FEHR PEERS

MEMORANDUM

Date: July 26, 2012

To: Michael Penrod and Chad Penrod, Parkstone Companies
Cc: Tony Locacciato, Meridian Consultants

From: Netai Basu and Miguel Nunez

Subject: ***Traffic Analysis of Hallock Drive Corridor – East Gateway Project Santa Paula, CA***

Ref: SM11-2482

In October 2011, Fehr & Peers evaluated the potential traffic impacts of the proposed East Gateway Project development and prepared a traffic memorandum to summarize the preliminary results of traffic impact analysis at 35 existing and 36 future intersections throughout the City of Santa Paula. Since that analysis was completed, modifications were made to the traffic volume forecasts. To supplement the analysis in the previous traffic memorandum, Fehr & Peers conducted an additional focused analysis of the Hallock Drive Corridor for the East Gateway Project to assess future traffic operations in compliance with Caltrans' request for the use of the Highway Capacity Manual (HCM) methodology.

This memorandum summarizes our focused traffic review of six intersections in the vicinity of the proposed East Gateway Project, including key intersections along SR 126, Hallock Drive, and Telegraph Road in Santa Paula.

PROJECT DESCRIPTION

The Limoneira Company is leading the planning effort to develop East Gateway Project, composed of approximately 140 acres of unincorporated agricultural and developed land at the eastern edge of Santa Paula. The specific plan area is generally bounded on the east by agricultural lands, on the south by the Santa Clara River, on the west by Haun Creek, and on the north by East Area 1 and by land south of SR-126 that lies within the current city limits. Access to East Gateway Project is provided by Telegraph Road, SR-126 and Hallock Drive. The proposed East Gateway Project would allow a maximum development within the project site as listed below. A specific plan is being prepared for the area southeast of SR 126 & Hallock Drive.

1. 560,000 square feet (sf) of retail/shopping center space
2. 68,500 sf of business park space
3. 215,000 sf of general light industrial space
4. 56,000 sf for manufacturing uses

5. In the specific plan area, up to 350,000 sf of business park development could be substituted for 300,000 sf of retail/shopping center space.

This analysis assumed the worst-case scenario, in terms of the intensity of traffic generated on the site: business park development was assumed in the analysis of AM peak hour conditions and retail/shopping center was assumed in the analysis of PM peak hour conditions. The project is estimated to generate up to approximately 20,892 net new daily trips, including approximately 1,007 trips in the weekday AM peak hour and approximately 2,269 trips in the weekday PM peak hour under the most conservative trip generation estimates.

ANALYSIS METHODOLOGY

The purpose of this analysis is to supplement the traffic analysis already performed using the intersection capacity utilization (ICU) methodology, as shown in the previous October 27, 2011 memorandum. Although the ICU methodology is the City's preferred method for analyzing intersections operations, the "Operational Analysis" method from *Highway Capacity Manual* (HCM) (Transportation Research Board, 2000) was employed to perform analysis for the selected six study intersections in the Hallock Drive Corridor, in accordance with policies established by the California Department of Transportation (Caltrans). The analysis was performed to assist the engineering team with determining the roadway intersection lane configuration necessary to accommodate projected future demand and developing mitigation measures that would mitigate the project traffic impacts, as well as to satisfy the Caltrans traffic impact analysis guidelines of applying the HCM methodology.

The HCM operational method determines two key operating characteristics of signalized intersections. The first characteristic is the average stopped delay experienced per vehicle. The second is the volume-to-capacity (V/C) ratio at intersections based on the amount of traffic traveling through the intersection, the lane geometries, and other factors affecting capacity such as on-street parking, bus operations near the intersection, and pedestrian volumes at the street crosswalks. These characteristics are used to evaluate the operation of each signalized intersection, which is described generally in terms of LOS based on delay. LOS categories range from excellent, nearly free-flow traffic at LOS A to overloaded, stop-and-go conditions at LOS F.

Table 1 provides LOS definitions for signalized intersections using the HCM methodology. Table 2 provides LOS definitions for stop-controlled intersections using the HCM methodology. The LOS definitions, ranges of delay, and ranges of V/C ratio shown in these tables represent average conditions for all vehicles at an intersection across an entire hour. Delays longer than the average condition are experienced by motorists on certain movements and/or during peak times within the peak hour.

TABLE 1
LEVEL OF SERVICE DEFINITIONS FOR SIGNALIZED INTERSECTIONS

Level of Service	Average Stopped Delay per Vehicle (seconds)	Definition
A	≤10	EXCELLENT. No vehicle waits longer than one red light and no approach phase is fully used.
B	>10 and ≤20	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	>20 and ≤35	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	>35 and ≤55	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	>55 and ≤80	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	>80	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths

Source: *Highway Capacity Manual,* Transportation Research Board, 2000.

TABLE 2
LEVEL OF SERVICE DEFINITIONS FOR
STOP-CONTROLLED INTERSECTIONS

Level of Service	Average Control Delay (seconds/vehicle)
A	≤ 10.0
B	> 10.0 and ≤ 15.0
C	> 15.0 and ≤ 25.0
D	> 25.0 and ≤ 35.0
E	> 35.0 and ≤ 50.0
F	> 50.0

Source: *Highway Capacity Manual,* Transportation Research Board, 2000.

The HCM stop-controlled methods were used to determine operating characteristics of the stop-controlled intersections analyzed in this study. These methods base LOS on the V/C ratio and the average stopped delay experienced per vehicle. The HCM 2000 methodology for signalized and all-way stop-controlled intersections estimates the average control delay for the vehicle at the intersection. For side-street stop-controlled intersections, the methodology estimates the control delays for each turning movement and identifies the delay for the longest delayed approach (if there is a shared lane, delay is averaged for all turning movements from that lane).

Caltrans general traffic impact analysis guidelines state that the transition between LOS C and LOS D (for signalized intersections this equates to 35 seconds of delay) is the desirable operating condition at state highway intersections, but "acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS." The Transportation Concept Report (TCR) for SR-126, however, states that LOS E is the minimum standard to be achieved. The TCR states that the recommended concept for SR-126 is "to maintain the existing 4 conventional/mixed flow facility for all segments from Route 101 in Ventura County to I-5 in Los Angeles County," yet also shows that the "Ultimate Transportation Concept is to preserve the right-of-way in segments 3 [east of Hallock Drive], 4, 5, and 6 for the possibility of future additional lanes, if necessary." This suggests that the proposed widening in the area around Hallock Drive may be acceptable to Caltrans. These ambiguities can be resolved once we initiate contact with Caltrans staff regarding specific improvement concepts. However,

the significant impact criteria used in this analysis was LOS C for the intersections in the City of Santa Paula (including SR 126 & Hallock Drive) and LOS D for intersections under Caltrans jurisdiction, namely SR-126 & Hallock Drive.

For all of the analyzed intersections, the Synchro software (version 6.14) was used to calculate delays and associated levels of service. Using the Synchro software and its embedded intersection micro-simulation model, SimTraffic, provided a corridor view to assess future traffic operations at each location in the corridor including the effect of upstream and downstream intersections, rather than as a series of isolated intersections. This analysis incorporated the current signal timing plans that were obtained from Caltrans and applies the HCM 2000 methodology. This analysis is based on preliminary roadway design drawings for the Hallock Drive corridor, including how access would be provided to the Specific Plan area.

ANALYZED INTERSECTIONS AND SCENARIOS

Six intersections immediately adjacent to the proposed East Gateway Project development were selected for additional HCM analysis. The intersections selected include both signalized and unsignalized intersections, as well as intersections that currently do not exist but will be built as part of the project or as part of East Area One. The future grade crossing on Hallock Drive north of Telegraph Road was included in the Synchro network as an intersection with no traffic volumes on the east and west approaches. This was done to allow for the analysis of a gate-down event if it is determined to be necessary. Because of the infrequent use of the rail line, this analysis did not assume that trains would be present and is focused on the traffic operations under typical weekday peak conditions.

The six analyzed intersections along with their control type are listed below:

1. Santa Paula Street & Hallock Drive (future signalized intersection)
2. Telegraph Road & Hallock Drive (Currently 2-way stop-controlled; to be signalized in the future)
3. SR-126 & Hallock Drive (signalized)
4. Old Hallock Drive/Northern Project Driveway & Hallock Drive (2-way stop-controlled)
5. Hallock Drive & Southern Project Driveway (future intersection; 2-way stop-controlled)
6. SR-126 & Project Driveway (future intersection; minor approach stop-controlled)

Five scenarios were analyzed during the typical weekday afternoon (PM) peak hour, and are:

- Existing
- Existing plus Project
- Future No Project
- Future with Project
- Future with Project with Mitigations

Only the weekday afternoon PM peak hour was selected for analysis because it represents the most conservative scenario. It has the highest traffic demand on nearly all turning movements, resulting in worse traffic conditions than the weekday AM peak hour. Any proposed roadway configuration or improvements developed based on the traffic review of the PM peak hour are expected to improve traffic operations during the AM peak hour.

HCM LEVEL OF SERVICE ANALYSIS FINDINGS

Assumptions regarding the lane configurations for each of the five scenarios analyzed are summarized in Figures 1 and 2. Table 3 summarizes the level of service results for all intersections across all scenarios based on the HCM methodology using Synchro.

Existing Conditions

Of the six analyzed intersections, SR-126 & Hallock Road (Intersection #3) is the only intersection that is currently signalized. This intersection is currently operated by Caltrans with a Type 170 Signal Controller. The signal timing plan data was received from Caltrans in December 2011. This intersection currently runs free with no specific cycle length and vehicles on each approach can actuate the maximum assigned green time as necessary. Based on filed observations, the average cycle length ranged between 120 to 150 seconds.

Currently, all existing intersections operate at acceptable levels of service.

Existing plus Project Conditions

Under Existing plus Project Conditions, the level of service at three of the intersections would degrade to an unacceptable level or service, and cause an impact:

- 2. Telegraph Road & Hallock Drive (LOS F)
- 3. SR-126 & Hallock Drive (LOS F)
- 4. Old Hallock Drive/Northern Project Driveway & Hallock Drive (LOS E)

Future No Project Conditions

For Future No Project Conditions, Hallock Drive will be extended north to the provide access to the future development in East Area One. Operation of the future signalized intersection of Santa Paula Street & Hallock Drive intersection was assumed to be coordinated with those to the south. The signal cycle length, timing and phasing for all analyzed signals in the Hallock Drive corridor were optimized in the analysis of all future scenarios to accommodate the forecast turning movement volumes. Assumed lane configurations are consistent with the improvements required per the final EIR and development agreement for East Area One.

Under Future No Project Conditions, the level of service at two of the intersections would degrade to an unacceptable level or service:

- 2. Telegraph Road & Hallock Drive (LOS F)
- 3. SR-126 & Hallock Drive (LOS F)

Future with Project Conditions

Under Future with Project Conditions, the level of service at three of the intersections would degrade to undesirable levels of service, namely,

- 2. Telegraph Road & Hallock Drive (LOS F)
- 3. SR-126 & Hallock Drive (LOS F)
- 4. Old Hallock Drive/Northern Project Driveway & Hallock Drive (LOS F)

Mitigation measures were developed for these three impacted intersections.

MITIGATION MEASURES

The additional improvements described below would result in acceptable levels of service at these locations and acceptable traffic operations in the Hallock Drive corridor, as summarized in Table 3. Figure 3 shows the loaded Synchro network under future with project with mitigation conditions.

Intersection 2: Telegraph Road & Hallock Drive

To mitigate the project impact at Telegraph Road & Hallock Drive and allow this intersection to operate at an acceptable level (LOS C) under the City's guidelines would require:

- Widening the northbound approach to provide an additional northbound left-turn lane.
- Restriping the eastbound approach to provide a shared though left-turn lane and a right-turn lane.
- Restriping the westbound approach to provide a shared though left-turn lane and a right-turn lane.
- Operating a 120-second cycle length and optimizing splits.
- Providing an overlap phase for the eastbound right-turn movement.
- The southbound left-turn lane is not needed to achieve the desired LOS, but would be helpful to store the few left-turning vehicles there and would also use the road space that would be present opposite the northbound dual left-turn lanes.

Implementing the mitigation measures described above would mitigate the impact and bring intersections operations to LOS C, as can be seen in Table 3.

Intersection 3: SR-126 & Hallock Drive

Achieving LOS D (per the HCM methodology) and LOS C (per the ICU methodology) at SR-126 & Hallock Drive would require:

- Widening the northbound approach to provide an additional northbound left-turn lane and an additional northbound through-lane. These dual left-turn lanes would complement those on the southbound approach.
- Operating a 120-second cycle length and optimizing splits.

Intersection 5: Old Hallock Drive/Project Driveway & Hallock Drive

Achieving an acceptable level of service at Old Hallock Drive/Project Driveway & Hallock Drive would require signalizing the intersection.

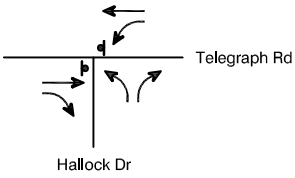
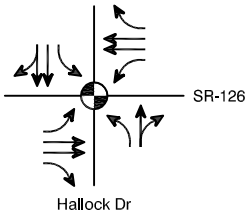
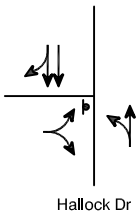
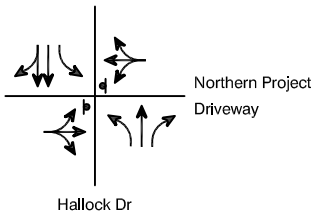
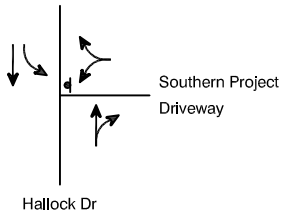
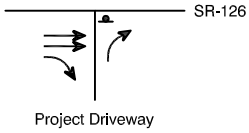
As summarized in Table 3, implementing the mitigation measures described above and shown in Figure 2 would result in no residual project traffic impacts at these intersections, and would greatly improve future traffic operations in the corridor.

Please contact us at (310) 458-9916 or by email if you have any questions or comments about this.

TABLE 3
SUPPLEMENTAL WEEKDAY AFTERNOON PEAK HOUR TRAFFIC ANALYSIS USING 2000 HCM METHODOLOGY
EAST GATEWAY PROJECT

Int. #	Intersection	Intersection Level of Service (Weekday PM peak hour)																	
		Existing				Existing + Project			Future No Project				Future w/ Project			Future w/Project w/Mitigation			
		Control	Type of Delay	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Sig. Impact?	Control	Type of Delay	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Sig. Impact?	Mitigation	Delay (sec/veh)	LOS	Residual Impact?
1	Santa Paula Street & Hallock Dr	n/a		n/a		n/a			Signal	Average Delay	14.4	A	21.9	C	No	No Mitigation Needed			n/a
2	Telegraph Rd & Hallock Dr	TWSC	Average	8.9	A	168.9	F	Yes	Signal	Average	103.1	F	101.6	F	Yes	Add a second NBL	28.4	C	No
			Worst-Movement	18.0	C	>300	F												
3	SR-126 & Hallock Dr	Signal	Average Delay	18.6	B	>300	F	Yes	Signal	Average Delay	58.4	E	144.8	F	Yes	Add second NBL and a second NBT	53.4	D	No
4	Old Hallock Dr/Northern Project Driveway & Hallock Dr	TWSC	Average	2.0	A	37.8	E	Yes	TWSC	Average	2.6	A	>300	F	Yes	Signalization	11.2	B	No
			Worst-Movement	10.2	B	>300	F			Worst-Movement	14.6	B	>300	F					
5	Hallock Dr & Southern Project Driveway	TWSC	Average	n/a		3.2	A	No	TWSC	Average	n/a		3.1	A	N/A	No Mitigation Needed			n/a
			Worst-Movement	n/a		9.7	A	No		Worst-Movement	n/a		10.8	B					
6	SR126 & Project Driveway	TWSC	Average	n/a		0.3	A	No	TWSC	Average	n/a		0.6	A	N/A	No Mitigation Needed			n/a
			Worst-Movement	n/a		15.0	B	No		Worst-Movement	n/a		40.2	E					

TWSC: Two-Way Stop-Controlled.

	EXISTING CONDITIONS	EXISTING PLUS PROJECT CONDITIONS
1. Santa Paula St & Hallock Dr	Future Intersection	SAME AS EXISTING CONDITIONS
2. Telegraph Rd & Hallock Dr		SAME AS EXISTING CONDITIONS
3. SR-126 & Hallock Dr		SAME AS EXISTING CONDITIONS
4. Old Hallock Dr/ Northern Project Driveway & Hallock Dr		
5. Southern Project Driveway & Hallock Dr	Future Intersection	
6. SR-126 & Project Driveway	Future Intersection	

LEGEND

- Traffic Signal
- Stop Sign

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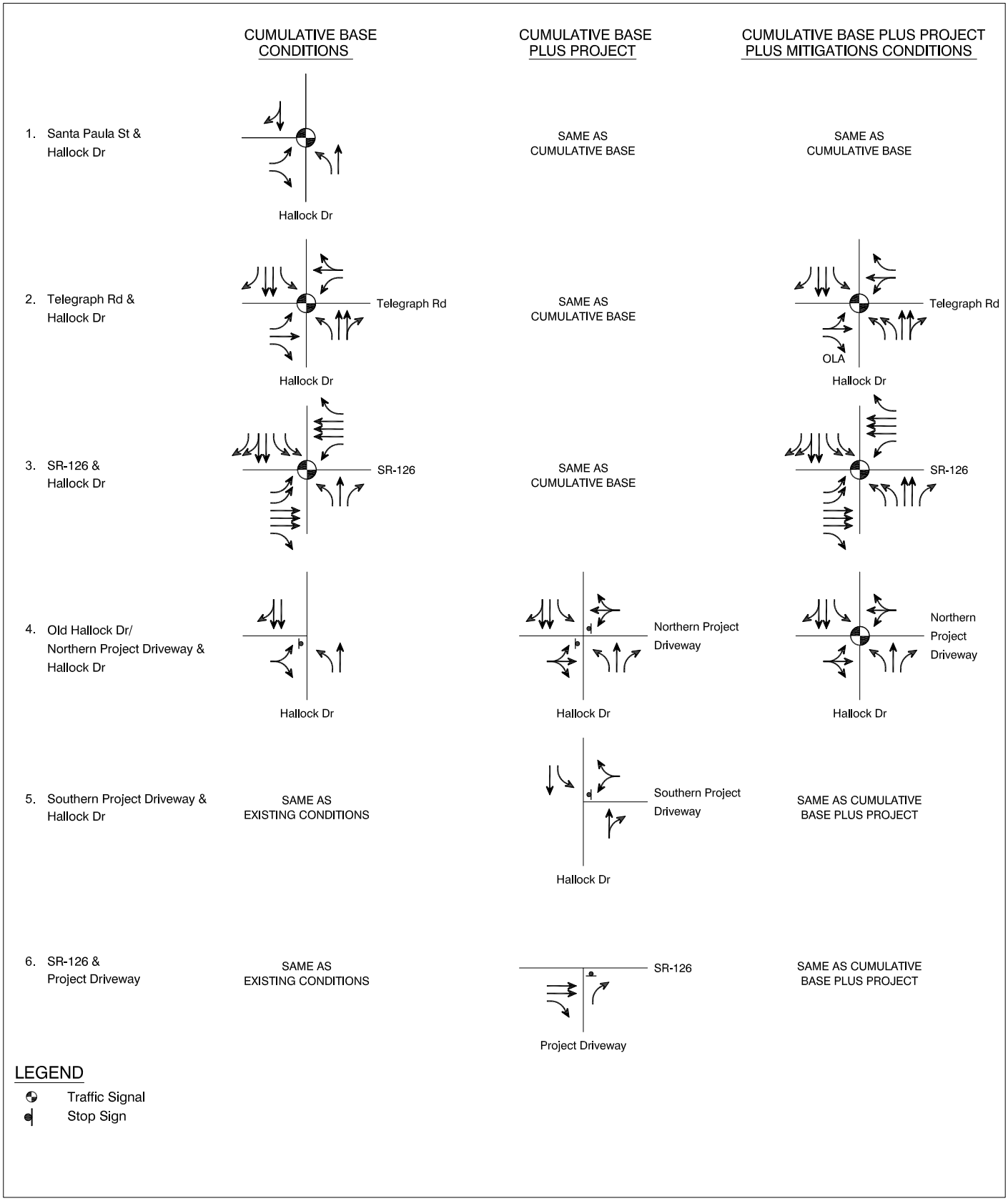
INTERSECTION LANE CONFIGURATIONS

Dec 15, 2011
N:\PROJECTS\Los Angeles\SM11-2482 EA2\Graphics\ACAD\EA2_Lane Configs.dwg

FIGURE 1



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INTERSECTION LANE CONFIGURATIONS

Dec 15, 2011
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FIGURE 2

FIGURE 3
FUTURE WITH PROJECT WITH MITIGATIONS
SYNCHRO LOADED NETWORK SCRENSHOT