SM ROCHA, LLC
TRAFFIC AND TRANSPORTATION CONSULTANTS

August 15, 2022

Bryan Armstrong
Eastridge Plaza Development, LLC
4643 S Ulster Street, Suite 240
Denver, Colorado 80237

RE: Eastridge Plaza / Traffic Generation Analysis
Aurora, Colorado

Dear Bryan,

SM ROCHA, LLC is pleased to provide traffic generation information for the development entitled Eastridge Plaza. This development is located at 3095 S Peoria Street in Aurora, Colorado.

This information has been revised to address City Staff review comments dated August 10, 2022, regarding traffic generation information for vacant units within the commercial existing building.

The intent of this analysis is to present traffic volumes likely generated by the adaptive reuse of the proposed development and consider potential impacts to the adjacent roadway network.

The following is a summary of analysis results.

Site Description and Access

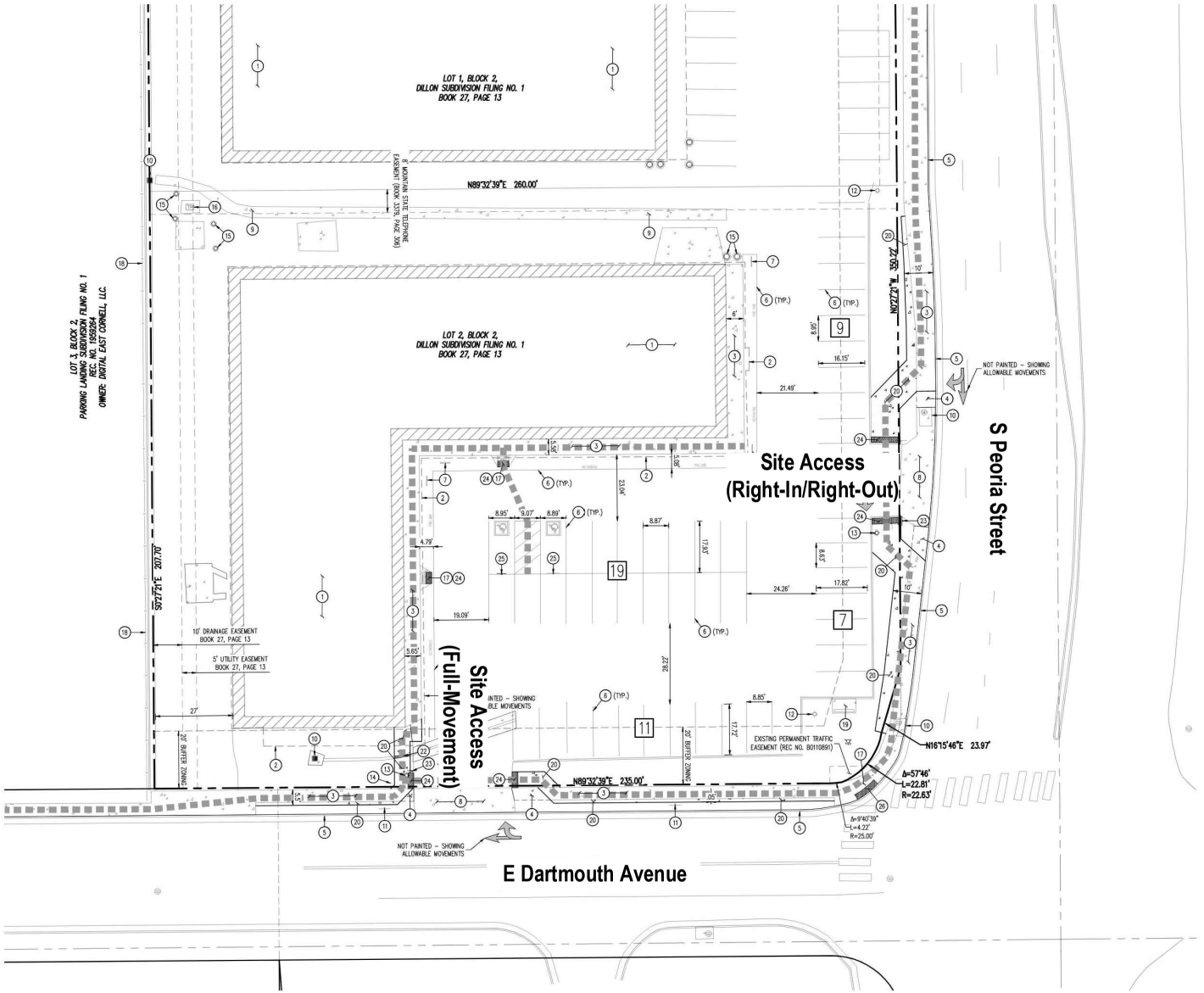
Land for the development is currently occupied by an approximate 16,400 square foot shopping retail plaza building within the overall Dillon Subdivision area. The development site is surrounded by a mix of residential and commercial land uses.

The proposed development is understood to entail the adaptive reuse of vacant units within the existing building. However, the adaptive reuses are conceptual and no specific land uses have been determined. For purposes of this analysis, there is assumed to be adaptive reuse for fast-food restaurant land uses within the two endcaps of the existing building.

Direct access to the development is existing and provided via one right-in/right-out access drive along S Peoria Street and one full-movement access drive along E Dartmouth Avenue. Shared access is also offered with the property to the north, providing one additional right-in/right-out access drive along S Peoria Street and one full-movement access onto E Cornell Avenue.

General site and access locations are shown on Figure 1. A conceptual site plan, as prepared by Galloway, is shown on Figure 2. This plan is provided for illustrative purposes only.


E Bates Circle
S Peoria Street
E Cornell Ave
Development Site
E Dartmouth Avenue
S Parker Road (State Highway 83)
Interstate 225
Dam Road
North
Not to Scale


LOT 1, BLOCK 2,
DILLON SUBDIVISION FILING NO. 1
BOOK 27, PAGE 13
LOT 2, BLOCK 2,
DILLON SUBDIVISION FILING NO. 1
BOOK 27, PAGE 13
N89°32'39"E 260.00'
8' MOUNTAIN STATE TELEPHONE EASEMENT (BOOK 3379, PAGE 360)
LOT 1, BLOCK 2,
DILLON SUBDIVISION FILING NO. 1
PARKING LANDMARK SUBDIVISION
REC. NO. 1195284
OWNER: DIGITAL EAST CORNELL, LLC
S0°27'21"E 207.70'
10' DRAINAGE EASEMENT
BOOK 27, PAGE 13
5' UTILITY EASEMENT
BOOK 27, PAGE 13
20' BUFFER ZONING
Site Access
(Full-Movement)
Site Access
(Right-In/Right-Out)
S Peoria Street
E Dartmouth Avenue
N89°32'39"E 235.00'
N16°15'46"E 23.97'
EXISTING PERMANENT TRAFFIC EASEMENT (REC NO. B0110891)
NOT PAINTED – SHOWING ALLOWABLE MOVEMENTS
NOT PAINTED – SHOWING ALLOWABLE MOVEMENTS
Δ=57°46'
L=22.81'
R=22.63'
Δ=9°40'39"
L=4.22'
R=25.00'
19
11
9
7

Vehicle Trip Generation

Standard traffic generation characteristics compiled by the Institute of Transportation Engineers (ITE) in their report entitled Trip Generation Manual, 11th Edition, were applied to the proposed land uses for the remaining vacant units of the existing building. Application of ITE's standard traffic generation characteristics allow for the estimation of average daily traffic (ADT) and peak hour vehicle trips likely generated by the adaptive reuses. A vehicle trip is defined as a one-way vehicle movement from point of origin to point of destination.

Due to the conceptual nature of the proposed development, no specific commercial land uses have been determined for the existing building's vacant units. However, it is understood that there is potential for fast-food restaurant land uses within the building's end caps, with more general retail encompassing the remaining vacant units.

Table 1 presents average trip generation rates for the development area proposed. In order to provide for a conservative analysis, ITE land use code 822 (Strip Retail Plaza) was used for estimating trip generation for the existing building's vacant units, with ITE land use code 933 (Fast-Food Restaurant without Drive-Through Window) applied to the building's end caps.

It is important to note that ITE describes how shopping center land uses contain trip generation data for additional facilities and outparcels including restaurants. Therefore, inclusion of the Fast-Food Restaurant without Drive-Through Window land use likely results in more reported site-generated trips than what is actually expected to occur over a typical 24-hour period and during peak traffic hours.

Table 1 – Trip Generation Rates

			TRIP GENERATION RATES						
ITE			24	AM PEAK HOUR			PM PEAK HOUR		
CODE	LAND USE	UNIT	HOUR	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
822	Strip Retail Plaza	KSF	54.45	1.42	0.94	2.36	3.30	3.30	6.59
933	Fast-Food Restaurant w/o DTW	KSF	450.49	25.04	18.14	43.18	16.61	16.61	33.21

Key: KSF = Thousand Square Feet Gross Floor Area.

Table 2 summarizes the projected ADT and peak hour traffic volumes likely generated by the adaptive reuse land uses.

Table 2 – Trip Generation Summary

ITE CODE	LAND USE	SIZE	TOTAL TRIPS GENERATED						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
822	Strip Retail Plaza	4.0 KSF	216	6	4	9	13	13	26
933	Fast-Food Restaurant w/o DTW	4.7 KSF	2,108	117	85	202	78	78	155
		Total:	*2,324*	*123*	*89*	*211*	*91*	*91*	*182*

Key: KSF = Thousand Square Feet Gross Floor Area.
Note: All data and calculations above are subject to being rounded to nearest value.

As Table 2 shows, the adaptive reuse of the existing building has the potential to generate approximately 2,324 daily trips with 211 of those occurring during the morning peak hour and 182 during the afternoon peak hour. Considering how the overall shopping center is an existing use, estimated trips shown in Table 2 are believed to already exist and may be accounted for within the overall development area and roadway network.

Adjustments to Trip Generation Rates

It is considered likely that a fast-food restaurant land use located within an overall mixed-use development of this type will attract trips from within area land uses. Utilizing research obtained by the National Cooperative Highway Research Program (NCHRP), ITE created an estimation tool[1] for determining internal capture for mixed-use developments. Using NCHRP Report 684 methodology, it is determined that the adaptive reuse of the vacant end caps as restaurant land uses has various internal capture percentages ranging from 3 to 41 percent. Applying vehicle occupancy estimates from ITE's Trip Generation Handbook, 3rd Edition, it is determined that overall averages of approximately 6% of total AM peak hour trips and approximately 33% of total PM peak hour trips from the overall development area will be captured internally.

ITE's internal capture spreadsheets are provided for reference in Attachment A.

While an overall mixed-use development area of this type is also likely to attract trips from pass-by or diverted linked trips from the adjacent roadway system, no trip reduction was taken in this analysis. This assumption continues to provide for a conservative analysis.

As example, published ITE pass-by and diverted link-trip data indicates an average trip generation reduction rate of approximately 50 percent as typical to fast-food restaurants. Therefore, primary trip generation for the proposed adaptive reuse equates to half of trip generation volumes presented in Table 2. A primary trip is defined by ITE as a trip made for the specific purpose of visiting the destination generator.

[1] NCHRP Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments, National Cooperative Highway Research Program, October 2010.

Table 3 illustrates projected ADT, AM Peak Hour, and PM Peak Hour traffic volumes likely generated by the proposed development upon build-out with reductions applied due to internal capture.

Table 3 – Trip Generation Summary with Reductions

ITE CODE	LAND USE	SIZE	TOTAL TRIPS GENERATED						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
		Internal Capture:	*21%*	*9%*	*13%*	*11%*	*37%*	*26%*	*32%*
822	Strip Retail Plaza	4.0 KSF	170	5	3	8	8	10	18
		Internal Capture:	*19%*	*3%*	*4%*	*4%*	*29%*	*41%*	*35%*
933	Fast-Food Restaurant w/o DTW	4.7 KSF	1,702	114	81	195	55	46	101
		Reduced Total:	***1,873***	***119***	***85***	***203***	***63***	***56***	***119***

Key: KSF = Thousand Square Feet Gross Floor Area.
Note: All data and calculations above are subject to being rounded to nearest value.

Upon build-out and with consideration for internal capture trip reductions, Table 3 illustrates that the existing building, with the adaptive reuse of the end caps, has the potential to generate approximately 1,873 daily trips with 203 of those occurring during the morning peak hour and 119 during the afternoon peak hour.

Development Impacts

Considering how the shopping center is existing and the proposed development is an adaptive reuse, trip generation is expected to already be accounted for within the existing area land uses and traffic volumes. Therefore, while Tables 2 and 3 show an increase in site-generated trips for current vacant units of the existing building, no additional impacts to the roadway network are anticipated.

Pedestrian Circulation & Safety Analysis

In accordance with Section 3.5.4 of the City's Traffic Impact Study Guidelines[2], an assessment to pedestrian connectivity and safety was considered.

Considering how the proposed development is an adaptive reuse of the existing commercial building, pedestrian accommodations already exist. However, to further improve multimodal facilities within the immediate area, the proposed development will provide improvements to the existing sidewalk surrounding the eastern and southern property lines.

[2] Traffic Impact Study Guidelines, City of Aurora, Public Works Department, June 2015.

Conclusion

This analysis assessed traffic generation for the Eastridge Plaza adaptive reuse development and potential impacts to the adjacent roadway network.

It is our professional opinion that the proposed site-generated traffic resulting from the existing shopping center's adaptive reuse is expected to create no negative impact to traffic operations for the surrounding roadway network and existing site access, nor at the site access drive intersections with S Peoria Street, E Cornell Avenue, and E Dartmouth Avenue. Analysis of site-generated traffic concludes that proposed development traffic volumes are already considered within the overall Dillon Subdivision.

We trust that our findings will assist in the planning and approval of the Eastridge Plaza adaptive reuse development. Please contact us should further assistance be needed.

Sincerely,

SM ROCHA, LLC
Traffic and Transportation Consultants

Brandon Wilson, EIT
Traffic Engineer

Fred Lantz, PE
Traffic Engineer

ATTACHMENT A

Internal Capture Spreadsheets

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Eastridge Plaza	**Organization:**	SM Rocha, LLC
Project Location:	3095 S Peoria Street	**Performed By:**	Brandon Wilson
Scenario Description:		**Date:**	8/15/2022
Analysis Year:		**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	28	KSF	67	40	27
Restaurant	933	5	KSF	202	117	85
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses[2]				0		
				269	157	112

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail	1.11	11%	9%	1.11	11%	9%
Restaurant	1.32	6%	1%	1.32	6%	1%
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		4	0	0	0
Restaurant	0	4		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	340	198	142
Internal Capture Percentage	5%	4%	6%
External Vehicle-Trips[5]	231	135	96
External Transit-Trips[6]	22	13	9
External Non-Motorized Trips[6]	9	6	3

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	9%	13%
Restaurant	3%	4%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	Eastridge Plaza
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.11	40	44	1.11	27	30
Restaurant	1.32	117	154	1.32	85	112
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	9		4	0	4	0
Restaurant	35	16		0	4	3
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		14	35	0	0	0
Retail	0		77	0	0	0
Restaurant	0	4		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	7	31	0		0
Hotel	0	2	9	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	4	40	44	29	4	4
Restaurant	4	150	154	106	9	2
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	4	26	30	19	3	2
Restaurant	4	108	112	77	6	1
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Eastridge Plaza	**Organization:**	SM Rocha, LLC
Project Location:	3095 S Peoria Street	**Performed By:**	Brandon Wilson
Scenario Description:		**Date:**	8/15/2022
Analysis Year:		**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	28	KSF	186	93	93
Restaurant	933	5	KSF	156	78	78
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses[2]				0		
				342	171	171

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail	1.11	11%	9%	1.11	11%	9%
Restaurant	1.19	16%	16%	1.19	16%	16%
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		27	0	0	0
Restaurant	0	38		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	392	196	196
Internal Capture Percentage	33%	33%	33%
External Vehicle-Trips[5]	170	84	86
External Transit-Trips[6]	35	18	17
External Non-Motorized Trips[6]	33	17	16

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	37%	26%
Restaurant	29%	41%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	Eastridge Plaza
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.11	93	103	1.11	93	103
Restaurant	1.19	78	93	1.19	78	93
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	2		30	4	27	5
Restaurant	3	38		7	17	7
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		8	2	0	0	0
Retail	0		27	0	0	0
Restaurant	0	52		0	0	0
Cinema/Entertainment	0	4	3		0	0
Residential	0	10	13	0		0
Hotel	0	2	5	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	38	65	103	47	7	6
Restaurant	27	66	93	37	11	11
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	27	76	103	55	8	7
Restaurant	38	55	93	31	9	9
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.