



## SM ROCHA, LLC

TRAFFIC AND TRANSPORTATION CONSULTANTS

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June 9, 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.

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 right-in/right-out access drive along S Peoria Street and one full-movement access onto E Cornell Avenue.

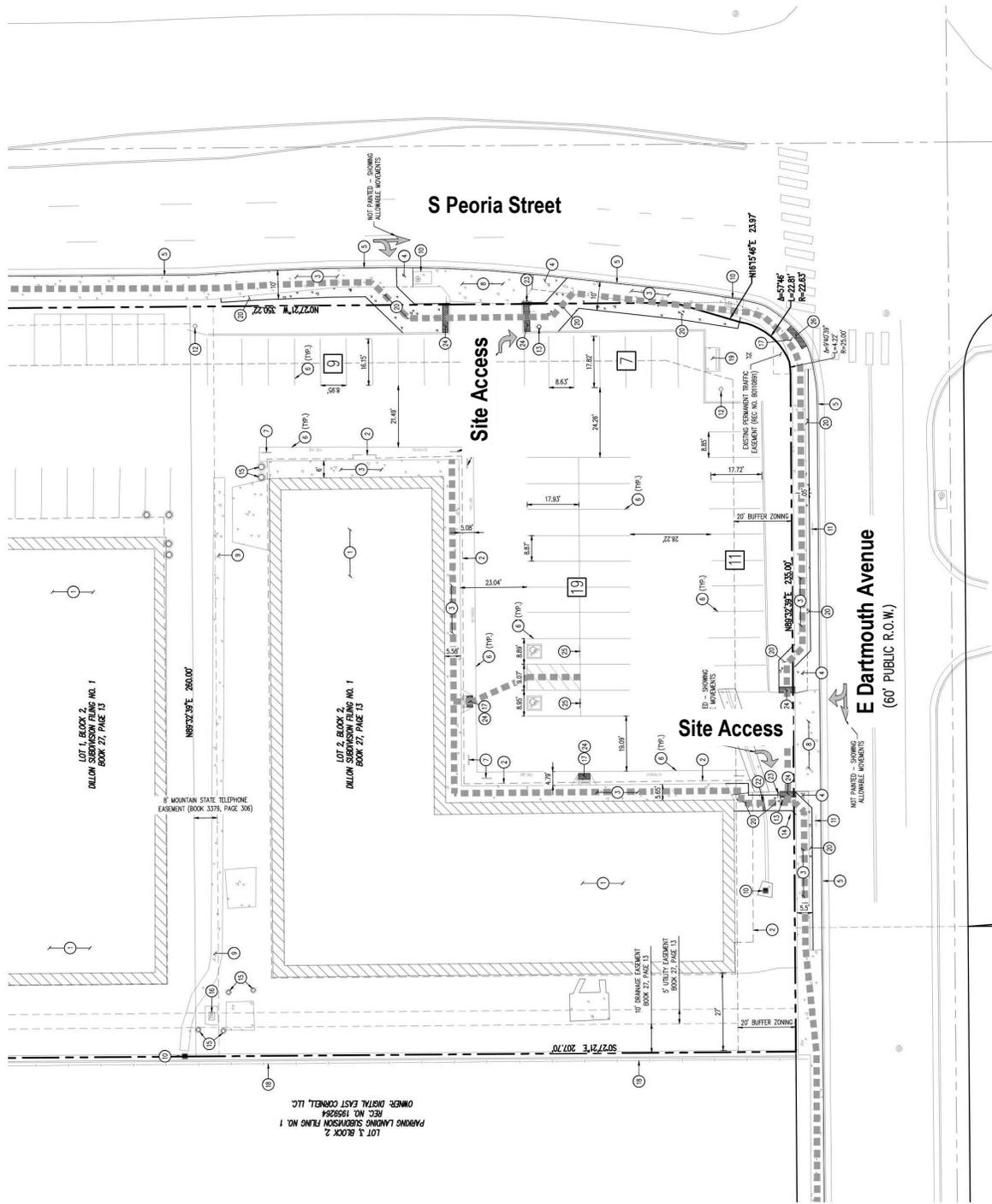
General site and access locations are shown on Figure 1.

A conceptual site plan, as prepared by Galloway, is shown on Figure 2. This plan is provided for illustrative purposes only.





Not to Scale



## Vehicle Trip Generation

Standard traffic generation characteristics compiled by the Institute of Transportation Engineers (ITE) in their report entitled Trip Generation Manual, 11<sup>th</sup> Edition, were applied to the proposed land use in order to estimate the average daily traffic (ADT) and peak hour vehicle trips. 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.

Considering how the existing land use is generally a shopping center land use, Table 1 only presents average trip generation rates for the adaptive reuse area proposed. Use of average trip generation rates presents a conservative analysis. Application of ITE land use code 822 (Strip Retail Plaza) was considered for analysis because of its best fit to the proposed land use description (ITE describes how shopping center land uses contain data for additional facilities and outparcels including restaurants). However, ITE land use code 933 (Fast-Food Restaurant without Drive-Through Window) was used for analysis because of its conservative rates.

**Table 1 – Trip Generation Rates**

ITE CODE	LAND USE	UNIT	TRIP GENERATION RATES						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
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
933	Fast-Food Restaurant w/o DTW	5.5 KSF	2,465	137	99	236	91	91	182
<i>Total:</i>			2,465	137	99	236	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 2,465 daily trips with 236 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<sup>1</sup> 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 2 to 35 percent. Applying vehicle occupancy estimates from ITE’s Trip Generation Handbook, 3<sup>rd</sup> Edition, it is determined that overall averages of approximately 2% of total AM peak hour trips and approximately 28% of total PM peak hour trips from the fast-food restaurant land uses 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.

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
<i>Internal Capture:</i>			15%	2%	2%	2%	20%	35%	28%
933	Fast-Food Restaurant w/o DTW	5.5 KSF	2,101	134	97	232	73	59	132
<b>Reduced Total:</b>			<b>2,101</b>	<b>134</b>	<b>97</b>	<b>232</b>	<b>73</b>	<b>59</b>	<b>132</b>

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

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

Upon build-out and with consideration for internal capture trip reductions, Table 3 illustrates that the adaptive reuse of the existing building has the potential to generate approximately 2,101 daily trips with 232 of those occurring during the morning peak hour and 131 during the afternoon peak hour.

It is further emphasized that projected traffic volumes are believed to already be accounted for within the existing overall development area.

### **Development Impacts**

ITE's estimation tool for determining internal capture was also applied to the overall shopping center in order to determine the fast-food restaurant land use's effect. Using NCHRP Report 684 methodology, it is determined that the existing overall area has various internal capture percentages ranging between 9 to 50 percent. Applying vehicle occupancy estimates from ITE's Trip Generation Handbook, 3<sup>rd</sup> Edition, it is determined that overall averages of approximately 11% of total AM peak hour trips and approximately 40% of total PM peak hour trips will be captured internally.

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

Considering how the shopping center is existing and the proposed development is an adaptive reuse, trip generation is expected to be accounted for within the existing area land uses and traffic volumes. As such, no additional impacts to the roadway network are anticipated.

## 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:	6/8/2022
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 <sup>3</sup>		
	ITE LUCs <sup>1</sup>	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	27	KSF	65	39	26
Restaurant	933	5	KSF	236	137	99
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses <sup>2</sup>				0		
				301	176	125

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized
Office						
Retail	1.14	2%	44%	1.14	3%	34%
Restaurant	1.88	8%	43%	1.88	8%	43%
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses <sup>2</sup>						

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						
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	518	302	216
Internal Capture Percentage	3%	3%	4%
External Vehicle-Trips <sup>5</sup>	145	84	61
External Transit-Trips <sup>6</sup>	37	21	16
External Non-Motorized Trips <sup>6</sup>	214	127	87

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	2%	2%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

<sup>1</sup>Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

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

<sup>3</sup>Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

<sup>4</sup>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.

<sup>5</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

<sup>6</sup>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

<b>Project Name:</b>	Eastridge Plaza
<b>Analysis Period:</b>	AM Street Peak Hour

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	1.14	39	44	1.14	26	30
Restaurant	1.88	137	258	1.88	99	186
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

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	9		4	0	4	0
Restaurant	58	26		0	7	6
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		14	59	0	0	0
Retail	0		129	0	0	0
Restaurant	0	4		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	7	52	0		0
Hotel	0	2	15	0	0	

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	0	0	0	0	0	0
Retail	4	40	44	18	1	18
Restaurant	4	254	258	66	20	109
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 <sup>3</sup>	0	0	0	0	0	0

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	0	0	0	0	0	0
Retail	4	26	30	14	1	9
Restaurant	4	182	186	47	15	78
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 <sup>3</sup>	0	0	0	0	0	0

<sup>1</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A  
<sup>2</sup>Person-Trips  
<sup>3</sup>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:	6/8/2022
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 <sup>3</sup>		
	ITE LUCs <sup>1</sup>	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	822	27	KSF	180	90	90
Restaurant	933	5	KSF	182	91	91
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses <sup>2</sup>				0		
				362	181	181

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized
Office						
Retail	1.30	1%	39%	1.33	1%	40%
Restaurant	1.88	6%	58%	1.88	6%	58%
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses <sup>2</sup>						

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		35	0	0	0
Restaurant	0	59		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	579	288	291
Internal Capture Percentage	32%	33%	32%
External Vehicle-Trips <sup>5</sup>	111	52	59
External Transit-Trips <sup>6</sup>	17	9	8
External Non-Motorized Trips <sup>6</sup>	201	102	99

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	50%	29%
Restaurant	20%	35%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

<sup>1</sup>Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

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

<sup>3</sup>Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

<sup>4</sup>Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made.

<sup>5</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

<sup>6</sup>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

<b>Project Name:</b>	Eastridge Plaza
<b>Analysis Period:</b>	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	1.30	90	117	1.33	90	120
Restaurant	1.88	91	171	1.88	91	171
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		35	5	31	6
Restaurant	5	70		14	31	12
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		9	3	0	0	0
Retail	0		50	0	0	0
Restaurant	0	59		0	0	0
Cinema/Entertainment	0	5	5		0	0
Residential	0	12	24	0		0
Hotel	0	2	9	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 <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	0	0	0	0	0	0
Retail	59	58	117	26	1	23
Restaurant	35	136	171	26	8	79
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 <sup>3</sup>	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 <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	0	0	0	0	0	0
Retail	35	85	120	38	1	34
Restaurant	59	112	171	21	7	65
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 <sup>3</sup>	0	0	0	0	0	0

<sup>1</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

<sup>2</sup>Person-Trips

<sup>3</sup>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.