



Source: Fehr & Peers, July 2013.



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## Exhibit 3.13-7 High School Project Trip Assignment



The City has generally used a minimum acceptable operating level of LOS D for unsignalized intersections; therefore, the following unsignalized study intersections would have a minimum acceptable threshold of LOS D.

- Tennant Avenue/Murphy Avenue (#10)
- Barrett Avenue/Murphy Avenue (#11)

The following unsignalized intersection would have a minimum acceptable threshold of LOS E, since it falls within the Tennant Avenue freeway zone:

- Tennant Avenue/Condit Road (#9)

For the unsignalized intersection, both the LOS threshold and peak-hour signal warrant analysis is used to identify significant traffic impacts.

### ***Impact Criteria***

#### ***Signalized Intersections***

The City of Morgan Hill has adopted the signalized intersection impact criteria as defined by the VTA; therefore, traffic impacts at City of Morgan Hill intersections would occur when the addition of traffic associated with implementation of the project causes:

1. Intersection operations to deteriorate from an acceptable level under Existing Conditions to an unacceptable level; or,
2. Exacerbation of unacceptable operations under Existing Conditions by increasing the average critical delay by more than 4 seconds and increasing the critical volume-to-capacity (V/C) ratio by 0.01 or more at an intersection operating at unacceptable LOS (LOS E or F depending on study location) under project conditions; or,
3. The V/C ratio increases by 0.01 or more at an intersection with unacceptable operations (LOS E or F depending on study location) when the change in critical delay is negative (i.e., decreases). This can occur if the critical movements change.

#### ***Unsignalized Intersections***

Level of service analysis at unsignalized intersections is generally used to determine the need for modifying intersection control type (i.e., all-way stop or signalization). As part of this evaluation, traffic volumes, delays, and traffic signal warrants are evaluated to determine if the existing intersection control is appropriate.

Significant impacts are defined to occur when an approach for two-way stop control or the intersection for all-way stop controlled locations operates at an unacceptable level (LOS E or F for

most unsignalized study locations) and the peak-hour signal warrant from the Manual on Uniform Traffic Control Devices (MUTCD) is met or exceeded under “with project” conditions.

### **Roadway Segment LOS Standard**

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 peak-hour segment volumes for all roadway segments, except for the freeway zones on Dunne Avenue (Walnut Grove Drive to Condit Road) and Tennant Avenue (Butterfield Boulevard to Condit Road), which were evaluated based on a LOS E standard.

### **Impact Criteria**

Roadway segment impacts are defined to occur when the addition of traffic from the proposed project causes:

1. Roadway segment operations to deteriorate from an acceptable level (LOS D or better) under Existing or 2030 Baseline Conditions to an unacceptable level (LOS E or worse); or
2. An increase in volume of one (1) percent in the capacity of a roadway segment that is already operating already operating unacceptably (LOS E or worse) under Existing or 2030 Baseline Conditions.

### **Freeway LOS Standard**

According to VTA’s Transportation Impact Analysis Guidelines, a freeway segment analysis should be included if the project meets one of the following requirements:

1. The proposed development project is expected to add traffic equal to at least one percent of a freeway segment’s capacity.
2. The proposed development project is adjacent to one of the freeway segment’s access or egress points.
3. Based on engineering judgment, Lead Agency staff determines that the freeway segment should be included in the analysis.

For mixed-flow lanes, freeway segment capacities are defined as 2,200 vehicles per hour per lane (vphpl) for four-lane freeway segments and 2,300 vphpl for six-lane freeway segments. HOV lane capacities are defined between 1,800 to 1,900 vphpl. The VTA’s LOS standard for freeway segments is LOS E.

### **Impact Criteria**

The implementation of the proposed project would result in a significant impact if the addition of project traffic on a freeway segment exceeded one of the following thresholds:

1. The addition of project traffic causes the operating level of a freeway segment to deteriorate from LOS E or better under Existing Conditions to LOS F; or
2. The number of new trips added by a proposed project to a segment already operating at LOS F under Existing Conditions is more than one percent of the freeway segment capacity.

### **3.13.6 - Project Impacts and Mitigation Measures**

#### **Existing Plus Project Traffic**

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**Impact TRANS-1: The proposed project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Existing Plus Project Conditions.**

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#### **Impact Analysis**

This impact evaluates roadway segment and intersection operations of the SEQ Area and the High School under Existing Plus Project conditions.

#### *SEQ Area (Program Level)*

#### **Roadways Levels of Service**

Project-generated traffic volumes were added to existing traffic volumes for each roadway segment and are presented in Table 3.13-10. Roadway types are based on the classifications as outlined in the City of Morgan Hill's General Plan.

The addition of project trips from the SEQ Area project would degrade operations on the Tennant Avenue segment between Condit Road and Murphy Avenue during both peak hours. Tennant Avenue is the major roadway that connects the SEQ Area to US 101. East of Murphy Avenue, Tennant Avenue is currently a two-lane undivided arterial, while west of Condit Avenue it is a four-lane divided arterial with a greater roadway volume capacity. It should be noted that this represents an extremely conservative worst-case scenario analysis, since it is unlikely that all the anticipated SEQ development would occur at the same time and/or in the near future. Therefore, potential impacts to the roadway segment will likely be less than represented in this Draft EIR. All other roadway segments are projected to operate at acceptable LOS D or better during both peak hours.

**Table 3.13-10: Existing Plus SEQ Area Roadway Levels of Service**

No.	Roadway Segment	Roadway Type	Peak Hour	Existing		Existing Plus Project	
				Traffic Volume	LOS	Traffic Volume	LOS
1	Dunne Avenue west of US 101	4-Lane Divided Arterial	AM	1,812	C	1,924	D
			PM	2,335	D	2,430	D
2	Dunne Avenue over US 101	Five-Lane Divided Arterial	AM	1,741	C	1,980	C
			PM	2,069	C	2,247	C
3	Dunne Avenue between US 101 and Condit Road	Six-Lane Divided Arterial	AM	1,745	C	2,073	C
			PM	1,629	C	1,866	C
4	Dunne Avenue between Condit Road and Murphy Avenue	Five-Lane Divided Arterial	AM	1,325	C	1,639	C
			PM	1,274	C	1,464	C
5	Dunne Avenue between Murphy Avenue and Hill Road	Four-Lane Divided Arterial	AM	1,383	C	1,446	C
			PM	1,254	C	1,320	C
6	Tennant Avenue west of US 101	Four-Lane Divided Arterial	AM	1,889	C	2,349	D
			PM	2,176	D	2,827	D
7	Tennant Avenue over US 101	Four-Lane Divided Arterial	AM	1,403	C	2,592	D
			PM	1,248	D	2,781	D
8	Tennant Avenue between US 101 and Condit Road	Four-Lane Divided Arterial	AM	729	C	2,636	D
			PM	752	C	3,136	D
9	Tennant Avenue between Condit Road and Murphy Avenue	Two-Lane Undivided Arterial	AM	461	C	<b>2,252</b>	<b>F</b>
			PM	555	C	<b>2,112</b>	<b>F</b>
10	Tennant Avenue between Murphy Road and Hill Road	Two-Lane Undivided Arterial	AM	312	C	964	D
			PM	313	C	814	C
11	Tennant between Hill Road and Foothill Avenue	Two-Lane Undivided Arterial	AM	127	A	235	C
			PM	117	A	247	C
12	Murphy between Dunne Avenue and San Pedro Avenue	Two-Lane Undivided Arterial	AM	231	C	604	C
			PM	186	C	426	C
13	Murphy Avenue between San Pedro Avenue and Barrett Avenue	Two-Lane Undivided Arterial	AM	178	C	547	C
			PM	170	C	364	C
14	Murphy Avenue between Barrett Avenue and Tennant Avenue	Two-Lane Undivided Arterial	AM	189	C	548	C
			PM	170	C	366	C

**Table 3.13-10 (cont.): Existing Plus SEQ Area Roadway Levels of Service**

No.	Roadway Segment	Roadway Type	Peak Hour	Existing		Existing Plus Project	
				Traffic Volume	LOS	Traffic Volume	LOS
15	Murphy Avenue between Tennant Avenue and Fisher Avenue	Two-Lane Undivided Arterial	AM	243	C	793	C
			PM	218	C	1,528	D
16	Murphy Avenue between Fisher Avenue and Maple Avenue	Two-Lane Undivided Arterial	AM	222	C	231	C
			PM	247	C	266	C
17	Murphy Avenue south of Maple Avenue	Two-Lane Undivided Arterial	AM	136	C	136	C
			PM	135	C	135	C
18	Barrett Avenue east of Murphy Avenue	Two-Lane Rural Road	AM	37	A	108	A
			PM	32	A	61	A
19	Hill Road between Dunne Avenue and Tennant Avenue	Two-Lane Undivided Arterial	AM	413	C	451	C
			PM	355	C	449	C
20	Hill Road between Tennant Avenue and Maple Avenue	Two-Lane Collector Road	AM	152	B	190	A
			PM	107	B	174	A
21	Maple Avenue between Murphy Avenue and Foothill Avenue	Two-Lane Rural Road	AM	98	A	107	A
			PM	119	A	138	A
22	Foothill Avenue between Tennant Avenue and Maple Avenue	Two-Lane Collector Road	AM	114	A	161	A
			PM	95	A	132	A
23	Foothill Avenue between Maple Avenue and Middle Avenue	Two-Lane Collector Road	AM	95	A	95	A
			PM	82	A	82	A

Notes:

<sup>1</sup> LOS = Level of service based on two-way peak-hour traffic

**Bold** type indicates unacceptable operations (LOS F).

Source: Fehr & Peers, 2013.

*High School Site (Project Level)*

**Intersection Levels of Service**

Intersection levels of service were calculated with the traffic added by the proposed High School to evaluate the operating conditions of the intersections and to identify potential impacts. The results of the intersection LOS calculations for Existing Plus High School Conditions are presented in Table 3.13-11. The corresponding calculation sheets are in Appendix H. The results for Existing Conditions are included for comparison purposes, along with the projected increases in critical delays and critical volume-to-capacity (V/C) ratios. Critical delay represents the delay associated with the critical movements of the intersection, or the movements that require the most “green time” and have

**Transportation**

the greatest effect on overall intersection operations. The changes in critical delay and critical V/C ratio between Existing and High School Conditions are used to identify significant impacts. Exhibit 3.13-8 depicts the Existing Plus High School intersection volumes.

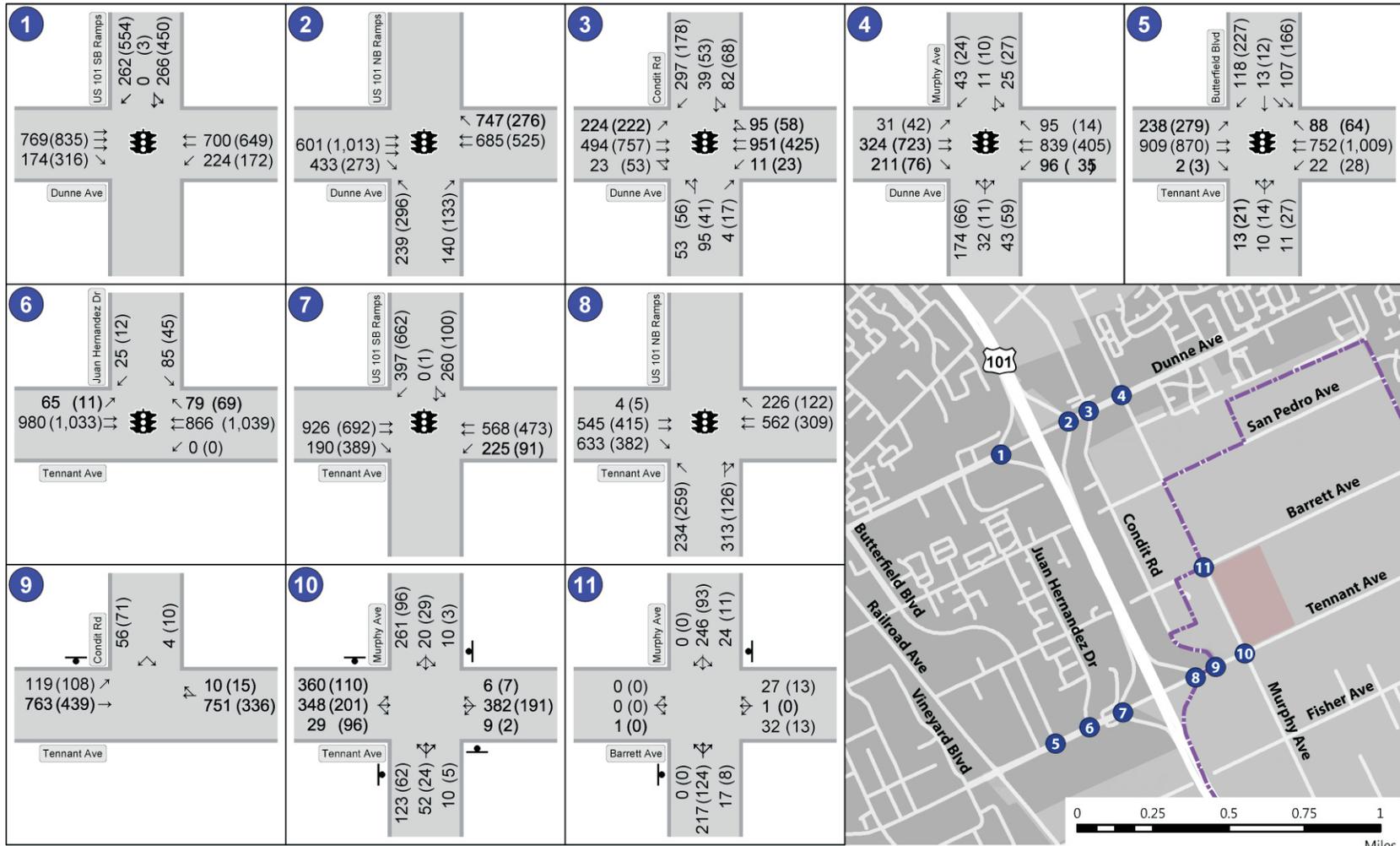
**Table 3.13-11: Existing Plus High School Intersections Levels of Service**

No.	Intersection	Peak Hour	Existing		Existing Plus Project			
			Delay <sup>1</sup>	LOS <sup>2</sup>	Delay <sup>1</sup>	LOS <sup>2</sup>	Δ in Critical V/C <sup>3</sup>	Δ in Critical Delay <sup>4</sup>
1	Dunne Avenue/ US 101 Southbound Ramps	AM	16.1	B	16.1	B	+0.093	-0.1
		PM	26.2	C	26.2	C	+0.000	0.0
2	Dunne Avenue/ US 101 Northbound Ramps	AM	13.6	B	13.2	B	+0.010	-0.2
		PM	15.1	B	15.0	B	+0.005	-0.1
3	Dunne Avenue/ Condit Road	AM	31.4	C	31.2	C	+0.024	-0.1
		PM	24.0	C	23.8	C	+0.007	-0.1
4	Dunne Avenue/ Murphy Avenue	AM	15.1	B	20.0	C+	+0.086	5.8
		PM	14.9	B	16.7	B	+0.029	2.5
5	Tennant Avenue/ Butterfield Boulevard	AM	21.7	C+	21.7	C+	+0.012	-0.3
		PM	26.5	C	26.5	C	+0.004	0.0
6	Tennant Avenue/ Juan Hernandez Drive	AM	7.1	A	7.2	A	+0.029	0.1
		PM	6.5	A	6.6	A	+0.008	0.0
7	Tennant Avenue/ US 101 Southbound Ramps	AM	21.6	C+	25.2	C	+0.129	6.2
		PM	30.1	C	31.4	C	+0.034	2.8
8	Tennant Avenue/ US 101 Northbound Ramps	AM	17.7	B	17.7	B	+0.107	0.3
		PM	19.3	B-	18.9	B-	+0.015	-0.1
9	Tennant Avenue/ Condit Avenue	AM	11.3	B	18.5	C	N/A	N/A
		PM	10.9	B	12.2	B	N/A	N/A
10	Tennant Avenue/ Murphy Avenue	AM	9.3	A	<b>95.3</b>	<b>F</b>	N/A	N/A
		PM	9.3	A	11.0	B	N/A	N/A
11	Murphy Avenue/ Barrett Avenue	AM	9.4	A	12.0	B	N/A	N/A
		PM	9.2	A	9.5	A	N/A	N/A

Notes:

1. Whole intersection weighted average control delay expressed in seconds per vehicle calculated using methods described in the 2000 HCM, with adjusted saturation flow rates to reflect Santa Clara County Conditions for signalized intersections. Total control delay for the worst movement is presented for side-street stop-controlled intersections.
  2. LOS = Level of service. LOS calculations conducted using the TRAFFIX 8.0 level of service analysis software package.
  3. Change in the critical volume-to-capacity (V/C) ratio between Existing and Existing Plus Project Conditions.
  4. Change in critical movement delay between Existing and Existing Plus Project Conditions.
- N/A = Change in critical V/C and delay not computed for unsignalized intersections.

Source: Fehr & Peers, 2013.



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## Exhibit 3.13-8 Existing Plus High School Intersection Peak-Hour Volumes, Traffic Controls, and Geometries

