	484	72	24	4	964
Input Volume	356	33	22	500	78	22	6	1017
% of Volume	93	85	91	97	92	109	67	95
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

**3: Silva Valley Parkway & Entrada Drive Performance by movement**

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	6.4	1.2	0.8	12.3	3.7	2.5
Vehicles Entered	11	278	52	9	258	608
Vehicles Exited	11	278	53	9	258	609
Hourly Exit Rate	44	1112	212	36	1032	2436
Input Volume	44	1133	211	44	1089	2521
% of Volume	100	98	100	82	95	97
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

**4: Silva Valley Parkway & Oak Meadow Elementary School Performance by movement**

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.4	0.3	0.0	0.0	0.2
Total Del/Veh (s)	5.8	1.1	0.8	6.4	0.6	1.0
Vehicles Entered	8	321	7	5	251	592
Vehicles Exited	9	321	7	5	251	593
Hourly Exit Rate	36	1284	28	20	1004	2372
Input Volume	33	1311	33	22	1067	2466
% of Volume	109	98	85	91	94	96
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0

**Total Network Performance**

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	47.3
Vehicles Entered	818
Vehicles Exited	792
Hourly Exit Rate	3168
Input Volume	16215
% of Volume	20
Denied Entry Before	0
Denied Entry After	0

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	LT	TR	UL	T	T	R	L	T
Maximum Queue (ft)	63	131	165	162	187	169	328	441	310	121	185	504
Average Queue (ft)	31	80	106	110	141	101	278	264	172	23	67	347
95th Queue (ft)	69	137	183	170	187	182	376	516	309	128	178	560
Link Distance (ft)		228	228		765	765		1556	1556			1049
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (ft)	160			340			260			180	175	
Storage Blk Time (%)		0					30	0	3	0		49
Queuing Penalty (veh)		0					100	1	4	0		21

**Intersection: 1: Silva Valley Parkway & Serrano Parkway**

Movement	SB
Directions Served	TR
Maximum Queue (ft)	482
Average Queue (ft)	331
95th Queue (ft)	536
Link Distance (ft)	1049
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Intersection: 2: Village Green Dr & Serrano Parkway**

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	TR	L	T	TR	LT	R	LTR
Maximum Queue (ft)	67	74	30	76	54	55	39	21
Average Queue (ft)	45	51	15	53	35	34	23	4
95th Queue (ft)	71	78	38	82	56	57	54	20
Link Distance (ft)	765	765		694	694	568		402
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			65				25	
Storage Blk Time (%)	0			2		7	2	
Queuing Penalty (veh)	0			0		2	2	

**Intersection: 3: Silva Valley Parkway & Entrada Drive**

Movement	WB	NB	SB
Directions Served	R	TR	L
Maximum Queue (ft)	51	10	46
Average Queue (ft)	26	2	23
95th Queue (ft)	54	14	52
Link Distance (ft)	145	347	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			90
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 4: Silva Valley Parkway & Oak Meadow Elementary School**

Movement	WB	SB
Directions Served	R	L
Maximum Queue (ft)	36	35
Average Queue (ft)	21	12
95th Queue (ft)	47	38
Link Distance (ft)	820	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		520
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Network Summary**

Network wide Queuing Penalty: 131
-----------------------------------