



11220 Assett Loop
Suite 202,
Manassas, VA 20109
703-365-9262
WellsandAssociates.com

TO: George Hong
Baileys Star LLC

FROM: William F. Johnson, P.E., PTOE
Griffin P. Kuhn

RE: Gatewood Plaza
City of Fairfax, Virginia

SUBJECT: Parking Reduction

DATE: May 3, 2024

INTRODUCTION

This memorandum provides an analysis to support a Special Exception (SE) submitted to allow the reduction of certain parking requirements for a proposed development in The City of Fairfax, Virginia. The site is located at 10201 Fairfax Boulevard, Fairfax VA, 22030, and is situated on the southern side of the signalized intersection of Boulevard Marketplace and Fairfax Boulevard (Route 50), between Fair Woods Parkway, and Eaton Place, as shown in Figure 1.

The site is currently zoned Commercial Retail (CR) and Residential Medium (RM). The Applicant, Baileys Star LLC proposes to rezone the Residential Medium (RM) portion of the site to be uniform with the existing Commercial Retail and apply for Special Exception applications to allow for a mixed-use redevelopment. The applicant plans to raze the existing office building and redevelop it with a mixed-use building consisting of up to 336 multi-family units and 18,520 GSF of ground-floor retail.

The current proposed site layout is provided in Figure 2. The following summarizes the development program depicted on the preliminary site layout:

- 50 Studio Units
 - 148 One-Bedroom Units
 - 34 One-Bedroom + Den Units
 - 102 Two-Bedroom Units
 - 18,520 GSF of Ground Floor Retail Space
-

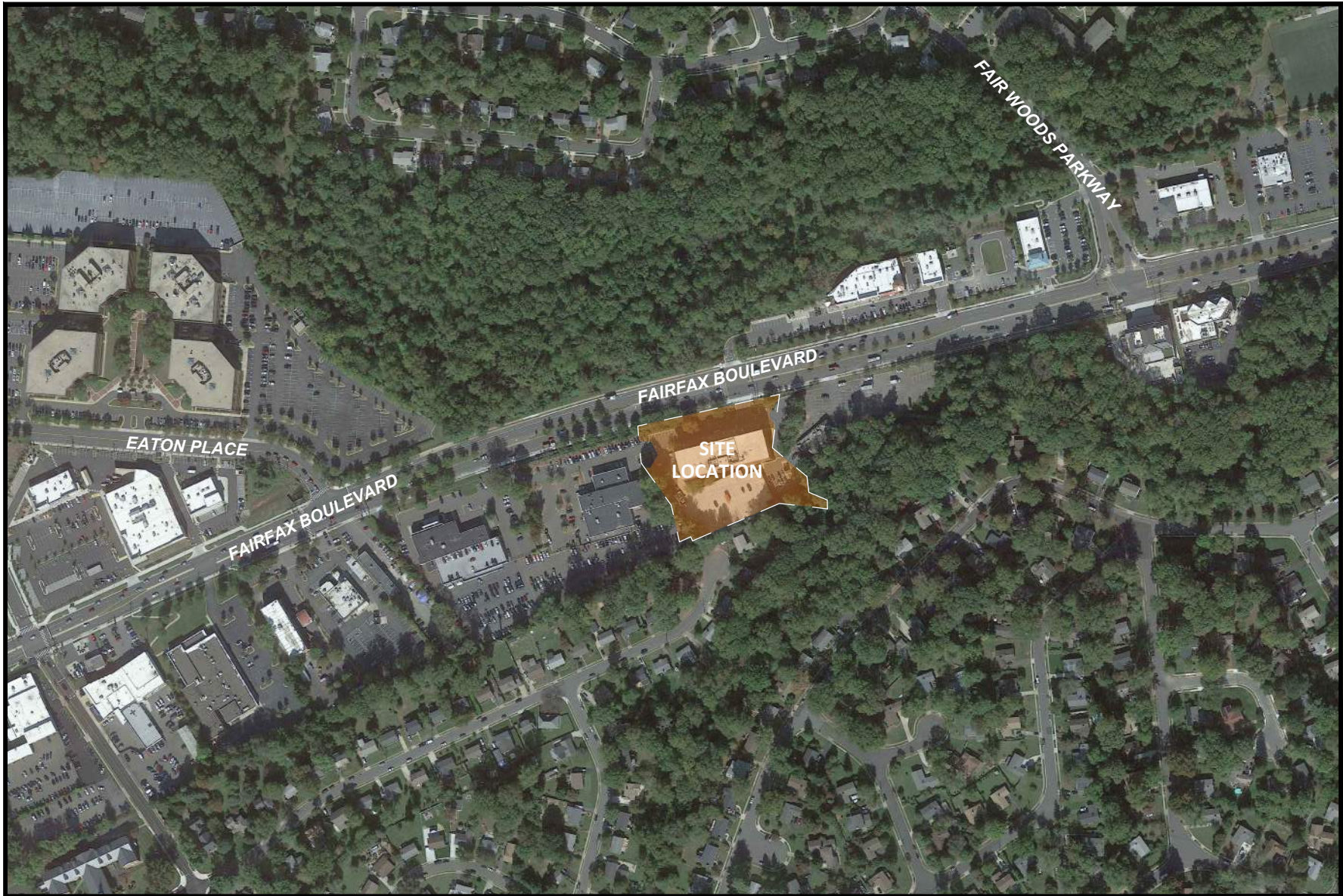


Figure 1
Site Location



NORTH
Gatewood Plaza
City of Fairfax, Virginia

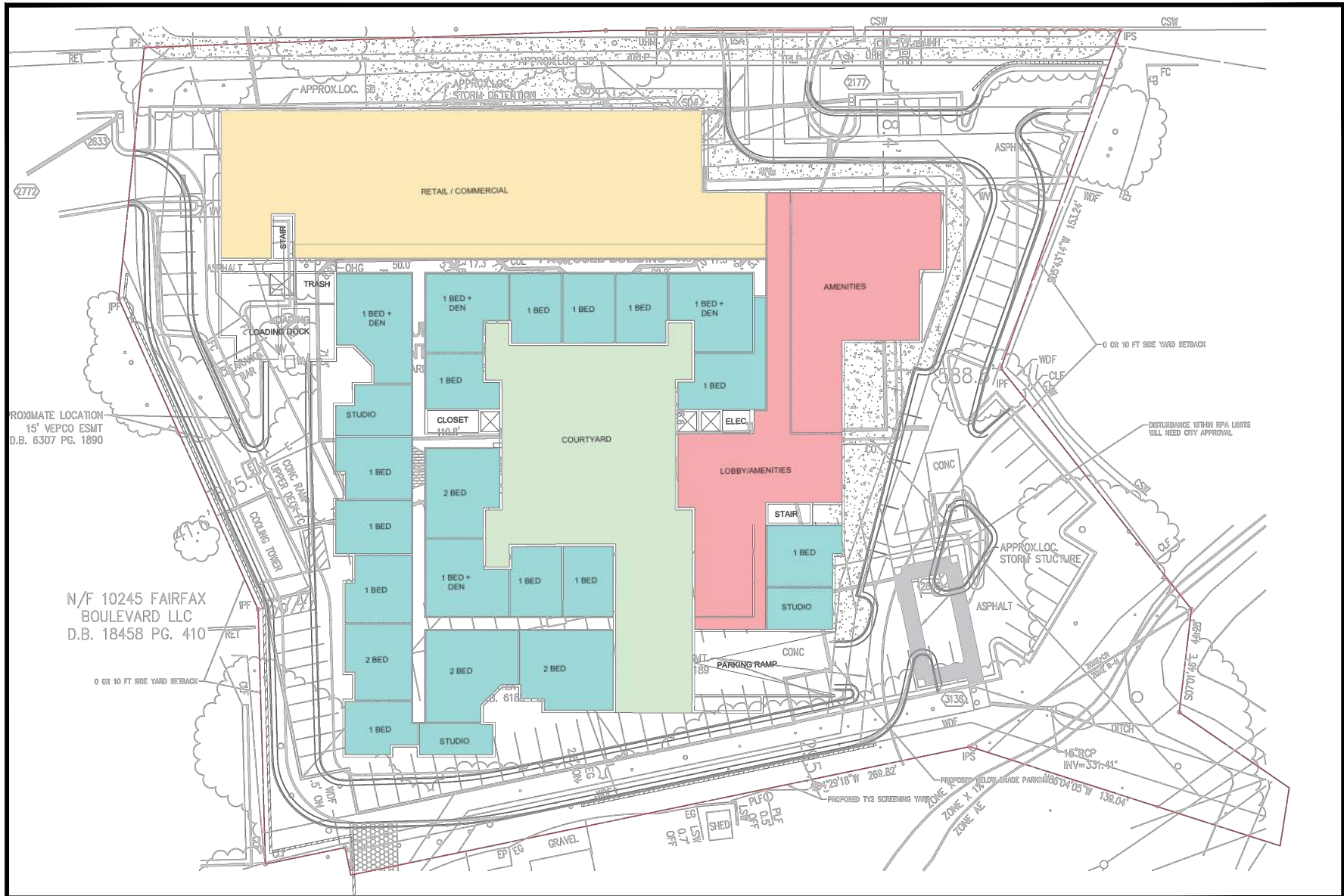


Figure 2
Conceptual Site Layout



NORTH

Gatewood Plaza
City of Fairfax, Virginia



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Based on information from the Applicant and as supported in this parking analysis, parking for the Gatewood Plaza site will be provided in a combination of below-grade structured and surface parking facilities. As described in this document, the **Applicant is seeking an overall 36 percent parking reduction from the County's Zoning Ordinance (the "Ordinance") requirements for the residential and non-residential components of the site, equivalent to a reduction of 231 spaces from a strict application of the Ordinance.** As a result, a Special Exception is hereby requested to allow the reduction from the Ordinance for the proposed parking supply. The following sections detail the justification for this parking reduction.

CITY OF FAIRFAX PARKING REQUIREMENTS

Chapter 110 Article 4, Section 3. E of the City Code (the Zoning Ordinance) provides the off-street parking requirements for developments. Table 1 summarizes the required parking for the proposed Gatewood Plaza development program.

As shown in Table 1, based on a strict application of the Ordinance, a total of 552 parking spaces would be required to serve the residential components and 93 parking spaces would be required to serve the non-residential components of the subject development. This results in a total of 645 parking spaces required to serve the entire proposed Gatewood Plaza development application.

INSTITUTE OF TRANSPORTATION ENGINEERS PARKING DEMAND

The Institute of Transportation Engineers (ITE) Parking Generation Manual, 6th Edition (2023) was consulted to inform practical parking demand for the proposed site development program. Table 2 summarizes the parking demand analysis based on the application of published peak parking demand ratios within the ITE Manual. For this analysis and in the interest of conservatism, 85th-percentile peak parking demand ratios were utilized to capture the highest reasonable demand for each site component. Excerpts from the ITE Manual are provided in Attachment 2.

Table 1
 Gatewood Plaza
 Parking - Ordinance Requirement Summary⁽¹⁾

Use	Use (Ordinance)	Size	Unit	Ordinance Requirement (1)	Parking Required
Residential - Multi-Family (1 Bedroom)	Multi-Family Housing	50	D.U.	1.5 Bedrooms (1)	75
Residential - Multi-Family (1 Bedroom)	Multi-Family Housing	148	D.U.	1.5 Bedrooms (1)	222
Residential - Multi-Family (1 Bedroom)	Multi-Family Housing	34	D.U.	1.5 Bedrooms (1)	51
Residential - Multi-Family (2 Bedroom)	Multi-Family Housing	<u>102</u>	D.U.	2.0 Bedrooms (2)	<u>204</u>
<i>Residential Subtotal</i>		<i>334</i>			<i>552</i>
Commercial	Retail-General	18,520	GSF	1 per 200 SF	93
TOTAL - Ordinance Required					645
Overall Parking Provided					414
Reduction (Spaces)					(231)
Reduction (%)					-36%

Notes:

(1) Based on *City of Fairfax Zoning Ordinance*.

Table 2
 Gatewood Plaza
 ITE Parking Generation Analysis ⁽¹⁾

Use	ITE Code	Size	Unit	85th Percentile Peak Parking Ratio		Parking Required
Multi-Family Housing (1 Bedroom)	218	232	D.U.	0.8 ⁽²⁾	per bedroom	186
Multi-Family Housing (2 Bedroom)	221	102	D.U.	1.45	per bedroom	<u>148</u>
<i>Residential Subtotal</i>						<i>334</i>
Strip Retail Plaza <40K	822	18,520	GSF	4.44	per 1,000 SF	<u>83</u>
<i>Non-Residential Subtotal</i>						<i>83</i>
TOTAL - ITE Analysis						417
Overall Parking Provided						414
Reduction from ITE (Spaces)						(3)
Reduction from ITE (%)						-1%

Notes:

(1) Based on Insitute of Transportation Engineers (ITE) [Parking Generation Manual](#), 6th Edition.

(2) Cacluclated using proportional distribution between average rate and 85th percentile of Code 221 due to small case size and a lack of 85th Percentile volume

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As summarized in Table 2, the ITE Manual publishes parking data specific to the number of bedrooms for Mid-Rise Multi-Family housing uses. According to ITE, the peak multi-family housing demand for 1 bedroom is equivalent to 0.8 parking spaces per 1 bedroom. The Peak multi-family housing demand for 2-bedroom units is equivalent to 1.45 parking spaces per unit.

The ITE manual for ITE Code 218 for 1 BR (Mid-Rise) Not Close to Rail Transit only features two studies and the publication does not provide an 85th-percentile value. To address this, the “2+ BR (Mid-Rise) Not close to Rail Transit” ITE Code (221) was established as a base and a factor between the 85th percentile and average rates was calculated. That value (1.18) was then applied to the average rate for the “1 BR” category in order to approximate the 85th percentile statistic. The calculation results in 186 Required spaces for 1-bedroom units.

The ITE Manual defines “Strip Retail Plaza (<40K)” as “an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit”. Based on this definition, and consistent with past practice, the non-residential components were evaluated as a “Strip Retail Plaza (<40K)” for purposes of this analysis. The ITE Manual publishes an 85th-percentile peak parking ratio of 4.44 parking spaces per 1,000 GSF of commercial uses.

As summarized in Table 2, based on published ITE rates, the proposed Gatewood Plaza development program would generate a peak demand of 417 parking spaces.

SHARED PARKING

As stated previously, the entire Gatewood Plaza site is designed to be an integrated mixed-use development. The ITE parking analysis summarized in Table 2 does not take direct account of the inherent synergy that a mix of residential and non-residential uses will have on overall site parking demand.

Shared parking, according to the Urban Land Institute (ULI) is defined as one parking space used “to serve two or more individual land uses without conflict or encroachment”. The sharing of parking spaces is a phenomenon that has been occurring for decades in urban and suburban communities. Parking demand for different land uses has unique temporal distributions, allowing the same parking space to be occupied by the peak demand of different land uses throughout the day.

The Urban Land Institute (ULI) publication Shared Parking, 3rd Edition has established a model and methodology for determining parking demand for various types of development. As identified in the publication, parking requirements are calculated through the shared use analysis that includes the following steps:

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1. Determine individual weekday peak parking ratios for each land use.
2. Determine the number of reserved parking spaces for each use.
3. Select time-of-day and monthly parking variation factors.
4. Calculate the hourly parking demand for weekdays for each month.

This methodology is especially useful in cases such as the Gatewood Plaza site, where a single parking space may be used for residents, visitors, commercial patrons, etc. Because each land use within a development may experience a peak parking demand at different times of the day or different months of the year relative to the other land uses on-site, the actual peak parking demand of the subject development may be less than if the peak parking demand of each land use was considered separately. Residents and their visitors, in general, experience peak parking demands in the late afternoon to early morning hours during the week whereas commercial uses experience peak demand during the workday and/or early evening hours.

ULI provides base weekday and weekend hourly parking accumulations for individual land uses for the purpose of establishing a base peak parking demand. However, for purposes of this study, the baseline parking demand associated with each use was based on those calculated parking demands using the ITE-published peak parking ratios (see Table 2).

The ULI model applies various hourly, monthly, and weekday/weekend adjustment factors to the parking demands of each land use. For informational purposes, these adjustment factor tables are provided in Attachment 3. The results of the shared parking analysis are summarized in Table 3.

As shown in Table 3, with the application of the Shared Parking model, the site overall would experience a peak weekday demand of 413 parking spaces and a peak weekend demand of 413 spaces.

PROPOSED PARKING SUPPLY

In order to accommodate the forecasted parking demand as calculated in this document and justified in the calculations based on published ITE and ULI methodologies summarized in Table 2 and Table 3, respectively, a **total parking supply consisting of a minimum of 414 parking spaces** is proposed to serve the Gatewood Plaza site. The parking supply will be accommodated through a combination of below-grade structured (garage) spaces and surface lot parking. In order to maximize the utility of the proposed parking supply, all parking will be unreserved for the use of site residents, visitors, employees, and patrons. Designated accessible (i.e., “handicapped”) parking will be provided in accordance with state building code requirements.

Table 3
Gateway Plaza

Shared Parking Demand Summary																		
Peak Month: DECEMBER -- Peak Period: 10 PM, WEEKEND																		
Land Use	Project Data		Weekday					Weekend					Weekday			Weekend		
			Base Ratio	Driving Adj	Non-Captive Ratio	Project Ratio	Unit For Ratio	Base Ratio	Driving Adj	Non-Captive Ratio	Project Ratio	Unit For Ratio	Peak Hr Adj	Peak Mo Adj	Estimated Parking Demand	Peak Hr Adj	Peak Mo Adj	Estimated Parking Demand
	Quantity	Unit										10 PM	December		10 PM	December		
Retail																		
Non-Residential (< 400 ksf)	18,520	sf GLA	2.90	100%	98%	2.85	ksf GLA	3.20	100%	98%	3.13	ksf GLA	30%	100%	16	35%	100%	20
Employee			0.70	100%	94%	0.66		0.80	100%	92%	0.74		40%	100%	5	45%	100%	6
Food and Beverage																		
Entertainment and Institutions																		
Hotel and Residential																		
Residential, Suburban																		
Studio Efficiency	50	units	0.85	100%	100%	0.85	unit	0.85	100%	100%	0.85	unit	95%	100%	41	89%	100%	38
1 Bedroom	148	units	0.90	100%	100%	0.90	unit	0.90	100%	100%	0.90	unit	95%	100%	127	89%	100%	119
1 Bedroom + Den	34	units	0.90	100%	100%	0.90	unit	0.90	100%	100%	0.90	unit	95%	100%	29	89%	100%	28
2+ Bedrooms	102	units	1.65	100%	100%	1.65	unit	1.65	100%	100%	1.65	unit	95%	100%	161	89%	100%	150
Reserved		res spaces	0.00	100%	100%	0.00	unit	0.00	100%	100%	0.00	unit	100%	100%	-	100%	100%	-
Visitor	334	units	0.10	100%	100%	0.10	unit	0.15	100%	100%	0.15	unit	100%	100%	34	100%	100%	51
Office																		
Additional Land Uses																		
													Customer/Visitor	50	Customer		71	
													Employee/Resident	363	Employee/Resident		341	
													Reserved	-	Reserved		-	
													Total	413	Total		413	

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CONCLUSIONS

Based on the parking analyses provided in the preceding, the following may be concluded:

1. The Gatewood Plaza development is planned as an integrated mixed-use project consisting of residential and non-residential components served by a parking garage and surface lot spots.
2. Based on a strict application of the City of Fairfax Zoning Ordinance, the proposed Gatewood Plaza mixed-use development program would require 620 parking spaces.
3. The Applicant proposes to provide a **minimum of 414 parking spaces** to accommodate the proposed mix of uses, representing a reduction of 231 spaces (or 36%) of the required site parking.
4. Based on published ITE peak parking demand ratios, the proposed mixed-use development would generate a peak parking demand of 417 parking spaces.
5. When considering the synergy of the proposed residential and non-residential uses, the Urban Land Institute's (ULI's) Shared Parking model results in a total peak parking demand of 413 spaces for the overall site. This overall parking demand calculation supports the site's proposed parking supply.
6. In order to maximize the utility of the proposed parking supply, all parking will be unreserved for the use of site residents, visitors, employees, and patrons.
7. Designated accessible (i.e., "handicapped") parking will be provided in accordance with state building code requirements.
8. The proposed development will accommodate secured bicycle parking consisting of bicycle parking spaces for residents. Additionally, short-term racks will be provided external to the building to provide bicycle parking for up to visitors.
9. The Applicant will implement Transportation Demand Management (TDM) strategies to leverage existing transit services and encourage the use of non-auto modes of travel, thereby reducing auto ownership.

Questions related to this parking analysis should be directed to Will Johnson at 703.676.3653 or wfjohnson@wellsandassociates.com.

Attachments: a/s



E. Parking ratio requirements

Off-street parking spaces shall be provided for all uses listed below in at least the minimum amounts specified.

USE TYPES/ USE GROUPS*	GENERAL REQUIREMENTS
RESIDENTIAL	
Single-family detached	2 spaces per unit
Single-family attached	2 spaces per unit
Duplexes	2 spaces per unit
Multifamily	1.5 spaces per one or less bedroom unit; 2 spaces per 2 or more bedroom unit
Townhouses	2 spaces per unit
Upper story residential/mixed use buildings	1.25 spaces per efficiency unit; 1.5 spaces per 1 bedroom unit; 2 spaces per 2 or more bedroom units; other uses as required herein
PUBLIC, CIVIC AND INSTITUTIONAL USES (SEE §3.4.1.E)	
Adult day care	5 spaces per 1,000 sq. ft. of floor area
Assisted living facility	1 space per 4 beds
Auditorium or arena	1 space per 4 seats
Day care centers	5 spaces per 1,000 sq. ft. of floor area
Day care home, family (less than 5)	No spaces in addition to spaces otherwise required
Day care home, family (5 to 12)	In addition to spaces otherwise required, 1 space for such home providing care for 5 to 7 children, and 2 spaces for such home providing care for 8 to 12 children
Detention facilities	Determined by zoning administrator per §4.2.10
Colleges and universities	10 spaces per classroom
Community services*	1 space per 300 sq. ft. of floor area
Congregate living facility	1.5 spaces per unit
Group homes/statutory	2 space per dwelling
Hospitals	1 space per 2 beds, but not less than 1 space per 200 sq. ft. of floor area
Medical care facilities*	1 space per 2 beds, but not less than 1 space per 200 sq. ft. of floor area
Nursery schools	5 spaces per 1,000 sq. ft. of floor area
Nursing homes	1 space per 5 beds
Parks and open areas*	Determined by zoning administrator per §4.2.10
Religious institutions	1 space per 4 seats in main assembly area
Schools, elementary and middle	2 spaces per classroom
Schools, high	5 spaces per classroom
Social service delivery	Determined by zoning administrator per §4.2.10
Utilities, minor*	None
Utilities, major*	1 space per 1,000 sq. ft. of floor area
Telecommunications towers/facilities	Determined by zoning administrator per §4.2.10
COMMERCIAL USES (SEE §3.4.1.F)	
Adult uses	1 space per 100 sq. ft. of floor area
Amusement centers	1 space per 250 sq. ft. of floor area
Animal care facilities	1 space per 250 sq. ft. of floor area
Art gallery or studio	1 space per 400 sq. ft. of floor area
Auction houses	5 spaces per 100 sq. ft. of floor area
Bed and Breakfasts	1 space per guest room, plus otherwise required parking

USE TYPES/ USE GROUPS*	GENERAL REQUIREMENTS
Brew pubs	1 space per 300 sq. ft. of floor area
Building supplies and lumber sales	1 space per 300 sq. ft. of floor area
Catering or delivery services	1 space per 200 sq. ft. of floor area
Cemeteries	Determined by zoning administrator per §4.2.10
Convenience stores	1 space per 200 sq. ft. of floor area
Fuel stations	1 space per 200 sq. ft. of floor area
Funeral homes	1 space per 50 square feet of floor space in funeral service rooms
Furniture, appliance or carpet/flooring stores	1 space per 400 sq. ft. of floor area
Grocery stores	1 space per 200 sq. ft. of floor area
Hotels; hotels, extended-stay; motels	1 space per guest room, plus 1 space per 200 sq. ft. of conference, banquet, restaurants or food services floor area
Manufacturing, limited*	1 space per 1,000 sq. ft. of floor area
Office, general*	1 space per 300 sq. ft. of floor area
Office, medical*	1 space per 200 sq. ft. of floor area
Parking, commercial or municipal	Determined by zoning administrator per §4.2.10
Plant nurseries and greenhouses	1 space per 200 sq. ft. of floor area
Private clubs	1 space per 200 sq. ft. of floor area
Recreation, indoor*	1 space per 250 sq. ft. of floor area
Recreation, outdoor*	Determined by zoning administrator per §4.2.10
Restaurants or food service	1 space per 200 sq. ft. of floor area; 1 space per 100 sq. ft. of floor area with dancing and entertainment; none for outdoor dining and service areas
Retail, general*	1 space per 200 sq. ft. of floor area
Retail, large format	1 space per 200 sq. ft. of floor area
Schools, technical, trade, business	6 per classroom, plus 1 per 300 sq. ft. of office floor area
Service, general*	1 space per 200 sq. ft. of floor area
Services, personal*	1 space per 200 sq. ft. of floor area
Shopping centers	1 space per 200 sq. ft. of floor area
Theater	1 space per 4 seats
Tobacco and smoke shops	1 space per 200 sq. ft. of floor area
Vehicle repair*	2 spaces per bay
Vehicle sales and leasing*	1 per 500 sq. ft. of floor area
Vehicle service*	2 spaces per bay
INDUSTRIAL USES (SEE §3.4.1.G)	
Crematorium	Determined by zoning administrator per §4.2.10
Fuel sales, residential	1 space per 1,000 sq. ft. of floor area
Manufacturing, general*	1 space per 1,000 sq. ft. of floor area
Manufacturing, heavy*	1 space per 1,000 sq. ft. of floor area
Manufacturing, limited*	1 space per 1,000 sq. ft. of floor area
Petroleum storage and distribution	Determined by zoning administrator per §4.2.10
Research and development*	1 space per 1,000 sq. ft. of floor area
Self-service storage facility	5 spaces, plus 1 space per 100 storage units
Vehicle storage and towing	One space per 300 sq. ft. of floor area
Warehouse/freight movement*	1 space per 1000 sq. ft. of floor area
Waste service*	1 per 300 sq. ft. of floor area + 1 per 1,000 sq. ft. of outside storage area

§4.2.4. Location of parking

Except as specified herein, required parking spaces must be located off-street, on the same lot as the building or use they are required to serve, and not be within any minimum required front or side yard area as specified in §1.5.12, unless otherwise specified below.

Land Use: 218 Multifamily Housing— 1 BR (Mid-Rise)

Description

Mid-rise multifamily housing with one bedroom is a residential building with between four and 10 floors (levels) of residence that consist entirely of 1-bedroom dwelling units. A studio or micro-apartment or condominium is treated as a 1-bedroom dwelling unit for this land use.

For this land use, a studio apartment is defined as a self-contained dwelling unit in which the living room, bedroom, and kitchen are combined into a single room. A micro-apartment is defined as a single-occupant studio apartment with a compact design that typically ranges between approximately 200 and 400 gross square feet. Access to individual dwelling units is through an outside building entrance, a lobby, elevator, and a set of hallways.

Land Use Subcategory

Data are separated into two subcategories for this land use: (1) not close to rail transit and (2) close to rail transit. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

Time-of-Day Distribution for Parking Demand

The current database for this land use does not have sufficient data to produce a detailed, hour-by-hour distribution of parking demand from which the analyst can determine a peak period of parking demand. Based on the time periods for which data were collected for this land use and on a review of comparable land uses with hour-by-hour parking demand data, the presumed peak period for parking demand for this land use is between late-evening and early-morning.

Additional Data

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 Per Dwelling Unit
Center City Core	Within ½ mile of rail transit	0.19 (4 sites)
Dense Multi-Use Urban	Within ½ mile of rail transit	0.31 (3 sites)
	Not within ½ mile of rail transit	0.53 (7 sites)
General Urban/Suburban	Within ½ mile of rail transit	0.88 (2 sites)
	Not within ½ mile of rail transit	0.71 (1 site)

The average peak parking occupancy at the 14 sites in a dense multi-use urban or center city core setting is 67 percent. The average peak parking occupancy at the three sites in a general urban/suburban setting is 77 percent.

The sites were surveyed in the 2010s and the 2020s in Colorado, District of Columbia, Massachusetts, and Wisconsin.

Source Numbers

537, 546, 583, 584, 585, 608

Multifamily Housing - 1 BR (Mid-Rise) Not Close to Rail Transit (218)

Peak Period Parking Demand vs: Dwelling Units

On a: Weekday (Monday - Friday)

Setting/Location: General Urban/Suburban

Number of Studies: 2

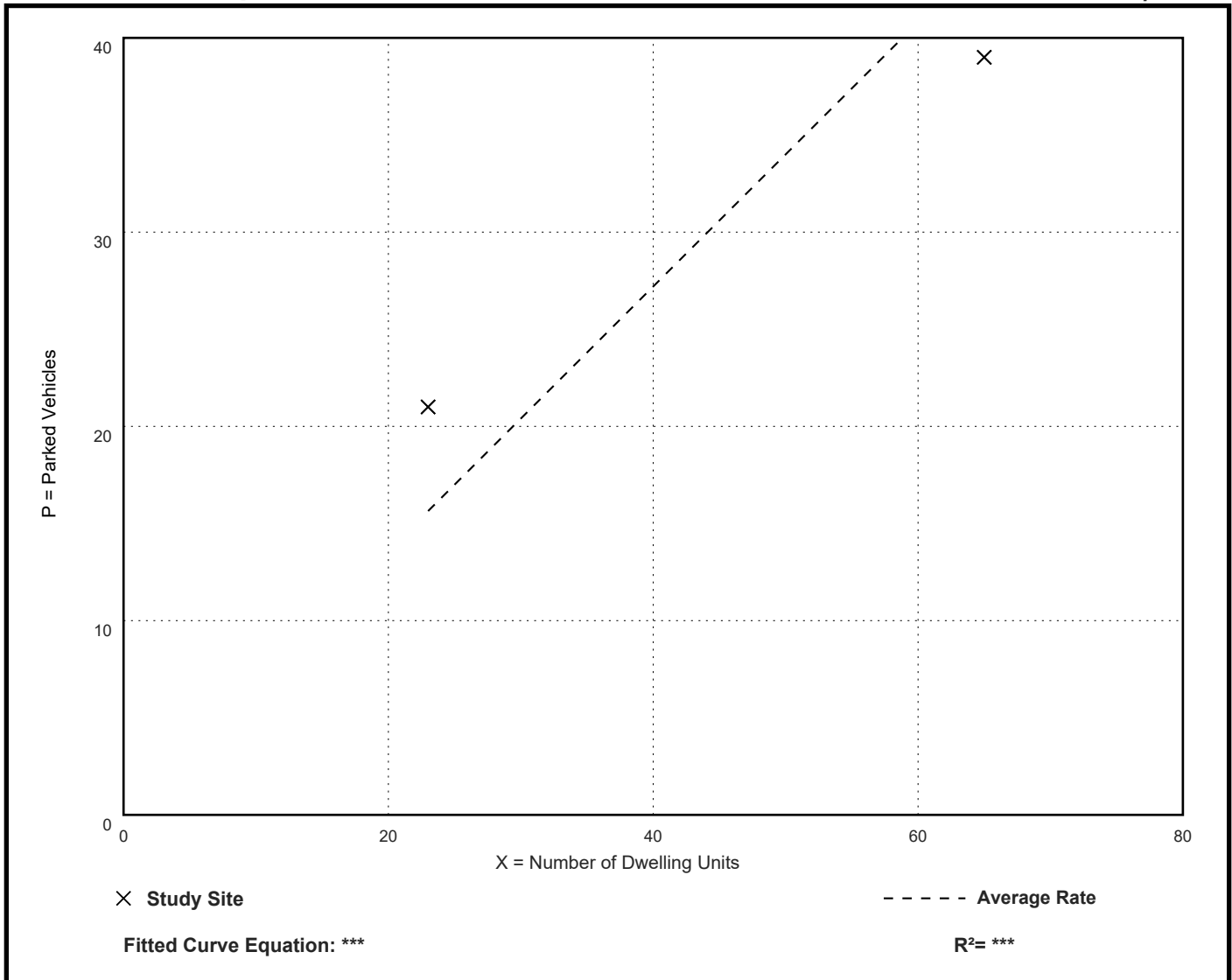
Avg. Num. of Dwelling Units: 44

Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.68	0.60 - 0.91	*** / ***	***	*** (***)

Data Plot and Equation

Caution – Small Sample Size



Land Use: 221 Multifamily Housing— 2+ BR (Mid-Rise)

Description

Mid-rise multifamily housing with two or more bedrooms is a residential building with between four and 10 floors (levels) of residence that contain at least one dwelling unit with two or more bedrooms. Access to individual dwelling units is through an outside building entrance, a lobby, elevator, and a set of hallways.

Land Use Subcategory

Data are separated into two subcategories for this land use: (1) not close to rail transit and (2) close to rail transit. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

Time-of-Day Distribution for Parking Demand

The following table presents a composite (weekday and Saturday) Time-of-Day distribution of parking demand for three general urban/suburban study sites.

Hour Beginning	Percent of Peak Parking Demand
	Weekday/Saturday Composite
12:00-4:00 a.m.	100
5:00 a.m.	96
6:00 a.m.	86
7:00 a.m.	77
8:00 a.m.	66
9:00 a.m.	60
10:00 a.m.	57
11:00 a.m.	55
12:00 p.m.	52
1:00 p.m.	50
2:00 p.m.	52
3:00 p.m.	51
4:00 p.m.	57
5:00 p.m.	62
6:00 p.m.	65
7:00 p.m.	68
8:00 p.m.	75
9:00 p.m.	82
10:00 p.m.	87
11:00 p.m.	91

Additional Data

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

Setting	Proximity to Rail Transit	Parking Supply Per Dwelling Unit	Average Peak Parking Occupancy
Center City Core	Within ½ mile of rail transit	0.73 (8 sites)	69%
Dense Multi-Use Urban	Within ½ mile of rail transit	0.88 (31 sites)	81%
	Not within ½ mile of rail transit	1.1 (35 sites)	76%
General Urban/ Suburban	Within ½ mile of rail transit	1.5 (6 sites)	74%
	Not within ½ mile of rail transit	1.7 (38 sites)	72%

The sites were surveyed in the 1990s, the 2000s, the 2010s, and the 2020s in California, Connecticut, District of Columbia, Maine, Maryland, Massachusetts, North Carolina, Ontario (CAN), Oregon, Tennessee, Virginia, Washington, and Wisconsin.

Source Numbers

209, 255, 277, 402, 419, 505, 512, 533, 535, 536, 537, 545, 546, 547, 575, 576, 577, 579, 581, 583, 584, 585, 587. 602, 603, 604, 620, 631

Multifamily Housing - 2+ BR (Mid-Rise) Not Close to Rail Transit (221)

Peak Period Parking Demand vs: Dwelling Units

On a: Weekday (Monday - Friday)

Setting/Location: General Urban/Suburban

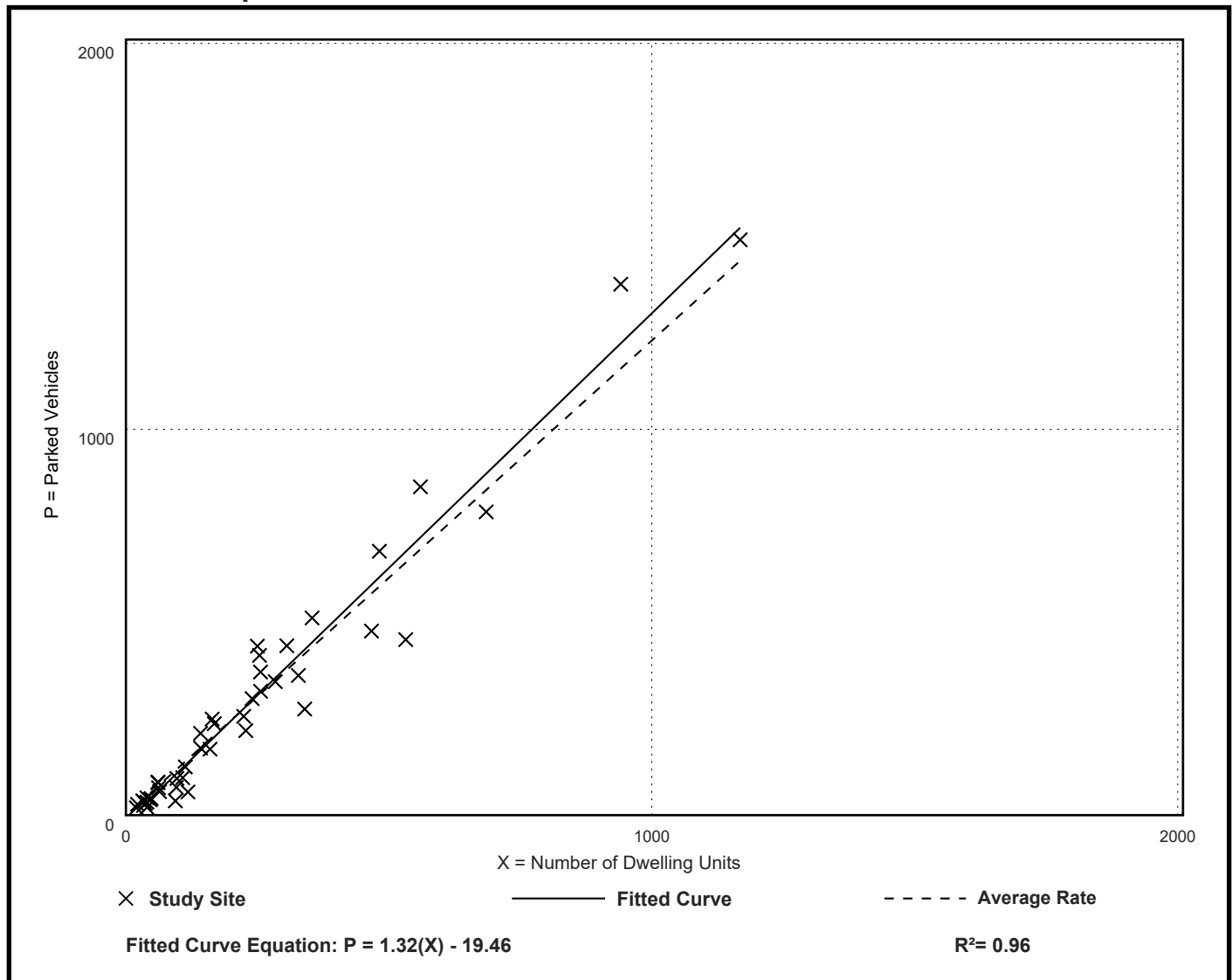
Number of Studies: 44

Avg. Num. of Dwelling Units: 231

Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.23	0.39 - 1.75	0.98 / 1.45	1.15 - 1.31	0.27 (22%)

Data Plot and Equation



Land Use: 822 Strip Retail Plaza (<40k)

Description

A strip retail plaza is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. Each study site in this land use has less than 40,000 square feet of gross leasable area (GLA). Because a strip retail plaza is open-air, the GLA is the same as the gross floor area (GFA) of the building.

The 40,000 square feet GLA threshold between shopping plaza and strip retail plaza (Land Use 822) is based on an examination of the parking demand database. All shopping plazas with a supermarket as their anchor in the database are larger than 40,000 square feet GLA.

Time-of-Day Distribution for Parking Demand

The following table presents a time-of-day distribution of parking demand on a Monday–Thursday (five study sites), a Friday (two study sites), and a Saturday (four study sites).

Hour Beginning	Percent of Peak Parking Demand		
	Monday–Thursday	Friday	Saturday
12:00–4:00 a.m.	–	–	–
5:00 a.m.	–	–	–
6:00 a.m.	–	–	–
7:00 a.m.	–	–	–
8:00 a.m.	19	19	–
9:00 a.m.	33	40	38
10:00 a.m.	47	44	55
11:00 a.m.	55	52	66
12:00 p.m.	89	96	85
1:00 p.m.	100	96	100
2:00 p.m.	73	84	96
3:00 p.m.	73	52	79
4:00 p.m.	66	50	66
5:00 p.m.	70	63	64
6:00 p.m.	75	49	67
7:00 p.m.	70	100	70
8:00 p.m.	54	94	70
9:00 p.m.	48	73	51
10:00 p.m.	–	–	–
11:00 p.m.	–	–	–

Additional Data

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

- 5.7 spaces per 1,000 square feet GLA (24 sites) in a general urban/suburban setting
- 3.3 spaces per 1,000 square feet GLA (3 sites) in a dense multi-use urban setting

The average peak parking occupancy is 50 percent at the general urban/suburban sites and 76 percent at the dense multi-use urban sites.

The sites were surveyed in the 1990s, the 2010s, and the 2020s in Alberta (CAN), British Columbia (CAN), California, Colorado, Kansas, Maine, Manitoba (CAN), Maryland, Michigan, Minnesota, Missouri, New York, 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

89, 209, 219, 297, 511, 601, 605, 606, 618, 619, 621, 635

Strip Retail Plaza (< 40k) (822)

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

On a: Weekday (Monday - Thursday)

Setting/Location: General Urban/Suburban

Number of Studies: 14

Avg. 1000 Sq. Ft. GLA: 18

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)
2.79	1.44 - 6.67	2.07 / 4.44	***	1.14 (41%)

Data Plot and Equation

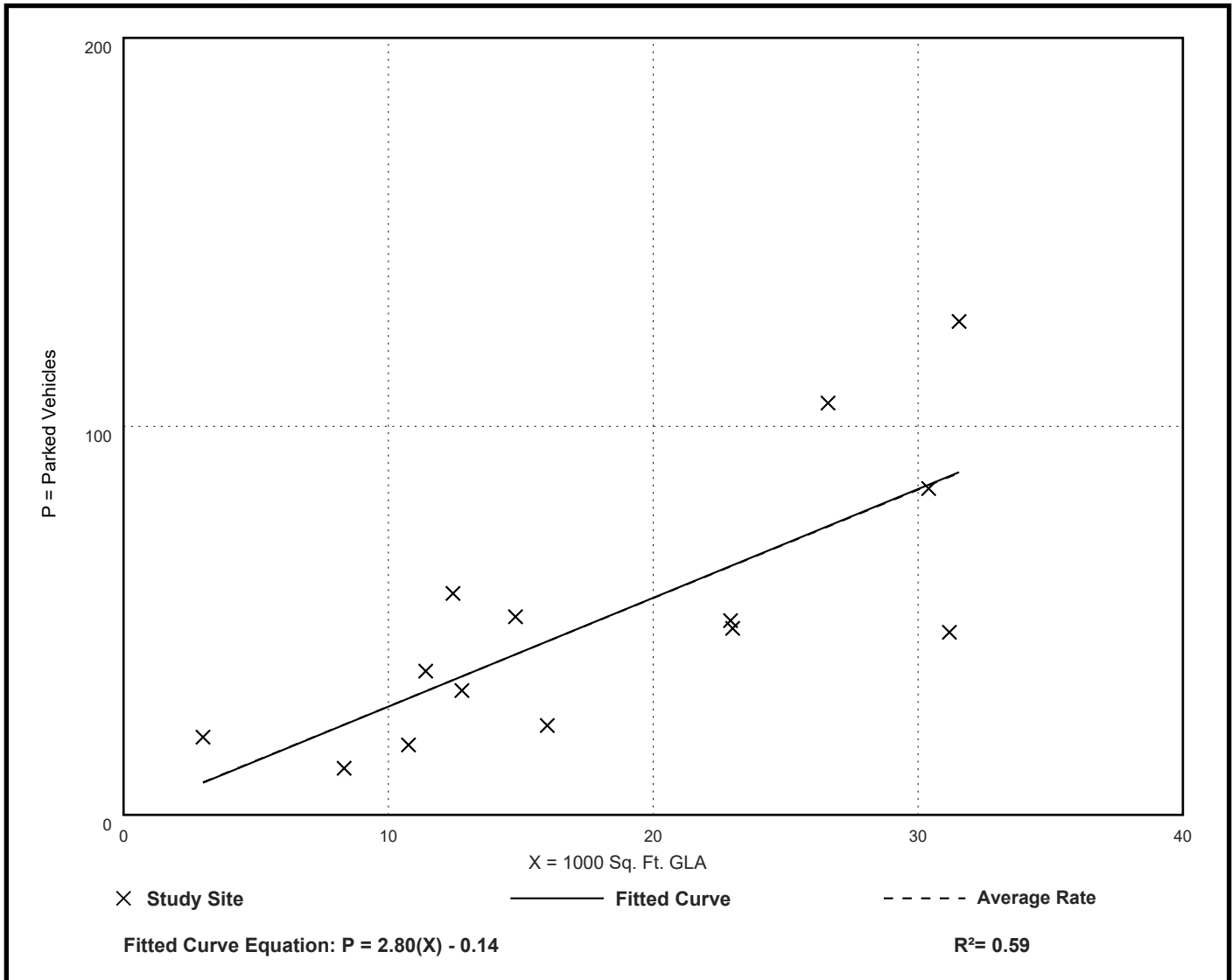


FIGURE 2-3 Monthly Adjustment Factors

Land use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Late Dec ¹	Notes
Retail														
Retail	59%	61%	70%	67%	72%	72%	70%	73%	66%	69%	76%	100%	85%	5
Employee	69%	71%	79%	77%	82%	82%	80%	83%	76%	78%	86%	100%	95%	
Supermarket/grocery	93%	86%	94%	92%	97%	94%	96%	95%	92%	95%	95%	100%	95%	6
Employee	100%	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Pharmacy	89%	85%	92%	89%	91%	89%	89%	90%	88%	92%	89%	100%	95%	6
Employee	99%	95%	100%	99%	100%	98%	98%	99%	98%	100%	98%	100%	100%	
Discount stores/ superstores	72%	72%	79%	76%	81%	79%	79%	81%	74%	79%	85%	100%	90%	6
Employee	82%	82%	88%	86%	91%	89%	89%	91%	84%	89%	95%	100%	100%	
Home improvement stores/garden	63%	62%	79%	90%	100%	92%	87%	84%	80%	85%	80%	75%	65%	6
Employee	72%	71%	89%	100%	100%	100%	97%	94%	90%	94%	90%	85%	75%	
Food and beverage														
Fine/casual dining	88%	87%	98%	94%	99%	94%	96%	96%	89%	93%	89%	100%	95%	6
Employee	99%	98%	100%	100%	100%	100%	100%	100%	99%	100%	100%	100%	100%	
Family restaurant	88%	87%	98%	94%	99%	94%	96%	96%	89%	93%	89%	100%	95%	6
Employee	99%	98%	100%	100%	100%	100%	100%	100%	99%	100%	100%	100%	100%	
Fast casual/fast food/ food court/food halls	85%	85%	97%	95%	99%	98%	100%	100%	93%	96%	92%	96%	95%	6
Employee	96%	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Bar/lounge/nightclub	87%	87%	100%	93%	97%	94%	97%	96%	94%	98%	92%	96%	95%	7
Employee	95%	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Entertainment and institutions														
Family entertainment (weekdays) ²	20%	26%	36%	50%	23%	45%	87%	68%	22%	25%	20%	48%	100%	8
Employee	50%	50%	50%	60%	50%	55%	97%	78%	50%	50%	50%	58%	100%	
Family entertainment (weekends)	79%	90%	91%	100%	60%	70%	72%	76%	70%	72%	74%	60%	80%	8
Employee	89%	100%	100%	100%	70%	80%	82%	86%	80%	82%	84%	70%	90%	
Active entertainment	79%	90%	91%	100%	60%	70%	72%	76%	70%	72%	74%	60%	100%	8
Employee	89%	100%	100%	100%	70%	80%	82%	86%	80%	82%	84%	70%	100%	
Amusement park/ water park	79%	90%	91%	100%	60%	70%	72%	76%	70%	72%	74%	60%	100%	8
Employee	89%	100%	100%	100%	70%	80%	82%	86%	80%	82%	84%	70%	100%	
Adult active entertainment	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%	8
Employee	95%	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
All movies (weekdays) ²	50%	50%	45%	33%	55%	50%	75%	55%	25%	25%	55%	55%	100%	5
Employee	60%	60%	55%	50%	65%	60%	85%	65%	50%	50%	65%	65%	100%	
All movies (weekends)	25%	40%	60%	35%	70%	75%	75%	45%	35%	40%	80%	90%	100%	
Employee	50%	50%	70%	50%	80%	85%	85%	55%	50%	50%	90%	100%	100%	
Live theater	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	100%	100%	5
Employee	75%	70%	90%	100%	95%	90%	85%	80%	75%	85%	90%	85%	100%	
Outdoor amphitheater	0%	0%	0%	10%	100%	100%	100%	100%	100%	50%	10%	10%	0%	5
Employee	10%	10%	10%	50%	100%	100%	100%	100%	100%	60%	50%	50%	10%	

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FIGURE 2-3 (continued)

Land use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Late Dec ¹	Notes
Entertainment and institutions (continued)														
Public park/ destination open space	25%	25%	50%	75%	100%	100%	100%	100%	100%	100%	75%	75%	25%	5
Employee	50%	50%	60%	85%	100%	100%	100%	100%	100%	100%	85%	85%	50%	
Museum/aquarium (weekdays) ²	20%	26%	36%	50%	23%	45%	87%	68%	22%	25%	20%	48%	100%	8
Employee	50%	50%	50%	60%	50%	55%	97%	78%	50%	50%	50%	58%	100%	
Museum/aquarium (weekends)	79%	90%	91%	100%	60%	70%	72%	76%	70%	72%	74%	60%	80%	
Employee	89%	100%	100%	100%	70%	80%	82%	86%	80%	82%	84%	70%	90%	
Arena	90%	100%	100%	100%	100%	75%	0%	0%	60%	65%	90%	100%	95%	8
Employee	100%	100%	100%	100%	100%	100%	10%	10%	75%	75%	100%	100%	100%	
Pro football stadium ³	0%	0%	0%	0%	90%	90%	90%	90%	100%	100%	100%	100%	100%	8
Employee	10%	10%	10%	10%	10%	10%	10%	100%	100%	100%	100%	100%	100%	
Pro baseball stadium	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%	8
Employee	10%	10%	25%	90%	100%	100%	100%	100%	100%	100%	10%	10%	10%	
Health club	100%	95%	85%	70%	65%	65%	65%	70%	80%	85%	85%	100%	95%	9
Employee	100%	100%	95%	80%	75%	75%	75%	80%	90%	95%	95%	100%	10%	
Public library	75%	75%	80%	85%	90%	90%	90%	90%	95%	95%	90%	65%	50%	8
Employee	85%	85%	85%	90%	95%	95%	90%	95%	100%	100%	95%	65%	50%	
Convention center ⁴	75%	100%	90%	55%	60%	50%	45%	75%	80%	85%	100%	100%	0%	8
Employee	85%	100%	100%	65%	70%	60%	55%	85%	90%	95%	100%	100%	0%	
Hotel and residential														
Hotel-business	60%	75%	90%	100%	95%	95%	95%	85%	90%	95%	80%	60%	55%	10,11
Hotel-leisure	80%	90%	100%	100%	90%	90%	100%	100%	75%	75%	75%	50%	100%	
Hotel employees	Use same factor as guests for type of hotel													
Restaurant/lounge	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%	
All meeting banquet (<100 sq ft/key)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Convention (>100 sq ft/key)	75%	100%	90%	55%	60%	50%	45%	75%	80%	85%	100%	100%	0%	
Restaurant/meeting employees	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Residential unreserved residents	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	100%	8
Reserved residents	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Visitor	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	100%	
Active senior housing	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	8
Residents	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

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FIGURE 2-3 (continued)

Land use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Late Dec ¹	Notes
Office														
Office	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%	12
Reserved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Employee	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%	
Open plan/ high-density office	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%	12
Reserved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Employee	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%	
Medical/dental office	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%	5
Employee	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%	
Daycare center	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%	5
Employee	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%	
Bank (drive-in branch)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	5
Employee	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

1. December = December 1–24; Late December = December 25–31.

2. Land uses particularly affected by school year on weekdays.

3. Because there is only one weeknight game and no Saturday games per NFL team September through November, and activity patterns are modified at adjacent uses, this category is not considered a design day for parking planning.

4. Many convention centers are completely dark in Late December.

5. Developed by team members from a combination of sources.

6. U.S. Census Bureau Unadjusted Estimates of Retail Sales, 2008–2017.

7. U.S. Census Bureau Unadjusted Estimates of Retail Sales, 2012–2017.

8. Confidential data provided by facility managers.

9. John W. Dorsett, "Parking Requirements for Health Clubs," *The Parking Professional*, April 2004.

10. <https://catalog.data.gov/dataset/monthly-hotel-occupancy-b2f97>.

11. <https://www.statista.com/statistics/206546/us-hotels-occupancy-rate-by-month/>.

12. Parking Study conducted by Patton Harris Rust & Associates for the Peterson Companies, 2001.

FIGURE 2-4 Weekday Time-of-Day Adjustments

Land use		6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 p.m.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 a.m.
Retail typical	Visitors	1%	5%	15%	35%	60%	75%	100%	100%	95%	85%	85%	85%	90%	80%	65%	45%	15%	5%	0%
December	Visitors	1%	5%	15%	30%	55%	75%	90%	100%	100%	95%	80%	85%	90%	90%	85%	50%	30%	10%	0%
Late December	Visitors	1%	5%	10%	20%	40%	65%	90%	100%	100%	100%	95%	85%	70%	55%	40%	25%	15%	5%	0%
All	Employees	10%	15%	25%	45%	75%	95%	100%	100%	100%	100%	100%	100%	100%	100%	90%	60%	40%	20%	0%
Supermarket/grocery	Visitors	5%	20%	30%	50%	60%	67%	85%	90%	95%	97%	100%	100%	100%	85%	55%	35%	20%	5%	5%
	Employees	20%	30%	40%	80%	90%	100%	100%	100%	100%	100%	100%	100%	80%	50%	35%	20%	20%	20%	20%
Pharmacy	Visitors	5%	20%	30%	60%	60%	67%	85%	90%	95%	97%	100%	100%	100%	85%	55%	35%	20%	5%	5%
	Employees	20%	30%	40%	80%	90%	100%	100%	100%	100%	100%	100%	100%	80%	50%	35%	20%	20%	20%	20%
Discount stores/superstores	Visitors	15%	35%	45%	65%	75%	85%	100%	100%	100%	100%	95%	85%	75%	60%	45%	30%	10%	5%	1%
	Employees	25%	45%	55%	75%	85%	100%	100%	100%	100%	100%	100%	95%	85%	70%	55%	40%	20%	0%	20%
Home improvement stores/garden	Visitors	15%	20%	35%	55%	85%	99%	100%	99%	98%	90%	85%	80%	75%	60%	50%	30%	10%	0%	0%
	Employees	25%	30%	45%	65%	95%	100%	100%	100%	100%	100%	95%	90%	85%	70%	60%	40%	20%	0%	0%
Food and beverage																				
Fine/casual dining	Visitors	0%	0%	0%	0%	15%	40%	75%	75%	65%	40%	50%	75%	95%	100%	100%	100%	95%	75%	25%
	Employees	0%	20%	50%	75%	90%	90%	90%	90%	90%	75%	75%	100%	100%	100%	100%	100%	100%	85%	35%
Family restaurant	Visitors	25%	50%	60%	75%	85%	90%	100%	90%	50%	45%	45%	75%	80%	80%	80%	60%	55%	75%	25%
	Employees	50%	75%	90%	90%	100%	100%	100%	100%	100%	75%	75%	95%	95%	95%	95%	80%	65%	65%	35%
Fast casual/fast food/food court/food halls	Visitors	5%	10%	20%	30%	55%	85%	100%	100%	90%	60%	55%	60%	85%	80%	50%	30%	20%	10%	5%
	Employees	20%	20%	30%	40%	75%	100%	100%	100%	95%	70%	60%	70%	90%	90%	60%	40%	30%	20%	20%
Bar/lounge/nightclub	Visitors	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	50%	75%	100%	100%	75%	50%
	Employees	0%	0%	0%	5%	5%	5%	5%	10%	10%	10%	20%	45%	70%	100%	100%	100%	100%	90%	60%
Entertainment																				
Family entertainment	Visitors	0%	0%	0%	0%	45%	65%	85%	95%	100%	95%	90%	70%	60%	45%	0%	0%	0%	0%	0%
	Employees	0%	0%	5%	25%	75%	100%	100%	100%	100%	100%	100%	80%	70%	55%	10%	5%	5%	5%	5%
Active entertainment	Visitors	0%	0%	0%	0%	25%	65%	85%	90%	95%	95%	90%	95%	100%	95%	90%	65%	10%	0%	0%
	Employees	5%	5%	5%	25%	75%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	10%	5%	5%
Adult active entertainment	Visitors	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	50%	75%	100%	100%	100%	100%
	Employees	0%	0%	0%	5%	5%	5%	5%	10%	10%	10%	20%	45%	70%	100%	100%	100%	100%	100%	100%
All movies typical	Visitors	0%	0%	0%	0%	0%	0%	20%	45%	55%	55%	55%	60%	60%	80%	100%	100%	80%	65%	40%
Late December	Visitors	0%	0%	0%	0%	0%	0%	35%	60%	75%	80%	80%	80%	70%	80%	100%	100%	85%	70%	55%
All	Employees	0%	0%	0%	0%	0%	10%	50%	60%	60%	75%	75%	100%	100%	100%	100%	100%	100%	70%	50%
Live theater	Visitors	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	25%	100%	100%	0%	0%	0%
	Employees	0%	10%	10%	20%	20%	20%	30%	30%	30%	30%	30%	30%	30%	100%	100%	100%	100%	30%	5%
Outdoor amphitheater	Visitors	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	25%	100%	100%	0%	0%	0%
	Employees	0%	10%	10%	20%	20%	20%	30%	30%	30%	30%	30%	30%	30%	100%	100%	100%	100%	30%	5%
Public park/destination open space	Visitors	1%	5%	10%	25%	50%	65%	85%	95%	100%	95%	90%	70%	90%	100%	100%	100%	80%	50%	10%
	Employees	5%	10%	25%	50%	75%	100%	100%	100%	100%	100%	100%	80%	100%	100%	100%	100%	100%	60%	20%
Museum/aquarium	Visitors	0%	0%	0%	0%	45%	65%	85%	95%	100%	95%	90%	85%	60%	30%	10%	0%	0%	0%	0%
	Employees	5%	5%	5%	25%	75%	100%	100%	100%	100%	100%	100%	80%	75%	10%	5%	0%	0%	5%	5%
Arena	Visitors	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	10%	25%	100%	100%	85%	0%	0%
No matinee	Employees	0%	10%	10%	20%	20%	20%	30%	30%	30%	30%	30%	30%	100%	100%	100%	100%	30%	10%	5%

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FIGURE 2-4 (continued)

Land use		6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 p.m.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 a.m.
Entertainment (continued)																				
Pro football stadium	Visitors	0%	0%	0%	1%	1%	1%	5%	5%	5%	5%	5%	5%	10%	50%	100%	100%	85%	25%	0%
	Employees	0%	10%	10%	20%	20%	20%	30%	30%	30%	30%	30%	30%	30%	100%	100%	100%	100%	100%	25%
Pro baseball stadium	Visitors	0%	0%	0%	1%	1%	1%	5%	5%	5%	5%	5%	5%	10%	50%	100%	100%	85%	25%	0%
	Employees	0%	10%	10%	20%	20%	20%	30%	30%	30%	30%	30%	30%	30%	100%	100%	100%	100%	100%	25%
Health club	Visitors	70%	40%	40%	70%	70%	80%	60%	70%	70%	70%	80%	90%	100%	90%	80%	70%	35%	10%	0%
	Employees	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	100%	100%	75%	50%	20%	20%	20%	0%
Public library	Visitors	0%	0%	0%	100%	100%	98%	98%	78%	72%	65%	70%	79%	60%	50%	40%	0%	0%	0%	0%
	Employees	0%	10%	50%	100%	100%	100%	100%	100%	100%	100%	100%	90%	75%	50%	20%	10%	0%	0%	0%
Daycare center	Visitors	0%	2%	25%	75%	20%	20%	20%	20%	20%	20%	100%	50%	20%	5%	0%	0%	0%	0%	0%
	Employees	0%	50%	75%	90%	90%	90%	90%	90%	90%	100%	100%	100%	60%	40%	10%	0%	0%	0%	0%
Convention center	Visitors	0%	0%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	30%	30%	10%	0%	0%	0%
	Employees	5%	30%	33%	33%	100%	100%	100%	100%	100%	100%	90%	70%	40%	25%	20%	20%	5%	0%	0%
Hotel and residential																				
Hotel-business	Visitors	95%	90%	80%	70%	60%	60%	55%	55%	60%	60%	65%	70%	75%	75%	80%	85%	95%	100%	100%
Hotel-leisure	Visitors	95%	95%	90%	80%	70%	70%	65%	65%	70%	70%	75%	80%	85%	85%	90%	95%	95%	100%	100%
Employee	Employees	10%	30%	100%	100%	100%	100%	100%	100%	100%	100%	70%	70%	40%	20%	20%	20%	20%	10%	5%
Restaurant/lounge	Visitors	0%	10%	30%	10%	10%	5%	100%	100%	33%	10%	10%	30%	55%	60%	70%	67%	60%	40%	30%
Meeting/banquet (<100 sq ft/key)	Visitors	0%	0%	30%	60%	60%	60%	65%	65%	65%	65%	65%	100%	100%	100%	100%	100%	50%	0%	0%
Convention (>100 sq ft/key)	Visitors	0%	0%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	30%	30%	10%	0%	0%	0%
Employee	Employees	10%	10%	60%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	40%	40%	20%	0%	0%	0%
Residential guest	Visitors	0%	10%	20%	20%	20%	20%	20%	20%	20%	20%	20%	40%	60%	100%	100%	100%	100%	80%	50%
Resident reserved	Residents	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Residential suburban	Residents	95%	80%	67%	55%	50%	45%	40%	40%	40%	40%	45%	50%	60%	70%	80%	85%	95%	97%	100%
Residential urban	Residents	95%	85%	75%	65%	60%	55%	50%	50%	50%	55%	60%	65%	70%	75%	80%	85%	95%	97%	100%
Active senior housing	Visitors & employees	95%	97%	100%	100%	99%	98%	98%	99%	98%	100%	99%	94%	96%	98%	97%	97%	97%	98%	98%
	Residents	95%	97%	100%	100%	99%	98%	98%	99%	98%	100%	99%	94%	96%	98%	97%	97%	97%	98%	98%
Office																				
Office	Visitors	0%	1%	20%	60%	100%	45%	15%	45%	95%	45%	15%	10%	5%	2%	1%	0%	0%	0%	0%
	Employees unreserved	3%	15%	50%	90%	100%	100%	85%	85%	95%	95%	85%	60%	25%	15%	5%	3%	1%	0%	0%
	Employees reserved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Medical/dental office	Visitors	0%	0%	90%	90%	100%	100%	30%	90%	100%	100%	90%	80%	67%	30%	15%	0%	0%	0%	0%
	Employees	0%	20%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	67%	30%	15%	0%	0%	0%	0%
Bank (drive-in branch)	Visitors	0%	0%	50%	90%	100%	50%	50%	50%	70%	50%	80%	100%	0%	0%	0%	0%	0%	0%	0%
	Employees	0%	0%	60%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%

Source: See chapter 4 discussions for each land use.

FIGURE 2-5 Weekend Time-of-Day Adjustments

Land use		6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
		a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.
Retail typical	Visitors	1%	5%	30%	50%	70%	90%	95%	100%	100%	95%	90%	80%	75%	70%	65%	50%	30%	10%	0%
	Employees	1%	5%	10%	35%	60%	85%	100%	100%	100%	100%	90%	80%	65%	60%	55%	50%	35%	15%	1%
December	Visitors	1%	5%	10%	20%	40%	60%	80%	95%	100%	100%	95%	85%	70%	60%	50%	30%	20%	10%	0%
	Employees	10%	15%	40%	75%	85%	95%	100%	100%	100%	100%	100%	95%	85%	80%	75%	65%	45%	15%	0%
Supermarket/ grocery	Visitors	10%	25%	50%	75%	95%	100%	100%	100%	100%	100%	100%	90%	50%	33%	25%	15%	5%	4%	3%
	Employees	15%	35%	70%	85%	100%	100%	100%	100%	85%	75%	60%	55%	45%	40%	30%	20%	10%	10%	5%
Pharmacy	Visitors	8%	25%	50%	75%	95%	100%	100%	100%	100%	100%	100%	90%	50%	33%	25%	15%	5%	4%	3%
	Employees	15%	35%	70%	85%	100%	100%	100%	100%	85%	75%	60%	55%	45%	40%	30%	20%	10%	10%	5%
Discount stores/ superstores	Visitors	10%	15%	20%	30%	45%	65%	85%	95%	100%	100%	100%	95%	80%	60%	45%	30%	10%	5%	1%
	Employees	20%	25%	30%	40%	55%	75%	95%	100%	100%	100%	100%	100%	90%	70%	55%	40%	20%	15%	0%
Home improvement stores/garden	Visitors	15%	20%	35%	55%	60%	80%	95%	100%	95%	95%	80%	75%	75%	80%	90%	70%	10%	0%	9%
	Employees	25%	30%	45%	65%	70%	90%	100%	100%	100%	100%	90%	85%	85%	90%	100%	80%	20%	0%	0%
Food and beverage																				
Fine/casual dining	Visitors	0%	0%	0%	0%	0%	15%	50%	55%	45%	45%	45%	60%	90%	95%	100%	90%	90%	90%	50%
	Employees	0%	20%	30%	60%	75%	75%	75%	75%	75%	75%	75%	100%	100%	100%	100%	100%	100%	85%	50%
Family restaurant	Visitors	10%	25%	45%	70%	90%	90%	100%	85%	65%	40%	45%	60%	70%	70%	65%	30%	25%	15%	10%
	Employees	50%	75%	90%	90%	100%	100%	100%	100%	100%	75%	75%	95%	95%	95%	95%	80%	65%	65%	35%
Fast casual/ fast food/food court/food halls	Visitors	5%	10%	20%	30%	55%	85%	100%	100%	90%	60%	55%	60%	85%	80%	50%	30%	20%	10%	5%
	Employees	15%	20%	30%	40%	75%	100%	100%	100%	95%	70%	60%	70%	90%	90%	60%	40%	30%	20%	20%
Bar/lounge/ nightclub	Visitors	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	50%	75%	100%	100%	100%	100%
	Employees	0%	0%	0%	5%	5%	5%	5%	10%	10%	10%	20%	45%	70%	100%	100%	100%	100%	100%	100%
Entertainment																				
Family entertainment	Visitors	0%	0%	0%	0%	25%	65%	85%	90%	95%	95%	90%	95%	100%	95%	90%	65%	10%	0%	0%
	Employees	5%	5%	5%	25%	75%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	10%	5%	5%
Active entertainment	Visitors	0%	0%	0%	0%	25%	65%	85%	90%	95%	95%	90%	95%	100%	95%	90%	65%	10%	0%	0%
	Employees	5%	5%	5%	25%	75%	100%	100%	100%	100%	100%	90%	100%	100%	100%	100%	75%	10%	5%	5%
Adult active entertainment	Visitors	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	50%	75%	100%	100%	100%	100%
	Employees	0%	0%	0%	5%	5%	5%	5%	10%	10%	10%	20%	45%	70%	100%	100%	100%	100%	100%	100%
All movies typical	Visitors	0%	0%	0%	0%	0%	0%	20%	45%	55%	55%	55%	60%	60%	80%	100%	100%	100%	80%	50%
	Late December	0%	0%	0%	0%	0%	0%	35%	60%	75%	80%	80%	80%	70%	80%	100%	100%	100%	85%	70%
Live theater	Visitors	0%	0%	0%	1%	1%	1%	1%	17%	67%	67%	1%	1%	1%	25%	100%	100%	0%	0%	0%
	Employees	0%	10%	10%	20%	20%	20%	30%	100%	100%	100%	30%	30%	100%	100%	100%	100%	30%	10%	5%
Outdoor amphitheater	Visitors	0%	0%	0%	1%	1%	1%	1%	17%	67%	67%	1%	1%	1%	25%	100%	100%	0%	0%	0%
	Employees	0%	10%	10%	20%	20%	20%	30%	100%	100%	100%	30%	30%	100%	100%	100%	100%	30%	10%	5%
Public park/ destination open space	Visitors	0%	0%	0%	1%	30%	60%	75%	90%	97%	100%	98%	85%	70%	80%	100%	100%	95%	50%	10%
	Employees	0%	0%	10%	25%	75%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	90%	80%
Museum/ aquarium	Visitors	0%	0%	0%	0%	45%	65%	85%	95%	100%	95%	90%	85%	60%	30%	10%	0%	0%	0%	0%
	Employees	5%	5%	5%	25%	75%	100%	100%	100%	100%	100%	100%	80%	75%	10%	5%	0%	0%	5%	5%
Arena No matinee	Visitors	0%	0%	0%	1%	1%	1%	1%	25%	95%	95%	81%	1%	1%	25%	100%	100%	0%	0%	0%
	Employees	0%	10%	10%	20%	20%	20%	30%	100%	100%	100%	100%	30%	100%	100%	100%	100%	30%	10%	5%

(continued on next page)

FIGURE 2-5 (continued)

Land use		6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 p.m.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	12 a.m.
Entertainment (continued)																				
Pro football stadium 8 p.m. start	Visitors	0%	0%	1%	1%	5%	5%	50%	100%	100%	85%	25%	0%	0%	0%	0%	0%	0%	0%	0%
	Employees	0%	5%	10%	20%	30%	30%	100%	100%	100%	100%	25%	10%	5%	5%	0%	0%	0%	0%	0%
Pro baseball stadium	Visitors	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	50%	90%	100%	100%	100%	100%	0%
	Employees	0%	0%	0%	5%	5%	5%	5%	5%	5%	5%	5%	20%	75%	75%	100%	100%	100%	100%	100%
Health club	Visitors	80%	45%	35%	50%	35%	50%	50%	30%	25%	30%	55%	100%	95%	60%	30%	10%	1%	0%	0%
	Employees	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	75%	100%	100%	75%	50%	20%	20%	20%	0%
Public library	Visitors	0%	0%	0%	0%	100%	90%	80%	65%	50%	35%	11%	5%	5%	0%	0%	0%	0%	0%	0%
	Employees	0%	0%	10%	50%	100%	100%	100%	100%	100%	50%	10%	10%	10%	10%	0%	0%	0%	0%	0%
Daycare center	Visitors	0%	2%	25%	75%	20%	20%	20%	20%	20%	20%	100%	50%	20%	5%	0%	0%	0%	0%	0%
	Employees	0%	50%	75%	90%	90%	90%	90%	90%	90%	100%	100%	100%	60%	40%	10%	0%	0%	0%	0%
Convention center	Visitors	0%	0%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	30%	30%	10%	0%	0%	0%
	Employees	5%	30%	33%	33%	100%	100%	100%	100%	100%	100%	90%	70%	40%	25%	20%	20%	5%	0%	0%
Hotel and residential																				
Hotel-business	Visitors	95%	90%	80%	70%	60%	60%	55%	55%	60%	60%	65%	70%	75%	75%	80%	85%	95%	100%	100%
Hotel-leisure	Visitors	95%	95%	90%	80%	70%	70%	65%	65%	70%	70%	75%	80%	85%	85%	90%	95%	95%	100%	100%
Employee	Employees	10%	30%	100%	100%	100%	100%	100%	100%	100%	100%	70%	70%	40%	20%	20%	20%	20%	10%	5%
Restaurant/ lounge	Visitors	0%	10%	30%	10%	10%	5%	100%	100%	33%	10%	10%	30%	55%	60%	70%	67%	60%	40%	30%
Meeting/banquet (<100 sq ft/key)	Visitors	0%	0%	30%	60%	60%	60%	65%	65%	65%	65%	65%	100%	100%	100%	100%	100%	50%	0%	0%
Convention (>100 sq ft/key)	Visitors	0%	0%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	30%	30%	10%	0%	0%	0%
	Employee	Employees	10%	10%	60%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	10%	10%
Residential guest	Visitors	0%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	40%	60%	100%	100%	100%	100%	80%	50%
Resident reserved	Residents	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Residential suburban	Residents	100%	95%	88%	80%	75%	70%	68%	65%	65%	68%	71%	74%	77%	80%	83%	86%	89%	92%	100%
Residential urban	Residents	90%	85%	80%	75%	70%	69%	68%	67%	66%	55%	60%	55%	50%	55%	65%	75%	85%	90%	100%
Active senior housing	Visitors	94%	98%	97%	95%	93%	94%	97%	99%	100%	100%	99%	98%	98%	98%	97%	95%	94%	98%	98%
	Employees	94%	98%	97%	95%	93%	94%	97%	99%	100%	100%	99%	98%	98%	98%	97%	95%	94%	98%	98%
Office																				
Office	Visitors	0%	20%	60%	80%	90%	100%	90%	80%	60%	40%	20%	10%	5%	0%	0%	0%	0%	0%	0%
	Employees unreserved	0%	20%	60%	80%	90%	100%	90%	80%	60%	40%	20%	10%	5%	0%	0%	0%	0%	0%	0%
	Employees reserved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Medical/ dental office	Visitors	0%	0%	90%	90%	100%	100%	30%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Employees	0%	20%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bank (drive-in branch)	Visitors	0%	0%	25%	40%	75%	100%	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Employees	0%	0%	90%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Source: See chapter 4 discussions for each land use.