ABC Engineering

Technical Memorandum

To:
From:
Date: Month Day, Year
Re: Corporate Campus – Transportation Study Addendum

ABC Engineering completed a Tier 4, Level III Transportation Impact Study of the proposed Corporate Campus development in Month of Year. Since the completion of that study, updates to the proposed site plan have been completed, including a change in the land use expectations. This memorandum addresses the changes to the site plan and whether they impact the results and recommendations of the full TIS. This memorandum is based the most recent site plan, dated Month Day, Year.

Changes to Site Plan

Based on comments from the City (and other agencies), information from the original Transportation Impact Study, and input from others, the developer changed the site plan as follows:

- Added a fast food restaurant to the land use mix, including a drive-thru window.
- Reduced the overall parking in the area by about 600 stalls, from 3,342 to 2,784 spaces.
- Identified the location of 78 bicycle parking spots.
- Begin discussions with CU Transit Services and identified the location of two potential bus stops.
- Revised the Avenue A extension sidewalk to a wider, multi-use trail.
- Identified the location of an outdoor bicycle maintenance station.
- Revised the office layout to include locker rooms, long-term bicycle parking, and an indoor bicycle maintenance station.
- Provided heavy truck movements for internal movements around the proposed site as well as to/from the docking areas.

In addition to the location of the underground parking access, several other changes to the site have been made. Table 1 lists a summary comparison of the changes from the site plan used in the original Transportation Impact Study to the current site plan.

Table 1 – Summary of Primary Site Plan Changes

Component	Site Plan from Trans. Impact Study	Current Site Plan
Total Building Square Footage	693,000	695,500
Total Parking Spaces	3,342	2,784
Total Bicycle Parking	Not Identified	78

Internal Bus Stops	N/A	2

Trip Generation Analysis

The decrease in apartment units will result in a decreased number of vehicle trips generated by the site and therefore in lower traffic volumes on the roadways. To understand the changes in trip generation for the site, a trip generation comparison was done. Table 2 shows those results for the weekday periods.

Table 2 – Weekday Trip Generation

Land Use Code – Source[1]	Description & Size	Weekday Daily		Weekday PM Peak Hour		Saturday Peak Hour	
		In	Out	In	Out	In	Out
710 - ITE	General Office (267,000 SF)	676	676	26	134	40	34
714 - ITE	Corporate Headquarters (200,000 SF)	413	413	2	61	5	6
Local - Spack	Medical Dental Office (30,000 SF)	259	259	23	46	4	14
310 - ITE	Hotel (180 Rooms)	391	391	29	28	38	30
Local - Spack	High Turnover Sit-Down Rest. (16,000 SF)	605	605	75	39	58	56
820 - ITE	Retail (40,000 SF)	393	393	38	41	49	45
850 - ITE	Supermarket (64,000 SF)	1,777	1,777	157	151	175	169
TIS NEW TRIPS TOTAL		**4,514**	**4,514**	**350**	**500**	**369**	**354**
TIS NEW TRIPS WITH 10% MODE SHARE		**4,063**	**4,063**	**315**	**450**	**332**	**319**
Added Fast Food Restaurant Per Current Site Plan							
Local – Spack	Fast Food Restaurant (2,500 SF)	287	287	21	20	50	50
CURRENT SITE PLAN NEW TRIPS WITH 10% MODE SHARE		**4,321**	**4,321**	**334**	**468**	**377**	**364**

[1] Local = Trip generation data collected by ABC Engineering in this regional area.

As shown in Table 2, the change in expected peak hour new trip generation is less than 100 total vehicles.

The trip distribution per the TIS indicated 25 percent of the new traffic will be travelling to/from the south. Using this percentage, the greatest increase in entering traffic from one direction is 12 vehicles. Similarly, the exiting traffic to the south will increase by 12 vehicles. Entering and exiting traffic to other directions will have fewer vehicles. This small amount of new traffic will not significantly alter the capacity results or the recommendations for roadway improvements based upon the capacity analyses.

Parking Analysis

Table 3 shows the parking requirements based on City code. Per the code, a fast food restaurant with drive-thru window requires one stall per 70 square feet of total building floor area, but not less than ten spaces.

Table 3 – Parking Requirements

Land Use	Development Units	Quantity	Minimum Required Vehicle Stalls
General Office	KSF	267.0	763
Corporate Headquarters	KSF	200.0	572
Medical Dental Office	KSF	30.0	120
Hotel	Rooms	180.0	180
High Turnover Sit-Down Rest.	KSF	16.0	200
Retail	KSF	40.0	160
Supermarket	KSF	64.0	256
TIS Required Parking Stalls			**2,251**
Added Fast Food Restaurant Per Current Site Plan			
Fast Food Restaurant	KSF	2.5	36
Current Site Plan Parking Requirements			**2,287**

The reduced parking supply, 2,784 spaces, is still well above the minimum requirements of the City code.

Table 4 shows the expected peak parking demand based upon the land uses. As in the original TIS, the peak demand is based on ITE and local parking data.

Table 4 – Peak Period Parking Demands[1]

Land Use Code – Source	Description & Size	Peak Parking Demand (Occupied Stalls)		Peak Parking Time	
		Weekday	Saturday	Weekday	Saturday
ITE – 701	Office Building, Suburban – 467,000 Square Feet	1,327	N/A*	09:00 – 11:00	N/A*
Local - Spack	Medical-Dental Office Building, Suburban – 30,000 Square Feet	101	26	14:00 – 17:00	10:00 – 13:00
ITE – 310	Hotel, Suburban – 180 rooms	161	216	22:00 – 05:00	22:00 – 06:00
Local - Spack	High-Turnover, Sit-Down Restaurant – 16,000 Square Feet	199	260	18:00 – 20:00	18:00 – 22:00
ITE – 820	Shopping Center – 40,000 Square Feet	151	187	13:00 – 14:00	13:00 – 14:00
ITE – 850	Grocery Store – 64,000 Square Feet	242	251	12:00 – 20:00	13:00 – 18:00
Local - Spack	Fast Food Restaurant – 2,500 Square Feet	30	24	12:00 – 13:00	12:00 – 20:00

[1] Unadjusted parking generation based on ITE's *Parking Generation, 4th Edition*.

* The office parking demand will be minimal or zero over the weekend. ITE does not provide weekend parking information for office land uses.

The proposed parking supply remains well in excess of the expected demand, even with the additional spaces from the new land use.

For the new land use, the drive-thru service is required to provide six queuing spaces in addition to one space at the service window. The current site plan shows an ability to accommodate 14 queued vehicles in the drive-thru lane, including at the service window. This amount is well above the minimum requirement.

ABC Engineering completed research into the vehicle stacking in the drive-thru area for several existing fast food restaurants. The maximum queuing was 13 vehicles with an average maximum around nine vehicles. The proposed drive-thru accommodates the expected demand based on this local data.

Bicycle Parking Analysis

The required bicycle parking per City code is based upon the amount of vehicle parking spaces provided. The current site plan shows 2,784 spaces, which translates into 31 required bicycle parking spots.

The bicycle parking is now shown in the current site plan and identifies two types – outdoor and indoor. A total of 52 outdoor bicycle parking spaces are scatter throughout the proposed site. Generally, two to four bicycle parking spots are provided near the front door of each individual building. Within the largest office building, an indoor storage room has been identified that can hold up to 26 bicycles. Combined, the current site plan provides 78 total bicycle parking spaces. This amount is 47 more spaces than required.

Multi-Modal Analysis

As mentioned, the developer has begun discussions with CCU Transit Services about new bus stops within the proposed site. The current site plan shows two locations of potential bus stops, complete with covered benches, pedestrian-level lighting, and heat lamps for warmth in the winter months. Assuming the conversations continue and end with a change in the bus route, these amenities will help ensure transit use at the site.

Along with the bicycle parking discussed above, the developer has added two bicycle maintenance stations. One site is outdoors near one of the proposed transit stops. A concrete pad offset from the trail allows for its use without blocking the transit stop or use of the adjacent trail. The second maintenance station is located within the indoor bicycle parking area and is an exclusive amenity to the larger office building.

A sidewalk along the Avenue A extension has been widened and converted into a multi-use trail. This trail now provides a link between the existing trail on Radio Drive and the proposed trail along the 12th Street extension. This change improves the overall trail connectivity within the City, allowing more people to use the trail system for commuting, access to shopping and eating areas, and recreation.

Finally, the current site plan identifies locker rooms within the larger office building. These locker rooms will encourage bicycle travel or walking for commuters to this office. If more people are using these modes, fewer cars will travel on the surrounding roads, improving expected operations with full development.

Current Site Plan Review

The current site plan is very similar to the previous one evaluated in the TIS. The access points and overall roadway system remain the same. The decrease in parking spaces provides more green space throughout the site and provides a minor increase in the distance between internal intersections.

The developer also provided the heavy truck turning movements for the roadways within the site and specific movements to the docking areas. As shown, trucks will be able to maneuver through the site to the docks and back without significant encroachment on adjacent lanes No issues were identified with these turning movements.

Conclusions

The modified site plan provides one additional building and land while reducing the supply of parking. Based on the trip generation and trip distribution, the maximum increase in vehicles during the peak hours for any particular route to or from the site is 12 vehicles. This small amount will not significantly impact the operational results or recommendations presented in the TIS.

The proposed parking supply remains well above the required minimum and expected demand for the site. The reduction did allow for more green space around the site and some longer distances between internal intersections.

Other changes to the site plan build upon the recommendations of the TIS, including providing indoor and outdoor bicycle parking in excess of the requirements, providing bicycle maintenance stations, discussing transit stops within the site, providing a trail adjacent to the Avenue A extension (connecting the Radio Drive trail with the proposed 12th Street extension trail), and identifies locker rooms within the larger office building. These changes are improvements to the site plan and will make it more likely that commuters and visitors explore and use other modes of travel.

The developer also provided the heavy truck turning movements around the site. These drawings confirm the ability of trucks to maneuver through the site and to/from the docking areas.

As mentioned, the current site plan shows many good changes that will improve the transportation operations in and around the site. None of the recommendations from the Transportation Impact Study need to be modified due to the changes in the current site plan.