APPENDIX L

Extended Studies – City of Pleasanton

FEHR PEERS

TECHNICAL MEMORANDUM

Date: November 1, 2013

To: Gary Sidhu, Alameda CTC

From: Julie Morgan, Fehr and Peers

Subject: Evaluation of NB I-680 Express Lane Project Effects on Traffic in City of Pleasanton

WC11-2855

As part of its plan to construct a northbound HOV/Express Lane on I-680 from SR 237 to SR 84 (Vallecitos Road), the Alameda CTC is conducting an extensive study of existing and future traffic operations along the corridor. In addition to the technical analysis of the effects of the proposed project on the I-680 NB freeway corridor, which are described in the Traffic Operations Analysis Report (TOAR), there has also been an evaluation of the effects of the project on the local circulation system within the City of Pleasanton.

Preliminary analysis results were reviewed with City staff at meetings in June, July and September, and additional analysis has been conducted to respond to City requests. During those discussions, staff expressed that their primary concern was about the effect of the Express Lane project on the amount of traffic that cuts through the City, particularly using the Sunol Boulevard exit off of northbound I-680. This memo contains the results of the analyses to address the question of cut-through traffic and the effect of the project on local traffic volumes within Pleasanton.

INVESTIGATION OF MODEL SENSITIVITY ON CUT-THROUGH TRAFFIC

Due to Pleasanton's location at the confluence of two major freeways, cut-through traffic has long been an issue of concern. In 2009-10, the City sponsored a video-based origin-destination study to quantify the amount of cut-through traffic using City streets (documented in a memo titled "*City of Pleasanton Cut-Through Traffic Evaluation*", Fehr & Peers, March 9, 2010). During the PM peak period, which is the period under study for the I-680 NB Express Lane project, the primary

direction of travel is northbound and eastbound. "Cut-through traffic" in that period would therefore be those vehicles that exit from northbound I-680, use local streets in Pleasanton, and then leave Pleasanton either by traveling further east on I-580 or surface streets such as Stanley Boulevard, or by traveling north of I-580 into Dublin or points beyond. The City's cut-through traffic study indicated that the I-680 interchange most affected by cut-through traffic is Sunol Boulevard. To respond to the City's questions about the effect of the I-680 NB Express Lane on the amount of cut-through traffic using the Sunol Boulevard off-ramp from I-680, we have investigated the following questions:

1. How well does the travel forecasting model being used for the Express Lane project reflect the existing cut-through traffic conditions?
2. What is the forecasted effect of the Express Lane project on the amount of cut-through traffic in Pleasanton?

To answer these questions, we have conducted a series of tests using the Alameda CTC regional travel demand model, which is the model being used to develop forecasts of future traffic conditions for the I-680 NB Express Lane project. The model was validated to a set of traffic counts conducted throughout the project study area in the fall of 2011. The model validation exercise, as well as the forecasted traffic volumes for the I-680 NB Express Lane project, have been reviewed and approved by Caltrans. For these new tests that are focused on the question of cut-through traffic, we have looked specifically at the usage of the Sunol Boulevard off-ramp and have tracked the trips that use that ramp to see where they go.

RESULTS OF MODEL SENSITIVITY TESTS ON CUT-THROUGH TRAFFIC

Table 1 presents the results of the model tests that help to answer the questions above. All of the volumes shown in the table are for a 4-hour peak period from 3 to 7 PM. The table contains the following information:

The first two data columns (shaded in purple) show a comparison between the 2009 count from the City's cut-through traffic study and the base year model. The I-580 HOV lanes were removed from the base year model for the purposes of this comparison because those lanes were not open at the time the 2009 counts were taken.

The middle two columns (shaded in orange) show a comparison between the 2011 count used in the model validation effort and the base year model with the I-580 HOV lanes included (because those lanes were open at the time of the 2011 counts).

The final two columns (shaded in blue) show the results from the 2040 model runs, first without the proposed I-680 NB Express Lane and then with the addition of that lane. The Express Lane terminates just north of SR 84.

The following observations can be drawn from the information in the table:

- The base year model does a good job of reflecting the existing volumes. The total volume on the Sunol Boulevard off-ramp matches well between the counts and the model values, both in the first comparison prior to the opening of the I-580 HOV lanes and in the second comparison after the lanes were opened.
- The base year model somewhat overestimates the amount of existing cut-through traffic, showing 55% of the Sunol Boulevard ramp traffic as being cut-through as compared to the 43% observed in the City study.
- The opening of the HOV lanes on I-580 appears to have had a noticeable effect in reducing the amount of cut-through traffic on the Sunol Boulevard ramp. While we only have direct cut-through observations from 2009, we can see that the total volume on the ramp declined substantially between the 2009 count and the 2011 count. Since the base year model was fairly good at reflecting the actual cut-through characteristics without the HOV lanes, we can assume that the model also does a good job of reflecting cut-through characteristics after the HOV lanes were opened, and it indicates a substantial drop in cut-through activity.
- The future year (2040) model projects a substantial increase in cut-through traffic. Even if we were to adjust the 2040 model results to account for the fact that the base year model tended to overestimate cut-through traffic, the adjusted 2040 cut-through values would still be substantially higher than the base year. This result is likely due to the increased traffic congestion being forecasted along I-580. (As we can tell from the base year model scenarios, the presence or absence of congestion along I-580 seems to substantially affect the amount of cut-through traffic using Sunol Boulevard.)
- The model results indicate that the I-680 NB Express Lane project would not cause an increase in cut-through traffic in the long term. Both the 2040 No Project and 2040 With

Project scenarios have substantial amounts of cut-through traffic, but the addition of the project does not result in an increase in cut-through activity.

EFFECTS OF PROJECT ON TRAFFIC VOLUMES IN PLEASANTON

As shown in Table 1 above, the travel demand model indicated almost no difference in total demand volumes at the Sunol Boulevard off-ramp between the No Project and the With Project scenarios under 2040 conditions. While developing traffic forecasts for use in the TOAR, we investigated the model's assignment results further and found that some of the non-cut-through traffic on the Sunol Boulevard ramp was traffic that the model was diverting from the freeway for a short distance and then returning, or was otherwise making non-intuitive short-distance changes to its travel path. After adjusting the volumes to account for these unrealistic travel paths, the results showed that the total volumes on the Sunol Boulevard off-ramp were higher under the With Project scenario than under the No Project scenario. The final year 2040 traffic demand forecasts approved by Caltrans for this project reflect this, where the With Project volumes on the Sunol Boulevard off-ramp are about 110 vehicles higher than the No Project volumes during the peak hour.

The results of the traffic analysis in the TOAR confirm the reasonableness of the conclusion that the Project would have the effect of increasing total demand volumes at the Sunol Boulevard off-ramp. The findings from the TOAR suggest that the Project will substantially alleviate the current bottlenecks at the Washington Boulevard interchange and around the Truck Scales and Andrade Road. However, by alleviating those bottlenecks, more traffic will reach the northern part of the study corridor and a new bottleneck will be created at Bernal Avenue. The combined effects of these changes would be to cause an increase in peak hour traffic volumes exiting the highway at some of the interchanges in Pleasanton, particularly at Sunol Boulevard, and to a lesser extent at Stoneridge Drive. It is also anticipated to cause a reduction in traffic exiting at the Bernal Avenue off-ramp, because some of that traffic would shift to use the Sunol Boulevard off-ramp instead due to the additional peak hour congestion on the freeway between those two interchanges. **Table 2** summarizes the changes in demand volumes at the three off-ramps leading into Pleasanton that are projected to occur as a result of the Project, based on the demand forecasts approved by Caltrans. Note that, in order to present a conservative analysis here, we did not use the projected volume decrease at Bernal Avenue off-ramp, but instead made no change to the Bernal Avenue off-ramp volumes in the City's model (described below).

LONG-TERM FUTURE IMPACTS ON LOCAL ROADS

The impact on the local roadway network of these Project-induced changes was evaluated by using the Citywide Synchro model that is maintained by the City and that has recently been used in the July 2011 *City of Pleasanton General Plan Housing Element Update*. The traffic volumes contained in this Synchro model reflect Buildout of the City's General Plan, including existing traffic, traffic anticipated from approved and pending developments, and traffic anticipated from development that could occur with full implementation of the General Plan. To reflect the effects of the Project, we added the anticipated change in year 2040 off-ramp traffic caused by the Project (that is, the values shown in Table 2) to the General Plan Buildout volumes, and distributed those trips proportionally through the network following the same patterns as were already reflected in the model.

The attached figures and table display the analysis results, as follows:

- **Figure 1** shows the locations of the 36 intersections throughout the City that were analyzed using the Citywide Synchro model.
- **Figure 2** shows the intersection turning movement volumes at all of the study intersections, with and without the Project, in the cumulative conditions.
- **Table 3** shows the results of the intersection LOS analysis, with and without the Project.

As shown in **Table 3**, the additional off-ramp traffic caused by the Project is expected to affect a number of the study intersections throughout the City. These effects are generally small, with average delay typically increasing by one or two seconds during the PM peak hour. The largest magnitude of change caused by the Project is at the Sunol Boulevard/Bernal Avenue/First Street intersection, where average delay increases by seven seconds and the LOS is E. It should be noted that this intersection is located in the City's Downtown area, which is exempt from vehicle LOS standards per the City's General Plan. All other intersections studied are at LOS D or better, under both the No Project and With Project scenarios. These results indicate that the Project causes relatively small changes at all of the intersections studied, and none of the changes are of a magnitude that would cause a significant impact per the City's General Plan policies.

NEAR-TERM IMPACTS ON LOCAL ROADS

City staff also asked for an evaluation of the Project's effects in a more near-term time horizon. The TOAR contains projections of demand volumes for the year 2020; those projections indicate that the effect of the Project will be smaller in 2020 than in 2040 (i.e., the change in demand volume at the Sunol Boulevard off-ramp caused by the Project is smaller in 2020 than in 2040). In order to present a more conservative analysis, we used the year 2040 Project-induced traffic changes and applied those to the City's Existing Plus Approved Projects Synchro model, which reflects a more near-term horizon than the General Plan Buildout scenario described previously.

The attached figures and table display the analysis results, as follows:

- **Figure 3** shows the intersection turning movement volumes at all of the study intersections, with and without the Project, in the near-term horizon.
- **Table 4** shows the results of the intersection LOS analysis, with and without the Project, in the near-term horizon.

The largest magnitude of change caused by the Project is again at the Sunol Boulevard/Bernal Avenue/First Street intersection, where average delay increases by six seconds and the LOS is D. The magnitude of changes caused by the Project are smaller than in the long-term (year 2040) scenario, and all of the study intersections operate at LOS D or better in both scenarios. Again, none of the changes are of a magnitude that would cause a significant impact per the City's General Plan policies.

CUT-THROUGH TRAFFIC EFFECTS

This memo began with an evaluation of the proportion of cut-through traffic on the Sunol Boulevard off-ramp, both under existing conditions and in the long-term (year 2040) scenario. In addition, the City has asked for an evaluation of the project's effects on cut-through traffic patterns in the near-term, and a calculation of the total amount of cut-through traffic on the Sunol Boulevard off-ramp.

As described earlier and shown on Table 1, the likelihood of drivers using Sunol Boulevard as a cut-through route seems to be linked to the level of congestion along I-580; namely, when congestion increases on I-580, the proportion of drivers using the Sunol Boulevard off-ramp to cut through Pleasanton and avoid the freeways increases. From the demand model, we looked at

the relationship between the level of congestion on I-580 (as represented by the volume-to-capacity or V/C ratio) and the percentage of cut-through traffic on the Sunol Boulevard off-ramp, and found that there was a linear relationship between those two elements. By conducting a linear interpolation between the base year and the year 2040 model results, we estimated the V/C ratios on I-580 in the near-term scenario, and from that estimated the resulting cut-through percentage.

Table 5 shows the resulting volumes at the Sunol Boulevard off-ramp, both in total and the proportion of that volume that is estimated to be made up of cut-through travelers. As shown, the amount of cut-through traffic is estimated to increase slightly as a result of the project, both in the near-term and the long-term scenarios.

BENEFITS OF PROJECT FOR PLEASANTON RESIDENTS

This memo has been narrowly focused on how the proposed northbound Express Lane project might adversely affect traffic in the City of Pleasanton. However, it is also important to consider the larger effects of the project on the efficiency of travel along the I-680 corridor; this condition also affects Pleasanton residents, since many of them travel along northbound I-680 during the PM peak period as they return home from work.

Table 6 shows the estimated time for a single-occupant vehicle to travel along northbound I-680 from SR 237 to SR 84. This information comes directly from the micro-simulation model, which captures the effects of bottlenecks and queuing. In the No Project condition, there is substantial queuing along I-680 from SR 237 to Washington and from Vargas to Andrade; this queuing already exists today, and is projected to get somewhat worse between now and 2020. The result is that it may take between 32 minutes and 46 minutes to travel between SR 237 and SR 84 during the typical late-afternoon commute period. With the addition of the new capacity represented by the Express Lane project, that queuing is expected to be almost entirely alleviated. The result is that the same trip between SR 237 and SR 84 would take about 13-15 minutes, and the travel time would be fairly consistent throughout the peak period. This effect should be of substantial benefit to all of the regular travelers along I-680, some of whom are Pleasanton residents.

CONCLUSIONS

In summary, the evaluation presented here reaches the following key conclusions about the effects of the I-680 Northbound Express Lane on local traffic in Pleasanton:

1. Implementation of the northbound I-680 Express Lane would allow more vehicles to reach the northern part of the I-680 corridor and thus would result in an increased amount of traffic using the Sunol Boulevard off-ramp during the afternoon commute period.
2. Implementation of the northbound I-680 Express Lane would have a modest effect on the level of congestion on I-580, and therefore would have a similarly modest effect on the percentage of the traffic using the Sunol Boulevard off-ramp that is cut-through traffic.
3. Both of the above effects have been captured in the analysis of the local street system presented in this memo; the magnitude of the change is relatively small and would not reach the level of a significant intersection impact, per the City's General Plan policies, under either the near-term or long-term scenarios.

Please contact us with any questions.

TABLE 1

RESULTS OF MODEL TESTS FOR CUT-THROUGH TRAFFIC ANALYSIS

	PM Peak Period (4-hour) Traffic Volumes					
	2009 Count	Base Model (no I-580 HOV)	2011 Count	Base Model (with I-580 HOV)	2040 Model, No Exp Lane	2040 Model, With Exp Lane
Total Volume, Sunol Blvd off-ramp	3,072	3,011	2,022	1,739	4,105	4,120
Cut-Through Traffic Volume	1,328	1,648	N/A	353	3,024	2,933
% Cut-Through Traffic	43%	55%	N/A	20%	74%	71%

Notes:

N/A = Not Available (cut-through traffic was not measured in the 2011 data collection effort).

2009 Count is from the City of Pleasanton Cut-Through Traffic Evaluation. The city study counted a 2-hour peak period; volumes have been doubled to reflect a 4-hour peak period to be comparable with the other values in this table.

TABLE 2
CHANGE IN YEAR 2040 PEAK HOUR VOLUMES DUE TO I-680 NB EXPRESS LANE PROJECT

	Change in Volume
Sunol Blvd Off-Ramp	+110
Bernal Ave Off-Ramp	-120*
Stoneridge Dr Off-Ramp	+80

** Note that the volume on the Bernal Avenue Off-ramp is projected to decrease by 120 vehicles. However, for the purposes of presenting a conservative analysis of local traffic effects in Pleasanton, we chose not to apply any volume decreases, and so applied a delta of zero to that ramp.*

Source: Fehr & Peers, 2013

TABLE 3
CUMULATIVE INTERSECTION PEAK HOUR LEVEL OF SERVICE RESULTS

	Location[1]	Control	Peak Hour	Cumulative Conditions			
				No Project		Plus Project	
				Delay[2]	LOS	Delay[2]	LOS
1	**Foothill Rd / Dublin Canyon Rd**	**Signal**	**PM**	**47**	**D**	**48**	**D**
2	Owens Dr / Willow Rd	Signal	PM	16	B	16	B
3	Owens Dr / East BART Station Dwy	Signal	PM	10	B	10	B
4	Hacienda Dr / Owens Dr	Signal	PM	32	C	32	C
5	Santa Rita Rd / Rosewood Dr	Signal	PM	26	C	26	C
6	Santa Rita Rd / Pimlico Dr	Signal	PM	23	C	23	C
7	Foothill Rd / Stoneridge Dr	Signal	PM	21	C	21	C
8	**Stoneridge Dr / Springdale Ave**	**Signal**	**PM**	**30**	**C**	**31**	**C**
9	Stoneridge Dr / Stoneridge Mall Rd	Signal	PM	22	C	22	C
10	Stoneridge Dr / Johnson Dr	Signal	PM	14	B	14	B
11	Stoneridge Dr / Hopyard Rd	Signal	PM	29	C	29	C
12	Stoneridge Dr / Hacienda Dr	Signal	PM	20	C	20	C
13	Owens Dr / West Las Positas Blvd	Signal	PM	18	B	18	B
14	West Las Positas Blvd / Santa Rita Rd	Signal	PM	24	C	24	C
15	Foothill Rd / West Las Positas Blvd	Signal	PM	15	B	15	B
16	West Las Positas Blvd / Hopyard Rd	Signal	PM	29	C	29	C
17	West Las Positas Blvd / Hacienda Dr	Signal	PM	20	C	20	C
18	Stoneridge Dr / W. Las Positas Blvd	Signal	PM	34	C	34	C
19	Stoneridge Dr / Santa Rita Rd	Signal	PM	34	C	34	C
20	Santa Rita Rd / Mohr Ave	Signal	PM	16	B	16	B
21	Santa Rita Rd / Valley Ave	Signal	PM	42	D	42	D
22	Valley Ave / Busch Rd	Signal	PM	53	D	53	D
23	Bernal Ave / I-680 NB Ramps	Signal	PM	11	B	11	B
24	**Koll Center Dr / Bernal Ave**	**Signal**	**PM**	**31**	**C**	**33**	**C**
25	**Bernal Ave / Valley Ave**	**Signal**	**PM**	**40**	**D**	**41**	**D**

26	Stanley Blvd / Santa Rita Rd	Signal	PM	16	B	16	B
27	Stanley Blvd / First Street	Signal	PM	14	B	14	B
28	**Stanley Blvd at Bernal Ave / Valley Ave**	**Signal**	**PM**	**41**	**D**	**45**	**D**
29	Bernal Ave / Vineyard Dr (N)	Signal	PM	12	B	12	B
30	Bernal Ave / Vineyard Dr (S)	Signal	PM	12	B	12	B
31	**Junipero Street / Sunol Blvd**	**Signal**	**PM**	**24**	**C**	**26**	**C**
32	Stoneridge Dr / El Charro Rd	Signal	PM	32	C	32	C
33	**Stanley Blvd / El Charro Rd**	**Signal**	**PM**	**32**	**C**	**34**	**C**
34	**Stoneridge Dr / I-680 NB Offramp**	**Signal**	**PM**	**10**	**A**	**11**	**B**
35	**Sunol Blvd / Bernal Ave**	**Signal**	**PM**	**53**	**D**	**60**	**E**
36	**Sunol Blvd / I-680 NB Ramps**	**Signal**	**PM**	**8**	**A**	**9**	**A**

Notes:

1. **Bold** indicates where additional project traffic causes an increase in average intersection control delay.
2.. Signalized intersection level of service based on average intersection control delay (in seconds) according to the *Highway Capacity Manual* (Transportation Research Board, 2000). For side-street stop-controlled intersections, delay is reported as: intersection average (worst case approach).

Source: Fehr & Peers and City of Pleasanton 2011; Fehr & Peers 2013

TABLE 4
NEAR-TERM INTERSECTION PEAK HOUR LEVEL OF SERVICE RESULTS

	Location[1]	Control	Peak Hour	Near-Term Conditions			
				No Project		Plus Project	
				Delay[2]	LOS	Delay[2]	LOS
1	**Foothill Rd / Dublin Canyon Rd**	**Signal**	**PM**	**51**	**D**	**53**	**D**
2	Owens Dr / Willow Rd	Signal	PM	16	B	16	B
3	Owens Dr / East BART Station Dwy	Signal	PM	9	A	9	A
4	Hacienda Dr / Owens Dr	Signal	PM	34	C	34	C
5	Santa Rita Rd / Rosewood Dr	Signal	PM	20	C	20	C
6	Santa Rita Rd / Pimlico Dr	Signal	PM	20	B	20	B
7	Foothill Rd / Stoneridge Dr	Signal	PM	21	C	21	C
8	Stoneridge Dr / Springdale Ave	Signal	PM	45	D	47	D
9	Stoneridge Dr / Stoneridge Mall Rd	Signal	PM	36	D	36	D
10	Stoneridge Dr / Johnson Dr	Signal	PM	13	B	13	B
11	Stoneridge Dr / Hopyard Rd	Signal	PM	33	C	33	C
12	Stoneridge Dr / Hacienda Dr	Signal	PM	21	C	21	C
13	Owens Dr / West Las Positas Blvd	Signal	PM	17	B	17	B
14	West Las Positas Blvd / Santa Rita Rd	Signal	PM	24	C	24	C
15	Foothill Rd / West Las Positas Blvd	Signal	PM	17	B	17	B
16	West Las Positas Blvd / Hopyard Rd	Signal	PM	31	C	31	C
17	West Las Positas Blvd / Hacienda Dr	Signal	PM	19	B	19	B
18	Stoneridge Dr / W. Las Positas Blvd	Signal	PM	35	D	35	D
19	Stoneridge Dr / Santa Rita Rd	Signal	PM	30	C	30	C
20	Santa Rita Rd / Mohr Ave	Signal	PM	17	B	17	B
21	Santa Rita Rd / Valley Ave	Signal	PM	40	D	40	D
22	Valley Ave / Busch Rd	Signal	PM	12	B	12	B
23	Bernal Ave / I-680 NB Ramps	Signal	PM	11	B	11	B
24	Koll Center Dr / Bernal Ave	Signal	PM	24	C	24	C
25	Bernal Ave / Valley Ave	Signal	PM	39	D	39	D

26	Stanley Blvd / Santa Rita Rd	Signal	PM	18	B	18	B
27	Stanley Blvd / First Street	Signal	PM	9	A	9	A
28	**Stanley Blvd at Bernal Ave / Valley Ave**	**Signal**	**PM**	**36**	**D**	**39**	**D**
29	Bernal Ave / Vineyard Dr (N)	Signal	PM	11	B	11	B
30	Bernal Ave / Vineyard Dr (S)	Signal	PM	11	B	11	B
31	**Junipero Street / Sunol Blvd**	**Signal**	**PM**	**22**	**C**	**24**	**C**
32	Stoneridge Dr / El Charro Rd	Signal	PM	22	C	22	C
33	Stanley Blvd / El Charro Rd	Signal	PM	Does Not Exist			
34	Stoneridge Dr / I-680 NB Offramp	Signal	PM	10	A	10	A
35	**Sunol Blvd / Bernal Ave**	**Signal**	**PM**	**47**	**D**	**53**	**D**
36	Sunol Blvd / I-680 NB Ramps	Signal	PM	8	A	8	A

Notes:

1. **Bold** indicates where additional project traffic causes an increase in average intersection control delay.
2.. Signalized intersection level of service based on average intersection control delay (in seconds) according to the *Highway Capacity Manual* (Transportation Research Board, 2000). For side-street stop-controlled intersections, delay is reported as: intersection average (worst case approach).

Source: Fehr & Peers and City of Pleasanton 2011; Fehr & Peers 2013

TABLE 5:
ESTIMATED TRAFFIC VOLUMES ON SUNOL BOULEVARD OFF-RAMP

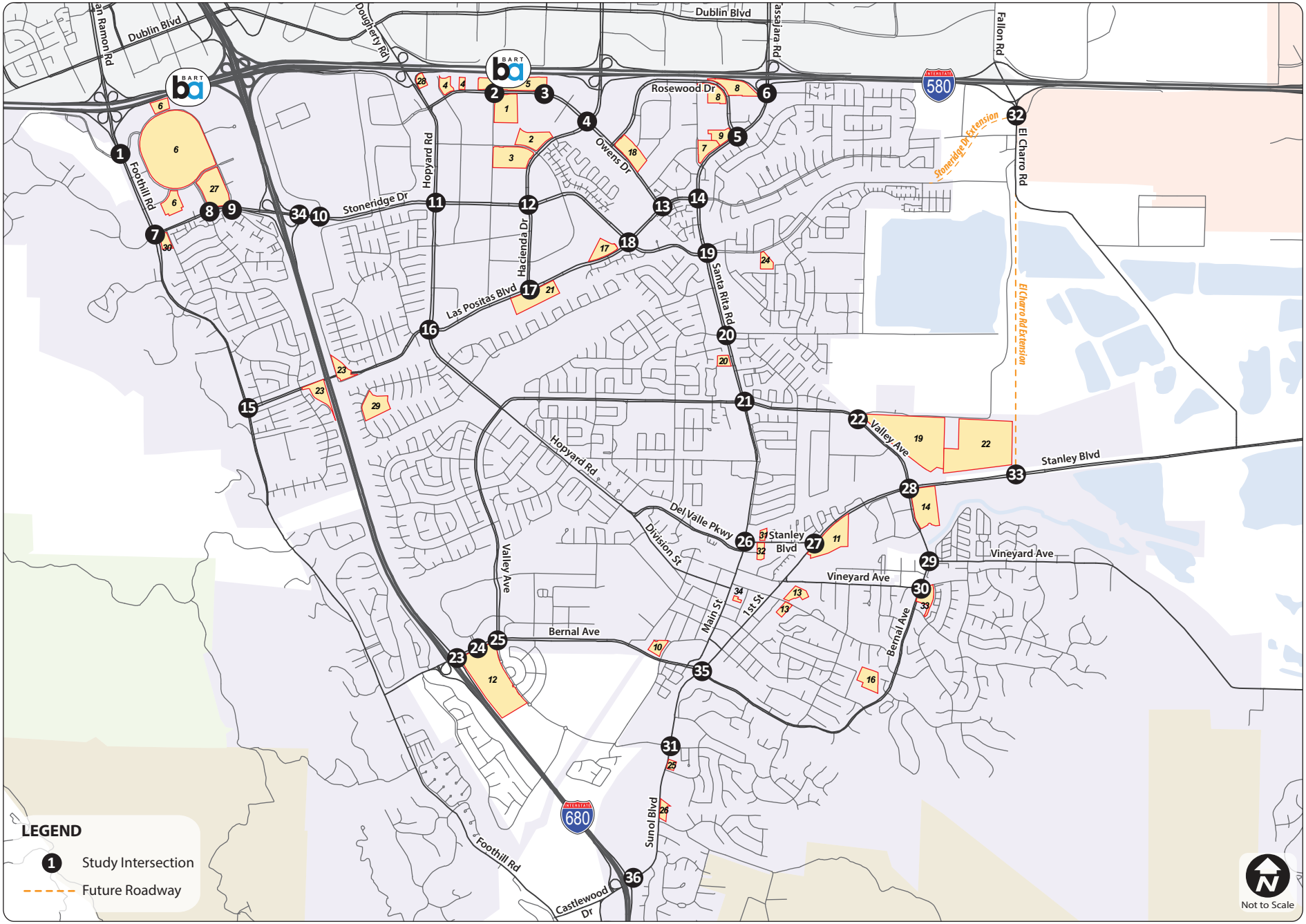
	2020 No Project	2020 With Project	2040 No Project	2040 With Project
Peak Hour Demand Volume (from City's Synchro model)	960	1,070	1,270	1,380
Estimated Cut-Through Percentage	35%	36%	74%	71%
Peak Hour Cut-Through Volume	336	385	940	980

Source: Fehr & Peers 2013

TABLE 6:
ESTIMATED TRAVEL TIME (IN MINUTES) FROM SR 237 TO SR 84, YEAR 2020

Time Period	No Project	With Project
4:30 – 4:45 PM	31.7	13.2
4:45 – 5:00 PM	35.1	12.9
5:00 – 5:15 PM	39.0	13.5
5:15 – 5:30 PM	43.2	13.9
5:30 – 5:45 PM	46.8	14.6
5:45 – 6:00 PM	43.8	15.1
6:00 – 6:15 PM	41.9	14.8
6:15 – 6:30 PM	39.9	14.0

Source: Fehr & Peers 2013



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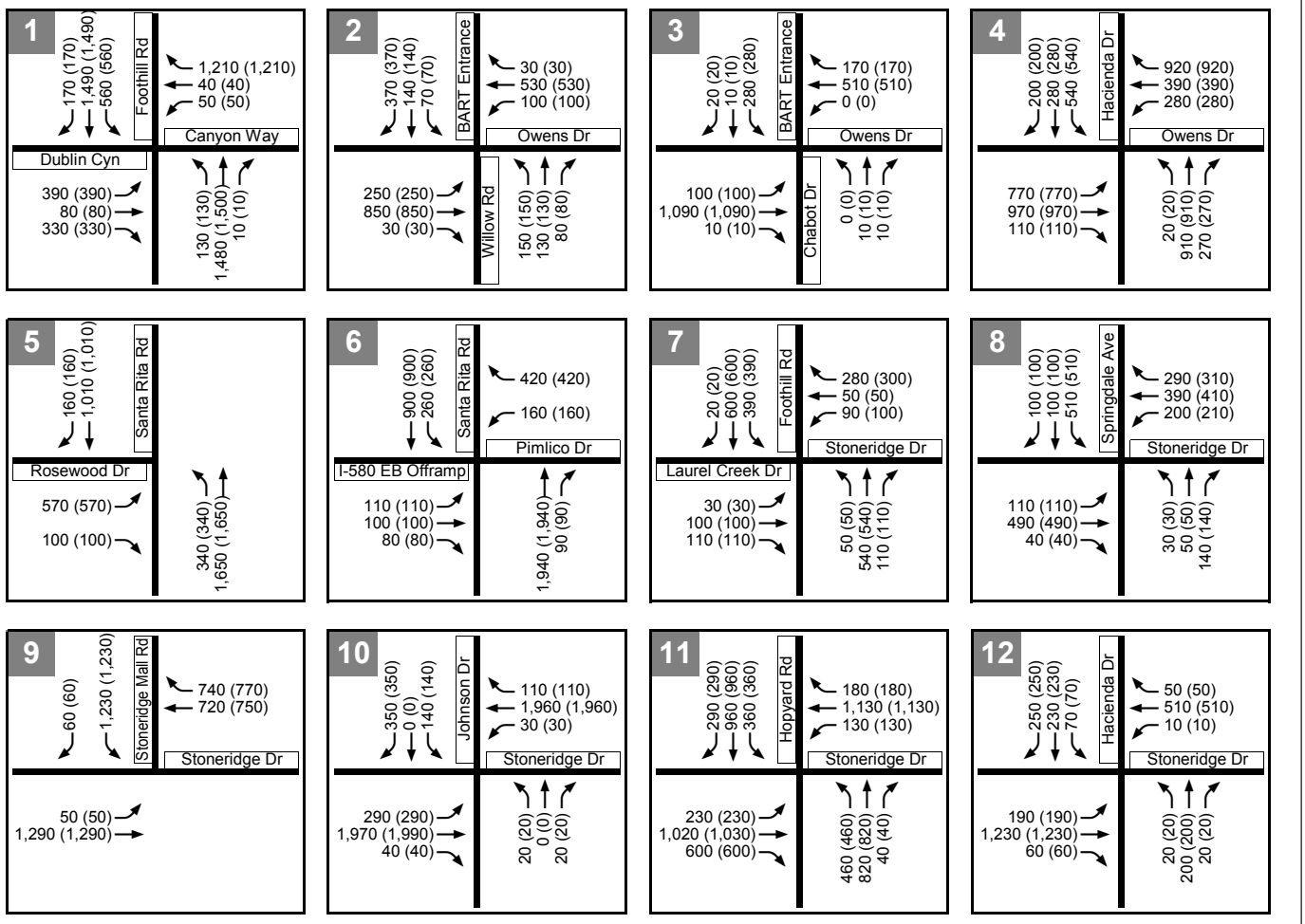
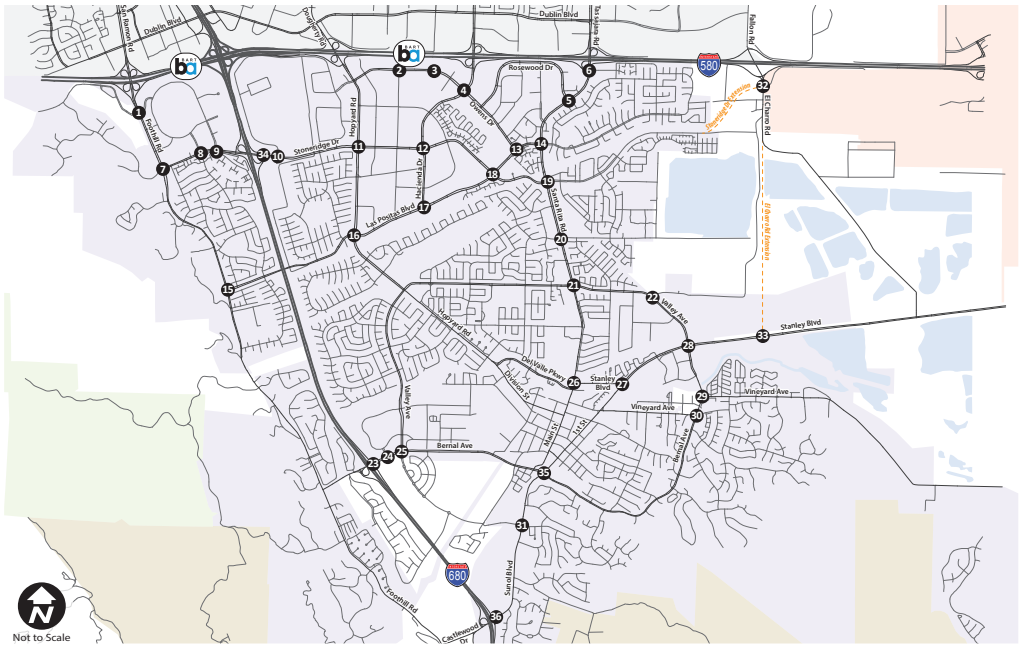
STUDY INTERSECTION LOCATIONS

FIGURE 1





VOLUMES KEY

XX (YY) No Project (Plus Project) PM Peak Hour Traffic Volumes

MAP KEY

1 Study Intersection

Future Roadway

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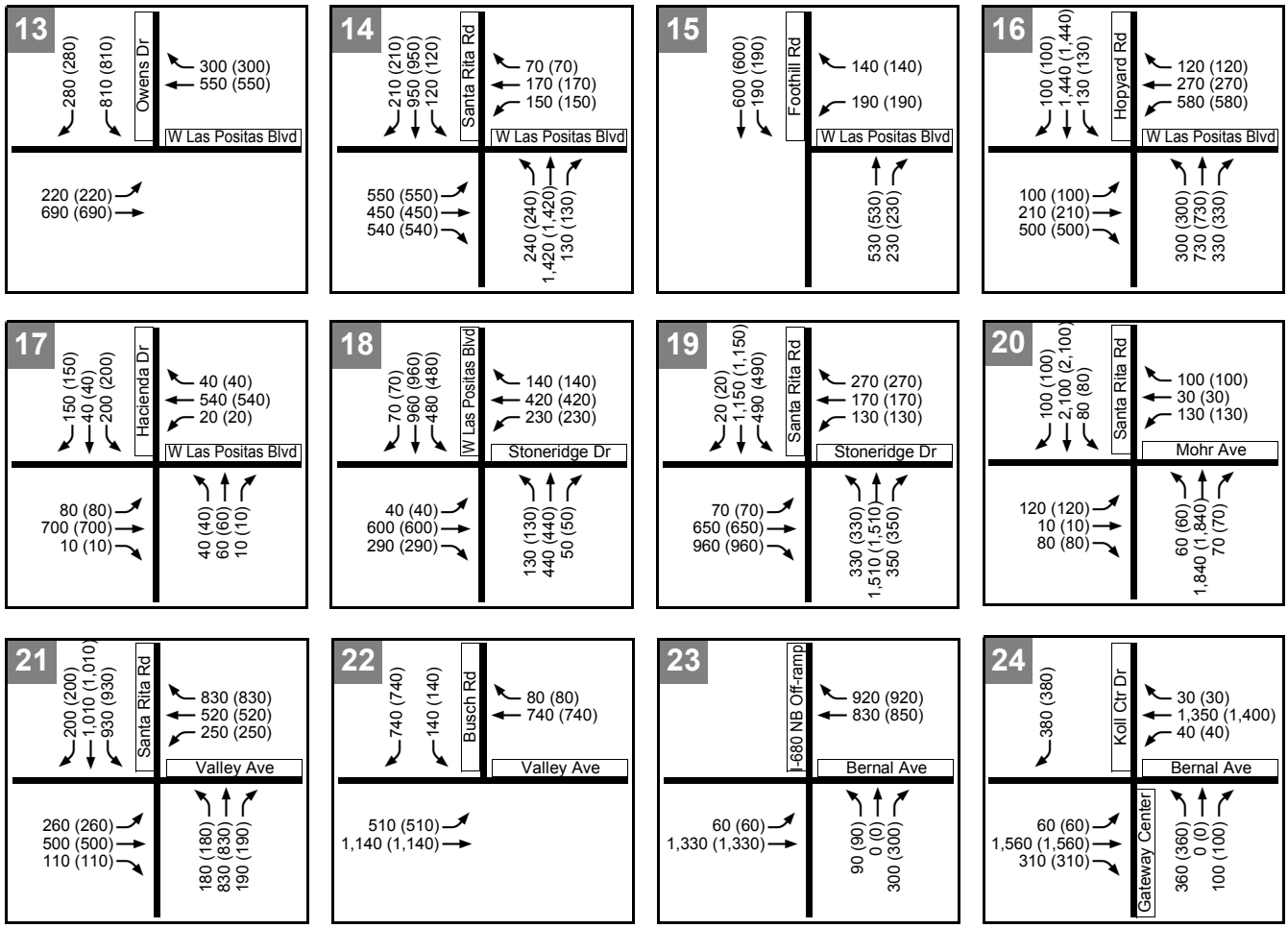
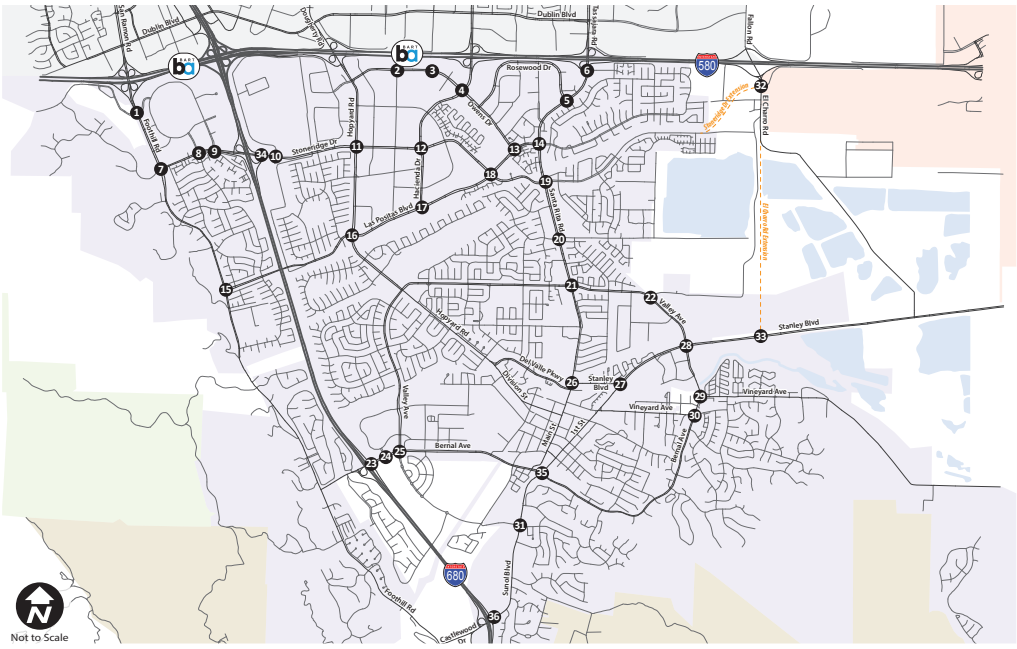
CUMULATIVE CONDITIONS
PM PEAK HOUR INTERSECTION VOLUMES

FIGURE 2A





VOLUMES KEY

XX (YY) No Project (Plus Project) PM Peak Hour Traffic Volumes

MAP KEY

1 Study Intersection

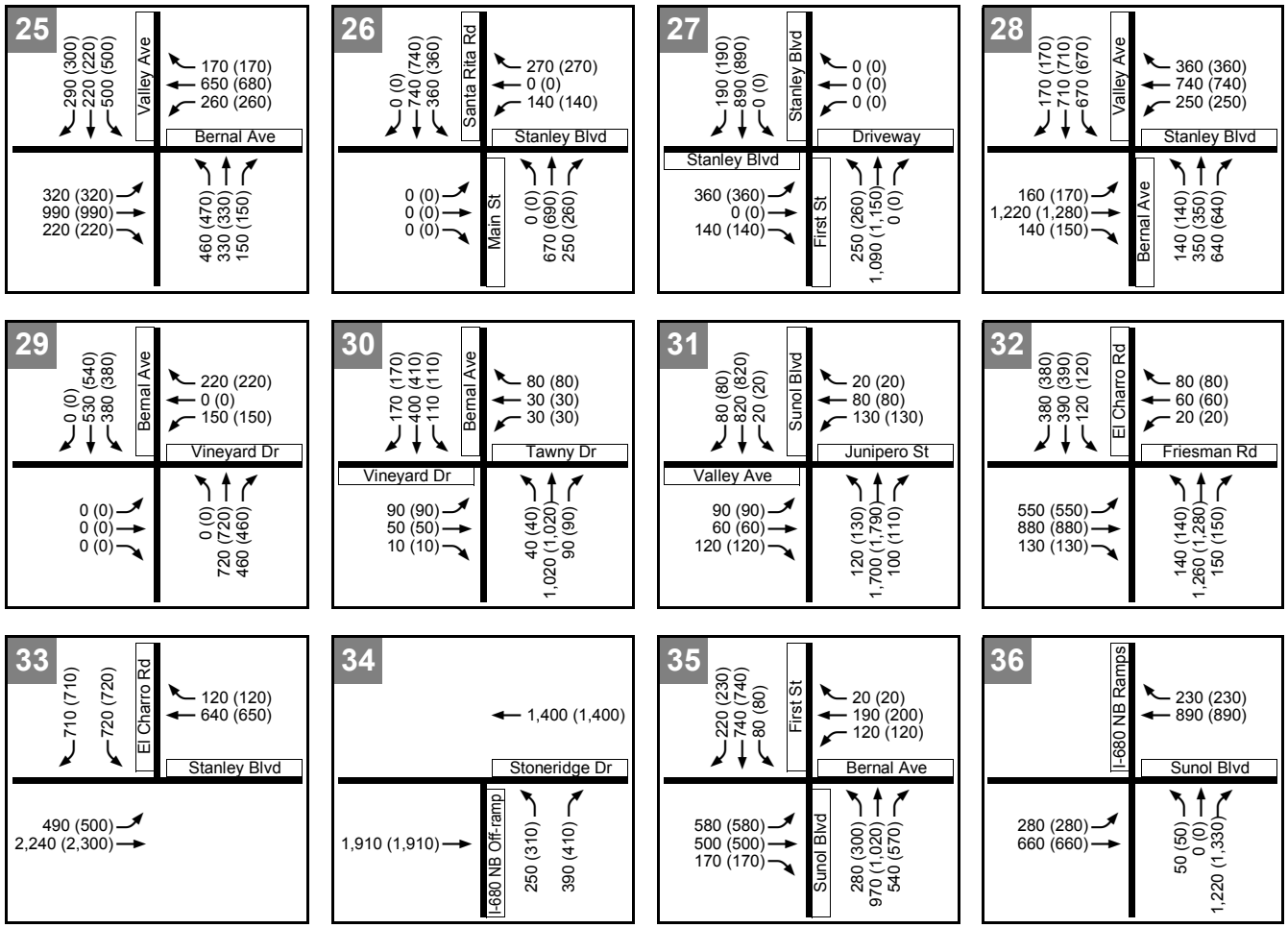
Future Roadway

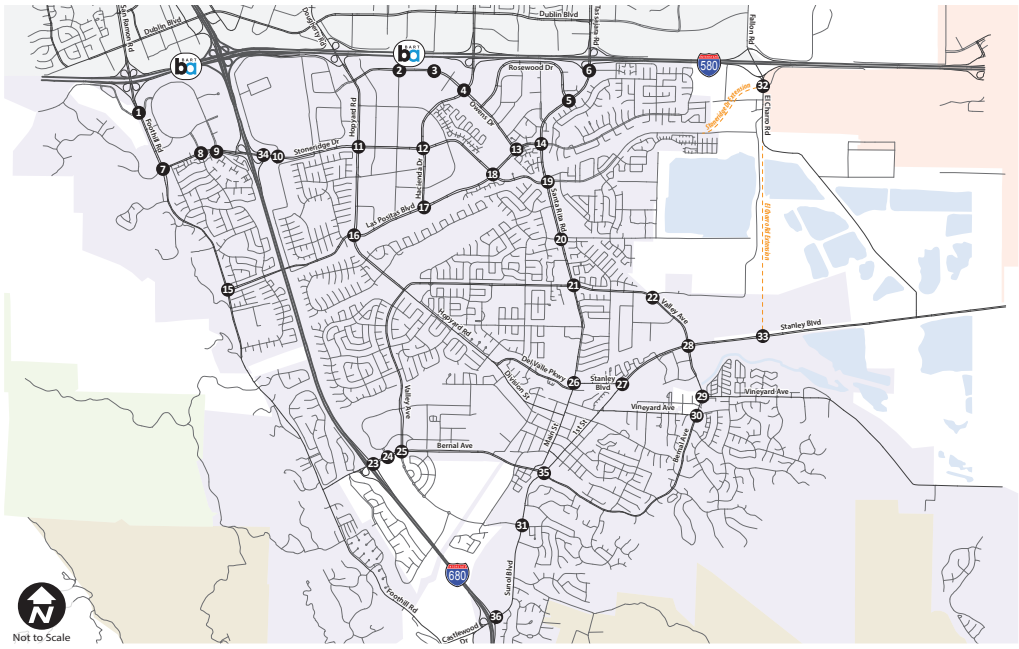
FEHR PEERS

WC11-2855\Analysis\Synchro\Pleasanton Analysis\08. Technical Memo\Figures and Tables\05.Figure2B-CumulativeVols

CUMULATIVE CONDITIONS PM PEAK HOUR INTERSECTION VOLUMES

FIGURE 2B





VOLUMES KEY

XX (YY) No Project (Plus Project) PM Peak Hour Traffic Volumes

MAP KEY

1 Study Intersection

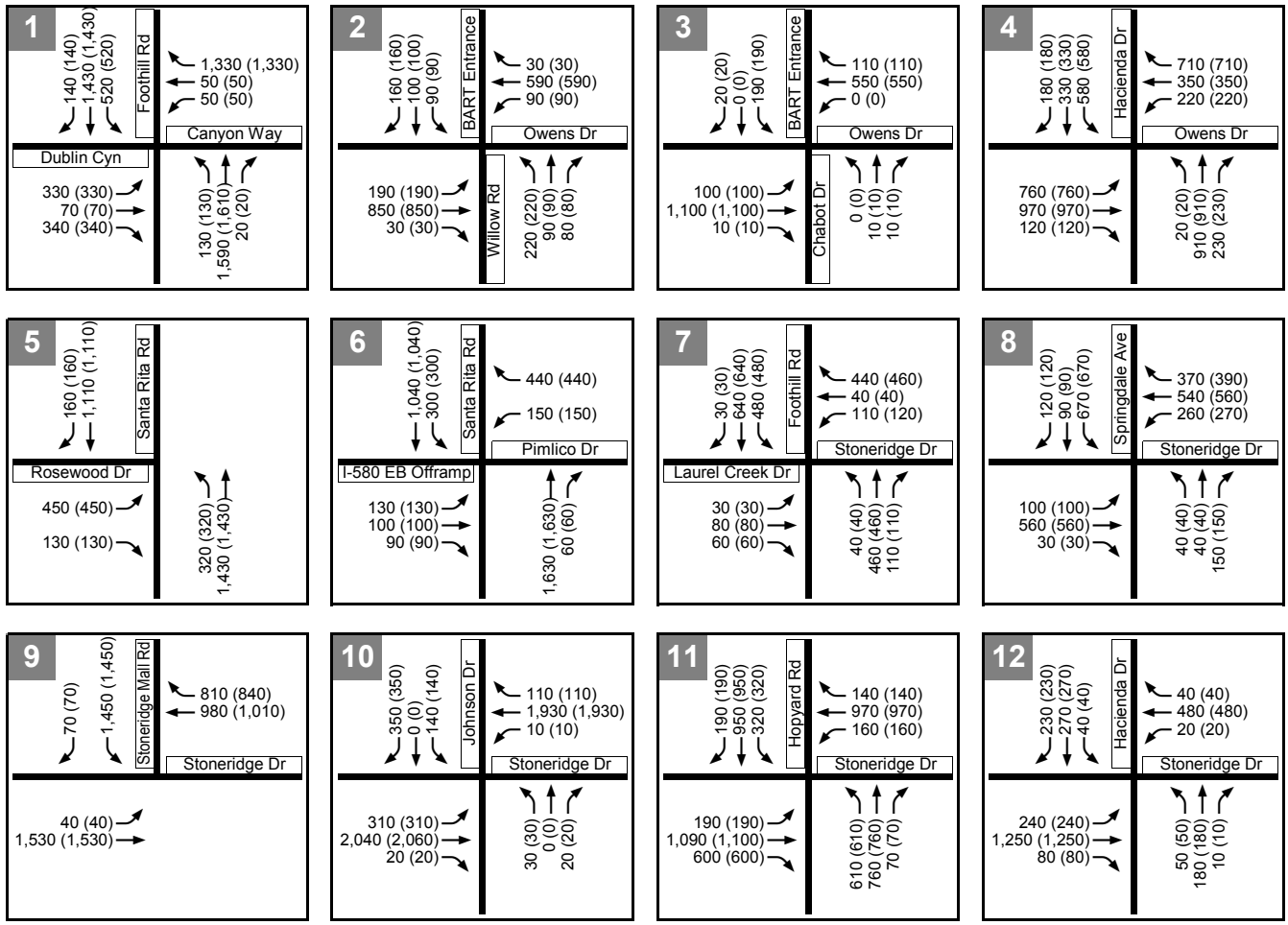
Future Roadway

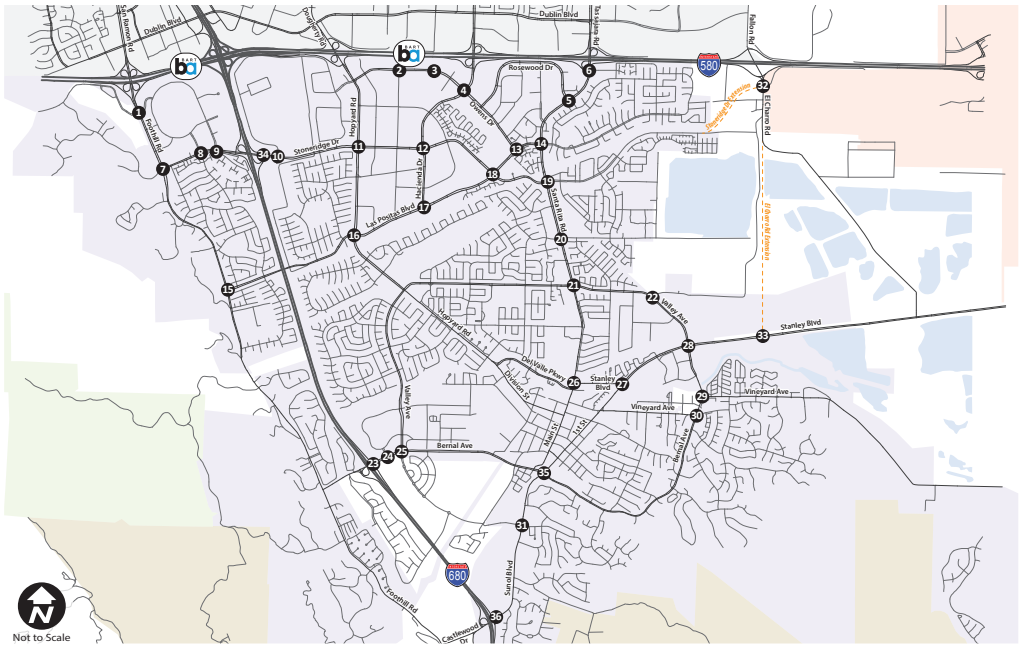
FEHR PEERS

CUMULATIVE CONDITIONS PM PEAK HOUR INTERSECTION VOLUMES

WC11-2855\Analysis\Synchro\Pleasanton Analysis\08. Technical Memo\Figures and Tables\05.Figure2C-CumulativeVols

FIGURE 2C





VOLUMES KEY

XX (YY) No Project (Plus Project) PM Peak Hour Traffic Volumes

MAP KEY

1 Study Intersection

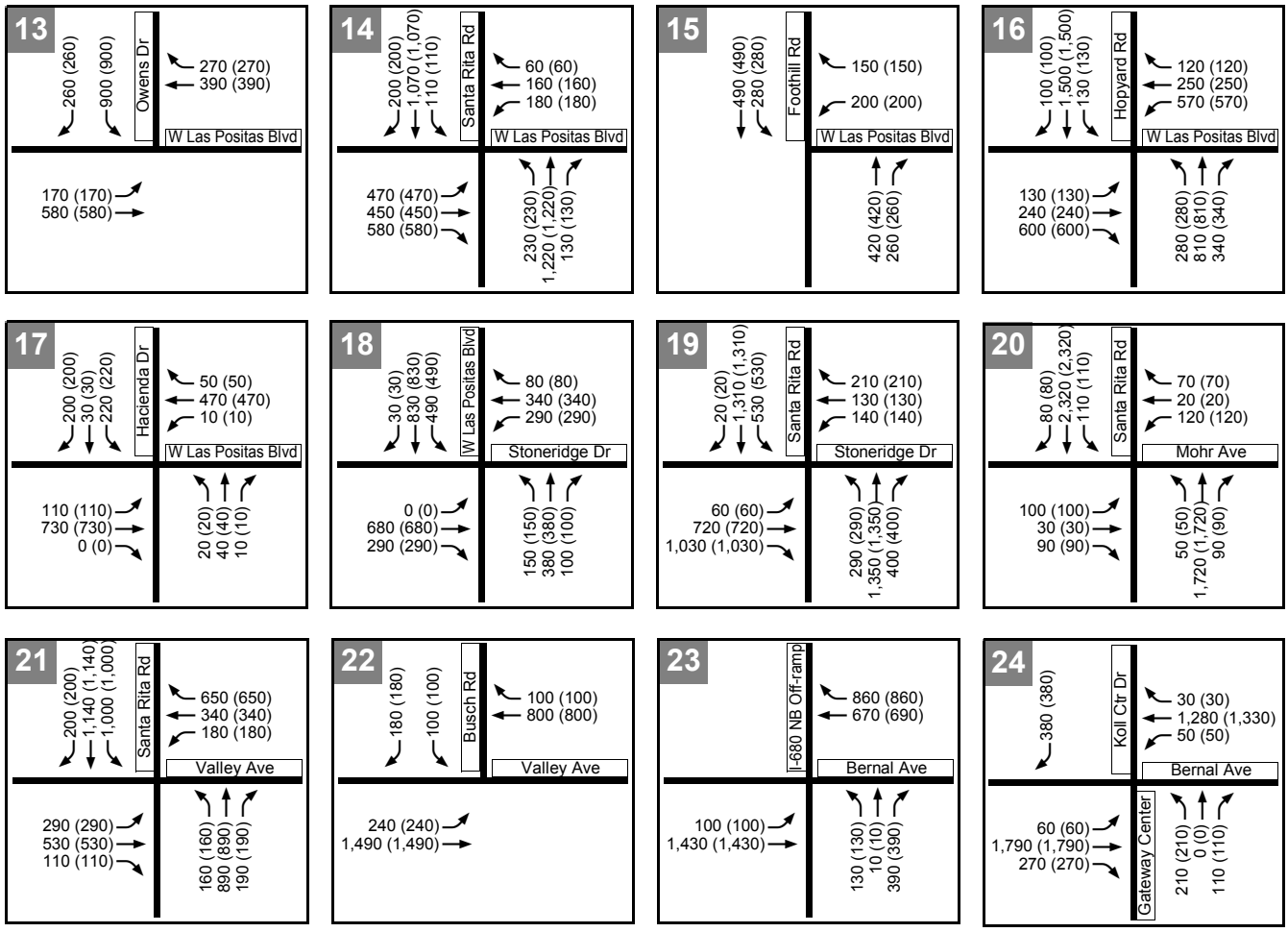
Future Roadway

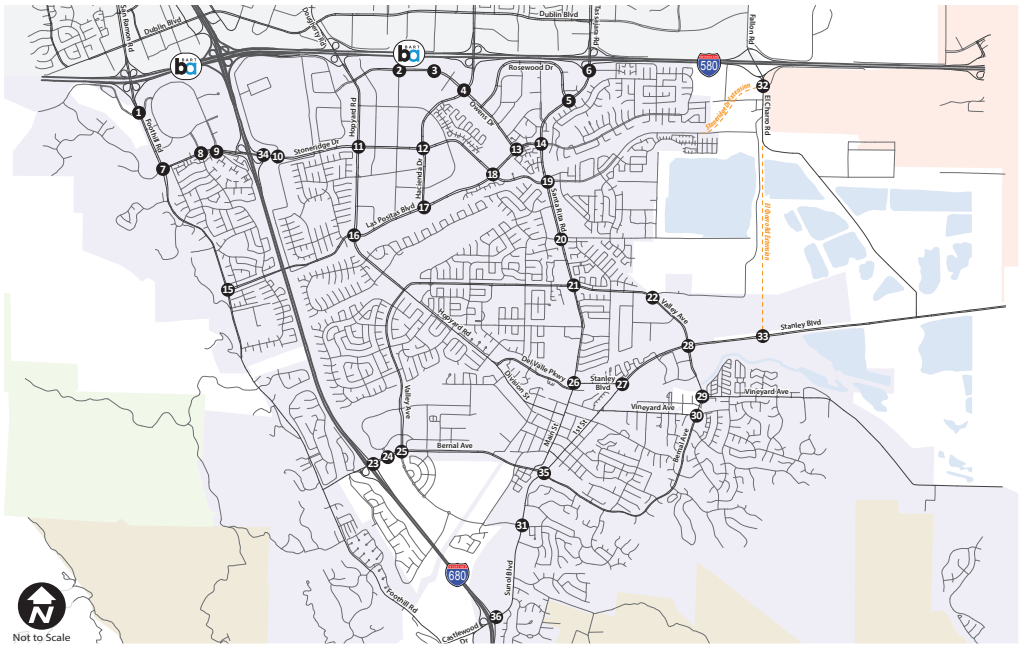
FEHR PEERS

WC11-2855\Analysis\Synchro\Pleasanton Analysis\08. Technical Memo\Figures and Tables\05.Figure3A-NTVols

NEAR-TERM CONDITIONS
PM PEAK HOUR INTERSECTION VOLUMES

FIGURE 3A





VOLUMES KEY

XX (YY) No Project (Plus Project) PM Peak Hour Traffic Volumes

MAP KEY

1 Study Intersection

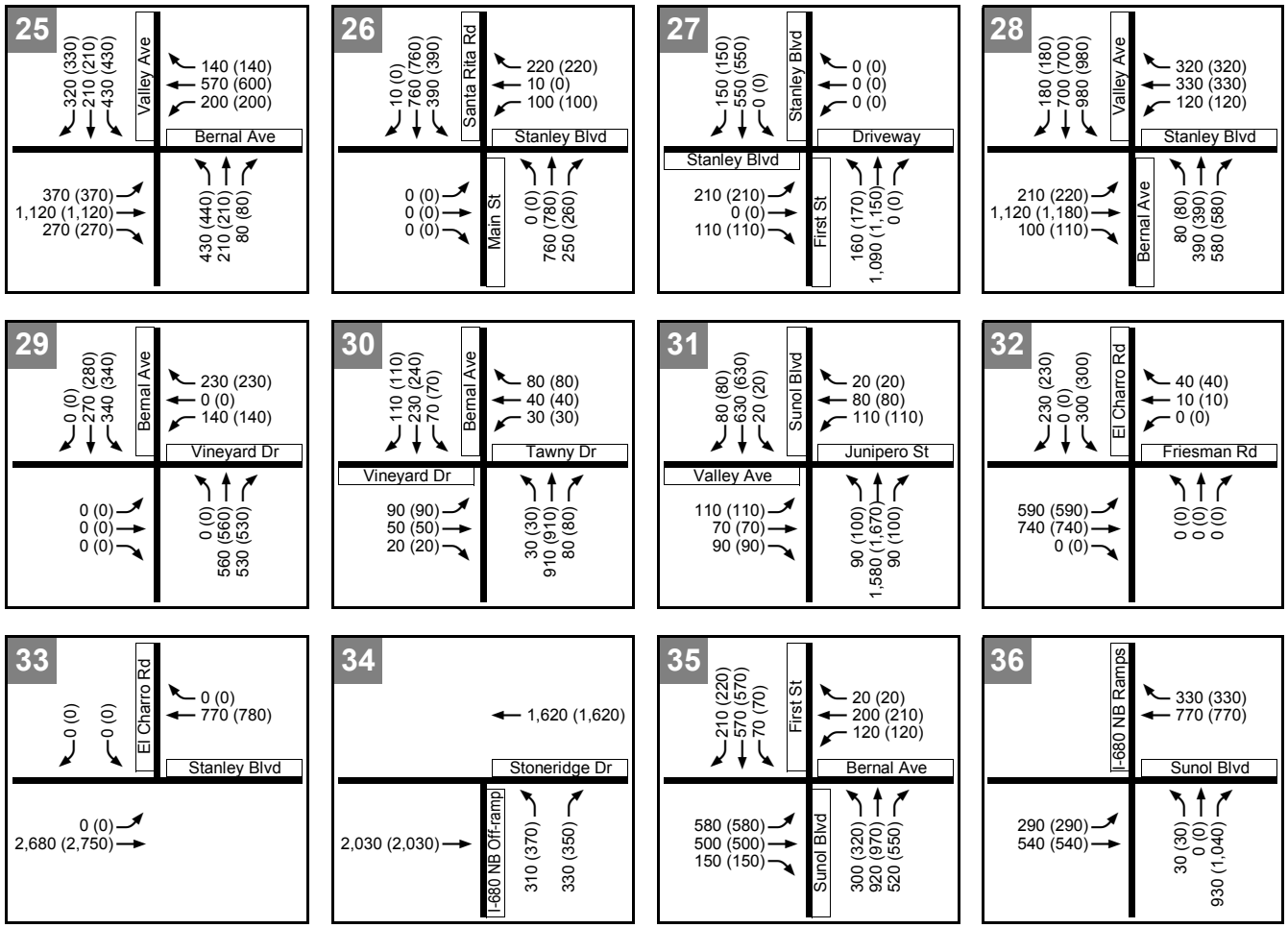
- - - - Future Roadway

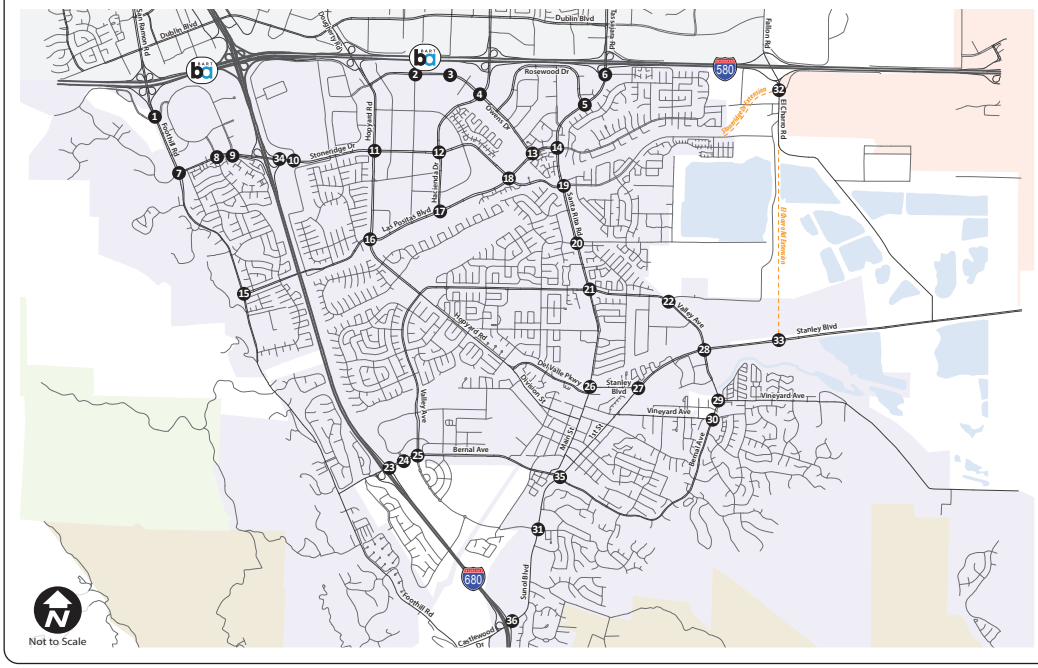
FEHR PEERS

WC11-2855\Analysis\Synchro\Pleasanton Analysis\08. Technical Memo\Figures and Tables\05.Figure3B-NTVols

NEAR-TERM CONDITIONS
PM PEAK HOUR INTERSECTION VOLUMES

FIGURE 3B





VOLUMES KEY

XX (YY) No Project (Plus Project) PM Peak Hour Traffic Volumes

MAP KEY

1 Study Intersection

Future Roadway

FEHR PEERS

WC11-2855\Analysis\Synchro\Pleasanton Analysis\08. Technical Memo\Figures and Tables\05.Figure3C-NTVols

NEAR-TERM CONDITIONS
PM PEAK HOUR INTERSECTION VOLUMES

FIGURE 3C

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October 7, 2013

Ms. Audrey Darnell
Senior Project Manager
Circlepoint
1814 Franklin Street, Suite 1000
Oakland, CA 94612

VIA E-MAIL: **a.darnell@circlepoint.com**

SUBJECT: I-680 Northbound Express Lane Project –
Evaluation of Local Carbon Monoxide Impacts in Pleasanton, CA

Dear Ms. Darnell:

The California Department of Transportation (Caltrans), in conjunction with the Alameda County Transportation Commission (Alameda CTC), proposes to construct a new HOV/Express lane facility on northbound I-680 from SR 237 (Calaveras Road) in Santa Clara County to SR 84 (Vallecitos Road) in Alameda County. The I-680 Northbound HOV/Express Lane Project (Project) would pass through the cities of Milpitas and Fremont, and unincorporated Alameda County.

In a comprehensive air quality technical report completed in September 2013[1], existing air quality within the project study limits was described in detail, as well as the predicted air quality impacts under future (2040) Build and No Build Alternatives. Localized carbon monoxide (CO) hotspot impacts located outside of the project limits were not considered.

For this study, possible localized CO hotspot impacts attributable to the project located outside of the Project limits in the city of Pleasanton, California (City) is considered.

[1] Carman, Joshua. "Air Quality Technical Report for the Interstate 680 Northbound Express Lane Project: SR 237 to SR 84," U.S. Department of Transportation, State of California and Alameda County Transportation Commission, 2013.

Background

CO, a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue, and can impair central nervous system functions. CO is emitted from the incomplete combustion of fossil fuels. Automobile exhausts account for the majority of the CO emissions; however, burning wood in fireplaces and wood stoves can contribute a substantial amount also. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follows the spatial and temporal distributions of vehicular traffic. The highest CO concentrations measured in the Bay Area are typically recorded during the winter. The Bay Area has met the CO air quality attainment standards for over a decade and is classified *attainment maintenance* by the U.S. EPA.

Localized CO Analysis

Carbon monoxide emissions from traffic generated by the project would be the pollutant of greatest concern at the local level. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of carbon monoxide. Air pollutant monitoring data indicate that carbon monoxide levels have been at healthy levels (i.e., below State and federal standards) in the Bay Area since the early 1990s. As discussed above, the region has been designated as attainment for the standard. There is an ambient air quality monitoring station in Livermore that measures carbon monoxide concentrations. The highest measured level over any 8-hour averaging period during the 3-year period ending in 2009 (the most recent data available from this station) is less than 2 parts per million (ppm), compared to the ambient air quality standard of 9.0 ppm. Bay Area Air Quality Management District (BAAQMD) screening guidance indicate that projects would have a less than significant impact to carbon monoxide levels if the project traffic assessment projects that traffic levels would not increase at any affected intersection to more than 44,000 vehicles per hour. The Pleasanton study intersections affected by the proposed project have much lower traffic volumes (less than 10,000 vehicles per hour). Therefore, the project would not cause or contribute to a violation of the CO ambient air quality standard, and the impact would be considered less-than-significant at receptors in Pleasanton.

Sincerely yours,

Joshua D. Carman
Consultant
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October 2, 2013

Ms. Audrey Darnell
Senior Project Manager
Circlepoint
1814 Franklin Street, Suite 1000
Oakland, CA 94612

VIA E-MAIL: **a.darnell@circlepoint.com**

SUBJECT: I-680 Northbound Express Lane Project –
Evaluation of Traffic Noise Increases in Pleasanton, CA

Dear Ms. Darnell:

The California Department of Transportation (Caltrans), in conjunction with the Alameda County Transportation Commission (Alameda CTC), proposes to construct a new HOV/Express lane facility on northbound I-680 from SR 237 (Calaveras Road) in Santa Clara County to SR 84 (Vallecitos Road) in Alameda County. The I-680 Northbound HOV/Express Lane Project (Project) would pass through the cities of Milpitas and Fremont, and unincorporated Alameda County.

23CFR772 provides procedures for preparing operational and construction noise studies and for evaluating noise abatement considered for federal and federal-aided highway projects. Under 23CFR772.7, projects are categorized as Type I, Type II, or Type III projects. The Federal Highway Administration (FHWA) defines a Type I project as a proposed federal or federal-aided highway project for the construction of a highway on a new location; the physical alteration of an existing highway where there is either a substantial horizontal or substantial vertical alteration; or other activities discussed in the definition of a Type I project. A Type II project involves construction of noise abatement on an existing highway with no changes to highway capacity or alignment. Type III projects do not require a noise analysis.

In a comprehensive noise study report (NSR) completed in October 2013[1], the existing noise environment within the project study limits was described in detail, as well as the predicted noise level increase under future (2040) Build and No Build Alternatives. Noise-sensitive receptors located outside of the project limits were not considered.

For this study, possible noise increases attributable to the project on noise-sensitive receptors located outside of the Project limits in the city of Pleasanton, California (City) is considered.

Existing Land Uses in Pleasanton

From SR 84 (Vallecitos Road) to I-580, in both the northbound and southbound directions, current land uses primarily consist of single-family residences, apartment buildings, corporate businesses, retail uses, a golf course, schools, parks, hotels, and a Wastewater Treatment Plant. There is a stretch along I-680 on the southern end of the project boundary that consists of undeveloped land, as well. Natural terrain and existing noise barriers, ranging in height from 10 to 16 feet, currently shield residences from I-680 traffic noise.

For this study, one long-term measurement and eight short-term measurements were taken in the vicinity of I-680 between SR 84 and I-580. Figure 1 shows an aerial map of the study region with the measurement locations labeled. The results of the long- and short-term field measurements are summarized in Tables 1 and 2, respectively. All noise data taken at the long-term receptor are shown in Figure 2. From SR 84 to Koopman Road, the land use is unincorporated with no noise-sensitive receptors adjacent to I-680. Therefore, no noise levels were measured along this segment. The long-term receptor and short-term receptors ST-1, ST-2, ST-3, and ST-4 were located along the mainline between Koopman Road and Sunol Boulevard. Two short-term receptors (ST-5 and ST-6) were located between Sunol Boulevard and Bernal Avenue. The final two short-term receptors (ST-7 and ST-8) were located along the I-680 corridor between Bernal Avenue and Stoneridge Drive.

[1] Thill, Michael. "Noise Study Report for the Interstate 680 Northbound HOV/Express Lane Project: SR 237 to SR 84," U.S. Department of Transportation, State of California and Alameda County Transportation Commission, 2013.

Figure 1. Map of Pleasanton with Long- and Short-Term Measurement Locations

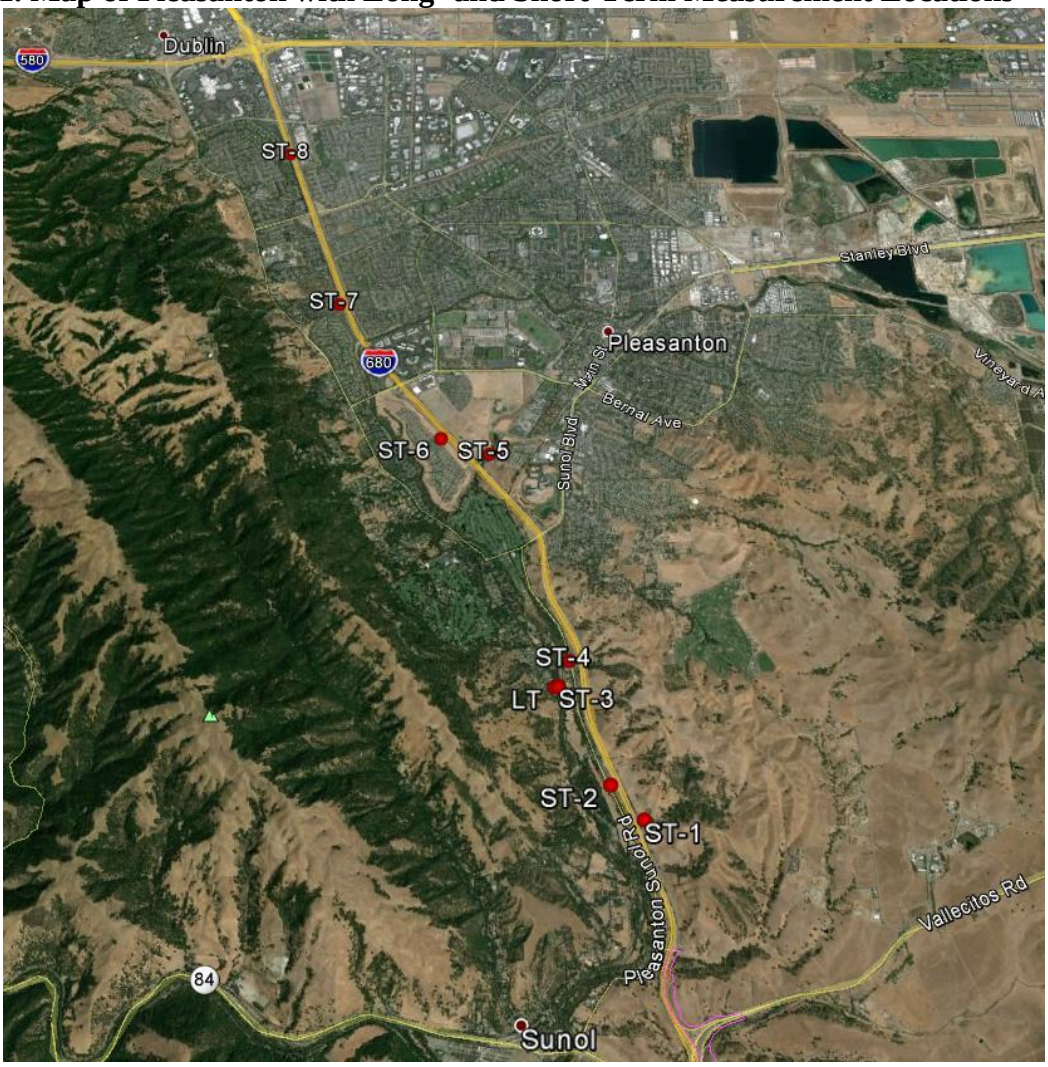


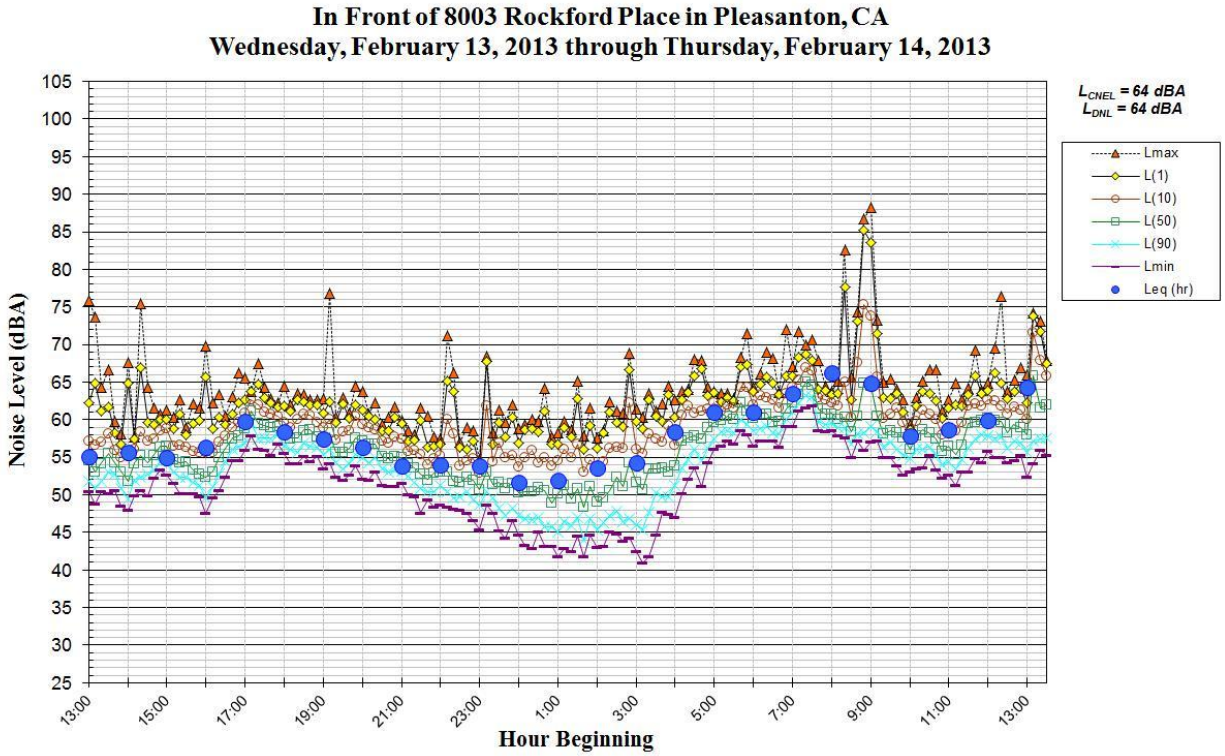
Table 1. Summary of Long-Term Noise Measurements

Receptor ID	Location	Date	Time	Measured Worst Hour $L_{eq[h]}$, dBA
LT	In front of 8003 Rockford Place, Pleasanton	2/13/2013	5:00 p.m.	60
		2/14/2013	8:00 a.m.	66

Table 2. Summary of Short-Term Measurements

Receptor ID	Location	Date	Time	10-min L_{eq}, dBA	Worst Hour $L_{eq[h]}$, dBA
ST-1	End of Koopman Road, Sunol	2/14/2013	10:30 a.m.	70	78
			10:40 a.m.	70	
ST-2	Pleasanton-Sunol Road, South of Railroad Crossing, Pleasanton	2/14/2013	10:50 a.m.	67	77
			11:00 a.m.	65	
ST-3	Back yard equiv. of 8019 Rockford Place, Pleasanton	2/14/2013	10:20 a.m.	58	65
			10:30 a.m.	58	
ST-4	Adjacent to 1 Verona Road, Pleasanton	2/14/2013	1:20 p.m.	59	61
			1:30 p.m.	58	
ST-5	Across from 5993 Sterling Greens Circle, Pleasanton	2/14/2013	9:50 a.m.	57	67
			10:00 a.m.	57	
ST-6	Across from 7128 Moss Tree Way, Pleasanton	2/14/2013	9:50 a.m.	60	70
			10:00 a.m.	60	
ST-7	Meadowlark Park, Pleasanton	2/14/2013	10:00 a.m.	57	65
			10:10 a.m.	57	
ST-8	Muirwood Community Park, Pleasanton	2/14/2013	10:00 a.m.	63	70
			10:10 a.m.	63	

Figure 2. Noise Measurements Taken at the Long-Term Receptor



Traffic Noise Analysis

The proposed project would not change either the horizontal or the vertical alignment of the freeway with respect to any noise sensitive receptors along I-680 in the City. There would be no increase in the number of through lanes. With no changes to the roadway along this segment I-680 through Pleasanton, only increased traffic would impact noise levels. As mentioned above, several noise-sensitive receptors were identified along the I-680 corridor, and existing noise barriers and terrain acoustically shield receptors from I-680 traffic noise. With no geometrical changes proposed, these noise barriers are expected to maintain the same effectiveness following the addition of the Express Lane south of Pleasanton.

The noise increase was considered under peak hour conditions, adjusted to maintain free-flow traffic conditions along I-680. If the peak hour traffic data for I-680 exceeds 1,800 vehicles per hour per lane in mixed-flow lanes and 1,400 vehicles per hour per lane in the Express Lanes, then I-680 traffic would flow below the posted speed limit. Therefore, to calculate the increase in traffic noise during free-flow peak hour conditions, the traffic data was adjusted to allow up to the maximum calculated vehicles per hour. Under these adjusted peak hour conditions for the I-680 mainline traffic, the noise level increase in 2040 would be no more than 1.3 dBA under No Project conditions. Under Project conditions that include traffic in both the Express Lane and mixed-flow lanes, the noise level increase in 2040 would be no more than 1.7 dBA. The relative increase in noise levels attributable to the project would be 0.4 dBA or less, which is not a detectable change with respect to human hearing. Permanent noise increases attributable to the project would not be measurable or perceptible, and the impact would be considered less-than-significant at receptors in Pleasanton.

Sincerely yours,

Carrie Janello
Consultant
Illingworth & Rodkin, Inc.