FEHR PEERS

DRAFT MEMORANDUM

Date: July 25, 2013

To: Wayne Rasmussen, Rasmussen Planning

From: Kathrin Tellez and Mackenzie Watten, Fehr & Peers

Subject: Comparison of Land Use Options for East Pleasanton Specific Plan

WC12-2967

This memorandum documents the transportation comparison of four land use and street network options for the East Pleasanton Specific Plan (EPSP). The comparison includes transportation metrics such as daily external vehicle trips, AM and PM peak hour external vehicle trips, internal trips, and trips by transit, and expected levels of walking and bicycling through the site. In addition, we reviewed the options qualitatively concerning potential cut-through traffic and number of access points. Expected peak hour intersection service levels at the intersections that would provide primary access to the site are also discussed, as well as next steps for further analysis on the preferred land use and circulation option.

OPTIONS DESCRIPTION

Four land use and circulation options are under consideration, with the land use elements of each option summarized in **Table 1**. All options have the same amount of retail and office land use and a generally even split between single and multi-family housing. Option 4 contains the most non-residential uses while Option 6 contains the most residential uses.

Appendix A displays the roadway layout for each of the options. The roadway layouts differ somewhat between options but share a common goal of connecting Busch Road from Valley Avenue to El Charro Road and completing the El Charro Road extension from Stoneridge Drive to Stanley Boulevard. An extension of Boulder Street from Valley Avenue through the site, terminating either at Busch Road or El Charro Road is considered within the options.

The trip generation discussion for each option is purposely separated from the circulation discussion to permit this task force to independently select the preferred roadway network from the preferred land use.

TABLE 1
LAND USE COMPARISON

Land Use	Option 1	Option 4	Option 5	Option 6
Single Family Households (in dwelling units)	500	641	715	1,352
Multi-Family Households (in dwelling units)	500	642	715	802
Retail (in square feet)	91,000	91,000	91,000	91,000
Office (in square feet)	442,000	442,000	442,000	442,000
Industrial (in square feet)	1,442,000	2,296,000	1,148,000	1,148,000

Source: Comparative Land Use Inventory and Roadway Layout, East Pleasanton Specific Plan, June 27, 2013

TRIP GENERATION COMPARISON

Traditional analysis methods commonly used by traffic engineers to quantify the vehicle trip making characteristics of development can overestimate vehicle trip generation of mixed-use development. This is due to an inability of traditional tools to accurately reflect the amount of internal trip linking or the level of trips made by transit, biking, and/or walking within and to a mixed-use site. This can result in increased development costs due to oversized infrastructure, and skewed public perception of the likely impacts of mixed-use development. The most common method used is outlined in the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (9th Edition). This method contains data primarily collected at suburban, single-use, freestanding sites. This limits their applicability to mixed-use development, such as that proposed in the Specific Plan. This method does not adequately account for key variables that influence travel such as development density and scale, location efficiency, land use mix, urban design and transit orientation.

Two significant new research studies provide the opportunity to improve the state of practice. One study sponsored by the US EPA[1] and another by the Transportation Research Board[2] have developed means to improve trip generation estimation for mixed-use development (MXD). The two studies examined over 260 mixed-use development sites throughout the U.S. and, using different approaches, developed new quantification methods. Fehr & Peers has reviewed the two methods, including the basis, capabilities, and appropriate uses of each, to produce a new method (MXD+) that combines the strengths of the two individual methods. MXD+ recognizes that traffic generation by mixed-use and other forms of sustainable development relate closely to the density, diversity, design, destination accessibility, transit proximity, and scale of development. MXD+ improves the accuracy of impact estimation and gives planners a tool to rationally balance land use mix and to incorporate urban design, context compatibility, and transit orientation to create lower-impact development.

The MXD+ methodology starts with ITE trip generation estimates but then adjusts those estimates to account for the mixed-use and environment characteristics.

Use of the MXD+ methodology requires more input data than a traditional trip generation application. Data detailing the geographic layout of the site, land use in the surrounding area, and socioeconomic data of both the site and the surrounding area were collected to inform the MXD+ methodology. Model inputs, in addition to land use information, include the number of jobs within a 30 minute transit ride of the EPSP area, the expected level of auto-ownership, and average household size. Sources used to collect this data include the Contra Costa Transportation Authority (CCTA) travel demand model, the Metropolitan Transportation Commission (MTC) travel demand model, Census and American Community Survey (ACS), the Bay Area Travel Survey (BATS), and the Specific Plan Options.

Table 2 shows the trip generation potential of each option through several different transportation metrics. External vehicle trips represent trips that would interact with roadway facilities outside the Project area and could potentially result in off-site traffic impacts. Internal capture represents trips that have both an origin and destination within EPSP, including residents

[1] *Traffic Generated by Mixed-Use Developments—A Six-Region Study Using Consistent Built Environmental Measures* (Ewing et al, ASCE UP0146, Sept 2011)
[2] National Cooperative Highway Research Program (NCHRP) Report 684 *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments* (Bochner et al, March 2011)

that shop or work within the development, in addition to office or industrial workers that may come from outside the EPSP for one trip, but patronize local establishments, such as a restaurant during lunch hour. External transit, walk, and bike trips represent those trips that visit or leave the site via modes other than automobile.

Roadway segment vehicle volumes on Busch Road and El Charro Road were estimated using buildout volume estimates from the Pleasanton Housing Element (HE) Environmental Impact Report (EIR). That document assumed a certain amount of development on the EPSP site and the Options below were compared relative to that estimate to generate a future total volume estimate, as shown in Table 2.

TABLE 2
TRIP GENERATION COMPARISON

Transportation Metric	Option 1	Option 4	Option 5	Option 6
Daily External Vehicle Trips	23,470	28,500	24,670	29,050
AM Peak Hour External Vehicle Trips	2,010	2,600	2,030	2,370
PM Peak Hour External Vehicle Trips	2,440	3,070	2,470	2,850
Daily Internal Trips	2,320	2,800	2,700	3,490
Daily External Transit/Walk/Bike Trips	970	1,220	1,120	1,510
Daily (AM Peak) [PM Peak] Roadway Segment Vehicle Volumes				
El Charro Road	19,200 (1,350) [1,740]	20,710 (1,530) [1,930]	19,560 (1,360) [1,750]	20,880 (1,460) [1,860]
Busch Road	15,680 (930) [1,030]	16,440 (1,020) [1,120]	15,860 (930) [1,030]	16,520 (980) [1,090]

Source: Fehr & Peers, July 2013.

Option 6 would generate the most daily external vehicle trips and would result in the most trips with origins and destinations in EPSP (internal trips). This high number of internal trips and corresponding transit/walk/bike trips is due to the high number of dwelling units on site and adjacent office/industrial land use. This option (and Option 4) would likely have the highest impact to off-site intersections and roadway segment operations.

Option 4 would generate the most peak hour trips and has the most non-residential development of the four land use options. With the large amount of industrial land area, truck traffic through the EPSP area could be the highest with Option 4 depending on the types of industrial land uses that are permitted. This option would likely have similar impacts to intersections and roadway segment operations external to the site as Option 6.

Options 1 and 5 have similar trip generating characteristics, and would both generate fewer external trips than Options 4 and 6. Option 5 would generate a higher percentage of internal trips than Option 1 due to its more balanced land use plan between residential and non-residential uses.

COMPARISON TO HOUSING ELEMENT ANALYSIS

The level of development in the EPSP area contemplated in the HE EIR analysis included approximately 900 dwelling units, and over 3,500,000 square-feet of non-residential development, including research and development, retail and industrial park development. Daily trip generation for the EPSP area under the HE analysis was approximately 35,000 daily trips, including 5,000 morning peak hour trips and 4,900 PM peak hour trips. This level of daily and peak hour trip generation is higher than the four EPSP alternatives currently under consideration, as shown on Table 2.

The HE transportation analysis evaluated morning and evening peak hour operations at 33 intersections in Pleasanton, including roadway connections from the EPSP area to the regional roadway system and numerous intersections on Santa Rita Road and Valley Avenue. Results of that analysis indicate that with planned development and roadway improvements, intersections

included in the HE EIR analysis would operate a level of service (LOS) D[3] or better with development in the EPSP area, when also considering the other proposed land use changes proposed as part of the Housing Element. The LOS results from that analysis are provided as **Attachment B.** Expected operations of key intersections in the vicinity of the EPSP area are discussed below.

Santa Rita Road at Valley Avenue: This intersection is projected to operate at LOS D or better during both peak hours considering build-out of the land uses identified in the General Plan and Housing Element. Projected peak hour service levels are not expected to change with the EPSP Options under consideration.

Busch Road at Valley Avenue: This intersection is projected to operate at LOS D or better during both peak hours considering build-out of the land uses identified in the General Plan and Housing Element. Projected peak hour service levels are not expected to change with the EPSP Options under consideration and may improve from the level shown in Attachment B with the connection of Boulder Street from Valley Avenue to the site.

Stanley Boulevard at Bernal Avenue/Valley Avenue: This intersection is projected to operate at LOS D or better during both peak hours considering build-out of the land uses identified in the General Plan and Housing Element. Projected peak hour service levels are not expected to change with the EPSP Options under consideration.

Stanley Boulevard at El Charro Road: This intersection is projected to operate at LOS D or better during both peak hours considering build-out of the land uses identified in the General Plan and Housing element EIR. Operations are expected to improve from LOS E to LOS D in the cumulative condition with the land-use development throughout the City consistent with the Housing Element land use designations. This intersection is a

[3] The operations of roadway facilities are described with the term "level of service" (LOS). LOS is a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (i.e., best operating conditions) to LOS F (worst operating conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F. The City of Pleasanton strives to maintain LOS D or better for peak hour signalized intersection operations. However, a number of intersections, referred to as Gateway and Exempted Downtown intersections, are exempt from the LOS D policy. This is more fully explained in the *Existing Transportation Conditions Assessment for East Pleasanton Specific Plan* memorandum dated October 26, 2012.

designated Gateway Intersection. For Gateway intersections, additional vehicle capacity could encourage more vehicle traffic that should remain on the regional transportation system and could also degrade the pedestrian experience and visual character of the intersection. The ultimate configuration of this intersection will be developed for the preferred land use and circulation Option and the EPSP Task Force will be consulted about the trade-offs between intersection capacity and level of service in the development of the final intersection configuration.

Stoneridge Drive at El Charro Road: This intersection is projected to operate at LOS D or better during both peak hours considering build-out of the land uses identified in the General Plan and Housing Element. Projected peak hour service levels are not expected to change with the EPSP options under consideration.

ROADWAY CAPACITY AND SIGNAL CONTROL

The four Options would generate vehicle volumes on nearby roadways at levels less than what has been previously assumed for the EPSP in the HE EIR. The HE EIR evaluated both El Charro Road and Busch Road as four-lane facilities. Busch Road, based on the trip generating potential of the current Options, could be planned as a two-lane facility with consideration for additional capacity at intersections. El Charro Road is planned as four lane facility. Although not defined in any of the Options, all other roadways within the site should be two-lane roadways.

New traffic signals would be needed at several locations throughout the site. It is anticipated that approximately five internal intersections would be signalized for Options 1 and 4. Option 5 would require approximately six signalized internal intersections, and Option 6 would require six or seven internal signalized intersections depending on how access to the industrial land use on the south-east area would be provided off of El Charro Road. When the preferred Option is chosen and further refined, and information is developed about how individual neighborhoods and parcels would take access to the primary roadway network, needed traffic control and intersection configurations can be better identified. All options would require approximately four existing signals to be modified.

QUALITATIVE ROADWAY EVALUATION

Qualitative aspects were evaluated for each option such as roadway design and how that induces or limits cut-through traffic, as well as the benefits of providing access to the site through Busch Road and Boulder Street versus just Busch Road.

All four alternatives provide access to the EPSP site from the Busch Road at Valley Avenue and Boulder Street at Valley Avenue intersections. Due to the number of trips generated by the EPSP potential land uses, maintaining access from these two intersections is beneficial to disperse traffic loads and allow more compact intersection designs to operate acceptably. Compact intersections have benefits for pedestrians and bicyclist as they reduce vehicle exposure and can create an environment conducive to non-motorized trips, potentially reducing the amount of vehicle traffic needed to be accommodated at the intersections. Option 4 connects both Busch Road and Boulder Street to El Charro Road. The remaining Options connect Boulder Street to Busch Road. The three options *without* the two connections to El Charro Road will likely need a larger intersection at the Busch Road at El Charro Road intersection to accommodate peak hour turning movements.

Under Option 4, the connection of Busch Road to El Charro Road would primarily serve an industrial zoned area and would need to be designed to accommodate the turning movements of large trucks. As this option has industrial land uses to the west of El Charro Road, higher levels of truck traffic could occur on Busch Road than the other options where industrial traffic is focused on El Charro Road.

Options 1 and 4 propose a curvilinear alignment of Busch Road. Under Options 1 and 5, the Boulder Street alignment is also curvilinear. There is a concern that direct roadway connections between Valley Avenue and El Charro Road would encourage cut-through traffic, defined as traffic that has neither an origin nor destination within the area of travel, on EPSP roadways not designed to accommodate regional travel. While it is likely that a proportion of traffic on El Charro Road will be through traffic, significant levels of cut-through traffic are not expected on Busch Road or Boulder Street. Traffic traveling southbound on Valley Avenue destined for eastbound Stanley Boulevard is unlikely to achieve significant travel time savings by traveling through the EPSP area. Boulder Street and Busch Road would have less capacity and more locations where traffic is controlled, allowing for local access, than Valley Avenue and Stanley

Boulevard. Traffic traveling on El Charro Road, destined for Stanley Boulevard would also increase their travel distance by traveling through the EPSP. Option 4 would provide the most direct connection between El Charro Road and Valley Avenue, via both Busch Road and Boulder Street (requiring left and right turns depending on the direction of travel). Option 1 provides the least direct connection between El Charro Road and Valley Avenue.

The curvilinear network has disadvantages for pedestrian and bicycle travel through the EPSP by increasing the distance between uses, potentially discouraging non-automobile trips. The curvilinear nature of the primary streets can also result in more cul-de-sac streets which potentially further increases walking/biking distances if they are not designed to provide a non-motorized connection. Curvilinear streets create angled intersections that can have sight distance and other operational issues and can also result in irregularly shaped parcels that can be difficult to fully utilize.

Two Options (Option 1 and 4) include a crisscrossing of Busch Road Boulder Street, with Boulder Street becoming the more northerly roadway. This creates a circuitous roadway network and could increase the level of traffic turning at each of the resulting intersections, potentially requiring additional capacity for vehicles. Option 1 also includes a T-intersection of Boulder Street into Busch Road at a curve in the roadway. A likely fourth leg of this intersection would serve a commercial parcel. Right-turns on red lights may need to be prohibited at this intersection for some movements due to sight distance constraints, reducing its overall capacity. The intersection would be approximately 1/4–mile from the El Charro Road at Busch Road intersection.

Options 5 and 6 include a curved Boulder Street that intersects with Busch Road. It is anticipated the resulting intersection would need to be signalized under either option. In Option 5, the potential connection is fairly close to a trail crossing that may also need to be signalized. In Option 6, the Boulder Street connection at Busch Road is approximately 750 feet from the El Charro Road at Busch Road intersection. The final roadway layout should consider how closely spaced intersections would operate as vehicle queue spillback from one intersection could affect the operations of the adjacent intersection.

Modifying roadway network Option 6 to relocate the intersection of Boulder Street at Busch Road approximately equidistant between the trail crossing and El Charro Road would permit better

signal timing progression along the corridor, potentially moderating speeds. Connecting Boulder Street to El Charro Road and providing an additional internal roadway connection could also be considered as this would disperse travel demand to El Charro Road resulting in two smaller intersections. The Boulder Street intersection at El Charro Road could be designed as a right-in/right-out intersection

Boulder Street and Busch Road are designated collector roadways and are intended to collect traffic from neighborhoods and connect to higher level roadways. Potential traffic calming elements on these roadways to discourage cut-through traffic need to consider the roadway function and land uses served. Some elements to consider include moderating travel speeds on the roadway through signal timing and not providing excess roadway capacity. Under scenarios where two connections to El Charro Road are proposed, one connection could be restricted to right-in/right-out operation to discourage through traffic. .

FUTURE ANALYSIS

For the preferred land use and circulation plan, Fehr & Peers will develop roadway cross section recommendations for the EPSP and also evaluate the following items:

- Internal intersection design and operations
- Emergency vehicle access and circulation
- Vehicular circulation within and adjacent to the site
- Parking policies
- Pedestrian access and circulation within and adjacent to the site
- Bicycle access and circulation within and adjacent to the site
- Transit and shuttle vehicle circulation within and adjacent to site, including the potential to reroute existing transit routes or developing new routes
- Pedestrian access to and from transit stops
- Truck circulation and loading dock access for commercial parcels
- Integration of Climate Action Plan goals
- Complete Streets implementation

Following development of the final EPSP land use and circulation option, intersection operations will be evaluated for off-site locations. Intersections to be included in the analysis will be identified through consultation with the Task Force, City Staff, also based on public comments received on the Notice of Preparation (NOP) for the Environmental Impact Report (EIR).

Attachments:

Appendix A – Comparative Land Use Inventory and Roadway Layout, East Pleasanton Specific Plan, June 27, 2013

Appendix B – Level of Service Summary from the Housing Element Analysis

- Zone 7 Open Space
- Private Open Space
- Public Parks
- Campus Office
- Destination Use
- Retail
- Retail Overlay
- Residential 4 DU/AC
- Residential 23 DU/AC
- Residential 30 DU/AC
- Industrial
- Potential Public School / Park Site
- Vista Point
- Staging Area
- Trail

EPSP OPTION 1

June 27, 2013

OPTION 1

Land Use Inventory

SF-R 4 d/a	SF-R 11d/a	MF-R 23d/a	MF-R 30d/a	Total Housing
500 units	0 units	195 units	305 units	1,000 units

Retail	Campus Office	Ind/ Flex	Destination Use
91,000 sq.ft.	442,000 sq.ft.	1,442,000 sq.ft.	3 acres

Public Park	Private Open Space
45 acres	34 acres

Zone 7 Open Space

Private Open Space

Public Parks

Campus Office

Destination Use

Retail

Retail Overlay

Residential 8 DU/AC

Residential 23 DU/AC

Residential 30 DU/AC

Industrial

Potential Public School / Park Site

Vista Point

Staging Area

Trail

EPSP OPTION 4

June 27, 2013

OPTION 4

Land Use Inventory

SF-R 8 d/a	MF-R 23d/a	MF-R 30d/a	Total Housing
641 units	250 units	392 units	1,283 Units

Retail	Campus Office	Indust./ Flex	Destination Use
91,000 sq.ft.	442,000 sq.ft.	2,296,000 sq.ft.	3 acres

Public Park	Private Open Space
46 acres	40 acres

Zone 7 Open Space

Private Open Space

Public Parks

Campus Office

Destination Use

Retail

Retail Overlay

Residential 4 DU/AC

Residential 11 DU/AC

Residential 23 DU/AC

Residential 30 DU/AC

Industrial

Potential Public School / Park Site

Vista Point

Staging Area

Trail

EPSP OPTION 5

June 27, 2013

OPTION 5

Land Use Inventory

SF-R 4 d/a	SF-R 11d/a	MF-R 23d/a	MF-R 30d/a	Total Housing
355 units	360 units	249 units	466 units	1,430 Units

Retail	Campus Office	Indust./ Flex	Destination Use
91,000 sq.ft.	442,000 sq.ft.	1,148,000 sq.ft.	3 acres

Public Park	Private Open Space
45 acres	35 acres

Zone 7 Open Space

Private Open Space

Public Parks

Campus Office

Destination Use

Retail

Retail Overlay

Residential 4 DU/AC

Residential 8-11 DU/AC

Residential 23 DU/AC

Residential 30 DU/AC

Industrial

Potential Public School / Park Site

Vista Point

Staging Area

Trail

EPSP OPTION 6

June 27, 2013

OPTION 6

Land Use Inventory

SF-R 4 d/a	SF-R 8 d/a	SF-R 11d/a	MF-R 23d/a	MF-R 30d/a	Total Housing
100 units	504 units	748 units	322 units	480 units	2,154 Units

Retail	Campus Office	Indust./ Flex	Destination Use
91,000 sq.ft.	442,000 sq.ft.	1,148,000 sq.ft.	3 acres

Public Park	Private Open Space
45 acres	35 acres

COMPARATIVE LAND USE INVENTORY

- Residential – Number of Units and % of S-F / M-F

	SF-R 4d/a	SF-R 8d/a	SF-R 11d/a	MF-R 23d/a	MF-R 30d/a	Total Housing	% Single Family	% Multi-Family
Option 1	500	--	--	195	305	1,000	50%	50%
Option 4	--	641	--	250	393	1,283	50%	50%
Option 5	355	--	360	249	466	1,430	50%	50%
Option 6	100	504	748	322	480	2,154	63%	37%

- Non-Residential – Square feet and acres

	Retail sq. ft.	Office sq. ft.	Industrial sq. ft.	Destination Use acres	Public Park acres	Private O.S. acres
Option1	91,000	442,000	1,442,000	3	45	34
Option 4	91,000	442,000	2,296,000	3	46	40
Option 5	91,000	442,000	1,148,000	3	45	35
Option 6	91,000	442,000	1,148,000	3	45	35

TABLE 3
INTERSECTION LEVEL OF SERVICE SUMMARY

Intersection	Traffic Control	Peak Hour	Existing[1] (Scenario 1)		Existing Plus Project (Scenario 2)		Existing Plus Approved Projects (Scenario 3)		Existing Plus Approved Projects Plus Project (Scenario 4a)		Existing Plus Approved Projects Plus Project Plus El Charro Road Extension (Scenario 4b)		Existing Plus Approved Projects Plus Pending Projects (Scenario 5)		Existing Plus Approved Projects Plus Pending Projects Plus Project (Scenario 6a)		Existing Plus Approved Projects Plus Pending Projects Plus El Charro Road Extension (Scenario 6b)		Cumulative Without Project (Scenario 7)		Cumulative With Project (Scenario 8)	
			Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS
1. Foothill Road / Dublin Canyon Road	Signal	AM	21	C	22	C	36	D	36	D	37	D	35	C	36	D	36	D	31	C	32	C
		PM	30	C	31	C	52	D	53	D	53	D	53	D	52	D	52	D	53	D	48	D
2. Owens Drive / Willow Road / BART	Signal	AM	16	B	15	B	15	B	15	B	15	B	16	B	17	B	17	B	16	B	17	B
		PM	16	B	15	B	16	B	16	B	16	B	16	B	17	B	17	B	16	B	16	B
3. Owens Drive / East BART Station Driveway	Signal	AM	6	A	6	A	6	A	6	A	6	A	7	A	7	A	7	A	7	A	7	A
		PM	9	A	9	A	9	A	9	A	9	A	10	A	10	A	10	A	9	A	10	A
4. Hacienda Drive / Owens Drive	Signal	AM	16	B	17	B	16	B	17	B	16	B	20	B	20	B	20	B	21	C	23	C
		PM	29	C	30	C	33	C	34	C	34	C	37	D	38	D	38	D	31	C	31	C
5. Santa Rita Road / Rosewood Drive	Signal	AM	9	A	9	A	9	A	9	A	10	A	8	A	8	A	9	A	8	A	8	A
		PM	17	B	17	B	19	B	20	B	21	C	22	C	22	C	23	C	26	C	27	C
6. Santa Rita Road / Pimlico Drive	Signal	AM	21	C	24	C	21	C	22	C	22	C	21	C	21	C	22	C	21	C	21	C
		PM	26	C	26	C	20	B	19	B	20	B	19	B	19	B	19	B	22	C	22	C
7. Foothill Road / Stoneridge Drive	Signal	AM	19	B	20	B	23	C	24	C	23	C	24	C	25	C	25	C	31	C	31	C
		PM	19	B	19	B	21	C	21	C	21	C	21	C	21	C	21	C	21	C	21	C
8. Stoneridge Drive / Springdale Avenue	Signal	AM	17	B	18	B	18	B	18	B	18	B	18	B	19	B	19	B	22	C	22	C
		PM	25	C	25	C	37	D	38	D	39	D	38	D	38	D	38	D	27	C	27	C
9. Stoneridge Drive / Stoneridge Mall Road	Signal	AM	7	A	7	A	15	B	16	B	17	B	15	B	16	B	16	B	11	B	11	B
		PM	27	C	25	C	35	C	36	D	36	D	35	C	35	C	36	D	22	C	22	C
10. Stoneridge Drive / Johnson Drive	Signal	AM	11	B	11	B	10	A	11	B	11	B	11	B	10	A	11	B	11	B	11	B
		PM	16	B	16	B	14	B	14	B	14	B	14	B	14	B	14	B	14	B	14	B
11. Stoneridge Drive / Hopyard Road	Signal	AM	25	C	25	C	31	C	31	C	26	C	31	C	31	C	26	C	28	C	28	C
		PM	36	D	35	C	34	C	34	C	32	C	34	C	35	C	32	C	29	C	30	C
12. Stoneridge Drive / Hacienda Drive	Signal	AM	23	C	25	C	22	C	25	C	25	C	24	C	25	C	25	C	25	C	26	C
		PM	23	C	23	C	21	C	21	C	21	C	21	C	21	C	21	C	21	C	21	C
13. Owens Drive / West Las Positas Boulevard	Signal	AM	10	A	10	A	10	A	10	A	10	A	11	B	11	B	11	B	11	B	12	B
		PM	13	B	13	B	14	B	14	B	14	B	16	B	16	B	15	B	15	B	16	B
14. West Las Positas Boulevard / Santa Rita Road	Signal	AM	24	C	27	C	25	C	26	C	27	C	30	C	31	C	33	C	28	C	31	C
		PM	23	C	23	C	25	C	25	C	25	C	31	C	30	C	28	C	24	C	24	C
15. Foothill Road / West Las Positas Boulevard	Signal	AM	14	B	14	B	17	B	18	B	18	B	18	B	18	B	18	B	32	C	33	C
		PM	11	B	11	B	13	B	14	B	14	B	14	B	14	B	14	B	14	B	13	B
16. West Las Positas Boulevard / Hopyard Road	Signal	AM	24	C	24	C	27	C	27	C	24	C	27	C	27	C	24	C	30	C	29	C
		PM	37	D	41	D	32	C	32	C	27	C	33	C	33	C	29	C	28	C	28	C
17. West Las Positas Boulevard / Hacienda Drive	Signal	AM	15	B	19	B	16	B	19	B	19	B	17	B	18	B	18	B	20	B	20	B
		PM	14	B	15	B	16	B	17	B	16	B	16	B	17	B	16	B	18	B	18	B
18. Stoneridge Drive / West Las Positas Boulevard	Signal	AM	21	C	21	C	26	C	28	C	29	C	28	C	28	C	28	C	36	D	40	D
		PM	24	C	26	C	37	D	37	D	36	D	37	D	37	D	36	D	33	C	34	C

TABLE 3
INTERSECTION LEVEL OF SERVICE SUMMARY

Intersection	Traffic Control	Peak Hour	Existing[1] (Scenario 1)		Existing Plus Project (Scenario 2)		Existing Plus Approved Projects (Scenario 3)		Existing Plus Approved Projects Plus Project (Scenario 4a)		Existing Plus Approved Projects Plus Project Plus El Charro Road Extension (Scenario 4b)		Existing Plus Approved Projects Plus Pending Projects (Scenario 5)		Existing Plus Approved Projects Plus Pending Projects Plus Project (Scenario 6a)		Existing Plus Approved Projects Plus Pending Projects Plus El Charro Road Extension (Scenario 6b)		Cumulative Without Project (Scenario 7)		Cumulative With Project (Scenario 8)	
			Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS
19. Stoneridge Drive / Santa Rita Road	Signal	AM	29	C	31	C	36	D	36	D	36	D	37	D	38	D	38	D	44	D	48	D
		PM	28	C	29	C	30	C	29	C	26	C	32	C	30	C	26	C	33	C	32	C
20. Santa Rita Road / Mohr Avenue	Signal	AM	16	B	18	B	16	B	17	B	17	B	16	B	18	B	17	B	16	B	17	B
		PM	15	B	16	B	15	B	17	B	15	B	16	B	17	B	16	B	15	B	16	B
21. Santa Rita Road / Valley Avenue	Signal	AM	35	C	36	D	36	D	37	D	35	C	36	D	37	D	35	C	41	D	41	D
		PM	44	D	45	D	39	D	40	D	39	D	38	D	40	D	38	D	42	D	43	D
22. Valley Avenue / Busch Road	Signal	AM	11	B	13	B	9	A	11	B	11	B	9	A	11	B	11	B	17	B	18	B
		PM	7	A	12	B	7	A	12	B	27	C	7	A	12	B	25	C	41	D	53	D
23. Bernal Avenue / I-680 NB Ramps	Signal	AM	21	C	28	C	24	C	24	C	24	C	23	C	24	C	24	C	21	C	22	C
		PM	12	B	12	B	12	B	11	B	12	B	12	B	11	B	11	B	10	A	10	A
24. Koll Center Drive / Bernal Avenue	Signal	AM	6	A	6	A	16	B	17	B	17	B	16	B	17	B	17	B	22	C	23	C
		PM	3	A	3	A	30	C	24	C	31	C	30	C	24	C	24	C	36	D	31	C
25. Bernal Avenue / Valley Avenue	Signal	AM	29	C	32	C	***57***	***E***	37	D	36	D	***56***	***E***	36	D	35	C	***56***	***E***	52	D
		PM	22	C	23	C	49	D	36	D	36	D	48	D	36	D	36	D	45	D	39	D
26. Stanley Boulevard / Santa Rita Road	Signal	AM	16	B	17	B	19	B	19	B	21	C	19	B	18	B	21	C	25	C	23	C
		PM	22	C	23	C	16	B	17	B	15	B	16	B	17	B	16	B	16	B	16	B
27. Stanley Boulevard / First Street	Signal	AM	16	B	18	B	11	B	11	B	11	B	11	B	11	B	11	B	11	B	12	B
		PM	13	B	14	B	12	B	12	B	13	B	12	B	12	B	13	B	17	B	18	B
28. Stanley Boulevard at Bernal Avenue / Valley Avenue	Signal	AM	48	D	42	D	53	D	46	D	50	D	55	D	49	D	49	D	41	D	46	D
		PM	46	D	43	D	34	C	36	D	41	D	35	C	34	C	41	D	43	D	41	D
29. Bernal Avenue / Vineyard Drive (N)	Signal	AM	15	B	15	B	18	B	18	B	17	B	18	B	18	B	18	B	24	C	24	C
		PM	11	B	11	B	11	B	11	B	11	B	11	B	11	B	11	B	12	B	12	B
30. Bernal Avenue / Vineyard Drive (S)	Signal	AM	16	B	16	B	21	C	23	C	23	C	21	C	23	C	24	C	40	D	36	D
		PM	9	A	11	B	11	B	11	B	11	B	11	B	11	B	11	B	12	B	12	B
31. Junipero Street / Sunol Boulevard	Signal	AM	29	C	31	C	40	D	39	D	41	D	40	D	39	D	40	D	***56***	***E***	50	D
		PM	21	C	21	C	22	C	22	C	22	C	23	C	23	C	22	C	27	C	24	C
32. Stoneridge Drive / El Charro Road	Signal	AM	*Intersection Does Not Exist*		*Intersection Does Not Exist*		19	B	21	C	27	C	21	C	21	C	27	C	39	D	40	D
		PM					23	C	23	C	27	C	23	C	23	C	28	C	32	C	32	C
33. Stanley Boulevard / El Charro Road	Signal	AM	*Intersection Does Not Exist*		*Intersection Does Not Exist*		*Intersection Does Not Exist*		*Intersection Does Not Exist*		28	C	Intersection Does Not Exist		Intersection Does Not Exist		32	C	***64***	***E***	54	D
		PM									21	C					21	C	36	D	32	C

Notes: [1.] Based on intersection turning movement volumes and intersection geometries provided to Fehr & Peers by City of Pleasanton.
Bold indicates gateway intersection, potentially exempt from the LOS D standard. ***Bold Italics*** indicates potentially significant impact.
Source: Fehr & Peers and City of Pleasanton, 2011.