



Memorandum

Date: April 25, 2022

To: Ms. Amber Sharpe, David J. Powers & Associates, Inc.

From: Kai-Ling Kuo, Jocelyn Lee

Subject: Transportation Study for Affordable Housing Development at 1601 Civic Center Drive in Santa Clara, California

This memorandum presents trip generation estimates and evaluates site access, on-site circulation, and effects on pedestrians, bicycles, and transit facilities for the proposed affordable housing development at 1601 Civic Center Drive in Santa Clara, California. The project site is located on the northwest corner of the Lincoln Street and Civic Center Drive intersection. The project proposes to demolish the existing commercial building on-site and construct a five-story residential development with 108 affordable units. Vehicle access to the site would be provided via a driveway on Civic Center Drive and a driveway on Lincoln Street. The Civic Center driveway would provide access to the on-site surface lot, and the Lincoln Street driveway would provide access to the garage parking (see Figure 1).

Project Trip Estimates

Through empirical research, data have been collected that show trip generation rates for many types of land uses. The research is compiled in the ITE *Trip Generation Manual, 11th Edition*. 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 rates published for “Mid-Rise Multifamily Housing” (Land Use Code 221) were used to estimate the trips generated by the proposed affordable housing development (see Table 1). The mid-rise multifamily housing category refers to apartments and condominiums located in a building that has between four to 10 floors of living space.

The ITE *Trip Generation Manual* provides rates for Affordable Housing (Land Use 223). However, the rates are based on only five studies. Thus, the multifamily housing (mid-rise) category provides a more accurate estimate for the project.

Per the Santa Clara Valley Transportation Authority (VTA) Transportation Impact Analysis Guidelines, housing projects located within 2,000 feet of a major bus stop can apply a two percent trip reduction to the trip generation. A major bus stop is defined as a stop where six or more buses per hour from the same or different routes stop during the peak period. The project is located within 2,000 feet of the bus stops along El Camino Real for VTA Routes 22 and 522, which both have a headway of 15 minutes during peak periods.

Based on the ITE trip generation rates and transit trip reduction, it is estimated that the proposed project would generate 480 daily trips, with 39 trips (9 in and 30 out) occurring during the AM peak hour and 41 trips (25 in and 16 out) occurring during the PM peak hour (see Table 1). The existing commercial building has been vacant since 2017, and therefore, no trip credit was given for the existing building on-site.



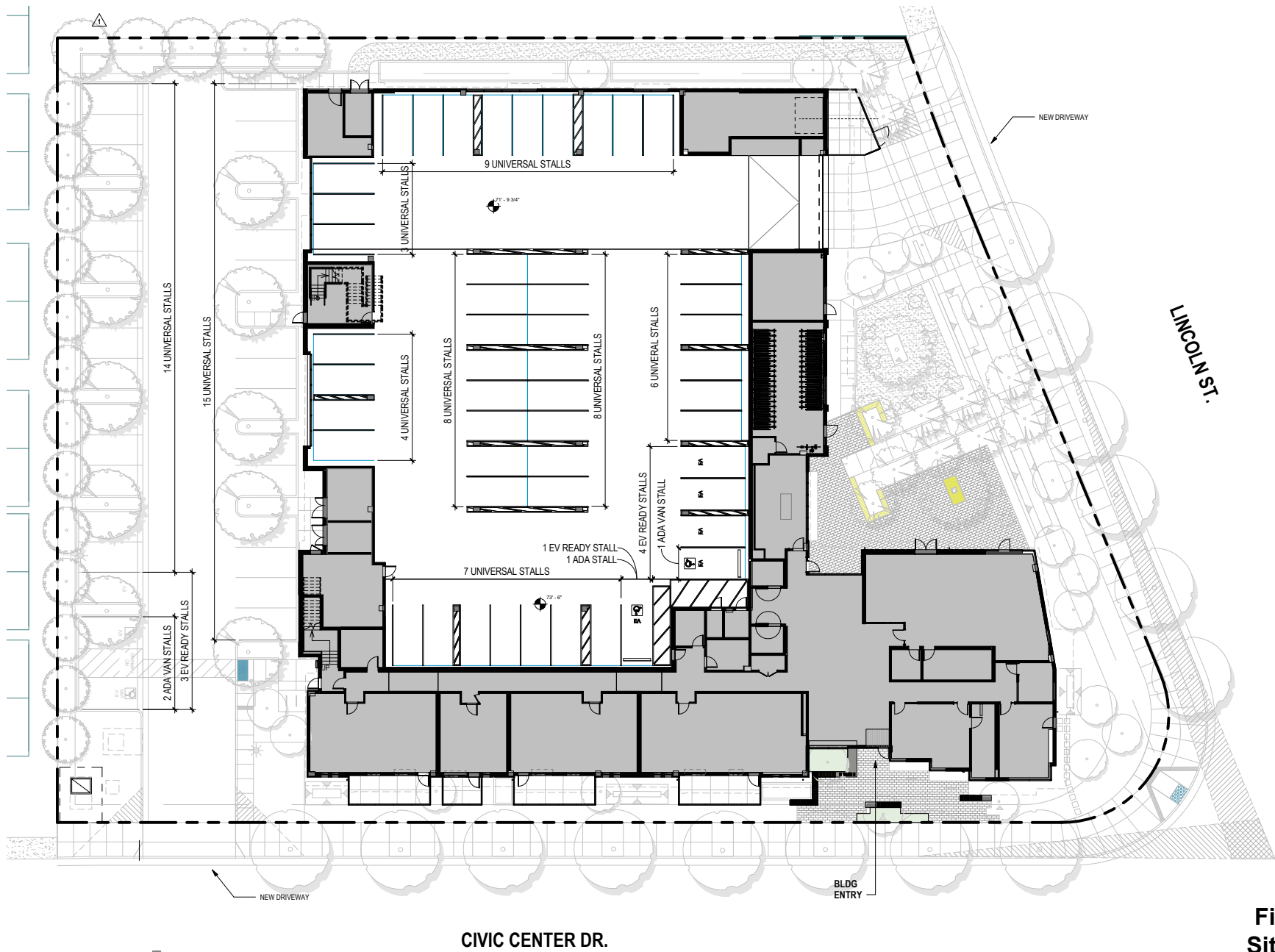


Figure 1
Site Plan

Table 1
Project Trip Generation

Land Use	Size	Daily		AM Peak Hour			PM Peak Hour				
		Trip Rate	Trips	Pk-Hr Rate	Trips		Pk-Hr Rate	Trips			
					In	Out	Total		In	Out	Total
Proposed Apartments ¹	108 du	4.54	490	0.37	9	31	40	0.39	26	16	42
- Transit Reduction (2%) ²			-10		0	-1	-1		-1	0	-1
Net Project Trips			480		9	30	39		25	16	41

Source: ITE *Trip Generation Manual*, 11th Edition, 2021.

1. Average ITE trip rates for Mid-Rise Multifamily Housing (Land Use 221) are used.

2. Per VTA TIA Guidelines, a transit trip reduction is applied to the project that is within 2,000 feet of a major bus stop.

Site Access and Circulation

A review of the project site plan was performed to determine if adequate site access and on-site circulation would be provided and to identify any access or circulation issues that should be improved. This review is based on the site plan, dated April 8, 2022 (see Figure 1) and in accordance with generally accepted traffic engineering standards.

Site Access

Vehicle access to the site would be provided via two new full access driveways on Civic Center Drive and Lincoln Street. The project would close the existing driveway on Civic Center Drive and create a new driveway approximately 175 feet west of the existing driveway. The project would add a new driveway on Lincoln Street. The driveway on Civic Center Drive would provide access to the surface parking lot, and the driveway on Lincoln Street would provide access to the parking garage.

The project would increase the number of driveways accessing the site from one to two driveways. Because the project would generate a low number of project trips, it is not necessary to provide two access points to the site for access and circulation. Increasing the access points would increase the conflicts between pedestrians/bicycles and vehicles. Therefore, the project should maintain only one driveway to access the site.

Recommendation: The project should provide only one driveway to access the site.

Driveway Design

The project driveways would provide two-way flow and would be 26 feet wide. According to the City of Santa Clara Municipal Code, Chapter 18.74 (Parking Regulations), two-way driveways providing access to 25 or more residential parking spaces should be at least 26 feet wide. The project driveways meet the requirement.

The Civic Center driveway shows approximately 30 feet of vehicle stacking space between the sidewalk and the first 90-degree parking stall, which would provide room for one inbound vehicle when vehicles back out of these parking stalls near the driveway. The Lincoln Street driveway shows approximately 65 feet of vehicle stacking space between the sidewalk and the first 90-degree parking stall, which would provide room for two inbound vehicles. Due to the low volume of project trips and the small number of on-site parking spaces, the probability of two or more inbound vehicles entering the

parking garage at the same time would likely be low. Therefore, the inbound stacking space at the driveways is expected to be adequate.

Sight Distance at Project Driveways

The proposed driveway locations were evaluated to determine if the sight distance at the driveways would be adequate. Adequate sight distance reduces the likelihood of a collision at driveways and provides drivers with the ability to locate sufficient gaps in traffic to exit a driveway. Sight distance of a driveway is evaluated based on the stopping sight distance recommended by Caltrans for a given design speed.

The landscape plan shows street trees would be added along the project frontage on Civic Center Drive and Lincoln Street. The type and location of the new street trees would be determined by the City at the implementation stage. Note that street trees have a high canopy and would not obstruct the view of drivers exiting the project driveways.

The posted speed limit on Civic Center Drive and Lincoln Street is 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 in both directions of Civic Center Drive and Lincoln Street to locate a sufficient gap to turn out of the driveways.

There is a roadway curve on Civic Center Drive, approximately 250 feet west of the driveway, and on Lincoln Street, approximately 190 feet north of the driveway. However, there would be adequate sight distance for identifying vehicles turning around the curve. The proposed Civic Center driveway is located approximately 305 feet west of the Lincoln Street/Civic Center Drive intersection. Therefore, the sight distance would be adequate for vehicles turning from Lincoln Street and continuing westbound along Civic Center Drive. The Lincoln Street driveway is located approximately 220 feet north of the Lincoln Street/Civic Center Drive intersection. Therefore, the sight distance would be adequate for vehicles turning from Civic Center Drive and continuing northbound along Lincoln Street.

On-street parking is allowed on Civic Center Drive and Lincoln Street near the proposed project driveways and could obstruct the vision of exiting drivers if there were cars parked next to the driveways. Therefore, the project should provide at least 15 feet of red curb along both sides of the driveways to prohibit parking.

Recommendation: The curb segments next to the project driveways on Civic Center Drive should be painted red for 15 feet to prohibit parking and ensure adequate sight distance for outbound traffic.

Traffic Operations at Project Driveways

The project trips that are estimated to occur at the driveways are 9 inbound trips and 30 outbound trips in the AM peak hour and 25 inbound trips and 16 outbound trips during the PM peak hour.

Due to the relatively low number of project-generated trips at the driveways, operational issues related to vehicle queueing and/or vehicle delay are not expected to occur at the driveway. Some minor vehicle queueing could occur along eastbound Civic Center Drive, northbound Lincoln Street, and on-site due to a combination of the inherent unpredictability of vehicle arrivals at the driveway and the random occurrence of gaps in traffic along the streets. Based on the proposed parking spaces in the surface lot and parking garage, there would be more vehicles accessing the Lincoln Street driveway than the Civic Center driveway.

At the Lincoln Street driveway, the estimated 15 inbound trips during the PM peak hour calculate to about one trip every 4 minutes, and 18 outbound trips in the AM peak hour calculate to about one trip every 3 minutes. Therefore, the probability of two or more inbound and outbound vehicles entering and

exiting the driveways at the same time would be low. The maximum queue is not expected to affect eastbound traffic on Civic Center Drive, northbound traffic on Lincoln Street, or on-site circulation.

Passenger Loading

The site plan does not show any loading zones for dropping off and picking up passengers along the project frontages or within the site, which would be inconvenient for people accessing the site using Uber/Lyft or other rideshare apps (e.g., Scoop, Waze Carpool). It is expected that vehicles would drop passengers off along Civic Center Drive, Lincoln Street, or within the surface parking lot or parking garage. Because parking is available along Civic Center Drive along the project frontage, the project should designate space as the pedestrian loading zone on Civic Center Drive near the entrance to the building lobby or designate a loading zone within the surface lot or parking garage near the building entrance.

Recommendation: The project should provide a passenger loading zone on Civic Center Drive near the entrance to the building lobby or within the surface parking lot or parking garage.

On-Site Circulation

The Civic Center driveway would provide access to the surface lot, and the Lincoln Street driveway would provide access to the adjacent parking garage. There would be no internal connection between the surface parking lot and parking garage, which is undesirable for on-site circulation because residents can enter the site and upon discovering that there is no available parking, must exit the site to check the other parking area. The project should provide internal circulation between the parking lot and parking garage.

The project would provide 90-degree parking throughout the site. All drive aisles are shown on the site plan to be 26 feet wide. The parking stalls measure 8.5 feet wide and 17 feet long for uniform stalls and 9 feet wide and 18 feet long for accessible and electric vehicle stalls. According to the City of Santa Clara Municipal Code, Chapter 18.74, off-street parking facilities may be designed with 100% uniform-size stalls, measuring 8.5 feet wide and 17 feet long. For parking facilities using the uniform stall dimensions, the minimum drive aisle width should be 24 feet. Therefore, the proposed parking stalls would meet the requirement. The proposed drive aisle width, in combination with the parking dimensions, would provide sufficient room for vehicles to back out of the 90-degree parking stalls.

On-site vehicle circulation was also evaluated to identify whether there are dead-end aisles within the surface lot and parking garage. 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. The surface lot would be a dead-end aisle. Because of the length of the lot, it would be very difficult to back out. The project should provide a turnaround space at the dead-end aisle to provide adequate circulation.

Recommendation: The project should provide a turnaround space at the dead-end aisle in the surface parking lot to provide adequate circulation. The project should provide internal circulation between the parking lot and parking garage.

Emergency Vehicle and Truck Access and Circulation

Emergency vehicles would access the project site from Lincoln Street, Civic Center Drive, and the surface parking lot drive aisle via the driveway on Civic Center Drive. The project would provide adequate emergency access because the project buildings would be within the hose reach by fire trucks on Lincoln Street and Civic Center Drive, or in the surface parking lot drive aisle.

The project would provide a ground floor trash room along the northeast edge of the building with a staging area and a dedicated path for trash maneuvering along the north side of the Lincoln Street

driveway. The trash collection would occur at the curb along Lincoln Street. Garbage trucks would stop on Lincoln Street and workers would roll the bins from the staging area via the path and return the bins to the staging area after they are serviced.

Effects on Pedestrians, Bicycles, and Transit Facilities

The following describes the existing and future transit, pedestrian and bicycle facilities that serve the site and evaluates whether appropriate bicycle and pedestrian access and transit service are provided between the site and nearby destinations.

Pedestrian Facilities

Pedestrian facilities in the study area consist of sidewalks and crosswalks. A continuous network of sidewalks is present along all of the surrounding streets. Crosswalks with pedestrian signal heads are located at all of the signalized intersections in the area. A high visibility crosswalk and a standard crosswalk are available along the north leg and west leg, respectively, of the Lincoln Street/Civic Center Drive intersection.

The project would add a new driveway on Lincoln Street and increase the number of driveways accessing the site from one to two driveways, which would increase the conflicts between pedestrians/bicycles and vehicles on Lincoln Street. As discussed above, the project should maintain only one driveway to access the site.

The project would construct new 10-foot-wide sidewalks along the project frontages on Lincoln Street and Civic Center Drive. With the new sidewalks, the project should ensure that the curb ramp at the northwest corner of the Lincoln Street/Civic Center Drive intersection is built to ADA standards. The sidewalks and ADA curb ramp would facilitate pedestrian movements between the project site and surrounding points of interest, such as bus stops. In addition to new sidewalks along the project frontages, the project would also construct a publicly accessible forecourt with pedestrian walkways from Lincoln Street.

Within the site, pedestrian paths would be provided between sidewalks on the adjacent streets, the surface parking lot, and the proposed building. Therefore, pedestrian access to all proposed facilities within the project site would be provided.

Recommendation: With the new sidewalks along the project frontages, the project should ensure that the curb ramp at the northwest corner of the Lincoln Street/Civic Center Drive intersection is built to ADA standards.

Bicycle Facilities

There are bike lanes on Warburton Avenue and Monroe Street that connect cyclists from the project site to the surrounding areas. According to the *Santa Clara Bicycle Master Plan Update 2018*, Class II bike lanes are recommended along Lincoln Street between Warburton Avenue and El Camino Real and along Scott Boulevard for the entire street. A Class III bicycle boulevard is recommended along Lincoln Street south of El Camino Real. Class IV separated bike lanes are recommended along El Camino Real for the entire street.

The project would provide secure bicycle storage in a bike room on the ground level in the east edge of the building. The bike room would be accessed using the pedestrian walkway from Lincoln Street. The project would also provide bike racks in the surface parking lot next to the back entrance of the building. Because the main entrance of the building is facing Civic Center Drive, the project should provide some bike racks near the main entrance.

It is expected that the project would generate some bicycle trips, which could utilize the existing bike lanes on surrounding streets to get to nearby commercial areas. According to the *Bicycle Master Plan Update 2018*, the proportion of Santa Clara residents that bicycle to work is about two percent, which equates to one new bicycle trip during the AM and PM peak hours for the project.

Recommendation: The project should provide bike racks near the main entrance on Civic Center Drive.

Transit Services

A bus stop for the VTA Frequent Route 22 is located 635 feet from the project site on El Camino Real at Lincoln Street. Other routes with bus stops less than 2,000 feet from the project site include Local Routes 21 and 59 and Rapid Route 522. Due to the proximity of bus stops to the project site, it is assumed that some residents of the project would utilize the existing transit services. Assuming a commute hour transit mode share of two percent (as recommended by VTA guidelines), the project would generate one new transit rider during the peak hours. Therefore, it is anticipated that the new ridership could be accommodated by the existing transit services.

Pedestrian and Bicycle Access to Schools

The project site is located within the boundary of Scott Lane Elementary School, Buchser Middle School, and Santa Clara High School, which are about 0.7-mile north, 1.3-miles southeast, and 2.1 miles southwest of the project site, respectively. Scott Lane Elementary School is within walking distance. Elementary students choosing to walk to the school could use Civic Center Drive, Warburton Avenue, and Scott Boulevard. Safe and direct pedestrian access to the school is provided via a continuous network of sidewalks with crosswalks provided at all signalized intersections. Some high school students may bike to the school via Lincoln Street and Benton Street. Although there are bike lanes on Benton Street, Lincoln Street is not a bike route and has no bike lanes. Therefore, most students are expected to be driven or drive to the schools.

Conclusions

The site plan shows adequate site access and on-site circulation, and no significant on-site circulation issues are expected to occur as a result of the project. The project would not have an adverse effect on the existing pedestrian, bicycle, or transit facilities in the study area.

Hexagon has the following recommendations resulting from the site access and circulation evaluation.

- The project should provide only one driveway to access the site.
- The project should provide a passenger loading zone on Civic Center Drive near the entrance to the building lobby or within the surface parking lot or parking garage.
- The project should provide internal circulation between the parking lot and parking garage.
- The project should provide a turnaround space at the dead-end aisle in the surface parking lot to provide adequate circulation.
- The project should ensure that the curb ramp at the northwest corner of the Lincoln Street/Civic Center Drive intersection is built to ADA standards.
- The project should provide bike racks near the main entrance on Civic Center Drive.