

## MEMORANDUM

Date: October 17, 2017  
 To: John Ott, Blue Bus, LLC  
 From: Greg Behrens, AICP, Fehr & Peers  
**Subject: Plaza 2555 Trip Generation Exercise**

RS17-3577

This memorandum summarizes the estimated existing and future trip generation for the parcels comprising the Plaza 2555 project site. Trip generation estimates for the project parcels were developed using the City of Davis travel demand forecasting (TDF) model.

### Project Site Overview

The proposed Plaza 2555 project would include 200 units of multi-family housing located at the northwest corner of the Cowell Boulevard and Research Park Drive intersection in Davis.

**Table 1** summarizes the proposed units for Plaza 2555.

**Figure 1** displays the TDF model traffic analysis zone (TAZ) that the project site is located within. TAZs are geographic shapes used in the TDF model to summarize data related to land uses located within their boundaries. Note that several other land uses are located within this TAZ, including Playfields Park and the residential subdivision located immediately south of the park. Therefore, identifying the trip generation characteristics specific to the project site requires additional TDF model refinement to isolate the project site from the nearby land uses located within the TAZ.

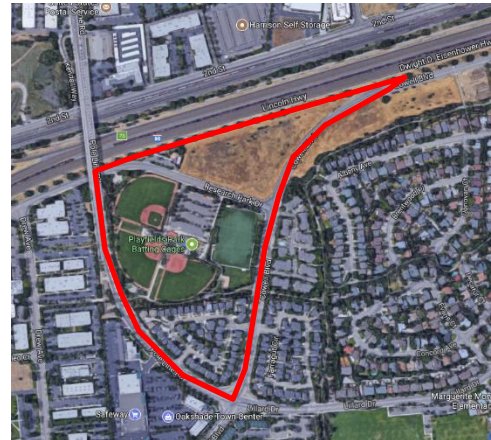


Figure 1. TDF Model TAZ Boundary

**Table 1. Proposed Plaza 2555 Unit Summary**

Unit Type	Number of Units	Number of Rooms
Micro Unit	30	30
One Bedroom Flat	17	17
Two Bedroom Flat	14	28
Three Bedroom Townhouse	9	27
Four Bedroom Flat	89	356
Four Bedroom Townhouse	7	28
Five Bedroom Flat	30	150
Five Bedroom Townhouse	4	20
<b>Total</b>	<b>200</b>	<b>656</b>

Source: John Ott email to Greg Behrens dated October 2, 2017.

**Model Land Use Overview**

**Table 2** summarizes the base year (i.e., existing conditions) and future year (i.e., future conditions) land use inputs included in the subject TAZ in the Davis TDF model. The current base year land use inputs compare to verified existing land uses in the following ways:

- Include 78 thousand square feet (ksf) of auto sales land use, when none exists within the TAZ today;
- Include 55 single family residential dwelling units, when 45 single family residential dwelling units and 12 duplex dwelling units (57 total dwelling units) are located within the TAZ today; and
- Do not include any accounting for the Comcast Service Center located within the TAZ today.

The future year land use inputs add seven duplex dwelling units and seven acres of light industrial land use within the TAZ.

**Table 2. TDF Model Land Use Inputs**

Land Use Type	Code	Units	Base Year Model	Future Year Model	Change
Single Family Residential	R1	DU	55	55	0
Single Family Residential (Duplex)	R2	DU	0	7	7
Apartments	R3	DU	0	0	0
Auto Sales	AS	ksf	78	78	0
Light Industrial	M1	Acre	0	7	7
Park	PK	Acre	17	17	0

Source: Fehr & Peers, 2017.

Inconsistencies between base year model land use inputs and existing development are common in TDF models. The primary purpose of TDF models is to reasonably project travel behavior, not to serve as a complete land use inventory for a given geographical area. However, when studying the transportation effects of potential land use changes, industry best practices call for refining relevant TDF model land use inputs to more accurately predict travel behavior.

**Trip Generation Methodology**

The project parcels are the only undeveloped parcels within the relevant TAZ. Therefore, it can be reasonably assumed that the difference between the base year and future year model land use inputs and their associated trip generation characteristics represent the project parcels.

We used the citywide TDF model to estimate trip generation for the project parcels using the following methods:

- Method #1 – Calculate the difference between the base year and future year model TAZ trip generation using the current model land use inputs. The method captures the trip generation as estimated by the current TDF model without any further refinement.

- Method #2 – Calculate the difference between the base year and future year model TAZ trip generation using the following refined model land use inputs:
  - Base Year Refinements – land use inputs adjusted to represent actual existing conditions.
  - Future Year Refinements – assumes buildout of project site parcels with ‘light industrial’ land use.
- Method #3 – Same as Method #2, but future year refinements assume buildout of project site parcels with ‘auto sales’ land use.
- Method #4 – Same as Method #2, but future year refinements assume buildout of project site parcels with the proposed Plaza 2555 project. This method classifies all project dwelling units under the ‘apartment’ land use category in the TDF model. Apartments typically generate a lower number of trips per dwelling unit compared to other residential land uses, therefore, this method produces a relatively low estimate for potential trip generation associated with the Plaza 2555 project.
- Method #5 – Same as Method #2, but future year refinements assume buildout of project site parcels with the proposed Plaza 2555 project. This method classifies all project dwelling units with two or less rooms under the ‘apartment’ land use category and all project dwelling units with three or more rooms under the ‘duplex’ land use category. From a trip generation perspective, the City of Davis TDF model lacks a distinction between low occupancy and high occupancy apartments, as well as an intermediate residential land use type between apartments and duplexes. The duplex land use category exhibits a higher trip generation rate than the apartment land use category, therefore, the duplex land use category was used to approximate the potential trip generation of the higher occupancy units. This method was included to capture the potential trip generating effects of the relatively high rooms-per-unit ratio proposed with the Plaza 2555 project.

Methods #2, #3, #4, and #5 portray actual existing land uses within the subject TAZ, and are therefore more appropriate methods for isolating the future travel characteristics of the project site compared to Method #1.

Methods #2 and #3 assume the buildout of the project site with ‘light industrial’ and ‘auto sales’ land uses, respectively. These land uses were selected solely because they are included within the subject TAZ in the current TDF model and, presumably, at some point during the model development process, represented the envisioned buildout land use for the vacant parcels within the TAZ. However, they do not necessarily represent the City’s current formal zoning classification for the project site parcels.

### **Trip Generation Results**

**Table 3** summarizes the TAZ land use inputs and project site trip generation for Methods #1 through #5 described above. Figures in *italics* represent land use and trip generation for the project site.

According to the analysis, the results of Methods #4 and #5 would most closely resemble the potential range of expected trip generation of the proposed project. Generally, the development of the proposed project would yield trip generation somewhere between the buildout of the vacant parcels with either ‘light

industrial' or 'auto sales' land uses. More detailed analysis is necessary to further refine the proposed project trip generation estimates, including adjustments for mode split, trip internalization, etc.

Further trip generation refinement is also necessary to appropriately capture the travel effects of the relatively high rooms-per-unit ratio proposed with the Plaza 2555 project. This ratio allows for higher occupancy of individual units, and therefore, a greater number of residents who would generate trips. Recently, similar high occupancy residential development proposals in Davis have estimated project trip generation using a trip generation rate per room rather than per unit to capture this effect. The current City of Davis TDF model was not built with the level of detail necessary to capture this nuance, therefore, a customized trip generation exercise would be necessary to produce a defensible trip generation estimate for Plaza 2555.

**Table 3. Trip Generation Results**

<b>Land Use Summary</b>																	
Land Use Type	Code	Units	Method #1 - Current Inputs			Method #2 - Light Industrial			Method #3 - Auto Sales			Method #4 - Plaza 2555 Project All Apartments			Method #5 - Plaza 2555 Project Apartment/Duplex Blend		
			Base Year Model	Future Year Model	Project Site (Change)	Base Year Model	Future Year Model	Project Site (Change)	Base Year Model	Future Year Model	Project Site (Change)	Base Year Model	Future Year Model	Project Site (Change)	Base Year Model	Future Year Model	Project Site (Change)
Single Family Residential	R1	DU	55	55	0	45	45	0	45	45	0	45	45	0	45	45	0
Single Family Residential (Duplex)	R2	DU	0	7	7	12	12	0	12	12	0	12	12	0	12	151	139
Apartments	R3	DU	0	0	0	0	0	0	0	0	0	0	200	200	0	61	61
Auto Sales	AS	ksf	78	78	0	0	0	0	0	78	78	0	0	0	0	0	0
Light Industrial	M1	Acre	0	7	7	1	7	6	1	1	0	1	1	0	1	1	0
Park	PK	Acre	17	17	0	17	17	0	17	17	0	17	17	0	17	17	0
<b>Vehicle Trip Summary</b>																	
<b>Daily Trips</b>			3,547	4,119	572	877	1,185	308	877	3,756	2,880	877	2,119	1,242	877	3,118	2,241
<b>AM Peak Hour Trips</b>			228	274	46	65	94	28	65	241	176	65	150	85	65	230	164
<b>PM Peak Hour Trips</b>			306	354	48	69	97	28	69	322	253	69	165	96	69	246	176

Note: ksf = 1,000 square feet.  
Source: Fehr & Peers, 2017.