HEXAGON TRANSPORTATION CONSULTANTS, INC.

Lillian Commons Medical Campus Development

Traffic Impact Analysis

Prepared for:

City of Morgan Hill

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Executive Summary

This report presents the results of the traffic impact analysis conducted for the proposed Lillian Commons Medical Campus Development project in Morgan Hill, California.

Project Description

The project site consists of 19.67 acres generally located in the northwest quadrant of the US 101/Tennant Avenue interchange and is bounded by Barrett Avenue to the north, Juan Hernandez Road to the west, the US 101 southbound off-ramp to the east, and an undeveloped parcel (north of Tennant Avenue) to the south. The project site consists of three existing parcels: two undeveloped adjoining parcels of land and an existing medical office and surgical facility. The applicant proposes a General Plan Amendment (to change the existing General Plan Land Use designation from Commercial to Mixed-Use Flex), Zoning Amendment (to amend the zoning district from Service Commercial and Planned Development to Mixed-Use Flex and Planned Development), Planned Development Master Plan, Tentative Parcel Map (to subdivide the project site into four parcels), and development of the project site.

The Master Plan development for the site consists of a 100,000-s.f. hospital with 55 beds, 10,000 s.f. of commercial and restaurant space, 200 multi-family units, the existing 15,900-s.f. medical office buildings plus an additional 10,000 s.f. of medical office space (for a total of 25,900 s.f. of medical office space), and 4,500 s.f. of urgent care space. Access to the project site would be provided via two driveways along Juan Hernandez Drive, with two additional driveways along Barrett Avenue providing emergency access only.

Scope of Study

The purpose of the study is to identify the potential traffic impacts related to the proposed project. The potential impacts related to the proposed development were evaluated following the standards and methodologies set forth by the City of Morgan Hill and the Santa Clara Valley Transportation Authority (VTA). The VTA administers the County Congestion Management Program (CMP). The study includes an analysis of AM and PM peak-hour traffic conditions for fourteen (14) signalized intersections, 4 unsignalized intersections, and 1 planned future intersection.

The study includes an analysis of AM and PM peak-hour traffic conditions for fourteen (14) signalized intersections, 4 unsignalized intersections, and 1 planned future intersection. Traffic conditions were evaluated for the following conditions:

Scenario 1: *Existing Conditions.* Existing peak-hour traffic volumes on the existing roadway network.

Scenario 2: *Existing Plus Project Conditions*. Existing traffic volumes plus project-generated traffic volumes.

Scenario 3: *Year 2035 General Plan No Project Conditions.* Buidout of the City's Year 2035 General Plan on the future transportation network.

Scenario 4: *Year 2035 General Plan with Project Conditions.* Year 2035 General Plan with Project conditions.

Project Trip Generation

Through empirical research, data have been collected that correlate to common land uses their propensity for producing traffic. Thus, for the most common land uses there are standard trip generation rates that can be applied to help predict the future traffic increases that would result from a new development. Trip generation estimates for each component of the proposed project are based on trip generation rates obtained from the Institute of Transportation Engineers' (ITE's) *Trip Generation Manual*, Tenth Edition, 2017.

Net Project Trip Generation

Based on the ITE trip generation rates, applicable trip reductions, and credit for the existing use on the project site, it is estimated that the proposed project would generate an additional 3,884 daily trips, with 313 trips (184 inbound and 129 outbound) occurring during the AM peak-hour and 327 trips (142 inbound and 185 outbound) occurring during the PM peak-hour.

Existing Plus Project Intersection Level of Service Analysis

The intersection level of service is summarized in Table ES-1. The results indicate that, measured against the City of Morgan Hill level of service standards, all of the study intersections are projected to operate at acceptable levels of service (LOS D or better) under existing plus project conditions, during both the AM and PM peak hours.

Based on the Peak-Hour Volume Signal Warrant, (Warrant #3 – Part B, CAMUTCD 2014 Edition), the intersection of Condit Road and Tennant Avenue (intersection #14) would continue to have peak-hour traffic volume levels that warrant installation of a traffic signal during the AM and PM peak hour under existing plus project conditions. However, the intersection is projected to operate at acceptable levels of service and, therefore, would not be impacted by the proposed project.

Freeway Segment Analysis

Per CMP technical guidelines, freeway segment level of service analysis shall be conducted on all segments to which the project is projected to add trips representing one percent or more of the freeway segment's capacity. Since the number of new trips added to the freeway segments by the proposed project do not equal or exceed one percent of the capacity of the freeway segments near the project site, a freeway level of service analysis for the CMP is not required.

Year 2035 General Plan Intersection Level of Service Analysis

The intersection level of service is summarized in Table ES-1. The results show that the following study intersection is projected to operate at an unacceptable level of service (LOS F) and have peak-hour

traffic volume levels that warrant installation of a traffic signal during the PM peak-hour under both Year 2035 General Plan without and with project conditions:

14. Tennant Avenue and Condit Road (**Impact**: PM peak-hour)

Based on City of Morgan Hill level of service significant impact thresholds, this constitutes a significant impact to the intersection.

Year 2035 General Plan Impacts and Mitigation Measures

14. Tennant Avenue and Condit Road

Mitigation: Possible improvements to mitigate the impact at this intersection consist of the implementation of a traffic signal. However, the decision to install a traffic signal should not be based solely on satisfying one traffic signal warrant. Instead, intersections that meet the peak-hour signal warrant should be subject to further analysis before determining that a traffic signal is necessary. Thus, the project impact at this intersection would be mitigated with payment of the traffic impact fee, as determined by City staff.

Vehicle Miles Traveled

A comparison of Vehicle Miles Traveled (VMT) for the adopted Year 2035 General Plan condition versus the Year 2035 General Plan conditions with the proposed project was made to determine the effects of the proposed project on traffic patterns within the City.

Table ES-2 presents the projected VMT associated with the project site. All data provided were calculated using the City's travel demand forecasting model and represent only those trips associated with the project site. The VMT results show that the proposed project would result in a decrease in daily VMT and daily trips when compared to the adopted GP land uses for the site. The decrease in VMT and trips is due to the development of the project site with a mixture of complementary land uses (housing, employment, and retail) in addition to provided services that Morgan Hill residents might currently access elsewhere. As a result, the VMT per trip also is shown to decrease, representing shorter trips associated with the proposed land uses.

The reduction in trip length is due to the addition of jobs and services in the City which is currently dominated by housing. These jobs and services cause trips to be internalized within the City resulting in a reduction in commute distances of residents in the City.

Other Transportation Issues

Site Access

All vehicular access to the project site would be provided via two proposed driveways on Juan Hernandez Drive (Driveways 1 and 2). The main driveway, Driveway 2, would be located in the middle of the project site frontage, approximately 500 feet south of Barrett Avenue and 300 feet north of St. James Drive. City staff has requested that Driveway 1 be relocated and aligned with St. James Drive to the north, forming the east leg of the intersection. The realigned intersection would continue to provide left-turn access to both St. James Drive and Driveway 1 from Juan Hernandez Drive, concentrating all movements at a single location.

Driveway 2 is projected to serve a larger amount of project traffic to and from the site. More than half of the project traffic (approximately 73%) would access the site via the Juan Hernandez Drive/Tennant

Avenue intersection, while the remaining project traffic would access the site from or be bound to the north on Juan Hernandez Drive.

Access Driveway Operations

Operations at the project site driveways with implementation of the proposed project were evaluated. It is estimated that no more than one vehicle would queue up within the southbound left-turn pockets along Juan Hernandez Drive (inbound traffic) and on site (outbound traffic) at both Driveways 1 and 2. All left-turning inbound traffic would experience average delays of no more than 8 seconds while left-turning outbound traffic would experience average delays of no more than 12 seconds during the peak hours (representing LOS B conditions at both driveway intersections) while waiting for a gap in traffic to complete the turn. Based on the projected average delays and queue lengths, it can be concluded that the project site driveways would operate adequately.

On-Site Circulation

Residential Area Access and Circulation

Two parking areas would serve the residential units. The first parking area (west parking area) would consist of a single drive aisle lined with 90-degree parking along both sides. This parking area would be located adjacent to Juan Hernandez Drive and would be accessed via the first internal driveway along Street A, located approximately 50 feet east of Driveway 2. It is estimated that outbound queue lengths at Driveway 2 would be no more than one vehicle during the peak hours. However, it should be noted that queue lengths longer than two vehicles per lane in the outbound direction at Driveway 2 would block access to the west residential parking area. Thus, it is recommended that “Keep Clear” pavement markings be installed along Street A at the west residential parking area to prevent outbound traffic at Driveway 2 from blocking access to this area. Alternatively, this driveway could be moved eastward farther away from Driveway 2.

The second residential parking area (east parking area) would run along the rectangular-shape residential area and would be accessible via three driveways along the north side of Street A. The circular layout of the east parking area would allow for continuous circulation while the various access points would provide for convenient access to specific areas without the need to navigate the entire parking area. However, this parking area consists of long straight drive aisles which typically increase the tendency of drivers to increase their speed. For this reason, it is recommended that installation of speed reduction measures be considered along the east parking area drive aisles. Speed reduction measures could be as simple as posting signage and/or pavement markings advising of the speed limit, to other physical deterrents such as speed bumps.

Non-Residential Area Access and Circulation

The non-residential land uses on the site, located south of Street A, would be accessible via both Driveways 1 and 2 (Streets A and B). All access to the restaurant/retail parking area would be provided via Street A while all access to the medical office buildings and urgent care building parking areas would be provided via Street B. Access to the hospital and hospital parking structure would be provided via both Streets A and B. With the exception of a dead-end drive aisle located within the restaurant/retail parking lot, all other parking areas are shown to provide continuous circulation. The restaurant/retail parking lot shows a turn-around location at the end of the drive aisle that would facilitate U-turns within the drive aisle.

Recommendation: The site design, including driveway widths, drive aisle widths, parking stall dimensions, and turn radii, must adhere to City of Morgan Hill design guidelines. All drive aisles must allow for two-way circulation and adequate circulation of larger vehicles (such as emergency trucks, garbage truck, and delivery trucks) throughout the project site.

Recommendation: It is recommended that "Keep Clear" pavement markings be installed along Street A at the west residential parking area to prevent outbound traffic at Driveway 2 from blocking access to this area. Alternatively, this driveway could be moved eastward farther away from Driveway 2.

Recommendation: To minimize the likelihood of drivers traveling through the residential parking areas at speeds that are unsafe as the result of the long straight drive aisles, it is recommended that installation of speed reduction measures be considered along the east residential parking drive aisles. Speed reduction measures could be as simple as posting signage and/or pavement markings advising of the speed limit, to other physical deterrents such as speed bumps.

Adhering to City of Morgan Hill standards and requirements, and implementing the above recommendations, the proposed site access and on-site circulation would be adequate to accommodate circulation of both passenger and emergency vehicles.

Sight Distance

Based on Caltrans requirements, the available sight distance at the project site driveways on Juan Hernandez Drive would be adequate.

Recommendation: The site design should ensure design features, in particular the landscaping and signage along the project site frontage and at the project site driveways, would not interfere with the sight distance at the proposed site driveway.

Emergency Vehicle and Truck Access

As recommended by the City of Morgan Hill, the two proposed driveways along Barrett Avenue would provide emergency vehicle access only. These two emergency-access only driveways, in conjunction with the other two project site driveways proposed along Juan Hernandez Drive, would provide a total of four access points for emergency vehicles to access any part of the project site. Thus, the design of the project site, including driveway and drive aisle widths and on-site turn radii, must be adequate to ensure emergency vehicles can maneuver through the site, from any of the proposed driveways, without a problem.

Recommendation: The ambulance access route to the hospital should be identified and, to the maximum extent possible, the identified route should be cleared of obstructions, such as crosswalks or parking spaces, that could potentially interfere with the ambulance's prompt access to the hospital.

Pedestrian Access and Circulation

The project site plan shows an extensive and continuous on-site pedestrian network, connecting all proposed land uses and parking areas on the site with existing sidewalks along the project site frontages on Juan Hernandez Drive and Barrett Avenue. Marked pedestrian pathways across parking lots also are shown throughout the site, providing a pedestrian connection between parking lots and buildings. Five-foot sidewalks are proposed surrounding all buildings and along drive aisles, forming a complete pedestrian network on site with connections to other existing pedestrian facilities (sidewalks, crosswalks) off site. Based on the proposed site plan layout, on-site pedestrian access and circulation would be adequate.

Parking

The project is proposing to provide a total of 1,010 on-site parking spaces, 500 of which would be provided within the proposed parking structure.

Section 18.72.030 of the Morgan Hill City Code specifies the required number of on-site parking spaces for different types of land uses. Based on the City's parking requirements and the proposed size and land uses of the project, the proposed project would be required to provide a total of 1,195 parking spaces, which is 185 parking spaces more than the proposed number of spaces.

The site plan states that a shared parking program is being proposed for the site.

Recommendation: The project applicant must work with the City of Morgan Hill to develop a shared parking program, or any other alternative that will reduce the peak parking demand to meet the proposed supply for the project.

Bicycle Parking

The site plan shows two bicycle parking locations within the residential area: one providing 10 bicycle parking spaces and the second one providing 15 bicycle parking spaces, for a total of 25 bicycle parking spaces. The proposed type of bicycle parking spaces is not identified.

According to Table 18.72-7 of the City Code and assuming only the residential units and the restaurant/retail space would be required to provide bicycle parking, the proposed project would be required to provide a total of 55 short-term bicycle parking spaces and 45 long-term bicycle parking spaces. Assuming all proposed land uses would be required to provide bicycle parking, the proposed project would be required to provide a total of 121 short-term bicycle parking spaces and 78 long-term bicycle parking spaces.

Recommendation: It is recommended that the proposed project provide adequate bicycle parking supply on site, based on the City's recommends bicycle-parking rates, to serve the potential demand of the project. The proposed project would be required to provide a total of 55 short-term bicycle parking spaces and 45 long-term bicycle parking spaces for the residential and restaurant uses only, or a total of 121 short-term bicycle parking spaces and 78 long-term bicycle parking spaces for all proposed land uses on-site.

Effects on Surrounding Residential Streets

An evaluation of the effects of project traffic along other streets in the immediate vicinity of the project site was completed. The evaluation consists of a roadway segment analysis to quantify the potential change in traffic volumes along the study roadway segments as a result of the proposed project. For the evaluation, the existing and projected daily traffic volumes with the project along the study roadway segments were compared to acceptable volume thresholds for each roadway segment to determine if the projected change in traffic volume would be considered significant.

Findings and Recommendations of the Roadway Segment Analysis

The following conclusions can be drawn from the evaluation of the study roadways:

- Traffic volumes at all study roadways are and would continue to be within the volume range characteristic for local and collector streets.
- Speeds along one of the four study roadway segments (Juan Hernandez Drive, south of Barrett Avenue, southbound direction) currently exceed the posted speed limit by more than 5 mph. Speeding is occurring under existing conditions and not caused by the project.
- Daily traffic volumes along Juan Hernandez Drive and Barrett Avenue are projected to increase by approximately 80-225% from existing conditions as a result of the proposed project, an increase which would be measurable and perceptible to residents of the adjacent neighborhood.

Intersection Operations Analysis

The analysis of intersection level of service was supplemented with an analysis of intersection operations for selected intersections where the project would add a significant number of left-turning vehicles to the intersection (typically 10 or more peak-hour trips per lane; less than 10 peak-hour trips would not affect the length of the queue).

Queuing Analysis Results

The vehicle queue analysis indicates that, currently, all study left-turn pockets and intersection approach have sufficient queue storage capacity to accommodate the existing maximum vehicle queue length for each movement. The addition of project traffic to the study intersections would result in no change to the 95th percentile vehicle queue lengths or would increase it by no more than 3 vehicles at other locations, such as the southbound left-turn movement at the intersection of Tennant Avenue and Juan Hernandez Drive. However, even with the addition of project traffic, the 95th percentile vehicle queue lengths are projected to continue to accommodate within the existing queue storage capacity at all study locations.

Site Access Alternative Evaluation

An evaluation of the site access alternative that would include full access at all four project site driveways shown on the site plan (two along Juan Hernandez Drive and two along Barrett Avenue) and maintaining Driveway 1 at its current location was conducted.

Site Access

Based on the relatively low traffic volumes along Barrett Avenue, east of Juan Hernandez Drive, the addition of project traffic to Driveways 3 and 4 would not affect traffic conditions along this roadway segment. However, depending on the school drop-off procedures, it is possible that during the school's peak 15-minute period, project traffic from/to Driveway 3 and 4 would experience short delays as they attempt to exit/enter the site and queues of school traffic are formed along Barrett Avenue as parents drop-off their children at school. Outside of the school's peak 15-minute period, traffic conditions and access along Barrett Avenue would be adequate.

Assuming that Driveway 1 would remain at its existing location, a queue length of no greater than one vehicle is projected at the left-turn pockets to the site (Driveway 1) and St. James Drive. Therefore, the storage provided by the TWLT lane would provide adequate storage for left-turning vehicles. However, as traffic volumes along Juan Hernandez Drive continue to increase, left-turns in and out of Driveway 1 and St. James Drive would experience longer delays affecting queue lengths at both locations. Therefore, it is recommended that Driveway 1 be relocated to the north and aligned with St. James Drive. The alignment of Driveway 1 would reduce conflicting turn movements by concentrating all turn-movements to a single location. Alternatively, access at Driveway 1 could be restricted to right-in and right-out only by extending the northbound left-turn lane/center raised median at St. James Drive past Driveway 1.

Potential Impacts on Pedestrians, Bicycles, and Transit

Project's Effect on Pedestrian Facilities

The existing sidewalks along both sides of Barrett Avenue and high-visibility crosswalks at the Juan Hernandez Drive/Barrett Avenue intersection, in conjunction with proposed on-site sidewalks that would provide a connection between the project's residential area and the sidewalks on Barrett Avenue, would

provide a continuous and safety-enhanced access between the project site and Barrett Elementary School.

Pedestrian destination along Butterfield Boulevard could be accessed via the continuous sidewalks on Barrett Avenue. Pedestrian access to the commercial areas along Tennant Avenue, however, would be challenging due to the discontinuous pedestrian network, forcing pedestrians to walk along the edge of undeveloped parcels. At the railroad tracks along Tennant Avenue, east of the Tennant Avenue/Vineyard Boulevard intersection, there is not a defined pedestrian crossing of the railroad tracks, or sidewalks on either side of the tracks along Tennant Avenue. Sidewalks begin along the north side of Tennant avenue approximately 100 feet west of the railroad tracks and at its intersection with Vineyard Boulevard along the south side of Tennant Avenue.

Even with the proposed complete on-site pedestrian network, the lack of a continuous pedestrian network off site would affect pedestrian access to/from the project site. The lack of connectivity between the project site and nearby pedestrian destinations potentially could discourage pedestrian activity or force pedestrians to walk along undeveloped roadway shoulders and/or within the street.

Recommendation: It is recommended that all existing and proposed curb ramps along the project site frontage and at intersections providing direct access to the project site be upgraded to comply with ADA standards.

Project's Effect on Bicycle Facilities

The proposed project could increase the demand on bicycle facilities in the vicinity of the project site. Assuming bicycle trips would comprise no more than one percent of the total project-generated trips, the project could generate no more than 3 new bicycle trips during the peak hours. The potential demand could be served by the bicycle facilities available in the vicinity of the project site. In addition, the Bikeways Master Plan map contained within the City of Morgan Hill General Plan shows proposed bike lanes along both side of Juan Hernandez Drive, between Tennant Avenue and San Pedro Avenue. Therefore, the potential increase in bicycle trips by the proposed project would not have an adverse effect on the existing or future bicycle facilities in the study area and would not require new off-site bicycle facilities.

Project's Effect on Transit Services

Since no bus routes currently exist that provide direct service between the project site and other pedestrian destinations in Morgan Hill, and there is currently only one local bus route (Route 87) serving the City of Morgan Hill with the nearest bus stop to the project site located approximately 2 miles away, the use of public transportation by residents/employees/patrons of the proposed project would be limited. Nevertheless, assuming an estimated one percent transit mode share, which is probably the highest that could be expected for the project, equates to approximately 3 to 4 new transit riders during the peak hours. The estimated number of new transit riders for the proposed project could be served by the existing bus line currently serving the project area.

Recommendation: With the development of the project, as well as the future development of other currently undeveloped parcels along Tennant Avenue in the vicinity of the project site, there will be an opportunity for VTA to expand the existing service area to this part of town, which is currently underserved. Potentially, a bus stop could be provided along the project site frontage to serve the project site, and adjacent residential neighborhood, directly.

Table ES 1
Intersection Level of Service Summary

Int. #	Intersection	Existing Control	Year 2035 Control	LOS Standard	Peak Hour	Count Date	Existing			Existing + Project					2035 General Plan No Project			2035 General Plan Plus Project				
							Warrant Met?	Delay[1]	LOS	Warrant Met?	Delay[1]	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C	Warrant Met?	Delay[1]	LOS	Warrant Met?	Delay[1]	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
1	Tennant Avenue and Juan Hernandez Drive	Signal	Signal	E	AM	02/06/20	--	10.5	B	--	10.9	B	1.3	0.072	--	19.0	B	--	19.7	B	1.1	0.015
					PM	02/06/20	--	10.2	B	--	10.9	B	1.5	0.070	--	20.7	C	--	19.5	B	-1.4	-0.023
2	Juan Hernandez Drive and St. James Drive	OWSC	OWSC	D	AM	02/06/20	No	8.8	A	No	11.7	B	N/A	N/A	No	9.6	A	No	13.7	B	N/A	N/A
					PM	02/06/20	No	8.7	A	No	11.3	B	N/A	N/A	No	9.3	A	No	14.3	B	N/A	N/A
3	Juan Hernandez Drive and Barrett Avenue	AWSC	AWSC	D	AM	02/06/20	No	8.4	A	No	8.6	A	N/A	N/A	No	9.0	A	No	9.2	A	N/A	N/A
					PM	02/06/20	No	7.5	A	No	7.8	A	N/A	N/A	No	8.2	A	No	8.1	A	N/A	N/A
4	Monterey Road and Watsonville Road/Butterfield Boulevard	Signal	Signal	D	AM	03/14/19	--	25.0	C	--	25.2	C	0.3	0.009	--	31.8	C	--	31.2	C	-1.2	-0.013
					PM	03/14/19	--	38.1	D	--	38.2	D	0.2	0.005	--	40.8	D	--	40.6	D	-0.3	-0.009
5	Butterfield Boulevard and Tennant Avenue	Signal	Signal	E	AM	02/06/20	--	29.8	C	--	29.9	C	0.3	0.016	--	51.6	D	--	50.1	D	-2.8	-0.015
					PM	02/06/20	--	33.9	C	--	34.1	C	0.5	0.015	--	38.3	D	--	38.0	D	-0.9	-0.012
6	Butterfield Boulevard and Barrett Avenue	Signal	Signal	D	AM	02/06/20	--	11.1	B	--	12.3	B	1.7	0.053	--	12.9	B	--	13.2	B	0.4	0.011
					PM	02/06/20	--	10.3	B	--	10.8	B	0.2	0.009	--	11.9	B	--	11.9	B	0.0	-0.003
7	Butterfield Boulevard and San Pedro Avenue	Signal	Signal	D	AM	03/14/19	--	13.0	B	--	13.0	B	0.0	0.009	--	13.6	B	--	13.6	B	0.0	0.006
					PM	03/14/19	--	13.2	B	--	13.2	B	0.0	0.013	--	14.8	B	--	14.9	B	0.2	0.004
8	Butterfield Boulevard and Dunne Avenue	Signal	Signal	D	AM	05/08/18	--	35.5	D	--	35.3	D	0.3	0.016	--	38.9	D	--	39.0	D	0.5	0.009
					PM	05/08/18	--	31.7	C	--	31.9	C	0.1	0.014	--	34.6	C	--	34.6	C	0.0	0.001
9	Butterfield Boulevard and Main Avenue	Signal	Signal	D	AM	05/08/18	--	27.6	C	--	27.7	C	0.4	0.008	--	30.8	C	--	30.7	C	-0.3	-0.002
					PM	05/08/18	--	29.8	C	--	30.3	C	0.8	0.015	--	36.3	D	--	35.7	D	-0.8	-0.007
10	Monterey Road and Tennant Avenue/Edmunson Avenue	Signal	Signal	E	AM	03/14/19	--	23.3	C	--	23.5	C	0.4	0.005	--	23.9	C	--	24.0	C	0.1	0.001
					PM	03/14/19	--	35.2	D	--	35.3	D	0.2	0.002	--	36.4	D	--	36.4	D	0.1	-0.001
11	Tennant Avenue and Vineyard Avenue	Signal	Signal	D	AM	02/06/20	--	16.4	B	--	16.5	B	0.1	0.003	--	17.2	B	--	17.3	B	0.1	0.003
					PM	02/06/20	--	19.4	B	--	19.5	B	0.1	0.004	--	20.2	C	--	20.2	C	0.0	0.002
12	Barrett Avenue and San Ramon Drive	TWSC	TWSC	D	AM	02/06/20	No	10.4	B	No	11.0	B	N/A	N/A	No	11.3	B	No	11.5	B	N/A	N/A
					PM	02/06/20	No	9.4	A	No	10.0	B	N/A	N/A	No	10.2	B	No	10.3	B	N/A	N/A
13	Dunne Avenue and Walnut Grove Drive	Signal	Signal	E	AM	03/28/19	--	18.4	B	--	18.4	B	0.0	0.001	--	20.1	C	--	20.4	C	0.4	0.010
					PM	03/28/19	--	28.5	C	--	28.5	C	0.0	0.001	--	28.1	C	--	28.1	C	0.1	0.002
14	Tennant Avenue and Condit Road	OWSC	OWSC	E	AM	06/04/19	**Yes**	14.7	B	**Yes**	15.1	C	N/A	N/A	**Yes**	24.2	C	**Yes**	24.2	C	N/A	N/A
					PM	06/04/19	**Yes**	14.6	B	**Yes**	15.2	C	N/A	N/A	**Yes**	**76.0**	**F**	**Yes**	**77.3**	**F**	N/A	N/A
15	US 101 NB Ramps and Tennant Avenue	Signal	Signal	E	AM	06/04/19	--	11.6	B	--	12.4	B	1.1	0.018	--	12.1	B	--	11.8	B	-0.2	-0.012
					PM	06/04/19	--	11.1	B	--	11.4	B	0.2	0.024	--	10.4	B	--	10.4	B	0.0	0.002
16	US 101 SB Ramps and Tennant Avenue	Signal	Signal	E	AM	06/04/19	--	21.5	C	--	22.2	C	0.9	0.037	--	31.2	C	--	31.2	C	-0.1	0.000
					PM	06/04/19	--	19.7	B	--	20.2	C	0.6	0.041	--	31.1	C	--	31.0	C	-0.2	-0.003
17	US 101 Northbound Ramps and Dunne Avenue	Signal	Signal	E	AM	05/08/18	--	5.3	A	--	5.3	A	0.0	0.001	--	7.4	A	--	6.7	A	-0.7	0.008
					PM	05/08/18	--	11.8	B	--	11.8	B	0.0	0.001	--	10.7	B	--	10.8	B	0.1	-0.006
18	US 101 Southbound Ramps and Dunne Avenue	Signal	Signal	E	AM	05/08/18	--	20.9	C	--	20.9	C	0.0	0.000	--	21.7	C	--	21.9	C	0.3	0.010
					PM	05/08/18	--	18.8	B	--	18.8	B	0.0	0.000	--	22.9	C	--	22.4	C	-0.8	-0.015
19	Juan Hernandez Drive and San Pedro Avenue	Future	OWSC	D	AM	--	--	--	--	--	--	--	--	--	No	9.6	A	No	9.7	A	N/A	N/A
	(Future Intersection)				PM	--	--	--	--	--	--	--	--	--	No	9.7	A	No	9.7	A	N/A	N/A

Notes:
[1]The reported delay and corresponding level of service for signalized and all-way stop-controlled intersections represent the average delay for all approaches at the intersection.
The reported delay and corresponding level of service for one- and two-way stop-controlled intersections are based on the stop-controlled approach with the highest delay.
Bold indicates unacceptable level of service.
Bold and boxed indicate significant impact.

Table ES 2
Year 2035 General Plan Vehicle Miles Traveled

Scenario	Daily		
	VMT	Trips	VMT per Trip
2035 General Plan No Project	5,254	30,384	5.78
2035 General Plan with Project	4,967	27,834	5.60
Change	**-287**	**-2,549**	**-0.18**
Percent Change	**-5%**	**-8%**	**-3%**

Source: City of Morgan Hill Travel Demand Model, Hexagon March 2020.
Notes:
VMT = Vehicle Miles Traveled associated with the project site.

1. Introduction

This report presents the results of the traffic impact analysis conducted for the proposed Lillian Commons/Medical Campus Development project in Morgan Hill, California.

Project Description

The project site consists of 19.67 acres generally located in the northwest quadrant of the US 101/Tennant Avenue interchange and is bounded by Barrett Avenue to the north, Juan Hernandez Road to the west, the US 101 southbound off-ramp to the east, and an undeveloped parcel (north of Tennant Avenue) to the south. The project site consists of three existing parcels: two undeveloped adjoining parcels of land, Assessor's Parcel Number (APN) 817-09-041 (13.94 acres) and APN 817-09-039 (4.04 acres), and an existing medical office and surgical facility on APN 817-09-040 (1.69 acres). The applicant proposes a General Plan Amendment (to change the existing General Plan Land Use designation from Commercial to Mixed-Use Flex), Zoning Amendment (to amend the zoning district from Service Commercial and Planned Development to Mixed-Use Flex and Planned Development), Planned Development Master Plan, Tentative Parcel Map (to subdivide the project site into four parcels), and development of the project site.

The Master Plan development for the site consists of a 100,000-s.f. hospital with 55 beds, 10,000 s.f. of commercial and restaurant space, 200 multi-family units, the existing 15,900-s.f. medical office buildings plus an additional 10,000 s.f. of medical office space (for a total of 25,900 s.f. of medical office space), and 4,500 s.f. of urgent care space. Parking would be provided on site within various surface parking lots and a three-story parking structure. Access to the project site would be provided via two driveways along Juan Hernandez Drive, with two additional driveways along Barrett Avenue providing emergency access only.

The project site location and the surrounding study area are shown on Figure 1. The project site plan is shown on Figure 2.

Scope of Study

The potential impacts related to the proposed development were evaluated following the standards and methodologies set forth by the City of Morgan Hill and the Santa Clara Valley Transportation Authority

Figure 1
Site Location and Study Intersections

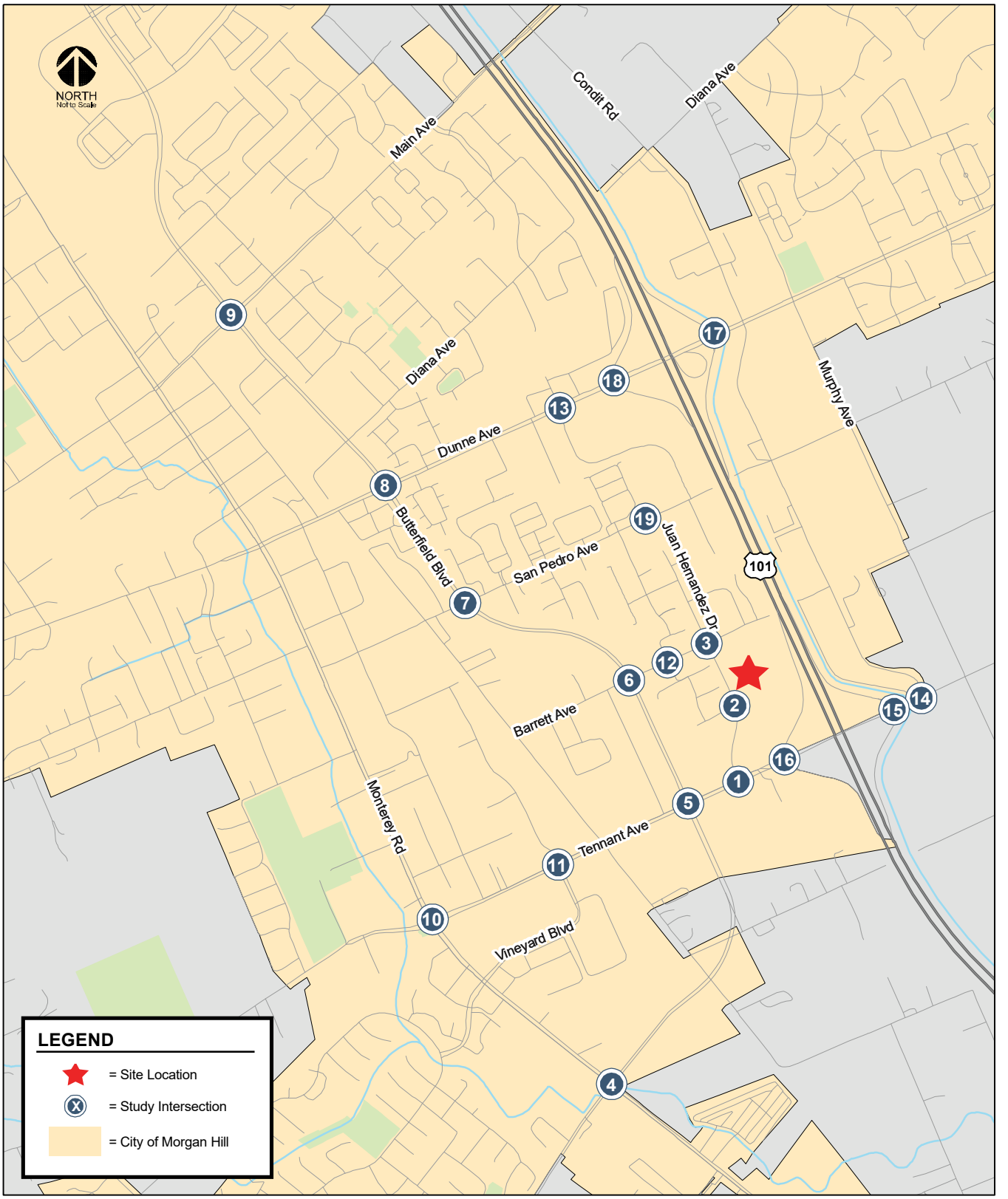
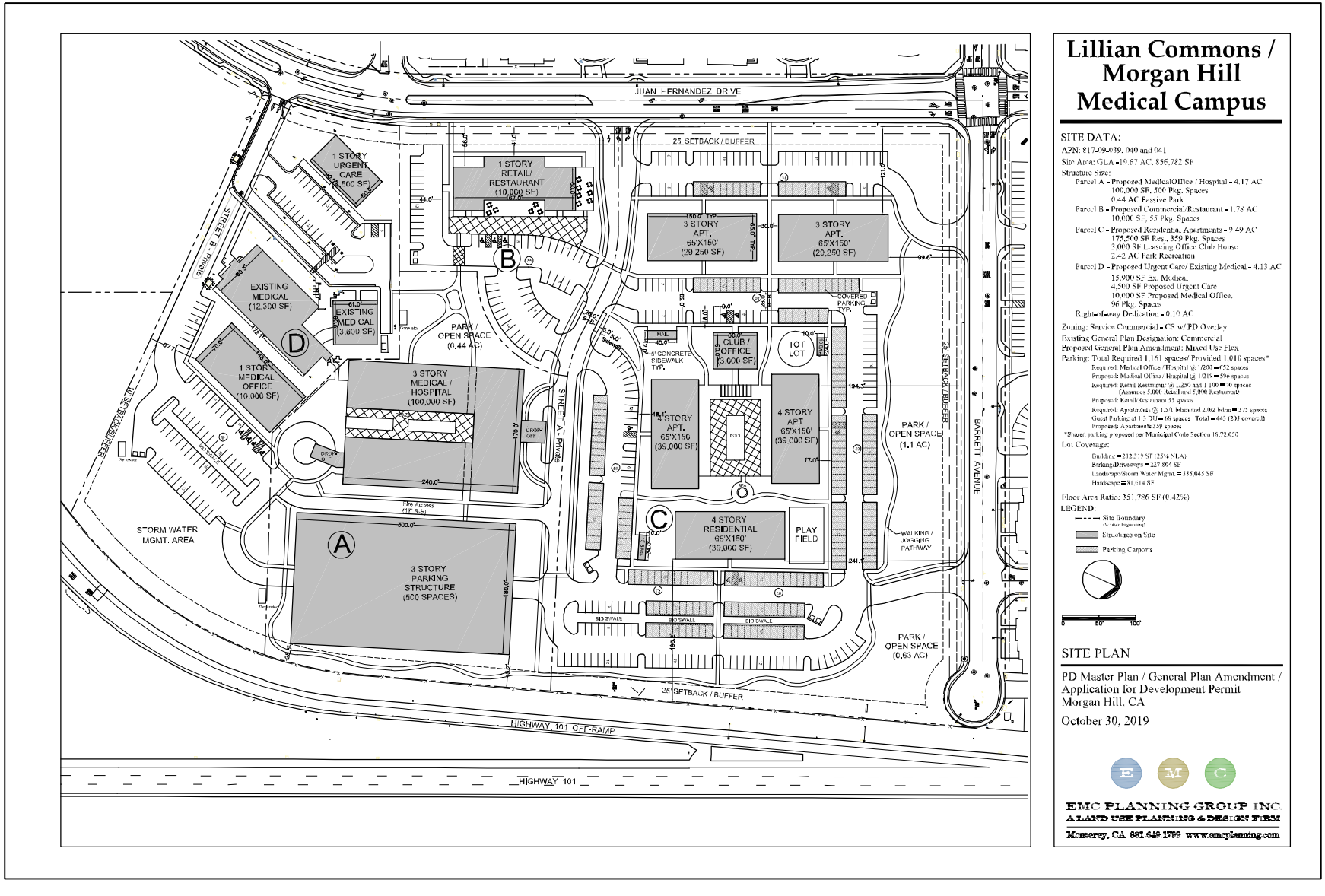


Figure 2
Site Plan



(VTA). The VTA administers the County Congestion Management Program (CMP). The study includes an analysis of AM and PM peak-hour traffic conditions for fourteen (14) signalized intersections, 4 unsignalized intersections, 1 planned future intersection, and 14 directional freeway segments. The study intersections and freeway segments are identified below.

Study Intersections

1. Tennant Avenue and Juan Hernandez Drive
2. Juan Hernandez Drive and St. James Drive (*unsignalized*)
3. Juan Hernandez Drive and Barrett Avenue (*unsignalized*)
4. Monterey Road and Watsonville Road/Butterfield Boulevard
5. Butterfield Boulevard and Tennant Avenue
6. Butterfield Boulevard and Barrett Avenue
7. Butterfield Boulevard and San Pedro Avenue
8. Butterfield Boulevard and Dunne Avenue
9. Butterfield Boulevard and Main Avenue
10. Monterey Road and Tennant Avenue/Edmunson Avenue
11. Tennant Avenue and Vineyard Avenue
12. Barrett Avenue and San Ramon Drive (*unsignalized*)
13. Dunne Avenue and Walnut Grove Drive
14. Tennant Avenue and Condit Road (*unsignalized*)
15. US 101 NB Ramps and Tennant Avenue
16. US 101 SB Ramps and Tennant Avenue
17. US 101 Northbound Ramps and Dunne Avenue
18. US 101 Southbound Ramps and Dunne Avenue
19. Juan Hernandez Drive and San Pedro Avenue (*Future*)

Study Freeway Segments

1. US 101 between SR-85 and Bailey Avenue
2. US 101 between Bailey Avenue and Coyote Creek Golf Drive
3. US 101 between Coyote Creek Golf Drive and Cochrane Road
4. US 101 between Cochrane Road and Dunne Avenue
5. US 101 between Dunne Avenue and Tennant Avenue
6. US 101 between Tennant Avenue and San Martin Avenue
7. US 101 between San Martin Avenue and Masten Avenue

Traffic conditions at all of the study intersections were analyzed for the weekday AM and PM peak hours. The weekday AM peak-hour of traffic is generally between 7:00 AM and 9:00 AM and the weekday PM peak-hour is typically between 4:00 PM and 6:00 PM. It is during these periods that the most congested traffic conditions occur on a typical weekday. Traffic conditions were evaluated for the conditions described below:

Scenario 1: *Existing Conditions.* Existing conditions represent existing peak-hour traffic volumes on the existing roadway network. Existing peak-hour traffic volumes were obtained from recently completed traffic studies and supplemented with new manual turning-movement counts at study intersections for which recent counts (less than two years old) were unavailable.

Scenario 2: *Existing Plus Project Conditions*. Project-generated traffic volumes were added to existing traffic volumes to estimate existing plus project conditions. Existing plus project conditions were evaluated relative to existing conditions in order to determine potential project impacts.

Scenario 4: *Year 2035 General Plan No Project Conditions.* Year 2035 General Plan No Project conditions represent future traffic volumes on the future transportation network. Year 2035 General Plan No Project conditions includes land use growth and transportation improvements associated with buildout of the City's General Plan.

Scenario 5: *Year 2035 General Plan with Project Conditions.* Year 2035 General Plan with Project conditions consist of Year 2035 General Plan No Project traffic conditions with the addition of traffic due to the proposed project and its associated land use amendment for the project site.

Methodology

This section presents the methods used to determine the traffic conditions for each scenario described above. It includes descriptions of the data requirements, the analysis methodologies, and the applicable level of service standards.

Data Requirements

The data required for the analysis were obtained from new peak-hour intersection turn-movement counts, previous traffic studies, the City of Morgan Hill, the 2018 CMP Monitoring and Conformance Report, the City of Morgan Hill Travel Demand Forecasting model, and field observations. The following data were collected from these sources:

- existing traffic volumes
- lane configurations
- signal timing and phasing
- average speeds on freeway segments
- Year 2035 traffic forecasts

Analysis Methodologies and Level of Service Standards

Traffic conditions at the study intersections were evaluated using level of service (LOS). *Level of Service* is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays. The analysis methods are described below.

Signalized Intersections

Signalized study intersections are subject to the City of Morgan Hill level of service standards. The City of Morgan Hill level of service methodology is TRAFFIX, which is based on the 2000 *Highway Capacity Manual* (HCM) method for signalized intersections. TRAFFIX evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. Since TRAFFIX is also the CMP-designated intersection level of service methodology, the City of Morgan Hill methodology employs the CMP defaults values for the analysis parameters, which include adjusted saturation flow rates to reflect conditions in Santa Clara County.

In accordance with the adopted threshold of significance described in the City of Morgan Hill's Guidelines for Preparation of Transportation Impact Reports, dated February 2010, all intersections within the City of Morgan Hill are required to meet the City's LOS standard of LOS D, with the exception of the following:

- **LOS F** for Downtown intersections and segments including at Main Avenue/Monterey Road, along Monterey Road between Main Avenue and Fifth Street, and along Depot Street at First Street through Fifth Street.

- **LOS E** for the following intersections and freeway zones:
    - Main Avenue and Del Monte Avenue
    - Main Avenue and Depot Street
    - Dunne Avenue and Del Monte Avenue
    - Dunne Avenue and Monterey Avenue
    - Dunne Avenue and Church Street
    - Dunne Avenue and Depot Street
    - Cochrane Road and Monterey Road
    - Tennant Avenue and Monterey Road
    - Tennant Avenue and Butterfield Boulevard
    - Cochrane Road Freeway Zone: from Madrone Parkway/Cochrane Plaza to Cochrane Road/DePaul Drive
    - Dunne Avenue Freeway Zone: from Walnut Grove Drive/East Dunne Avenue to Condit Road/East Dunne Avenue
    - Tennant Avenue Freeway Zone: from Butterfield Boulevard/Tennant Avenue to Condit Road/Tennant Avenue

The correlation between average delay and level of service for signalized intersections is shown in Table 1.

Unsignalized Intersections

The methodology used to determine the level of service for unsignalized intersections is also TRAFFIX and the *2000 HCM* methodology for unsignalized intersection analysis. This method is applicable for both one-way/two-way and all-way stop-controlled intersections. For the analysis of stop-controlled intersections, the *2000 HCM* methodology evaluates intersection operations on the basis of average control delay time for all vehicles on the stop-controlled approaches. For the purpose of reporting level of service for one- and two-way stop-controlled intersections, the delay and corresponding level of service for the stop-controlled minor street approach with the highest delay is reported. For all-way stop-controlled intersections, the reported average delay and corresponding level of service is the average for all approaches at the intersection.

The City of Morgan Hill uses a minimum acceptable level of service standard of LOS D for unsignalized intersections (with the exception of unsignalized intersections located within the Downtown area and freeway zones, as described above), in accordance with its adopted threshold of significance in its Guidelines for Preparation of Transportation Impact Reports. The correlation between average delay and level of service for unsignalized intersections is shown in Table 2.

Signal Warrants

The level of service analysis at unsignalized intersections is supplemented with an assessment of the need for signalization of the intersection. The need for signalization of unsignalized intersections is assessed based on the Peak Hour Volume Warrant (Warrant 3) described in the *California Manual on Uniform Traffic Control Devices for Streets and Highways (CA MUTCD)*, Part 4, Highway Traffic Signals, 2014. This method makes no evaluation of intersection level of service, but simply provides an indication whether vehicular peak-hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal. The decision to install a traffic signal should not be based purely on the warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Additionally, engineering judgment is exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Intersections that meet the peak-hour

Table 1
Signalized Intersection Level of Service Definitions Based on Control Delay

Level of Service	Description	Average Control Delay per Vehicle (sec.)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	up to 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	Greater than 80.0

Sources: Transportation Research Board, *2000 Highway Capacity Manual* (Santa Clara County and City of Gilroy adopted level of service methodology). *Traffic Level of Service Analysis Guidelines*, Santa Clara County Transportation Authority Congestion Management Program, June 2003.

Table 2
Unsignalized Intersection Level of Service Definitions Based on Control Delay

Level of Service	Description	Average Control Delay per Vehicle (sec.)
A	Operations with very low delays occurring with favorable progression.	up to 10.0
B	Operations with low delays occurring with good progression.	10.1 to 15.0
C	Operations with average delays resulting from fair progression.	15.1 to 25.0
D	Operation with longer delays due to a combination of unfavorable progression of high V/C ratios.	25.1 to 35.0
E	Operation with high delay values indicating poor progression and high V/C ratios. This is considered to be the limited of acceptable delay.	35.1 to 50.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation and poor progression.	Greater than 50.0

Source: Transportation Research Board, *2000 Highway Capacity Manual* (Santa Clara County and City of Gilroy adopted level of service methodology).

warrant are subject to further analysis before determining that a traffic signal is necessary. Other options such as traffic control devices, signage, or geometric changes may be preferable based on existing field conditions.

Freeway Segments

According to CMP Traffic Impact Analysis Guidelines, dated October 2014, a freeway level of service analysis is required if the number of project trips added to any freeway segment equals or exceeds one percent of the capacity of the segment. The key freeway segments in the study area were evaluated to determine if the project traffic on each segment would exceed this threshold. In the vicinity of the project site, US 101 has three mixed-flow lanes in each direction of travel south of Cochrane Road, and three mixed-flow lanes plus one high occupancy vehicle (HOV) lane north of Cochrane Road. The CMP specifies that a capacity of 2,300 vehicles per hour per lane (vphpl) be used for mixed-flow lane segments that are three lanes or wider in one direction, and a capacity of 2,200 vphpl be used for mixed-flow lane segments that are two lanes wide in one direction. A capacity of 1,650 vphpl was used for high occupancy vehicle (HOV) lanes. Thus, the three mixed-flow lanes on US 101 near the project site have a capacity of 6,900 vph plus 1,650 vph for the segments with HOV lanes. Using the CMP's one-percent threshold, a freeway level of service analysis for US 101 would be needed if the project adds 69 or more trips to the freeway segments (mixed-flow lanes) near the site.

A review of the project trip assignment indicates that the highest number of project trips in any direction on the subject freeway segments would be no more than 42 trips during both the AM and PM peak hours. Since the number of project trips on the freeway falls below the one-percent threshold, the project would not cause a significant increase in traffic on the freeway segments in the study area, and a freeway level of service analysis is not required. The freeway capacity analysis is summarized on Table 3.

Report Organization

The remainder of this report is divided into five chapters. Chapter 2 describes existing conditions in terms of the existing roadway network, transit service, and existing bicycle and pedestrian facilities. Chapter 3 presents the project impact on the transportation system and describes the recommended mitigation measures under existing plus project conditions. Chapter 4 presents the traffic conditions in the study area under Year 2035 General Plan conditions without and with the proposed project and its land use amendment. Chapter 5 presents the analysis of other transportation related issues, including site access. Chapter 6 presents the conclusions of the traffic impact analysis.

Table 3
Freeway Segment Capacity Evaluation

#	Freeway	Segment	Direction	Peak Hour	Capacity: Mixed-Flow # of Lanes	Capacity: Mixed-Flow Capacity[1] (vph)	Capacity: HOV # of Lanes	Capacity: HOV Capacity[1] (vph)	Project Trips: Mixed-Flow Lane Volume (vph)	Project Trips: Mixed-Flow Lane % of Capacity	Project Trips: HOV Lane Volume (vph)	Project Trips: HOV Lane % of Capacity
1	US 101	from Masten Avenue to San Martin Avenue	NB	AM	3	6,900	--	--	40	0.6	--	--
			NB	PM	3	6,900	--	--	27	0.4	--	--
2	US 101	from San Martin Avenue to Tennant Avenue	NB	AM	3	6,900	--	--	40	0.6	--	--
			NB	PM	3	6,900	--	--	27	0.4	--	--
3	US 101	from Tennant Avenue to East Dunne Avenue	NB	AM	3	6,900	--	--	35	0.5	--	--
			NB	PM	3	6,900	--	--	41	0.6	--	--
4	US 101	from East Dunne Avenue to Cochrane Road	NB	AM	3	6,900	--	--	35	0.5	--	--
			NB	PM	3	6,900	--	--	41	0.6	--	--
5	US 101	from Cochrane Road to Coyote Creek Golf Drive	NB	AM	3	6,900	1	1,650	29	0.4	6	0.4
			NB	PM	3	6,900	1	1,650	36	0.5	5	0.3
6	US 101	from Coyote Creek Golf Drive to Bailey Avenue	NB	AM	3	6,900	1	1,650	22	0.3	13	0.8
			NB	PM	3	6,900	1	1,650	41	0.6	0	0.0
7	US 101	from Bailey Avenue to SR 85	NB	AM	3	6,900	1	1,650	28	0.4	7	0.4
			NB	PM	3	6,900	1	1,650	36	0.5	5	0.3
8	US 101	from SR 85 to Bailey Avenue	SB	AM	3	6,900	1	1,650	34	0.5	3	0.2
			SB	PM	3	6,900	1	1,650	25	0.4	12	0.7
9	US 101	from Bailey Avenue to Coyote Creek Golf Drive	SB	AM	3	6,900	1	1,650	34	0.5	3	0.2
			SB	PM	3	6,900	1	1,650	24	0.3	13	0.8
10	US 101	from Coyote Creek Golf Drive to Cochrane Road	SB	AM	3	6,900	1	1,650	28	0.4	9	0.5
			SB	PM	3	6,900	1	1,650	24	0.3	13	0.8
11	US 101	from Cochrane Road to East Dunne Avenue	SB	AM	3	6,900	--	--	37	0.5	--	--
			SB	PM	3	6,900	--	--	37	0.5	--	--
12	US 101	from East Dunne Avenue to Tennant Avenue	SB	AM	3	6,900	--	--	37	0.5	--	--
			SB	PM	3	6,900	--	--	37	0.5	--	--
13	US 101	from Tennant Avenue to San Martin Avenue	SB	AM	3	6,900	--	--	24	0.3	--	--
			SB	PM	3	6,900	--	--	39	0.6	--	--
14	US 101	from San Martin Avenue to Masten Avenue	SB	AM	3	6,900	--	--	24	0.3	--	--
			SB	PM	3	6,900	--	--	39	0.6	--	--

Notes:
[1]Capacities for freeway mixed-flow and HOV lanes were obtained from VTA Transportation Impact Analysis Guidelines (October 2014)

2. Existing Conditions

This chapter describes the existing conditions for all of the major transportation facilities in the vicinity of the site, including the roadway network, transit service, and bicycle and pedestrian facilities.

Existing Roadway Network

Regional access to the project site is provided via US 101. Local access to the site is provided by Tennant Avenue, Barrett Avenue, San Pedro Avenue, Dunne Avenue, Monterey Road, Butterfield Boulevard, Juan Hernandez Drive, and Condit Road. These facilities are described below.

US 101 is a north-south freeway extending northward to San Francisco and southward through Gilroy. US 101 is an eight-lane freeway (three mixed-flow lanes and one high-occupancy vehicle (HOV) lane in each direction) north of Cochrane Road. South of Cochrane Road, it is a six-lane freeway with no HOV lanes. Access to and from the project area is provided via a full interchange at Tennant Avenue.

Tennant Avenue is classified in the City of Morgan Hill General Plan as a 4- to 6-lane major arterial. Tennant Avenue extends from Monterey Road eastward to the east foothills, terminating at a T-intersection with Carey Avenue. West of Monterey Road, Tennant Avenue changes designation to Edmundson Avenue. Tennant Avenue provides regional access to the project site via its full interchange with US 101.

Barrett Avenue is an east-west two-lane undivided roadway that extends from Railroad Avenue eastward to just west of US 101. East of US 101, Barrett Avenue continues eastward from west of Murphy Avenue to Trail Drive, in the east foothills, where it terminates. The posted speed limit on Barrett Avenue is 30 miles per hour (mph) and reduces to 25 mph in the vicinity of the Barrett Elementary School when children are present. Sidewalks on both sides of the street are found along Barrett Avenue, west of US 101, with the exception of two short segments along two undeveloped parcels located just east of Railroad Avenue. No sidewalks are found along Barrett Avenue, east of US 101. Barrett Avenue is the northern project site boundary and would provide emergency access to the project site via two driveways.

San Pedro Avenue is an east-west two-lane undivided roadway that extends from Monterey Road eastward to just west of US 101, then it continues again on the east side of US 101 to its terminus point at Hill Road. West of US 101, San Pedro Avenue has a posted speed limit of 35 mph. San Pedro Avenue would provide access to the project site via Butterfield Boulevard and via the future Juan Hernandez Drive extension.

Dunne Avenue is classified in the City of Morgan Hill General Plan as a four-lane major arterial, with the exception of the two-lane arterial segment between Del Monte Avenue and Peak Avenue. Dunne Avenue

transverses the City extending from the east part of town to the west with a posted speed limit of 35 to 40 mph and sidewalks along both sides of the street. Bike lanes are found along both side of Dunne Avenue between Peak Avenue and Gallop Drive (east of US 101). Dunne Avenue would provide access to the project site via Butterfield Boulevard and Walnut Grove Avenue.

Monterey Road is classified in the City of Morgan Hill General Plan as a four-lane major arterial that runs directly through Morgan Hill. Monterey Road extends from Market Street, in downtown San Jose, to US 101 south of the City of Gilroy. Monterey Road has posted speed limits ranging from 25 to 50 mph. Within the downtown area (between Main Avenue and Dunne Avenue), sidewalks are present along both sides of the street. However, north and south of the downtown area, segments of sidewalks are missing along one or both sides of Monterey Road. The segment of Monterey Road between Main Avenue and Dunne Avenue is designated as a bike route (Class III facility), while the segments of Monterey Road north of Main Avenue and south of Dunne Avenue currently provide bike lanes (Class II) along both sides of the street. Monterey Road would provide access to the project site via Tennant Avenue and Butterfield Boulevard.

Butterfield Boulevard is a north-south four-lane divided arterial roadway that begins in the northern part of town at its intersection with Cochrane Road and extends southward to its intersection with Monterey Road where it changes designation to Watsonville Road. Butterfield Boulevard has a posted speed limit of 45 mph. Along with Monterey Road, Butterfield Boulevard serves as a primary north-south route within the City of Morgan Hill. Butterfield Boulevard is planned to be extended north of Cochrane Road as a two-lane arterial to connect to Madrone Parkway. Bike lanes are currently provided along the entire length of Butterfield Boulevard. Butterfield Boulevard would provide access to the project site via Barrett Avenue and Tennant Avenue.

Juan Hernandez is a two-lane north-south undivided roadway that begins at Tennant Avenue and extends northward to north of San Vicente Drive where it currently terminates. Juan Hernandez Drive is planned to be extended northward from its current terminus point to connect to San Pedro Avenue. The posted speed limit on Juan Hernandez Drive is 35 mph and reduces to 25 mph in the vicinity of the Barrett Elementary School when children are present. Juan Hernandez Drive has sidewalks on both sides of the street, with the exception of the west side of the street between Tennant Avenue and St. James Drive. Being the western project site boundary, Juan Hernandez Drive would provide direct access to the project site via two driveways.

Condit Road is a two-lane north-south undivided roadway that extends from Tennant Avenue northward to Half Road (north of Main Street) where it currently terminates. Condit Road runs parallel to and east of US 101, with a posted speed limit of 45 mph. Condit Road would provide access to the project site via Tennant Avenue.

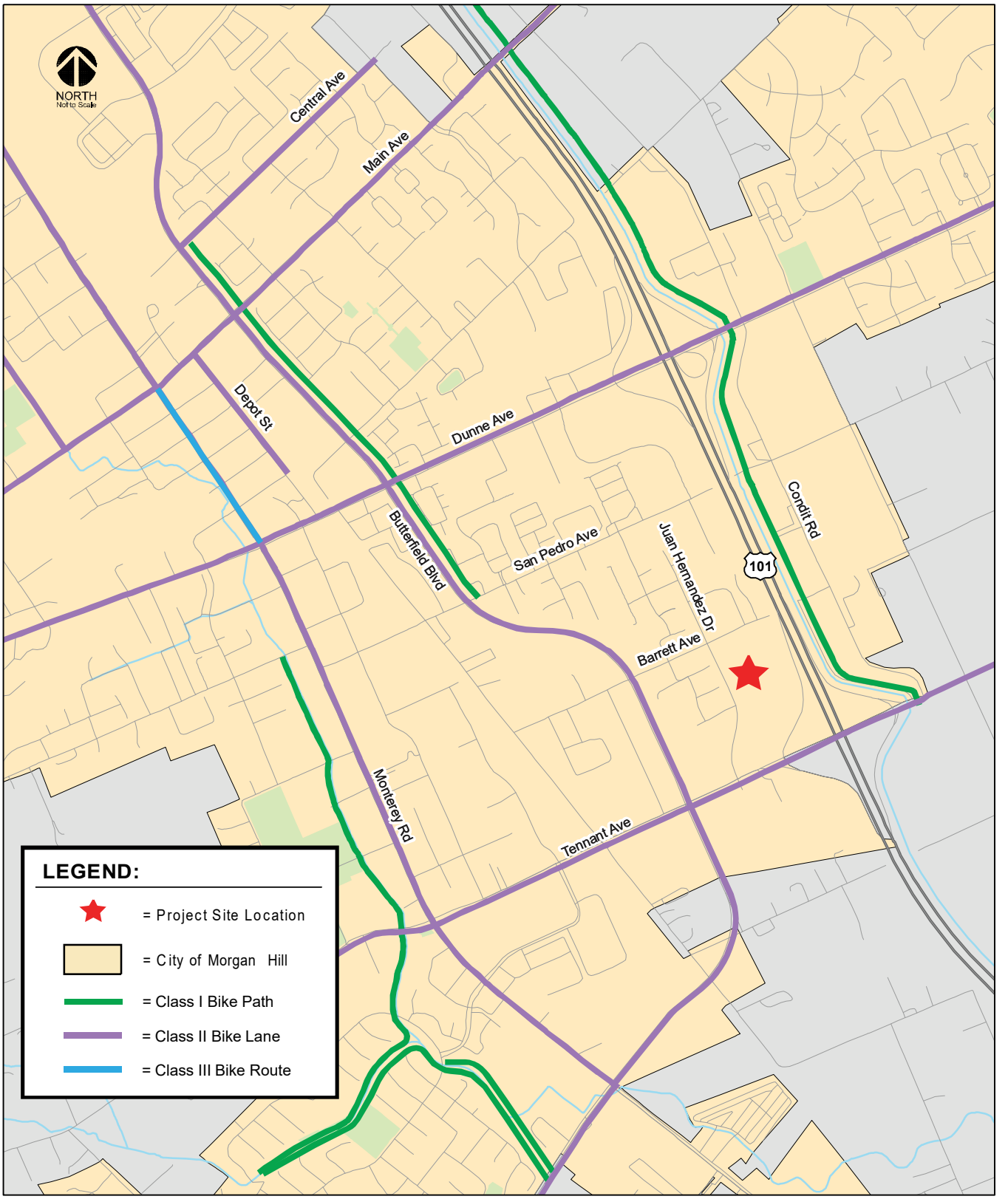
Existing Bicycle and Pedestrian Facilities

There are numerous bike lanes and bike paths in the vicinity of the project site. The existing bicycle facilities within the study area are described below and shown on Figure 3.

Class I Trail or Path is an off-street path with exclusive right-of-way for non-motorized transportation used for commuting as well as recreation. Class I bikeways are currently provided at the following locations:

- Along the west bank of Little Llagas Creek, extending from Watsonville Road and La Crosse Drive north to Spring Avenue.
- Along the east side of Butterfield Boulevard, between San Pedro Avenue and Central Avenue.

Figure 3
Existing Bicycle Facilities



- An unpaved bike path, the Madrone Channel Trail, running along the east side of US 101, between Tennant Avenue and Cochrane Road.

Class II Bike Lanes are on street striped bike lanes. Within the project vicinity, Class II bikeways are present along the following roadways:

- Tennant Avenue, from Olympic Drive to east of US 101
- Butterfield Boulevard, along its entire length
- Monterey Road, nearly its entire length within City of Morgan Hill limits, with the exception of the segment that runs through downtown between Dunne Avenue and Main Avenue
- Dunne Avenue, from Peak Avenue to east of Hill Road
- Main Avenue, from Peak Avenue to east of US 101

Class III Bike Routes are signed bike routes that provide a connection through residential, downtown, and rural/hillside areas to Class I and Class II facilities. Bike routes serve as transportation routes within neighborhoods to parks, schools, and other community amenities. The segment of Monterey Road between Main Avenue and Dunne Avenue is designated as a bike route.

Pedestrian facilities in the study areas consist primarily of sidewalks, crosswalks, and pedestrian signals at signalized intersections. All of the signalized intersections in the vicinity of the project site have marked crosswalks and pedestrian push buttons and signal heads along at least two of the legs of the intersection. However, the project site is located within an area that is highly undeveloped. Residential neighborhoods are located both north and west of the project site, while parcels south of the project site are mainly undeveloped. Tennant Avenue, east of Butterfield Boulevard, is lined with predominantly undeveloped parcels. As such, continuous sidewalks along some roadway segments in the vicinity of the project site are not available, in particular along undeveloped areas. Additionally, curb ramps at intersections surrounding the project site are non-Americans with Disabilities Act (ADA)-compatible wheelchair ramps.

Sidewalks are provided along most residential and commercial areas in the vicinity of the project site. However, the following roadway segments in the immediate project area have missing sidewalks along one or both sides of the street:

Juan Hernandez Drive – Sidewalks are missing along the west side of the street between Tennant Avenue and St. James Drive (undeveloped parcel).

Tennant Avenue – Sidewalks are missing along both sides of street between Butterfield Boulevard and Juan Hernandez Drive, along two undeveloped parcels east of Railroad Avenue (including along the at grade railroad crossing), and along both sides of the street east of US 101.

Butterfield Boulevard – Sidewalks are missing along the east side of the street between Tennant Avenue and San Pedro Avenue.

Existing Transit Service

Existing transit service in Morgan Hill is primarily provided by Santa Clara County VTA buses. Although the City of Morgan Hill is served by various local and express bus routes, none of the existing bus routes currently serve the project site area directly. The nearest bus stops to the project site are located north of the Monterey Road/Tennant Avenue intersection, approximately one-mile walking distance west of the project site.

Additionally, the Morgan Hill Caltrain Station, located on the east side of Depot Street, is approximately 1.5 miles northwest of the project site and provides a connection to most transit lines serving Morgan

Hill in addition to Caltrain. The Morgan Hill Caltrain Station includes 42 bicycle parking spaces (12 bicycle racks and 30 bicycle lockers) and 486 vehicle parking spaces.

The existing transit services serving Morgan Hill are described below and shown on Figure 4. It should be noted that the bus routes described below are based on information obtained from the VTA website in February 2020, at the time this analysis was being conducted. However, due to the unprecedented events caused by Covid19 and the order to shelter in place issued by Santa Clara County Department of Public Health, as of March 17, 2020 and until further notice, VTA is running reduced bus service for essential travel.

VTA Bus Services

The City of Morgan Hill is served by VTA bus routes 68, 87, 121, 168, and 287. The routes are described below.

Frequent Bus Route 68 operates on Monterey Road on its route between the Gilroy Transit Center and the San Jose Diridon Transit Center with 15-minute headways on weekdays in the AM and PM commute periods. Route 68 operates between 4:00 AM and 1:30 AM. The nearest Route 68 stop to the project site is located at the intersection of Monterey Road and Tennant Avenue.

Local Bus Route 87 operates on Main Avenue on its route between Burnett Avenue and the Morgan Hill Civic Center (Main and Dewitt) with approximately 60-minute headways in the AM and PM commute periods. Route 87 operates between 6:30 AM and 5:45 PM. The nearest Route 87 stops to the project site are located near the intersection of Monterey Road and Main Avenue, approximately 2 miles northwest of the project site.

Express Route 121 operates on Butterfield Boulevard and Monterey Road on its route between the Gilroy/Morgan Hill Transit Center and the Lockheed Martin Transit Center. It operates northbound only with 15 to 30-minute headways during the AM commute period and southbound only with 15 to 30-minute headways during the PM commute period. The nearest Route 121 stop to the project site is located at the intersection of Monterey Road and Tennant Avenue.

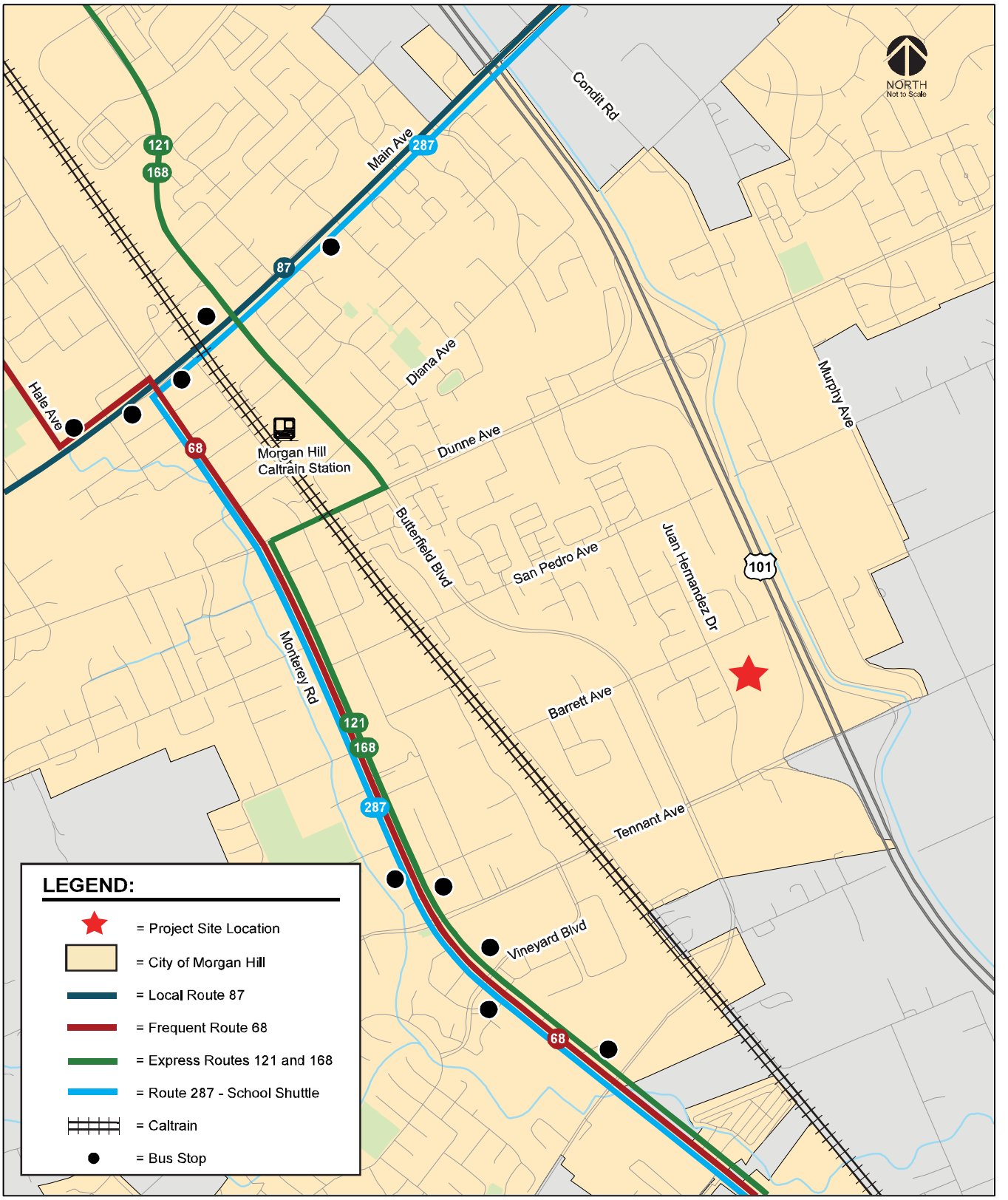
Express Route 168 operates on Butterfield Boulevard and Monterey Road on its route between the Gilroy/Morgan Hill Transit Center and the San Jose Diridon Transit Center. It operates northbound only with 30- to 45-minute headways during the AM commute period and southbound only with 15- to 30-minute headways during the PM commute period. The nearest Route 168 stop to the project site is located at the intersection of Monterey Road and Tennant Avenue.

School Shuttle Route 287 operates on Main Avenue and Monterey Road on its route between Live Oak High School and San Martin. It operates a single southbound trip at 3:17 PM from Live Oak High School to the intersection of Monterey Road and San Martin Avenue.

Caltrain

Commuter rail service between San Francisco and Gilroy is provided by Caltrain. The Morgan Hill Caltrain Station is located along Depot Street, with main access and parking off of Butterfield Boulevard, approximately 1.5 miles northwest of the project site. At the Morgan Hill Station, Caltrain provides service in the northbound direction only during the AM commute period and in the southbound direction only during the PM commute period with approximately 30- to 40-minute headways during each of the commute hours.

Figure 4
Existing Transit Services



Existing Intersection Lane Configurations

The existing lane configurations at the study intersections were determined by observations in the field and are shown on Figure 5.

Existing Traffic Volumes

Existing peak-hour traffic volumes were obtained from recently completed traffic studies and supplemented with manual turning-movement counts (conducted in February 2020) at intersections where counts were either unavailable or outdated (more than 2 years old). The existing peak-hour intersection volumes are shown on Figure 6. Intersection turning-movement counts conducted for this analysis are presented in Appendix A and peak-hour intersection turning movement volumes for all intersections and study scenarios are tabulated in Appendix B.

Existing Intersection Level of Service Analysis

The results of the intersection level of service analysis and signal warrant checks under existing conditions are summarized in Table 4. The results show that, measured against the City of Morgan Hill level of service standards, all the study intersections currently operate at an acceptable level of service, LOS D or better, under existing conditions during both the AM and PM peak hours.

Based on the Peak-Hour Volume Signal Warrant, (Warrant #3 – Part B) described in the California *Manual on Uniform Traffic Control Devices* (MUTCD), 2014 Edition, the existing traffic volumes at the Condit Road and Tennant Avenue intersection are sufficient to warrant installation of a traffic signal during the AM and PM peak hour under existing conditions. All other unsignalized study intersections currently have traffic conditions that fall below the thresholds that warrant signalization.

The level of service calculation sheets are included in Appendix C. The peak-hour signal warrant sheets are contained in Appendix D.

Existing Freeway Levels of Service

As discussed in Chapter 1 of this report, a freeway level of service analysis was not conducted since the number of new trips added to the freeway segments by the proposed project do not equal or exceed one percent of the capacity of the freeway segments near the project site. Based on CMP Traffic Impact Analysis Guidelines, a freeway level of service analysis is not required.

Figure 5
Existing Lane Configurations

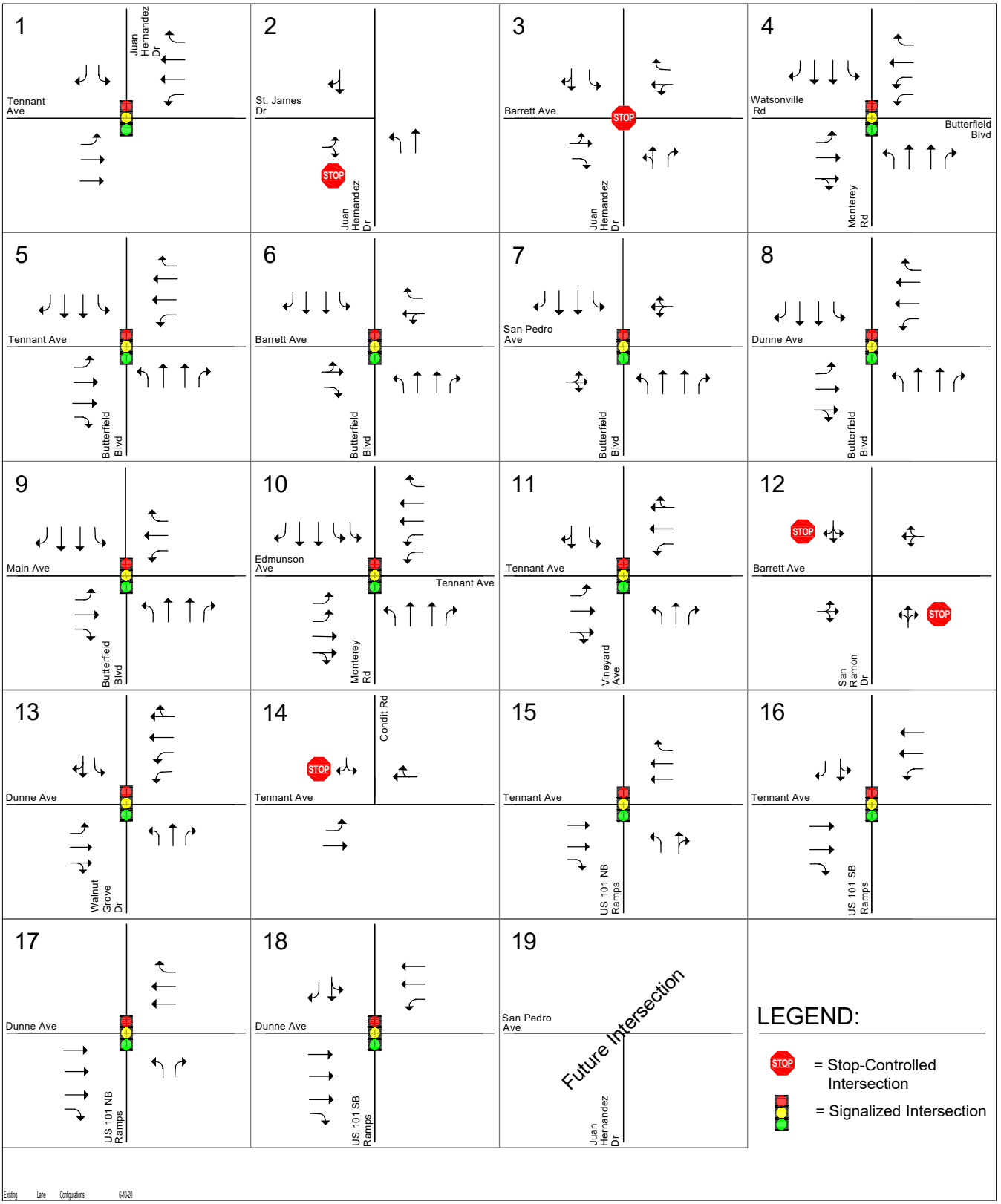


Figure 6
Existing Traffic Volumes

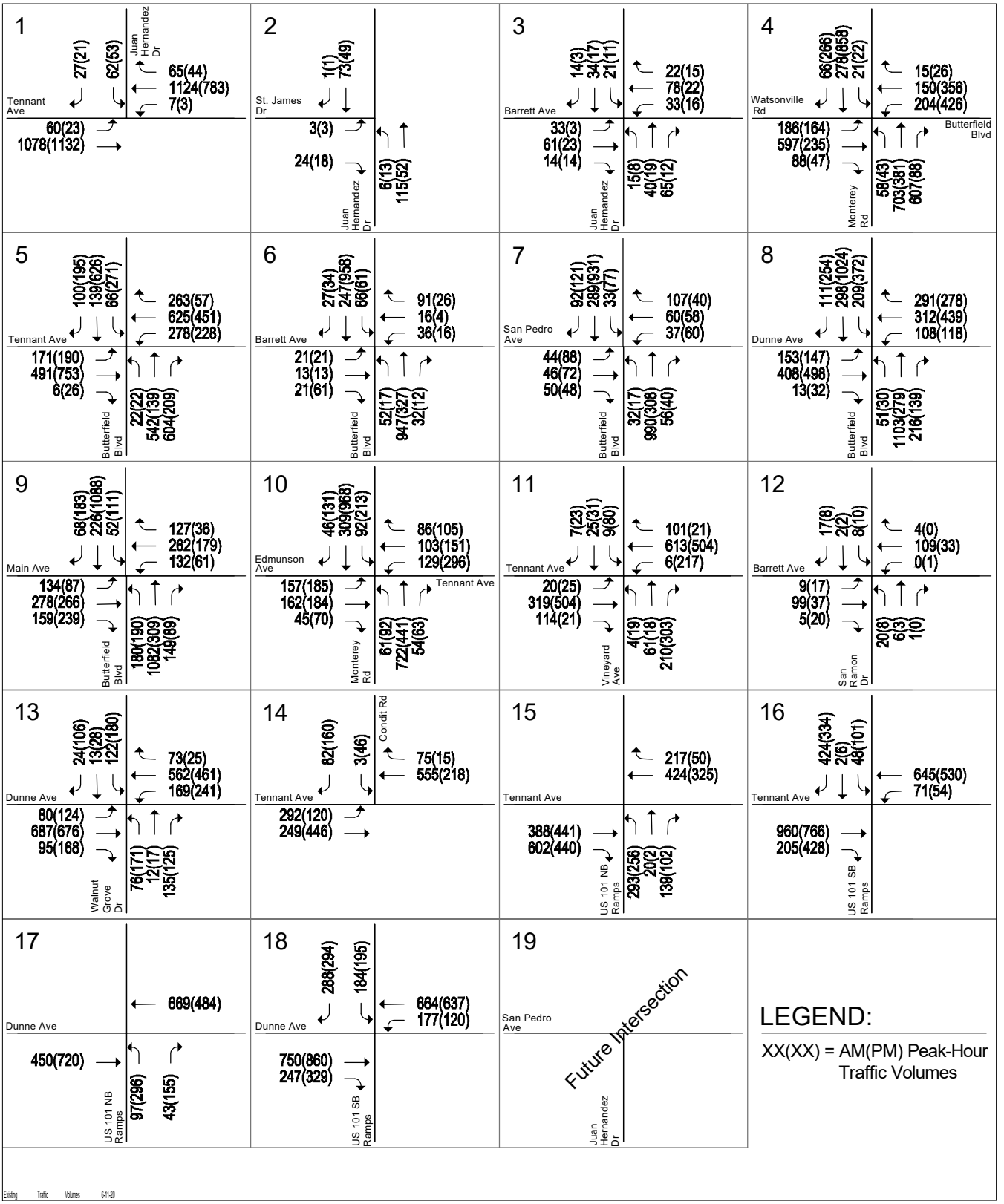


Table 4
Existing Intersection Levels of Service

Int. #	Intersection	Existing Control	LOS Standard	Peak Hour	Count Date	Warrant Met?	Delay[1]	LOS
1	Tennant Avenue and Juan Hernandez Drive	Signal	E	AM	02/06/20	--	10.5	B
				PM	02/06/20	--	10.2	B
2	Juan Hernandez Drive and St. James Drive	OWSC	D	AM	02/06/20	No	8.8	A
				PM	02/06/20	No	8.7	A
3	Juan Hernandez Drive and Barrett Avenue	AWSC	D	AM	02/06/20	No	8.4	A
				PM	02/06/20	No	7.5	A
4	Monterey Road and Watsonville Road/Butterfield Boulevard	Signal	D	AM	03/14/19	--	25.0	C
				PM	03/14/19	--	38.1	D
5	Butterfield Boulevard and Tennant Avenue	Signal	E	AM	02/06/20	--	29.8	C
				PM	02/06/20	--	33.9	C
6	Butterfield Boulevard and Barrett Avenue	Signal	D	AM	02/06/20	--	11.1	B
				PM	02/06/20	--	10.3	B
7	Butterfield Boulevard and San Pedro Avenue	Signal	D	AM	03/14/19	--	13.0	B
				PM	03/14/19	--	13.2	B
8	Butterfield Boulevard and Dunne Avenue	Signal	D	AM	05/08/18	--	35.5	D
				PM	05/08/18	--	31.7	C
9	Butterfield Boulevard and Main Avenue	Signal	D	AM	05/08/18	--	27.6	C
				PM	05/08/18	--	29.8	C
10	Monterey Road and Tennant Avenue/Edmunson Avenue	Signal	E	AM	03/14/19	--	23.3	C
				PM	03/14/19	--	35.2	D
11	Tennant Avenue and Vineyard Avenue	Signal	D	AM	02/06/20	--	16.4	B
				PM	02/06/20	--	19.4	B
12	Barrett Avenue and San Ramon Drive	TWSC	D	AM	02/06/20	No	10.4	B
				PM	02/06/20	No	9.4	A
13	Dunne Avenue and Walnut Grove Drive	Signal	E	AM	03/28/19	--	18.4	B
				PM	03/28/19	--	28.5	C
14	Tennant Avenue and Condit Road	OWSC	E	AM	06/04/19	**Yes**	14.7	B
				PM	06/04/19	**Yes**	14.6	B
15	US 101 NB Ramps and Tennant Avenue	Signal	E	AM	06/04/19	--	11.6	B
				PM	06/04/19	--	11.1	B
16	US 101 SB Ramps and Tennant Avenue	Signal	E	AM	06/04/19	--	21.5	C
				PM	06/04/19	--	19.7	B
17	US 101 Northbound Ramps and Dunne Avenue	Signal	E	AM	05/08/18	--	5.3	A
				PM	05/08/18	--	11.8	B
18	US 101 Southbound Ramps and Dunne Avenue	Signal	E	AM	05/08/18	--	20.9	C
				PM	05/08/18	--	18.8	B
19	Juan Hernandez Drive and San Pedro Avenue *(Future Intersection)*	Future	D	AM	--	--	--	--
				PM	--	--	--	--

Notes:

[1]The reported delay and corresponding level of service for signalized and all-way stop-controlled intersections represent the average delay for all approaches at the intersection. The reported delay and corresponding level of service for one- and two-way stop-controlled intersections are based on the stop-controlled approach with the highest delay.

3.
Existing Plus Project Conditions

This chapter describes existing plus project traffic conditions, significant project impacts, and measures that are recommended to mitigate project impacts. Included are descriptions of the significance criteria that define an impact, estimates of project-generated traffic, identification of the impacts, and descriptions of the mitigation measures. Existing plus project conditions are represented by existing traffic conditions with the addition of traffic generated by the proposed project.

Significant Impact Criteria

Significance criteria are used to establish what constitutes an impact. Significance criteria for impacts on intersections for this analysis are based on the City of Morgan Hill and CMP Level of Service standards.

Definition of Significant Signalized Intersection Impacts

All intersections within the City of Morgan Hill are required to meet the City's LOS standard of LOS D, with the exception of the following:

- **LOS F** for Downtown intersections and segments including at Main Avenue/Monterey Road, along Monterey Road between Main Avenue and Fifth Street, and along Depot Street at First Street through Fifth Street;
- **LOS E** for the following intersections and freeway zones:
    - Main Avenue and Del Monte Avenue
    - Main Avenue and Depot Street
    - Dunne Avenue and Del Monte Avenue
    - Dunne Avenue and Monterey Avenue
    - Dunne Avenue and Church Street
    - Dunne Avenue and Depot Street
    - Cochrane Road and Monterey Road
    - Tennant Avenue and Monterey Road
    - Tennant Avenue and Butterfield Boulevard
    - Cochrane Road Freeway Zone: from Madrone Parkway/Cochrane Plaza to Cochrane Road/DePaul Drive
    - Dunne Avenue Freeway Zone: from Walnut Grove Drive/East Dunne Avenue to Condit

Road/East Dunne Avenue
- Tennant Avenue Freeway Zone: from Butterfield Boulevard/Tennant Avenue to Condit Road/Tennant Avenue

Eight of the fourteen signalized study intersections are located within the LOS E standard areas. The remaining six signalized study intersections have a LOS D standard.

According to the City of Morgan Hill level of service guidelines, a development is said to create a significant adverse impact on traffic conditions at a signalized intersection if for either peak hour:

1. The level of service at the intersection degrades from an acceptable level (LOS D or LOS E as identified above) under existing conditions to an unacceptable level (LOS E or F) under project conditions, or
2. The level of service at the intersection is an unacceptable level (LOS E or F as identified above) under existing conditions and the addition of project trips causes the average critical delay to increase by four (4) or more seconds *and* the volume-to-capacity ratio (V/C) to increase by 0.01.

An exception to this rule applies when the addition of project traffic reduces the amount of average delay for critical movements (i.e., the change in average delay for critical movements is negative). In this case, the threshold of significance is an increase in the critical V/C value by 0.01 or more.

Definition of Significant Unsignalized Intersection Impacts

Unsignalized intersections within the City of Morgan Hill have a minimum operating level of LOS D, with the exception of unsignalized intersections located within the Downtown area and freeway zones, as identified above, which have a LOS E or F standard. One of the unsignalized study intersections has is located within the LOS E standard area while the remaining four unsignalized intersections have a LOS D standard.

According to the City of Morgan Hill level of service significant impact thresholds, a development is said to have a significant adverse impact on traffic conditions at an unsignalized intersection if for either peak hour the addition of project traffic causes the worst approach (for one- and two-way stop control) or the intersection (for all-way stop control) delay to degrade to an unacceptable LOS E or F ***and*** the traffic volumes at the intersection are sufficiently high to satisfy the peak-hour volume signal warrant.

Transportation Network under Existing Plus Project Conditions

It is assumed in this analysis that the roadway network and intersection configurations under existing plus project conditions would be the same as described under existing conditions.

Project Description

The 19.67-acre project site is generally located in the northwest quadrant of the US 101/Tennant Avenue interchange and is mostly undeveloped with the exception of two currently occupied existing medical office buildings totaling 15,900 square feet (s.f.). The existing medical office buildings are proposed to remain and would be part of the Planned Development Mater Plan. The Master Plan development for the site includes the following land uses:

- a 100,000-s.f. hospital with 55 beds,
- 10,000 s.f. of commercial and restaurant space,
- 200 multi-family residential units,

- 25,900 s.f. of medical office space (existing 15,900 s.f. plus an additional 10,000 s.f.), and
- 4,500 s.f. of urgent care space.

The project site plan shows a total of four access driveway, two along Juan Hernandez Drive and two along Barrett Avenue. However, the City has requested that the two proposed access points along Barret Avenue be designated as emergency access only due to the potential conflict with traffic to/from the adjacent Barrett Elementary School, located just north of the project site. In addition, City staff has stated that the southernmost driveway along Juan Hernandez Drive (existing driveway) needs to be relocated and aligned with St. James Drive, located approximately 100 feet north of the driveway, to form a four-legged intersection. Thus, this analysis assumes that all project site access would be provided via the two proposed driveways along Juan Hernandez Drive only, and that the southernmost driveway would be realigned with St. James Drive, as requested by City staff.

Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear are estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic entering and exiting the site is estimated for the AM and PM peak hours. As part of the project trip distribution step, an estimate is made of the directions to and from which the project trips would travel. In the project trip assignment step, the project trips are assigned to specific streets and intersections in the study area. These procedures are described further in the following sections.

Trip Generation

Through empirical research, data have been collected that correlate to common land uses their propensity for producing traffic. Thus, for the most common land uses there are standard trip generation rates that can be applied to help predict the future traffic increases that would result from a new development. Trip generation estimates for each component of the proposed project are based on trip generation rates obtained from the Institute of Transportation Engineers' (ITE's) *Trip Generation Manual*, Tenth Edition, 2017.

Proposed Project Trip Generation

Project trip generation was estimated by applying to the size of the proposed development the applicable ITE trip generation rates. ITE trip generation rates for the following land uses were utilized:

- Multi-family housing (mid-rise) – ITE land use #221
- High-turnover (sit-down) restaurant – ITE land use #932
- Hospital – ITE land use #610
- Medical-dental office building – ITE land use #720
- Urgent care clinic – ITE land use #630

It should be noted that since it is unknown the amount of restaurant land use versus the retail land use, as a conservative approach, trip generation for the proposed restaurant/retail land use was estimated based on restaurant rates only. Restaurant land use is a higher trip generator compared to retail land use, resulting in a conservative trip generation estimate.

The trip estimates for each of the proposed land use components of the project were reduced to account for internalization, or trips made between each of the proposed land uses. The reductions are based on the assumption that vehicle trips generated by each of the proposed land uses of the site

would be reduced due to internalization of trips. Trip reductions for mixed-use components are based on the smaller trip-generator of the two uses. Reductions were applied for the internalization between the residential and retail components (15%) and between the residential and employment components (3%) of the project, as recommended by the VTA's *Transportation Impact Analysis Guidelines*, October 2014.

In addition, trip generation for retail uses is typically adjusted to account for pass-by-trips. Pass-by-trips are trips that would already be on the adjacent roadways (and are therefore already counted in the existing traffic) but would turn into the site while passing by. Justification for applying the pass-by-trip reduction is founded on the observation that such retail traffic is not actually generated by the retail development but is already part of the ambient traffic levels. Pass-by-trips are therefore excluded from the traffic projections (although pass-by traffic is accounted for at the site entrances). A typical pass-by trip reduction of 20% for retail development within the City of Morgan Hill was applied to the retail (or restaurant) component of the proposed project.

Based on the ITE trip generation rates and applicable trip reductions, it is estimated that the proposed project would generate 4,102 daily trips, with 333 trips (201 inbound and 132 outbound) occurring during the AM peak-hour and 346 trips (146 inbound and 200 outbound) occurring during the PM peak-hour.

Existing Site Trips

The project site is currently occupied with 15,900 s.f. of medical office space. The trip generation estimates include the existing medical office buildings, in addition to the proposed additional medical office space, as part of the Master Plan development for the site. Thus, in order to avoid double counting trips associated with the existing uses on the project site, traffic associated with these uses were subtracted from the trips estimated to be generated by the proposed Master Plan. The trips generated by the existing uses on site were obtained from new driveway counts completed in February 2020. Based on the driveway counts, the existing medical office buildings generate 218 daily vehicle trips, with 20 trips (17 inbound and 3 outbound) occurring during the AM peak-hour and 19 trips (4 inbound and 15 outbound) occurring during the PM peak-hour.

Net Project Trip Generation

Based on the ITE trip generation rates, applicable trip reductions, and credit for the existing use on the project site, it is estimated that the proposed project would generate an additional 3,884 daily trips, with 313 trips (184 inbound and 129 outbound) occurring during the AM peak-hour and 327 trips (142 inbound and 185 outbound) occurring during the PM peak-hour. The trip generation estimates for the proposed project are presented in Table 5.

Trip Distribution

The trip distribution patterns for project-generated traffic for each of the proposed land uses was estimated based on existing travel patterns on the surrounding roadway system, locations of complementary land uses, and the City of Morgan Hill Traffic Demand Forecasting (TDF) Model. The project trip distribution patterns for each land use are discussed below and shown graphically on Figure 7.

Table 5
Project Trip Generation Estimates

			Daily		AM Peak Hour						PM Peak Hour					
					Split			Trip			Split			Trip		
Land Use	Size		Rate	Trip	Rate	In	Out	In	Out	Total	Rate	In	Out	In	Out	Total
Proposed Land Uses																
Multifamily Housing (Mid-Rise) - ITE LU #221	200	Dwelling Units	5.44	1,088	0.36	26%	74%	19	53	72	0.44	61%	39%	54	34	88
15% Housing and Retail Mixed-Use Reduction[1]				-163				-3	-8	-11				-8	-5	-13
3% Housing and Employment Mixed-Use Reduction[2]				-33				-1	-2	-3				-2	-1	-3
High-Turnover (Sit-Down) Restaurant - ITE LU #932	10,000	Square Feet	112.18	1,122	9.94	55%	45%	54	45	99	9.77	62%	38%	61	37	98
15% Housing and Retail Mixed-Use Reduction[1]				-163				-8	-3	-11				-5	-8	-13
20% PM Passby Reduction[3]				-17				0	0	0				-11	-6	-17
Hospital - ITE LU #610	55	Beds	22.32	1,228	1.84	72%	28%	73	28	101	1.89	28%	72%	29	75	104
Medical-Dental Office Building - ITE LU #720	25,900	Square Feet	34.80	901	2.78	78%	22%	56	16	72	3.46	28%	72%	25	65	90
Urgent Care (Clinic) - ITE LU #630	4,500	Square Feet	38.16	172	3.69	78%	22%	13	4	17	3.28	29%	71%	4	11	15
3% Housing and Employment Mixed-Use Reduction[2]				-33				-2	-1	-3				-1	-2	-3
Total				**4,102**				**201**	**132**	**333**				**146**	**200**	**346**
Existing Medical Office Driveway Counts[4]				**218**				**17**	**3**	**20**				**4**	**15**	**19**
Net Project Trips (Proposed - Existing Driveway Counts)				**3,884**				**184**	**129**	**313**				**142**	**185**	**327**

Source: ITE Trip Generation Manual, 10th Edition, 2017
ITE LU # = ITE land use number

[1]As prescribed by the VTA Transportation Impact Analysis Guidelines (October 2014), the maximum trip reduction for a mixed-use development project with housing and retail components is equal to 15% off the smaller trip generator.

[2]As prescribed by the VTA Transportation Impact Analysis Guidelines (October 2014), the maximum trip reduction for a mixed-use development project with housing and employment components is equal to 3% off the smaller trip generator.

[3]A 20% pass-by reduction is typically applied during the PM peak-hour to retail projects in Morgan Hill.

[4]Daily trips for the existing medical offices were estimated based on the ratio between the peak-hour driveway counts and ITE rates.

Figure 7
Project Trip Distribution

Trip Assignment

The peak-hour trips associated with each of the proposed project land use components were added to the transportation network in accordance with the distribution patterns discussed above. Figure 8 shows the assignment of project traffic on the local transportation network. A tabular summary of project traffic at each study intersection is contained in Appendix B.

Existing Plus Project Traffic Volumes

Project trips for each of the land use components, as represented in the above project trip assignment, were added to the existing traffic volumes to obtain existing plus project traffic volumes. The existing plus project traffic volumes are shown on Figure 9.

Existing Plus Project Intersection Level of Service Analysis

The results of the level of service analysis and signal warrant checks under existing plus project conditions are summarized in Table 6. The results indicate that, measured against the City of Morgan Hill level of service standards, all of the study intersections are projected to operate at acceptable levels of service (LOS D or better) under existing plus project conditions, during both the AM and PM peak hours.

Based on the Peak-Hour Volume Signal Warrant, (Warrant #3 – Part B, CAMUTCD 2014 Edition), the intersection of Condit Road and Tennant Avenue (intersection #14) would continue to have peak-hour traffic volume levels that warrant installation of a traffic signal during the AM and PM peak hour under existing plus project conditions. According to the City of Morgan Hill level of service significant impact thresholds, the project would have an impact at this intersection if the intersection is projected to operate at unacceptable level of service conditions and the peak-hour signal warrant is met during the same peak-hour. The intersection is projected to operate at acceptable levels of service and, therefore, would not be impacted by the proposed project.

The level of service calculation sheets are included in Appendix C. The peak-hour signal warrant sheets are contained in Appendix D.

Freeway Segment Analysis

As discussed in Chapter 1 of this report, per CMP technical guidelines, freeway segment level of service analysis shall be conducted on all segments to which the project is projected to add trips representing one percent or more of the freeway segment's capacity. Since the number of new trips added to the freeway segments by the proposed project do not equal or exceed one percent of the capacity of the freeway segments near the project site, a freeway level of service analysis for the CMP is not required. The percentage of traffic projected to be added by the project to freeway segments in the project area is summarized in Table 3, Chapter 1.

Figure 8
Project Trip Assignment

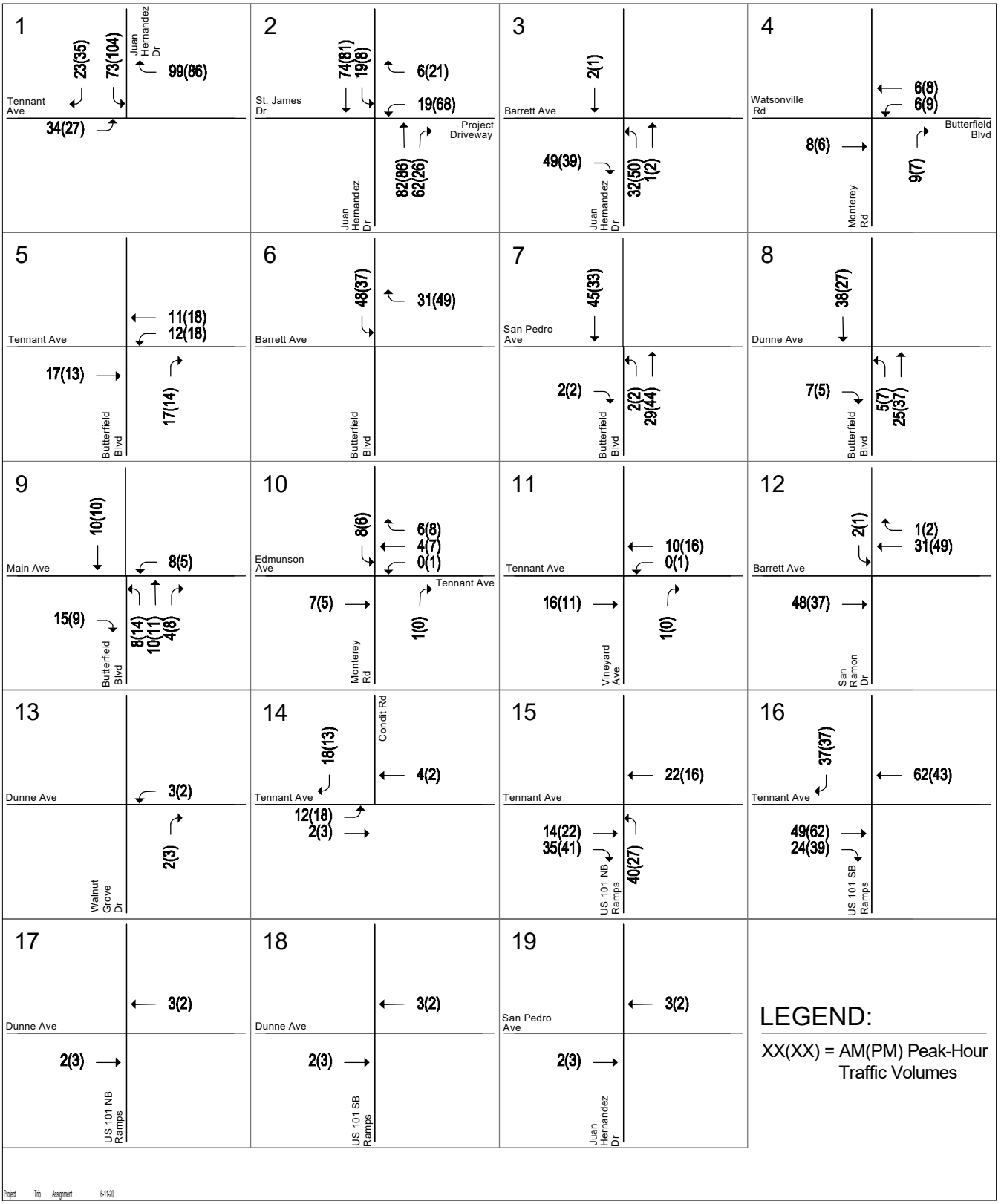


Figure 9
Existing Plus Project Traffic Volumes

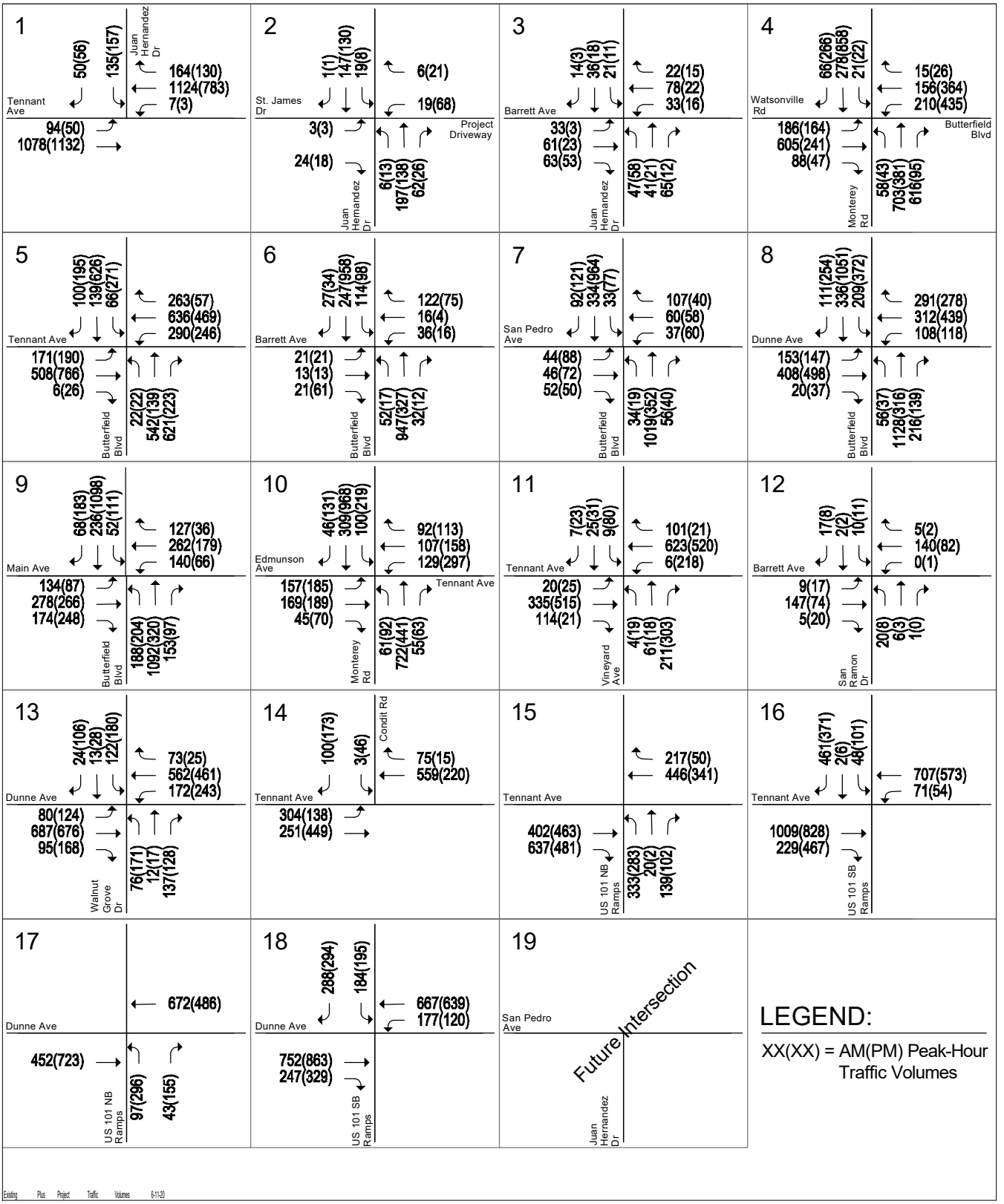


Table 6
Existing Plus Project Intersection Levels of Service

Int. #	Intersection	Existing Control	LOS Standard	Peak Hour	Count Date	Existing			Existing + Project				
						Warrant Met?	Delay[1]	LOS	Warrant Met?	Delay[1]	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
1	Tennant Avenue and Juan Hernandez Drive	Signal	E	AM	02/06/20	--	10.5	B	--	10.9	B	1.3	0.072
				PM	02/06/20	--	10.2	B	--	10.9	B	1.5	0.070
2	Juan Hernandez Drive and St. James Drive	OWSC	D	AM	02/06/20	No	8.8	A	No	11.7	B	N/A	N/A
				PM	02/06/20	No	8.7	A	No	11.3	B	N/A	N/A
3	Juan Hernandez Drive and Barrett Avenue	AWSC	D	AM	02/06/20	No	8.4	A	No	8.6	A	N/A	N/A
				PM	02/06/20	No	7.5	A	No	7.8	A	N/A	N/A
4	Monterey Road and Watsonville Road/Butterfield Boulevard	Signal	D	AM	03/14/19	--	25.0	C	--	25.2	C	0.3	0.009
				PM	03/14/19	--	38.1	D	--	38.2	D	0.2	0.005
5	Butterfield Boulevard and Tennant Avenue	Signal	E	AM	02/06/20	--	29.8	C	--	29.9	C	0.3	0.016
				PM	02/06/20	--	33.9	C	--	34.1	C	0.5	0.015
6	Butterfield Boulevard and Barrett Avenue	Signal	D	AM	02/06/20	--	11.1	B	--	12.3	B	1.7	0.053
				PM	02/06/20	--	10.3	B	--	10.8	B	0.2	0.009
7	Butterfield Boulevard and San Pedro Avenue	Signal	D	AM	03/14/19	--	13.0	B	--	13.0	B	0.0	0.009
				PM	03/14/19	--	13.2	B	--	13.2	B	0.0	0.013
8	Butterfield Boulevard and Dunne Avenue	Signal	D	AM	05/08/18	--	35.5	D	--	35.3	D	0.3	0.016
				PM	05/08/18	--	31.7	C	--	31.9	C	0.1	0.014
9	Butterfield Boulevard and Main Avenue	Signal	D	AM	05/08/18	--	27.6	C	--	27.7	C	0.4	0.008
				PM	05/08/18	--	29.8	C	--	30.3	C	0.8	0.015
10	Monterey Road and Tennant Avenue/Edmunson Avenue	Signal	E	AM	03/14/19	--	23.3	C	--	23.5	C	0.4	0.005
				PM	03/14/19	--	35.2	D	--	35.3	D	0.2	0.002
11	Tennant Avenue and Vineyard Avenue	Signal	D	AM	02/06/20	--	16.4	B	--	16.5	B	0.1	0.003
				PM	02/06/20	--	19.4	B	--	19.5	B	0.1	0.004
12	Barrett Avenue and San Ramon Drive	TWSC	D	AM	02/06/20	No	10.4	B	No	11.0	B	N/A	N/A
				PM	02/06/20	No	9.4	A	No	10.0	B	N/A	N/A
13	Dunne Avenue and Walnut Grove Drive	Signal	E	AM	03/28/19	--	18.4	B	--	18.4	B	0.0	0.001
				PM	03/28/19	--	28.5	C	--	28.5	C	0.0	0.001
14	Tennant Avenue and Condit Road	OWSC	E	AM	06/04/19	**Yes**	14.7	B	**Yes**	15.1	C	N/A	N/A
				PM	06/04/19	**Yes**	14.6	B	**Yes**	15.2	C	N/A	N/A
15	US 101 NB Ramps and Tennant Avenue	Signal	E	AM	06/04/19	--	11.6	B	--	12.4	B	1.1	0.018
				PM	06/04/19	--	11.1	B	--	11.4	B	0.2	0.024
16	US 101 SB Ramps and Tennant Avenue	Signal	E	AM	06/04/19	--	21.5	C	--	22.2	C	0.9	0.037
				PM	06/04/19	--	19.7	B	--	20.2	C	0.6	0.041
17	US 101 Northbound Ramps and Dunne Avenue	Signal	E	AM	05/08/18	--	5.3	A	--	5.3	A	0.0	0.001
				PM	05/08/18	--	11.8	B	--	11.8	B	0.0	0.001
18	US 101 Southbound Ramps and Dunne Avenue	Signal	E	AM	05/08/18	--	20.9	C	--	20.9	C	0.0	0.000
				PM	05/08/18	--	18.8	B	--	18.8	B	0.0	0.000
19	Juan Hernandez Drive and San Pedro Avenue *(Future Intersection)*	Future	D	AM	--	--	--	--	--	--	--	--	--
				PM	--	--	--	--	--	--	--	--	--

Notes:
[1]The reported delay and corresponding level of service for signalized and all-way stop-controlled intersections represent the average delay for all approaches at the intersection. The reported delay and corresponding level of service for one- and two-way stop-controlled intersections are based on the stop-controlled approach with the highest delay.

4.
Year 2035 General Plan Conditions

This chapter presents the long-term Year 2035 General Plan traffic conditions with and without the proposed project. The proposed Planned Development Master Plan subdivision and site uses require a General Plan Amendment (GPA) and Zoning Amendment. The current adopted General Plan land use designation for the 19.67-acre project site is Commercial and is located within a Service Commercial (CS) zoning district with Planned Development (PD) Combining District overlay. The applicant proposes to change the Commercial General Plan designation to Mixed-Use Flex, and through a Zoning Amendment requests to amend the zoning district to Mixed-Use Flex and Planned Development (PD) Combining District.

Year 2035 General Plan conditions are comprised of forecasted traffic volumes and reflect estimated traffic growth associated with the proposed land use amendment for the project as well as buildout of the projected land use growth and transportation improvements identified in the City of Morgan Hill General Plan. This chapter describes the procedure used to determine Year 2035 General Plan traffic volumes and the resulting traffic conditions with the proposed land use amendment. The analysis includes an evaluation of the proposed land use amendment (Year 2035 General Plan plus project conditions) against the adopted 2035 General Plan (No Project) conditions.

Year 2035 General Plan Transportation Network

The Year 2035 General Plan traffic forecasts include land use growth and transportation improvements associated with buildout of the City's General Plan as identified in the City's *2010 General Plan Circulation Element*. Several new roadways are planned under Year 2035 General Plan conditions to provide for enhanced connectivity and circulation throughout the City. The roadway improvements presented in Table 7 and Figure 10 are planned and assumed to be completed under Year 2035 General Plan conditions. Some of these roadway improvements will result in changes to intersection lane geometrics, as also identified in the *2010 General Plan Circulation Element,* will be required to implement the Year 2035 GP roadway improvements. Figure 11 shows the planned intersection geometries under Year 2035 General Plan conditions.

Though not planned as part of the City's GP roadway network, the City has requested that the 2035 GP roadway network includes the extension of Juan Hernandez Drive from its current terminus point north of San Vicente Drive to San Pedro Avenue, creating a new T-intersection with San Pedro Avenue. In addition, the Year 2035 General Plan transportation network also includes the planned widening of US 101 to include an HOV lane in both the southbound and northbound directions between Cochrane Road and Monterey Road in Gilroy, as identified in the Valley Transportation Plan (VTP) 2040 adopted

Table 7
Year 2035 General Plan Roadway Improvements

No	2035 Roadway Improvements
1	Extension of Butterfield Blvd as a 2-lane collector between Madrone Pkwy and Cochrane Rd
2	Extension of Hale Ave/Santa Teresa Blvd as a 2-lane multi-modal arterial between Main Ave and Spring Ave
3	Closure of DeWitt Ave between Price Drive and Spring Ave
4	Extension of Walnut Grove as a 2-lane collector between Dunne Ave and Diana Ave
5	Tennant Ave widening as a 4-lane arterial between Condit Rd and Murphy Ave
6	Monterey Rd widened to a 4-lane arterial between Cochrane Rd and Old Monterey Rd / Llagas Creek Dr
7	Dunne Ave widened to a 4-lane arterial between Monterey Rd and Del Monte Ave
8	Modifications to intersection control and access at San Pedro Ave and Monterey Rd
9	Extension of Madrone Parkway as a 2-lane arterial between Hale Ave and Monterey Rd
10	Realignment of DeWitt Ave as a 2-lane arterial with Sunnyside Ave
11	Extension of Mission View Dr as a 2-lane collector between Cochrane Rd and Vista del Lomas Ave
12	Mission View Dr upgraded to a 2-lane multi-modal arterial between Cochrane Rd and Half Rd
13	Extension of Murphy Ave/Mission View Dr as a 2-lane multi-modal arterial between Half Rd and Diana Ave
14	Cochrane Rd widened to a 6-lane arterial between Monterey Rd and Mission View Dr
15	Main Ave widened to a 4-lane arterial between Depot St and Butterfield Blvd
16	Watsonville Rd widened to a 4-lane arterial between La Alameda and Monterey Rd
17	Extension of Serene Dr as a 2-lane collector between Jarvis Dr and Central Ave
18	Dunne Avenue intersection at Depot Street closed with Dunne Avenue grade separation from Union Pacific railroad tracks
19	Extension of McKevly Lane as a 2-lane collector between West Edmundson Ave and La Crosse Dr
20	Tennant Ave widened to a 6-lane arterial between US 101 and Butterfield Blvd
21	Extension of Hill Rd/Peet Rd as a 2-lane collector between Half Rd and Main Ave

Source: City of Morgan Hill General Plan Circulation Element Network and Policy Revisions Transportation Impact Analysis, prepared by Fehr & Peers Transportation Consultants, July 2009.

by the VTA in October 2013. The VTP 2040 also identifies the conversion of the HOV lanes all along US 101 within Santa Clara County to express lanes.

Year 2035 General Plan Land Use and Traffic Forecasts

Traffic volume forecasts were completed by Hexagon based on the proposed Morgan Hill 2035 General Plan land use projections and using the City of Morgan Hill's TDF model. Model volume forecasts were developed for both the Base Year 2015 baseline conditions and the Year 2035 General Plan conditions. These forecasts are considered "raw" model volume forecasts, which on their own do not represent future volume conditions, but are simply used to forecast growth and travel pattern changes expected in the future due to the land use changes associated with the Morgan Hill 2035 General Plan. To obtain the final traffic volume forecasts, adjustments are made to raw model volume forecasts and used in conjunction with existing count data. This process is further explained below.

Turn-Movement Adjustments

Adjustments were made to the raw forecasted volumes from the model to account for instances where the turn movements produced by the model are relatively coarse. The adjustment process begins by comparing and adjusting baseline model forecasts (Year 2015 forecasts representing existing conditions) with existing traffic counts. By adjusting the baseline model forecasts with existing volumes, model projections are calibrated with actual travel patterns on the existing roadway network. Once the base model forecasts are calibrated, future model forecasts are developed for Year 2035 General Plan conditions. These represent the "raw" model volume forecasts.

Figure 10
Year 2035 General Plan Roadway Improvements

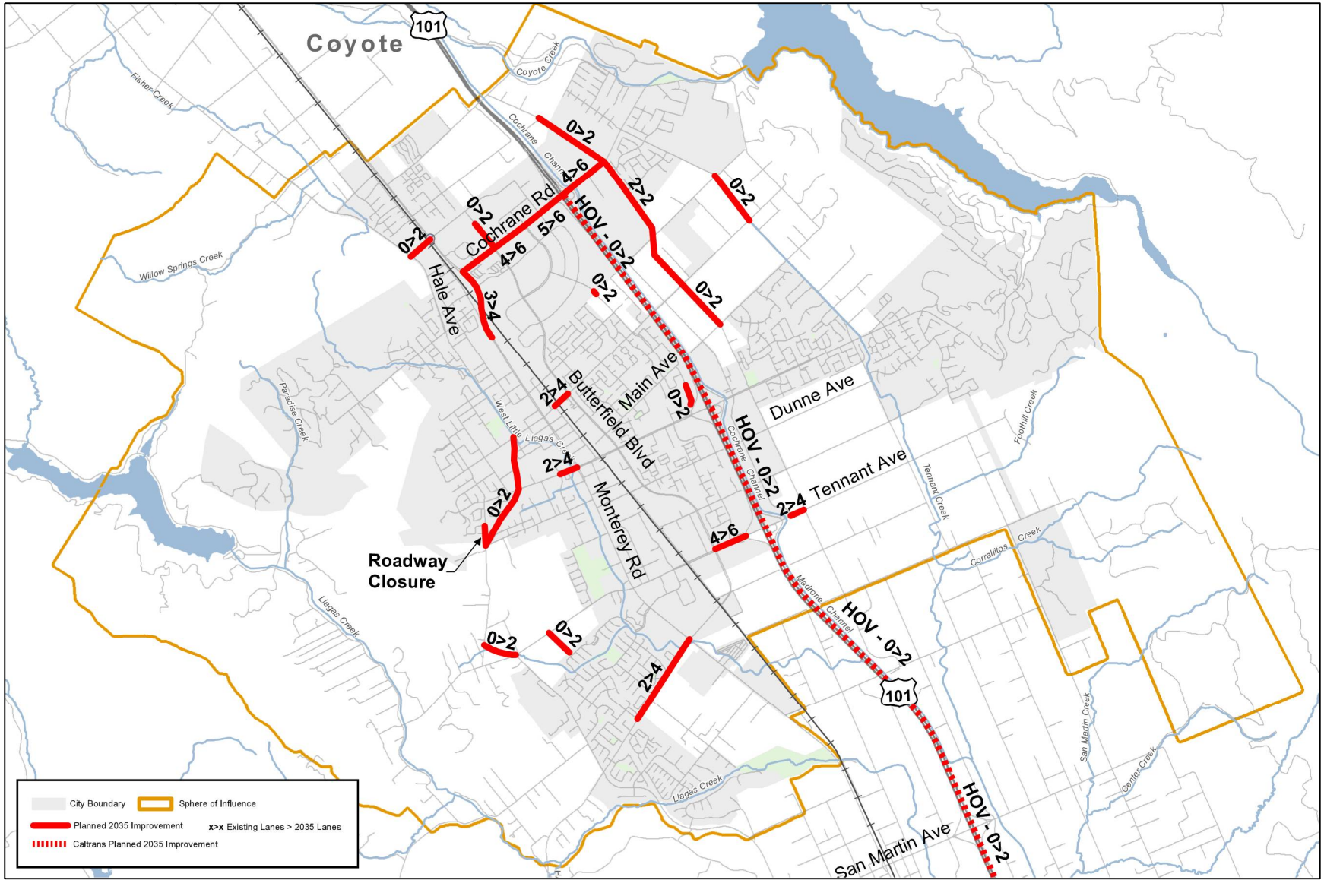
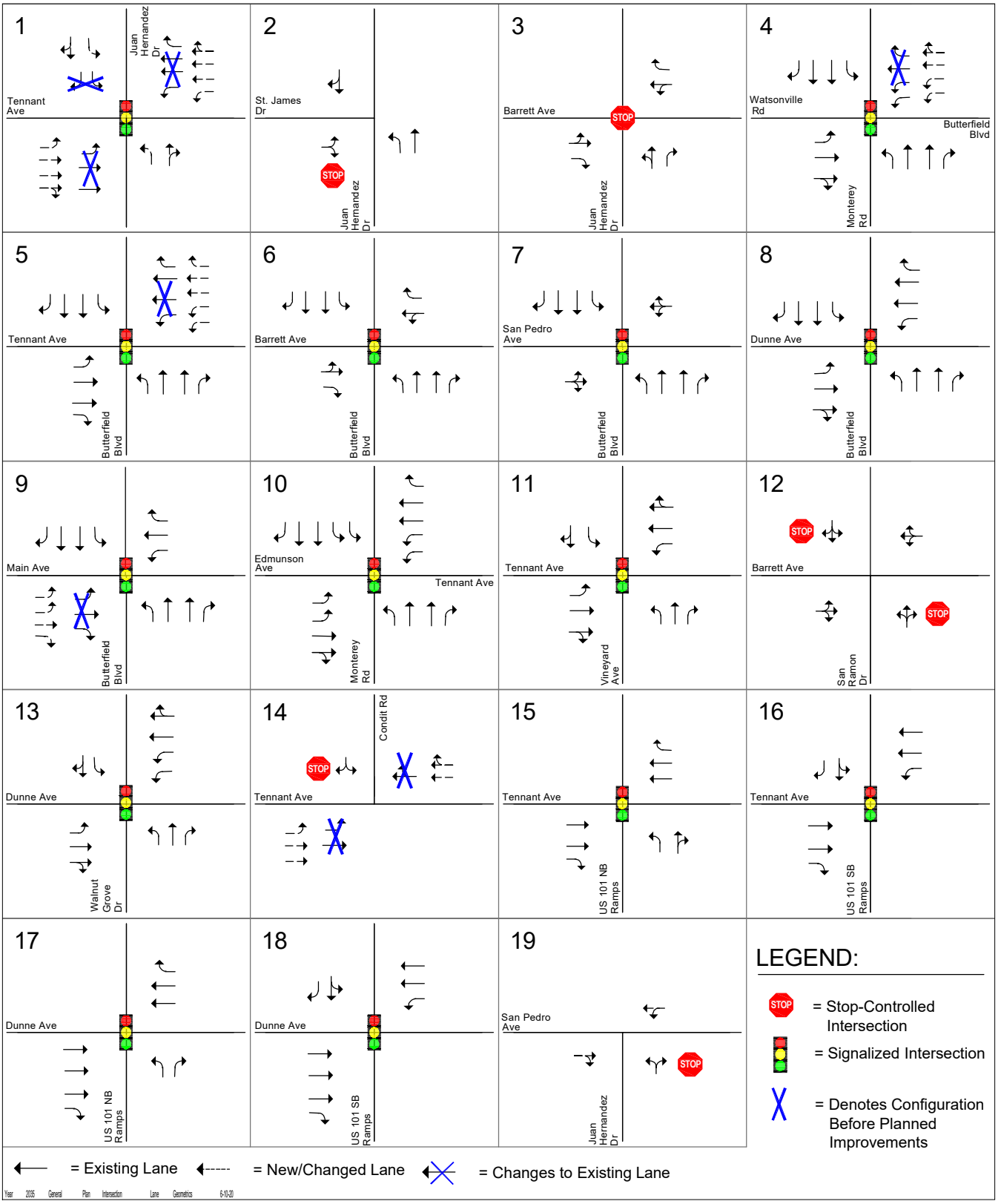


Figure 11
Year 2035 General Plan Intersection Lane Geometrics



To obtain the final traffic volume forecasts, raw model volume forecasts in conjunction with existing count data are used. Final future traffic volume forecasts are developed by adding to the existing traffic count data the projected growth between the baseline (Year 2015) and the General Plan (Year 2035) raw model volume forecasts. The adjustment process is outlined below:

Final Traffic Volume Forecast = Existing Count + (2035 GP Forecast - 2015 Forecast)

It should be noted that as a conservative approach, it was assumed in this analysis that, unless a major change in the roadway network or existing land use is projected for the future conditions, all future model forecast volumes would be no less than the existing traffic counts. Figure 12 shows the Year 2035 General Plan no project traffic volumes. Appendix B lists 2035 General Plan no project traffic volumes at each study intersection.

Year 2035 Project Trip Generation Estimates

The City's traffic forecasting model was used to produce Year 2035 AM and PM peak hour traffic forecasts with the proposed land use amendment and site uses. The current General Plan land uses contained in the Traffic Analysis Zone(s) that represent the project site were adjusted to reflect the proposed land use amendment and site uses.

Hexagon prepared trip estimates for the project site's adopted GP land uses included in the City's traffic model and the proposed project site uses. The adopted 2035 GP land uses for the project site include 89,000 s.f. of retail and service space, 60,000 s.f. of office space, and 14,000 s.f. of medical office space.

When compared to the adopted land uses included in the City's General Plan for the project site, the proposed project would result in a reduction of the daily trips that would be generated by the project site. The proposed site uses would also result in a net increase of 140 AM peak-hour trips and a reduction of 42 PM peak-hour trips. The trip generation estimates under Year 2035 General Plan Amendment Conditions for the proposed uses for the project site are presented in Table 8. Figure 13 presents the 2035 General Plan with project traffic volumes. Appendix B lists 2035 General Plan with project traffic volumes at each study intersection.

Year 2035 General Plan Intersection Level of Service Analysis

The level of service and signal warrant check results under Year 2035 General Plan without and with project conditions are summarized in Table 9. The results show that the following study intersection is projected to operate at an unacceptable level of service (LOS F) and have peak-hour traffic volume levels that warrant installation of a traffic signal during the PM peak-hour under both Year 2035 General Plan without and with project conditions:

14. Tennant Avenue and Condit Road (**Impact**: PM peak-hour)

Based on City of Morgan Hill level of service significant impact thresholds, this constitutes a significant impact to the intersection.

All other study intersections are projected to operate at acceptable levels of service under Year 2035 General Plan with project conditions during the AM and PM peak hours.

Figure 12
Year 2035 General Plan No Project Traffic Volumes

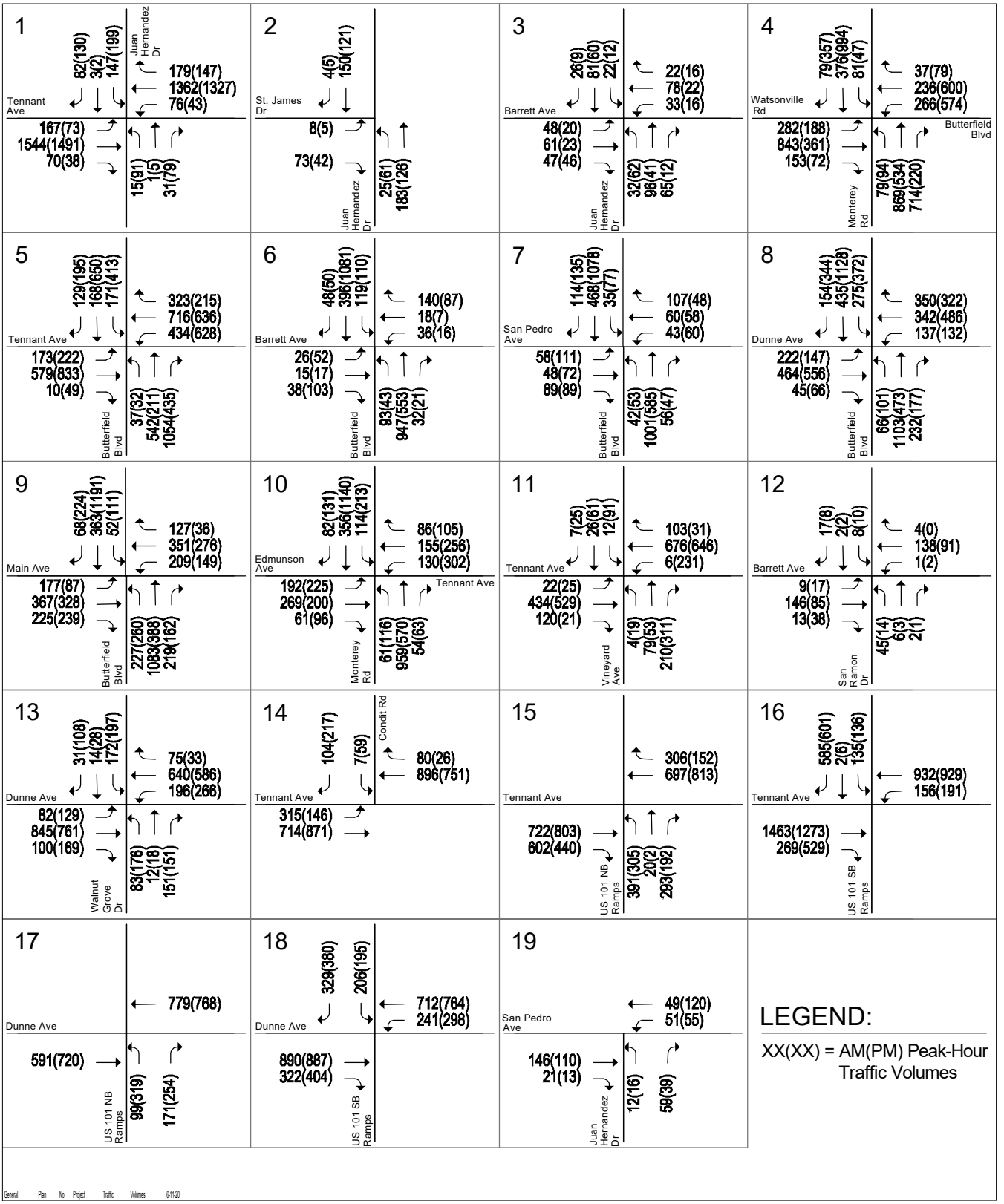


Table 8
Year 2035 General Plan Trip Generation Estimates

Land Use	Size	Daily Rate	Daily Trip	AM Peak Hour Rate	AM Split In	AM Split Out	AM Trip In	AM Trip Out	AM Trip Total	PM Peak Hour Rate	PM Split In	PM Split Out	PM Trip In	PM Trip Out	PM Trip Total
Proposed Land Uses															
Multifamily Housing (Mid-Rise) - ITE LU #221	200 Dwelling Units	5.44	1,088	0.36	26%	74%	19	53	72	0.44	61%	39%	54	34	88
15% Housing and Retail Mixed-Use Reduction[1]			-163				-3	-8	-11				-8	-5	-13
3% Housing and Employment Mixed-Use Reduction[2]			-33				-1	-2	-3				-2	-1	-3
High-Turnover (Sit-Down) Restaurant - ITE LU #932	10,000 Square Feet	112.18	1,122	9.94	55%	45%	54	45	99	9.77	62%	38%	61	37	98
15% Housing and Retail Mixed-Use Reduction[1]			-163				-8	-3	-11				-5	-8	-13
20% PM Passby Reduction[3]			-17				0	0	0				-11	-6	-17
Hospital - ITE LU #610	55 Beds	22.32	1,228	1.84	72%	28%	73	28	101	1.89	28%	72%	29	75	104
Medical-Dental Office Building - ITE LU #720	25,900 Square Feet	34.80	901	2.78	78%	22%	56	16	72	3.46	28%	72%	25	65	90
Urgent Care (Clinic) - ITE LU #630	4,500 Square Feet	38.16	172	3.69	78%	22%	13	4	17	3.28	29%	71%	4	11	15
3% Housing and Employment Mixed-Use Reduction[2]			-33				-2	-1	-3				-1	-2	-3
Total			**4,102**				**201**	**132**	**333**				**146**	**200**	**346**
General Plan Land Uses															
General Office Building - ITE LU #710	60,000 Square Feet	9.74	584	1.16	86%	14%	60	10	70	1.15	16%	84%	11	58	69
Medical-Dental Office Building - ITE LU #720	14,000 Square Feet	34.80	487	2.78	78%	22%	30	9	39	3.46	28%	72%	13	35	48
Shopping Center - ITE LU #820	89,000 Square Feet	37.75	3,360	0.94	62%	38%	52	32	84	3.81	48%	52%	163	176	339
20% PM Passby Reduction[3]			-68				0	0	0				-33	-35	-68
Total			**4,363**				**142**	**51**	**193**				**154**	**234**	**388**
Difference (Proposed - GP Land Uses)			**-261**				**59**	**81**	**140**				**-8**	**-34**	**-42**

Source: ITE Trip Generation Manual, 10th Edition 2017
ITE LU # = ITE land use number

[1]As prescribed by the VTA Transportation Impact Analysis Guidelines (October 2014), the maximum trip reduction for a mixed-use development project with housing and retail components is equal to 15% off the smaller trip generator.

[2]As prescribed by the VTA Transportation Impact Analysis Guidelines (October 2014), the maximum trip reduction for a mixed-use development project with housing and employment components is equal to 3% off the smaller trip generator.

[3]A 20% pass-by reduction is typically applied during the PM peak-hour to retail projects in Morgan Hill.

Figure 13
Year 2035 General Plan with Project Traffic Volumes

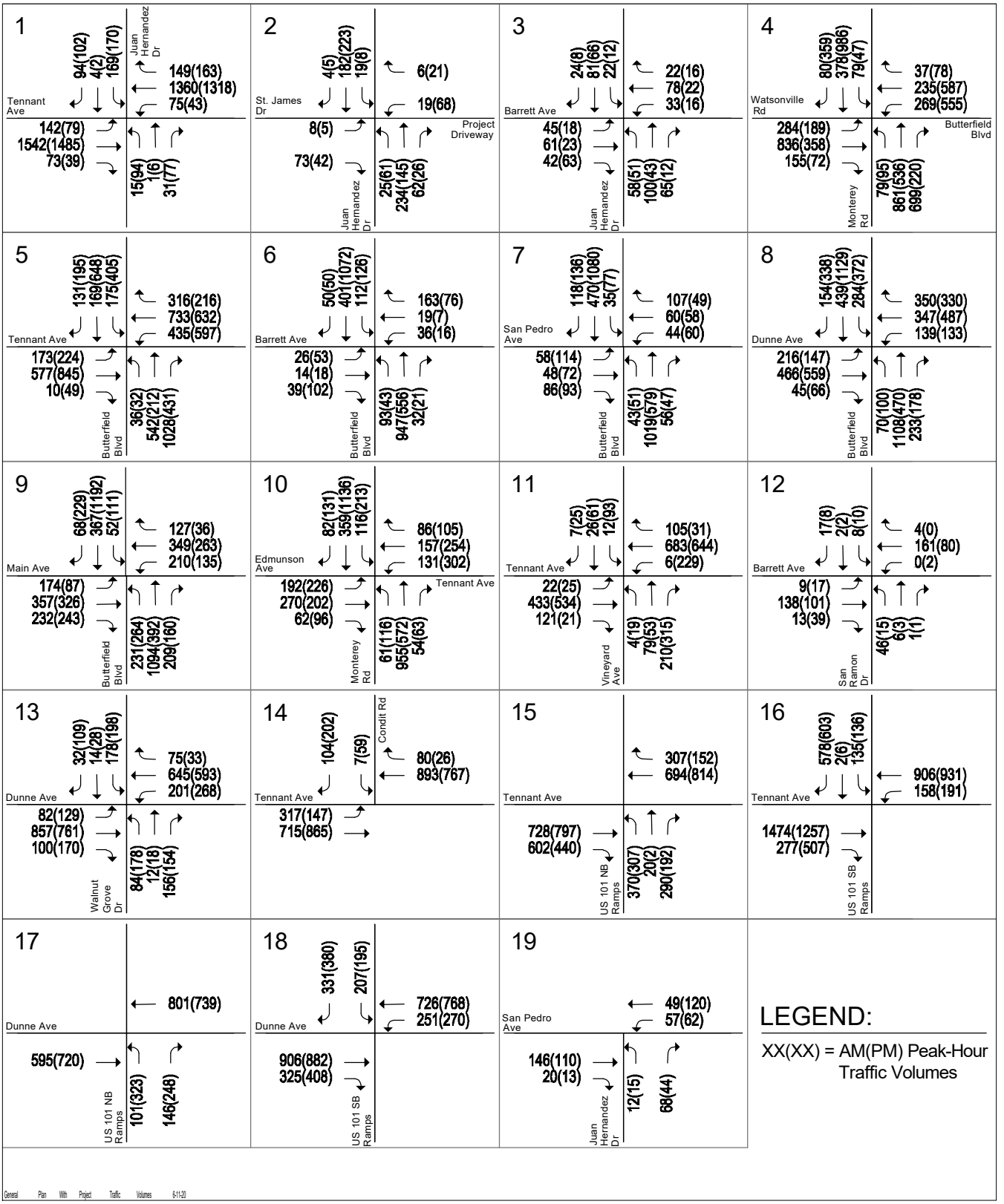


Table 9
Year 2035 General Plan Conditions Intersection Levels of Service

Int. #	Intersection	Year 2035 Control	2035 General Plan No Project			2035 General Plan Plus Project				
			Warrant Met?	Delay[1]	LOS	Warrant Met?	Delay[1]	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
1	Tennant Avenue and Juan Hernandez Drive	Signal	--	19.0	B	--	19.7	B	1.1	0.015
			--	20.7	C	--	19.5	B	-1.4	-0.023
2	Juan Hernandez Drive and St. James Drive	OWSC	No	9.6	A	No	13.7	B	N/A	N/A
			No	9.3	A	No	14.3	B	N/A	N/A
3	Juan Hernandez Drive and Barrett Avenue	AWSC	No	9.0	A	No	9.2	A	N/A	N/A
			No	8.2	A	No	8.1	A	N/A	N/A
4	Monterey Road and Watsonville Road/Butterfield Boulevard	Signal	--	31.8	C	--	31.2	C	-1.2	-0.013
			--	40.8	D	--	40.6	D	-0.3	-0.009
5	Butterfield Boulevard and Tennant Avenue	Signal	--	51.6	D	--	50.1	D	-2.8	-0.015
			--	38.3	D	--	38.0	D	-0.9	-0.012
6	Butterfield Boulevard and Barrett Avenue	Signal	--	12.9	B	--	13.2	B	0.4	0.011
			--	11.9	B	--	11.9	B	0.0	-0.003
7	Butterfield Boulevard and San Pedro Avenue	Signal	--	13.6	B	--	13.6	B	0.0	0.006
			--	14.8	B	--	14.9	B	0.2	0.004
8	Butterfield Boulevard and Dunne Avenue	Signal	--	38.9	D	--	39.0	D	0.5	0.009
			--	34.6	C	--	34.6	C	0.0	0.001
9	Butterfield Boulevard and Main Avenue	Signal	--	30.8	C	--	30.7	C	-0.3	-0.002
			--	36.3	D	--	35.7	D	-0.8	-0.007
10	Monterey Road and Tennant Avenue/Edmunson Avenue	Signal	--	23.9	C	--	24.0	C	0.1	0.001
			--	36.4	D	--	36.4	D	0.1	-0.001
11	Tennant Avenue and Vineyard Avenue	Signal	--	17.2	B	--	17.3	B	0.1	0.003
			--	20.2	C	--	20.2	C	0.0	0.002
12	Barrett Avenue and San Ramon Drive	TWSC	No	11.3	B	No	11.5	B	N/A	N/A
			No	10.2	B	No	10.3	B	N/A	N/A
13	Dunne Avenue and Walnut Grove Drive	Signal	--	20.1	C	--	20.4	C	0.4	0.010
			--	28.1	C	--	28.1	C	0.1	0.002
14	Tennant Avenue and Condit Road	OWSC	**Yes**	24.2	C	**Yes**	24.2	C	N/A	N/A
			Yes	**76.0**	**F**	**Yes**	**77.3**	**F**	N/A	N/A
15	US 101 NB Ramps and Tennant Avenue	Signal	--	12.1	B	--	11.8	B	-0.2	-0.012
			--	10.4	B	--	10.4	B	0.0	0.002
16	US 101 SB Ramps and Tennant Avenue	Signal	--	31.2	C	--	31.2	C	-0.1	0.000
			--	31.1	C	--	31.0	C	-0.2	-0.003
17	US 101 Northbound Ramps and Dunne Avenue	Signal	--	7.4	A	--	6.7	A	-0.7	0.008
			--	10.7	B	--	10.8	B	0.1	-0.006
18	US 101 Southbound Ramps and Dunne Avenue	Signal	--	21.7	C	--	21.9	C	0.3	0.010
			--	22.9	C	--	22.4	C	-0.8	-0.015
19	Juan Hernandez Drive and San Pedro Avenue *(Future Intersection)*	OWSC	No	9.6	A	No	9.7	A	N/A	N/A
			No	9.7	A	No	9.7	A	N/A	N/A

Notes:
[1]The reported delay and corresponding level of service for signalized and all-way stop-controlled intersections represent the average delay for all approaches at the intersection. The reported delay and corresponding level of service for one- and two-way stop-controlled intersections are based on the stop-controlled approach with the highest delay.
Bold indicates unacceptable level of service.
Bold and boxed indicate significant impact.

Year 2035 General Plan Impacts and Mitigation Measures

Described below are the intersection impact and recommended mitigation measures under Year 2035 General Plan conditions.

14. Tennant Avenue and Condit Road

Impact: This intersection is projected to operate at an unacceptable level of service (LOS F) during the PM peak hour under Year 2035 General Plan conditions without and with the project. Additionally, the peak-hour traffic signal warrant checks indicate that the intersection would have traffic volumes that meet thresholds that warrant signalization

during the PM peak-hour under both Year 2035 General Plan without and with project conditions. This constitutes a significant impact to the intersection based on the City's impact criteria.

Mitigation: Possible improvements to mitigate the impact at this intersection consist of the implementation of a traffic signal. However, the decision to install a traffic signal should not be based solely on satisfying one traffic signal warrant. Instead, intersections that meet the peak-hour warrant should be subject to further analysis before determining that a traffic signal is necessary. Engineering judgment should be exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Other options such as traffic control devices, signage, or geometric changes should be considered and may be preferable based on existing field conditions. Thus, the project imapct at this intersection would be mitigated with payment of the traffic impact fee, as determined by City staff.

Vehicle Miles Traveled

A comparison of Vehicle Miles Traveled (VMT) for the adopted Year 2035 General Plan condition versus the Year 2035 General Plan conditions with the proposed project was made to determine the effects of the proposed project on traffic patterns within the City.

In general, whenever new trips are added to the transportation system, VMT will increase proportionally to the number of trips being added. A proposed development that would intensify land use would generally be expected to result in higher overall VMT for the proposed project. However, there are several types of land uses that can be exceptions to this generalization. Land uses that tend to minimize the increase in VMT, and even reduce VMT projections, are land uses that involve adding new housing closer to jobs or new jobs closer to housing.

In an area dominated by housing, adding jobs without displacing housing, while increasing trips, can actually reduce VMT by reducing commute distances. These types of land use changes can cause trips to be internalized within the area in which the change is proposed and can reduce through trips in adjacent areas, thereby reducing VMT.

Adding jobs and displacing housing in an area dominated by housing will usually reduce VMT because the displaced trips, usually traveling in the peak direction, are eliminated. The substituted trips are usually shorter in length (thus reducing VMT). This type of land use will cause trips to be internalized within the area in which the land use is proposed and will reduce through trips in some adjacent areas, both as a result of the internalization as well as the reduced number of trips made from households.

Table 10 presents the projected VMT associated with the project site. All data provided, including trip length, number of vehicles, VMT, and the directional orientation of the trips, were calculated using the City's travel demand forecasting model and represent only those trips associated with the project site. The VMT results show that the proposed project would result in a decrease in daily VMT and daily trips when compared to the adopted GP land uses for the site. The decrease in VMT and trips is due to the development of the project site with a mixture of complementary land uses (housing, employment, and retail) in addition to provided services that Morgan Hill residents might currently access elsewhere. As a result, the VMT per trip also is shown to decrease, representing shorter trips associated with the proposed land uses.

Table 10
Year 2035 General Plan Vehicle Miles Traveled

Scenario	Daily		
	VMT	Trips	VMT per Trip
2035 General Plan No Project	5,254	30,384	5.78
2035 General Plan with Project	4,967	27,834	5.60
Change	**-287**	**-2,549**	**-0.18**
Percent Change	**-5%**	**-8%**	**-3%**

Source: City of Morgan Hill Travel Demand Model, Hexagon March 2020.
Notes:
VMT = Vehicle Miles Traveled associated with the project site.

The reduction in trip length is due to the addition of jobs and services in the City which is currently dominated by housing. These jobs and services cause trips to be internalized within the City resulting in a reduction in commute distances of residents in the City.

5.
Other Transportation Issues

This chapter presents an analysis of other transportation issues associated with the project site, including:

- Site access and on-site circulation
- Parking
- Intersection operations analysis – vehicle queuing and left-turn pocket storage at intersections
- Roadway segment analysis
- Alternative access evaluation
- Potential impacts to bike, pedestrian and transit facilities

Unlike the level of service impact methodology, which is adopted by the City Council, the analyses in this chapter are based on professional judgment in accordance with the standards and methods employed by the traffic engineering community.

Project Site Access and Circulation

A review of the site plan for the proposed project (dated October 30, 2019) was performed to determine if adequate site access is provided and to identify any access and circulation issues that should be improved. This review was completed in accordance with generally accepted traffic engineering standards.

The project site plan shows a total of four access driveway, two along Juan Hernandez Drive and two along Barrett Avenue. However, the City has requested that the two proposed access points along Barret Avenue be designated as emergency access only due to the potential conflict with traffic to/from the adjacent Barrett Elementary School, located just north of the project site. In addition, City staff has stated that the southernmost driveway along Juan Hernandez Drive (existing driveway) needs to be relocated and aligned with St. James Drive, located approximately 100 feet north of the driveway, to form a four-legged intersection. Thus, the analysis of the proposed project presented in the previous chapters assumes that all project site access would be provided via the two proposed full-access driveways along Juan Hernandez Drive only, and that the southernmost driveway would be realigned with St. James Drive, as requested by City staff.

For informational purposes, an evaluation of a site access alternative that would include full-access at all four project site driveways shown on the site plan and the evaluation of the southermost driveway

along Juan Hernandez Drive reamining at its current location, were conducted and the results are presented in a subsequent section within this chapter.

Site Access

As described previously and illustrated on Figure 14, all vehicular access to the project site would be provided via two proposed driveways on Juan Hernandez Drive (listed as Driveways 1 and 2 on Figure 14). The main driveway, Driveway 2, would be located in the middle of the project site frontage, approximately 500 feet south of Barrett Avenue and 300 feet north of St. James Drive. As shown on the site plan, Driveway 2 would include an inbound southbound left-turn lane along Juan Hernandez Drive and two outbound lanes (a left-turn and a right-turn lane) plus one receiving lane on site. Driveway 2 would feed into Street A, an east-west roadway that would provide access to the residential units (located on the north side of Street A) and the retail/restaurant space, the hospital drop-off area, and the hospital parking structure (all located on the south side of Street A). Driveway 1, currently located along the southern project site boundary approximately 100 feet south of St. James Drive and 700 feet north of Tennant Avenue, is the existing driveway that provides access to the existing uses on site. City staff has requested that Driveway 1 be relocated and aligned with St. James Drive to the north, forming the east leg of the intersection. The realigned intersection would continue to provide left-turn access to both St. James Drive and Driveway 1 from Juan Hernandez Drive, concentrating all movements at a single location. Driveway 1 would continue to provide access to the existing buildings on site in addition to the proposed urgent care building, additional medical office space, second hospital drop-off area (located on the back of the building), and would provide a secondary access to the hospital parking structure.

Driveway 2 is projected to serve a larger amount of project traffic to and from the site. More than half of the project traffic (approximately 73%) would access the site from the south via the Juan Hernandez Drive/Tennant Avenue intersection, while the remaining project traffic would access the site from or be bound to the north on Juan Hernandez Drive.

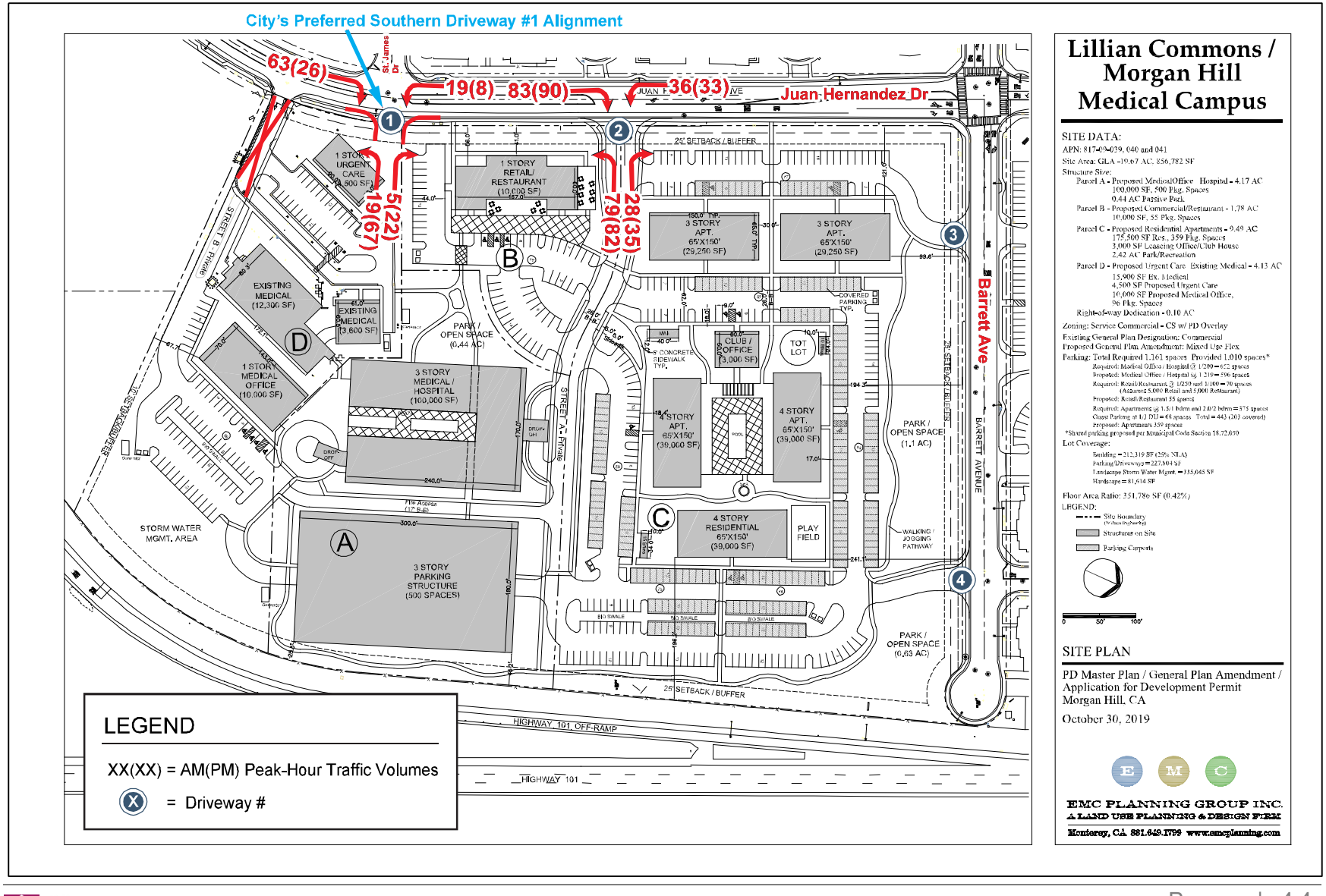
Access Driveway Operations

It is estimated that a total of 119 inbound and 107 outbound project trips during the AM peak-hour and 123 inbound and 117 outbound trips during the PM peak-hour would access Driveway 2 (see Figure 14). Driveway 1 is projected to serve less traffic, with 82 inbound and 24 outbound project trips during the AM peak-hour and 34 inbound and 89 outbound trips during the PM peak-hour. The existing traffic volumes on Juan Hernandez Drive at the project site driveways (both directions combined) are approximately 200 and 100 vehicles during the AM and PM peak hours, respectively.

Project traffic making a left-turn into or out of the site would be in conflict with existing traffic along Juan Hernandez Drive. Left-turning inbound traffic would be in conflict with northbound traffic along Juan Hernandez Drive (119 and 52 vehicles during the AM and PM peak hours, respectively), while left-turning outbound traffic would be in conflict with traffic along both directions on Juan Hernandez Drive (197 and 101 vehicles during the AM and PM peak hours, respectively). Right-turning outbound traffic would experience minimal conflict because, due to the relatively low existing traffic volumes along northbound Juan Hernandez Drive, there would be adequate gaps in traffic to allow vehicles to exit the site with minimal delay.

Operations at the project site driveways with implementation of the proposed project were evaluated. It is estimated that no more than one vehicle would queue up within the southbound left-turn pockets along Juan Hernandez Drive (inbound traffic) and on site (outbound traffic) at both Driveways 1 and 2 . All left-turning inbound traffic would experience average delays of no more than 8 seconds while left-turning outbound traffic would experience average delays of no more than 12 seconds during the peak

Figure 14
Project Trips at Site Access Points



hours (representing LOS B conditions at both driveway intersections) while waiting for a gap in traffic to complete the turn. Based on the projected average delays and queue lengths, it can be concluded that the project site driveways would operate adequately.

On-Site Circulation

On-site Streets A and B would serve all inbound and outbound traffic to/from the project site and would provide access to all on-site parking areas. Street A, the project site's main drive aisles, would bisect the project site separating the residential portion of the project (north side of Street A) from the non-residential land uses (south side of Street A). Internal driveways along Street A would provide access to the proposed land uses on site. The first internal driveway would be located along the north side of Street A, approximately 50 feet east of Driveway 2, and it would provide access to a surface parking lot serving two of the proposed residential buildings. Four more driveways (two each along the north and south sides of Street A) located approximately 120 and 180 feet east of the first internal driveway along Street A would provide access to the residential area to the north and the restaurant/retail space to the south. The last set of internal driveways along Street A, located at the eastern end of Street A, would provide access to the residential parking area and the hospital parking structure. In additions, the hospital's drop-off area also would be accessible directly from Street A.

It is assumed in this analysis that the realigned Driveway 1 would connect to the north side of the parking area located between the proposed urgent care building and existing medical office buildings, rather than the south side as it is shown on the site plan, providing access to Street B the south part of the site. Street B would serve the medical offices (both existing and proposed) and would provide a secondary access point to the hospital parking garage. As it is currently shown on the site plan, there would be no direct connection between Street A and Street B. Street B also would provide access to a second hospital drop-off area located in the back of the building.

Residential Area Access and Circulation

Two parking areas would serve the residential units. The first parking area (west parking area) would consist of a single drive aisle lined with 90-degree parking along both sides. This parking area would be located adjacent to Juan Hernandez Drive and would be accessed via the first internal driveway along Street A, located approximately 50 feet east of Driveway 2. As discussed previously, it is estimated that outbound queue lengths at Driveway 2 would be no more than one vehicle during the peak hours. However, it should be noted that queue lengths longer than two vehicles per lane in the outbound direction at Driveway 2 would block access to the west residential parking area. Thus, it is recommended that "Keep Clear" pavement markings be installed along Street A at the west residential parking area to prevent outbound traffic at Driveway 2 from blocking access to this area. Alternatively, this driveway could be moved eastward farther away from Driveway 2.

The west residential parking area also would connect to one of the emergency access driveways (Driveway 3) on Barrett Avenue, which would result in a dead-end near Barrett Avenue. Dead end aisles are undesirable because drivers can enter the aisle, and upon discovering that there is no available parking, must back out or conduct three-point turns. Given that this drive aisle would be circulated primarily by residents of the proposed residential development, and parking spaces would be designated for specific tenants, there is no need for residents to circulate the drive aisle in search of available parking, making dead-end drive aisles less problematic.

The second residential parking area (east parking area) would run along the rectangular-shape residential area and would be accessible via three driveways along the north side of Street A. The second emergency access driveway on Barrett Avenue (Driveway 4) also would connect to the east residential parking area. The circular layout of the east parking area would allow for continuous

circulation while the various access points would provide for convenient access to specific areas without the need to navigate the entire parking area. However, this parking area consists of long straight drive aisles which typically increase the tendency of drivers to increase their speed. For this reason, it is recommended that installation of speed reduction measures be considered along the east parking area drive aisles. Speed reduction measures could be as simple as posting signage and/or pavement markings advising of the speed limit, to other physical deterrents such as speed bumps.

Non-Residential Area Access and Circulation

The non-residential land uses on the site, located south of Street A, would be accessible via both Driveways 1 and 2 (Streets A and B). All access to the restaurant/retail parking area would be provided via Street A while all access to the medical office buildings and urgent care building parking areas would be provided via Street B. Access to the hospital and hospital parking structure would be provided via both Streets A and B. With the exception of a dead-end drive aisle located within the restaurant/retail parking lot, all other parking areas are shown to provide continuous circulation. The restaurant/retail parking lot shows a turn-around location at the end of the drive aisle that would facilitate U-turns within the drive aisle.

Recommendation: The site design, including driveway widths, drive aisle widths, parking stall dimensions, and turn radii, must adhere to City of Morgan Hill design guidelines. All drive aisles must allow for two-way circulation and adequate circulation of larger vehicles (such as emergency trucks, garbage truck, and delivery trucks) throughout the project site.

Recommendation: It is recommended that “Keep Clear” pavement markings be installed along Street A at the west residential parking area to prevent outbound traffic at Driveway 2 from blocking access to this area. Alternatively, this driveway could be moved eastward farther away from Driveway 2.

Recommendation: To minimize the likelihood of drivers traveling through the residential parking areas at speeds that are unsafe as the result of the long straight drive aisles, it is recommended that installation of speed reduction measures be considered along the east residential parking drive aisles. Speed reduction measures could be as simple as posting signage and/or pavement markings advising of the speed limit, to other physical deterrents such as speed bumps.

Adhering to City of Morgan Hill standards and requirements, and implementing the above recommendations, the proposed site access and on-site circulation would be adequate to accommodate circulation of both passenger and emergency vehicles.

Sight Distance

Adequate sight distance should be provided at the project driveway. The project site driveways along Juan Hernandez Drive are located along a roadway segment with minimal visual obstruction. Outbound traffic at the driveways must be able to see opposing traffic in order to safely complete a turn out of the site. Since left-turns out of the driveway would be allowed, outbound traffic must be able to see traffic along both directions on Juan Hernandez Drive.

The posted speed limit on Juan Hernandez Drive is 35 mph and reduces to 25 mph in the vicinity of the Barrett Elementary School when children are present. According to the Caltrans *Highway Design Manual*, the minimum required stopping sight distance for a roadway with a posted speed limit of 35 mph is 250 feet. The sight distance from Driveways 1 and 2 to the north extends to the intersection of Juan Hernandez Drive/Barrett Avenue and for more than 400 feet to the south. Therefore, based on Caltrans requirements, the available sight distance at the project site driveways on Juan Hernandez Drive would be adequate.

Recommendation: The site design should ensure design features, in particular the landscaping and signage along the project site frontage and at the project site driveways, would not interfere with the sight distance at the proposed site driveway.

Emergency Vehicle and Truck Access

As recommended by the City of Morgan Hill, the two proposed driveways along Barrett Avenue would provide emergency vehicle access only. These two emergency-access only driveways, in conjunction with the other two project site driveways proposed along Juan Hernandez Drive, would provide a total of four access points for emergency vehicles to access any part of the project site. Thus, the design of the project site, including driveway and drive aisle widths and on-site turn radii, must be adequate to ensure emergency vehicles can maneuver through the site, from any of the proposed driveways, without a problem.

Ambulance access to the hospital's emergency room is not identified on the site plan. The ambulance access route to the hospital should be identified and, to the maximum extent possible, the identified route should be cleared of obstructions, such as crosswalks or parking spaces, that could potentially interfere with the ambulance's prompt access to the hospital.

Trash collection vehicles would enter, circulate, and exit the site via Driveways 1 and 2. With the exception of the residential parking area adjacent to Juan Hernandez Drive, and with the implementation of adequate driveway/drive aisle widths and turn radii, trash collector trucks would be able to maneuver throughout the site to access the trash enclosures and circulate in and out of the site without a problem.

Recommendation: The ambulance access route to the hospital should be identified and, to the maximum extent possible, the identified route should be cleared of obstructions, such as crosswalks or parking spaces, that could potentially interfere with the ambulance's prompt access to the hospital.

Pedestrian Access and Circulation

The project site plan shows an extensive and continuous on-site pedestrian network, connecting all proposed land uses and parking areas on the site with existing sidewalks along the project site frontages on Juan Hernandez Drive and Barrett Avenue. Marked pedestrian pathways across parking lots also are shown throughout the site, providing a pedestrian connection between parking lots and buildings. Five-foot sidewalks are proposed surrounding all buildings and along drive aisles, forming a complete pedestrian network on site with connections to other existing pedestrian facilities (sidewalks, crosswalks) off site. Based on the proposed site plan layout, on-site pedestrian access and circulation would be adequate.

Parking

The project is proposing to provide a total of 1,010 on-site parking spaces, 500 of which would be provided within the proposed parking structure.

Section 18.72.030 of the Morgan Hill City Code specifies the required number of on-site parking spaces for different types of land uses. Table 11 below summarizes the required number of parking spaces per proposed land use, as defined in Table 18.72-2 of the City Code. Based on the City's parking requirements and the proposed size and land uses of the project, the proposed project would be required to provide a total of 1,195 parking spaces, which is 185 parking spaces more than the proposed number of spaces.

Table 11
Vehicular Parking Requirements

Land Use	Size	City's Parking Requirement*	# of Parking Spaces Required	# of Parking Spaces Provided [1]	Net Diff
Proposed Land Uses					
Apartments	200 DU	1.5 space per one-bedroom unit 2 spaces per two-bedroom unit	375 [2]	359	
		1 guest space per 3 units	67		
		subtotal:	442	359	-83
Hospital	100,000 s.f.	1 space per 200 s.f.	500	500	0
Medical Offices	25,900 s.f.	1 space per 200 s.f.	130	96	-57
Clinic	4,500 s.f.	1 space per 200 s.f.	23		
Restaurant	10,000 s.f.	1 space per 100 s.f.	100 [3]	55	-45
			1,195	1,010	-185

* Source: City's parking requirement per Municipal Code Section 18.72

[1] Provided number of parking spaces were obtained from project site plan dated October 30, 2019.

[2] Since the break-down of the proposed residential units is not provided on the site plan, the number of parking spaces required for the residential units was obtained from the site plan.

[3] The required parking calculations for the restaurant/retail land use assumed, as a conservative approach, the restaurant parking rate for all of the proposed restaurant/retail land use since the restaurant rates is higher than the retail rate. Assuming 50%/50% breakdown of the retail and restaurant land use, the number of required parking spaces for this use would be 70 spaces, for a total of 1,165 spaces for the project.

DU = Dwelling units; s.f. = Square feet.

It should be noted that the calculated parking requirements presented on Table 11 assume the restaurant parking rate for all of the proposed restaurant/retail land use since the restaurant rates is higher than the retail rate (1 parking space per every 100 s.f. of restaurant space compared to 1 parking space for every 250 s.f. of retail space). Assuming a 50%/50% breakdown of the restaurant/retail land use, the number of required parking spaces for this use would be 70 spaces, for a total of 1,165 spaces for the project.

The City of Morgan Hill Municipal Code (section 18.72.050) also provides possible alternatives to satisfy the number of on-site parking spaces required to allow for creative parking solutions, enhance economic vitality, promote walking, biking, and the use of transit, and encourage the efficient use of land resources consistent with the General Plan. Such alternatives include in-lieu payments (applicable to Downtown mixed-use and neighborhood mixed-use zoning districts only), providing off-site parking, consolidated parking, shared parking, valet parking, projects determined to have low parking demand based on the finds of a parking demand study, and with the implementation of a Transportation Demand Management (TDM) Plan.

The site plan states that a shared parking program is being proposed for the site. Shared parking is typically implemented between two (or more) land uses that have different peak-demand periods. Parking requirements are based on the peak parking demand for specific land uses, or the amount of parking a land use would need to serve its demand during its peak period. During the off-peak periods, the parking demand is typically less. In addition, different land uses have different peak-demand periods. For example, according to the Urban Land Institute's publication *Shared Parking*, Second Edition, the peak parking demand period for a medical office building occurs at 10:00 AM and 2:00 PM, while the peak-demand period for a residential development is after 7:00 PM. Shared parking between

these two uses would allow for the medical office building to use the residential parking during office's peak-demand since the residential parking demand would be low, and vice versa.

The Municipal Code states that multiple land uses on a single parcel or development site may use shared parking facilities when operation hours or peak hours of the land uses are different. However, the Code also states that parking will be shared by non-residential land uses only. In addition, a parking demand study must be completed and approved by the Community Development Director demonstrating that there would be no substantial conflicts between the land uses' peak parking demand and that combined parking demand will not exceed the total parking spaces available. Additionally, the shared parking facility should be located no farther than 400 feet from the primary entrance of the land uses which it would serve.

Recommendation: The project applicant must work with the City of Morgan Hill to develop a shared parking program, or any other alternative that will reduce the peak parking demand to meet the proposed supply for the project.

Bicycle Parking

The site plan shows two bicycle parking locations within the residential area: one providing 10 bicycle parking spaces and the second one providing 15 bicycle parking spaces, for a total of 25 bicycle parking spaces. The proposed type of bicycle parking spaces is not identified.

According to the City of Morgan Hill Municipal Code 18.72.080, all multi-family developments of five units or more and commercial parking lots of ten spaces or more are required to provide both short-term (Class II) and long-term (Class I) bicycle parking. Short-term parking, or bike racks, provide a convenient and readily accessible place to park for two hours or less, while long-term parking, or bike lockers, provide a secure and weather-protected place to park bicycles for a longer period of time, typically provided for employees or residents. The City Code does not specify the types of land use associated with commercial parking lots.

According to Table 18.72-7 of the City Code, residential projects are required to provide short-term bicycle parking equivalent to 10% of the required number of vehicular parking spaces for the project, or a minimum of 4 spaces, in addition to long-term parking spaces equivalent to 1 space per every 5 units. Non-residential projects are required to provide short-term bicycle parking spaces equivalent to 10% of the required number of vehicular parking spaces for the project and 1 long-term parking space for every 20 required vehicular parking spaces. Assuming only the residential units and the restaurant/retail space would be required to provide bicycle parking, the proposed project would be required to provide a total of 55 short-term bicycle parking spaces and 45 long-term bicycle parking spaces (see Table 12 below). Assuming all proposed land uses would be required to provide bicycle parking, the proposed project would be required to provide a total of 121 short-term bicycle parking spaces and 78 long-term bicycle parking spaces.

Recommendation: It is recommended that the proposed project provide adequate bicycle parking supply on site, based on the City's recommends bicycle-parking rates, to serve the potential demand of the project. The proposed project would be required to provide a total of 55 short-term bicycle parking spaces and 45 long-term bicycle parking spaces for the residential and restaurant uses only, or a total of 121 short-term bicycle parking spaces and 78 long-term bicycle parking spaces for all proposed land uses on-site.

Table 12
Bicycle Parking Requirements

Land Use	Size	Required Auto Spaces	City's Parking Requirement* Short-Term	Long-Term	Required Bicycle Parking Spaces Short-Term	Long-Term
Assuming Only Residential and Commercial Land Uses						
Residential	200 Dwelling Units	442	10% of Required Auto Spaces	1 per 5 units	45	40
Restaurant	10,000 Square Feet	100	10% of Required Auto Spaces	1 per 20 Required Auto Spaces	10	5
				Total	**55**	**45**
Assuming ALL Proposed Land Uses						
Residential	200 Dwelling Units	442	10% of Required Auto Spaces	1 per 5 units	45	40
Non-Residential	140,400 Square Feet	753	10% of Required Auto Spaces	1 per 20 Required Auto Spaces	76	38
				Total	**121**	**78**

* City's bicycle parking requirement per Municipal Code Section 18.72.080.

Effects on Surrounding Residential Streets

The proposed project site is located in close proximity to three major thoroughfares: Tennant Avenue, Dunne Avenue, and Butterfield Boulevard. As discussed in the site access section, it is projected that the majority of the project traffic would access the site via the Juan Hernandez Drive/Tennant Avenue intersection. However, some project traffic could utilize other adjacent local facilities for travel between the project site and other major thoroughfares or nearby destinations, such as schools, parks, shopping centers, and others. For this reason, an evaluation of the effects of project traffic along other streets in the immediate vicinity of the project site was completed. The study roadway segments include:

1. Juan Hernandez Drive, North of Barrett Avenue
2. Barrett Avenue, East of Juan Hernandez Drive
3. Juan Hernandez Drive, South of Barrett Avenue
4. Barrett Avenue, West of Juan Hernandez Drive
5. San Ramon Drive, North of Barrett Avenue
6. San Pedro Avenue, East of San Ramon Drive
7. Juan Hernandez Drive, North of Tennant Avenue

The evaluation consists of a roadway segment analysis to quantify the potential change in traffic volumes along the study roadway segments as a result of the proposed project. For the evaluation, the existing and projected daily traffic volumes with the project along the study roadway segments were compared to acceptable volume thresholds for each roadway segment to determine if the projected change in traffic volume would be considered significant.

Unlike the intersection level of service analysis methodology, which has established impact thresholds, the analyses contained in this section are based on professional judgment in accordance with the standards and methods employed by the traffic engineering community. Several studies have been made regarding the indirect impacts of traffic on residential neighborhoods. The variables affecting these impacts include traffic volumes, type, or makeup, of traffic (i.e. passenger cars, trucks, motorcycles, emergency vehicles, etc.), traffic speed, perception of through traffic as a percentage of

total traffic, adequacy of street alignment (i.e., horizontal and vertical curvature), accident experience, on-street parking, residential dwelling setbacks from the street, pedestrian traffic, and street pavement conditions (which would add to traffic noise as the pavement deteriorates). Other factors that may be a contributor to neighborhood nuisance levels include socio-economic status of the neighborhood, and expectations of the residents regarding traffic volumes; however, these are beyond the purview of CEQA and are provided here for informational purposes only.

Existing Surrounding Roadway Characteristics

All roadway segments evaluated consist of two-lane undivided roadways that provide access to residential areas and provide a connection between the residential neighborhoods and arterial roadways (Dunne Avenue, Tennant Avenue, and Butterfield Boulevard). All study roadway segments include on-street parking on both sides of the street and no striped bike lanes. A brief description of each of the selected surrounding roadways is provided below:

- ***Juan Hernandez Drive*** currently provides a connection between Tennant Avenue and San Pedro Avenue via San Ramon Drive; however, it is planned to be extended northward from its current terminus point north of San Vicente Drive to San Pedro Avenue. The posted speed limit on Juan Hernandez Drive is 35 miles per hour (mph) and reduces to 25 mph in the vicinity of the Barrett Elementary School when children are present.
- ***Barrett Avenue*** provides a connection between Juan Hernandez Drive and Butterfield Boulevard. The Barrett Elementary School is located at the northeast corner of the intersection of Juan Hernandez Drive and Barrett Avenue. The posted speed limit on Barrett Avenue is 30 mph and reduces to 25 mph in the vicinity of the Barrett Elementary School when children are present.
- ***San Ramon Drive*** extends between Barrett Avenue and San Pedro Avenue, west of and parallel to Juan Hernandez Drive. There is no posted speed limit on San Ramon Drive. Therefore, the assumed speed limit, based on the California Vehicle Code speed limit for residential districts, is 25 mph.
- ***San Pedro Avenue*** extends between Monterey Road and US 101, providing connections to Butterfield Boulevard and Walnut Grove Avenue. West of US 101, San Pedro Avenue has a posted speed limit of 35 mph.

All of the evaluated roadways are classified as collector roadways in the City of Morgan Hill 3025 General Plan, Transportation section, with the exception of San Ramon Drive which would be classified as a local street. General guidelines regarding threshold volumes pertaining to collector and local streets have been recommended within several studies and reference material including the Highway Capacity Manual (HCM). There is variation in these accepted threshold volumes, but in general, local streets have the primary function of providing access to immediately adjacent land, with the secondary function of traffic movement. One lane of traffic in each direction is the standard for local streets, with a typical design speed of 25 mph and average daily traffic (ADT) volumes typically ranging from 50 to 2,000 vehicles. Collector streets are typically defined as roadways that provide a connection between local/residential roads and arterial roads, providing a balance between access and mobility. The typical design speed for collector streets is usually between 25 and 45 miles per hour (depending on the area), and, according to the U.S. Department of Transportation – Federal Highway Administration, collector streets can carry ADT volumes typically ranging from 300 to 2,600 (rural collectors) up to 6,000 vehicles (urban collectors).

Existing Roadway Conditions

Speed and count (twenty-four-hour tube counts) data were collected on February 6, 2020 along the study roadway segments. The traffic count data revealed that the study roadway segments currently carry between 600 (along San Ramon Drive) and 2,700 (along San Pedro Avenue) daily vehicles (both directions combined) near the project site. Based on the typical traffic volume ranges associated with local and collector streets, all of the study roadway segments currently serve the recommended traffic volumes associated with their classification.

All of the study roadways have a posted speed limit of 30-35 mph. The speed surveys revealed that the 85th percentile speeds along the study roadway segment of Juan Hernandez Drive, south of Barrett Avenue, were measured to exceed the posted speed limit by 8 mph in the southbound direction. The speeds along the rest of the study segments were measured to be lower than the posted speed limit or within 5 mph of the posted speed limit (segment of San Pedro Avenue, east of San Ramon Drive). Speeds within 5 mph of the posted speed limits are considered reasonable. Therefore, based on the speed surveys, vehicular speeds along the study roadway segment of Juan Hernandez Drive, along the project site frontage and in the southbound direction, would be considered excessive. There are currently no apparent speeding issues along the remaining study roadway segments.

Table 13 summarizes the existing traffic volumes and 85th percentile speeds collected along each of the studied roadway segments.

Project's Effect on Study Roadway Segments

The effects of project traffic on the each of the study roadway segments were evaluated based on field observations, the collected traffic volume and speed data, and project traffic projections.

As it was presented in the project trip assignment, the majority of the project trips would utilize Tennant Avenue, via Juan Hernandez Drive, to access the project site. The rest of the project traffic would utilize roadways to the north to access the site from Butterfield Boulevard, San Pedro Avenue, and Dunne Avenue. It is estimated that the project would add almost 3,000 daily trips to Juan Hernandez Drive to the south and approximately 1,000 daily trips to Juan Hernandez Drive to the north. The majority of the traffic added to the north would continue onto Barrett Avenue, west of Juan Hernandez Drive. Daily project traffic added to the rest of the study roadway segments would be minimal (less than 100 daily trips). The increase in daily traffic volumes along Juan Hernandez Drive (just south of Barrett Avenue) and Barrett Avenue would be approximately 81% and 101%, respectively, from existing conditions. The increase in daily traffic volumes along Juan Hernandez Drive south of the project site would be approximately 225% from existing conditions. Thus, with implementation of the proposed project, daily traffic volumes along Juan Hernandez Drive (south of Barrett Avenue) and Barrett Avenue would approximately double from the existing traffic levels, while the daily traffic volumes along Juan Hernandez Drive south of the project site would more than triple. Daily traffic volume increases along the rest of the study roadway segments would be minimal, with an increase of no more than 6% in daily traffic volumes.

Even with the additional traffic added to the adjacent roadway network, all study roadway segments would continue to carry the recommended average daily traffic volumes associated with their street classification (see Table 13). However, although the projected average daily trips along the study roadway segments are within acceptable ranges, the added project trips to both Juan Hernandez Drive and Barrett Avenue constitute an increase in traffic of approximately 80-225% from the existing daily traffic volumes, which would be a measurable and perceptible increase in traffic volumes.

Table 13
Roadway Segment Analysis

#	Roadway Segment	Count Date	Direction	Speed (mph) Limit	Speed (mph) 85th Percentile	Average Daily Traffic Volumes (ADT) Existing	Project Trips	% Change	Existing + Project
1	Juan Hernandez Drive, North of Barrett Avenue	02/06/20	Northbound	35	29	426	17	4%	443
			Southbound	35	29	384	17	4%	401
			Total			810	34	4%	844
2	Barrett Avenue, East of Juan Hernandez Drive	02/06/20	Eastbound	30	23	579	0	0%	579
			Westbound	30	23	615	0	0%	615
			Total			1,194	0	0%	1,194
3	Juan Hernandez Drive, South of Barrett Avenue	02/06/20	Northbound	35	35	657	517	79%	1,174
			Southbound	35	43	617	518	84%	1,135
			Total			1,274	1,035	81%	2,309
4	Barrett Avenue, West of Juan Hernandez Drive	02/06/20	Eastbound	30	23	504	501	99%	1,005
			Westbound	30	30	490	500	102%	990
			Total			994	1,001	101%	1,995
5	San Ramon Drive, North of Barrett Avenue	02/06/20	Northbound	25*	21	347	17	5%	364
			Southbound	25*	22	265	17	6%	282
			Total			612	34	6%	646
6	San Pedro Avenue, East of San Ramon Drive	02/06/20	Eastbound	35	39	1,438	33	2%	1,471
			Westbound	35	32	1,272	33	3%	1,305
			Total			2,710	66	2%	2,776
7	Juan Hernandez Drive, North of Tennant Avenue	02/06/20	Northbound	35	35	657	1,437	219%	2,094
			Southbound	35	43	617	1,433	232%	2,050
			Total			1,274	2,870	225%	4,144

*Assumed speed limit, based on the California Vehicle Code which states that the speed limit for residential districts is 25 miles per hour, unless otherwise posted.

Findings and Recommendations of the Roadway Segment Analysis

The following conclusions can be drawn from the evaluation of the study roadways:

- Traffic volumes at all study roadways are and would continue to be within the volume range characteristic for local and collector streets.
- Speeds along one of the four study roadway segments (Juan Hernandez Drive, south of Barrett Avenue, southbound direction) currently exceed the posted speed limit by more than 5 mph. Speeding is occurring under existing conditions and not caused by the project.
- Daily traffic volumes along Juan Hernandez Drive and Barrett Avenue are projected to increase by approximately 80-225% from existing conditions as a result of the proposed project, an increase which would be measurable and perceptible to residents of the adjacent neighborhood.

Intersection Operations Analysis

The analysis of intersection level of service was supplemented with an analysis of intersection operations for selected intersections where the project would add a significant number of left-turning vehicles to the intersection (typically 10 or more peak-hour trips per lane; less than 10 peak-hour trips would not affect the length of the queue). The intersection operations analysis includes the following study intersections:

1. Tennant Avenue and Juan Hernandez Drive – Southbound left-turn and eastbound left-turn
3. Juan Hernandez Drive and Barrett Avenue – Northbound approach
6. Butterfield Boulevard and Barrett Avenue – Southbound left-turn

Vehicle queues were estimated using a Poisson probability distribution, which estimates the probability of "n" vehicles for a vehicle movement using the following formula:

$$P(x=n) = \frac{\lambda^n e^{-(\lambda)}}{n!}$$

Where:
P (x=n) = probability of "n" vehicles in queue per lane
n = number of vehicles in the queue per lane
λ = Average number of vehicles in the queue per lane (vehicles per hour per lane/signal cycles per hour)

The basis of the analysis is as follows: (1) the Poisson probability distribution is used to estimate the 95th percentile maximum number of queued vehicles per cycle for a particular movement; (2) the estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated maximum queue length is compared to the existing or planned available storage capacity for the movement. This analysis thus provides a basis for estimating future left-turn storage requirements at intersections. The 95th percentile queue length value indicates that during the peak hour, a queue of this length or less would occur on 95 percent of the signal cycles. Likewise, a queue length larger than the 95th percentile queue would only occur on 5 percent of the signal cycles (about 3 cycles during the peak hour for a signal with a 60-second cycle length). Therefore, left-turn storage pocket designs based on the 95th percentile queue length would ensure that storage space would be exceeded only 5 percent of the time. The 95th percentile queue length is also known as the "design queue length".

Queuing Analysis Results

The vehicle queue estimates and a tabulated summary of the findings are provided in Table 14. The analysis indicates that, currently, all study left-turn pockets and intersection approach have sufficient queue storage capacity to accommodate the existing maximum vehicle queue length for each movement. The addition of project traffic to the study intersections would result in no change to the 95th percentile vehicle queue lengths or would increase it by no more than 3 vehicles at other locations, such as the southbound left-turn movement at the intersection of Tennant Avenue and Juan Hernandez Drive. However, even with the addition of project traffic, the 95th percentile vehicle queue lengths are projected to continue to accommodate within the existing queue storage capacity at all study locations.

The vehicular queuing analysis (Poisson probability calculations) is included in Appendix E.

Table 14
Vehicle Queuing Analysis

	Juan Hernandez Drive and Tennant Avenue				Juan Hernandez Drive and Barrett Avenue		Butterfield Boulevard and Barrett Avenue	
	Southbound Left		Eastbound Left		Northbound Through/Left		Southbound Left	
Measurement	SBL AM	SBL PM	EBL AM	EBL PM	NBT/L AM	NBT/L PM	SBL AM	SBL PM
Existing Conditions								
Cycle Length/Control Delay (sec)[1]	60	60	60	60	8.5	7.8	60	60
Lanes	1	1	1	1	1	1	1	1
Volume (vph)	62	53	60	23	55	27	66	61
Volume (vphpl)	62	53	60	23	55	27	66	61
95th %. Queue (veh/ln.)	3	3	3	2	1	1	3	3
95th %. Queue (ft./ln)[2]	75	75	75	50	25	25	75	75
Storage (ft./ ln.)	150	150	300	300	175	175	200	200
Adequate (Y/N)	YES	YES	YES	YES	YES	YES	YES	YES
Existing Plus Project Conditions								
Cycle Length/Control Delay (sec)[1]	60	60	60	60	9.1	8.6	60	60
Lanes	1	1	1	1	1	1	1	1
Volume (vph)	135	157	94	50	88	79	114	98
Volume (vphpl)	135	157	94	50	88	79	114	98
95th %. Queue (veh/ln.)	5	6	4	3	1	1	4	4
95th %. Queue (ft./ln)[2]	125	150	100	75	25	25	100	100
Storage (ft./ ln.)	150	150	300	300	175	175	200	200
Adequate (Y/N)	YES	YES	YES	YES	YES	YES	YES	YES

Notes:
[1] Cycle lengths for signalized intersections, and control delays for unsignalized intersections.
[2] Assumes 25 feet per vehicle queued

Site Access Alternative Evaluation

As mentioned previously, an evaluation of the site access alternative that would include full access at all four project site driveways shown on the site plan (two along Juan Hernandez Drive and two along Barrett Avenue) and maintaining Driveway 1 at its current location was conducted. The evaluation was

conducted for the purpose of identifying how the additional two site access driveways, which were assumed to provide emergency access only in the analysis, would affect surrounding traffic conditions with the project, in particular along the project site frontage on Barrett Avenue where Barrett Elementary School is located immediately north of the project site. The evaluation of Driveway 1 at its current location would show the effect of the project on traffic conditions at Driveway 1 and the nearby intersection of Juan Hernandez Drive/St. James Drive.

Under the site access alternative, access at Driveway 2 would change since some of the residential traffic at Driveway 2 would utilize Driveways 3 and 4. Site access at Driveway 1 would remain unchanged. On-site circulation, emergency vehicular access and circulation, and pedestrian access and circulation, as well as projected traffic conditions at all study facilities outside the immediate project site area would remain the same as described in the previous sections.

Site Access

It is projected that since Driveways 3 and 4, in addition to Driveway 2, would serve the residential areas of the project, project traffic at Driveways 3 and 4 would be minimal. It is estimated that approximately 3 inbound and 8 outbound trips during the AM peak-hour and 8 inbound and 6 outbound trips during the PM peak-hour would utilize these two driveways combined. This represents a total of 11 AM peak-hour and 14 PM peak-hour new trips along Barrett Avenue, east of Juan Hernandez Drive. Project trips at Driveway 1 are anticipated to remain unchanged. The project traffic volumes at the project site driveways under the site access alternative are presented graphically on Figure 15.

Barrett Avenue Driveways Evaluation

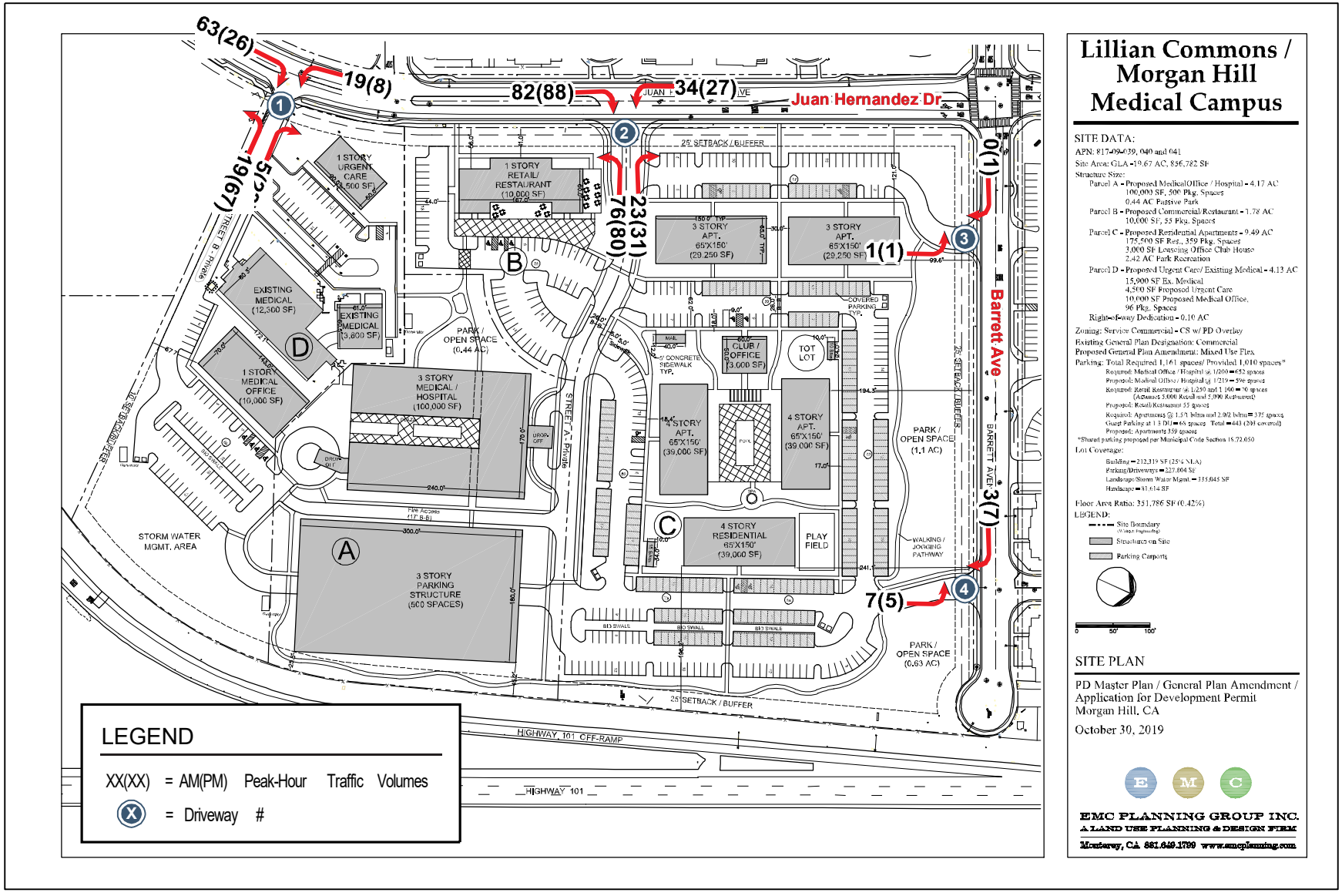
Twenty-four-hour tube counts conducted on February 2020 along Barrett Avenue, east of Juan Hernandez Drive, show that this segment of Barrett Avenue serves approximately 270 vehicles during the AM peak-hour and approximately 100 vehicles during the PM peak-hour. The larger traffic volumes during the morning peak-hour correspond to Barrett Elementary School traffic. The peak traffic volumes along this segment of Barrett Avenue occur during the 7:00-8:00 AM hour (271 vehicles) and the 2:00-3:00 PM hour (176 vehicles). Traffic volumes along this segment of Bassett Avenue outside of the above two peak hours average approximately 55 vehicles per hour.

Based on the relatively low traffic volumes along Barrett Avenue, east of Juan Hernandez Drive, the addition of project traffic to Driveways 3 and 4 would not affect traffic conditions along this roadway segment. However, depending on the school drop-off procedures, it is possible that during the school's peak 15-minute period, project traffic from/to Driveway 3 and 4 would experience short delays as they attempt to exit/enter the site and queues of school traffic are formed along Barrett Avenue as parents drop-off their children at school. Outside of the school's peak 15-minute period, traffic conditions and access along Barrett Avenue would be adequate.

Driveway 1 Evaluation

Driveway 1 would continue to provide full access. However, the close proximity of Driveway 1 to the Juan Hernandez Drive/St. James Drive intersection (approximately 100 feet to the south), in addition to the increase in traffic volumes at the site driveway, could potentially create conflicts between southbound left-turning traffic accessing Driveway 1 and northbound left-turning traffic at St. James Drive. The existing back-to-back southbound left-turn lane at Driveway 1 and northbound left-turn lane at St. James Drive would be converted to a two-way left-turn (TWLT) lane providing approximately 100 feet of queue storage capacity for left-turning traffic at both locations.

Figure 15
Project Trips at Site Access Points – Site Access Alternative



A queue length of no greater than one vehicle is projected at the left-turn pockets to the site (Driveway 1) and St. James Drive. Therefore, the storage provided by the TWLT lane would provide adequate storage for left-turning vehicles. However, as traffic volumes along Juan Hernandez Drive continue to increase, left-turns in and out of Driveway 1 and St. James Drive would experience longer delays affecting queue lengths at both locations. Therefore, it is recommended that Driveway 1 be relocated to the north and aligned with St. James Drive. The alignment of Driveway 1 would reduce conflicting turn movements by concentrating all turn-movements to a single location. Alternatively, access at Driveway 1 could be restricted to right-in and right-out only by extending the northbound left-turn lane/center raised median at St. James Drive past Driveway 1.

Potential Impacts on Pedestrians, Bicycles, and Transit

Pedestrian Access

As discussed previously, pedestrian facilities in the study area consist primarily of sidewalks, crosswalks, and pedestrian signals at signalized intersections. The adjacent intersection of Juan Hernandez Drive/Barrett Avenue has high-visibility crosswalks along all four legs of the intersection, and the Juan Hernandez Drive/Tennant Avenue intersection has marked crosswalks and pedestrian signal heads along the north and west legs of the intersection. However, the project site is located within an area that is highly undeveloped. Tennant Avenue, east of Butterfield Boulevard, is lined with predominantly undeveloped parcels. As such, continuous sidewalks along some roadway segments in the vicinity of the project site are not available. Sidewalks are currently missing along both sides of Tennant Avenue near the project site, along the west side of Juan Hernandez Drive south of St. James Drive, and along the east side of Butterfield Boulevard between Tennant Avenue and San Pedro Avenue. Although sidewalks are available along the entire project site frontage, the missing sidewalks along some of the streets near the project site would result in a discontinuous pedestrian network in the project area. Additionally, curb ramps at intersections surrounding the project site are non-Americans with Disabilities Act (ADA)-compatible wheelchair ramps.

Project's Effect on Pedestrian Facilities

It can be expected that new pedestrian traffic would be generated by the proposed project. The project site is located within what would be considered a walking distance (0.5-1 mile) from various commercial uses along the Tennant Avenue corridor, various employment opportunities along Butterfield Boulevard, and Barrett Elementary School is located across from the project site.

The existing sidewalks along both sides of Barrett Avenue and high-visibility crosswalks at the Juan Hernandez Drive/Barrett Avenue intersection, in conjunction with proposed on-site sidewalks that would provide a connection between the project's residential area and the sidewalks on Barrett Avenue, would provide a continuous and safety-enhanced access between the project site and Barrett Elementary School.

Pedestrian destination along Butterfield Boulevard could be accessed via the continuous sidewalks on Barrett Avenue. Pedestrian access to the commercial areas along Tennant Avenue, however, would be challenging due to the discontinuous pedestrian network, forcing pedestrians to walk along the edge of undeveloped parcels. At the railroad tracks along Tennant Avenue, east of the Tennant Avenue/Vineyard Boulevard intersection, there is not a defined pedestrian crossing of the railroad tracks, or sidewalks on either side of the tracks along Tennant Avenue. Sidewalks begin along the north side of Tennant avenue approximately 100 feet west of the railroad tracks and at its intersection with Vineyard Boulevard along the south side of Tennant Avenue.

Even with the proposed complete on-site pedestrian network, the lack of a continuous pedestrian network off site would affect pedestrian access to/from the project site. The lack of connectivity between the project site and nearby pedestrian destinations potentially could discourage pedestrian activity or force pedestrians to walk along undeveloped roadway shoulders and/or within the street.

Recommendation: It is recommended that all existing and proposed curb ramps along the project site frontage and at intersections providing direct access to the project site be upgraded to comply with ADA standards.

Bicycle Facilities

Bike lanes are currently provided along Tennant Avenue and Butterfield Boulevard near the project site. These bike lanes provide a connection to other bicycle facilities throughout Morgan Hill. No bike lanes currently serve the project site directly.

Project's Effect on Bicycle Facilities

The proposed project could increase the demand on bicycle facilities in the vicinity of the project site. Assuming bicycle trips would comprise no more than one percent of the total project-generated trips, the project could generate no more than 3 new bicycle trips during the peak hours. The potential demand could be served by the bicycle facilities available in the vicinity of the project site. In addition, the Bikeways Master Plan map contained within the City of Morgan Hill General Plan shows proposed bike lanes along both side of Juan Hernandez Drive, between Tennant Avenue and San Pedro Avenue. Therefore, the potential increase in bicycle trips by the proposed project would not have an adverse effect on the existing or future bicycle facilities in the study area and would not require new off-site bicycle facilities.

Transit Services

Although the City of Morgan Hill is served by various local and express bus routes (bus Routes 68, 121, 168, and 185), none of the existing bus routes currently serve the project site directly. The nearest bus stops to the project site are located north of the Monterey Road/Tennant Avenue intersection, approximately one-mile walking distance west of the project site. Additionally, the Morgan Hill Caltrain Station, located on the east side of Depot Street, is approximately 1.5 miles northwest of the project site and provides a connection to most transit lines serving Morgan Hill in addition to Caltrain.

Typical mode split in Morgan Hill would be a three percent transit share. Assuming up to three percent transit mode share for the project equates to no more than 10 transit riders during each of the peak hours. The transit ridership demands of the proposed project could be accommodated by the existing transit services.

Project's Effect on Transit Services

Since no bus routes currently exist that provide direct service between the project site and other pedestrian destinations in Morgan Hill, and there is currently only one local bus route (Route 87) serving the City of Morgan Hill with the nearest bus stop to the project site located approximately 2 miles away, the use of public transportation by residents/employees/patrons of the proposed project would be limited. Nevertheless, assuming an estimated one percent transit mode share, which is probably the highest that could be expected for the project, equates to approximately 3 to 4 new transit riders during the peak hours. The estimated number of new transit riders for the proposed project could be served by the existing bus line currently serving the project area.

Recommendation: With the development of the project, as well as the future development of other currently undeveloped parcels along Tennant Avenue in the vicinity of the project site, there will be an opportunity for VTA to expand the existing service area to this part of town, which is currently underserved. Potentially, a bus stop could be provided along the project site frontage to serve the project site, and adjacent residential neighborhood, directly.

6. Conclusions

The potential impacts of the project were evaluated in accordance with the standards set forth by the City of Morgan Hill and the Santa Clara Valley Transportation Authority (VTA). The study included an analysis of AM and PM peak-hour traffic conditions for 14 signalized intersections, 4 unsignalized intersections, 1 planned future intersection.

The impacts of the project on intersections were identified on the basis of the City of Morgan Hill Level of Service standards. Project impacts on other transportation facilities, such as pedestrian facilities, bicycle facilities and transit, were determined on the basis of engineering judgment.

Existing Plus Project Intersection Level of Service Analysis

The results of the intersection level of service analysis indicate that, measured against the City of Morgan Hill level of service standards, all of the study intersections are projected to operate at acceptable levels of service (LOS D or better) under existing plus project conditions, during both the AM and PM peak hours.

Based on the Peak-Hour Volume Signal Warrant, the intersection of Condit Road and Tennant Avenue (intersection #14) would continue to have peak-hour traffic volume levels that warrant installation of a traffic signal during the AM and PM peak hour under existing plus project conditions. However, the intersection is projected to operate at acceptable levels of service and, therefore, would not be impacted by the proposed project.

Freeway Segment Analysis

Per CMP technical guidelines, freeway segment level of service analysis shall be conducted on all segments to which the project is projected to add trips representing one percent or more of the freeway segment's capacity. Since the number of new trips added to the freeway segments by the proposed project do not equal or exceed one percent of the capacity of the freeway segments near the project site, a freeway level of service analysis for the CMP is not required.

Year 2035 General Plan Intersection Level of Service Analysis

The results of the intersection level of service analysis indicate that the following study intersection would be impacted during the PM peak-hour under Year 2035 General Plan with project conditions:

14. Tennant Avenue and Condit Road (**Impact**: PM peak-hour)

Year 2035 General Plan Impacts and Mitigation Measures

14. Tennant Avenue and Condit Road

Mitigation: Possible improvements to mitigate the impact at this intersection consist of the implementation of a traffic signal. However, the decision to install a traffic signal should not be based solely on satisfying one traffic signal warrant. Instead, intersections that meet the peak-hour signal warrant should be subject to further analysis before determining that a traffic signal is necessary. Thus, the project impact at this intersection would be mitigated with payment of the traffic impact fee, as determined by City staff.

Vehicle Miles Traveled

The VMT results show that the proposed project would result in a decrease in daily VMT and daily trips when compared to the adopted GP land uses for the site. The decrease in VMT and trips is due to the development of the project site with a mixture of complementary land uses (housing, employment, and retail) in addition to provided services that Morgan Hill residents might currently access elsewhere. As a result, the VMT per trip also is shown to decrease, representing shorter trips associated with the proposed land uses.

The reduction in trip length is due to the addition of jobs and services in the City which is currently dominated by housing. These jobs and services cause trips to be internalized within the City resulting in a reduction in commute distances of residents in the City.

Other Transportation Issues

Project Site Access and Circulation

Access Driveway Operations

Operations at the project site driveways with implementation of the proposed project were evaluated. It is estimated that no more than one vehicle would queue up within the southbound left-turn pockets along Juan Hernandez Drive (inbound traffic) and on site (outbound traffic) at both Driveways 1 and 2. All left-turning inbound traffic would experience average delays of no more than 8 seconds while left-turning outbound traffic would experience average delays of no more than 12 seconds during the peak hours (representing LOS B conditions at both driveway intersections) while waiting for a gap in traffic to complete the turn. Based on the projected average delays and queue lengths, it can be concluded that the project site driveways would operate adequately.

On-Site Circulation

Recommendation: The site design, including driveway widths, drive aisle widths, parking stall dimensions, and turn radii, must adhere to City of Morgan Hill design guidelines. All drive aisles must allow for two-way circulation and adequate circulation of larger vehicles (such as emergency trucks, garbage truck, and delivery trucks) throughout the project site.

Recommendation: It is recommended that "Keep Clear" pavement markings be installed along Street A at the west residential parking area to prevent outbound traffic at Driveway 2 from blocking access to this area. Alternatively, this driveway could be moved eastward farther away from Driveway 2.

Recommendation: To minimize the likelihood of drivers traveling through the residential parking areas at speeds that are unsafe as the result of the long straight drive aisles, it is recommended that installation of speed reduction measures be considered along the east residential parking drive aisles. Speed reduction measures could be as simple as posting signage and/or pavement markings advising of the speed limit, to other physical deterrents such as speed bumps.

Adhering to City of Morgan Hill standards and requirements, and implementing the above recommendations, the proposed site access and on-site circulation would be adequate to accommodate circulation of both passenger and emergency vehicles.

Sight Distance

Based on Caltrans requirements, the available sight distance at the project site driveways on Juan Hernandez Drive would be adequate.

Recommendation: The site design should ensure design features, in particular the landscaping and signage along the project site frontage and at the project site driveways, would not interfere with the sight distance at the proposed site driveway.

Emergency Vehicle and Truck Access

The design of the project site, including driveway and drive aisle widths and on-site turn radii, must be adequate to ensure emergency vehicles can maneuver through the site, from any of the proposed driveways, without a problem.

Recommendation: The ambulance access route to the hospital should be identified and, to the maximum extent possible, the identified route should be cleared of obstructions, such as crosswalks or parking spaces, that could potentially interfere with the ambulance's prompt access to the hospital.

Parking

The project is proposing to provide a total of 1,010 on-site parking spaces, 500 of which would be provided within the proposed parking structure. Based on the City's parking requirements and the proposed size and land uses of the project, the proposed project would be required to provide a total of 1,195 parking spaces, which is 185 parking spaces more than the proposed number of spaces.

The site plan states that a shared parking program is being proposed for the site.

Recommendation: The project applicant must work with the City of Morgan Hill to develop a shared parking program, or any other alternative that will reduce the peak parking demand to meet the proposed supply for the project.

Bicycle Parking

Recommendation: It is recommended that the proposed project provide adequate bicycle parking supply on site, based on the City's recommends bicycle-parking rates, to serve the potential demand of the project. The proposed project would be required to provide a total of 55 short-term bicycle parking spaces and 45 long-term bicycle parking spaces for the residential and restaurant uses only, or a total of 121 short-term bicycle parking spaces and 78 long-term bicycle parking spaces for all proposed land uses on-site.

Effects on Surrounding Residential Streets

Findings and Recommendations of the Roadway Segment Analysis

The following conclusions can be drawn from the evaluation of the study roadways:

- Traffic volumes at all study roadways are and would continue to be within the volume range characteristic for local and collector streets.
- Speeds along one of the four study roadway segments (Juan Hernandez Drive, south of Barrett Avenue, southbound direction) currently exceed the posted speed limit by more than 5 mph. Speeding is occurring under existing conditions and not caused by the project.
- Daily traffic volumes along Juan Hernandez Drive and Barrett Avenue are projected to increase by approximately 80-225% from existing conditions as a result of the proposed project, an increase which would be measurable and perceptible to residents of the adjacent neighborhood.

Intersection Operations Analysis

Queuing Analysis Results

The vehicle queue analysis indicates that, currently, all study left-turn pockets and intersection approach have sufficient queue storage capacity to accommodate the existing maximum vehicle queue length for each movement. The addition of project traffic to the study intersections would result in no change to the 95th percentile vehicle queue lengths or would increase it by no more than 3 vehicles at other locations, such as the southbound left-turn movement at the intersection of Tennant Avenue and Juan Hernandez Drive. However, even with the addition of project traffic, the 95th percentile vehicle queue lengths are projected to continue to accommodate within the existing queue storage capacity at all study locations.

Site Access Alternative Evaluation

Site Access

Based on the relatively low traffic volumes along Barrett Avenue, east of Juan Hernandez Drive, the addition of project traffic to Driveways 3 and 4 would not affect traffic conditions along this roadway segment. However, depending on the school drop-off procedures, it is possible that during the school's peak 15-minute period, project traffic from/to Driveway 3 and 4 would experience short delays as they attempt to exit/enter the site and queues of school traffic are formed along Barrett Avenue as parents drop-off their children at school. Outside of the school's peak 15-minute period, traffic conditions and access along Barrett Avenue would be adequate.

Assuming that Driveway 1 would remain at its existing location, a queue length of no greater than one vehicle is projected at the left-turn pockets to the site (Driveway 1) and St. James Drive. Therefore, the storage provided by the TWLT lane would provide adequate storage for left-turning vehicles. However, as traffic volumes along Juan Hernandez Drive continue to increase, left-turns in and out of Driveway 1 and St. James Drive would experience longer delays affecting queue lengths at both locations. Therefore, it is recommended that Driveway 1 be relocated to the north and aligned with St. James Drive. The alignment of Driveway 1 would reduce conflicting turn movements by concentrating all turn-movements to a single location. Alternatively, access at Driveway 1 could be restricted to right-in and right-out only by extending the northbound left-turn lane/center raised median at St. James Drive past Driveway 1.

Potential Impacts on Pedestrians, Bicycles, and Transit

Project's Effect on Pedestrian Facilities

Recommendation: It is recommended that all existing and proposed curb ramps along the project site frontage and at intersections providing direct access to the project site be upgraded to comply with ADA standards.

Project's Effect on Bicycle Facilities

The potential increase in bicycle trips by the proposed project would not have an adverse effect on the existing or future bicycle facilities in the study area and would not require new off-site bicycle facilities.

Project's Effect on Transit Services

Recommendation: With the development of the project, as well as the future development of other currently undeveloped parcels along Tennant Avenue in the vicinity of the project site, there will be an opportunity for VTA to expand the existing service area to this part of town, which is currently underserved. Potentially, a bus stop could be provided along the project site frontage to serve the project site, and adjacent residential neighborhood, directly.

Lillian Commons Medical Campus Development

Technical Appendices

June 19, 2020

Appendix A

Traffic Counts

Appendix B

Volume Summary

Appendix C

Level of Service Calculations

Appendix D

Signal Warrant Analysis

Appendix E

Poisson Probability (Queuing) Calculations