



# Lenhart Traffic Consulting, Inc.

Transportation Planning & Traffic Engineering

## Existing Parking Spaces

The total number of existing parking spaces is calculated as follows and conforms with the prior parking calculations.

Existing surface spaces as of last submittals:	
DSP 05041, America Blvd Theater, Retail & Office	2,151 Spaces
Existing structure at Metro IV (Garage A)	+1,455 Spaces
Existing underground garage	+1,167 Spaces
Parcel S parking structure	+289 Spaces
Less surface parking removed for Parcel S	-312 Spaces
<hr/>	
<b>Original Total (from September 25, 2013 Memo)</b>	<b>4,750 Spaces</b>
Plus Parcel R parking structure	+95 Spaces
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<b>Revised Total with Parcel R</b>	<b>4,845 Spaces</b>

## Proposed Revisions

The potential re-development of the existing structure at Metro IV (Garage A) would result in a 50% reduction in parking (-728 spaces) for a total of approximately 727 spaces at this structure plus the addition of approximately 200 multi-family residential units. This would reduce the total parking supply to 4,117 spaces. The table below reflects the potential revision to Garage A.

<b>Office – 2017/2019 Analysis</b>		<b>Office – Revised (2021 Analysis)</b>	
Metro I	330,400 SF	Metro I	330,400 SF
Metro II	0 SF	Remove Metro II Office	0 SF
Metro III	494,000 SF	Metro III	494,000 SF
Metro IV	195,350 SF	Metro IV	195,350 SF
America Blvd	58,886 SF	America Blvd	58,886 SF
Parcel S Office	16,741 SF	Parcel S Office	16,741 SF
<hr/>		<hr/>	
<b>Total Office</b>	<b>1,095,377 SF</b>	<b>Total Office</b>	<b>1,095,377 SF</b>
<b>Retail – 2017/2019 Analysis</b>		<b>Retail – Revised (2021 Analysis)</b>	
Independence One	28,000 SF	Independence One	28,000 SF
America Blvd	34,903 SF	America Blvd	34,903 SF
Theater at America Blvd	93,100 SF	Theater at America Blvd	93,100 SF
Parcel S Retail	68,783 SF	Parcel S Retail	68,783 SF
<hr/>		<hr/>	
<b>Total Retail</b>	<b>224,786 SF</b>	<b>Total Retail</b>	<b>224,786 SF</b>
<b>Residential – 2017/2019 Analysis</b>		<b>Residential – Revised (2021 Analysis)</b>	
Independence One	112 Units	Independence One	112 Units
Residential Tower	910 Units	Residential Tower	910 Units
Metro II Residential	339 SF	Metro II Residential	339 Units
<b>Garage A</b>	<b>0 Units</b>	<b>Garage A</b>	<b>200 Units</b>
<hr/>		<hr/>	
<b>Total Residential</b>	<b>1361 Units</b>	<b>Total Residential</b>	<b>1561 Units</b>

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## Revisions to Parking Spaces

The total number of existing parking spaces is calculated as follows and conforms with the prior parking calculations.

Existing surface spaces as of last submittals: DSP 05041, America Blvd Theater, Retail & Office	2,151 Spaces
Existing structure at Metro IV (Garage A)	+1,455 Spaces – 728 Spaces
Existing underground garage	+1,167 Spaces
Parcel S parking structure	+289 Spaces
Less surface parking removed for Parcel S	-312 Spaces
Plus Parcel R parking structure	+95 Spaces
<hr/>	
<b>Revised Total with Garage A Reduction</b>	<b>4,117 Spaces</b>

The 2019 updated shared parking analysis shown on Exhibit 1 has been conducted using parking demand models from the Institute for Transportation Engineers (ITE) Parking Generation Manual, 5th Edition (released in January of 2019) which now includes dense multi-use urban demand models to better assess parking demand in this mixed-use urban setting, particularly with the close proximity of the transit station (< ½ Mile).

Exhibit 1 is the new updated spreadsheet, and the highlights are as follows:

- The recent ITE Parking Manual added new land uses that more accurately reflect the parking requirements of the existing uses and their proximity to transit. They added “Dense Multi-Use Urban” land uses for retail, office, and residential. They also added residential uses within ½ mile of transit.
- The residential uses have been separated into residential units (# units) and the student housing towers (# beds). ITE added parking in terms of the number of beds and this would be more reasonable to evaluate the towers in terms of beds rather than units given the student housing nature of the facility.
- The maximum parking demand is 2,403 spaces based on the attached ITE analysis.
- Current spaces are 4,845 but approximately half of the Garage A spaces would be eliminated resulting in a total of approximately 4,117 spaces.
- There would be a surplus of 1,714 spaces with the proposed conversion of Garage A to eliminate half the parking spaces and develop approximately 200 multi-family residential units

The parking report above is based on the overall parking supply and demand within the entirety of UTC, and it shows that with the conversion of half of the garage to approximately 200 units, that the overall UTC would have a surplus of 1,714 spaces.

Transportation Planning Division also requested an assessment of the parking demand in Garage A to determine actual parking demands. The parking report below is a monthly parking report from Garage A depicting the actual daily parking demand for the entire month of February 2022.

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## Transportation Planning & Traffic Engineering

Day	Date	Tickets Issued	Tickets Cash	Counted Tickets	Spaces	Ticket Value	Per Ticket Value	Value per Space	Total Revenue	Revenue per Space	Per Trans Park
Tue	2/1/2022	283	215	64	1,455	\$226.00	\$1.05	\$0.16	\$226.00	\$0.16	
Wed	2/2/2022	284	224	60	1,455	\$169.00	\$0.75	\$0.12	\$169.00	\$0.12	
Thu	2/3/2022	295	216	79	1,455	\$189.00	\$0.88	\$0.13	\$189.00	\$0.13	
Fri	2/4/2022	293	236	57	1,455	\$305.00	\$1.29	\$0.21	\$305.00	\$0.21	
Sat	2/5/2022	94	66	28	1,455	\$181.00	\$2.74	\$0.12	\$181.00	\$0.12	
Sun	2/6/2022	84	47	37	1,455	\$91.00	\$1.94	\$0.06	\$91.00	\$0.06	
Mon	2/7/2022	259	206	53	1,455	\$145.00	\$0.70	\$0.10	\$145.00	\$0.10	
Tue	2/8/2022	292	211	75	1,455	\$264.00	\$1.25	\$0.18	\$264.00	\$0.18	
Wed	2/9/2022	259	198	61	1,455	\$128.00	\$0.65	\$0.09	\$128.00	\$0.09	
Thu	2/10/2022	273	205	68	1,455	\$201.00	\$0.98	\$0.14	\$201.00	\$0.14	
Fri	2/11/2022	270	214	56	1,455	\$204.00	\$0.95	\$0.14	\$204.00	\$0.14	
Sat	2/12/2022	90	70	20	1,455	\$166.00	\$2.37	\$0.11	\$166.00	\$0.11	
Sun	2/13/2022	62	42	20	1,455	\$143.00	\$3.40	\$0.10	\$143.00	\$0.10	
Mon	2/14/2022	274	206	56	1,455	\$178.00	\$0.86	\$0.12	\$178.00	\$0.12	
Tue	2/15/2022	260	205	55	1,455	\$211.00	\$1.03	\$0.15	\$211.00	\$0.15	
Wed	2/16/2022	273	211	62	1,455	\$162.00	\$0.77	\$0.11	\$162.00	\$0.11	
Thu	2/17/2022	302	236	66	1,455	\$269.00	\$1.14	\$0.18	\$269.00	\$0.18	
Fri	2/18/2022	275	214	61	1,455	\$191.00	\$0.89	\$0.13	\$191.00	\$0.13	
Sat	2/19/2022	76	51	25	1,455	\$108.00	\$2.12	\$0.07	\$108.00	\$0.07	
Sun	2/20/2022	81	53	28	1,455	\$106.75	\$2.01	\$0.07	\$106.75	\$0.07	
Mon	2/21/2022	139	80	59	1,455	\$115.00	\$1.44	\$0.08	\$115.00	\$0.08	
Tue	2/22/2022	308	235	73	1,455	\$293.50	\$1.25	\$0.20	\$293.50	\$0.20	
Wed	2/23/2022	258	187	71	1,455	\$169.00	\$0.90	\$0.12	\$169.00	\$0.12	
Thu	2/24/2022	271	208	63	1,455	\$223.00	\$1.07	\$0.15	\$223.00	\$0.15	
Fri	2/25/2022	287	216	71	1,455	\$186.00	\$0.86	\$0.13	\$186.00	\$0.13	
Sat	2/26/2022	95	65	30	1,455	\$189.00	\$2.91	\$0.13	\$189.00	\$0.13	
Sun	2/27/2022	75	42	33	1,455	\$63.00	\$1.50	\$0.04	\$63.00	\$0.04	
Mon	2/28/2022	292	233	59	1,455	\$384.00	\$1.65	\$0.26	\$384.00	\$0.26	
Totals		6,104	4,592	1,490		\$5,260.25			\$5,260.25		
Averages		218	164	53	1,455	\$187.87	\$1.15	\$0.13	\$187.87	\$0.13	

This report showed that the maximum number of parking tickets for any one day was 308 tickets. This does not mean that 308 vehicles were parked at the same time. It means that throughout the day they issued 308 tickets and if the vehicles came and went at different times throughout the day (as expected) then the actual parking demand at any one time would be a maximum of 308. It should also be noted that Kaiser Permanente was under a temporary contract to utilize parking spaces in Garage A while their facility was under construction at the West Hyattsville Metro Station. Therefore the 308 peak parking demand is actually an inflated number due to the temporary usage of Kaiser Permanente.

Once half of the garage spaces are eliminated for the conversion of that portion of Garage A to residential units, that would result in 728 parking spaces remaining to serve the residential units and other users

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currently using Garage A. Based on ITE Parking Generation's peak parking demand estimates for this use, we'd need a minimum of 262 spaces to accommodate 200 units.

According to parking data from February of 2022, the peak parking demand for Garage A was 308 on any given day. The existing demand of 308 spaces plus 262 spaces needed to accommodate the new residential units would equate to a peak parking demand of 570 vehicles for the proposed use. Since there would be 728 spaces available in Garage A, that would leave a surplus of 158 spaces in the garage which would be more than adequate.

If you have any questions regarding this matter, please do not hesitate to contact me at the number below.

Thanks,  
Mike Lenhart

**EXHIBIT 1**  
**University Town Center (Updated October 22, 2021)**  
**SHARED PARKING ANALYSIS - UPDATED**  
**WEEKDAY PEAK HOURLY DEMAND**

Land Use	Density		
Office =	1,095,377	sq. ft.	
Residential =	451	units	PLUS 200 MF units at Toledo Garage for a total of 651 units
Residential Towers =	910	beds	
Retail =	224,786	sq. ft.	

NOTE: 4,845 Existing Spaces minus 50% (-728) Parking Spaces in the Metro IV Structure for a revised total of 4117 spaces

**Peak Parking Demand:**

Peak Parking Demand for Office (per ITE) =	$P = 1.44 \times (\text{ksf}) + 47.42 =$	1,625
Peak Parking Demand for Residential (per ITE) =	$P = 0.65 \times (\text{\#Units}) + 6.12 =$	429
Peak Parking Demand for Residential Towers (per ITE) =	$P = 0.35 \times (\text{\#Beds}) =$	319
Peak Parking Demand for Retail (per ITE) =	$\text{Ln}(P) = 0.94 \text{ Ln}(\text{ksf}) + 1.26 =$	573

**Weekday**

Time of Day	Residential %	Residential Demand	Office %	Office Demand	Retail %	Retail Demand	Residential Towers %	Residential Towers Demand	Total Demand	Supplied	Surplus
5:00 AM	100%	429	<b>0%</b>	0	<b>2%</b>	11	<b>100%</b>	319	440	4117	3677
6:00 AM	94%	403	<b>10%</b>	163	<b>4%</b>	23	<b>94%</b>	300	589	4117	3528
7:00 AM	83%	356	26%	423	<b>5%</b>	29	<b>83%</b>	265	808	4117	3309
8:00 AM	71%	305	65%	1056	15%	86	<b>71%</b>	226	1447	4117	2670
9:00 AM	61%	262	95%	1544	32%	183	<b>61%</b>	195	1989	4117	2128
10:00 AM	55%	236	100%	1625	54%	309	<b>55%</b>	175	2170	4117	1947
11:00 AM	54%	232	100%	1625	71%	407	<b>54%</b>	172	2264	4117	1853
12:00 PM	53%	227	99%	1609	99%	567	<b>53%</b>	169	2403	4117	1714
1:00 PM	50%	215	99%	1609	100%	573	<b>50%</b>	160	2397	4117	1720
2:00 PM	49%	210	97%	1576	90%	516	<b>49%</b>	156	2302	4117	1815
3:00 PM	49%	210	94%	1528	83%	476	<b>49%</b>	156	2214	4117	1903
4:00 PM	50%	215	90%	1463	81%	464	<b>50%</b>	160	2142	4117	1975
5:00 PM	58%	249	56%	910	84%	481	<b>58%</b>	185	1640	4117	2477
6:00 PM	64%	275	20%	325	86%	493	<b>64%</b>	204	1093	4117	3024
7:00 PM	67%	287	11%	179	80%	458	<b>67%</b>	214	924	4117	3193
8:00 PM	70%	300	<b>10%</b>	163	63%	361	<b>70%</b>	223	824	4117	3293
9:00 PM	76%	326	<b>10%</b>	163	42%	241	<b>76%</b>	242	730	4117	3387
10:00 PM	83%	356	<b>5%</b>	81	15%	86	<b>83%</b>	265	523	4117	3594
11:00 PM	90%	386	<b>0%</b>	0	<b>10%</b>	57	<b>90%</b>	287	443	4117	3674
12:00 AM	93%	399	<b>0%</b>	0	<b>5%</b>	29	<b>93%</b>	297	428	4117	3689

Maximum Weekday Hourly Demand = 2,403 Spaces  
Current Spaces Supplied = 4,117 Spaces  
Parking Surplus = 1,714 Spaces

- NOTE: 1. Parking Generation and Hourly diurnal time-of-day rates are obtained from the ITE Parking Generation Manual, 5th Edition (2019)  
2. ITE did not provide some hourly data. Percentages in **bold italics** indicate estimated values.  
3. Peak Parking for Residential based on Dense Multi-Use Peak Parking within 1/2 mile of transit.  
4. Peak Parking for retail based on Non-Friday Non-December Dense Multi-Use Urban Peak Parking Demand Formula  
5. Peak Parking for office based on Dense Multi-Use Urban Peak Parking Demand Formula

## Land Use: 221 Multifamily Housing (Mid-Rise)

### Description

Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and with between three and 10 levels (floors) of residence. Multifamily housing (low-rise) (Land Use 220), multifamily housing (high-rise) (Land Use 222), and affordable housing (Land Use 223) are related land uses.

### Time of Day Distribution for Parking Demand

The following table presents a time-of-day distribution of parking demand on a weekday (one general urban/suburban study site), a Saturday (two general urban/suburban study sites), and a Sunday (one dense multi-use urban study site).

Hour Beginning	Percent of Peak Parking Demand		
	Weekday	Saturday	Sunday
12:00–4:00 a.m.	100	100	100
5:00 a.m.	94	99	–
6:00 a.m.	83	97	–
7:00 a.m.	71	95	–
8:00 a.m.	61	88	–
9:00 a.m.	55	83	–
10:00 a.m.	54	75	–
11:00 a.m.	53	71	–
12:00 p.m.	50	68	–
1:00 p.m.	49	66	33
2:00 p.m.	49	70	40
3:00 p.m.	50	69	27
4:00 p.m.	58	72	13
5:00 p.m.	64	74	33
6:00 p.m.	67	74	60
7:00 p.m.	70	73	67
8:00 p.m.	76	75	47
9:00 p.m.	83	78	53
10:00 p.m.	90	82	73
11:00 p.m.	93	88	93

### Additional Data

In prior editions of *Parking Generation*, the mid-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of parking demand data found no clear differences in parking demand between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

The average parking supply ratios for the study sites with parking supply information are shown in the table below.

Setting	Proximity to Rail Transit	Parking Supply Ratio	
		Per Dwelling Unit	Per Bedroom
Center City Core	Within ½ mile of rail transit	1.1 (15 sites)	1.0 (12 sites)
Dense Multi-Use Urban	Within ½ mile of rail transit	1.2 (39 sites)	0.9 (34 sites)
	Not within ½ mile of rail transit	1.2 (65 sites)	0.8 (56 sites)
General Urban/ Suburban	Within ½ mile of rail transit	1.5 (25 sites)	0.8 (12 sites)
	Not within ½ mile of rail transit	1.7 (62 sites)	1.0 (39 sites)

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, Colorado, District of Columbia, Maryland, Massachusetts, New Jersey, New York, Oregon, Virginia, Washington, and Wisconsin.

*It is expected that the number of bedrooms and number of residents are likely correlated to the parking demand generated by a residential site. Parking studies of multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex). Future parking studies should also indicate the number of levels contained in the residential building.*

### Source Numbers

21, 209, 247, 255, 277, 401, 402, 419, 505, 512, 522, 533, 535, 536, 537, 538, 545, 546, 547, 575, 576, 577, 579, 580, 581, 583, 584, 585, 587

# Multifamily Housing (Mid-Rise) (221)

## Peak Period Parking Demand vs: Dwelling Units

On a: Weekday (Monday - Friday)

Setting/Location: Dense Multi-Use Urban (< 1/2 mile to rail transit)

Peak Period of Parking Demand: 10:00 p.m. - 5:00 a.m.

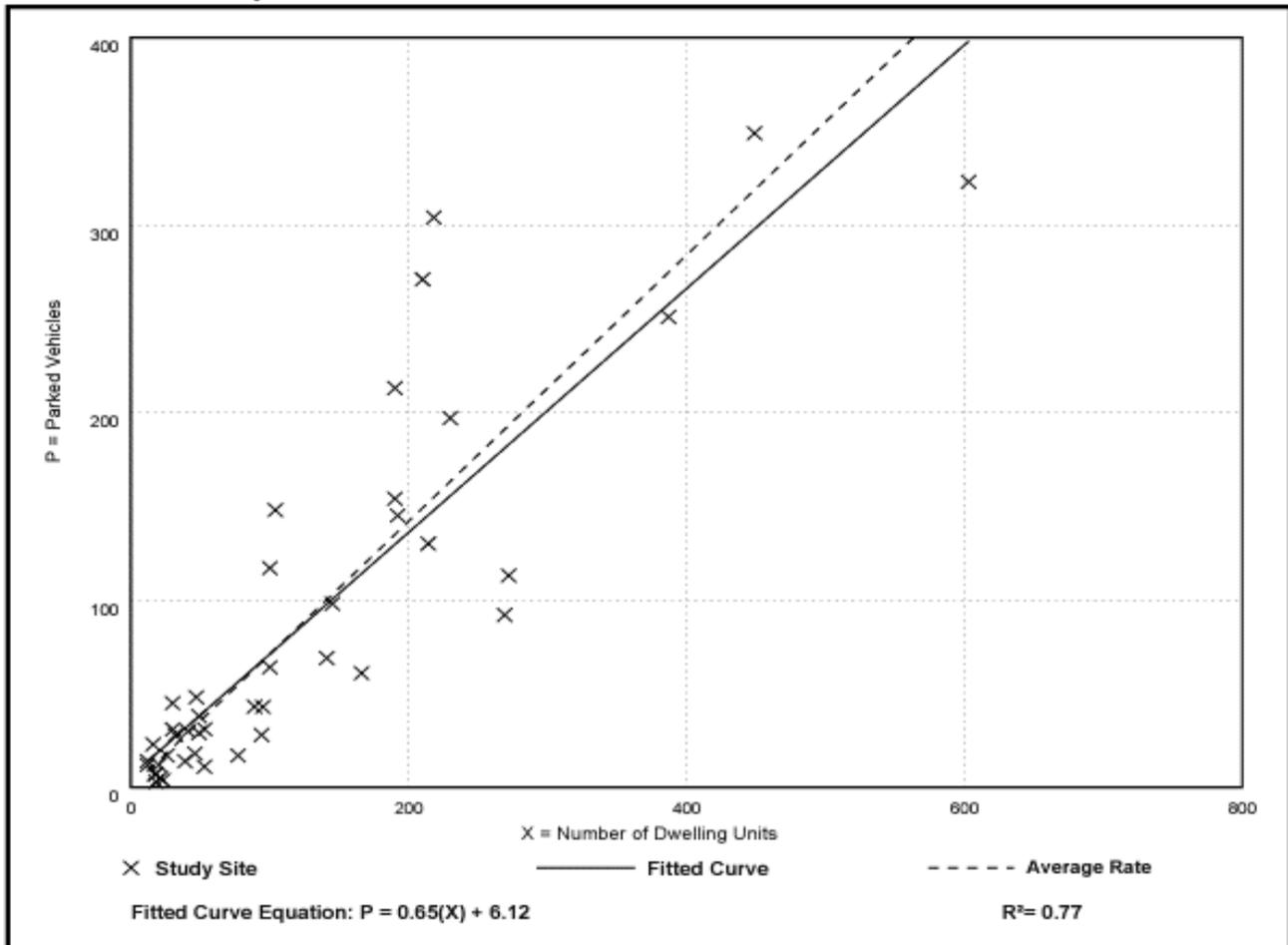
Number of Studies: 43

Avg. Num. of Dwelling Units: 121

## Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.71	0.17 - 1.50	0.47 / 1.17	0.61 - 0.81	0.32 ( 45% )

## Data Plot and Equation



## Land Use: 222 Multifamily Housing (High-Rise)

### Description

High-rise multifamily housing includes apartments and condominiums that have more than 10 levels (floors) of residence. They are likely to have one or more elevators. Multifamily housing (low-rise) (Land Use 220), multifamily housing (mid-rise) (Land Use 221), and affordable housing (Land Use 223) are related land uses.

### Additional Data

In prior editions of *Parking Generation*, the high-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of parking demand data found no clear differences in parking demand patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

The average parking supply ratios for the study sites with parking supply information are shown in the table below.

Setting	Proximity to Rail Transit	Parking Supply Ratio	
		Per Dwelling Unit	Per Bedroom
Center City Core	Within ½ mile of rail transit	0.7 (14 sites)	0.6 (13 sites)
Dense Multi-Use Urban	Within ½ mile of rail transit	0.6 (6 sites)	0.5 (6 sites)
	Not within ½ mile of rail transit	0.6 (1 site)	0.3 (1 site)
General Urban/ Suburban	Within ½ mile of rail transit	Not Available	Not Available
	Not within ½ mile of rail transit	1.2 (6 sites)	0.9 (1 site)

The sites were surveyed in the 1980s, the 2000s, and the 2010s in District of Columbia, Tennessee, and Virginia.

*It is expected that the number of bedrooms and number of residents are likely correlated to the parking demand generated by a residential site. Parking studies of multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex). Future parking studies should also indicate the number of levels contained in the residential building.*

### Source Numbers

71, 402, 583

# Multifamily Housing (High Rise) (222)

## Peak Period Parking Demand vs: Dwelling Units

On a: Weekday (Monday - Friday)

Setting/Location: Dense Multi-Use Urban (< 1/2 mile to rail transit)

Peak Period of Parking Demand: 10:00 p.m. - 5:00 a.m.

Number of Studies: 3

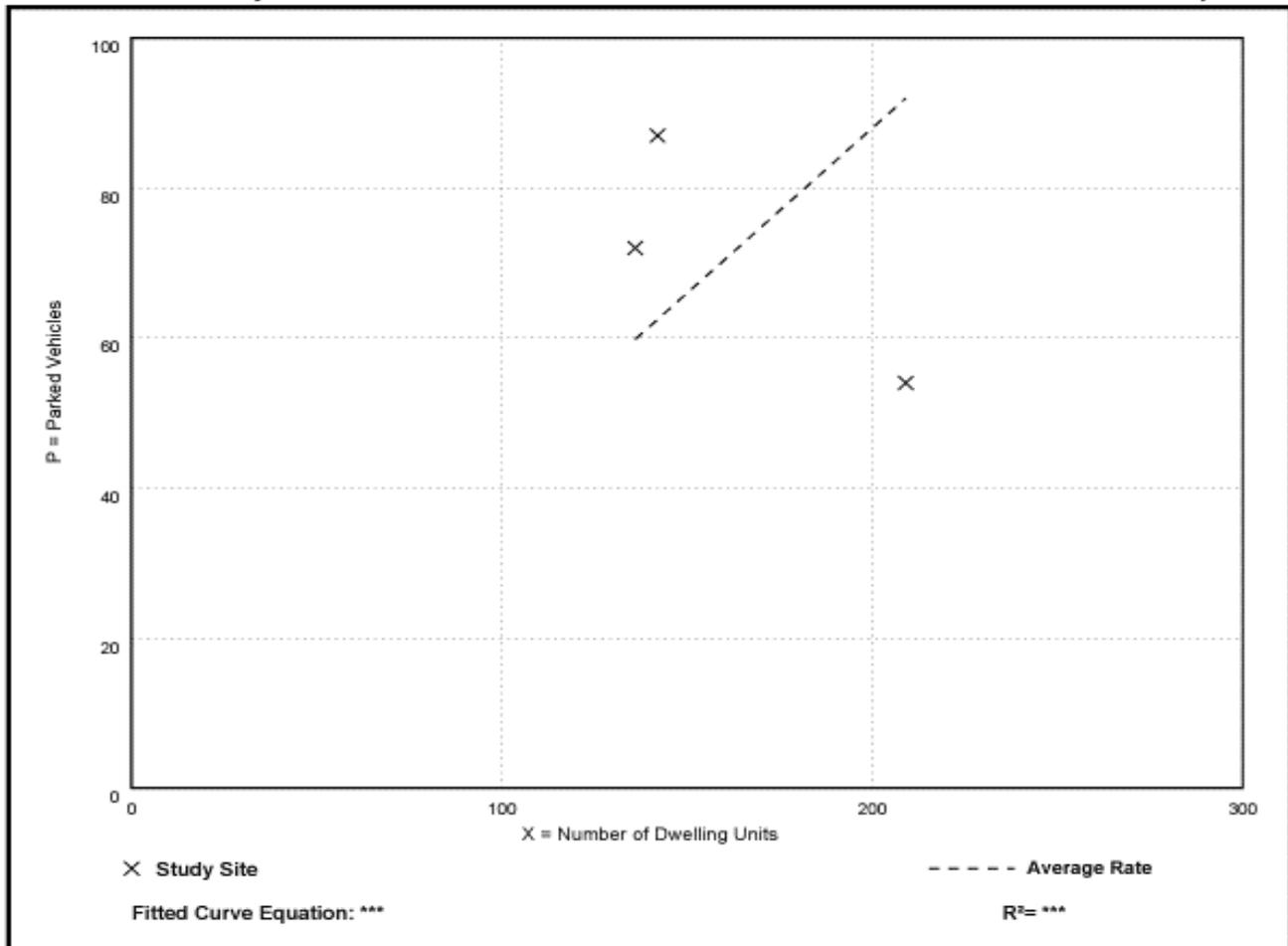
Avg. Num. of Dwelling Units: 162

### Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.44	0.26 - 0.61	0.35 / 0.61	***	0.19 ( 43% )

### Data Plot and Equation

*Caution – Small Sample Size*



# Multifamily Housing (High Rise) (222)

## Peak Period Parking Demand vs: Bedrooms

On a: Weekday (Monday - Friday)

Setting/Location: Dense Multi-Use Urban (< 1/2 mile to rail transit)

Peak Period of Parking Demand: 10:00 p.m. - 5:00 a.m.

Number of Studies: 3

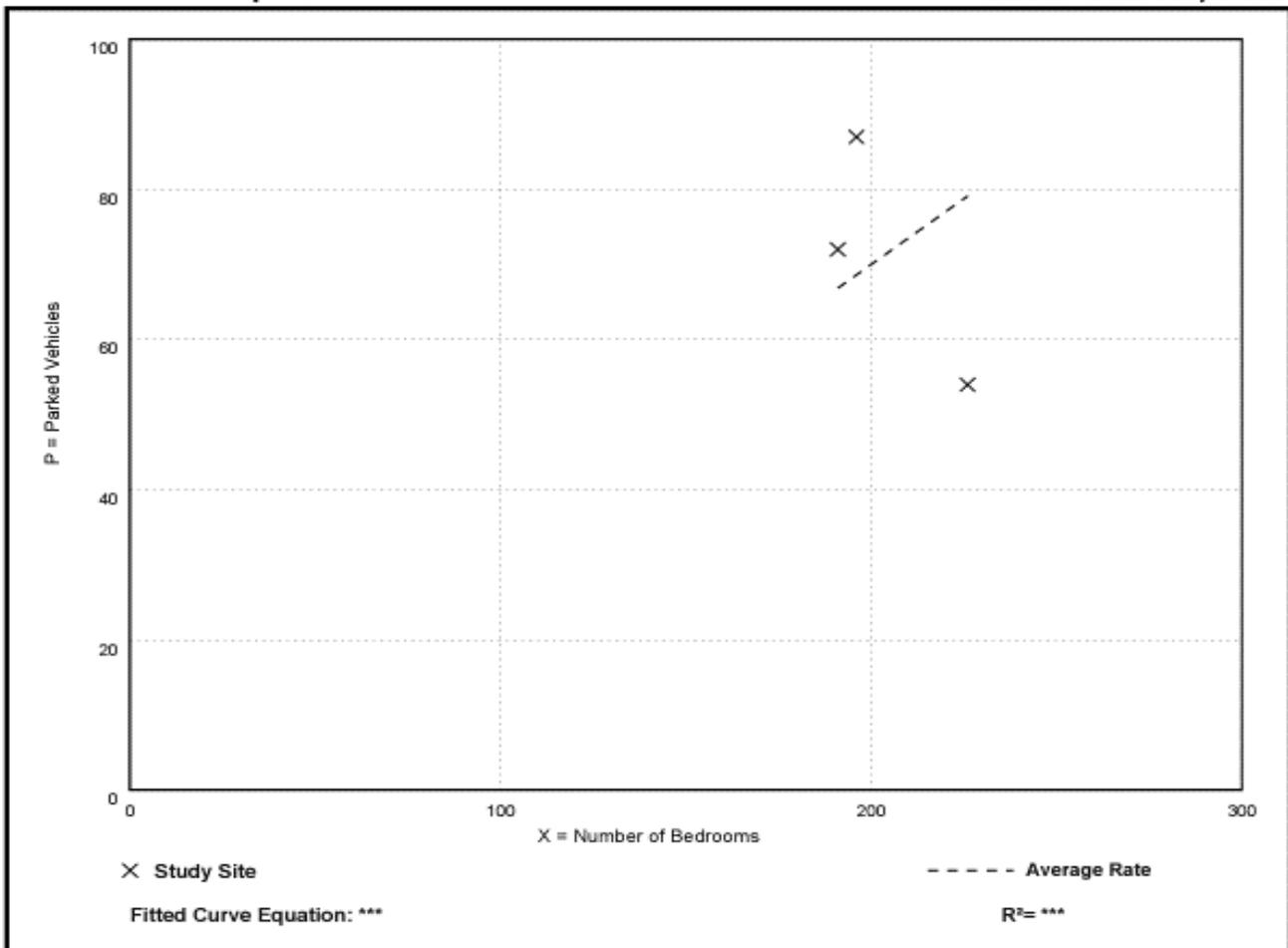
Avg. Num. of Bedrooms: 204

## Peak Period Parking Demand per Bedroom

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.35	0.24 - 0.44	0.28 / 0.44	***	0.11 ( 31% )

## Data Plot and Equation

Caution – Small Sample Size



## Land Use: 710 General Office Building

### Description

A general office building houses multiple tenants. It is a location where affairs of businesses, commercial or industrial organizations, or professional persons or firms are conducted. An office building or buildings may contain a mixture of tenants including professional services, insurance companies, investment brokers, and tenant services, such as a bank or savings and loan institution, a restaurant, or cafeteria and service retail facilities. A general office building with a gross floor area of 5,000 square feet or less is classified as a small office building (Land Use 712). Corporate headquarters building (Land Use 714), single tenant office building (Land Use 715), medical-dental office building (Land Use 720), office park (Land Use 750), and research and development center (Land Use 760) are additional related uses.

If information is known about individual buildings, it is suggested that the general office building category be used rather than office parks when estimating parking generation for one or more office buildings in a single development. The office park category is more general and should be used when a breakdown of individual or different uses is not known. If the general office building category is used and if additional buildings, such as banks, restaurants, or retail stores are included in the development, the development should be treated as a multiuse project. On the other hand, if the office park category is used, internal trips are already reflected in the data and do not need to be considered.

When the buildings are interrelated (defined by shared parking facilities or the ability to easily walk between buildings) or house one tenant, it is suggested that the total area or employment of all the buildings be used for calculating parking generation. When the individual buildings are isolated and not related to one another, it is suggested that parking generation be calculated for each building separately and then summed.

### Time of Day Distribution for Parking Demand

The following table presents a time-of-day distribution of parking demand on a weekday at 30 study sites in a general urban/suburban setting and two study sites in a dense multi-use urban setting.

Hour Beginning	Percent of Weekday Peak Parking Demand	
	General Urban/Suburban	Dense Multi-Use Urban
12:00–4:00 a.m.	–	–
5:00 a.m.	–	–
6:00 a.m.	–	–
7:00 a.m.	13	26
8:00 a.m.	48	65
9:00 a.m.	88	95
10:00 a.m.	100	100
11:00 a.m.	100	100
12:00 p.m.	85	99
1:00 p.m.	84	99
2:00 p.m.	93	97
3:00 p.m.	94	94
4:00 p.m.	85	90
5:00 p.m.	56	–
6:00 p.m.	20	–
7:00 p.m.	11	–
8:00 p.m.	–	–
9:00 p.m.	–	–
10:00 p.m.	–	–
11:00 p.m.	–	–

### Additional Data

The average parking supply ratios for the study sites with parking supply information are as follows:

- 2.9 spaces per 1,000 square feet GFA in a dense multi-use urban setting that is not within ½ mile of rail transit (seven sites)
- 3.3 spaces per 1,000 square feet GFA (73 sites) and 1.2 spaces per employee (20 sites) in a general urban/suburban setting that is not within ½ mile of rail transit
- 3.0 spaces per 1,000 square feet GFA (seven sites) and 0.8 spaces per employee (two sites) in a general urban/suburban setting that is within ½ mile of rail transit

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Arizona, California, Colorado, Connecticut, Georgia, Illinois, Massachusetts, Minnesota, Montana, New Jersey, New York, Oklahoma, Oregon, Pennsylvania, Texas, Utah, and Washington.

### Source Numbers

21, 22, 47, 122, 124, 142, 172, 201, 202, 205, 211, 215, 216, 217, 227, 239, 241, 243, 276, 295, 399, 400, 425, 431, 433, 436, 438, 440, 516, 531, 540, 551, 555, 556, 557, 571, 572, 588

# General Office Building (710)

**Peak Period Parking Demand vs: 1000 Sq. Ft. GFA**

**On a: Weekday (Monday - Friday)**

**Setting/Location: Dense Multi-Use Urban**

Peak Period of Parking Demand: 9:00 a.m. - 4:00 p.m.

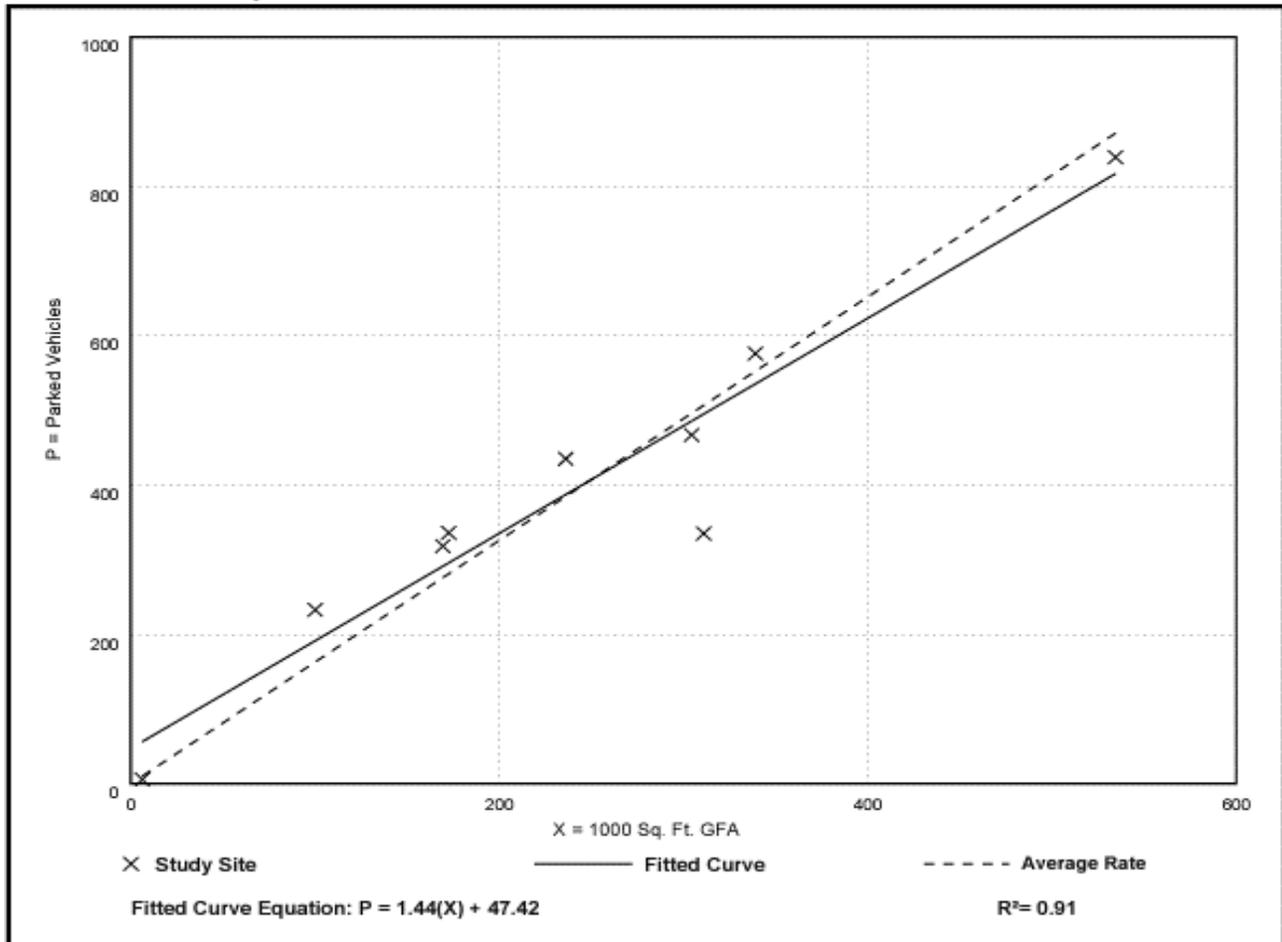
Number of Studies: 9

Avg. 1000 Sq. Ft. GFA: 241

## Peak Period Parking Demand per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.63	0.97 - 2.33	1.55 / 2.14	***	0.32 ( 20% )

## Data Plot and Equation



## Land Use: 820 Shopping Center

### Description

A shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. A shopping center's composition is related to its market area in terms of size, location, and type of store. A shopping center also provides on-site parking facilities sufficient to serve its own parking demands.

### Time of Day Distribution for Parking Demand

The following table presents a time-of-day distribution of parking demand **during the month of December** on a weekday (seven study sites), a Friday (eight study sites), and a Saturday (19 study sites).

Hour Beginning	Percent of Peak Parking Demand during December		
	Weekday	Friday	Saturday
12:00–4:00 a.m.	–	–	–
5:00 a.m.	–	–	–
6:00 a.m.	–	–	–
7:00 a.m.	–	–	–
8:00 a.m.	–	–	–
9:00 a.m.	–	–	–
10:00 a.m.	–	74	–
11:00 a.m.	–	87	85
12:00 p.m.	77	97	97
1:00 p.m.	100	100	98
2:00 p.m.	98	92	100
3:00 p.m.	90	85	97
4:00 p.m.	76	84	88
5:00 p.m.	82	78	77
6:00 p.m.	89	75	64
7:00 p.m.	90	63	–
8:00 p.m.	84	–	–
9:00 p.m.	–	–	–
10:00 p.m.	–	–	–
11:00 p.m.	–	–	–

The following table presents a time-of-day distribution of parking demand **during a non-December month** on a weekday (18 study sites), a Friday (seven study sites), and a Saturday (13 study sites).

Hour Beginning	Percent of Non-December Peak Parking Demand		
	Weekday	Friday	Saturday
12:00–4:00 a.m.	–	–	–
5:00 a.m.	–	–	–
6:00 a.m.	–	–	–
7:00 a.m.	–	–	–
8:00 a.m.	15	32	27
9:00 a.m.	32	50	46
10:00 a.m.	54	67	67
11:00 a.m.	71	80	85
12:00 p.m.	99	100	95
1:00 p.m.	100	98	100
2:00 p.m.	90	90	98
3:00 p.m.	83	78	92
4:00 p.m.	81	81	86
5:00 p.m.	84	86	79
6:00 p.m.	86	84	71
7:00 p.m.	80	79	69
8:00 p.m.	63	70	60
9:00 p.m.	42	–	51
10:00 p.m.	15	–	38
11:00 p.m.	–	–	–

#### Additional Data

The parking demand database includes data from strip, neighborhood, community, town center, and regional shopping centers. Some of the centers contain non-merchandising facilities, such as office buildings, movie theaters, restaurants, post offices, banks, health clubs, and recreational facilities.

Many shopping centers, in addition to the integrated unit of shops in one building or enclosed around a mall, include outparcels (peripheral buildings or pads located on the perimeter of the center adjacent to the streets and major access points). These buildings are typically drive-in banks, retail stores, restaurants, or small offices. Although the data herein do not indicate which of the centers studied included peripheral buildings, it can be assumed that some of the data show their effect.

The parking demand data plots and analysis are based on the total gross leasable area (GLA) of the center. In cases of smaller centers without an enclosed mall or peripheral buildings, the GLA could be the same as the gross floor area (GFA) of the center.

The average parking supply ratios for the study sites with parking supply information are the following:

- 5.1 spaces per 1,000 square feet GFA (137 sites) in a general urban/suburban setting
- 4.7 spaces per 1,000 square feet GFA (five sites) in a dense multi-use urban setting

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alabama, Alberta (CAN), Arizona, California, Colorado, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, North Carolina, New Jersey, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Virginia, and Washington.

*Future data submissions should attempt to provide information on the composition of each study site (types and number of stores, restaurants, or other tenants within the shopping center).*

### **Source Numbers**

3, 18, 21, 32, 39, 47, 87, 88, 89, 103, 142, 145, 152, 153, 154, 174, 175, 176, 179, 202, 203, 204, 205, 209, 215, 219, 224, 241, 265, 274, 313, 314, 315, 431, 432, 433, 436, 438, 441, 511, 525, 527, 531, 533, 542, 556, 558, 565

# Shopping Center - Non-December (820)

**Peak Period Parking Demand vs: 1000 Sq. Ft. GLA**

**On a: Weekday (Monday - Thursday)**

**Setting/Location: Dense Multi-Use Urban**

Peak Period of Parking Demand: 12:00 - 6:00 p.m.

Number of Studies: 5

Avg. 1000 Sq. Ft. GLA: 91

## Peak Period Parking Demand per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
2.76	1.86 - 3.58	2.63 / 3.58	***	0.72 ( 26% )

## Data Plot and Equation

*Caution – Small Sample Size*

