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MEMORANDUM

Date: September 10, 2009

To: Scott Creer, City of Morgan Hill

From: Daniel Rubins, P.E. and Jason Nesdahl, P.E.

Subject: ***Hale Avenue/Santa Teresa Boulevard Extension – Neighborhood Street Analysis***
SJ09-1121

This neighborhood street analysis estimates shifts in traffic associated with a new 2-lane multi-modal arterial extension of Hale Avenue/Santa Teresa Boulevard between Main Avenue and Spring Avenue in Morgan Hill. Traffic forecasts were based on output from a new Morgan Hill travel demand model developed by Fehr & Peers. During the process of our work in preparing new future year forecasts, we determined that the Hale Avenue/Santa Teresa Boulevard extension only requires two travel lanes in this section by 2030. In the current General Plan Circulation Element, the Santa Teresa Boulevard extension was planned to include four travel lanes (two in each direction) between Tilton Avenue and Spring Avenue.

The purpose of the extension is to complete a new north-south arterial that provides a direct route for residents to travel within and through the City of Morgan Hill. This connection would provide an alternate to Monterey Road that would primarily serve traffic on the west side of Morgan Hill on an appropriate facility. Currently, vehicles use local residential and minor collector streets to travel through and within this area. This new connection would reduce the volume on some residential streets that were not designed to carry the volume that is present today.

This memorandum presents the estimates of the change in weekday daily traffic on local streets due to the two-lane Hale Avenue/Santa Teresa Boulevard extension between Main Avenue and Spring Avenue. This analysis was completed under Existing Conditions and Year 2030 Current General Plan Conditions for 14 existing roadway segments and two (2) future segments presented on Figure 1 and listed below:

1. Dewitt Ave between Main Ave and Via Grande
2. Dewitt Ave between Spring Ave and Origlia Ln
3. Peak Ave between Marcia Dr and Claremont Dr
4. Peak Ave between Alkire Ave and Noble Ct
5. Sunnyside Ave between West Edmundson Ave and La Vista Ct
6. Hale Ave between Hillwood Ln and Wright Ave
7. Monterey Rd between Wright Ave and El Toro St
8. Monterey Rd between 3rd St and 4th St
9. Monterey Rd between San Pedro Ave and Cosmo Ave
10. West Main St between Hale Ave and Del Monte Ave
11. Dunne Ave between Dewitt Ave and La Selva Dr
12. Dunne Ave between Peak Ave and Viewcrest Ln

13. Edmundson Ave between Dewitt Ave and Sunnyside Ave
14. Edmundson Ave between Sunnyside Ave and Olympic Dr
15. Hale Ave/Santa Teresa Blvd between Main St and Dunne Ave (Future Extension)
16. Hale Ave/Santa Teresa Blvd between Dunne Ave and Spring Ave (Future Extension)

These daily roadway segment counts were conducted between October 2007 and January 2009.

LAND USE AND NETWORK ASSUMPTIONS

This analysis is based on the *2001 General Plan* and uses the land use and planned roadway assumptions for the base year (2007) and Year 2030 Current General Plan Conditions presented in the *Morgan Hill Travel Demand Forecasting Model & Future Improvements Study* (Fehr & Peers, June 2009). The key roadway assumptions are: 1) construction of a 2-lane multi-modal arterial extension of Hale Avenue/Santa Teresa Boulevard extension from Main Avenue to Spring Avenue, and 2) closure of DeWitt Avenue between Price Drive and Spring Avenue. The ultimate access configuration of the DeWitt Avenue closure would be determined upon design and construction of the Hale Avenue/Santa Teresa Boulevard extension as a 2-lane multi-modal arterial between Main Avenue and Spring Avenue.

FORECAST METHOD

The daily roadway forecasts were developed based on the guidelines published in *National Cooperative Highway Research Program (NCHRP) Report 255*[1]*,* which were applied to refine the raw model forecasts. This method uses the difference and/or ratio between counts and model volumes and adjusts the existing volume to provide reasonable future forecasts. Ultimately, forecasts were developed for Existing Conditions with the Hale Avenue/Santa Teresa Boulevard extension and Year 2030 Current General Plan Conditions with and without the extension.

ROADWAY SEGMENT LEVEL OF SERVICE

Roadway segments in Morgan Hill were analyzed using comparison of the daily volume to threshold volumes for various roadway types presented in **Table 1**. It is important to note that daily volume thresholds are used for planning purposes and traffic during peak periods may result in worse operations than illustrated by the daily LOS. The City of Morgan Hill does not have a formally adopted roadway segment operating standard. Thus, for the purposes of this analysis and to be consistent with planning efforts in Morgan Hill and other jurisdictions, LOS D was used as a guideline for the long-range planning evaluation of daily segment volumes.

[1] National Cooperative Highway Research Program (NCHRP). *Report 255: Highway Traffic Data for Urbanized Area Project Planning and Design.* Washington, D.C.: National Academy Press, 1982.

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TABLE 1
DAILY TWO-WAY ROADWAY SEGMENT LEVEL OF SERVICE DEFINITIONS

Roadway Type	Maximum Daily Volume (both directions except freeways)				
	LOS A	LOS B	LOS C	LOS D	LOS E
2-Lane Undivided Arterial[3]			9,100	16,700	17,700
2-Lane Divided Arterial[3]			9,700	17,600	18,700
4-Lane Undivided Arterial[3]			17,500	27,400	28,900
4-Lane Divided Arterial[3]			19,200	35,400	37,400
2-Lane Collector[4]	2,600	5,200	7,800	11,000	12,900

Notes:

1 The LOS capacity thresholds are based on HCM 2000 methodology and are generally appropriate for suburban and rural areas.

2 Non-directional peak hour traffic volumes are assumed to be 10% of the daily traffic volume. Directional split is assumed 70/30. For 2-lane arterial and 4-lane undivided arterial a directional split of 60/40 is assumed. All volumes are approximate and assume ideal roadway characteristics.

3 LOS A and B are not defined for arterial roadways using the HCM 2000 methods.

4 For collector roadway segments, capacity is based on the neighborhood quality of life rather than the physical carrying capacity of the road. This assumes a standard suburban neighborhood, 40-foot roadway width, and 25 mile per hour speed limit with normal speed violation rates.

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

EXISTING CONDITIONS

The change in average daily traffic (ADT) shown in **Table 2** was determined by subtracting the Existing Conditions model runs with and without the Hale Avenue/Santa Teresa Boulevard extension. Measured against City of Morgan Hill LOS standards, all of the roadway segments will operate at an acceptable level (i.e., LOS D or better) under Existing Conditions without or with the Hale Avenue/Santa Teresa Boulevard extension.

The following key changes in volume are projected to occur with the Hale Avenue/Santa Teresa Boulevard extension in place under Existing Conditions:

- Shift from Monterey Road between Main Avenue and Dunne Avenue: Monterey Road will decrease by 4,680 vehicles per day (vpd) as a substantial proportion of those vehicles will shift to Hale Avenue/Santa Teresa Boulevard from Main Avenue to Dunne Avenue. This shift from Monterey Road moves traffic from Main Avenue between Hale Avenue/Santa Teresa Boulevard and Monterey Road to Dunne Avenue. In addition, traffic is expected to decrease on Main Avenue between Hale Avenue and Monterey Road by 2,640 vpd and will increase Dunne Avenue between Hale Avenue/Santa Teresa Boulevard and Monterey Road by roughly 3,600 vpd.

- Shift from DeWitt Avenue between Main Avenue and Spring Avenue: With the closure of DeWitt Avenue from Price Drive to Spring Avenue, DeWitt Avenue south of Main Avenue decreases by 1,720 vpd. A similar shift would occur with the new extension even if DeWitt Avenue to Hale Avenue/Santa Teresa Boulevard were left open, which indicates latent demand for Hale Avenue/Santa Teresa Boulevard between Dunne Avenue and Spring Avenue. Existing neighborhood street traffic will also shift from Peak Avenue and Dunne Avenue (west of extension) to the Hale Avenue/Santa Teresa Boulevard between Main Avenue and Spring Avenue.

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TABLE 2
EXISTING CONDITIONS
WITHOUT AND WITH HALE AVE/SANTA TERESA BLVD EXTENSION
DAILY TWO-WAY ROADWAY SEGMENT LEVELS OF SERVICE

Roadway Segment	Existing Conditions					
		Without Extension		With Extension		
	Roadway Type	ADT[1]	LOS[2]	ADT[1]	LOS[2]	Δ in ADT[3]
1. Dewitt Ave between Main Ave and Via Grande	2-Lane Local Street	2,320	B	600	A	-1,720
2. Dewitt Ave between Spring Ave and Origlia Ln	2-Lane Undivided Arterial	4,000	C	5,200	C	1,200
3. Peak Ave between Marcia Dr and Claremont Dr	2-Lane Collector	1,660	A	1,600	A	-60
4. Peak Ave between Alkire Ave and Noble Ct	2-Lane Collector	4,960	B	4,400	B	-560
5. Sunnyside Ave between West Edmundson Ave and La Vista Ct	2-Lane Undivided Arterial	6,360	C	7,000	C	640
6. Hale Ave between Hillwood Ln and Wright Ave	2-Lane Undivided Arterial	5,900	C	6,000	C	100
7. Monterey Rd between Wright Ave and El Toro St	4-Lane Divided Arterial	15,880	C	15,800	C	-80
8. Monterey Rd between 3rd St and 4th St	4-Lane Divided Arterial	17,780	C	13,100	C	-4,680
9. Monterey Rd between San Pedro Ave and Cosmo Ave	4-Lane Divided Arterial	21,900	D	21,300	D	-600
10. West Main St between Hale Ave and Del Monte Ave	2-Lane Undivided Arterial	8,940	C	6,300	C	-2,640
11. Dunne Ave between Dewitt Ave and La Selva Dr	2-Lane Collector	3,220	B	2,700	B	-520
12. Dunne Ave between Peak Ave and Viewcrest Ln	2-Lane Undivided Arterial	6,580	C	10,200	D	3,620
13. Edmundson Ave between Dewitt Ave and Sunnyside Ave	2-Lane Undivided Arterial	5,590	C	6,000	C	410
14. Edmundson Ave between Sunnyside Ave and Olympic Dr	2-Lane Undivided Arterial	6,430	C	6,100	C	-330
15. Hale Ave/Santa Teresa Blvd between Main St and Dunne Ave	2-Lane Divided Arterial	Does Not Exist		6,800	C	6,800
16. Hale Ave/Santa Teresa Blvd between Dunne Ave and Spring Ave	2-Lane Divided Arterial	Does Not Exist		3,400	C	3,400

Notes:
[1] ADT = Average two-way daily traffic.
[2] LOS = Level of service.
Source: Fehr & Peers, August 2009.

- Shift to DeWitt Avenue between Spring Avenue and Edmundson Avenue: DeWitt Avenue increases by 1,200 vpd between Spring Avenue and Edmundson Avenue. Both Monterey Road and Edmundson Avenue (Sunnyside to Olympic) decrease with the new extension indicating that some through traffic is better served with the new facility. Sunnyside Avenue south of Edmundson Avenue increases by 640 vpd indicating an overall shift in some through traffic.

Minimal changes in daily traffic will occur on Peak Avenue, Hale Avenue and Monterey Road north of Main Avenue. The estimated daily traffic of the new Hale Avenue/Santa Teresa Boulevard extension is 3,400 to 6,800 vpd between Main Avenue and Spring Avenue under Existing Conditions.

YEAR 2030 CURRENT GENERAL PLAN CONDITIONS

Table 3 shows the daily forecasts, LOS, and change in ADT for Year 2030 Current General Plan Conditions without and with the Hale Avenue/Santa Teresa Boulevard extension. Measured against the City of Morgan Hill LOS standard, all of the study roadway segments will operate at an acceptable level of service under Year 2030 Conditions without or with the Hale Avenue/Santa Teresa Boulevard extension.

The following key changes are expected to occur with the planned extension under Year 2030 Current General Plan Conditions (with similar trends as under Existing Conditions):

- Shift from Monterey Road between Main Avenue and Dunne Avenue: Monterey Road will decrease by 3,500 vehicles per day (vpd) as a substantial proportion of those vehicles will shift to Hale Avenue/Santa Teresa Boulevard from Main Avenue to Dunne Avenue. This shift from Monterey Road increases Dunne Avenue between Hale Avenue/Santa Teresa Boulevard and Monterey Road by 2,000 daily vehicles.
- Shift from DeWitt Avenue between Main Avenue and Spring Avenue: With the closure of DeWitt Avenue from Price Drive to Spring Avenue, DeWitt Avenue south of Main Avenue decreases by 2,900 vpd. A similar shift would occur with the new extension even if DeWitt Avenue to Hale Avenue/Santa Teresa Boulevard were left open, which indicates latent demand for Hale Avenue/Santa Teresa Boulevard between Dunne Avenue and Spring Avenue. Existing neighborhood street traffic will also shift from Peak Avenue and Dunne Avenue (west of extension) to the Hale Avenue/Santa Teresa Boulevard between Main and Spring Avenues.
- Shift to DeWitt Avenue between Spring Avenue and Edmundson Avenue: DeWitt Avenue increases by 3,800 vpd between Spring Avenue and Edmundson Avenue. Both Monterey Road and Edmundson Avenue (Sunnyside to Olympic) decrease with the new extension indicating that some through traffic is better served with the new facility. Sunnyside Avenue south of Edmundson Avenue increases by 2,200 vpd indicating an overall shift in some through traffic.

Minimal changes in daily traffic occurred on Peak Avenue. The estimated daily traffic of the extension is 8,300 to 9,700 vpd between Main Avenue and Spring Avenue in 2030.

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TABLE 3
YEAR 2030 CURRENT GENERAL PLAN CONDITIONS
WITHOUT AND WITH HALE AVE/SANTA TERESA BLVD EXTENSION
DAILY TWO-WAY ROADWAY SEGMENT LEVELS OF SERVICE

Roadway Segment	Year 2030 Current General Plan Conditions					
		Without Extension		With Extension		
	Roadway Type	ADT[1]	LOS[2]	ADT[1]	LOS[2]	Δ in ADT[3]
1. Dewitt Ave between Main Ave and Via Grande	2-Lane Local Street	3,500	B	600	A	-2,900
2. Dewitt Ave between Spring Ave and Origlia Ln	2-Lane Undivided Arterial	5,200	C	9,000	C	3,800
3. Peak Ave between Marcia Dr and Claremont Dr	2-Lane Collector	1,600	A	1,600	A	0
4. Peak Ave between Alkire Ave and Noble Ct	2-Lane Collector	5,600	C	4,600	C	-1,000
5. Sunnyside Ave between West Edmundson Ave and La Vista Ct	2-Lane Undivided Arterial	8,200	C	10,400	D	2,200
6. Hale Ave between Hillwood Ln and Wright Ave	4-Lane Undivided Arterial	5,100	C	6,500	C	1,400
7. Monterey Rd between Wright Ave and El Toro St	4-Lane Divided Arterial	32,000	D	31,200	D	-800
8. Monterey Rd between 3rd St and 4th St	4-Lane Divided Arterial	28,600	D	25,100	D	-3,500
9. Monterey Rd between San Pedro Ave and Cosmo Ave	4-Lane Divided Arterial	27,500	D	25,800	D	-1,700
10. West Main St between Hale Ave and Del Monte Ave	2-Lane Undivided Arterial	5,300	C	6,200	C	900
11. Dunne Ave between Dewitt Ave and La Selva Dr	2-Lane Collector	3,600	B	3,200	B	-400
12. Dunne Ave between Peak Ave and Viewcrest Ln	4-Lane Undivided Arterial	6,600	C	8,600	C	2,000
13. Edmundson Ave between Dewitt Ave and Sunnyside Ave	2-Lane Undivided Arterial	5,600	C	5,000	C	-600
14. Edmundson Ave between Sunnyside Ave and Olympic Dr	4-Lane Undivided Arterial	12,800	C	11,300	C	-1,500
15. Hale Ave/Santa Teresa Blvd between Main St and Dunne Ave	2-Lane Divided Arterial	Does Not Exist		9,700	C	9,700
16. Hale Ave/Santa Teresa Blvd between Dunne Ave and Spring Ave	2-Lane Divided Arterial	Does Not Exist		8,300	C	8,300

Notes:
[1] ADT = Average two-way daily traffic.
[2] LOS = Level of service.

Source: Fehr & Peers, August 2009.

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EFFECT OF POTENTIALLY NARROWING MONTEREY ROAD

City staff is evaluating a number of roadway general plan amendments (GPAs) that modify the Circulation Element roadway network and land use GPAs such as the Downtown Morgan Hill Specific Plan. The roadway GPAs include a possible narrowing of Monterey Road from four to two lanes through Downtown Morgan Hill between Main and Dunne Avenues. With the possible narrowing and all other proposed GPAs, the traffic volume on the Hale Avenue/Santa Teresa Boulevard extension would increase by approximately 3,600 vehicles per day (vpd) from Main Avenue to Dunne Avenue. The estimated increase on the extension immediately south of Dunne Avenue is 400 vpd with a narrowed Monterey Road Thus, with all roadway and land use GPAs, Hale Avenue/Santa Teresa Boulevard would serve an estimated 13,300 vpd from Main Avenue to Dunne Avenue, and 8,700 vpd from Dunne Avenue to Spring Avenue. These volumes could be adequately served by the two-lane muli-modal arterial cross-section proposed for the extension.

In addition, Dunne Avenue between Hale Avenue/Santa Teresa Boulevard and Monterey Road would also experience an increase in daily traffic of 3,500 vehicles to 12,100 daily vehicles with a narrowed Monterey Road in downtown. Similar to the extension, this volume could be adequately served by a two-lane roadway. Other local streets would experience little or no change in daily traffic volume with all roadway and land use GPAs.

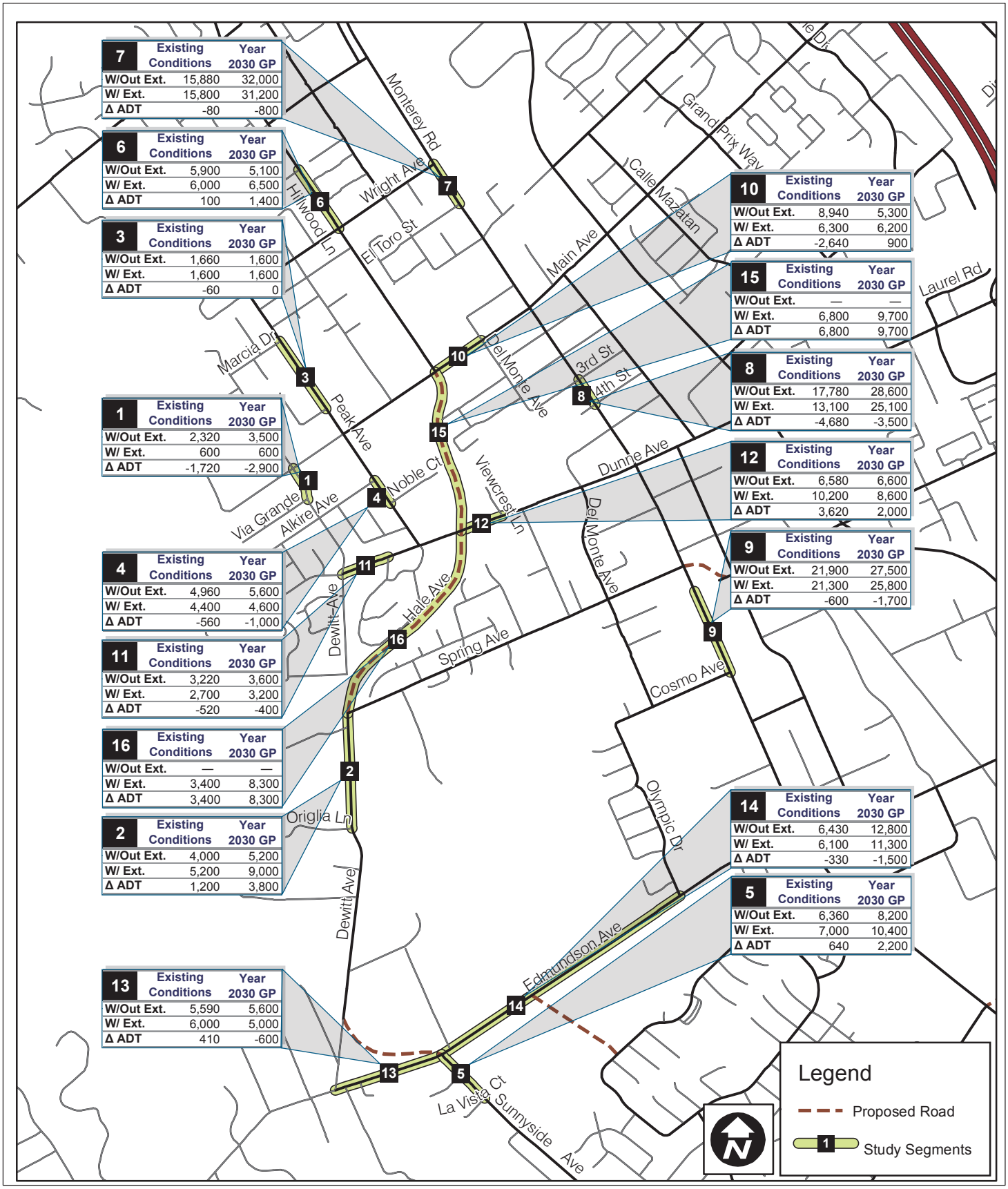
CONCLUSION

With the construction of the Hale Avenue/Santa Teresa Boulevard Extension, traffic will shift from Monterey Road, Peak Avenue, and DeWitt Avenue to the extension between Main Avenue and Spring Avenue under either Existing Conditions or Year 2030 Current General Plan Conditions. Neighborhood traffic on Peak Avenue between Wright Avenue and Dunne Avenue does not change substantially, but noticeable reductions are projected to occur on several neighborhood streets. The possible closure of DeWitt Avenue between Prince Drive and Spring Avenue does not significantly alter the daily traffic on DeWitt Avenue south of Main Avenue, indicating that the extension is needed to better serve traffic in this area. The extension is a more direct route for traffic from northwest Morgan Hill to/from the southwest Morgan Hill (Santa Teresa Boulevard and Watsonville Road) and reduces existing and future through traffic from neighborhood streets designed for local traffic.

If Monterey Road were narrowed through downtown from four to two lanes as studied for a possible separate general plan amendment, traffic would be 400 to 3,600 vehicles per day higher than shown on Figure 1 for the planned Hale Avenue/Santa Teresa Boulevard extension and Dunne Avenue east of the extension. However, these resulting volumes could be accommodated by the proposed two-lane cross-section on these roadways through Year 2030. Other local streets would experience little or no change in daily traffic volume with the possible narrowing.

Attachment:

Figure 1 - Average Daily Traffic Without and With Hale Avenue/Santa Teresa Blvd Extension



Hale Avenue / Santa Teresa Boulevard Extension

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Average Daily Traffic Without and With Hale Avenue/Santa Teresa Blvd Extension

Figure 1