

MEMORANDUM

Date: June 4, 2018
To: Heidi Tschudin, Brian Mickelson, and Ike Njoku, City of Davis
From: Greg Behrens, Fehr & Peers
Subject: **Plaza 2555 Trip Generation Analysis**

RS18-3672

This memorandum presents the results of the multimodal trip generation analysis for the proposed Plaza 2555 residential project, which is located in South Davis at the Cowell Boulevard and Research Park Drive intersection.

Methodology

The conventional methodology for estimating travel characteristics for most proposed land development projects involves applying an industry-recommended trip generation rates to each relevant land use typology comprising a project (e.g., a specified number of trips per dwelling unit for residential projects). However, given the nature of the dwelling unit composition and occupancy proposed with the Plaza 2555 project, a more tailored approach is necessary to estimate project travel characteristics. This approach is consistent with prior City transportation studies for proposed college student-oriented apartment complexes, including the Lincoln40 Transportation Impact Study.¹ These studies utilized recent trip generation data gathered at local student-oriented apartment complexes instead of applying trip generation rates for traditional multifamily residential land uses included in the Institute of Transportation Engineer's *Trip Generation Manual* (derived from nation-wide surveys) or the City of Davis travel demand model (derived from the 1997 version of the *Trip Generation Manual* and local surveys completed in 2003).

This analysis relies on multimodal trip generation data previously collected at comparable apartment complexes in the City of Davis, including Sharps & Flats Apartments, Octave Apartments, Pacifico Student Housing Cooperative, The U Apartments, and Greystone Apartments. These apartment complexes and the

¹ The Lincoln40 Transportation Impact Study (June 2017) utilized trip generation data collected at the Lexington Apartments and the Arbors Apartments, both located on Olive Drive near the proposed Lincoln40 project site. These data were determined to be inappropriate for the purposes of estimating trip generation for Plaza 2555, since the data sources are located significantly closer to the UC Davis core campus area than the Plaza 2555 project site, and residential location within Davis has a substantial effect on a student's mode choice for commute travel to and from campus (see Table 35 in the *Results of the 2016-17 Campus Travel Survey*, Institute of Transportation Studies and Transportation and Parking Services, UC Davis).

proposed Plaza 2555 project share traits that would be expected to yield similar travel characteristics, including an emphasis on student-oriented housing, a similar distance from the UC Davis core campus area, and similar on-site parking provisions. Therefore, these data are used to estimate the trip generation for the proposed Plaza 2555 project. This refined methodology is consistent with the recommended approach described in the *Plaza 2555 Trip Generation Exercise* memorandum dated October 17, 2017.

Data Sources

The vehicle, bicycle, pedestrian, and transit trip generation rates utilized in this analysis were derived from the following multimodal trip generation counts:

- Daily, AM peak hour, and PM peak hour vehicle trip generation for Sharps & Flats Apartments, Octave Apartments, and Pacifico Student Housing Cooperative.²
- AM peak hour and PM peak hour bicycle, pedestrian, and transit trip generation for The U Apartments and Greystone Apartments.³

This analysis did not include any new data collection.

Trip Generation Rates

Table 1 summarizes the daily, AM peak hour, and PM peak hour vehicle trip generation counts and rates, expressed as vehicle trips per bedroom. The project would generate an estimated 2.93 daily, 0.12 AM peak hour, and 0.19 PM peak hour vehicle trips per bedroom.

Table 2 summarizes the AM peak hour and PM peak hour bicycle trip generation counts and rates, expressed as bicycle trips per bedroom. The project would generate an estimated 0.06 AM peak hour and 0.06 PM peak hour bicycle trips per bedroom.

Table 3 summarizes the AM peak hour and PM peak hour pedestrian and transit trip generation counts and rates, expressed as pedestrian and transit trips per bedroom. The project would generate an estimated 0.09 AM peak hour and 0.08 PM peak hour pedestrian and transit trips per bedroom. Note that these represent blended rates for pedestrians and transit users as reported in the Sterling Apartments Transportation Impact Study. The Sterling Apartments study states that nearly all pedestrians entering and exiting the surveyed apartment complexes were traveling to or from adjacent Unitrans bus stops on Fifth Street. Given the availability of Unitrans bus service on Cowell Boulevard and Research Park Drive within the vicinity of the Plaza 2555 project site, similar travel behavior would be expected of Plaza 2555 project residents.

² Collected by Fehr & Peers in Fall 2016 as part of the UC Davis Travel Demand Model update.

³ Collected by KD Anderson & Associates in Spring 2016 as part of the Sterling Apartments Transportation Impact Study. Counts did not include daily bicycle, pedestrian, and transit trip generation.

Table 1
Vehicle Trip Generation Rate Summary

Vehicle Trip Generation Count							
Count Location	Daily	AM Peak Hour			PM Peak Hour		
	Trips	Trips	In %	Out %	Trips	In %	Out %
Drew Circle north of Sharps & Flats north driveway	2,770	113	21%	79%	182	58%	42%

Vehicle Trip Generation Rates per Bedroom								
Apartments	Bedrooms	Daily	AM Peak Hour			PM Peak Hour		
		Rate	Rate	In %	Out %	Rate	In %	Out %
Sharps & Flats, Octave Apartments, and Pacifico Student Cooperative Housing	945	2.93	0.12	21%	79%	0.19	58%	42%

Note: Bedroom total calculated as follows: 406 (Sharps & Flats) + 491 (Octave Apartments) + 48 (Pacifico Student Housing Cooperative) = 945 total bedrooms.
Source: Fehr & Peers, 2018.

Table 2
Bicycle Trip Generation Rate Summary

Bicycle Trip Generation Count						
Count Location	AM Peak Hour			PM Peak Hour		
	Trips	In %	Out %	Trips	In %	Out %
The U Apartments	27	4%	96%	28	68%	32%
Greystone Apartments	20	10%	90%	20	50%	50%
<i>Total</i>	<i>47</i>	<i>6%</i>	<i>94%</i>	<i>48</i>	<i>60%</i>	<i>40%</i>

Bicycle Trip Generation Rates per Bedroom							
Apartments	Bedrooms	AM Peak Hour			PM Peak Hour		
		Rate	In %	Out %	Rate	In %	Out %
The U Apartments and Greystone Apartments	854	0.06	6%	94%	0.06	60%	40%

Note: Bedroom total calculated as follows: 504 (The U Apartments) + 350 (Greystone Apartments) = 854 total bedrooms.
Source: *Traffic Impact Analysis for Sterling 5th Street Apartments*, KD Anderson & Associates, 2016.

Table 3
Pedestrian and Transit Trip Generation Rate Summary

Pedestrian and Transit Trip Generation Count						
Count Location	AM Peak Hour			PM Peak Hour		
	Trips	In %	Out %	Trips	In %	Out %
The U Apartments	50	6%	94%	34	71%	29%
Greystone Apartments	30	10%	90%	31	48%	52%
<i>Total</i>	<i>80</i>	<i>7%</i>	<i>93%</i>	<i>65</i>	<i>60%</i>	<i>40%</i>

Pedestrian and Transit Trip Generation Rates per Bedroom							
Apartments	Bedrooms	AM Peak Hour			PM Peak Hour		
		Rate	In %	Out %	Rate	In %	Out %
The U Apartments and Greystone Apartments	854	0.09	7%	93%	0.08	60%	40%

Note: Bedroom total calculated as follows: 504 (The U Apartments) + 350 (Greystone Apartments) = 854 total bedrooms.
Source: *Traffic Impact Analysis for Sterling 5th Street Apartments*, KD Anderson & Associates, 2016.

Trip Generation Results

Table 4 presents the results of the multimodal trip generation analysis for the 665-bedroom Plaza 2555 project. The project would generate an estimated 1,949 daily, 80 AM peak hour, and 128 PM peak hour vehicle trips, 37 AM peak hour and 38 PM peak hour bicycle trips, and 63 AM peak hour and 51 PM peak hour pedestrian and transit trips.

For all modes, the majority of AM peak hour trips would be outbound trips, likely for travel to school or work. Inbound and outbound trips would be more evenly balanced during the PM peak hour as residents return from school or work and also leave the project site for shopping, dining, and recreational trips.

The applicant has not provided information regarding the planned number of beds or occupants per room. Therefore, this analysis assumes that the project would have an average occupancy per room comparable to the surveyed apartments described above (approximately 1.15 occupants per room). This figure is consistent with the occasional room-sharing known to occur at student-oriented apartments throughout the City.

Table 4
Plaza 2555 Project Trip Generation Summary

Project (Bedrooms)	Mode	Daily	AM Peak Hour			PM Peak Hour		
		Trips	Trips	In	Out	Trips	In	Out
Plaza 2555 (665)	Vehicle	1,949	80	17	63	128	74	54
	Bicycle	NA	37	2	35	38	23	15
	Pedestrian and Transit	NA	63	5	58	51	31	20

Sources: Plaza 2555 Project Description, April 27, 2018; Fehr & Peers, 2018.

Next Steps

Both the City of Davis General Plan and the South Davis Specific Plan designate a commercial land use for the project site.⁴ Specific permitted uses for the project site include office for professional and administrative uses, custom/light manufacturing, light wholesale, storage, distribution, and vending, research services, and other businesses or service establishments determined appropriate by the Planning Commission.⁵

The respective circulation elements of the General Plan and South Davis Specific Plan, as well as their associated environmental review documents, identify future transportation system modifications based on the anticipated travel demand resulting from planned land use growth. Therefore, local planning efforts to date have not contemplated the development of the project site with residential uses or the transportation system modifications, if any, necessary to accommodate anticipated project travel demand per the General Plan goals and policies related to multimodal transportation operations and access.

Estimating trip generation for a proposed development project is a first step towards understanding the transportation needs of a project as well as how it could change the performance and required infrastructure of the surrounding transportation system. The following next steps would provide a greater understanding of the proposed project’s consistency with General Plan transportation goals and policies and the City of Davis Street Standards:

- Estimate the project’s trip distribution and trip assignment. This involves estimating where project trips are expected to travel to/from, as well as determining the paths along which project trips would travel (e.g., determining the number of project trips that would depart the project westbound on Research Park Drive versus southbound on Cowell Boulevard).

⁴ City of Davis General Plan, Land Use and Growth Management Element, 2007 & South Davis Specific Plan, 1989.

⁵ City of Davis Ordinance No. 1852, Planned Development #7-95, 2000.

- Conduct a traffic operations analysis at the Cowell Boulevard/Research Park Drive intersection, including peak hour delay and level of service calculations, queue analyses, and traffic signal warrants analyses. At a minimum, the operations analysis should be conducted for 'existing' and 'existing plus project' conditions.
- Conduct a site access assessment to examine items such as bicycle connectivity between the project site and the South Davis off-street bicycle network and vehicular ingress/egress at the project driveways.

Additionally, City staff could consider preparing a corridor plan for Cowell Boulevard between I-80 and Drummond Avenue. This plan would allow the City to analyze and identify future transportation needs along the corridor through a holistic planning process, accounting for a variety of factors including the recent increase in Cowell Boulevard cut-through traffic, the proposed Plaza 2555 project, and the buildout of vacant parcels within the vicinity of the corridor (e.g., University Research Park), among others. This would be consistent with General Plan Policy TRANS 2.8, which sets forth a process for preparing corridor plans to improve the function, safety, and appearance of selected corridors in the City of Davis, including Cowell Boulevard between I-80 and Drummond Avenue (Corridor #6).