



Memorandum

To: Michelle Kimball, City of San Jose
From: Robert Del Rio, T.E.
Date: April 23, 2015
Subject: 45 N. San Pedro Traffic Operations Analysis

Introduction

Hexagon Transportation Consultants, Inc. has completed a traffic operations study for the proposed 45 N. San Pedro Street mixed-use development project in downtown San Jose, California. The project site is located between North San Pedro Street and North Almaden Avenue, just north of Santa Clara Street. The project as proposed would consist of up to 11,969 s.f. of retail space along with 201 residential units. The site is currently used as a surface parking lot. Figure 1 shows the project site location.

Since the project site is located in the Downtown Core area boundary, it is covered under 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 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 proposed driveway locations. Truck access, including trash pickup and loading activities, was evaluated. Parking and on-site vehicular circulation also was analyzed. Lastly, bicycle and pedestrian access and safety were evaluated.

Existing Conditions

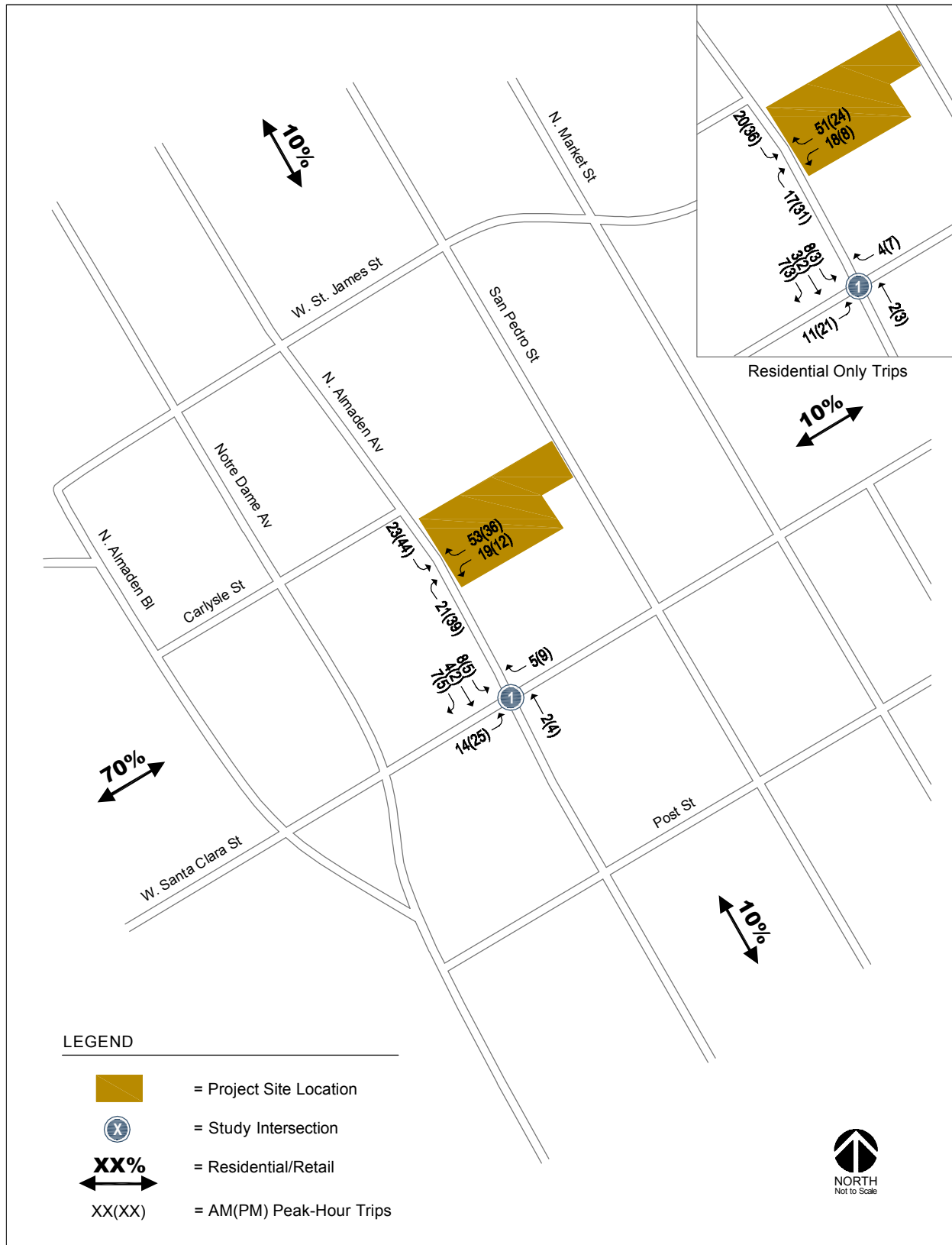
This section describes the existing conditions for all of the major transportation facilities in the vicinity of the site, including the roadway network, transit service, and bicycle and pedestrian facilities.

Existing Roadway Network

Regional access to the project site is provided by SR 87. Local site access is provided by North Market Street, North San Pedro Street, North Almaden Avenue, West St. James Street, West Santa Clara Street, and West St. John Street. All of the streets in the study area provide street parking, most of which is metered. The local roadways and SR 87 are described below.

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 and Santa Clara Street.

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



N. Market Street is a north-south, four-lane street that provides access to and from the site via W. St. John Street and W. Santa Clara Street. Market Street ultimately turns into Coleman Avenue to the north and First Street to the south.

N. San Pedro Street is a north-south two-lane street that serves as the eastern boundary of the project site. It begins at Bassett Street and extends south to where it terminates at San Fernando Street.

N. Almaden Avenue is a short north-south two-lane street that serves as the western boundary of the project site. North of Almaden Avenue extends between W. St. John Street and San Fernando Street. The sole project site entrance is located along Almaden Avenue.

W. St. John Street is an east-west two-lane street that extends between N. Almaden Boulevard and N. Eighteenth Street. W. St. John Street provides access to the site via Almaden Avenue.

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

Existing Bicycle and Pedestrian Facilities

Pedestrian facilities in the study area consist mostly of sidewalks along all of the surrounding streets. Crosswalks are located at all of the intersections in the area, and all signalized intersections in the area include pedestrian signal heads. Overall the existing sidewalks have good connectivity and provide pedestrians with safe routes to the surrounding land uses in the area. In addition, Bike Share and Zip Car locations are provided throughout the Downtown area. The nearest bike share and Zip car locations are located just north of the project site, within walking distance, at the intersections of San Pedro Street and St. John Street, and Market Street and St. John Street, respectively.

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. St. James Street and W. St. John Street just ¼ mile west of the project site.

None of the roadways in the immediate vicinity of the project site contain Class II bicycle facilities (striped bike lanes). However, within the larger study area, the following roadways contain bike lanes:

- Coleman Avenue, west of SR 87
- N. Almaden Boulevard, south of W. St. John Street
- San Fernando Street, between Bird Avenue and Tenth Street
- Third Street, between Jackson Street and I-280
- Santa Clara Street, between Stockton Avenue and SR 87

The City of San Jose has developed a public Bike Share system that allows users to rent and return bicycles at various popular locations. A bike share station currently exists on N. San Pedro Street at W. St. John 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 VTA, Caltrain, Altamont Commuter Express (ACE), and Amtrak. Figure 3 shows the existing transit facilities.

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.

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 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 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.

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 station is located approximately ¼ mile east of the project site. 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 92 weekday trains that carry approximately 47,000 riders on an average weekday. The project site is located about 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 commute hours.

Altamont Commuter Express Service

The Altamont Commuter Express (ACE) provides commuter passenger train service across the Altamont between Stockton and San Jose during the weekdays. ACE stops at the San Jose Diridon station four times during both the morning and evening commute hours.

Figure 2
Existing Bicycle Facilities and Zip Car Locations

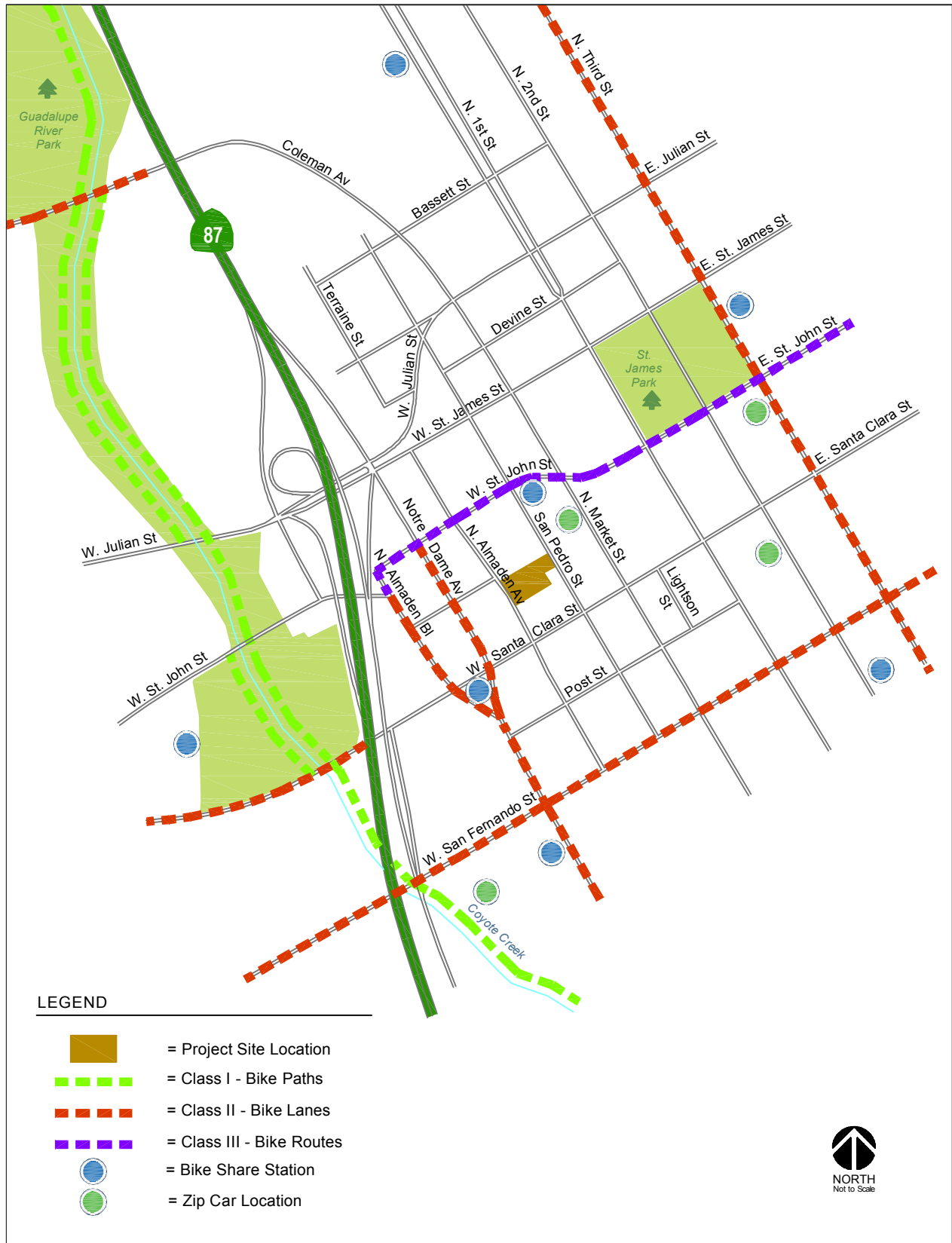
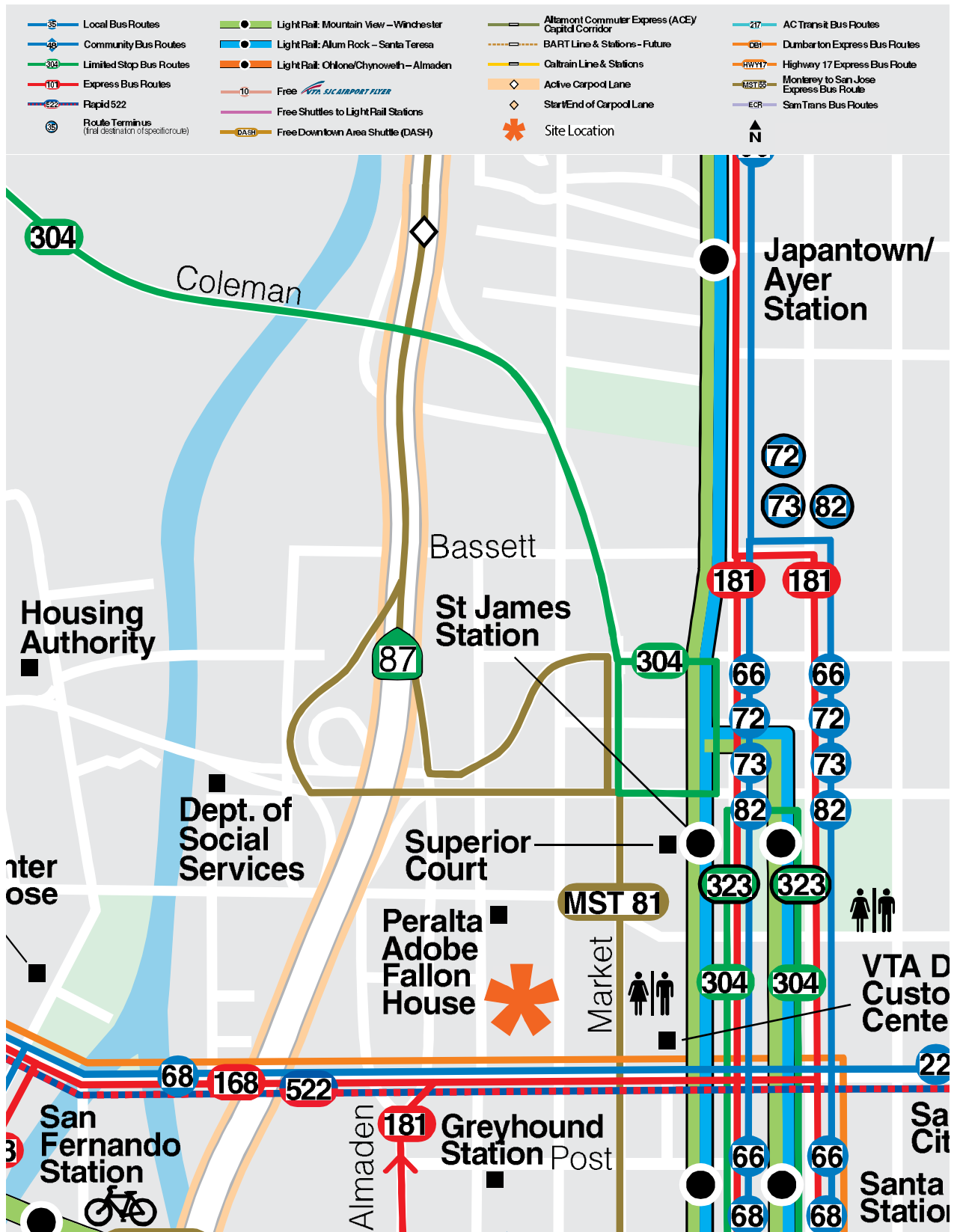


Figure 3
Existing Transit Facilities



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 proposed mix of land uses were applied and are described below.

VTA Trip Reductions

A mixed-use development with complementary land uses such as residential and retail will generate and attract trips internally between the uses. 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. A 25 percent trip reduction was applied to the development 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, since the project site is located within 2,000 feet of an LRT station (Santa Clara Station), the total number of trips generated by the residential component of the project can be reduced by up to 9 percent, per VTA guidelines. Since the project will be located in the heart of downtown San Jose, it is very likely that the project would generate fewer vehicle trips.

Net Project Trips

The trip generation estimates for the proposed project are shown in Table 2. After applying the appropriate trip generation rates and trip reductions, the project would generate 1,457 new daily vehicle trips, with 116 new trips occurring during the AM peak hour and 131 new trips occurring during the PM peak hour. Using the inbound/outbound splits recommended by the ITE, the project would produce 44 inbound and 72 outbound trips during the AM peak, and 83 inbound and 48 outbound trips during the PM peak.

Project Trip Distribution and Trip Assignment

The trip distribution pattern for the residential component of the project was based on previous traffic studies prepared for similar projects in downtown San Jose. Since the retail component of the project would serve mostly the local community, the retail trip distribution pattern was developed accordingly. The project trips were assigned to the roadway network based on the proposed project driveway locations and access, existing travel patterns in the area, freeway access, and the relative locations of complementary land uses. The project trip distribution patterns and trip assignment are shown on Figure 1.

Vehicular Site Access and Circulation

The site access and circulation analysis is based on the April 17, 2015 site plan prepared by Steinberg. The ground level site plan is shown on Figure 4. As proposed, the full access driveway on N. Almaden Avenue will provide access to a four-level parking garage that includes two below grade parking levels. The garage will include a total of 273 parking spaces for automobiles, 54 parking spaces for motorcycles, and 54 parking spaces for bicycles.

Table 2
Project Trip Generation Estimates

Land Use	Size	Daily Trip Rate	Daily Trips	AM Peak Hour						PM Peak Hour					
				Pk-Hr Factor	Splits		Trips			Pk-Hr Factor	Splits		Trips		
					In	Out	In	Out	Total		In	Out	In	Out	Total
Proposed Land Uses															
Residential															
Apartments	201 units	6.0	1,206	10.0%	35%	65%	42	79	121	10.0%	65%	35%	79	42	121
Internalization Reduction (25%)							-1	-3	-4				-5	-6	-11
Housing near LRT or Caltrain Station (9%) ^a			-109				-4	-7	-11				-7	-4	-11
Sub-Total Residential			1,097				37	69	106				67	32	99
Retail															
Retail	11,969 s.f.	40.0	479	3.0%	70%	30%	10	4	14	9.0%	50%	50%	22	21	43
Internalization Reduction (25%)			-120				-3	-1	-4				-6	-5	-11
Sub-Total Retail			359				7	3	10				16	16	32
Net Project Trips			1,457				44	72	116				83	48	131

Source: Based on "Apartments" rates contained in the San Jose TIA Handbook, August 2009.
^aBased on transit trip reduction as recommended by VTA TIA Guidelines (adopted March 2009)

Project Driveway

The project driveway is shown to be 26 feet wide. According to the City of San Jose *Residential Design Guidelines*, standard driveways and entry drives with two-way traffic should be at least 20 feet wide for residential developments. Therefore, the proposed width of the project driveway would be adequate to serve the project.

The site plan shows the entrance to the parking garage would be located approximately 50 feet from the face of curb on N. Almaden Avenue. The City typically requires a minimum distance of 50 feet in order to provide adequate stacking space for at least two inbound vehicles.

It is assumed that the project parking garage will be restricted to the use of residents only. Patrons of the retail space on the project site would utilize surrounding public street parking and parking garages. The project-generated trips that will occur at this driveway are 37 inbound trips and 69 outbound trips during the AM peak hour, and 67 inbound trips and 32 outbound trips during the PM peak hour. Vehicle queuing issues are not expected to occur at this driveway based on the relatively low number of project trips at the driveway and minimal traffic volume on Almaden Avenue.

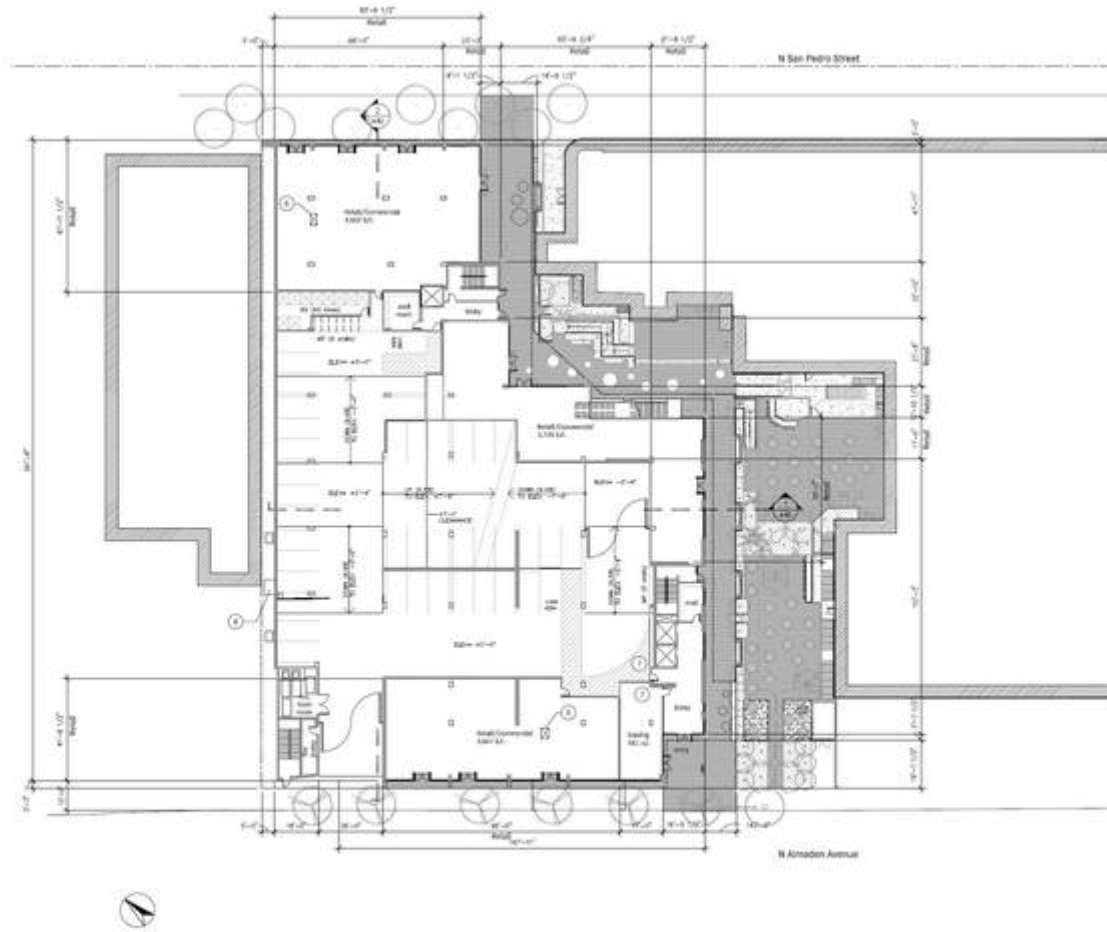
Sight Distance at the Driveway Serving the Project

Based on the site plan provided, the driveway serving the project would be free and clear of obstructions, thereby ensuring that exiting vehicles can see pedestrians on the sidewalk and vehicles traveling on N. Almaden Avenue. Adequate sight distance (sight distance triangles) should be provided at the driveway in accordance with Caltrans standards. Sight distance triangles should be measured approximately 10 feet back from the traveled way. Appropriate visible and/or audible warning signals should be provided at the project driveway to alert pedestrians and bicyclists of vehicles exiting the garage.

Providing the 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 driveway on N. Almaden Avenue, which has a posted speed limit of 25 mph, the Caltrans stopping sight distance is 200 feet (based on a design speed of 30 mph). Thus, a driver must be able to see 200 feet down N. Almaden Avenue in order to stop and avoid a collision.

Based on the project site plan, it can be concluded that the project driveway would meet the Caltrans sight distance standards.

Figure 4
Ground Level Site Plan



- NOTES:
- ① OUTLINE OF LEVEL ABOVE
 - ② 1x TANDEN PARKING SPACE
 - ③ MP+ MOTOR CYCLE PARKING
 - ④ FIRE PERSON ACCESS PAD
 - ⑤ BS+BIKE STORAGE
 - ⑥ COMMERCIAL EXHAUST SHAFT
 - ⑦ FIRE DEPARTMENT COMPLEX WHP. LOCATION TO BE DETERMINED.

Level 1 (STREET LEVEL)

Scale: 1"=20'-0" 04/13/2015



Modera Mixed-Use Building
 San Jose, California
 MILL CREEK RESIDENTIAL

FLOOR PLAN / A22

Vehicular On-Site Circulation

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 each level measure 26 feet wide. The drive aisles would meet the City's standard.

On-site vehicular circulation was reviewed for the project in accordance with generally accepted traffic engineering standards. Circulation through each of the levels of the parking garage will not be continuous due to dead-end drive aisles near San Pedro Street and Almaden Avenue. Circulation through the street level and second level of the parking garage will not be possible without proceeding up to the second level from street level or down from the second level. Otherwise, drivers will be forced to back out of the two dead-end aisles on each level. In addition, vehicles will need to back down drive aisles when existing parking stalls located adjacent to garage walls on each of the parking levels. If the use of the parking garage is restricted to residents only and assigned parking is implemented, the dead-end drive aisles and parking adjacent to walls would not be problematic.

Pedestrian Access and Circulation

Sidewalks are provided along both San Pedro Street and Almaden Avenue. The sidewalks would provide access to the proposed retail uses along N. San Pedro Street, as well as various points of entry for residents on N. Almaden Avenue.

According to the San Jose Bike Plan 2020 Bikeway Network map, no additional bicycle facilities are planned in the study area.

Truck Access and Circulation

Though not specified on the site plan, it is presumed that all garbage trucks and large delivery vehicles will perform their operations outside of the building at the curb, which is common for this type of mixed-use development. Figure 4 shows a trash enclosure on-site. Although the trash staging areas are not shown on the site plan, it is assumed that trash bins will be wheeled out to N. Almaden Avenue for garbage truck pickup. However, this will need to be verified.

The City of San Jose should consider adding standard loading zones on N. Almaden Avenue for general deliveries, such as FedEx or UPS trucks.

Parking

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 additional off-street parking for the retail component of the project. Based on these parking ratios, the project is required to provide a total of 201 off-street parking spaces.

The project proposes a total of 273 on-site parking stalls: 41 ground level spaces, 52 spaces on upper level 2, 99 spaces on basement level A, and 81 spaces on basement level B. In addition, the project proposes a total of 54 motorcycle parking stalls: 22 spaces on basement level A, 15 spaces on basement level B, 6 spaces on ground level, and 11 spaces on upper level 2. Furthermore, public street parking is available along the project frontages on N. Almaden Avenue and N. San Pedro Street and within the public parking garage along San Pedro Street directly across from the project site. Thus, an adequate amount of parking would be provided.

The site plan does not show parking stall dimensions. The City of San Jose off-street parking design standard for uniform car spaces is 8.5 feet wide x 17 feet long where a standard 26-foot wide two-way drive aisle is provided. As previously described, all of the drive aisles on-site are measured 26 feet wide. Thus, it is recommended that the project applicant coordinate with City staff to determine if the proposed parking stall dimensions and drive aisle widths will be adequate to serve the project.

Tandem parking is being proposed on all of the parking levels with the exception of street level. In order to guarantee effective use of the tandem parking spaces, all of the tandem spaces should be assigned parking. If assigned, the tandem spaces would not be expected to create any parking related issues. In the City of San Jose, the Planning Director may issue a development permit to allow tandem parking spaces to satisfy up to 50 percent of the off-street parking requirement for a project.

Bicycle Parking

The project proposes 54 long-term bicycle parking spaces on the ground floor level. The bicycle spaces are located on the east side of the building near San Pedro Street.

Vehicular Queuing Analysis

Vehicle queues were estimated using TRAFFIX, which is based on the 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.

Table 3
Queuing Analysis Summary

Scenario	Peak Hour	Projected Queue Length (Vehicles)			
		Almaden Ave/Santa Clara			
		NBL	SBL	EBL	WBL
Existing	AM	3	2	6	0
	PM	5	6	8	0
ExistingProject Plus Project	AM	3	3	6	0
	PM	5	6	9	0
Background	AM	3	2	7	0
	PM	4	8	11	0
Background Plus Project	AM	3	3	7	0
	PM	5	9	11	0
Strategy 2000	AM	4	2	9	0
	PM	7	9	14	0
Available Storage					
Existing & Background Storage (feet)		275	350	50	50
Existing & Background Storage (Vehicle) ¹		11	14	2	2
¹ Assumed 25 feet per vehicle. Red numbers indicate movements for which projected queue lengths exceed available storage capacity.					

The queuing analysis indicates that the eastbound left-turn movement at Almaden Avenue and Santa Clara Street intersection currently does not have adequate queue storage capacity to serve the existing queue lengths during the peak hours. The addition of project traffic would increase the projected maximum queue lengths at the study locations by at most one vehicle.

Conclusions

Overall, the site plan shows adequate site access and on-site circulation. Below are recommendations resulting from the site plan review.

Recommendations

- Appropriate visible and/or audible warning signals should be provided at the project driveway to alert pedestrians and bicyclists of vehicles exiting the garage.
- The City of San Jose should consider adding standard loading zones on N. Almaden Avenue adjacent for general deliveries, such as FedEx or UPS trucks.
- The project applicant should coordinate with City staff to determine the parking stall dimensions and drive aisle widths that will be necessary to serve the project.
- In order to guarantee effective use of the tandem parking spaces and circulation with the parking garage, the garage use should be restricted to residents only with assigned parking.