

Drainage Reports

Abbreviated Water & Sewer Need Reports

Water Study

Wastewater Study

Stormwater Waiver Application



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To: The Bell Group LLC
 c/o George H. Bell

From: Jamie Blakeman, PE, PTOE

Job Number: 17.1033.001

RE: Storage @ Shea LLC
 Traffic Impact & Mitigation Analysis

Location: Approx. 300' east of 116th St. south of Shea Blvd.

Date: October 18, 2017



EXPIRES 6-30-19

INTRODUCTION

J2 Engineering and Environmental Design (J2) has prepared a Traffic Impact and Mitigation Analysis for the proposed Shea Self Storage development, located approximately 300 feet east of 116th Street south of Shea Boulevard, in Scottsdale, Arizona. See **Figure 1** for a vicinity map.

The proposed development will be comprised of an approximately 105,864 square foot (SF) building with a net leasable area of 79,398 SF intended for 700 storage units. See **Attachment A** and **Figure 2** for the site map.

The objective of this Traffic Impact and Mitigation Analysis is to analyze the traffic related impacts of the proposed development to the adjacent roadway network.

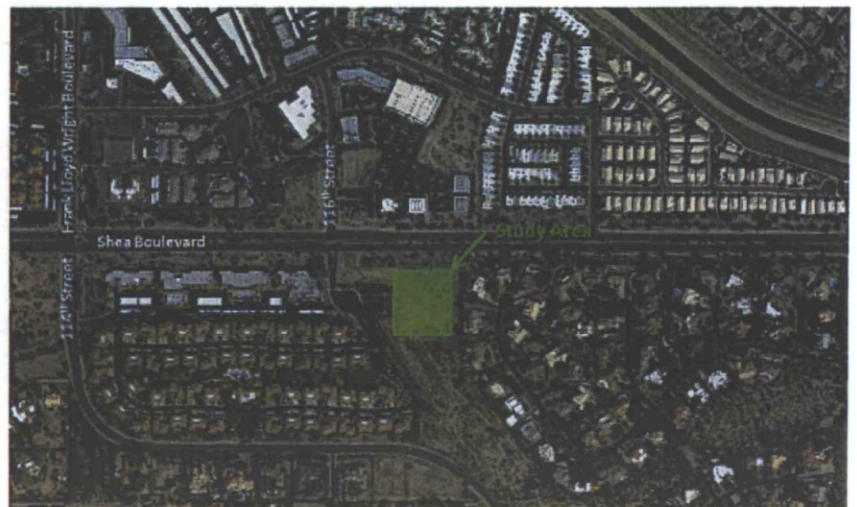


Figure 1- Vicinity Map



EXISTING CONDITIONS

This parcel is currently undeveloped land, and is currently zoned for S-R developments. Shea Boulevard borders the property to the north. Directly east of the property is a residential community. The main buildings for the Mirage Crossing Office Condominiums, an office and residential development, are located west of 116th Street. A parking lot also serving the Mirage Crossing Office Condominiums is located to the east of 116th Street just west of the proposed Shea Self Storage. Immediately south of the proposed development is currently undeveloped land.

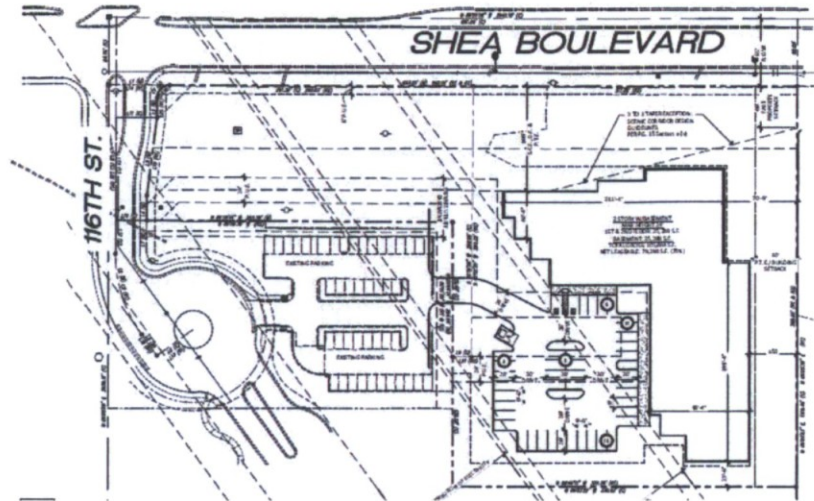


Figure 2- Site Map

STUDY ROADWAY SEGMENTS

Shea Boulevard is an east-west roadway within the vicinity of the proposed development. Shea Boulevard provides three (3) lanes for each direction of travel, with a raised center median. At the intersection with 116th Street, Shea Boulevard provides dedicated left and right turn lanes for both directions of travel. The access at the intersection is limited to left-in, right-in and right-out. The 2014 Average Daily Traffic (ADT) volume along Shea Boulevard from Frank Lloyd Wright Boulevard/114th Street to 124th Street is 39,000 vehicles per day. The 2016 City of Scottsdale *Transportation Master Plan* categorizes Shea Boulevard as a major arterial. There is a posted speed limit of 50 mph within the vicinity area.

Frank Lloyd Wright Boulevard/114th Street is a north-south roadway within the vicinity of the proposed development. North of Shea Boulevard, Frank Lloyd Wright Boulevard provides two (2) lanes for each direction of travel, with a raised center median. South of Shea Boulevard, 114th Street provides one (1) lane for each direction of travel with a two-way left turn lane. The 2014 Average Daily Traffic (ADT) volume along Frank Lloyd Wright Boulevard from Shea Boulevard to Via Linda is 21,500 vehicles per day, 114th Street between Shea Boulevard and Mountain View Road is 3,000 vehicles per day. The 2016 City of Scottsdale *Transportation Master Plan* categorizes Frank Lloyd Wright Boulevard as a minor arterial, with 114th Street classified as a minor collector. There is a posted speed limit of 40 mph north of Shea Boulevard, and 30 mph south of Shea Boulevard.





116th Street is a north-south roadway within the vicinity of the proposed development. 116th Street provides one (1) lane for each direction of travel. There is a posted speed limit of 25 mph.

PROPOSED DEVELOPMENT

The proposed Shea Self Storage development will include one two-story building, with a basement. The site will be located approximately 300 feet east of 116th Street south of Shea Boulevard, in Scottsdale, Arizona.

The proposed site plan indicates that this development will have one (1) access point. The single access driveway will connect through the existing Mirage Crossing Office Condominiums parking lot.

TRIP GENERATION (EXISTING ZONING)

The existing parcel is currently zoned for S-R land uses. The trip generation for the existing S-R zoning was calculated utilizing the Institute of Transportation Engineers (ITE) publication entitled *Trip Generation Manual, 9th Edition*. This publication is considered the standard for the transportation engineering profession. The ITE trip generation rates and equations are based on studies that measured the trip generation characteristics for various types of land uses. The rates and equations are expressed in terms of trips per unit of land use type.

According to the City of Scottsdale Code of Ordinances, the S-R Service Residential zoning is intended primarily to provide offices of a residential scale and character to serve nearby neighborhoods; and secondarily, to offer medium density residential land uses. Therefore an office building was assumed on this site for the S-R zoning.

As shown on the site plan, the net site area is 165,029 SF. It is reasonable to assume a development with a floor area ratio (FAR) of 0.50 on this site. Therefore, an 82,515 SF office building (S-R zoning) was assumed. The trip generation was calculated utilizing the ITE Land Use 710 General Office Building. See **Table 1** below. See **Attachment B** for detailed trip generation calculations.

Table 1 – Trip Generation for S-R Land Use (82,515 SF Office)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
General Office Building	710	82.5	1000 SF GFA	910	129	113	15	123	21	102





Another land use allowed under S-R zoning is a day care center. The Tutor Time of Scottsdale located at 11350 E. Via Linda less than a mile northwest of the proposed site is a 10,000 SF building, and The Goddard Preschool located at 13940 N. Frank Lloyd Wright Boulevard less than three miles northwest of the proposed site is a 7,500 SF building. Therefore, as a conservative estimate, a 10,000 SF day care center was assumed. The trip generation was calculated utilizing the ITE Land Use 565 Day Care Center. See **Table 2** below. See **Attachment B** for detailed trip generation calculations.

Table 2 – Trip Generation for S-R Land Use (10,000 SF Day Care Center)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Day Care Center	565	10	1000 SF GFA	741	122	65	57	123	58	65

A charter school is a potential land use under S-R zoning. Student enrollment for some of nearby charter schools located in the City of Scottsdale range between 400 to 1,400 students. BASIS Scottsdale, located approximately 1 ½ miles east of the proposed development, is an approximate 70,377 SF school, with an estimated student enrollment of approximately 1,100 students. Mission Montessori Academy is located 1 2/3 mile east of the proposed development with an approximate enrollment of 270 students.

Taking the average between the two nearby charter schools, a charter school with an enrollment of 685 students was assumed. Due to the assumed similar operations, trip generation for a charter school was calculated utilizing the ITE Lane Use 536 Private School (K-12). See **Table 3** below. See **Attachment B** for detailed trip generation calculations.

Table 3 – Trip Generation for S-R Land Use (635 Student Charter School)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Charter School	536	685	Students	1,699	555	338	216	116	49	68

TRIP GENERATION (PROPOSED ZONING)

It has been requested that the parcel be rezoned from S-R zoning to C-1 zoning. According to the City of Scottsdale Code of Ordinances, the C-1 Neighborhood Commercial zoning is intended to provide a center for convenience shopping and services for nearby neighborhoods. The district provides for small business retail and service establishments which supply commodities and services to meet the daily needs of the community.

For the purposes of this report, the trip generations for two different C-1 land uses were calculated, first for a fast-food restaurant with a drive-through window, and second for a shopping center.





The fast-food restaurant with a drive-through window was assumed to be 3,000 SF, which is a typical size for this type of use. The trip generation was calculated utilizing the ITE Land Use 934 Fast-Food Restaurant with Drive-Through Window. See **Table 4** below. See **Attachment B** for detailed trip generation calculations.

Table 4 – Trip Generation for C-1 Land Use (3,000 SF Fast-Food w/Drive-Thru)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Fast-Food Restaurant with Drive-Through Window	934	3	1000 SF GFA	1,488	136	69	67	98	51	47

An 82,515 SF shopping center was assumed utilizing a reasonable FAR of 0.50. The trip generation was calculated utilizing the ITE Land Use 820 Shopping Center. See **Table 5** below. See **Attachment B** for detailed trip generation calculations.

Table 5 – Trip Generation for C-1 Land Use (82,515 SF Shopping Center)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Shopping Center	820	82.5	1000 SF GFA	3,523	79	49	30	306	147	159

TRIP GENERATION (PROPOSED DEVELOPMENT)

The proposed self storage development will be comprised of a 105,864 SF building with a net rentable area (NRA) of 79,398 SF intended for 700 storage units. See **Figure 2** for the site map. The proposed trip generation was calculated utilizing the ITE Land Use 151 Mini-Warehouse. See **Table 6** below. See **Attachment B** for detailed trip generation calculations.

Table 6 – Trip Generation for the Proposed Development (105,864 SF GLA/79,398 SF NRA Self Storage)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Mini-Warehouse	151	79.4	1000 SF NRA	131	9	5	4	15	8	7
Total				131	9	5	4	15	8	7



TRIP GENERATION COMPARISON

The trips generated by an 82,515 SF office building, a 10,000 SF day care center, and a charter school with an enrollment of 685 students under the existing S-R zoning were compared. The charter school generated more trips than the office building or the day care center.

For the proposed C-1 zoning, the trips generated by a 3,000 SF fast-food restaurant with drive-through window, and a 82,515 SF shopping development were compared. While the fast-food restaurant generated more AM peak hour trips, the shopping center generates more daily and PM peak hour trips. Therefore, the trips generated by a charter school with 685 students (existing S-R zoning) and an 82,515 SF shopping center (proposed C-1 zoning) were compared and are shown in **Table 7**.

**Table 7 - Trip Generation Comparison
Existing S-R Zoning (Charter School) vs. Proposed C-1 Zoning (Shopping Center)**

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Existing S-R Zoning (Charter School)	536	685	Students	1,699	555	338	216	116	49	68
Proposed C-1 (Shopping Center)	820	82.5	1000 SF GFA	3,523	79	49	30	306	147	159
Difference				1,825	-476	-289	-186	190	98	92

Selecting the higher trip generator of the two existing zoning land uses and comparing it to the higher trip generator of the three proposed zoning land uses results in the proposed zoning land uses to potentially generate 1,825 additional daily trips, 476 fewer AM peak hour trips, and 190 additional PM peak hour trips.

SUMMARY

The proposed development of the Shea Self Storage consists of a 105,864 SF building with a NRA of 79,398 SF intended for 700 storage units. Shea Self Storage will be located approximately 300' east of 116th Street south of Shea Boulevard, in Scottsdale, Arizona. The proposed development is anticipated to generate a total of 131 weekday trips, with 9 and 15 trips occurring during the AM and PM peak hours, respectively.

Existing S-R Zoning

The trip generation for three potential S-R land uses was calculated and included an 82,515 SF office, a 10,000 SF day care center, and a charter school with an enrollment of 685 students. A charter school generated the most trips with 1,699 weekday, 405 AM peak, and 85 PM peak hour trips.

Proposed C-1 Zoning

The trip generation for two potential C-1 land uses was calculated and included a 3,000 SF fast-food restaurant with drive-through window and an 82,515 SF shopping center. While the fast-food restaurant



generated more AM peak hour trips, the shopping center generated more daily and PM peak hour trips. The shopping center generated 3,523 weekday trips, and 79 and 306 trips during the AM and PM peak hours, respectively.

The six trip generation comparison calculations are shown in **Table 8**. The proposed self storage development generates far fewer trips than the existing S-R zoning for a potential office, a day care center or a charter school land use. Additionally, the proposed site generates far fewer trips than the proposed C-1 zoning for a potential fast-food restaurant with drive-through window or a shopping center. The proposed C-1 zoning has the potential to generate more weekday daily trips, however fewer AM and PM peak hour trips, with the exception of the PM peak hour trips for a shopping center.

Table 8 - Trip Generation Calculation Summary

Land Use		ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
					Total	Total	In	Out	Total	In	Out
Existing S-R Zoning	Office	710	82.5	1000 SF GFA	910	129	113	15	123	21	102
	Day Care Center	565	10	1000 SF GFA	741	122	65	57	123	58	65
	Private School (K-12)	536	685	Students	1,699	555	338	216	116	49	68
Proposed C-1 Zoning	Fast-Food w/Drive-Thru	934	3	1000 SF GFA	1,488	136	69	67	98	51	47
	Shopping Center	820	82.5	1000 SF GFA	3,523	79	49	30	306	147	159
Proposed Development	Self Storage	151	79	1000 SF NRA	131	9	5	4	15	8	7

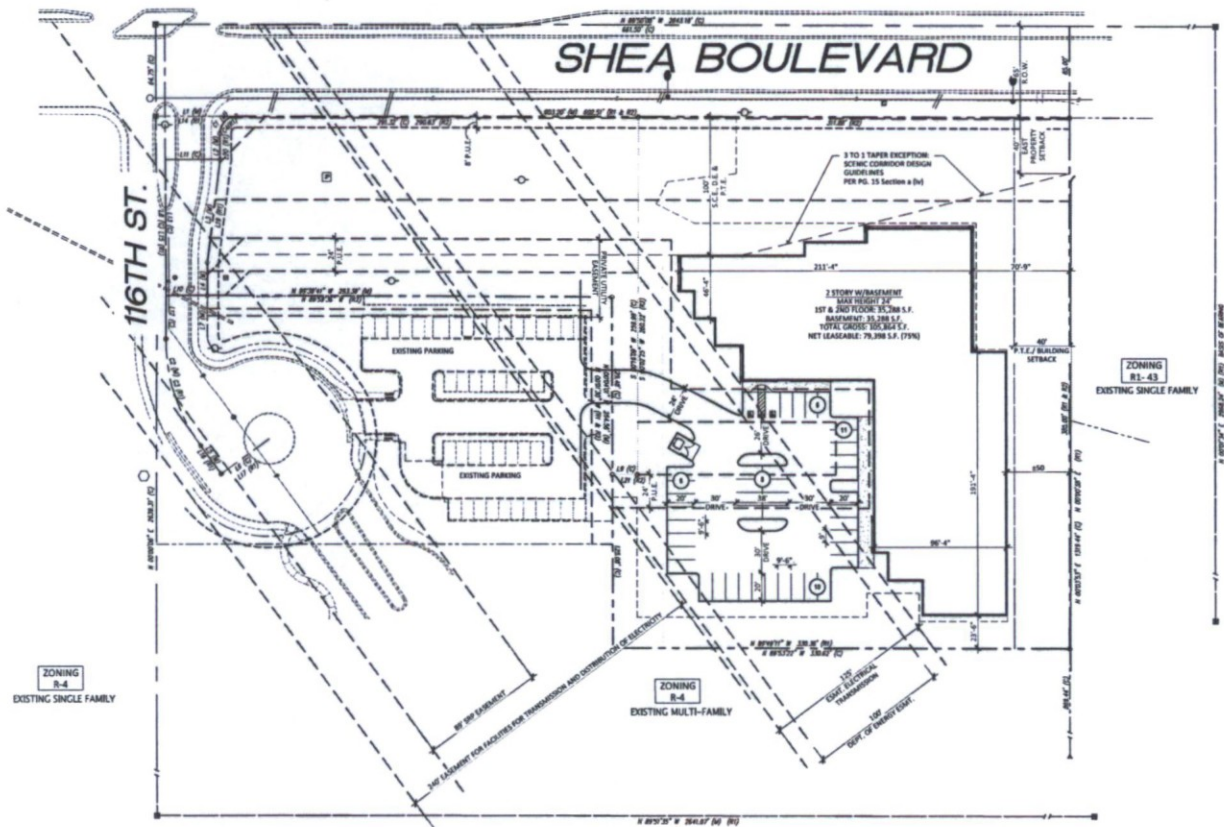
The location of the proposed site provides direct access to Shea Boulevard through the use of 116th Street. The 2014 ADT along Shea Boulevard from Frank Lloyd Wright Boulevard/114th Street to 124th Street was 39,000 vehicles per day. It is assumed that all trips for the proposed Shea Self Storage development will access the site via Shea Boulevard. Therefore, the weekday volume along Shea Boulevard will increase by 131 vehicles per day. This is an approximate increase of 0.34% in the average weekday traffic volume along Shea Boulevard. **Therefore, the proposed Shea Self Storage development will have minimal impacts to the traffic operations along the surrounding roadway network.**





**Attachment A
Proposed Site Plan**

ZONING
S-R
SERVICE RESIDENTIAL



ZONING
S-R
SERVICE RESIDENTIAL

ZONING
R-4
EXISTING SINGLE FAMILY

ZONING
R-4
EXISTING MULTI-FAMILY

ZONING
R1-43
EXISTING SINGLE FAMILY

SITE PLAN
SCALE: 1" = 40'-0"



PROJECT DIRECTORY

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SITE DATA

EXISTING ZONING:	SR REZONE TO C-1
GROSS SITE AREA:	4.60 ACRES (200,492 S.F.)
NET SITE AREA:	3.78 ACRES (165,029 S.F.)
PROPOSED USE:	INTERNALIZED COMMUNITY STORAGE
MAX BUILDING HEIGHT:	24 FEET
BUILDING AREA (2-STORY W/BSMT.):	105,864 S.F.
SITE COVERAGE:	22%
FAR (D.B. MAX):	132,023 S.F. ALLOWED 70,576 S.F. PROVIDED
OPEN SPACE/LANDSCAPE	(104,463 S.F.) 63%
TOTAL PARKING REQUIRED:	43 SPACES
STORAGE (105,864 S.F.)	INTERNALIZED COMMUNITY STORAGE @ 1/2500 = 43 SPACES
TOTAL PARKING PROVIDED:	43 SPACES
ACCESSIBLE SPACES REQUIRED:	2 SPACES
ACCESSIBLE SPACES PROVIDED:	2 SPACES

STORAGE AT SHEA (CONCEPTUAL)
SEC 116TH STREET AND SHEA BOULEVARD
SCOTTSDALE, AZ
DATE: 06-14-2017 (PRELIMINARY)

SP-1
RCAA# 17120.5





**Attachment B
Trip Generation**

Self Storage - Net Rentable Area

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour				
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out		
Mini-Warehouse	151	79.4	1000 SF NRA	1.65	50%	50%	0.11	52%	48%	0.19	53%	47%	131	66	65	9	5	4	15	8	7	Average	
Mini-Warehouse	151	79.4	1000 SF NRA	1.19	50%	50%	0.04	52%	48%	0.11	53%	47%	94	47	47	3	2	1	9	5	4	Minimum	
Mini-Warehouse	151	79.4	1000 SF NRA	2.17	50%	50%	0.19	52%	48%	0.64	53%	47%	172	86	86	15	8	7	51	27	24	Maximum	
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour				
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out		
Mini-Warehouse	151	79.4	1000 SF NRA	N/A	N/A	N/A	T=0.14(X) - 2.06	52%	48%	N/A	N/A	N/A	N/A	N/A	N/A	9	5	4	N/A	N/A	N/A	Equation	
Mini-Warehouse				Standard Deviation	1.34			0.34			0.45												
Mini-Warehouse				Number of Studies	4			7			7												
Mini-Warehouse				Average Size	114			85			85												

Mini-warehouses are buildings in which a number of storage units or vaults are rented for the storage of goods. They are typically referred to as "self-storage" facilities. Each unit is physically separated from other units, and access is usually provided through an overhead door or other common access point.

S-R Zoning Use

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour				
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out		
General Office Building	710	82.5	1000 SF GFA	11.03	50%	50%	1.56	88%	12%	1.49	17%	83%	910	455	455	129	113	15	123	21	102	Average	
General Office Building	710	82.5	1000 SF GFA	3.58	50%	50%	0.6	88%	12%	0.49	17%	83%	295	148	148	50	44	6	40	7	34	Minimum	
General Office Building	710	82.5	1000 SF GFA	28.80	50%	50%	5.98	88%	12%	6.39	17%	83%	2,376	1188	1188	493	434	59	527	90	438	Maximum	
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour				
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out		
General Office Building	710	82.5	1000 SF GFA	Ln(T)=0.76Ln(X)+3.68	50%	50%	Ln(T)=0.80Ln(X)+1.57	88%	12%	T=1.12(X)+78.45	17%	83%	1,134	567	567	164	144	20	171	29	142	Equation	
General Office Building				Standard Deviation	6.15			1.4			1.37												
General Office Building				Number of Studies	79			218			236												
General Office Building				Average Size	197			222			215												

565-Day Care Center

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour				
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out		
Day Care Center	565	10	1000 SF GFA	74.06	50%	50%	12.18	53%	47%	12.34	47%	53%	741	370	370	122	65	57	123	58	65	Average	
Day Care Center	565	10	1000 SF GFA	35	50%	50%	4.43	53%	47%	2.66	47%	53%	350	175	175	44	23	21	27	13	14	Minimum	
Day Care Center	565	10	1000 SF GFA	126.07	50%	50%	34.92	53%	47%	33.66	47%	53%	1,261	630	630	349	185	164	337	158	178	Maximum	
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour				
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out		
Day Care Center	565	10	1000 SF GLA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Equation	
Day Care Center				Standard Deviation	24.53			6.4			6.93												
Day Care Center				Number of Studies	7			67			68												
Day Care Center				Average Size	5			4			4												

