HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

To: Joseph Dyke, City of San Jose

From: Robert Del Rio, T.E.
Ricky Williams

Date: October 5, 2016

Subject: Greyhound Site Residential Development Traffic Operations Analysis

Introduction

Hexagon Transportation Consultants, Inc. has completed a traffic operations study for the proposed residential development on the Greyhound site in San Jose. The project as proposed would consist of two towers providing up to 785 residential units with up to 20,000 square feet (s.f.) of ground floor retail. The site is located along the south side of Post Street, between South Almaden Avenue and South San Pedro Street. The site was formerly occupied by the Greyhound Bus Station. Figure 1 shows the project site location.

The proposed project's most recent description states that the project will be accessed via two full-access residential driveways and two loading driveways along South San Pedro Street. However, the City has stated that only a total of three driveways, two on San Pedro Street and one on Almaden Avenue will be allowed. The City has recommended that the proposed site access be adjusted to provide the two full access residential driveways on San Pedro Street and an on-site loading dock along Almaden Avenue as Almaden Avenue has larger curb-to-curb width to allow for truck movements.

Since the project site is located in the Downtown Core area boundary, it is covered under the San Jose Downtown Strategy 2000 Environmental Impact Report (EIR). Accordingly, City staff has already concluded that the project is in conformance with the City of San Jose Transportation Level of Service Policy (Council Policy 5-3) and will not require preparation of a comprehensive Transportation Impact Analysis (TIA). The Public Works department has indicated, however, that a traffic operations study is required in order to identify potential operational issues that could occur as a result of the proposed project. This traffic study is intended to satisfy the City's request.

Scope of Study

The purpose of the traffic operations study was to identify any potential operational issues that could occur as a result of the project. Based on the proposed project size, site-generated traffic was estimated. Vehicular site access was evaluated based on the project's proposed driveway locations. Truck access, including trash pickup and loading activities, were evaluated. Parking and on-site vehicular circulation also was analyzed.

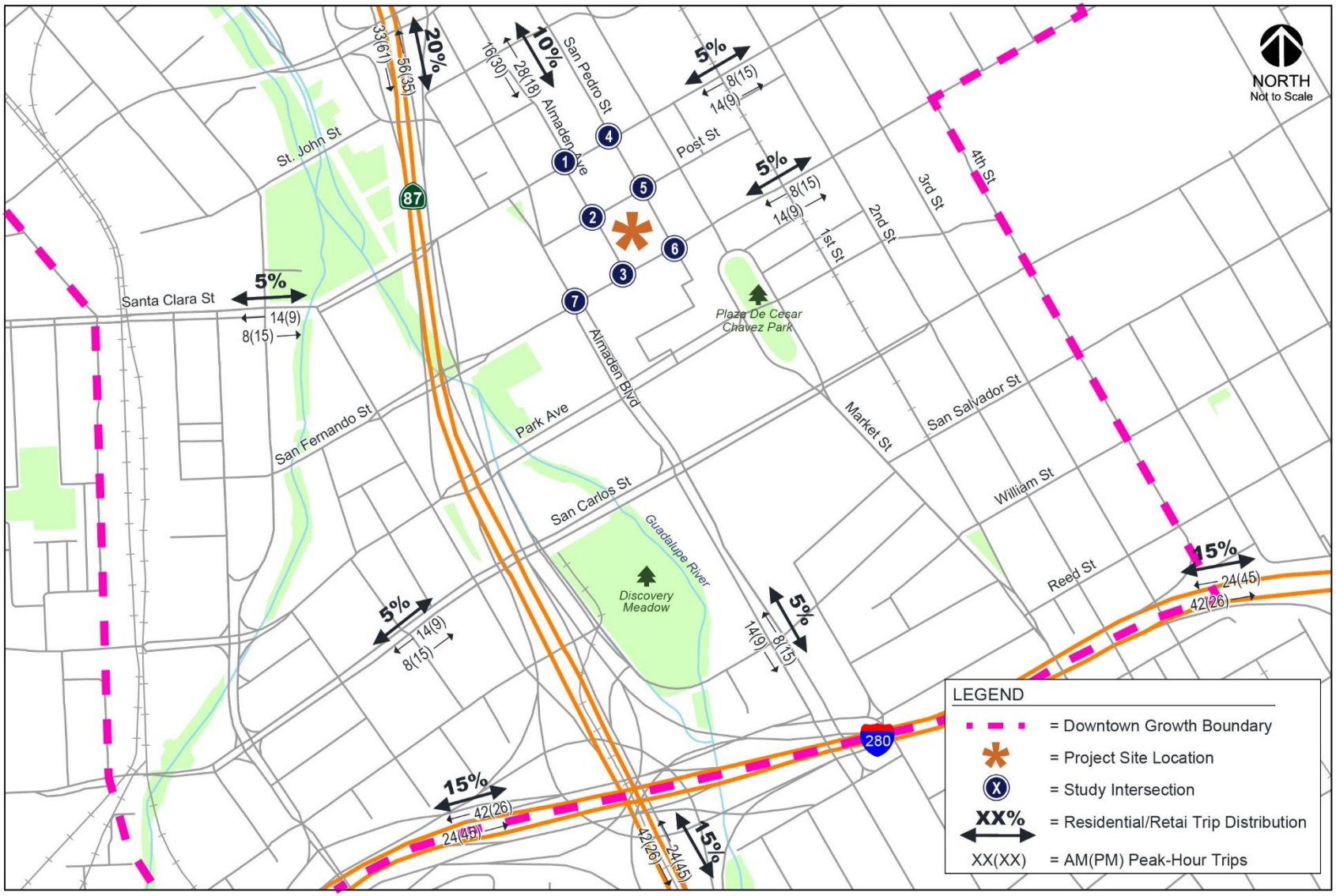
Existing Conditions

This section 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 by SR 87 and I-280. Local site access is provided by Almaden Boulevard, Santa Clara Street, San Fernando Street, Almaden Avenue, San Pedro Street, and Post Street. The local and regional roadways are described below.

Figure 1
Site Location, Study Intersections and Project Trip Distributions, and Project Trip Assignments



SR 87 is primarily a six-lane freeway (four mixed-flow lanes and two HOV lanes) that is aligned in a north-south orientation within the project vicinity. SR 87 begins at its interchange with SR 85 and extends northward, terminating at its junction with US 101. SR 87 provides access to US 101 and I-280/I-680. Access to the site to and from SR 87 is provided via interchanges at Julian Street/St. James Street, Santa Clara Street, Woz Way, and Auzerais Avenue/Delmas Avenue.

Interstate-280 is an eight-lane freeway in the vicinity of the site. It extends northwest to San Francisco and east to King Road in San Jose, at which point it makes a transition into I-680 to Oakland. Access to and from the site is provided via its ramps at 1st Street, 7th Street, and Almaden Boulevard/Vine Street, and via SR 87.

Almaden Boulevard is a north-south four-lane street that extends between St. John Street and Grant Street, just south of I-280. Almaden Boulevard provides access to and from the project site via Post Street and San Fernando Street.

Santa Clara Street is an east-west four-lane street located north of the project site. Santa Clara Street provides access to and from the project site via San Pedro Street and Almaden Avenue.

San Fernando Street is generally an east-west two-lane street that extends intermittently as East San Fernando Street from 1st Street to King Road in East San Jose and as West San Fernando Street from 1st Street to Race Street. Class II bike lanes are provided along both sides of San Fernando Street, between 11th Street and Montgomery Street (Diridon Station). San Fernando Street provides access to the project site via Almaden Avenue and Post Street.

Almaden Avenue is a north-south street that extends between San Fernando Street and St. James Street along the project site's western frontage. South of the project site, Almaden Avenue continues from Viola Avenue (just south of the San Jose Convention Center) southward to Alma Avenue, where it transitions into Almaden Expressway. Almaden Avenue is a two-lane street with on-street metered parking along both sides of the street and 25 mph speed limit between San Fernando Street and Santa Clara Street. Near the project frontage, there are loading zones provided along the west side of the street for the existing Greyhound Bus Station and along the east side of the street near San Fernando Street. Access to the parking garage of a commercial building along the west side of Almaden Avenue is provided north of Post Street. The street width along the project frontage is approximately 50 feet. However, the street narrows to 40 feet near its intersection with San Fernando Street and 40 feet between Post Street and Santa Clara Street.

San Pedro Street is a north-south street that extends intermittently as North San Pedro Street between Basset Street and Santa Clara Street, and as South San Pedro Street between Santa Clara Street and San Fernando Street. San Pedro Street is a two-lane street with on-street metered parking along the west side of the street and 25 mph speed limit. San Pedro Street is generally 40 feet wide. However, the street narrows to approximately 35 feet near its intersections with San Fernando Street Santa Clara Street. Near the project frontage, the east side of San Pedro Street includes landscape islands adjacent to loading zones and an entrance and exit as well as truck dock for the Market Post Tower building. The landscape islands narrow the street width to approximately 30 feet. North of Post Street, San Pedro Street provides access to two commercial buildings via several garage entrances/exist and truck docks. San Pedro Street runs along the project's eastern site boundary and is proposed to provide direct access to the project site via two full access driveways and two truck docks, based on the provided site plan.

Post Street is an east-west two-lane street that extends between Almaden Boulevard and 1st Street. Post Street runs along the project's northern boundary, providing access to and from the site via Almaden Avenue and San Pedro Street.

Existing Bicycle and Pedestrian Facilities

Pedestrian facilities in the study area consist mostly of sidewalks along all of the surrounding streets including the project frontages along Post Street, S. Almaden Avenue and S. San Pedro Street. Overall, the existing sidewalks have good connectivity and provide pedestrians with safe routes to the surrounding land uses in the area. Crosswalks and pedestrian signal heads are located at all signalized intersections within the project area, including the intersections of Almaden Avenue and San Pedro Street with Santa Clara Street. Crosswalks along all four legs of the intersections also are provided at the unsignalized intersections of S. San Pedro Street with Post Street and W. San Fernando Street. There is no crosswalk provided on the

east approach of the S. Almaden Avenue and W. San Fernando Street intersection. There also are no crosswalks provided at the S. Almaden Avenue and Post Street intersection.

Class II bicycle facilities (striped bike lanes) are not provided along the roadways fronting the project site (Post Street, S. Almaden Street, and S. San Pedro Street) . However, there are Class II bicycle facilities provided along both sides of San Fernando Street, between 11th Street and Montgomery Street. East of 11th Street, San Fernando Street is a designated Class III bike path and provides "sharrow" or shared-lane pavement markings from 11th to 17th Streets. Other bike lanes along roadways within the larger study area include the following:

- Woz Way, between San Carlos Street and Almaden Avenue
- Park Avenue, between Woz Way and Market Street, and west of Montgomery Street
- Almaden Boulevard, between Woz Way and Santa Clara Street
- Santa Clara Street, west of Almaden Boulevard
- 2nd Street, between San Salvador Street and Keyes Street
- 3rd Street, between Jackson Street and Humboldt Street
- 4th Street, between Jackson Street and I-280

The Guadalupe River multi-use trail system runs through the City of San Jose along the Guadalupe River and is shared between pedestrians and bicyclists and separated from motor vehicle traffic. The Guadalupe River trail is an 11-mile continuous Class I bikeway from Curtner Avenue in the south to Alviso in the north. This trail system can be accessed via W. San Fernando Street approximately ¼ mile west of the project site.

The City of San Jose has developed a public Bike Share system that allows users to rent and return bicycles at various popular locations. Bike Share and Zip Car locations are provided throughout the Downtown area. The nearest bike share and Zip car locations are within walking distance, at the intersections of Almaden Boulevard and Almaden Avenue with Santa Clara Street. Figure 2 shows the existing bicycle facilities and Zip car locations.

Existing Transit Services

Existing transit services to the study area are provided by the Santa Clara Valley Transportation Authority (VTA), Caltrain, Altamont Commuter Express (ACE), and Amtrak. The transit stations and local VTA bus lines near the project site are shown on Figure 3.

Bus Service

The downtown area is served by many local bus lines. The bus lines that operate within ¼ mile walking distance of the project site are listed in Table 1, including their route description and commute hour headways.

The VTA also provides a shuttle service within the downtown area. The downtown area shuttle (DASH) provides shuttle service from the San Jose Diridon Caltrain Station to San Jose State University, and the Paseo De San Antonio and Convention Center LRT Stations via San Fernando and San Carlos Streets.

VTA Light Rail Transit (LRT) Service

The Santa Clara Valley Transportation Authority (VTA) currently operates the 42.2-mile VTA light rail line system extending from south San Jose through downtown to the northern areas of San Jose, Santa Clara, Milpitas, Mountain View and Sunnyvale. The service operates nearly 24-hours a day with 15-minute headways during much of the day.

The Mountain View–Winchester and Alum Rock–Santa Teresa LRT lines operate within walking distance of the project site. The Santa Clara LRT stations are located approximately ¼ mile east of the project site on 1st and 2nd Streets, between E. Santa Clara and E. San Fernando Streets. The San Jose Diridon Station is located along the Mountain View–Winchester LRT line and is served by Caltrain, ACE, and Amtrak.

Caltrain Service

Commuter rail service between San Francisco and Gilroy is provided by Caltrain, which currently operates

Figure 2
Existing Bicycle Facilities and Zip Car Locations

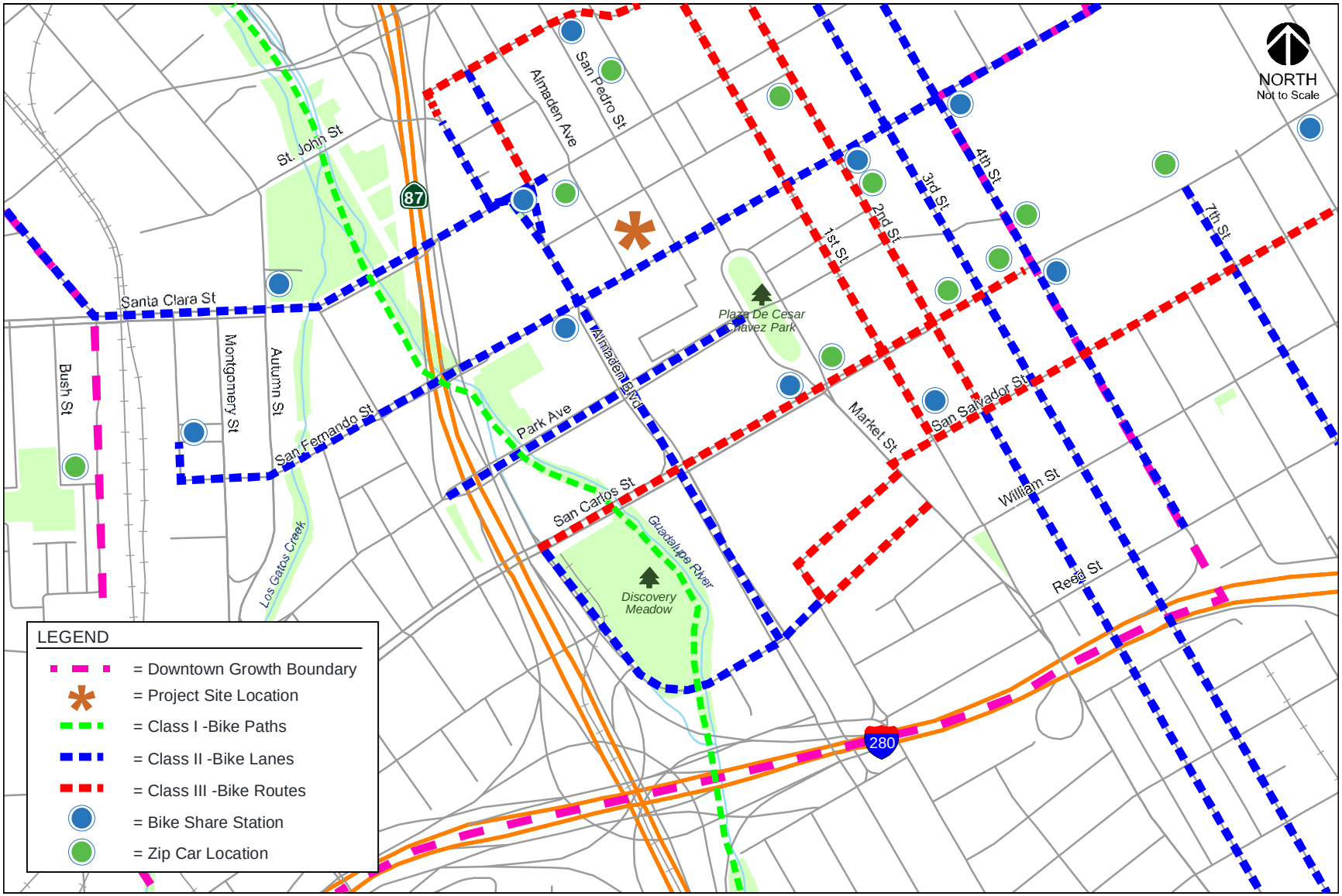


Figure 3
Existing Transit Facilities

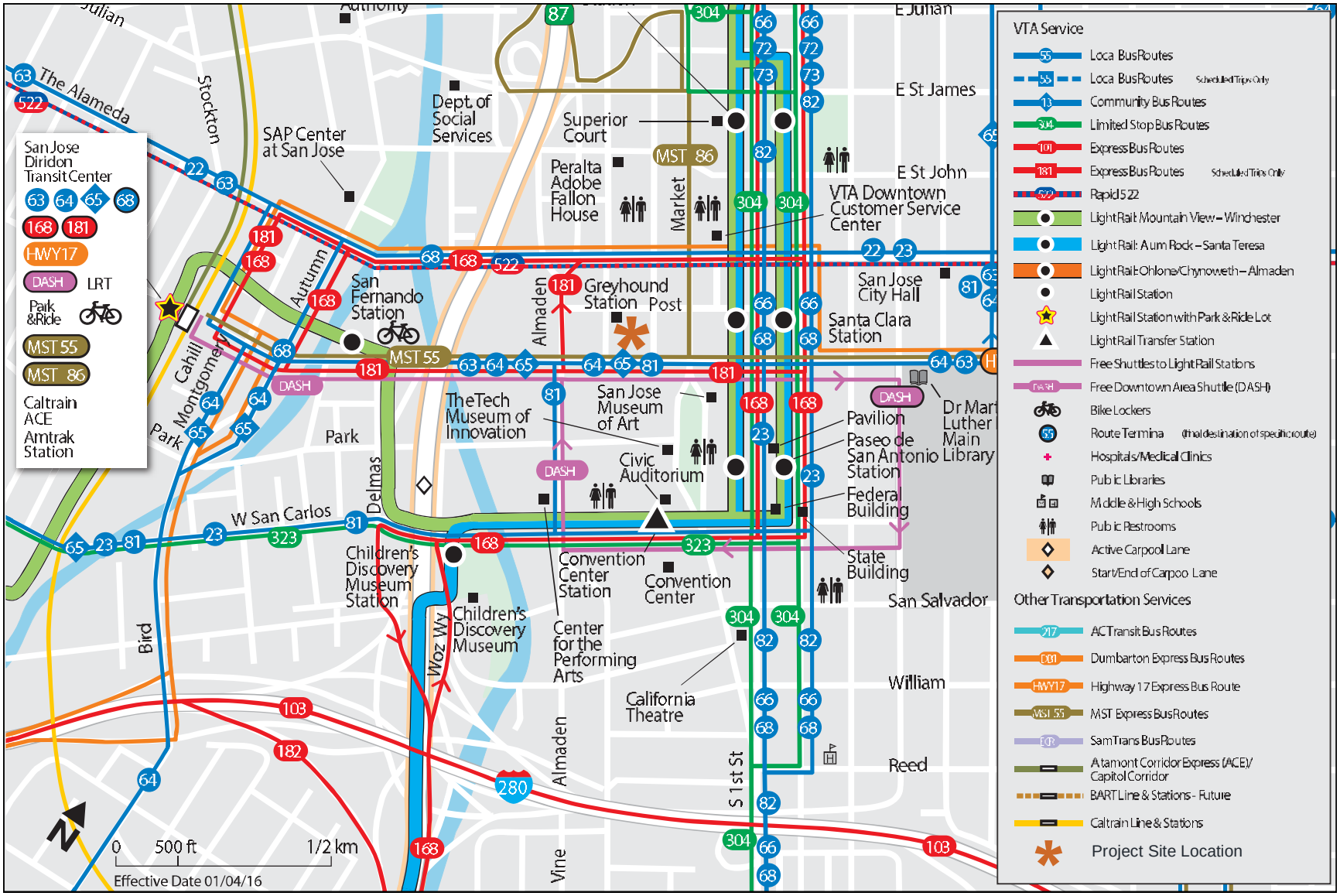


Table 1
Existing Bus Service Near the Project Site

Bus Route	Route Description	Headway /a/
Local Route 22	Palo Alto Transit Center to Eastridge Transit Center via El Camino	12 min
Local Route 63	Almaden Expwy. & Camden to San Jose State University	30 min
Local Route 64	Almaden LRT Station to McKee & White via Downtown San Jose	15 min
Community Route 65	Kooser & Blossom Hill to 13th & Hedding	45 - 50 min
Local Route 66	Kaiser San Jose Medical Center to Dixon Landing Road (Milpitas)	15 min
Local Route 68	Gilroy Transit Center to San Jose Diridon Station	15-20 min
Local Route 72	Senter & Monterey to Downtown San Jose	15 min
Local Route 73	Snell/Capitol to Downtown San Jose	15 min
Local Route 81	San Jose State University-Moffett Field/Ames Cord	25-30 min
Local Route 82	Westgate to Downtown San Jose	30 min
Express Route 168	Gilroy Transit Center to San Jose Diridon Station	30 min
Express Route 181	Fremont BART Station to San Jose Diridon Station	15 min
Limited Stop Route 304	Santa Teresa LRT Station to Sunnyvale Transit Center	30 min
Limited Stop Route 323	Downtown San Jose to De Anza College	15 min
Rapid 522	Palo Alto Transit Center to Eastridge Transit Center	15 min
Hwy 17 Express (Route 970)	Downtown Santa Cruz / Scotts Valley to Downtown San Jose	10 - 30 min

Notes:
/a/ Approximate headways during peak commute periods.

92 weekday trains that carry approximately 47,000 riders on an average weekday. The project site is located less than ¾ mile from the San Jose Diridon Station. The Diridon Station provides 581 parking spaces, as well as 18 bike racks and 48 bike lockers. Trains stop frequently at the Diridon station between 4:30 AM and 10:30 PM in the northbound direction, and between 6:28 AM and 1:34 AM in the southbound direction. Caltrain provides passenger train service seven days a week, and provides extended service to Morgan Hill and Gilroy during weekday commute hours.

Altamont Commuter Express Service

ACE provides commuter rail service between Stockton, Tracy, Pleasanton, and San Jose during commute hours, Monday through Friday. Service is limited to four westbound trips in the morning and four eastbound trips in the afternoon/ evening with headways averaging 60 minutes. ACE trains stop at the Diridon Station between 6:32 AM and 9:17 AM in the westbound direction, and between 3:35 PM and 6:38 PM in the eastbound direction.

Amtrak Service

Amtrak provides daily commuter passenger train service along the 170-mile Capitol Corridor between the Sacramento region and the Bay Area, with stops in San Jose, Santa Clara, Fremont, Hayward, Oakland, Emeryville, Berkeley, Richmond, Martinez, Suisun City, Davis, Sacramento, Roseville, Rocklin, and Auburn. The Capitol Corridor trains stop at the San Jose Diridon Station eight times during the weekdays between approximately 7:38 AM and 11:55 PM in the westbound direction. In the eastbound direction, Amtrak stops at the Diridon Station seven times during the weekdays between 6:40 AM and 7:15 PM.

The Coast Starlight trains provide daily passenger train service between Los Angeles and Seattle. The southbound Coast Starlight train stops at the San Jose Diridon Station at 9:55 AM and departs at 10:07 AM. The northbound Coast Starlight train stops at the Diridon Station at 8:11 PM and departs at 8:23 PM.

Project Trip Generation

Through empirical research, data have been collected that quantify the amount of traffic produced by common land uses. 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. The magnitude of traffic added to the roadway system by a particular development is estimated by multiplying the applicable trip generation rates by the size of the development. The trip generation rates contained in the San Jose TIA Handbook, August 2009 were used for this study. Trip reductions associated with the project site's proximity to transit and the mixed-use components of the project were applied and are described below.

Trip Reductions

Since the project site is located within 2,000 feet of an LRT station (three total stations within 2,000 feet, including San Fernando, Convention Center, and Santa Clara Stations), the total number of trips generated by the residential component of the project can be reduced by up to 9 percent, per VTA guidelines.

A mixed-use development with complementary land uses such as residential and retail will result in a reduction of external site trips. Thus, the number of vehicle trips generated for each use may be reduced, since a portion of the trips would not require entering or exiting the site. Therefore, based on VTA's recommended mixed-use reduction, a 15 percent trip reduction was applied to the proposed project. The reduction is applied to the smaller of the two complimentary trip generators (retail use), and the same number of trips is then subtracted from the larger trip generator (residential use).

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 25% for retail development within Santa Clara County was applied to the retail component of the proposed project.

Net Project Trips

After applying the appropriate trip generation rates and trip reductions, the project is projected to generate 445 new trips during the AM peak hour and 463 new trips during the PM peak hour. Using the recommended inbound/outbound splits, the project would produce 163 inbound and 282 outbound trips during the AM peak, and 295 inbound and 168 outbound trips during the PM peak. The trip generation estimates are summarized in Table 2.

It should be noted that the project site was formerly occupied by the Greyhound Bus Station, which generated traffic throughout the day. Although traffic was previously accessing the project site, as a conservative approach, no trip credit was taken for the existing use on site.

The project site also is located within the Downtown Growth Area. The Downtown Growth Area land use designation is characterized by mixed land uses and high rise buildings that create opportunities for multi-modal travel and strong transit demand. In addition, the availability of bicycle lanes and sidewalks throughout downtown and the project's close proximity to major transit services will provide for and encourage the use of multi-modal travel options (bicycling and walking) and reduce the use of single-occupant automobile travel. Therefore, the estimates of trips to be generated by the proposed project as presented and evaluated within this study may represent an over-estimation of traffic and impacts associated with the proposed project. It is expected that the auto trips ultimately generated by the project would be less and the identified operational and parking issues reduced with the use of the multi-modal transportation system within the Downtown area.

Table 2
Project Trip Generation Estimates

Land Use	Size		Daily Trip Rate	Daily Trips	AM Peak Hour Pk-Hr Factor	AM Peak Hour Splits In	AM Peak Hour Splits Out	AM Peak Hour Trips In	AM Peak Hour Trips Out	AM Peak Hour Trips Total	PM Peak Hour Pk-Hr Factor	PM Peak Hour Splits In	PM Peak Hour Splits Out	PM Peak Hour Trips In	PM Peak Hour Trips Out	PM Peak Hour Trips Total
Proposed Land Uses																
Residential																
Apartments	785	units	6.0	4,710	10%	35%	65%	165	306	471	10%	65%	35%	306	165	471
Internalization Reduction (15%)[a]								-1	-3	-4				-6	-5	-11
Housing near LRT or Caltrain Station (9%)[b]				-424				-15	-27	-42				-28	-14	-42
Sub-Total Residential				4,286				149	276	425				272	146	418
Retail																
Retail	20,000	s.f.	40.0	800	3%	70%	30%	17	7	24	9%	50%	50%	36	36	72
Internalization Reduction (15%)[a]				-120				-3	-1	-4				-5	-6	-11
Pass-By Trips (25%)[c]				--				--	--	--				-8	-8	-16
Sub-Total Retail				680				14	6	20				23	22	45
Total Gross Project Trips				**4,966**				**163**	**282**	**445**				**295**	**168**	**463**

Notes:
Source: Based on "Apartments" and "Specialty Retail/Strip Commercial" rates contained in the San Jose TIA Handbook, August 2009.
[a]As prescribed by the Transportation Impact Analysis Guidelines from VTA (October 2014), the maximum trip reduction for mixed-use development project with housing and retail is equal to 15% off the retail component.
[b]As prescribed by the Transportation Impact Analysis Guidelines from VTA (October 2014), the maximum trip reduction for housing located within a 2,000-foot walk of a transit facility is equal to 9% off the residential component. (The project will be located within 2,000-foot walk of the Santa Clara LRT Station and San Fernando LRT Station.)
[c]A pass-by trip reduction of 25% was applied to the retail component of the project for the PM peak hour. The reduction was applied to the net retail project trips after applying the internalization reduction.

Project Trip Distribution and Trip Assignment

The trip distribution pattern for the project was based on previous traffic studies prepared for similar projects in Downtown San Jose. The project trips were assigned to the roadway network based on the proposed project driveway locations, existing travel patterns in the area, freeway access, and the relative locations of complementary land uses. The project trip distribution patterns are presented in Figure 1. The project trip assignment for the proposed driveway locations are shown on Figure 4.

Vehicular Site Access and Circulation

Site access analysis based on the proposed site plan and City recommended site access adjustments was conducted to identify operational deficiencies with the site access points and parking layout. This analysis is done to ensure adequate driveway and drive aisle widths are provided for vehicles to safely and efficiently access the site and maneuver throughout the parking areas.

The project proposes two full-access driveways as well as two loading/truck driveways along S. San Pedro Street. The City has recommended that the proposed site access be adjusted to provide the two full access residential driveways on San Pedro Street and an on-site loading dock along Almaden Avenue as Almaden Avenue has larger curb-to-curb width to allow for truck movements. The existing driveway along Post Street would be eliminated with the development of the proposed project.

Proposed Site Access

The site access and circulation evaluation is based on the September 10, 2015 site plan prepared by C2K Architecture, Inc. The ground level site plan is shown on Figure 6. The project proposes two full-access driveways on S. San Pedro Street. Parking for the proposed project would be provided within a five-level parking garage that includes three below-grade parking levels and a total of 736 parking spaces. Based on the site plan, access to the parking garage would be gated at the proposed driveways.

Figure 4
Project Trips at Project Driveways

Figure 5
Ground Level Site Plan

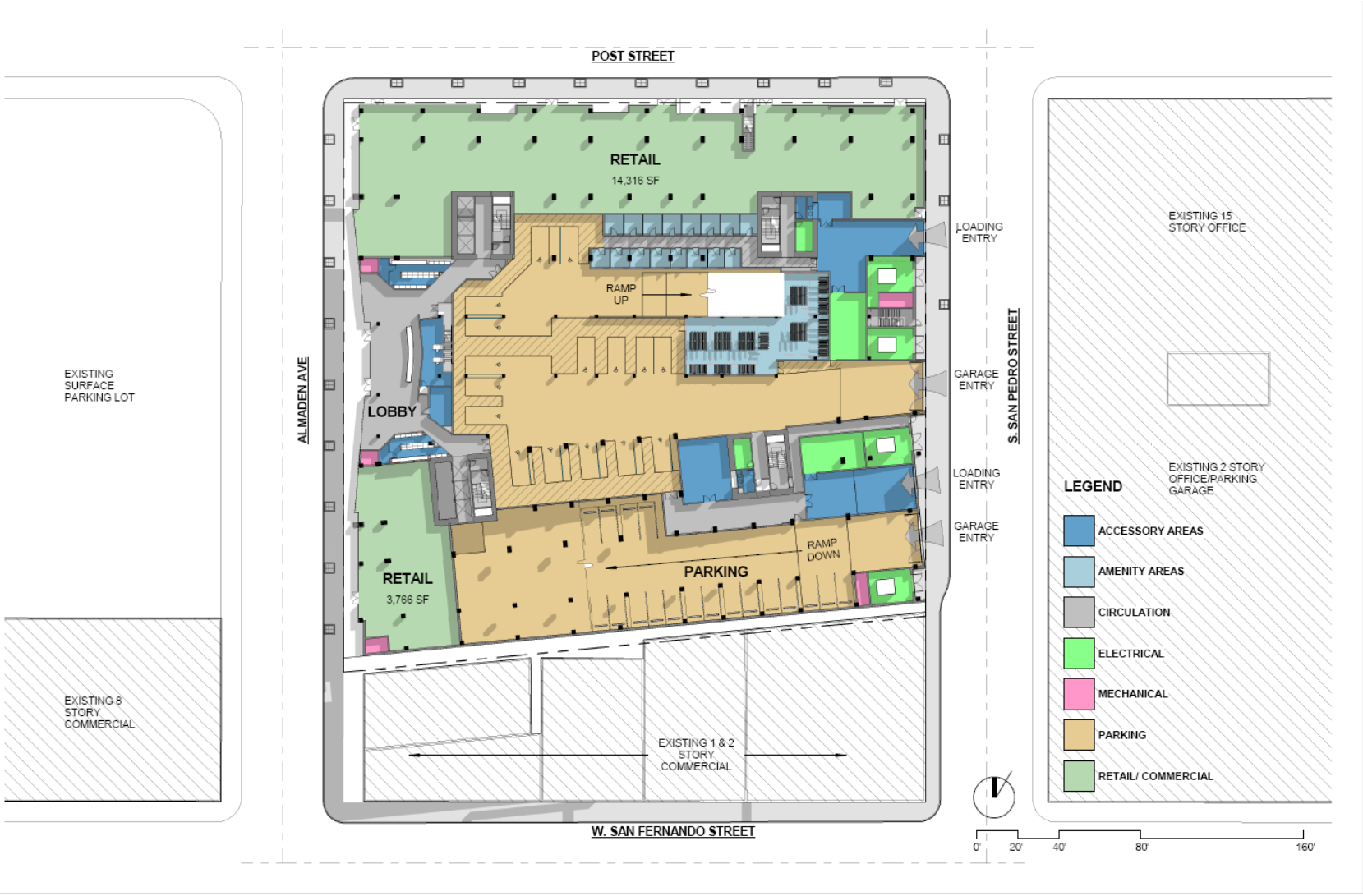


Figure 4 indicates the project-generated trips at the proposed project driveways on S. San Pedro Street. Project traffic is projected to access the site from both northbound and southbound S. San Pedro Street and either make a right- or left-turn into the site.

Based on the site plan provided, the proposed full access driveways along S. San Pedro Street appear to be approximately 26 feet in width. This meets the City of San Jose municipal code standard that requires on-site drive aisles and driveways that serve two-way traffic to be 26 feet wide. In addition, the City typically requires parking garage entrances to be located at least 50 feet from the face of the curb in order to provide adequate stacking space for at least two inbound vehicles. This requirement, however, may not always be achievable in the downtown area due to the zero setback requirements for buildings located in downtown. It is recommended that the proposed garage entrance gates be located a minimum of one car length back from the sidewalk (within the parking garage) on S. San Pedro Street to be able to accommodate one entering vehicle at the garage entrance gates without blocking the sidewalk.

The proposed residential component of the project is projected to generate approximately 149 inbound and 276 outbound trips during the AM peak hour and 272 inbound and 146 outbound trips during the PM peak hour. These trips would access and leave the parking garage during the peak hours. Assuming those trips would use the two proposed garage entrances equally, a maximum of 136 trips would access each of the project driveways during the PM peak hour (only about 75 trips during the AM peak hour), representing 2-3 vehicles per minute at each project driveway. The number of vehicles that can be served by the garage gates will depend on their service rate. However, an automated entrance gate should have the ability to serve 3 vehicles per minute. Therefore, it is not anticipated that vehicle queues at the project garage entrances would become an issue, in particular since traffic volumes along this segment of San Pedro Street are relatively low.

Sight Distance at the Driveway Serving the Project

Providing appropriate sight distance reduces the likelihood of a collision at a driveway or intersection and provides drivers with the ability to exit a driveway or locate sufficient gaps in traffic. Sight distance generally should be provided in accordance with Caltrans standards. The minimum acceptable sight distance is often considered the Caltrans stopping sight distance. Sight distance requirements vary depending on the roadway speeds. For the project driveways on S. San Pedro Street, which has a speed limit of 25 miles per hour (mph), the Caltrans stopping sight distance is 150 feet for design speeds of 25 mph. Thus, a driver must be able to see 150 feet down S. San Pedro Street when turning into and out of the project driveways to avoid a collision.

The proposed project will have two full access driveways, one located approximately 150 feet south of the S. San Pedro Street/Post Street intersection, and the other approximately 125 feet north of the S. San Pedro Street/San Fernando Street intersection. Two loading docks also will be located approximately 175 feet south of the San Pedro Street/Post Street intersection.

Based on the proposed driveway locations, minimum sight distance from each of the project driveways to the north (towards the S. San Pedro Street/Post Street intersection) would be met if the posted speed limit of 25 mph is in compliance. Additionally, the four-way stop control at the S. San Pedro Street/Post Street intersection should provide adequate gaps in traffic flow along southbound S. San Pedro Street for vehicles at each of the project driveways to exit the project site. The available sight distance from the project driveways to the S. San Pedro Street/San Fernando Street intersection does not meet the Caltrans sight distance requirements for streets with 25 mph speed limits. However, vehicle speeds are much lower when completing turn-movements through an intersection. Therefore, vehicles turning onto northbound S. San Pedro Street from San Fernando Street would be traveling at speeds that allow them to slow down or stop if necessary at the sight of vehicles exiting the project driveways.

The driveways serving the project should be free and clear of obstructions, thereby ensuring that all exiting vehicles can see pedestrians on the sidewalk and vehicles travelling on S. San Pedro Street. Adequate sight distance (sight distance triangles) should be provided at each of the driveways in accordance with Caltrans standards. Sight distance triangles should be measured approximately 10 feet back from the travelled way. Appropriate visible and/or audible warning signals should be provided at the project driveways to alert pedestrians and bicyclists of vehicles exiting the parking garages.

There are three existing driveways that serve parking garages along the east side of San Pedro Street directly opposite the project site frontage. Project driveways along S. San Pedro Street should be aligned as close as possible with the opposing driveways serving the Market Post Tower building (55 South Market Street) and adjacent underground parking structure. The alignment of the proposed and existing opposing driveways would provide for a clear line of sight for drivers exiting and entering each driveway as well as reduce conflicting movements between the driveways. As proposed, the project and opposing driveways will be closely aligned and will allow drivers at each driveway with a clear line of sight of turn movements to and from the opposing driveway. Figure 6 indicates the project and opposing driveway locations along San Pedro Street.

The City's recommended relocation of the loading docks to Almaden Avenue will result in a reduction in the driveway cuts along the project frontage on San Pedro Street that would also further reduce the potential for conflicts near the project driveways.

Vehicular On-Site Circulation

The site plans provided to Hexagon show only the ground level of parking, including the driveways, garage entrances, and parking areas on the ground level floor. Analysis of circulation beyond the ground floor was not conducted due to limited information provided. The City's standard width for two-way drive aisles is 26 feet wide where 90-degree parking is provided. This allows sufficient room for vehicles to back out of parking spaces. According to the site plan, the drive aisles on the ground level were measured to be approximately 26 feet wide, satisfying the City requirements. Drive aisle widths on each level of parking must meet the City's design requirements.

On-site vehicle circulation was reviewed for the project in accordance with generally accepted traffic engineering standards. As proposed, vehicles would enter the parking area via one of two project driveways from S. San Pedro Street. These driveways appear to provide access to separate parking areas: the northern driveway (driver closer to the San Pedro Street/Post Street intersection) would provide access to the above ground-level parking while the southern driveway would provide access to the below ground-level parking. Circulation through the garages appears to be efficient with two-way rectangular circulation aisles within at least the first level of parking.

No dead end aisles are shown on the ground level. Should dead-end aisles exist on upper or lower levels, parking stalls within these dead-ends should be restricted to residents only and assigned parking should be implemented. With proper signage indicating the resident only parking restrictions, potential dead-end aisles and parking adjacent to walls would not be problematic.

With different access driveways, the above ground-level and below ground-level parking levels are not connected to each other and become two separate parking garages. Overall, the project should ensure that vehicles are provided with adequate turn radii in every level as well as adequate turn-around space in the highest and lowest parking levels. It is desirable that vehicles do not encounter dead-ends at the end of the garages, and that they do not have to make a three-point turn or reverse to change directions within the garage. Incorporating these recommendations into the design of the parking garages will allow for adequate access and circulation of vehicles within the parking garages.

Truck Access and Circulation

Proposed Truck Access

The project is proposing trash pick-up occur within one of the truck loading spaces along S. San Pedro Street. Trash bins or dumpsters should be placed within the loading area dock for garbage pick-up. As per the City of San Jose Downtown off-street loading requirements, the project should ensure that each enclosed trash area is well ventilated and has adequate drain and wash systems to accommodate anticipated waste.

Based on the City of San Jose off-street loading standard for developments in the Downtown Area, the project is required to provide three off-street loading spaces for the residential component and one off-street loading space for the retail component. The project, as shown in the provided site plan, has two planned off-street loading areas with access off South San Pedro Street. The project requires two additional loading

spaces to meet the City requirements. As per section 20.70.450 of the Downtown Zoning Regulations, the Planning Director may authorize the reduction of two on-site loading spaces to one on-site loading space in connection with the issuance of a development permit if the Director finds that sufficient on-street loading space exists to accommodate circulation and manipulation of freight. It is recommended that the project pursue this reduction in off-street loading spaces by providing at least two on-street loading spaces. It is recommended that at least one of these loading spaces be designated for the residential component and be located near the lobby on Almaden Avenue. The project should work with City Staff to ensure that all loading spaces provided meet City standards for height and width, and do not interfere with vehicular traffic on the street.

Truck turning paths for a smaller single-unit truck (WB30) and larger WB 40 truck were reviewed at the site truck docks. The review of truck turning paths indicates that the approximately 30 foot width of San Pedro Street will be adequate for WB 30 trucks to perform turn movements at the proposed project truck docks. The WB 40 may not be applicable to the project site given that it will not fit within the provided dock space. However, the review indicates that WB 40 trucks also would be able to complete turn maneuvers on San Pedro Street, but would need to run over the curb near the project truck dock driveway cut. The widening of driveways beyond the maximum 26 feet width is not consistent with General Plan and City goals. Figures 6 and 7 present the truck turning paths along San Pedro Street at the project loading docks.

City of San Jose Truck Access Recommendation

The proposed project truck loading areas along S. San Pedro Street would be located directly across from the loading areas across the street, which may cause issues with trucks attempting to enter the sites simultaneously, and may inhibit traffic flow along S. San Pedro Street.

The City has requested that the project move the project truck loading areas to the Almaden Avenue project frontage. This request would eliminate potential conflict between trucks accessing the proposed project loading area on S. San Pedro Street and the Market Post Tower loading area. The alternative loading locations would be required to meet the same standards for trash enclosures and pick-up, and off-street space requirements as described above. The relocation of these loading areas would likely require a relocation of the residential lobby. If possible, the project should seek to locate on-street loading spaces to be adjacent to the alternative lobby location.

Street width along Almaden Avenue along the project frontage would be approximately 40 feet should the sidewalk along the project frontage be widened 10 feet. Therefore, the trucks would be provided approximately 10 feet of additional turning width along Almaden Avenue than would be provided along S. San Pedro Street and would not need to contend with the landscape islands, should the truck docks be relocated as requested by the City.

Pedestrian and Bicycle Circulation and Transit Access

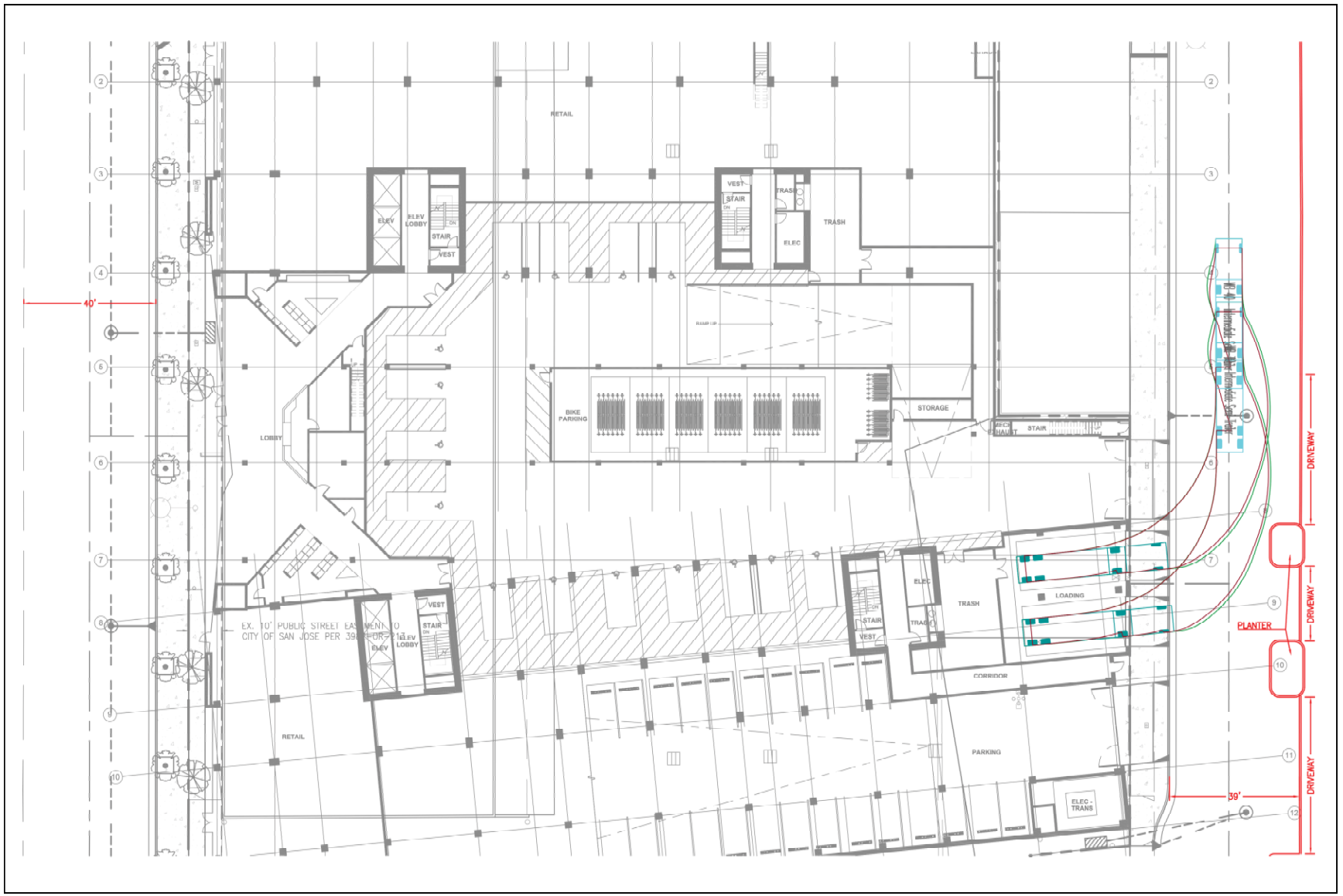
Pedestrian Access and Bicycle Circulation

Sidewalks are provided along each of the streets that bound the project site. Crosswalks are available at the adjacent unsignalized intersections of S. San Pedro Street/Post Street, S. San Pedro Street/San Fernando Street, and Almaden Avenue/San Fernando Street. Crosswalks at both of the San Fernando Street intersections consist of high visibility (typical continental crosswalk markings) crosswalks and include reflective signage along San Fernando Street. Field observations revealed that these pedestrian crossings along San Fernando Street are well respected by motorists and bicyclists travelling east and west along San Fernando Street and provide good pedestrian visibility and enhanced safety. Pedestrian crosswalks and signage do not exist across any legs of the Almaden Avenue/Post Street intersection.

The project will be conditioned to install crosswalks, with appropriate signage, on both approaches of Almaden Avenue at the Almaden Avenue/Post Street intersection. In order to provide crosswalks across the west approach (Post Street) of the intersection, stop control on both approaches of Almaden Avenue at the intersection will be required. The City will perform a stop warrant analysis at the Almaden Avenue/Post Street intersection to determine whether all-way stop control at the intersection is warranted. If warranted,

Figure 6
Truck Turning Paths (WB 30 Truck)

Figure 7
Truck Turning Paths (WB 40 Truck)



the project will be required to implement stop control on both approaches of Almaden Avenue at the intersection.

The project is proposing pedestrian improvements as part of its development. These improvements include Americans with Disabilities Act- (ADA) compliant accessible ramps at the southeast corner of the Almaden Avenue/Post Street intersection, and at the southwest corner of the S. San Pedro Street/Post Street intersection. The project also is proposing to widen the sidewalk along all three project frontages, including a 15-foot sidewalk along Almaden Avenue and approximately 12-foot sidewalks along Post Street and S. San Pedro Street. With the proposed project, the existing driveway along Post Street would be removed. These improvements to the pedestrian network, in addition to the above recommended improvement, would enhance the existing pedestrian network and increase pedestrian safety and comfort in the immediate vicinity to the site. Overall, the existing pedestrian facilities have good connectivity and provide adequate pedestrian access to surrounding areas and services, and would improve with the implementation of the proposed project improvements.

With the proposed project access driveway locations, all project traffic accessing the parking garages would do so via S. San Pedro Street. Pedestrians along the project frontage on S. San Pedro Street would be forced to cross two closely-spaced project driveways (in addition to two loading/truck driveways).

With the City's recommended relocation of the loading docks to Almaden Avenue, project access driveways would be located along two of the project frontages, reducing the number of driveways pedestrians would have to cross along a single project frontage. The Downtown Streetscape Master Plan (DSMP) provides design guidelines for existing and future development for the purpose of enhancing the pedestrian experience in the Greater Downtown area. Per the DSMP, both Almaden Avenue and San Pedro Street are designated Downtown Pedestrian Network Street (DPNS) which are intended to support a high level of pedestrian activity as well as retail and transit connections. The streets provide a seamless network throughout the downtown that is safe and comfortable for pedestrians and connects all major downtown destinations. Design features of a DPNS create an attractive and safe pedestrian environment to promote walking as the primary travel mode. The DSMP policies state that vehicles crossing the sidewalk are often a safety hazard for pedestrians and measures should be taken within the design for any new project to minimize the number of curb cuts and driveways. Providing project access along two of the project frontages as recommended by the City would reduce the amount of pedestrian and vehicle conflicts along the west side of S. San Pedro Street as encouraged by the DSMP policies.

The project site is well served by various existing bicycle facilities including Class II bicycle lanes along San Fernando Street south of the project site. Additionally, the Guadalupe River Park Trail, a Class I pedestrian and bicycle trail, is accessible via San Fernando Street and Santa Clara Street, less than a quarter mile from the project site. According to the San Jose Bike Plan 2020 Bikeway Network map, no additional bicycle facilities are planned in the study area.

Transit Facilities

The project is in close proximity to major transit services located along the surrounding roadways and would provide the opportunity for multi-modal travel to and from the project site. The nearby bicycle facilities along San Fernando Street provide access to major transit stations and provide for a balanced transportation system as outline in the Envision 2040 General Plan goals and policies.

Parking

Projects in the downtown area are located in close proximity to offices, recreation, and retail services, allowing individuals to satisfy their daily needs for work or shop near their place of residence. The availability of bicycle lanes and sidewalks throughout the downtown and the project's close proximity to major transit services will provide for and encourage the use of multi-modal travel options (bicycling and walking) and reduce the demand for on-site parking described below.

According to the City of San Jose Downtown Zoning Regulations, the project is required to provide one off-street parking space per residential unit. The project is not required to provide any parking for the retail use. Thus, the project is required to provide 785 off-street parking spaces. The project is proposing 736 off-street parking spaces, which is 49 spaces fewer than the requirement.

The proposed project would need to provide an additional 49 parking spaces to meet the Downtown parking requirements, or implement plans/programs that would reduce the amount of parking required to serve the proposed project.

Transportation Demand Management

To meet the Downtown parking requirements, the project should develop and implement a Transportation Demand Management (TDM) plan. Based on City Code 20.70.330.A, the project may receive up to a fifteen percent reduction in the number of spaces required at the discretion of the Planning Director. To receive this fifteen percent reduction the project must:

1. Have developed a TDM program that provides evidence that a TDM program will reduce parking demand and identifies the percentage of parking demand that will be reduced through the TDM program. The TDM program will incorporate one or more elements of TDM including, but not limited to, measures such as Ecopass, parking cash-out, alternate work schedules, ride sharing, transit, carpool/vanpools, shared parking, or any other reasonable measures; and
2. Demonstrate that it can maintain the TDM program for the life of the project and is reasonably certain that the parking shall continue to be provided and maintained at the same location for the services of the building or use for which such parking is required, during the life of the building or use.

A TDM plan, developed as part of this project, that will achieve at least a seven percent reduction in parking is required in order to meet Downtown parking requirements.

Bicycle Parking

Based on the projects downtown location, it is likely that residents of the proposed residential units will be able to work in close proximity to the site, or will be able to quickly access transit to reach their place of work. Therefore, the project is required to meet the City's Bicycle Parking requirements The City of San Jose Downtown Zoning Regulations require one bicycle parking space per four living units, and one bicycle parking space per 3,000 s.f. of retail. Based on these requirements, the project is required to provide 196 and 7 bicycle parking spaces for the residential and retail components of the proposed project, respectively. Bicycle parking spaces shall consist of at least sixty percent long-term and at most forty percent short-term spaces. Thus, the proposed project is required to provide a total of 203 bicycle parking spaces, including at least 122 long-term parking spaces. The site plan shows a long-term bicycle parking area within the ground level of the garage, but does not specify the number of bicycles that can be stored in this area. The project must meet the required bicycle parking set forth by the City. However, it is recommended that bicycle parking that exceeds the City's requirements be provided on-site to encourage the use of non-auto modes of travel.

Vehicular Queuing Analysis

Vehicle queues were estimated using TRAFFIX, which is based on the Highway Capacity Manual (HCM) 2000 methodology. The basis of the analysis is as follows: the estimated maximum queue length obtained from TRAFFIX is compared to the existing or planned available storage capacity for the movement. This analysis thus provides a basis for estimating future storage requirements at intersections. The results of the queue analysis are summarized in Table 3.

The queuing analysis shows that the southbound left-turn and westbound left-turn movements at one the intersection of Almaden Boulevard and San Fernando Street currently experience vehicular queue lengths that exceed the available storage capacity under existing conditions and would continue to do so under background conditions. The proposed project is projected to increase the queue for the southbound left-turn movement by 2-3 vehicles and the westbound left-turn movement by 2-4 vehicles during the peak hours.

The southbound left-turn pocket at the intersection of Almaden Boulevard and San Fernando Street could be extended an additional 150-200 feet. However, extending the existing southbound left-turn pocket would require partial removal of the landscaped center median.

Table 3
Queuing Analysis Summary

Scenario	Peak Hour	Projected Queue Length (Vehicles)																	
		Almaden Ave/Santa Clara St			Alamden Ave/Post St			Almaden Ave/San Fernando St		San Pedro St/Santa Clara St			San Pedro St/Post St			San Pedro St/San Fernando St		Alamden Blvd/San Fernando St	
		NB	SB	WBL	NB	SB	WB	SB	EBL	NB	SB	WBL	NB	SB	EB	SBL	EBL	SBL	WBL
Existing	AM	5	3	0	0	0	0	0	0	6	2	2	0	0	0	0	0	**9**	6
	PM	6	8	0	0	0	0	1	0	5	7	2	0	0	0	1	0	**8**	**16**
Existing + Project	AM	5	3	0	0	0	0	0	0	9	3	**3**	0	0	0	4	0	**11**	**9**
	PM	7	8	0	0	0	1	2	0	6	10	**3**	0	1	0	4	0	**11**	**18**
Background	AM	5	4	0	0	0	0	0	0	6	2	2	0	0	0	0	0	**9**	6
	PM	6	10	0	0	0	0	1	0	6	7	2	0	0	0	1	0	**9**	**17**
Background + Project	AM	5	4	0	0	0	0	0	0	9	3	**3**	0	0	0	4	0	**11**	**10**
	PM	6	11	0	0	0	1	2	0	7	10	**3**	0	1	0	4	0	**12**	**19**
Strategy 2000	AM	6	4	0	0	0	0	1	0	7	2	2	0	0	0	1	0	**14**	**8**
	PM	9	12	1	0	0	1	6	0	8	**12**	2	0	0	0	5	0	**14**	**28**
Available Storage																			
Existing & Background Storage (feet)		275	350	50	325	275	275	325	125	275	250	50	325	275	250	325	125	125	175
Existing & Background Storage (Vehicle)[1]		11	14	2	13	11	11	13	5	11	10	2	13	11	10	13	5	5	7

[1]Assumed 25 feet per vehicle.
Red numbers indicate movements for which projected queue lengths exceed available storage capacity.

Currently, the westbound left-turn queue at the intersection of Almaden Boulevard and San Fernando Street is projected to be 6 and 16 vehicles during the AM and PM peak hours, respectively. The westbound approach consists of a left-turn and a shared right-and-through lane (plus bike lane). The left-turn pocket is approximately 125 feet long, providing queue storage for approximately 5 vehicles. A 50-foot two-way left-turn (TWLT) lane connects the westbound left-turn lane with the eastbound left-turn lane at the upstream intersection of Almaden Avenue and San Fernando Street. It was observed that the westbound left-turn queue at Almaden Boulevard/San Fernando Street often extends out of the left-turn pocket blocking westbound through traffic along San Fernando Street or, on occasions, extends into the TWLT lane back to Almaden Avenue/San Fernando Street. Providing additional queue storage capacity for this movement is not feasible due to right-of-way constraints.

The project is projected to increase the westbound left-turn movement queue at the intersection of San Pedro Street/Santa Clara Street by one vehicle during both peak hours, exceeding the available queue storage capacity by one vehicle. It is not feasible to extend the westbound left-turn pocket at this intersection due to the back-to-back left-turning lanes with the Market Street/Santa Clara Street intersection.

The extension of turn-pockets to accommodate the projected queues at the above described intersections would require street widening along with narrowing of sidewalks and/or removal of bike lanes. The removal and/or alteration of improvements intended to encourage the use of multi-modal travel to accommodate vehicular demand is not consistent with General Plan goals. Therefore, the extension of turn-pockets at the intersections is not recommended. The projects close proximity to major transit services and pedestrian and bicycle facilities along San Fernando Street would provide for and encourage the use of multi-modal travel options and reduce the use of single-occupant automobile travel. It is expected that the auto trips ultimately generated by the project would be less than those estimated within this study and the identified operational deficiencies (queues at intersections) reduced as development and the planned enhancement of the multi-modal transportation system progresses within the downtown area.

All other study locations are projected to have adequate left-turn queue storage capacity to serve the proposed project.

Conclusions

The project as proposed would consist of up to 785 apartment units and 20,000 s.f. of retail space. Parking for the proposed project would be provided within a five-level parking garage with a total of 736 parking spaces. The project proposes that access to the parking garage be provided via two driveways along S. San Pedro Street (the project's eastern site boundary). Each driveway would have a gated entrance into the parking garage. The project also is proposing two additional driveways providing access to two off-street truck loading areas along S. San Pedro Street. The City of San Jose has requested that the project relocate the truck loading areas to Almaden Avenue (the project's western site boundary).

Since the project site is located in the Downtown Core area boundary, it is covered by the San Jose Downtown Strategy 2000 EIR. Accordingly, City staff has already concluded that the project is in conformance with the City of San Jose Transportation Level of Service Policy (Council Policy 5-3) and will not require preparation of a comprehensive Transportation Impact Analysis (TIA).

The project site was formerly occupied by the Greyhound Bus Station, which generated traffic throughout the day. Although traffic was previously accessing the project site, as a conservative approach, no trip credit was taken for the existing use on site. The project site also is located within the Downtown Growth Area which is characterized by mixed land uses and high-rise buildings that create opportunities for multi-modal travel and strong transit demand. In addition, the availability of bicycle lanes and sidewalks throughout downtown and the project's close proximity to major transit services will provide for and encourage the use of multi-modal travel options (bicycling and walking) and reduce the use of single-occupant automobile travel. Therefore, the estimates of trips to be generated by the proposed project as presented and evaluated within this study may represent an over-estimation of traffic and impacts associated with the proposed project. It is expected that the auto trips ultimately generated by the project would be less and the identified operational and parking issues reduced with the use of the multi-modal transportation system within the Downtown area.

A summary of the site access and circulation review along with recommended adjustments is provided below.

Recommendations

- Project driveway(s) along S. San Pedro Street should be aligned as close as possible with the opposing driveways serving the Market Post Tower building (55 South Market Street) and adjacent underground parking structure. The alignment of the proposed and existing opposing driveways would provide for a clear line of sight for drivers exiting and entering each driveway as well as reduce conflicting movements between the driveways.
- Installation of crosswalks, with appropriate signage, on both approaches of Almaden Avenue at the Almaden Avenue/Post Street intersection. In order to provide crosswalks across the west approach (Post Street) of the intersection, stop control on both approaches of Almaden Avenue at the intersection will be required. The City will perform a stop warrant analysis at the Almaden Avenue/Post Street intersection to determine whether all-way stop control at the intersection is warranted. If warranted, the project will be required to implement stop control on both approaches of Almaden Avenue at the intersection.
- The City recommends the relocation of one off-street loading dock driveway from San Pedro Street to Almaden Avenue and one on-street loading space on Almaden Avenue at the lobby entrance.
- Construct handicap ramp at the Post Street and Almaden Avenue intersection at the project frontage.
- The proposed garage entrance gates should be located a minimum of one car length back from the sidewalk (within the parking garage due to the zero setback requirements in the Downtown area) on S. San Pedro Street to be able to accommodate one entering vehicle at the garage entrance gates without blocking the sidewalk.
- Install appropriate visible and/or audible warning signs at the project driveways to alert pedestrians and bicyclists of vehicles exiting the garage.
- The project should implement the following:
    - Develop a TDM program to reduce parking demand. The TDM program will incorporate one or more elements of TDM including, but not limited to, measures such as Ecopass, parking cash-out, alternate work schedules, ride sharing, transit, carpool/vanpools, shared parking, or any other reasonable measures
    - Ensure that vehicles are provided with adequate turn radii in every level as well as adequate turn-around space in the highest and lowest parking levels.
    - Provide bicycle parking that exceeds the City's requirements be provided on-site to encourage the use of non-auto modes of travel