December 12, 2023

James Parvesse, P.E., C.M.E.
Municipal Engineer
Township of Lawrence
2207 Lawrenceville Road
Lawrence Township, NJ 08648

RE: Operational and Parking Evaluation
Mercer Mall: Proposed Starbucks Outparcel
Lawrence Township, Mercer County, New Jersey

Dear James,

McMahon, a Bowman Company has completed a trip generation and parking evaluation associated with the proposed Starbucks within the Mercer Mall, which is located on the north side of Brunswick Avenue (US Route 1) in Lawrence Township, Mercer County, NJ (see **Figure 1A and 1B**). Access to the Mercer Mall will remain unchanged with the development of the Starbucks outparcel. Overall access is provided via a signalized access along Quakerbridge Road (County Route 533), as well as multiple right-in/right-out only driveways along Brunswick Avenue (US Route 1).

The proposed Starbucks will be an outparcel with a drive-through and Starbucks will be relocating from its existing in-line space in the shopping center. The former in-line Starbucks space will then be converted to commercial space for use by another tenant. A dedicated parking field is also proposed to be provided for the Starbucks outparcel, as illustrated in the latest site plan prepared by Kimley-Horn, which can be seen in **Figure 2**, the Starbucks outparcel will have 2,200 square feet of building space, where the prior in-line store had approximately 1,000 square feet of building space. The dedicated parking field will have a total of fourteen (14) parking spaces, including two (2) ADA parking spaces and three (3) 5-minute parking spaces and a designated turn-around. With the construction of the Starbucks outparcel, the overall parking within the center will decrease from 2,034 to 1,992 spaces resulting in a loss of 42 spaces.

This letter report has been prepared to provide a summary of the anticipated trip generation characteristics and drive-through operations associated with the proposed Starbucks, as well as an evaluation of the anticipated parking demands. As the number of parking spaces within the center will be reduced, a summary of the required parking for the overall center based upon the Township's requirements is provided for the overall center and for the Starbucks outparcel. The existing and proposed parking supply and demand within the center adjacent to the proposed Starbucks outparcel is provided. The parking demand for the Starbucks outparcel is based upon data compiled within the Institute of Transportation Engineers' publication entitled, *Trip Generation Manual, Sixth Edition*.

SUMMARY

Based upon the evaluation completed, it is our opinion that the proposed Starbucks outparcel within the Mercer Mall will not have an adverse impact on the overall traffic operations or parking demand within the center. Upon review of this report, the following can be concluded:

1) Despite the reduction in overall parking to the center resulting from the proposed development, there is sufficient parking to accommodate existing and anticipated parking demand.
2) Based upon the operational characteristics of the proposed use, which typically sees peak traffic during the weekday morning time periods, it can be concluded that the Starbucks with Drive Through will not have an adverse impact on the other existing uses within the shopping center.
3) Based upon the proposed design of the pad, the orientation of the drive-through, and anticipated queuing at the drive-through, the designed drive-through facility provides sufficient stacking for the use.

STARBUCKS OPERATIONAL CHARACTERISTICS

The existing in-line Starbucks, which occupies approximately 1,000 square feet of building space, is open Monday through Saturday from 6:00 AM to 9:00 PM and Sundays from 6:00 AM to 7:30 PM. The existing Starbucks offers inside dining and pick-up option for mobile orders, as there is no drive-through service provided. The proposed Starbucks will be located within a separate outparcel with 2,200 square feet of building space and includes inside dining and pick-up options, as well as a drive-through. The drive-through is designed to provide two lanes for placing orders before merging back into a single lane for pick-up, which can accommodate up to seventeen (17) vehicles as illustrated in Figure 2. The outparcel will have a total of fourteen (14) parking spaces, including two (2) ADA parking spaces and three (3) 5-minute parking spaces.

Access to the outparcel will be provided via the existing accesses that serves the Mercer Mall, which includes the signalized access along Quakerbridge Road (County Route 533), as well as multiple right-in/right-out only driveways along Brunswick Avenue (US Route 1). Based upon the location of the outparcel (see Figures 1A and 1B), patrons traveling north along Brunswick Avenue (US Route 1) along with patrons traveling east or west along Quakerbridge Road (County Route 533) will utilize the signalized access along Quakerbridge Road to access the Starbucks. Patrons traveling south along Brunswick Avenue (US Route 1) will most likely enter via the northern right-in access along Brunswick Avenue (US Route 1).

Figure 3 illustrates the travel routes and how vehicles will then access the drive-through for Starbucks. For patrons entering via the signalized access along Quakerbridge Road (County Route 533), they will turn left and then right into either the parking lot or drive through. For those entering via Brunswick Avenue (US Route 1), wayfinding signs will be provided directing patrons to travel to the internal T-intersection to turn right and then to turn right onto the access aisle located to the east of the Starbucks. This signage will ensure that all patrons using the drive-through will enter the site at the same location.

TRIP GENERATION CHARACTERISTICS

The trip generation characteristics for the existing in-line Starbucks and the proposed Starbucks outparcel with a drive-through, as well as the projected commercial use associated with the existing Starbucks building space has been estimated based upon data compiled within the Institute of Transportation Engineers' (ITE) publication entitled *Trip Generation Manual, 11th Edition*. Specifically, the existing Starbucks trip generation is based upon Land Use Code 936: Coffee/Donut Shop without Drive-Through Window, while the proposed Starbucks outparcel is based upon Land Use Code 937: Coffee/Donut Shop with Drive-Through Window. The change in the in-line building space to a commercial use was then based upon the rates for Land Use Code 820 – Shopping Center (>150k) since the space is part of the overall shopping center.

Table 1 provides a summary of the anticipated trip generation characteristics associated with the change within the center to provide the Starbucks outparcel and replace the existing in-line Starbucks space with general retail space. The total additional trips associated with the change in uses in the center would then consist of three trip types: (1) internal or shared trips with other uses within the center; (2) pass-by trips or trips that are already being made on the adjacent roadway network (i.e., home to Starbucks to work); and (3) new trips or trips that would be generated as a result of the proposed new land uses within the center. To be conservative, no reductions for shared trips with the existing center have been accounted for in Table 1. The pass-by for the proposed Starbucks Outparcel is then based upon pass-by rates for Land Use Code 934: Fast-Food Restaurants with Drive Through Windows, since no specific data is available for Coffee/Donut Shops with Drive-Through Windows and Indoor Seating.

Table 1 – Peak Hour Vehicular Trip Generation Characteristics

Description	Size (s.f.)	Daily	Weekday Morning			Weekday Afternoon			Saturday Midday		
			Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Proposed Starbucks Outparcel (1)	2,200	1,174	96	93	189	43	43	86	97	96	193
Proposed Retail Space (2)	1,000	37	1	0	1	2	1	3	2	2	4
Less Existing Starbucks (3)	-1,000	-536	-47	-46	-93	-16	-16	-32	-28	-29	-57
Total Additional Trips	2,200	675	50	47	97	29	28	57	71	69	140
Less Pass-By Trips (4)		-78	-24	-24	-48	-15	-15	-30	-31	-31	-62
New Trips		**597**	**26**	**23**	**49**	**14**	**13**	**27**	**40**	**38**	**78**

(1) Based on rates for Land Use Code 937: Coffee/Donut Shop with Drive-Through Window.
(2) Based on rates for Land Use Code 820: Shopping Center (>150k).
(3) Based on rates for Land Use Code 936: Coffee/Donut Shop without Drive-Through Window. Daily is based on multiplying the daily trips for land use code 937 times the ratio of the combined rates for the weekday morning and afternoon trips for Land Use Code 936 divided by 937.
(4) Pass-by rate based on ITE Land Use Code 934 Fast-Food Restaurant with Drive-Through, which has a pass-by rate of 50% and 55% during the weekday morning and afternoon, respectively. A pass-by rate of 45% or 10% less than the weekday afternoon has been utilized for the Saturday midday, since there is no data in the manual for this time-period. Daily is based on combined weekday morning and afternoon peak periods.

As can be seen from Table 1, it is anticipated the Mercer Mall would generate 597 total new trips (entering and exiting) on a typical weekday, of which 49 and 27 total new trips (entering and exiting) would be generated during the weekday morning and afternoon peak hours, respectively, with the construction of the Starbucks outparcel. During the Saturday midday peak hour, the Mercer Mall would generate 78 total new trips (entering and exiting) with the construction of the Starbucks outparcel. It is important to note that two trips are equivalent to one vehicle, as each vehicle that enters throughout the day will also exit the site.

DRIVE THROUGH OPERATIONS

According to the footnote provided below *Table 5.16* of the Lawrence Township *Land Use Ordinance (LUO)*, the drive through for the Starbucks outparcel will be required to provide space for at least 12 vehicles per drive-through window for queuing purposes. As illustrated in **Figure 4**, there is space for up to seventeen (17) vehicles to queue from the drive-through pick-up window to the entrance of the drive-through, where two lanes are provided for taking orders.

Drive through vehicle queues were observed at three (3) Starbucks sites within Pennsylvania. The data from the observations along with aerials of the sites are provided for reference in **Attachment A**. It is noted that all three sites included a single drive-through lane for both ordering and pick-up. However, the maximum observed queue was for ten (10) vehicles, which occurred at the King of Prussia site.

Based upon these observations and the Township's requirement to provide stacking for at least twelve (12) vehicles, the site design to provide up to seventeen (17) vehicles within the drive through is expected to be adequate. If the drive-through queue were to extend beyond the designated drive-through area, the queue is not expected to impact any other area uses, or primary drive aisles, within the Mercer Mall based upon the location of the proposed outparcel and orientation of the drive-through.

REQUIRED PARKING

The section of the Mercer Mall located within Lawrence Township is illustrated in **Figure 5**. This area of the shopping center contains a total of 481,847 square feet of commercial space with 2,034 parking spaces. The Lawrence Township LUO requires a shopping center with 400,000 to 599,999 square feet of gross leasable area (GLA) to provide 4.5 parking spaces per 1,000 square feet of GLA. The existing shopping center would be required to provide a total of 2,169 parking spaces based upon the 4.5 spaces per 1,000 square feet of commercial space.

With the additional building space provided by the proposed Starbucks parcel, which is approximately 2,200 square feet, the overall parking in the shopping center will be reduced by a total of 42 parking spaces from 2,034 to 1,992 parking spaces. With the completion of the Starbucks the shopping center would then be required to provide a total of 2,179 parking spaces.

As the proposed parking supply with the completion of the Starbucks outparcel results in a total of 1,992 parking spaces and 2,179 parking spaces are required, a variance is then requested to allow for the reduction in the total number of parking spaces within the Mercer Mall. To demonstrate that there will be sufficient parking within Mercer Mall and specifically, the areas surrounding the proposed Starbucks outparcel, existing parking demand observations were completed.

EXISTING PARKING SUPPLY AND DEMAND

Under current conditions, the Mercer Mall provides a total of 2,034 spaces. The construction of the Starbucks outparcel will result in a net decrease in the overall parking of 42 spaces reducing the overall parking supply to 1,992 spaces. As this value is less than the required parking, existing parking demand counts were conducted on a typical weekday, Friday and Saturday, to support the requested variance.

Existing parking demand counts were conducted within the Mercer Mall from 6:00 AM to 6:00 PM on a typical weekday (Tuesday, Wednesday, or Thursday) and a typical Friday. During the weekday and Friday time-periods, the parking demand was limited to the parking fields located adjacent to the existing and proposed Starbucks outparcel with the observations documented every thirty minutes. These parking demand counts were conducted on Thursday, September 21, 2023, and Friday, September 29, 2023. **Figure 6** illustrates the zones for the weekday and Friday observations along with the corresponding parking supply and maximum observed demand for the weekday and Friday for each zone, which does not occur during the same intervals.

Parking demand counts were also conducted within the Mercer Mall from 9:00 AM to 3:00 PM on a typical Saturday. These parking demand counts were conducted on October 7, 2023 within the entire center and documented every sixty minutes. **Figure 7** illustrates the zones for the Saturday observations along with the corresponding parking supply and maximum observed demand for each zone, which do not occur during the

same intervals. The parking for the entire center was only documented on a typical Saturday, as according to the Institute of Transportation Engineers' publication entitled *Parking Generation Manual, Sixth Edition* Saturdays have the highest parking demand for Land Use Code 820: Shopping Centers. The corresponding pages from the manual are provided in **Attachment B** for general suburban/urban locations during non-December months for the weekday (Monday to Thursday), Friday, and Saturday periods.

Additional tables and charts illustrating the existing parking supply and demand within the zones surrounding the existing and proposed Starbucks outparcel, which includes Zones 1 to 7, are provided in **Attachment C**. **Table 2** provides a summary of the existing peak parking demand within Zones 1 to 7 for the typical weekday, Friday and Saturday compared to the existing parking supply. As can be seen from Table 3, the peak parking times within the surrounding zones to the proposed Starbucks outparcel do not coincide with the typical peak operational hours for the Starbucks that are typically in the morning (i.e., 6:30 AM to 9:30 AM).

Table 2 – Existing Peak Parking Demand and Supply
Surrounding the Existing and Proposed Starbucks Outparcel

Description	Zones							Total
	1	2	3	4	5	6	7	
Thursday, September 21, 2023								
Peak Parking Demand (6:00 PM)	47	17	13	17	12	38	37	**181**
Parking Supply	82	23	24	66	86	67	86	434
Available Spaces	35	6	11	49	74	29	49	253
Percent Occupied	57%	74%	54%	26%	14%	57%	43%	42%
Friday, September 29, 2023								
Peak Parking Demand (3:30 PM)	36	22	24	39	21	29	33	**204**
Parking Supply	82	23	24	66	86	67	86	434
Available Spaces	46	1	0	27	65	38	53	230
Percent Occupied	44%	96%	100%	59%	24%	43%	38%	47%
Saturday, October 7, 2023								
Peak Parking Demand (2:00 PM)	52	18	8	62	50	50	52	**292**
Parking Supply	82	23	24	66	86	67	86	434
Available Spaces	30	5	16	4	36	17	34	142
Percent Occupied	63%	78%	33%	94%	58%	75%	60%	67%

Table 3 provides a summary of the existing peak parking demand within Zones 1 to 7 for the typical weekday, Friday, and Saturday during the peak operational time period (9:00 AM) that are typically associated with the proposed Starbucks. When the peak parking demand from Tables 2 and 3 are compared to one another, there are at least 60 additional parking spaces available within zones 1 to 7 during the peak operational hours associated with Starbucks. This is a function of when the surrounding retail uses open compared to when the Starbucks is operational, i.e., 6:00 AM for Starbucks versus 9:00 AM or later for the surrounding retail uses.

Table 3 – Existing Peak Parking Demand and Supply: 9:00 AM
Surrounding the Existing and Proposed Starbucks Outparcel

Description	Zones							Total
	1	2	3	4	5	6	7	
Thursday, September 21, 2023								
Peak Parking Demand (9:00 AM)	38	14	18	21	8	8	11	**118**
Parking Supply	82	23	24	66	86	67	86	434
Available Spaces	44	9	6	45	78	59	75	316
Percent Occupied	46%	61%	75%	32%	9%	12%	13%	27%
Friday, September 29, 2023								
Peak Parking Demand (9:00 AM)	39	15	19	23	9	8	11	**124**
Parking Supply	82	23	24	66	86	67	86	434
Available Spaces	43	8	5	43	77	59	75	310
Percent Occupied	48%	65%	79%	35%	10%	12%	13%	29%
Saturday, October 7, 2023								
Peak Parking Demand (9:00 AM)	13	6	4	37	17	26	9	**112**
Parking Supply	82	23	24	66	86	67	86	434
Available Spaces	69	17	20	29	69	41	77	322
Percent Occupied	16%	26%	17%	56%	20%	39%	10%	26%

PROJECTED STARBUCKS PARKING DEMAND

Based upon a comparison of the existing and proposed parking requirements for the shopping center, the shopping center would be required to provide an additional 10 spaces with completion of the Starbucks outparcel according to the Township code. The site plan for the Starbucks illustrates a total of fourteen (14) parking spaces adjacent to the outparcel, which includes two (2) ADA spaces and three (3) spaces that will be signed for mobile/carryout orders with a limit on the time patrons may park within the reserve spaces.

A review of the anticipated peak parking demand based upon data within the Institute of Transportation Engineers' publication entitled *Parking Generation Manual, Sixth Edition* for similar land uses was conducted. **Table 4** summarizes the projected peak parking demand based upon the building area for Land Use Code 937: Coffee/Donut Shop with Drive-Through Window. The corresponding pages from the manual, including the time of day peak demand during a typical weekday, are provided in **Attachment C.** Although the Saturday data from the manual shows a higher parking demand than on the weekday, it is noted that there were only two data points provided for the Saturday whereas the weekday is based on eleven (11) studies.

Table 4 – Starbucks Projected Peak Parking Demand (1)

Time Period	Average Rate per 1,000 square feet of GFA	Peak Parking Demand
Weekday	5.10	11 spaces
Saturday	8.70	19 spaces

(1) Based on Institute of Transportation Engineers' publication entitled *Parking Generation Manual, Sixth Edition* for Land Use Code 937: Coffee/Donut Shop with Drive-Through Window.

As there will be fourteen (14) spaces provided adjacent to the outparcel, the peak weekday parking demand can be accommodated within this lot. However, during Saturday when the parking demand for Starbucks may exceed the provided parking spaces, patrons will most likely park within a proximate parking field that is connected via pedestrian infrastructure, such as Zones 3 or 4 and walk to the Starbucks. As these areas were observed to have additional capacity, the parking from the Starbucks can be accommodated within these immediately adjacent parking areas.

Utilizing the peak demand from Table 4 and the hourly time of day parking demand for Land Use Code 937, the estimated peak demand corresponding to the existing count intervals when the parking counts were conducted were then determined. Tables and charts documenting the projected parking throughout these intervals for the proposed Starbucks outparcel are provided in **Attachment D**.

PROJECTED PARKING SUPPLY AND DEMAND

The parking demand based upon the hourly time of day for the Starbucks as documented in Attachment D was then overlaid onto the existing parking demand within Zones 1 through 7 as documented in Attachment B. The resultant parking demand tables for Zones 1 through 7 along with time of day charts with the completion of the Starbucks are then provided in **Attachment E.** The existing parking demand within Zone 1, as well as any overflow parking demand associated with the Starbucks were reassigned to the surrounding Zones, such as Zones 4 and 5.

Tables 5 and 6 summarize the peak demand within Zones 1 through 7 based upon the overall peak for the Mercer Mall and for the morning peak periods only, respectively. As can be seen, there is ample parking within the zones surrounding the proposed Starbucks outparcel to accommodate the prior demand associated with Zone 1 along with the Starbucks parking demand.

Table 5 – Projected Peak Parking Demand and Supply
Surrounding the Existing and Proposed Starbucks Outparcel

Description	Zones							Total
	1	2	3	4	5	6	7	
Typical Weekday								
Peak Parking Demand (6:00 PM)	40	17	13	31	12	38	37	188
Parking Supply	40	23	24	66	86	67	86	392
Available Spaces	0	6	11	35	74	29	49	204
Percent Occupied	100%	74%	54%	47%	14%	57%	43%	48%
Typical Friday								
Peak Parking Demand (3:30 PM)	40	22	24	41	21	29	33	210
Parking Supply	40	23	24	66	86	67	86	392
Available Spaces	0	1	0	25	65	38	53	182
Percent Occupied	100%	96%	100%	62%	24%	43%	38%	54%
Typical Saturday								
Peak Parking Demand (2:00 PM)	36	18	8	66	72	50	52	302
Parking Supply	40	23	24	66	86	67	86	392
Available Spaces	4	5	16	0	14	17	34	90
Percent Occupied	90%	78%	33%	100%	84%	75%	60%	77%

Table 6 – Projected Peak Parking Demand and Supply: 9:00 AM
Surrounding the Existing and Proposed Starbucks Outparcel

Description	Zones							Total
	1	2	3	4	5	6	7	
Typical Weekday								
Peak Parking Demand (9:00 AM)	40	14	18	30	8	8	11	129
Parking Supply	40	23	24	66	86	67	86	392
Available Spaces	0	9	6	36	78	59	75	263
Percent Occupied	100%	61%	75%	45%	9%	12%	13%	33%
Typical Friday								
Peak Parking Demand (9:00 AM)	40	15	19	33	9	8	11	135
Parking Supply	40	23	24	66	86	67	86	392
Available Spaces	0	8	5	33	77	59	75	257
Percent Occupied	100%	65%	79%	50%	10%	12%	13%	34%
Typical Saturday								
Peak Parking Demand (9:00 AM)	27	6	4	41	17	26	9	130
Parking Supply	40	23	24	66	86	67	86	392
Available Spaces	13	17	20	25	69	41	77	262
Percent Occupied	68%	26%	17%	62%	20%	39%	10%	33%

A review of the overall parking within the entire Mercer Mall, which is documented in Attachment E on a typical Saturday with completion of the Starbucks outparcel, was also completed. The overall shopping center peak parking demand is projected as 1,110 parking spaces during the Saturday interval from 2:00 PM to 3:00 PM. This demand is less than the provided parking spaces of 1,992 with completion of the Starbucks outparcel. As this value is still below the provided parking (1,992) within the Mercer Mall with completion of the Starbucks, it can be concluded that this development will not have an adverse impact on the operations of the Mercer Mall.

CONCLUSIONS

Based upon the operational characteristics associated with the proposed Starbucks, which typically peaks during the weekday morning time periods, it can be concluded that the Starbucks outparcel with a drive-through will not have an adverse impact on the other existing uses within the Mercer Mall. Based upon the location of the outparcel and the proposed wayfinding signs that will be provided to direct patrons to the drive through, the drive through queue should not interfere with access to any other uses within the center. As designed, the dual drive through lanes for ordering with a single lane for pick-up will allow for up to seventeen (17) vehicles to queue within the drive through, which meets the Township's minimum required stacking (12 spaces). Based upon observations of three Starbucks with single-lane drive-throughs, the stacking providing for the proposed outparcel should be adequate to meet the anticipated need.

As the proposed parking supply with the completion of the Starbucks outparcel results in a total of 1,992 parking spaces and 2,179 parking spaces are required, a variance is then requested to allow for the reduction in the total number of parking spaces within the Mercer Mall. To demonstrate that there will be sufficient parking within Mercer Mall and specifically, the areas surrounding the proposed Starbucks outparcel, existing parking demand observations were completed, and the parking associated with the Starbucks was then

overlaid onto these areas. Based upon the proposed parking supply in the surrounding areas and the projected parking demand within these areas, it can be concluded that there is space to accommodate the loss of parking spaces along with the increase in demand associated with the proposed Starbucks.

A review of the peak parking demand for the overall Mercer Mall was also conducted, which included an evaluation and projection of the peak December operations as well. Based upon the projected overall parking demand with completion of the Starbucks (1,110 parking spaces), the proposed parking supply of 1,992 spaces is adequate to meet the parking demands associated with the Mercer Mall. As a result, the required parking based upon the *Land Use Ordinance* to provide 2,179 parking spaces can be reduced as requested without impacting the operations of the Mercer Mall as the future parking supply (1,992) is adequate to meet the projected parking demands.

Based upon the evaluation completed, it is our opinion that the proposed Starbucks outparcel within the Mercer Mall will not have an adverse impact on the overall traffic operations and parking demand within the center. Furthermore, the location of the outparcel and the ability to provide for up to seventeen (17) vehicles to queue within the drive through lanes will also ensure that the outparcel can meet the anticipated demand without adversely impacting access to other areas within Mercer Mall.

If you have any questions regarding this evaluation for the proposed Starbucks, please feel free to contact me at skoza@mcmahonassociates.com or 215-283-9444.

Sincerely,

Sandy A. Koza, P.E., PTOE
Senior Project Manager
NJ PE License No. 24GE04735300

Attachments

CC: Adam Hendricks, Federal Realty Investment Trust

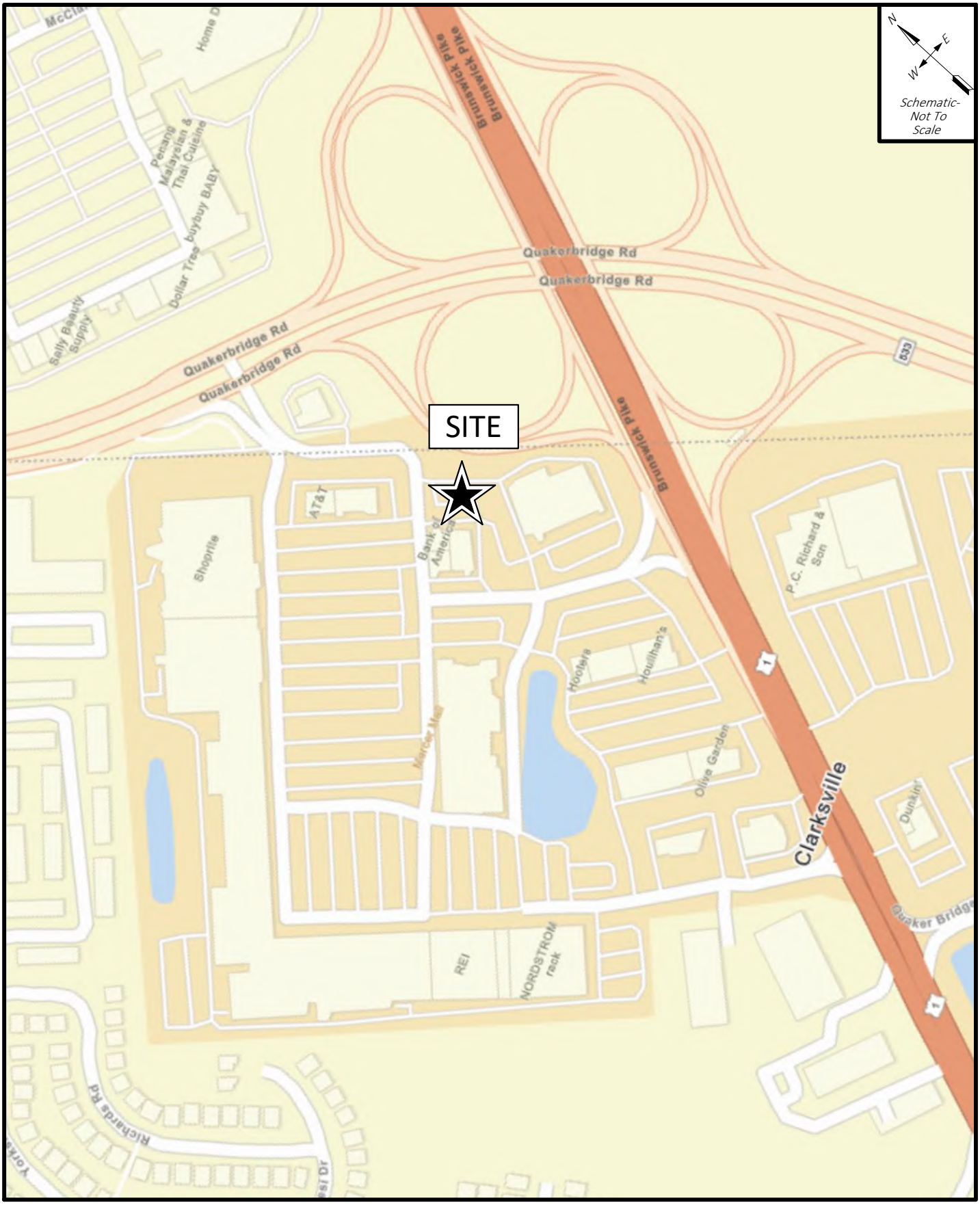


FIGURE 1A

Site Location Map

MERCER MALL

LAWRENCE TOWNSHIP, MERCER COUNTY, NJ

McMAHON
a **Bowman** company

Q:\PA-FTWA-MC\MCM\eng\FEDERRE1\MercerSC\Traffic\Graphics\Site Location.dwg

FIGURE 1B

Site Location Aerial

MERCER MALL

LAWRENCE TOWNSHIP, MERCER COUNTY, NJ

McMAHON
a **Bowman** company

Q:\PA-FTWA-MC\MCM\eng\FEDERRE1\MercerSC\Traffic\Graphics\Aerial.dwg

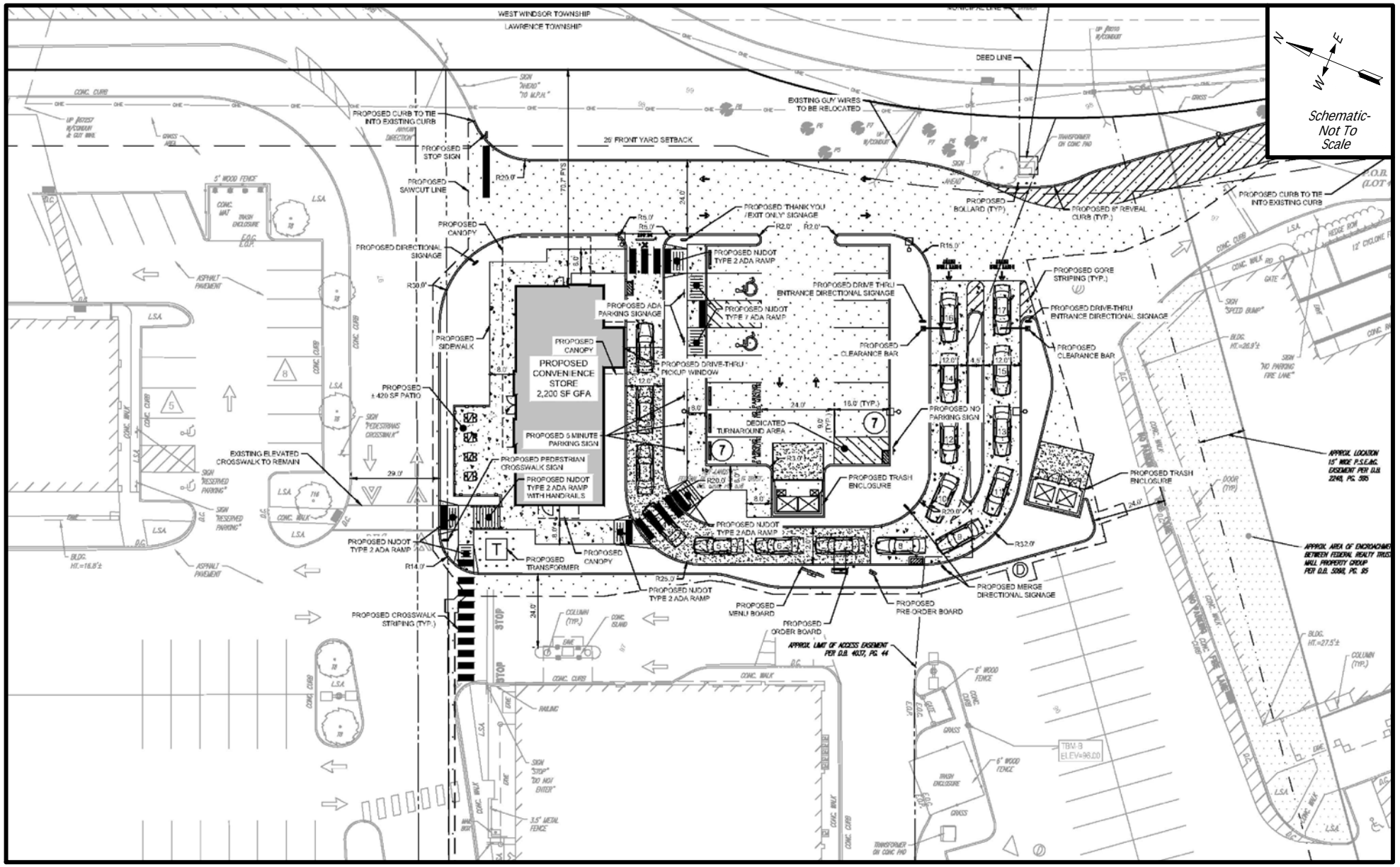


FIGURE 2

Site Plan (Prepared by Kimley Horn)

MERCER MALL

LAWRENCE TOWNSHIP, MERCER COUNTY, NJ

McMAHON
a Bowman company

- Q:\PA-FTWA-MC\MCM\eng\FEDERRE1\MercerSC\Traffic\Evaluation Letter\4-Graphics\Site Plan.dwg

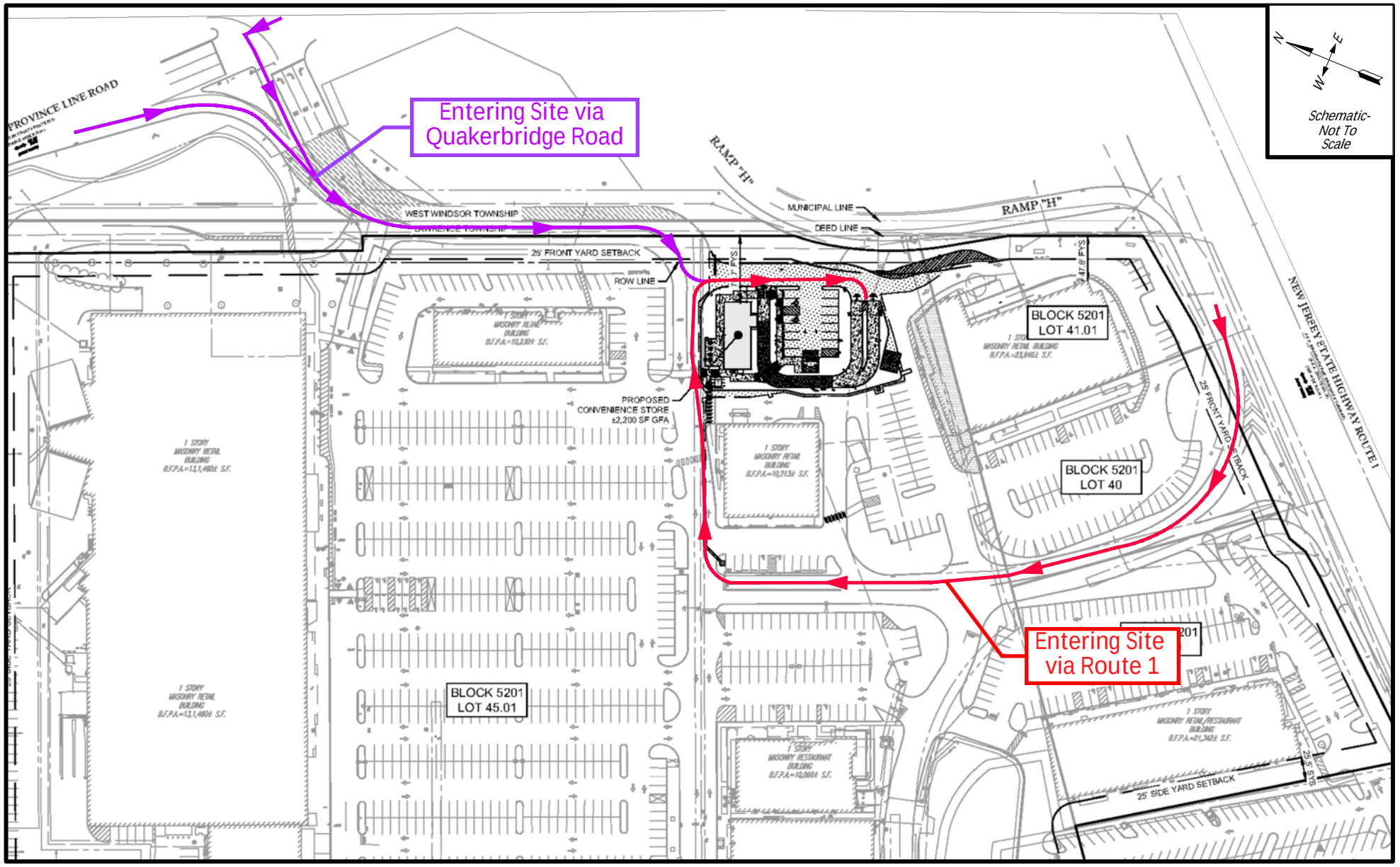


FIGURE 3

Starbucks Area Traffic Circulation (prepared by Kimley Horn)

MERCER MALL

LAWRENCE TOWNSHIP, MERCER COUNTY, NJ

McMAHON
a Bowman company

- Q:\PA-FTWA-MC\MCM\eng\FEDERRE1\MercerSC\Traffic\Evaluation Letter\4-Graphics\33-CirculationQueues.dwg

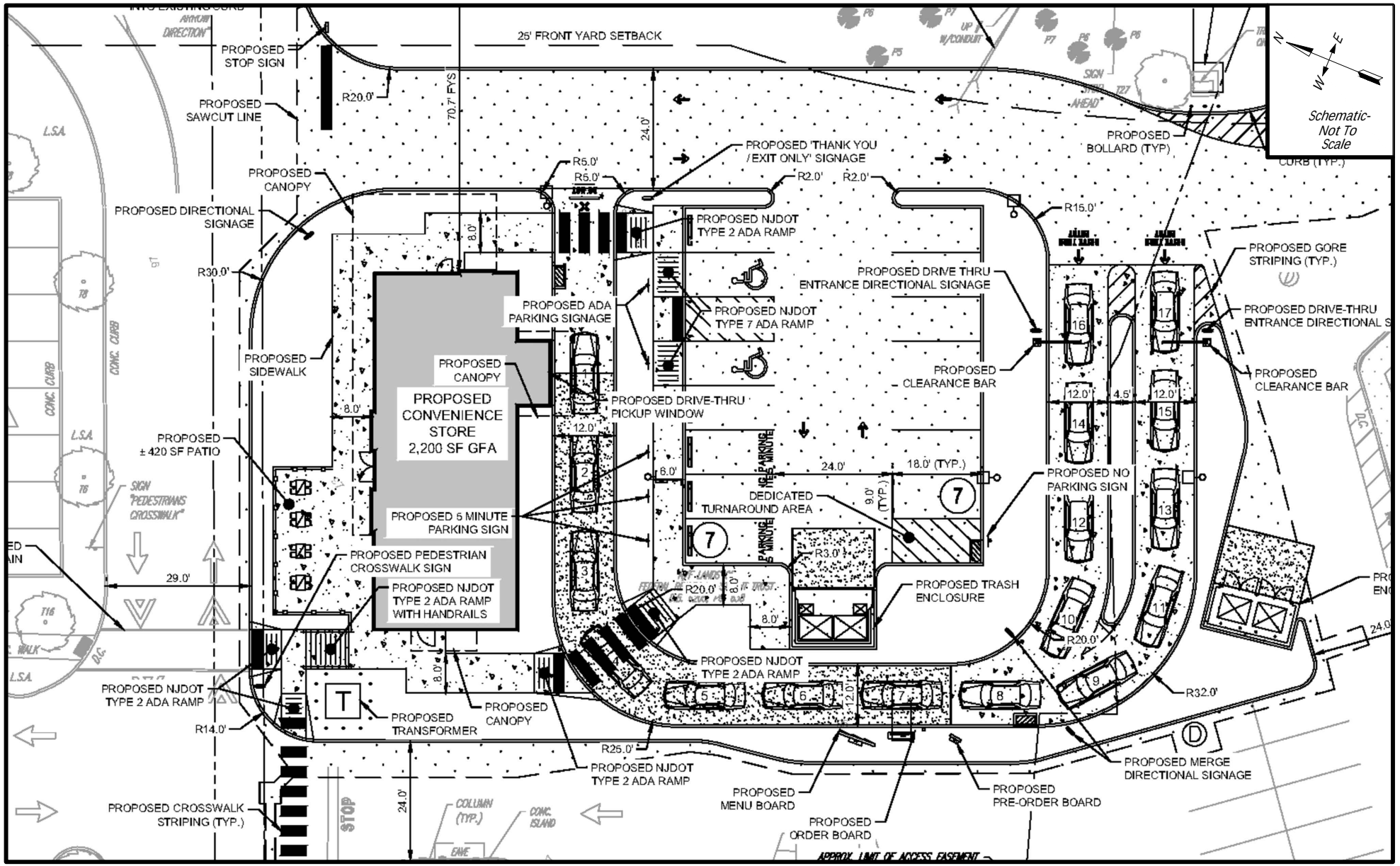


FIGURE 4

Drive Through Window Stacking: 17 Vehicles (prepared by Kimley Horn)

MERCER MALL

LAWRENCE TOWNSHIP, MERCER COUNTY, NJ

McMAHON
a Bowman company

Q:\PA-FTWA-MC\MCM\eng\FEDERRE1\MercerSC\Traffic\Evaluation Letter\4-Graphics\33-CirculationQueues.dwg

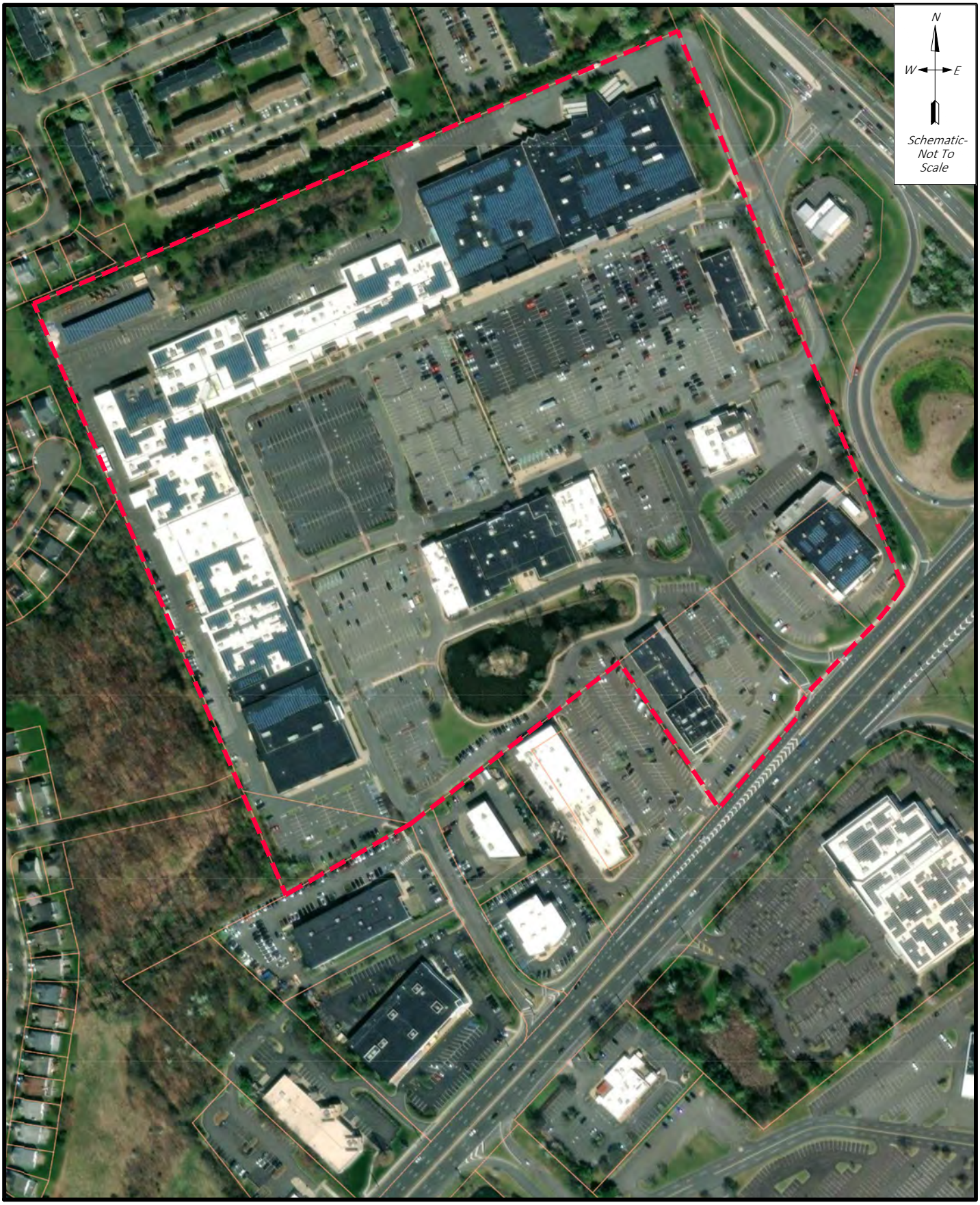


FIGURE 5

Mercer Mall Limits within Lawrence Township

MERCER MALL

LAWRENCE TOWNSHIP, MERCER COUNTY, NJ

McMAHON
a **Bowman** company

Q:\PA-FTWA-MC\MCM\eng\FEDERRE1\MercerSC\Traffic\Evaluation Letter\4-Graphics\3-TaxMapAerial.dwg

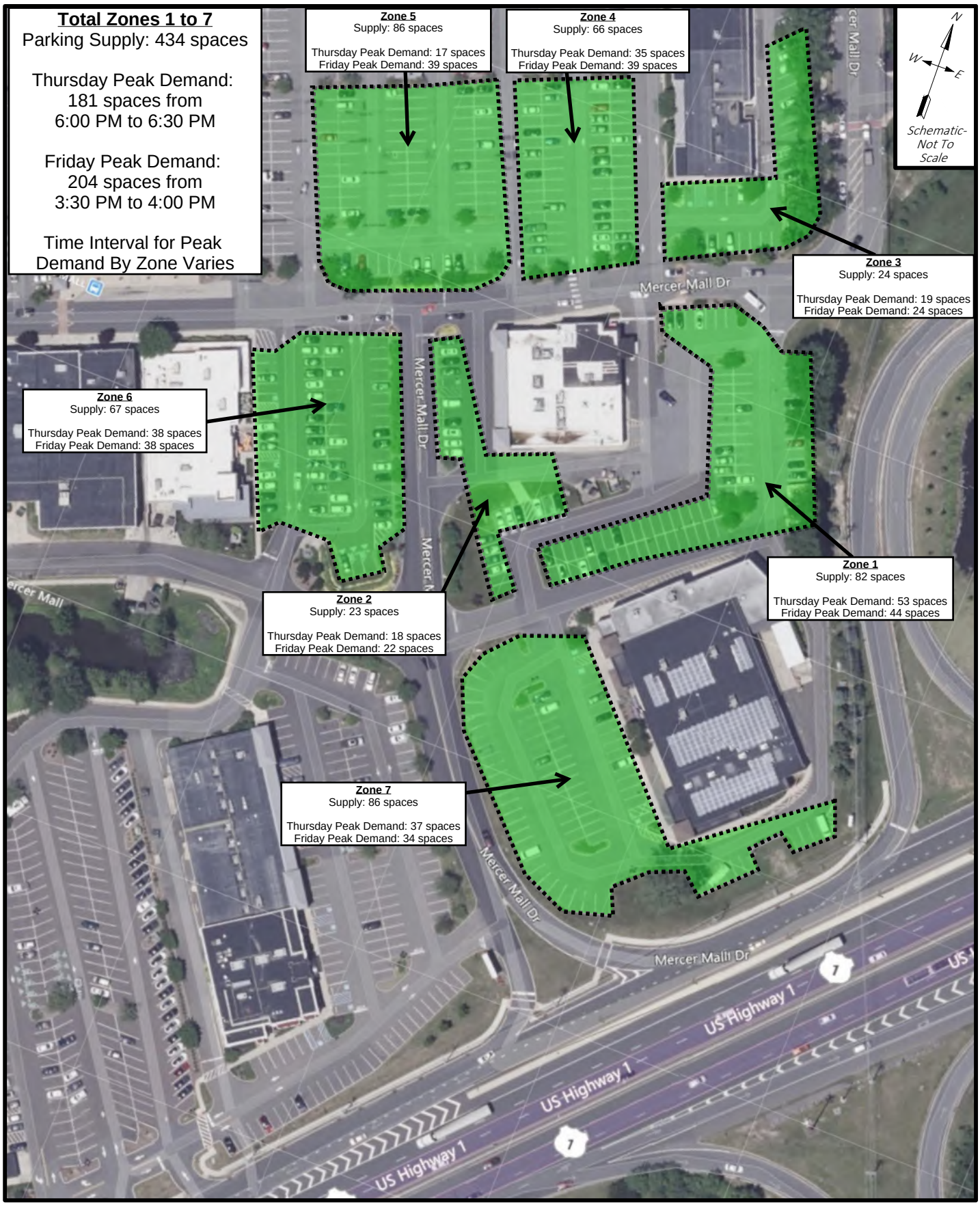


FIGURE 6

Weekday Parking Zones: Supply and Demand

MERCER MALL

LAWRENCE TOWNSHIP, MERCER COUNTY, NJ

McMAHON
a **Bowman** company

Q:\PA-FTWA-MC\MCM\eng\FEDERRE1\MercerSC\Traffic\Graphics\Aerial.dwg

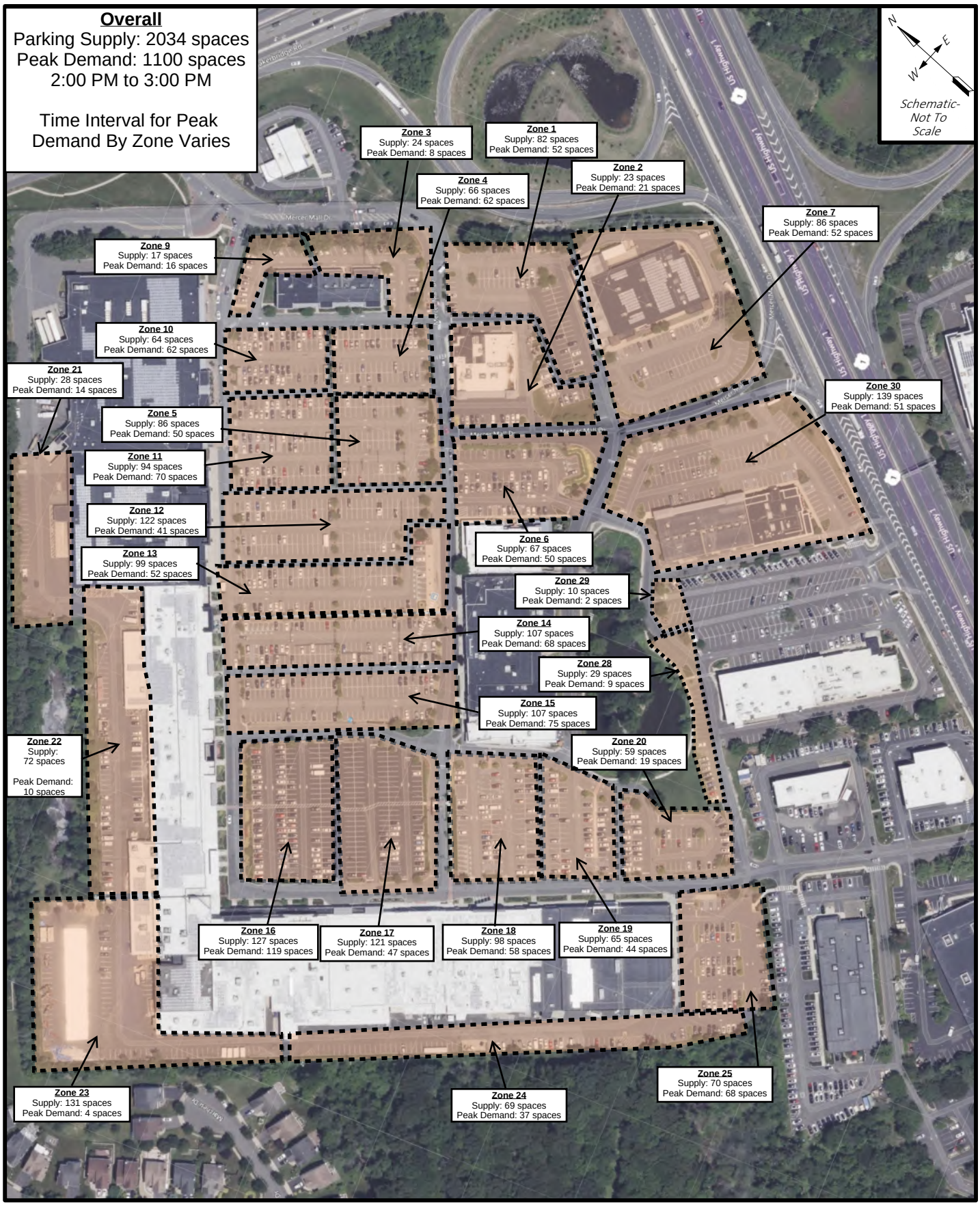


FIGURE 7

Saturday Parking Zones: Supply and Demand

MERCER MALL

LAWRENCE TOWNSHIP, MERCER COUNTY, NJ

McMAHON
a **Bowman** company

Q:\PA-FTWA-MC\MCM\eng\FEDERRE1\MercerSC\Traffic\Graphics\Aerial.dwg

McMAHON
a Bowman company

Attachment A

Starbucks Drive Through Observations

425 Commerce Drive, Suite 200, Fort Washington, PA 19034
P: 215.283.9444
mcmahonassociates.com | bowman.com

Starbuck's
Weekday Morning (7:00 AM to 9:00 AM)
Drive Through Operational Data

Average Drive-Thru Trip Generation Details		
Store Size	2343	
Rate per 1,000 s.f.	79.96	
Percent Enter/Exit	51%	49%
Queue Summary [1,2]		
Minimum Queue	0	
Average Queue	4	
95th Percentile Queue	8	
Maximum Queue	10	

(1) Queue measured in number of vehicles starting at the pick-up window.

(2) Based on entire count period for all three sites (not averaged).

Starbuck's
Weekday Morning (7:00 AM to 9:00 AM)
Drive Through Operational Data

Date: Tuesday, July 25, 2023
Location: 180 West Dekalb Pike Valley Forge, King of Prussia, PA 19406
Store Size: 1842 s.f.

Interval	Drive-Thru				PEAK HOUR
	Enter	Exit	Total	Queue (1)	
7:00 AM to 7:00 AM	10	10	20	2	- - -
7:05 AM to 7:05 AM				4	
7:10 AM to 7:10 AM				1	
7:15 AM to 7:15 AM	19	15	34	2	- - -
7:20 AM to 7:20 AM				5	
7:25 AM to 7:25 AM				3	
7:30 AM to 7:30 AM	17	19	36	4	- - -
7:35 AM to 7:35 AM				2	
7:40 AM to 7:40 AM				1	
7:45 AM to 7:45 AM	19	19	38	3	128
7:50 AM to 7:50 AM				4	
7:55 AM to 7:55 AM				6	
8:00 AM to 8:00 AM	23	26	49	3	157
8:05 AM to 8:05 AM				3	
8:10 AM to 8:10 AM				4	
8:15 AM to 8:15 AM	21	20	41	4	164
8:20 AM to 8:20 AM				6	
8:25 AM to 8:25 AM				2	
8:30 AM to 8:30 AM	28	31	59	4	187
8:35 AM to 8:35 AM				5	
8:40 AM to 8:40 AM				6	
8:45 AM to 8:45 AM	25	30	55	7	204
8:50 AM to 8:50 AM				10	
8:55 AM to 8:55 AM				4	
Total	162	170	332		
Peak Hour Volumes	**97**	**107**	**204**		
Rate per 1,000 s.f.	**110.75**				
Percent Enter/Exit	**48%**	**52%**	**100%**		
Queue Summary (1,2)					
Minimum Queue	1				
Average Queue	4				
95th Percentile Queue	7				
Maximum Queue	10				

(1) Queue measured in number of vehicles starting at the pick-up window.

(2) Based on entire count period.

180 West Dekalb Pike Valley Forge, King of Prussia, PA 19406

180 West Dekalb Pike Valley Forge, King of Prussia, PA 19406

Starbuck's
Weekday Morning (7:00 AM to 9:00 AM)
Drive Through Operational Data

Date: Tuesday, July 25, 2023
Location: 1601 Egypt Rd, Phoenixville, PA 19460
Store Size: 2386 s.f.

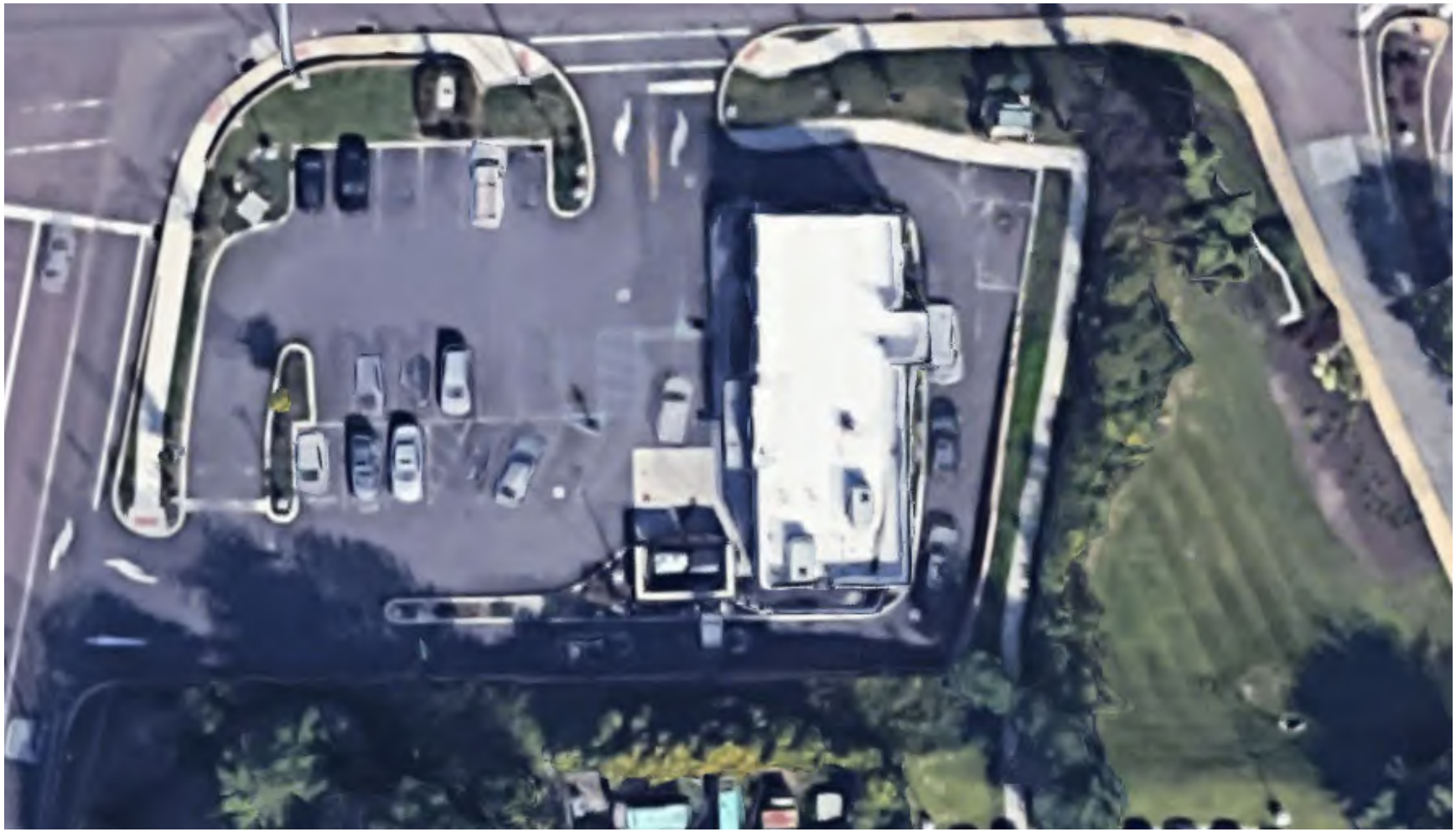
Interval	Drive-Thru				PEAK HOUR
	Enter	Exit	Total	Queue (1)	
7:00 AM to 7:00 AM	8	7	15	1	- - -
7:05 AM to 7:05 AM				2	
7:10 AM to 7:10 AM				3	
7:15 AM to 7:15 AM	11	12	23	3	- - -
7:20 AM to 7:20 AM				5	
7:25 AM to 7:25 AM				2	
7:30 AM to 7:30 AM	12	15	27	2	- - -
7:35 AM to 7:35 AM				4	
7:40 AM to 7:40 AM				5	
7:45 AM to 7:45 AM	21	19	40	4	105
7:50 AM to 7:50 AM				5	
7:55 AM to 7:55 AM				6	
8:00 AM to 8:00 AM	24	18	42	8	132
8:05 AM to 8:05 AM				8	
8:10 AM to 8:10 AM				7	
8:15 AM to 8:15 AM	22	21	43	7	152
8:20 AM to 8:20 AM				5	
8:25 AM to 8:25 AM				5	
8:30 AM to 8:30 AM	24	20	44	8	169
8:35 AM to 8:35 AM				6	
8:40 AM to 8:40 AM				7	
8:45 AM to 8:45 AM	26	21	47	5	176
8:50 AM to 8:50 AM				6	
8:55 AM to 8:55 AM				9	
Total	148	133	281		
Peak Hour Volumes	**96**	**80**	**176**		
Rate per 1,000 s.f.	**73.76**				
Percent Enter/Exit	**55%**	**45%**	**100%**		
Queue Summary (1,2)					
Minimum Queue	1				
Average Queue	5				
95th Percentile Queue	8				
Maximum Queue	9				

(1) Queue measured in number of vehicles starting at the pick-up window.

(2) Based on entire count period.

1601 Egypt Rd, Phoenixville, PA 19460

1601 Egypt Rd, Phoenixville, PA 19460



Starbuck's
Weekday Morning (7:00 AM to 9:00 AM)
Drive Through Operational Data

Date: Tuesday, July 25, 2023
Location: 205 Concourse Blvd, Dresher, PA 19025
Store Size: 2800 s.f.

Interval			Drive-Thru				PEAK HOUR
			Enter	Exit	Total	Queue [1]	
7:00 AM	to	7:00 AM	14	11	25	1	- - -
7:05 AM	to	7:05 AM				3	
7:10 AM	to	7:10 AM				1	
7:15 AM	to	7:15 AM	12	12	24	2	- - -
7:20 AM	to	7:20 AM				3	
7:25 AM	to	7:25 AM				4	
7:30 AM	to	7:30 AM	22	17	39	5	- - -
7:35 AM	to	7:35 AM				5	
7:40 AM	to	7:40 AM				5	
7:45 AM	to	7:45 AM	24	20	44	1	132
7:50 AM	to	7:50 AM				4	
7:55 AM	to	7:55 AM				4	
8:00 AM	to	8:00 AM	21	16	37	7	144
8:05 AM	to	8:05 AM				3	
8:10 AM	to	8:10 AM				2	
8:15 AM	to	8:15 AM	15	20	35	1	155
8:20 AM	to	8:20 AM				0	
8:25 AM	to	8:25 AM				5	
8:30 AM	to	8:30 AM	18	17	35	3	151
8:35 AM	to	8:35 AM				1	
8:40 AM	to	8:40 AM				4	
8:45 AM	to	8:45 AM	19	18	37	1	144
8:50 AM	to	8:50 AM				1	
8:55 AM	to	8:55 AM				3	
Total			145	15	276		
Peak Hour Volumes			**82**	**73**	**155**		
Rate per 1,000 s.f.			**55.36**				
Percent Enter/Exit			**53%**	**47%**	**100%**		
Queue Summary [1,2]							
Minimum Queue			0				
Average Queue			3				
95th Percentile Queue			5				
Maximum Queue			7				

(1) Queue measured in number of vehicles starting at the pick-up window.

(2) Based on entire count period.

205 Concourse Blvd, Dresher, PA 19025

205 Concourse Blvd, Dresher, PA 19025

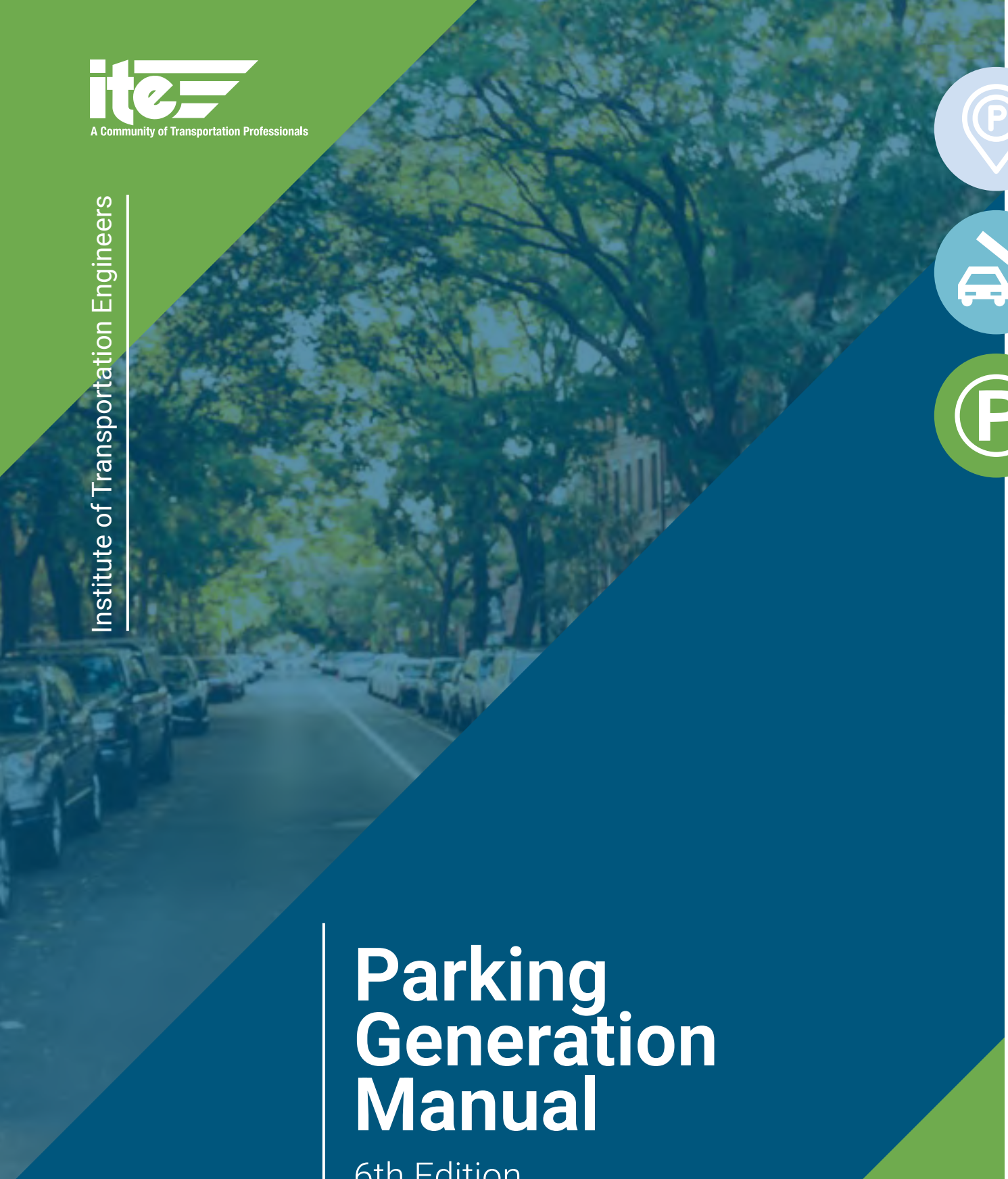
Attachment B

ITE Parking Demand Data

425 Commerce Drive, Suite 200, Fort Washington, PA 19034
P: 215.283.9444
mcmahonassociates.com | bowman.com

ite
A Community of Transportation Professionals

Institute of Transportation Engineers



Parking Generation Manual

6th Edition

October 2023

Land Use: 820 Shopping Center (>150k)

Description

A shopping center 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 at least 150,000 square feet of gross leasable area (GLA). It often has more than one anchor store. Various names can be assigned to a shopping center within this size range, depending on its specific size and tenants, such as community center, regional center, superregional center, fashion center, and power center.

A shopping center of this size typically contains more than retail merchandising facilities. Office space, a movie theater, restaurants, a post office, banks, a health club, and recreational facilities are common tenants.

A shopping center of this size can be enclosed or open-air. Parking demand generated at a shopping center is based upon the total GLA of the center. In the case of a smaller center without an enclosed mall or peripheral buildings, the GLA is the same as the gross floor area (GFA) of the building.

The 150,000 square feet GLA threshold value between this shopping center land use and shopping plaza (Land Use 821) is based on an examination of parking demand data. For a shopping plaza that is smaller than the threshold value, the presence or absence of a supermarket within the plaza has a noticeable effect on site parking demand. For a shopping center that is larger than the threshold value, the parking demand generated by its other major tenants appears to mask the effects of the presence or absence of an on-site supermarket.

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 (five study sites), and a Saturday (six study sites).

Hour Beginning	Percent of Peak Parking Demand		
	Weekday (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.	—	—	—
9:00 a.m.	—	—	—
10:00 a.m.	47	—	67
11:00 a.m.	69	88	84
12:00 p.m.	97	93	94
1:00 p.m.	100	97	98
2:00 p.m.	94	95	100
3:00 p.m.	87	100	91
4:00 p.m.	82	95	72
5:00 p.m.	84	92	59
6:00 p.m.	82	87	—
7:00 p.m.	—	—	—
8:00 p.m.	—	—	—
9:00 p.m.	—	—	—
10:00 p.m.	—	—	—
11:00 p.m.	—	—	—

Additional Data

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 study sites include peripheral buildings, it can be assumed that some of the data show their effect.

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

- 3.9 spaces per 1,000 square feet GLA (23 sites) in a general urban/suburban setting
- 3.2 spaces per 1,000 square feet GLA (1 site) in a dense multi-use urban setting

The average peak parking occupancy at these 24 sites is 62 percent.

The sites were surveyed in the 1990s, the 2000s, the 2010s, and the 2020s in Alberta (CAN), California, Illinois, Kansas, Maine, Maryland, Massachusetts, Minnesota, New Jersey, New York, Ontario (CAN), Oregon, Pennsylvania, Tennessee, Texas, and Virginia.

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, 145, 152, 179, 224, 313, 315, 431, 433, 436, 441, 511, 525, 542, 565, 604, 605, 615, 620, 621, 628, 634

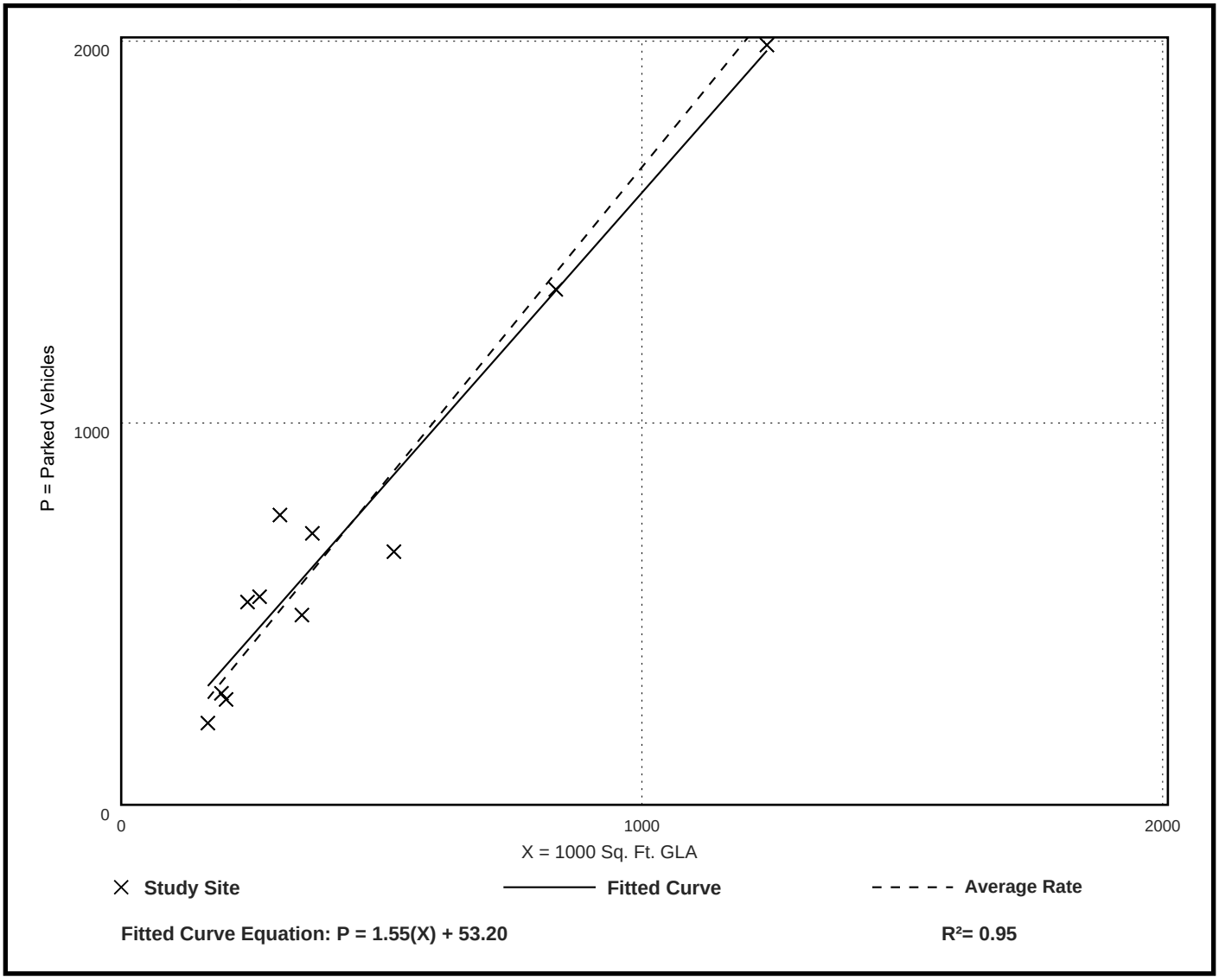
Shopping Center (>150k)
(820)

Peak Period Parking Demand vs: 1000 Sq. Ft. GLA
On a: Weekday (Monday - Thursday)
Setting/Location: General Urban/Suburban
Number of Studies: 11
Avg. 1000 Sq. Ft. GLA: 426

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)
1.67	1.27 - 2.49	1.43 / 2.25	***	0.34 (20%)

Data Plot and Equation



Fitted Curve Equation: P = 1.55(X) + 53.20

R^2= 0.95

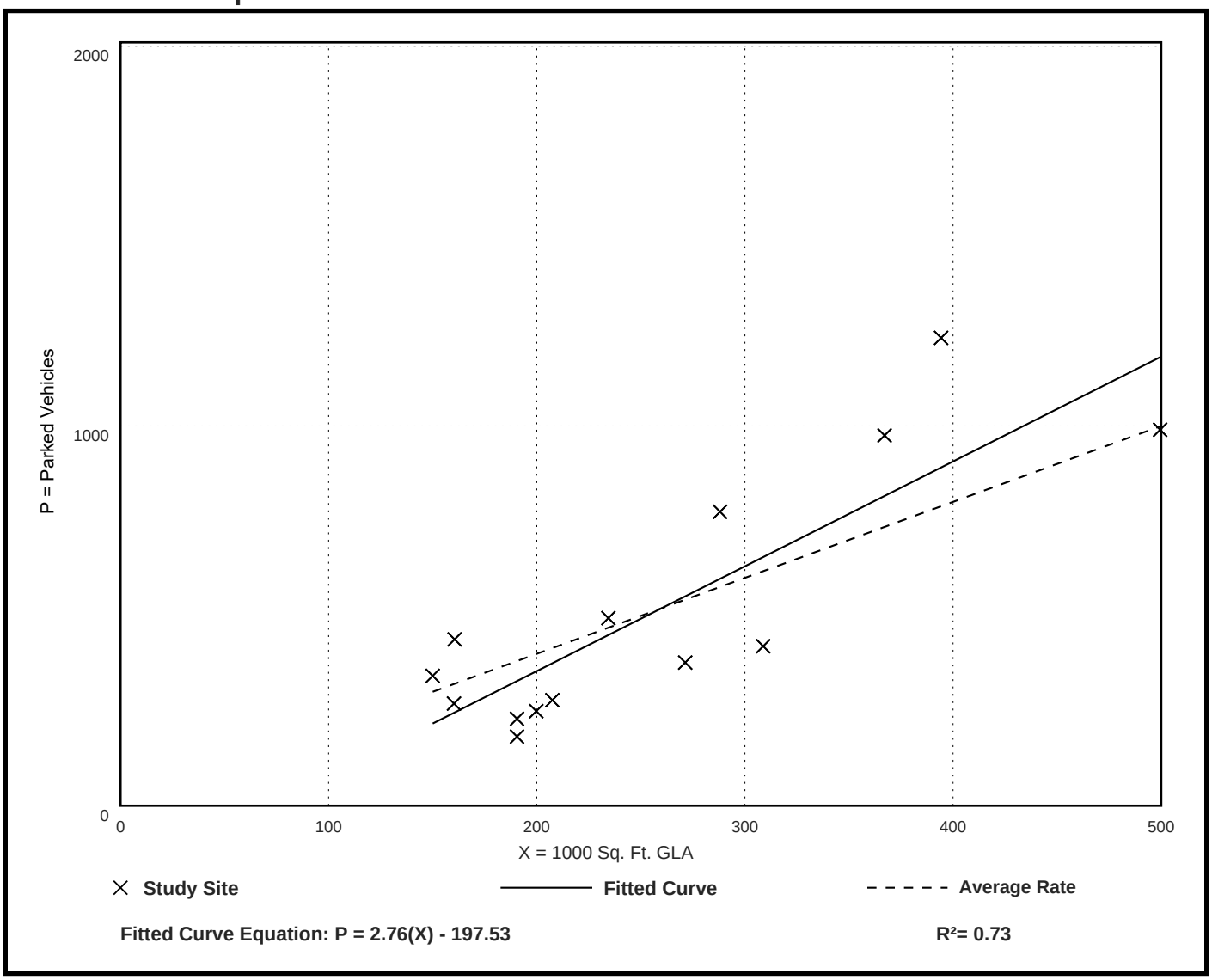
Shopping Center (>150k)
(820)

Peak Period Parking Demand vs: 1000 Sq. Ft. GLA
On a: Friday
Setting/Location: General Urban/Suburban
Number of Studies: 14
Avg. 1000 Sq. Ft. GLA: 259

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)
2.00	0.96 - 3.12	1.36 / 2.72	***	0.70 (35%)

Data Plot and Equation



Fitted Curve Equation: P = 2.76(X) - 197.53

R^2= 0.73

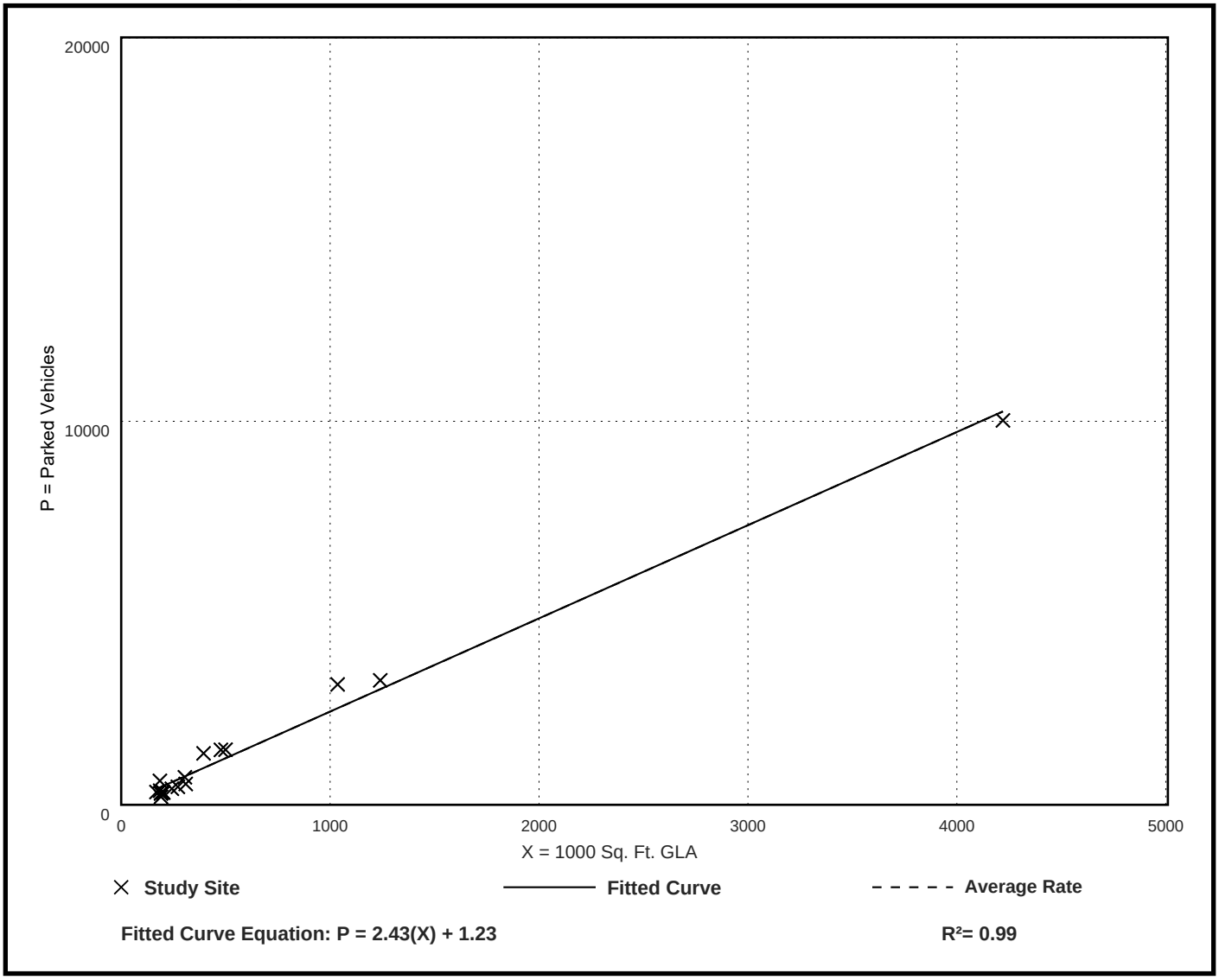
Shopping Center (>150k)
(820)

Peak Period Parking Demand vs: 1000 Sq. Ft. GLA
On a: Saturday
Setting/Location: General Urban/Suburban
Number of Studies: 18
Avg. 1000 Sq. Ft. GLA: 584

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)
2.43	1.09 - 3.40	1.73 / 3.08	***	0.51 (21%)

Data Plot and Equation



Fitted Curve Equation: P = 2.43(X) + 1.23

R^2= 0.99

Land Use: 937 Coffee/Donut Shop with Drive-Through Window

Description

This land use includes any coffee and donut restaurant that has a drive-through window as well as a walk-in entrance area at which a patron can purchase and consume items. The restaurant sells freshly brewed coffee (along with coffee-related accessories) and a variety of food/drink products such as donuts, bagels, breads, muffins, cakes, sandwiches, wraps, salads, and other hot and cold beverages. The restaurant marketing and sales may emphasize coffee beverages over food (or vice versa). A coffee/donut shop typically holds long store hours (more than 15 hours) with an early morning opening. Limited indoor seating is generally provided for patrons and table service is not provided.

Time-of-Day Distribution for Parking Demand

The following table presents a time-of-day distribution of parking demand on a weekday at four study sites in a general urban/suburban setting.

Hour Beginning	Percent of Monday–Thursday Peak Parking Demand
12:00–4:00 a.m.	–
5:00 a.m.	–
6:00 a.m.	–
7:00 a.m.	91
8:00 a.m.	100
9:00 a.m.	97
10:00 a.m.	97
11:00 a.m.	71
12:00 p.m.	77
1:00 p.m.	66
2:00 p.m.	54
3:00 p.m.	57
4:00 p.m.	63
5:00 p.m.	–
6:00 p.m.	–
7:00 p.m.	–
8:00 p.m.	–
9:00 p.m.	–
10:00 p.m.	–
11:00 p.m.	–

Additional Data

The average parking supply ratio for the 12 study sites in a general urban/suburban setting and with parking supply information is 10.3 spaces per 1,000 square feet GFA. The average peak parking occupancy at these sites is 50 percent.

The sites were surveyed in the 2000s, the 2010s, and the 2020s in Maine, Nevada, New Jersey, Ontario (CAN), Tennessee, and Washington.

Source Numbers

405, 407, 412, 433, 442, 509, 523, 540, 620

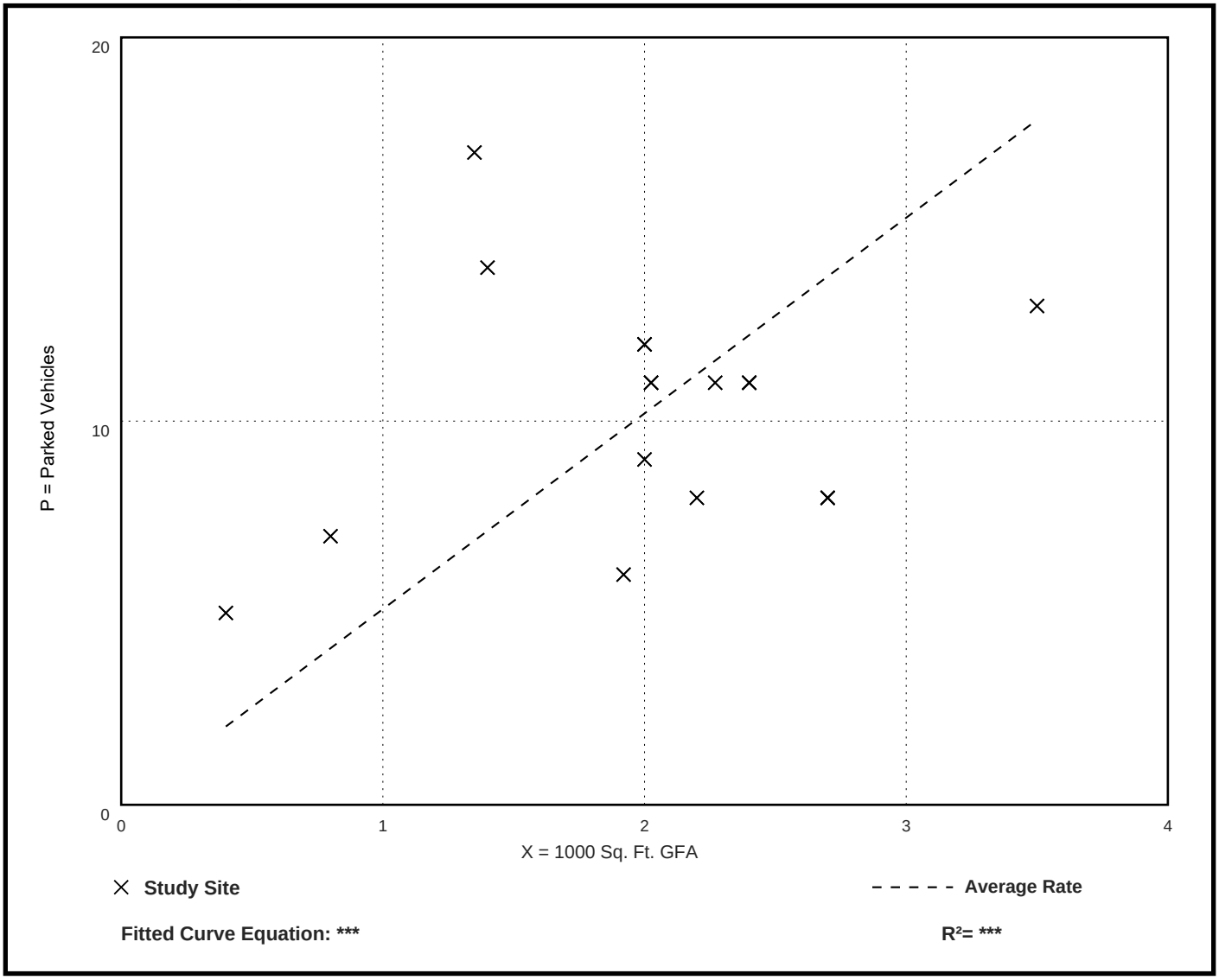
Coffee/Donut Shop with Drive-Through Window (937)

Peak Period Parking Demand vs: 1000 Sq. Ft. GFA
On a: Weekday (Monday - Friday)
Setting/Location: General Urban/Suburban
Number of Studies: 17
Avg. 1000 Sq. Ft. GFA: 2.0

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)
5.10	2.96 - 12.59	4.45 / 10.75	***	2.44 (48%)

Data Plot and Equation



Fitted Curve Equation: *

R^2= *

Coffee/Donut Shop with Drive-Through Window (937)

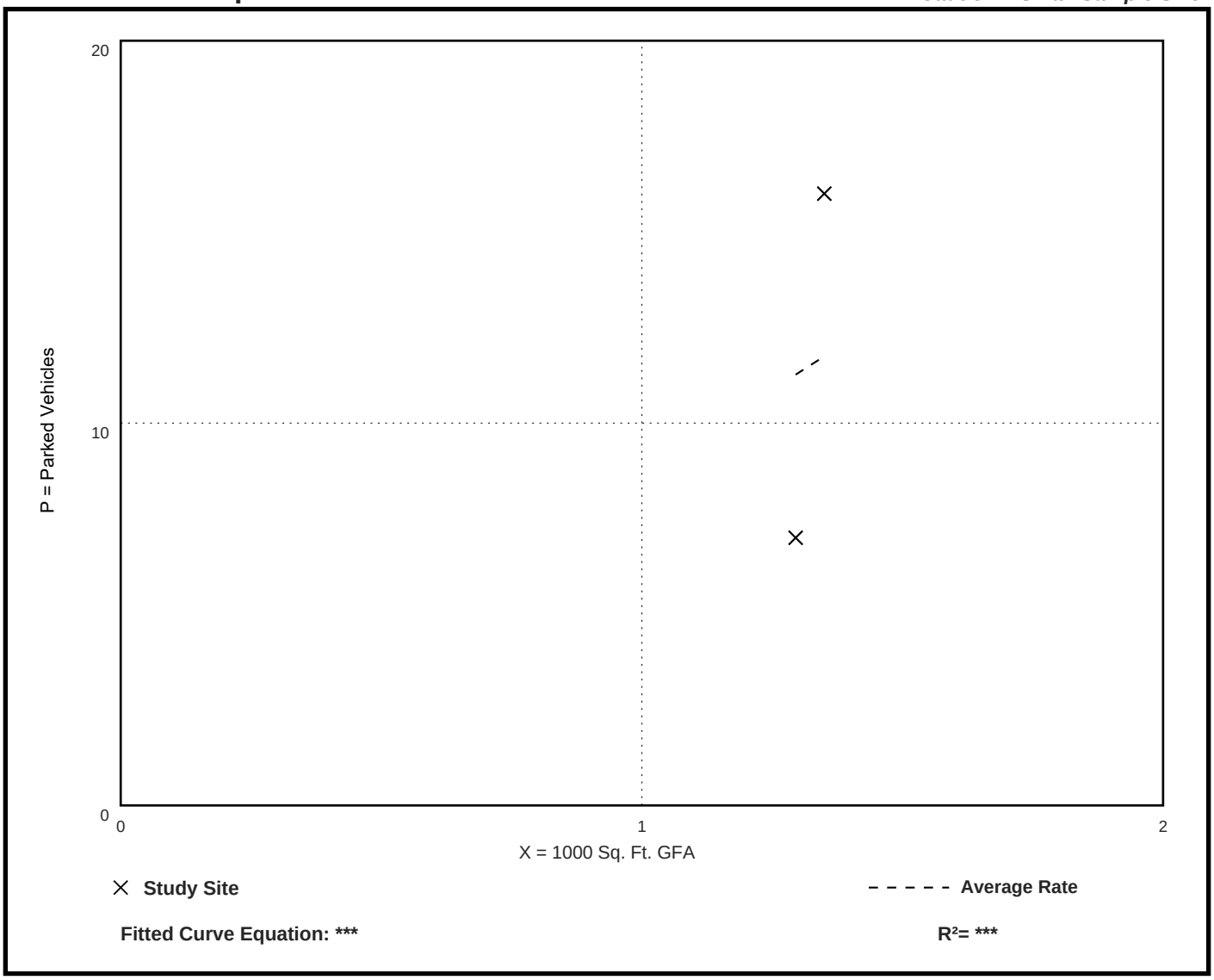
Peak Period Parking Demand vs: 1000 Sq. Ft. GFA
On a: Saturday
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. 1000 Sq. Ft. GFA: 1.3

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)
8.70	5.41 - 11.85	*** / ***	***	*** (***)

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: ***

R^2= ***

McMAHON
a Bowman company

Attachment C

Existing Parking Supply and Demand Details

425 Commerce Drive, Suite 200, Fort Washington, PA 19034
P: 215.283.9444
mcmahonassociates.com | bowman.com

Table C1- Existing Typical Weekday Parking Demand Versus Supply

Interval	Parking Demand for Thursday, September 21, 2023								Total
	Location								
	1	2	Subtotal	3	4	5	6	7	
6:00 AM	11	9	20	7	8	4	2	2	43
6:30 AM	14	11	25	11	15	5	4	3	63
7:00 AM	25	11	36	10	19	5	4	4	78
7:30 AM	31	15	46	11	19	4	4	4	88
8:00 AM	33	14	47	15	24	4	6	8	104
8:30 AM	37	15	52	15	22	5	5	9	108
9:00 AM	38	14	52	18	21	8	8	11	118
9:30 AM	40	15	55	12	18	8	10	11	114
10:00 AM	44	15	59	19	24	7	11	12	132
10:30 AM	44	11	55	15	25	10	15	15	135
11:00 AM	31	5	36	17	29	10	14	18	124
11:30 AM	34	8	42	15	30	9	15	15	126
12:00 PM	40	10	50	15	34	10	17	14	140
12:30 PM	44	9	53	17	33	11	16	15	145
1:00 PM	41	10	51	15	30	10	15	16	137
1:30 PM	45	9	54	18	33	11	18	17	151
2:00 PM	44	9	53	17	32	11	17	15	145
2:30 PM	46	11	57	15	34	13	16	14	149
3:00 PM	45	13	58	14	31	14	15	13	145
3:30 PM	32	5	37	17	35	16	18	25	148
4:00 PM	34	7	41	18	32	17	14	26	148
4:30 PM	53	16	69	18	23	16	22	29	177
5:00 PM	52	18	**70**	16	21	14	23	33	177
5:30 PM	41	17	58	14	16	15	36	32	171
6:00 PM [1]	47	17	64	13	17	12	38	37	181
Peak Demand by Zone [2]	**53**	**18**	**70**	**19**	**35**	**17**	**38**	**37**	**217**
Peak Overall Demand [1]	**47**	**17**	**64**	**13**	**17**	**12**	**38**	**37**	**181**
Parking Supply	**82**	**23**	**105**	**24**	**66**	**86**	**67**	**86**	**434**
Available Spaces [3]	**35**	**6**	**41**	**11**	**49**	**74**	**29**	**49**	**253**
Percent Occupied [4]	**57%**	**74%**	**61%**	**54%**	**26%**	**14%**	**57%**	**43%**	**42%**

(1) Overall peak parking demand for Zones 1 through 7.

(2) Peak parking demand by zone, which varies by time of day.

(3) Available spaces equals parking supply less peak parking demand for overall center.

(4) Percent occupied equals peak parking demand per overall center divided by parking supply.

Table C2- Existing Typical Friday Parking Demand Versus Supply

Interval	Parking Demand for Friday, September 29th, 2023								Total
	Location								
	1	2	Subtotal	3	4	5	6	7	
6:00 AM	9	7	16	8	7	3	2	1	37
6:30 AM	13	8	21	10	12	4	5	4	56
7:00 AM	28	9	37	11	19	4	5	4	80
7:30 AM	29	12	41	12	19	2	4	5	83
8:00 AM	29	12	41	15	22	3	6	6	93
8:30 AM	33	18	51	14	22	7	8	10	112
9:00 AM	39	15	54	19	23	9	8	11	124
9:30 AM	40	14	54	15	21	9	11	12	122
10:00 AM	44	15	59	20	25	9	12	15	140
10:30 AM	42	18	**60**	22	27	11	15	14	149
11:00 AM	33	9	42	21	30	11	15	15	134
11:30 AM	35	10	45	19	31	15	19	19	148
12:00 PM	44	11	55	18	35	22	18	20	168
12:30 PM	43	11	54	18	35	29	22	22	180
1:00 PM	42	12	54	19	35	31	29	24	192
1:30 PM	30	17	47	23	33	39	31	27	200
2:00 PM	36	19	55	20	33	25	26	31	190
2:30 PM	34	18	52	2	31	27	29	30	171
3:00 PM	36	19	55	21	35	26	32	28	197
3:30 PM [1]	36	22	58	24	39	21	29	33	204
4:00 PM	35	20	55	22	37	23	27	30	194
4:30 PM	30	21	51	19	36	22	25	34	187
5:00 PM	28	17	45	21	30	16	35	32	179
5:30 PM	29	19	48	22	29	17	36	29	181
6:00 PM	31	21	52	20	31	19	38	30	190
Peak Demand by Zone [2]	**44**	**22**	**60**	**24**	**39**	**39**	**38**	**34**	**240**
Peak Overall Demand [1]	**36**	**22**	**58**	**24**	**39**	**21**	**29**	**33**	**204**
Parking Supply	**82**	**23**	**105**	**24**	**66**	**86**	**67**	**86**	**434**
Available Spaces [3]	**46**	**1**	**47**	**0**	**27**	**65**	**38**	**53**	**230**
Percent Occupied [4]	**44%**	**96%**	**55%**	**100%**	**59%**	**24%**	**43%**	**38%**	**47%**

(1) Overall peak parking demand for Zones 1 through 7.

(2) Peak parking demand by zone, which varies by time of day.

(3) Available spaces equals parking supply less peak parking demand for overall center.

(4) Percent occupied equals peak parking demand per overall center divided by parking supply.

Table C3 - Existing Typical Weekday Parking Demand Versus Supply

Interval	Parking Demand for Saturday, October 7, 2023																Total Zones 1-15
	Location																
	1	2	3	4	5	6	7	Subtotal	9	10	11	12	13	14	15	Subtotal	
9:00 AM	13	6	4	37	17	26	9	112	2	31	26	15	22	9	12	117	229
10:00 AM	12	7	6	38	20	28	11	122	4	33	29	17	37	39	24	183	305
11:00 AM	23	17	7	31	29	21	17	145	16	37	31	19	48	35	47	233	378
12:00 PM	32	17	4	42	38	18	32	183	12	39	40	23	47	50	63	274	457
1:00 PM	44	19	7	56	47	40	41	254	14	47	48	33	48	60	75	325	579
2:00 PM [1]	52	18	8	62	50	50	52	**292**	13	62	63	37	52	68	67	362	654
3:00 PM	45	21	6	59	48	48	51	278	15	59	70	41	43	62	70	360	638
Peak Demand by Zone [2]	**52**	**21**	**8**	**62**	**50**	**50**	**52**	**292**	**16**	**62**	**70**	**41**	**52**	**68**	**75**	**362**	**971**
Peak Overall Demand [1]	**52**	**18**	**8**	**62**	**50**	**50**	**52**	**292**	**13**	**62**	**63**	**37**	**52**	**68**	**67**	**362**	**654**
Parking Supply	**82**	**23**	**24**	**66**	**86**	**67**	**86**	**434**	**17**	**64**	**94**	**122**	**99**	**107**	**107**	**610**	**1044**
Available Spaces [3]	**30**	**5**	**16**	**4**	**36**	**17**	**34**	**142**	**4**	**2**	**31**	**85**	**47**	**39**	**40**	**248**	**390**
Percent Occupied [4]	**63%**	**78%**	**33%**	**94%**	**58%**	**75%**	**60%**	**67%**	**76%**	**97%**	**67%**	**30%**	**53%**	**64%**	**63%**	**59%**	**63%**

Table C3 - Existing Typical Weekday Parking Demand Versus Supply (continued)

Interval	Parking Demand for Saturday, October 7, 2023													Total Zones 16-29	Total All Zones
	Location														
	16	17	18	19	20	21	22	23	24	25	26	28	29		
9:00 AM	11	2	1	1	1	8	6	2	7	12	50	1	1	103	332
10:00 AM	32	9	13	3	8	12	6	4	22	56	50	1	2	218	523
11:00 AM	86	24	29	22	8	12	4	4	22	56	50	2	1	320	698
12:00 PM	99	47	58	25	14	14	8	4	37	66	50	6	1	429	886
1:00 PM	100	45	47	34	14	14	8	4	37	66	50	6	1	426	1005
2:00 PM [1]	110	39	41	44	19	14	10	4	37	68	50	8	2	446	**1100**
3:00 PM	119	32	42	40	17	14	10	4	33	68	50	9	2	440	1078
Peak Demand by Zone [2]	**119**	**47**	**58**	**44**	**19**	**14**	**10**	**4**	**37**	**68**	**50**	**9**	**2**	**481**	**1100**
Peak Overall Demand [1]	**110**	**39**	**41**	**44**	**19**	**14**	**10**	**4**	**37**	**68**	**50**	**8**	**2**	**446**	**1100**
Parking Supply	**127**	**121**	**98**	**65**	**59**	**28**	**72**	**131**	**69**	**70**	**111**	**29**	**10**	**990**	**2034**
Available Spaces [3]	**17**	**82**	**57**	**21**	**40**	**14**	**62**	**127**	**32**	**2**	**61**	**21**	**8**	**544**	**934**
Percent Occupied [4]	**87%**	**32%**	**42%**	**68%**	**32%**	**50%**	**14%**	**3%**	**54%**	**97%**	**45%**	**28%**	**20%**	**45%**	**54%**

(1) Overall peak parking demand for all zones

(2) Peak parking demand by zone, which varies by time of day.

(3) Available spaces equals parking supply less peak parking demand for overall center.

(4) Percent occupied equals peak parking demand per overall center divided by parking supply.

Chart C1: Zones 1 to 7
Existing Parking Demand on Thursday, September 21, 2023

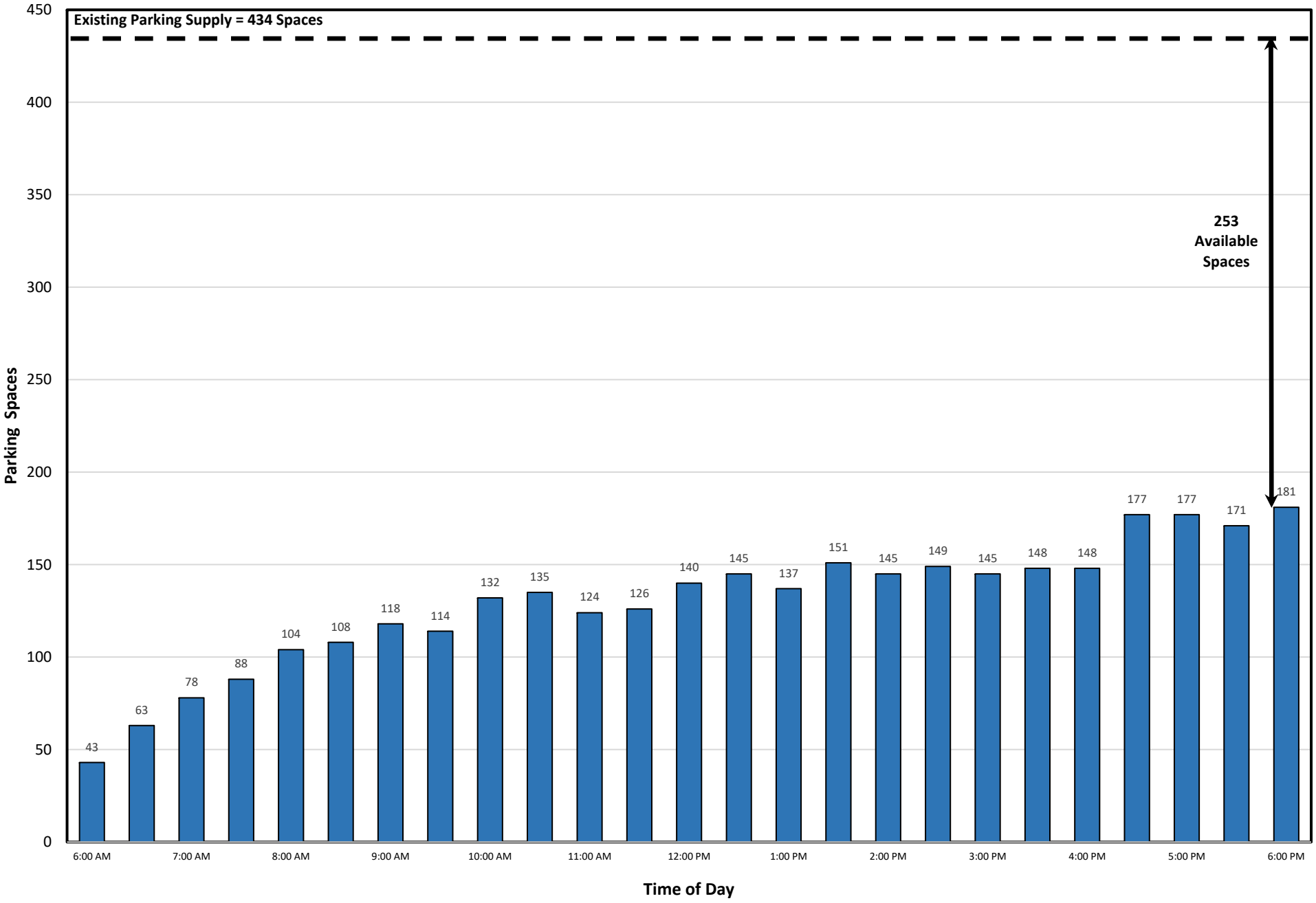


Chart C2: Zones 1 to 7
Existing Parking Demand on Friday, September 29, 2023

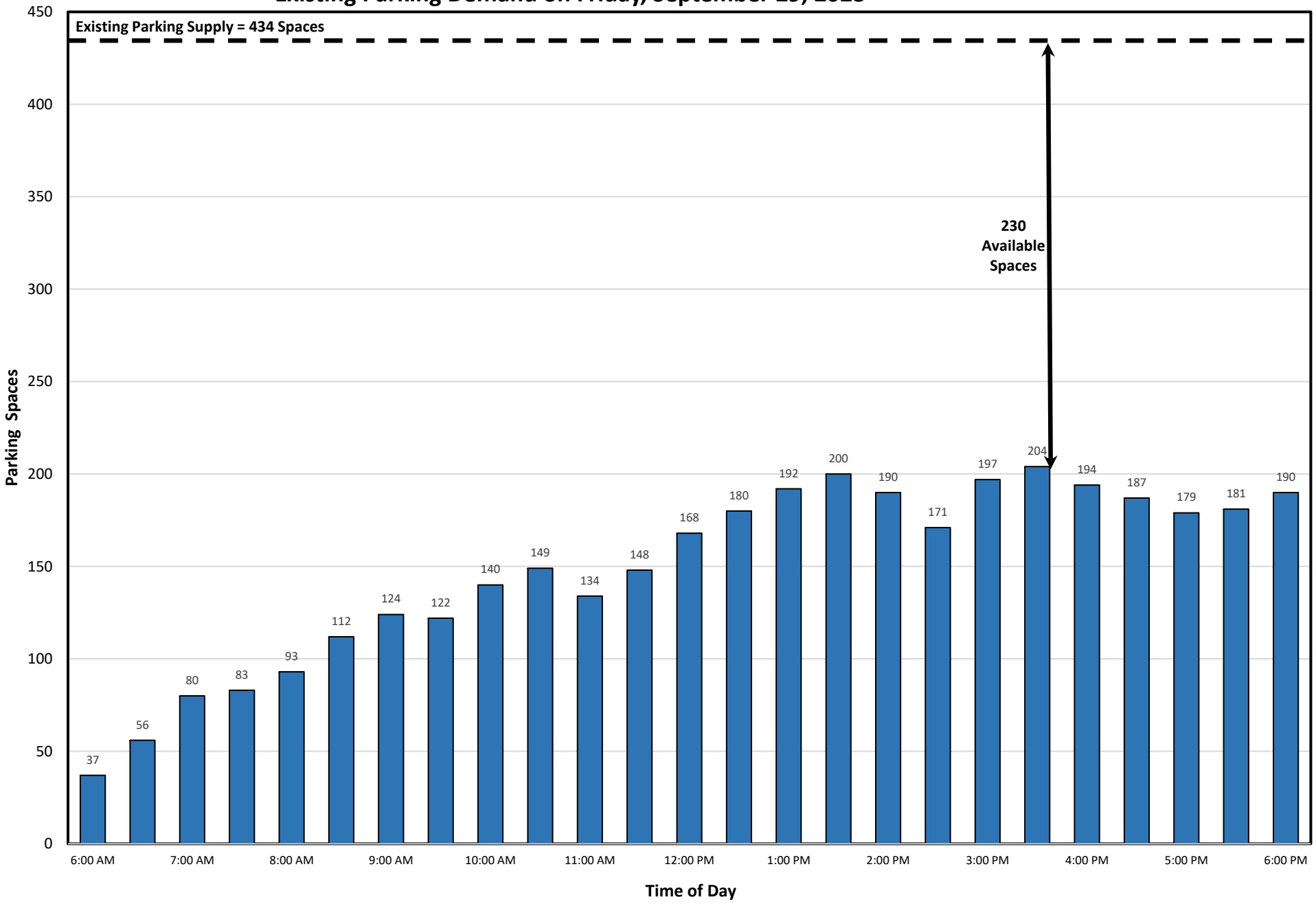


Chart C3 - Zones 1 to 7 Only
Existing Parking Demand on Saturday, October 7, 2023

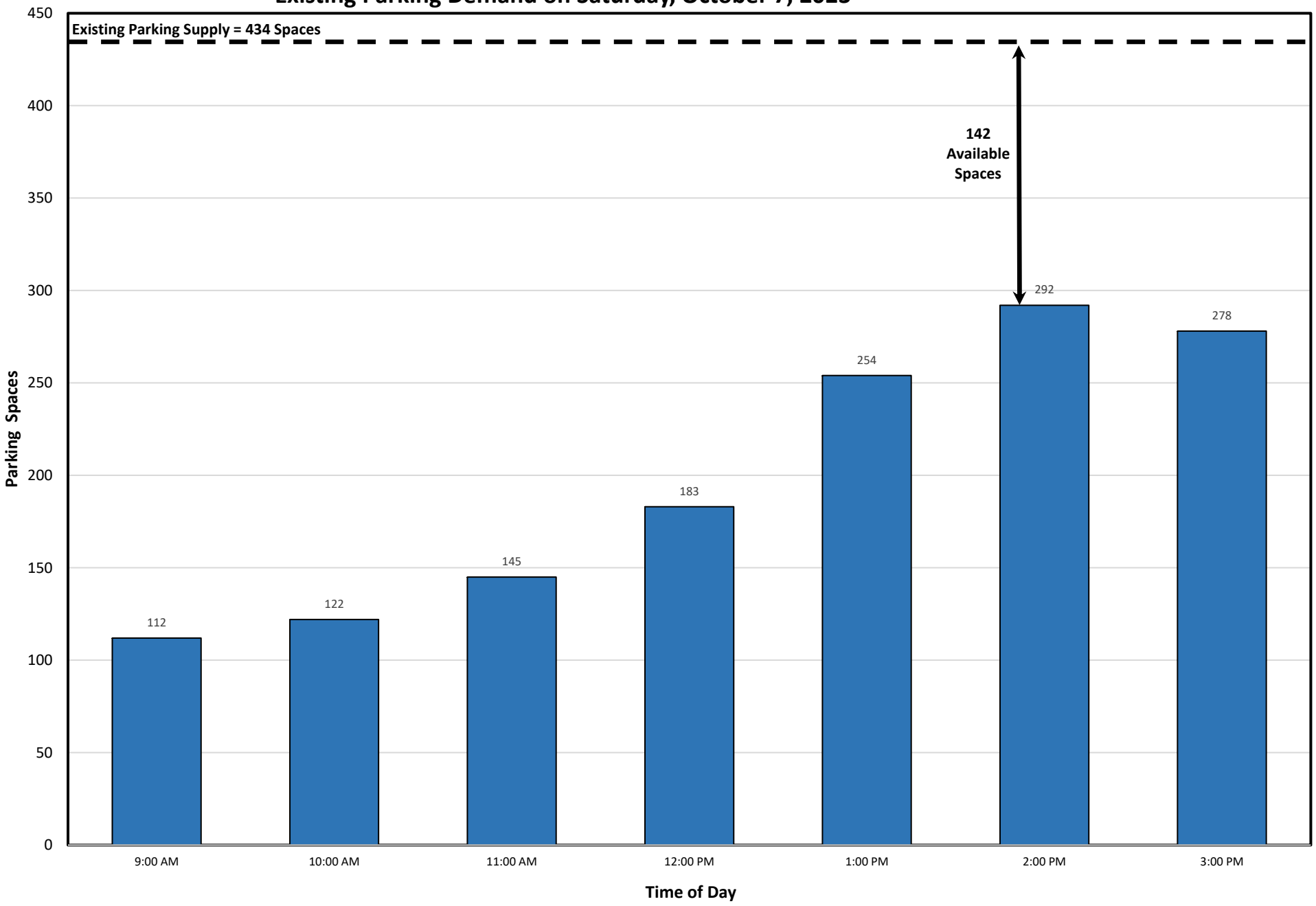
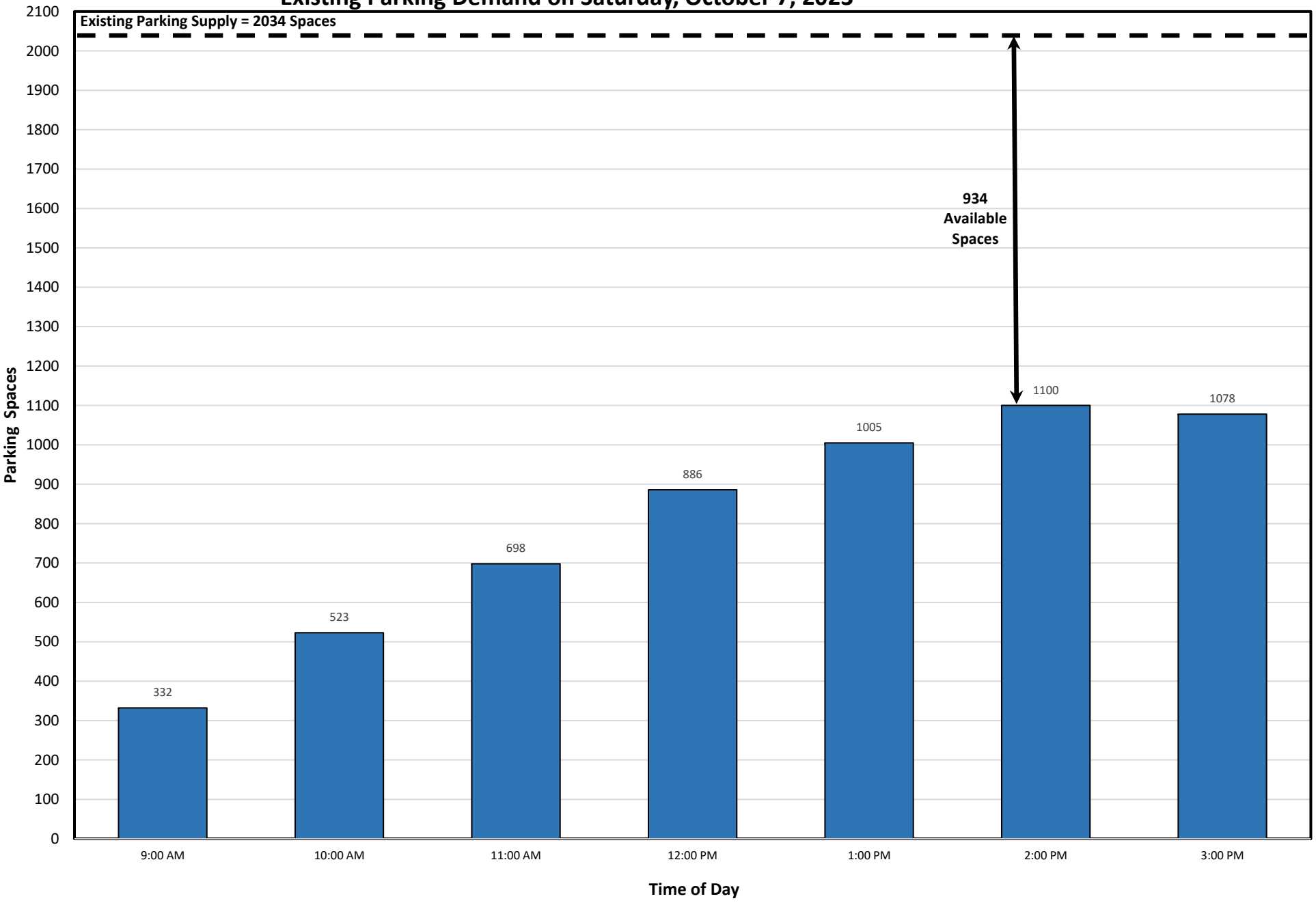


Chart C4 - All Zones
Existing Parking Demand on Saturday, October 7, 2023



Attachment D

Starbucks Parking Demand Projections

425 Commerce Drive, Suite 200, Fort Washington, PA 19034
P: 215.283.9444
mcmahonassociates.com | bowman.com

Table D1

Weekday Hourly Distribution of Parking Demand by Land Use

Source: ITE *Parking Generation Manual* , 5th Edition

Land Use Code	937
Land Use	937 Coffee/Donut Shop with Drive-Through Window
Setting	General Urban/Suburban
Time Period	Weekday
# Data Sites	4

Time	Peak Period Parking Demand Based on 2,200 s.f.	11 spaces
	Percent of Weekday Peak Parking Demand	Parking Demand
6:00 AM [(1)]	91.0%	10
7:00 AM	91.0%	10
8:00 AM	100.0%	11
9:00 AM	97.0%	11
10:00 AM	97.0%	11
11:00 AM	71.0%	8
12:00 PM	77.0%	8
1:00 PM	66.0%	7
2:00 PM	54.0%	6
3:00 PM	57.0%	6
4:00 PM	63.0%	7
5:00 PM	62.0%	7
6:00 PM [(2)]	62.0%	7

(1) 6:00 AM interval set to 7:00 AM interval as no data is available for this time period.

(1) 5:00 and 6:00 PM intervals set to 4:00 PM interval as no data is available for this time period.

Table D2

Saturday Hourly Distribution of Parking Demand [(1)]

Land Use Code	937
Land Use	937 Coffee/Donut Shop with Drive-Through Window
Setting	General Urban/Suburban
Time Period	Saturday

Time	Peak Period Parking Demand Based on 2,200 s.f.	19 spaces
	Percent of Weekday Peak Parking Demand	Parking Demand
6:00 AM	91.0%	17
7:00 AM	91.0%	17
8:00 AM	100.0%	19
9:00 AM	97.0%	18
10:00 AM	97.0%	18
11:00 AM	71.0%	13
12:00 PM	77.0%	15
1:00 PM	66.0%	13
2:00 PM	54.0%	10
3:00 PM	57.0%	11
4:00 PM	63.0%	12
5:00 PM	62.0%	12
6:00 PM	62.0%	12

(1) Based on Weekday hourly patterns since no daily pattern is provided for Saturday.

Attachment E

Future Parking Supply and Demand Details

425 Commerce Drive, Suite 200, Fort Washington, PA 19034
P: 215.283.9444
mcmahonassociates.com | bowman.com

Table E1-Future Projected Weekday Parking Demand with Starbucks

Interval	Projected Starbucks Parking Demand [1]	Projected Parking Demand with Starbucks							Total
		Location							
		1 [2]	2	3	4 [2]	5	6	7	
6:00 AM	10	21	9	7	8	4	2	2	53
6:30 AM	10	24	11	11	15	5	4	3	73
7:00 AM	10	35	11	10	19	5	4	4	88
7:30 AM	10	40	15	11	20	4	4	4	98
8:00 AM	11	40	14	15	28	4	6	8	115
8:30 AM	11	40	15	15	30	5	5	9	119
9:00 AM	11	40	14	18	30	8	8	11	129
9:30 AM	11	40	15	12	29	8	10	11	125
10:00 AM	11	40	15	19	39	7	11	12	143
10:30 AM	11	40	11	15	40	10	15	15	146
11:00 AM	8	39	5	17	29	10	14	18	132
11:30 AM	8	40	8	15	32	9	15	15	134
12:00 PM	8	40	10	15	42	10	17	14	148
12:30 PM	8	40	9	17	45	11	16	15	153
1:00 PM	7	40	10	15	38	10	15	16	144
1:30 PM	7	40	9	18	45	11	18	17	158
2:00 PM	6	40	9	17	42	11	17	15	151
2:30 PM	6	40	11	15	46	13	16	14	155
3:00 PM	6	40	13	14	42	14	15	13	151
3:30 PM	6	38	5	17	35	16	18	25	154
4:00 PM	7	40	7	18	33	17	14	26	155
4:30 PM	7	40	16	18	43	16	22	29	184
5:00 PM	7	40	18	16	40	14	23	33	184
5:30 PM	7	40	17	14	24	15	36	32	178
6:00 PM [3]	**7**	**40**	**17**	**13**	**31**	**12**	**38**	**37**	**188**
Peak Demand by Zone [4]	**11**	**40**	**18**	**19**	**46**	**17**	**38**	**37**	**215**
Peak Overall Demand [3]	**7**	**40**	**17**	**13**	**31**	**12**	**38**	**37**	**188**
Parking Supply	**14**	**40**	**23**	**24**	**66**	**86**	**67**	**86**	**392**
Available Spaces [5]	**7**	**0**	**6**	**11**	**35**	**74**	**29**	**49**	**204**
Percent Occupied [6]	**50%**	**100%**	**74%**	**54%**	**47%**	**14%**	**57%**	**43%**	**48%**

(1) Based on hourly weekday parking demand from Table C1

(2) With development of Starbucks outparcel, parking supply is reduced to 40 spaces. Existing parking demand over 26 spaces has been transferred from Zone 1 into Zone 4.

(3) Overall peak parking demand for Zones 1 through 7.

(4) Peak parking demand by zone, which varies by time of day.

(5) Available spaces equals parking supply less peak parking demand for overall center.

(6) Percent occupied equals peak parking demand per overall center divided by parking supply.

Table E2-Future Projected Friday Parking Demand with Starbucks

Interval	Projected Starbucks Parking Demand [1]	Projected Parking Demand with Starbucks							Total
		Location							
		1 [2]	2	3	4 [2]	5	6	7	
6:00 AM	10	19	7	8	7	3	2	1	47
6:30 AM	10	23	8	10	12	4	5	4	66
7:00 AM	10	38	9	11	19	4	5	4	90
7:30 AM	10	39	12	12	19	2	4	5	93
8:00 AM	11	40	12	15	22	3	6	6	104
8:30 AM	11	40	18	14	26	7	8	10	123
9:00 AM	11	40	15	19	33	9	8	11	135
9:30 AM	11	40	14	15	32	9	11	12	133
10:00 AM	11	40	15	20	40	9	12	15	151
10:30 AM	11	40	18	22	40	11	15	14	160
11:00 AM	8	40	9	21	31	11	15	15	142
11:30 AM	8	40	10	19	34	15	19	19	156
12:00 PM	8	40	11	18	47	22	18	20	176
12:30 PM	8	40	11	18	46	29	22	22	188
1:00 PM	7	40	12	19	44	31	29	24	199
1:30 PM	7	37	17	23	33	39	31	27	207
2:00 PM	6	40	19	20	35	25	26	31	196
2:30 PM	6	40	18	2	31	27	29	30	177
3:00 PM	6	40	19	21	37	26	32	28	203
3:30 PM [3]	**6**	**40**	**22**	**24**	**41**	**21**	**29**	**33**	**210**
4:00 PM	7	40	20	22	39	23	27	30	201
4:30 PM	7	37	21	19	36	22	25	34	194
5:00 PM	7	35	17	21	30	16	35	32	186
5:30 PM	7	36	19	22	29	17	36	29	188
6:00 PM	7	38	21	20	31	19	38	30	197
Peak Demand by Zone [4]	**11**	**40**	**22**	**24**	**47**	**39**	**38**	**34**	**244**
Peak Overall Demand [3]	**6**	**40**	**22**	**24**	**41**	**21**	**29**	**33**	**210**
Parking Supply	**14**	**40**	**23**	**24**	**66**	**86**	**67**	**86**	**392**
Available Spaces [5]	**8**	**0**	**1**	**0**	**25**	**65**	**38**	**53**	**182**
Percent Occupied [6]	**43%**	**100%**	**96%**	**100%**	**62%**	**24%**	**43%**	**38%**	**54%**

(1) Based on hourly weekday parking demand from Table C1

(2) With development of Starbucks outparcel, parking supply is reduced to 40 spaces. Existing parking demand over 26 spaces has been transferred from Zone 1 into Zone 4.

(3) Overall peak parking demand for Zones 1 through 7.

(4) Peak parking demand by zone, which varies by time of day.

(5) Available spaces equals parking supply less peak parking demand for overall center.

(6) Percent occupied equals peak parking demand per overall center divided by parking supply.

Table E3-Future Projected Saturday Parking Demand with Starbucks for Zones 1 to 7 Only

Interval	Projected Starbucks Parking Demand [1]	Projected Parking Demand with Starbucks							Total
		Location							
		1 [2]	2	3	4 [2]	5 [2]	6	7	
9:00 AM	18	27	6	4	41	17	26	9	130
10:00 AM	18	26	7	6	42	20	28	11	140
11:00 AM	13	36	17	7	31	29	21	17	158
12:00 PM	15	40	17	4	49	38	18	32	198
1:00 PM	13	39	19	7	66	55	40	41	267
2:00 PM [1]	**10**	**36**	**18**	**8**	**66**	**72**	**50**	**52**	**302**
3:00 PM	11	37	21	6	66	60	48	51	289
Peak Demand by Zone [4]	**18**	**40**	**21**	**8**	**66**	**72**	**50**	**52**	**302**
Peak Overall Demand [3]	**10**	**36**	**18**	**8**	**66**	**72**	**50**	**52**	**302**
Parking Supply	**14**	**40**	**23**	**24**	**66**	**86**	**67**	**86**	**392**
Available Spaces [5]	**4**	**4**	**5**	**16**	**0**	**14**	**17**	**34**	**90**
Percent Occupied [6]	**71%**	**90%**	**78%**	**33%**	**100%**	**84%**	**75%**	**60%**	**77%**

(1) Based on hourly weekday parking demand from Table C2

(2) With development of Starbucks outparcel, parking supply is reduced to 40 spaces. Existing parking demand over 26 spaces has been transferred from Zone 1 into Zones 4 and 5.

Starbucks parking over 14 spaces has been transferred to Zone 4.

(3) Overall peak parking demand for Zones 1 through 7.

(4) Peak parking demand by zone, which varies by time of day.

(5) Available spaces equals parking supply less peak parking demand for overall center.

(6) Percent occupied equals peak parking demand per overall center divided by parking supply.

Table E4 - Projected Typical Saturday Parking Demand Versus Supply

Interval	Projected Parking Demand with Starbucks [5]																Total Zones 1-15
	Location																
	1	2	3	4	5	6	7	Subtotal	9	10	11	12	13	14	15	Subtotal	
9:00 AM	27	6	4	41	17	26	9	130	2	31	26	15	22	9	12	117	247
10:00 AM	26	7	6	42	20	28	11	140	4	33	29	17	37	39	24	183	323
11:00 AM	36	17	7	31	29	21	17	158	16	37	31	19	48	35	47	233	391
12:00 PM	40	17	4	49	38	18	32	198	12	39	40	23	47	50	63	274	472
1:00 PM	39	19	7	66	55	40	41	267	14	47	48	33	48	60	75	325	592
2:00 PM [1]	**36**	**18**	**8**	**66**	**72**	**50**	**52**	**302**	**13**	**62**	**63**	**37**	**52**	**68**	**67**	**362**	**664**
3:00 PM	37	21	6	66	60	48	51	289	15	59	70	41	43	62	70	360	649
Peak Demand by Zone [2]	**40**	**21**	**8**	**66**	**72**	**50**	**52**	**302**	**16**	**62**	**70**	**41**	**52**	**68**	**75**	**362**	**995**
Peak Overall Demand [1]	**36**	**18**	**8**	**66**	**72**	**50**	**52**	**302**	**13**	**62**	**63**	**37**	**52**	**68**	**67**	**362**	**664**
Parking Supply	**40**	**23**	**24**	**66**	**86**	**67**	**86**	**392**	**17**	**64**	**94**	**122**	**99**	**107**	**107**	**610**	**1002**
Available Spaces [3]	**4**	**5**	**16**	**0**	**14**	**17**	**34**	**90**	**4**	**2**	**31**	**85**	**47**	**39**	**40**	**248**	**338**
Percent Occupied [4]	**90%**	**78%**	**33%**	**100%**	**84%**	**75%**	**60%**	**77%**	**76%**	**97%**	**67%**	**30%**	**53%**	**64%**	**63%**	**59%**	**66%**

Table DE - Projected Typical Saturday Parking Demand Versus Supply (continued)

Interval	Parking Demand for Saturday, October 7, 2023													Total Zones 16-30	Total All Zones
	Location														
	16	17	18	19	20	21	22	23	24	25	26	28	29		
9:00 AM	11	2	1	1	1	8	6	2	7	12	50	1	1	103	350
10:00 AM	32	9	13	3	8	12	6	4	22	56	50	1	2	218	541
11:00 AM	86	24	29	22	8	12	4	4	22	56	50	2	1	320	711
12:00 PM	99	47	58	25	14	14	8	4	37	66	50	6	1	429	901
1:00 PM	100	45	47	34	14	14	8	4	37	66	50	6	1	426	1018
2:00 PM [1]	**110**	**39**	**41**	**44**	**19**	**14**	**10**	**4**	**37**	**68**	**50**	**8**	**2**	**446**	**1110**
3:00 PM	119	32	42	40	17	14	10	4	33	68	50	9	2	440	1089
Peak Demand by Zone [2]	**119**	**47**	**58**	**44**	**19**	**14**	**10**	**4**	**37**	**68**	**50**	**9**	**2**	**481**	**1110**
Peak Overall Demand [1]	**110**	**39**	**41**	**44**	**19**	**14**	**10**	**4**	**37**	**68**	**50**	**8**	**2**	**446**	**1110**
Parking Supply	**127**	**121**	**98**	**65**	**59**	**28**	**72**	**131**	**69**	**70**	**111**	**29**	**10**	**990**	**1992**
Available Spaces [3]	**17**	**82**	**57**	**21**	**40**	**14**	**62**	**127**	**32**	**2**	**61**	**21**	**8**	**544**	**882**
Percent Occupied [4]	**87%**	**32%**	**42%**	**68%**	**32%**	**50%**	**14%**	**3%**	**54%**	**97%**	**45%**	**28%**	**20%**	**45%**	**56%**

(1) Overall peak parking demand for all zones

(2) Peak parking demand by zone, which varies by time of day.

(3) Available spaces equals parking supply less peak parking demand for overall center.

(4) Percent occupied equals peak parking demand per overall center divided by parking supply.

(5) Refer to Table D3 for Starbucks demand and transfers of existing parked vehicles from Zone 1 to Zones 4 and 5.

Chart E1: Zones 1 to 7 Only
Projected Weekday Parking Demand by Time of Day with Starbucks

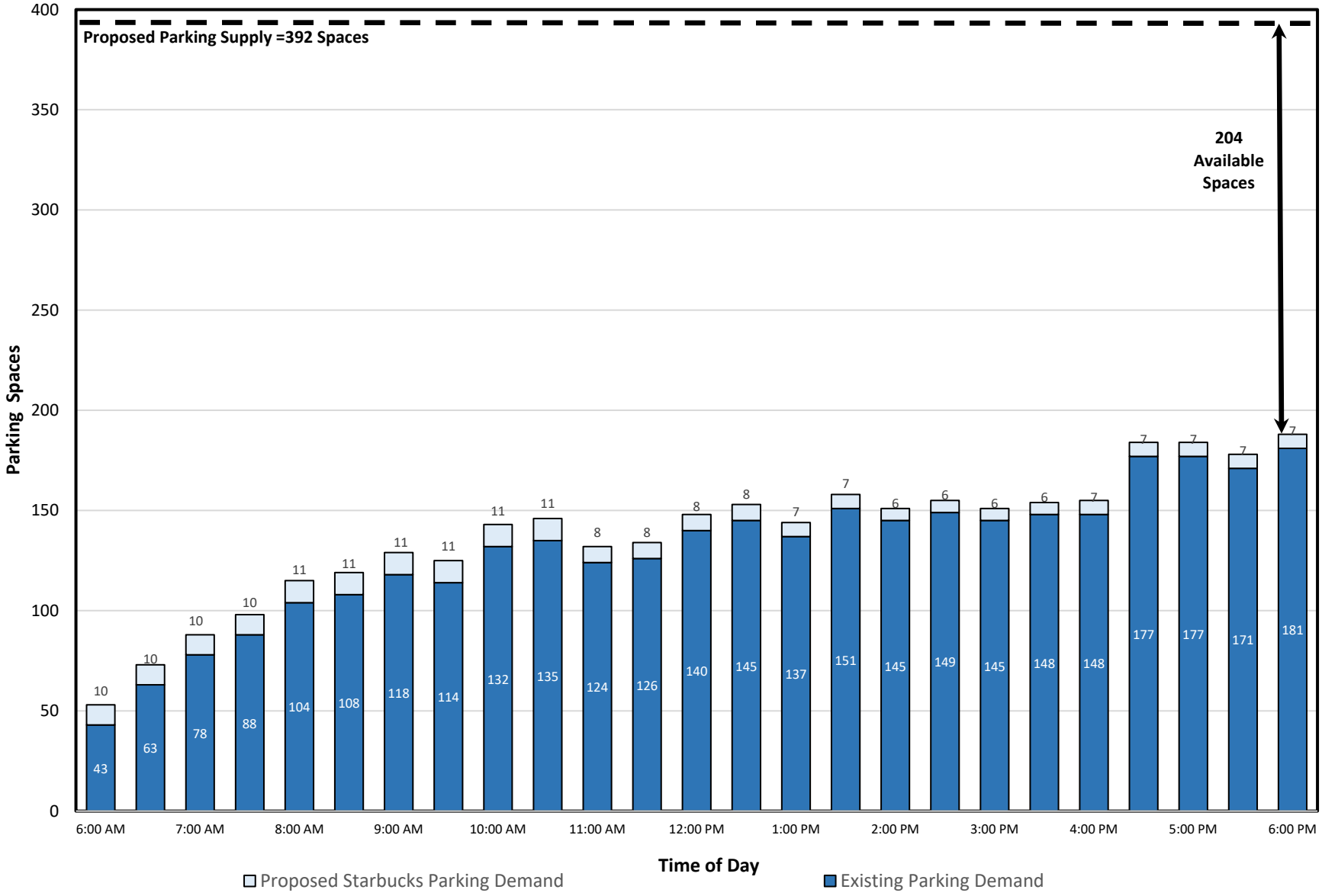


Chart E2: Zones 1 to 7 Only
Projected Friday Parking Demand by Time of Day with Starbucks

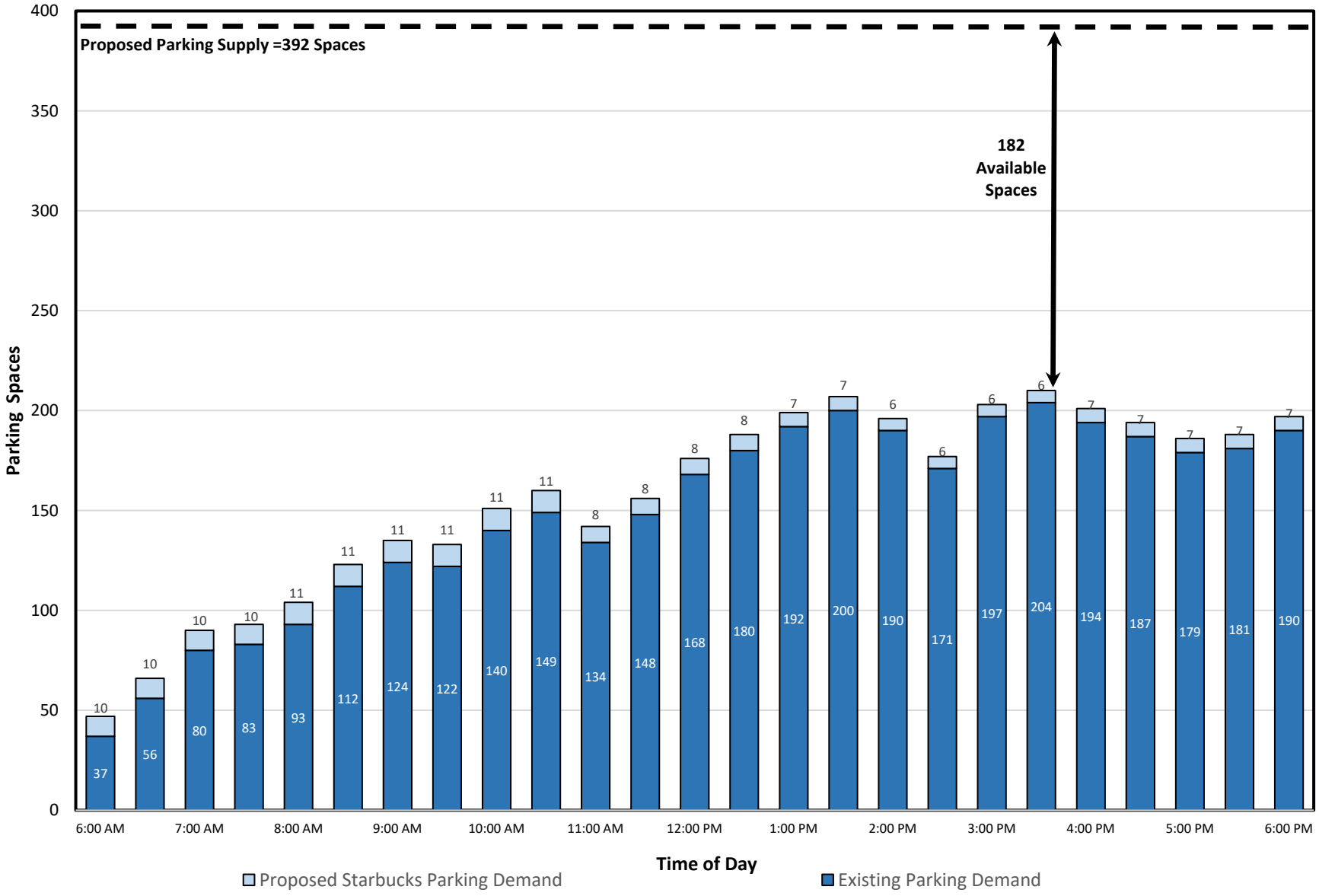


Chart E3: Zones 1 to 7 Only
Projected Saturday Parking Demand by Time of Day with Starbucks

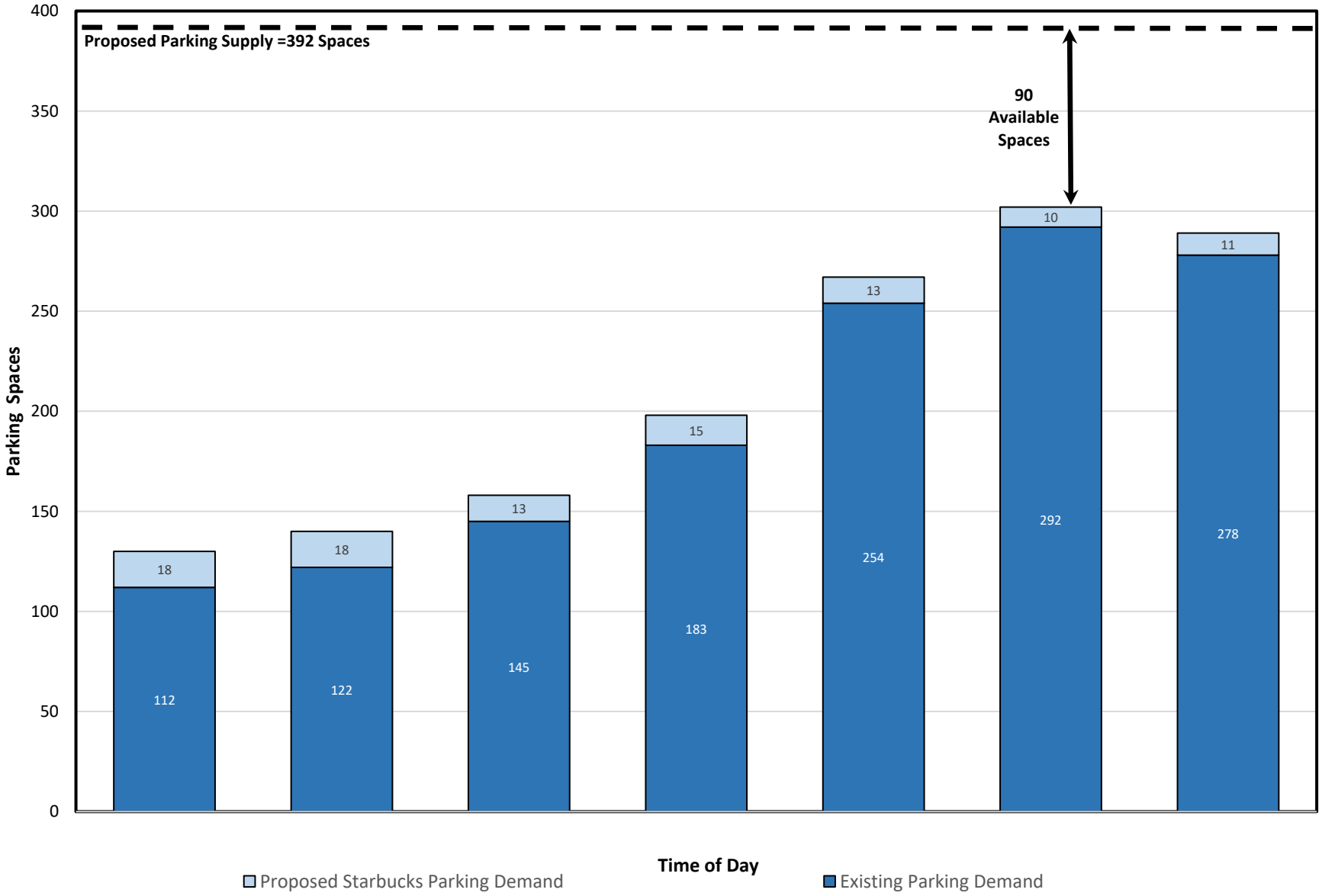


Chart E4: All Zones
Projected Saturday Parking Demand by Time of Day with Starbucks