

## MEMORANDUM

**DATE:** November 19, 2018

**TO:** Gus Miragias Executive Director  
Artisan Childcare Center  
2330 Washington Street, Newton MA

**FROM:** Robert J. Michaud, P.E. – Managing Principal  
Daniel A. Dumais, P.E. – Senior Project Manager

**RE:** **Proposed Artisan Childcare Center Expansion**  
2330 Washington Street – Newton, MA



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MDM Transportation Consultants, Inc. (MDM) has prepared the framework for a Parking Management Plan (PMP) for the Artisan Childcare Center expansion located at 2330 Washington Street in Newton, Massachusetts. This framework is based on supplemental parking counts conducted under normal Artisan operations during the week of November 6-9, 2018, and specific additional PMP commitments by Artisan to be implemented based on discussions with Newton Planning and Engineering staff held on November 16, 2018. The PMP builds on and refines the prior PMP commitments by Artisan as submitted as part of the initial Application for Special Permit.

### SUMMARY OF ARTISAN PROGRAMMING

Artisan currently employs twelve (12) staff including 7 full-time staff with daytime shifts beginning at 7:30 AM and 9:30 AM and 5 part-time staff that have early morning and late afternoon shifts. Three (3) additional music teachers are also programmed to teach at the school throughout the week. Current Artisan staff schedules and associated on-site staff totals by hour of day is summarized in **Exhibit 1**. In summary, peak on-site staffing occurs between the hours of 9:00 AM and 4:00 PM with some anticipated part-time and full-time overlap at shift periods (9 AM and 4 PM). Corresponding peak parking activity reflects this overlap based on supplemental parking observation counts conducted in November 2018 and as described in the following section.

		700	730	800	830	900	930	10	1030	11	1130	12	1230	1	130	2	230	3	330	4	430	5	530	
	Teacher Number	Time																						
Full Time	1 (Combo admin /teacher)																							
	2																							
	3																							
	4																							
	5																							
	6																							
	7 (Combo admin /teacher)																							
	8																							
	9																							
	10																							
	11																							
		3	6	6	6	6	11	11	11	11	11	11	11	11	11	11	11	11	11	8	5	5	5	5
Part Time	1																							
	2																							
	3																							
	4																							
	5																							
	6																							
	7																							
	8																							
	9																							
	10																							
	11																							
		5	5	5	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	3	6	6	6	6
Music	M&M																							
	Piano																							
	Violin																							
		0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Grand Total		8	11	12	12	12	12	12	12	12	12	12	12	11	11	11	11	11	11	11	11	11	11	

Source: Artisan Childcare Center

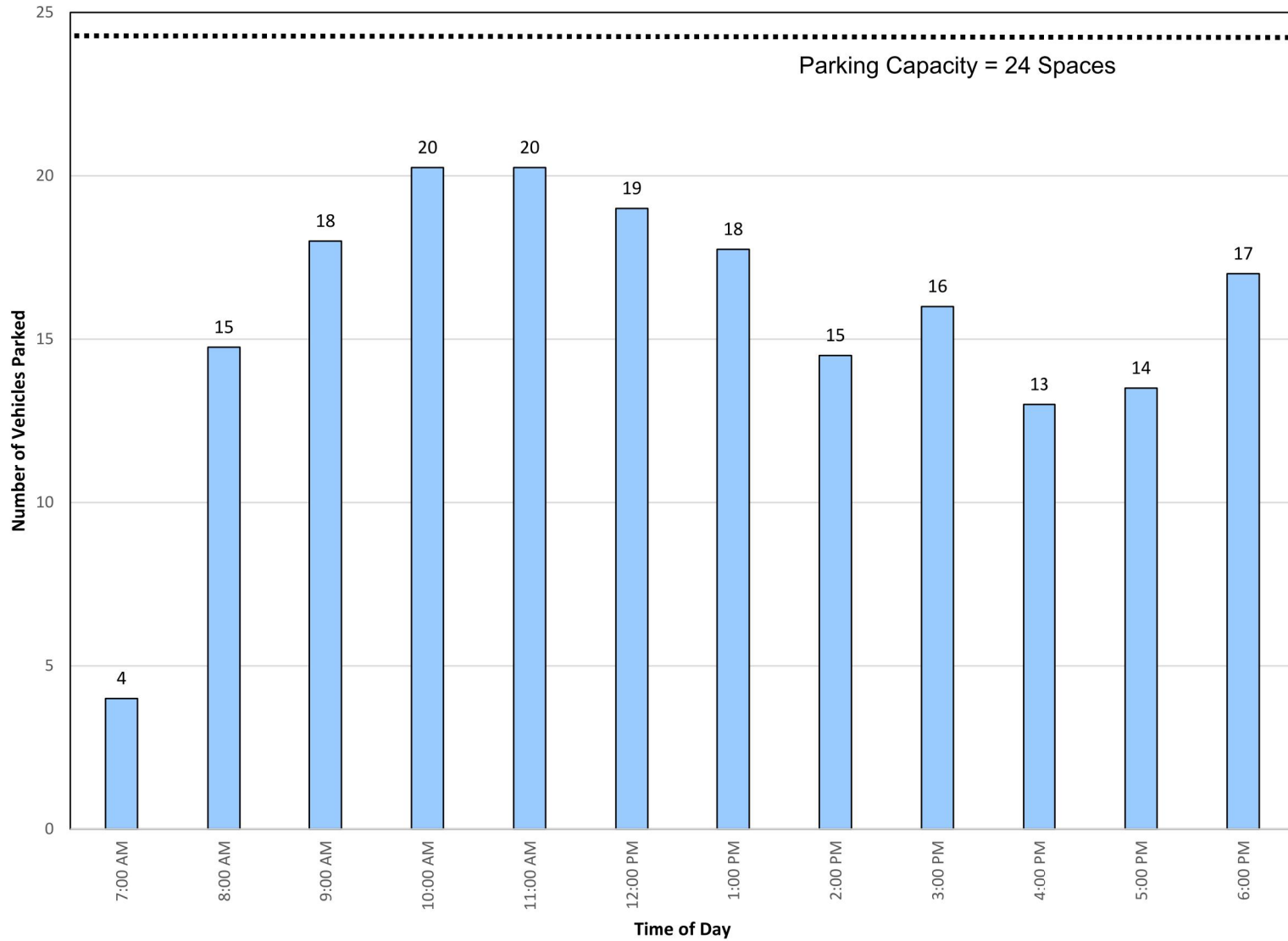
Under expanded enrollment, an increase of up to 9 additional staff is anticipated, bringing the total staffing to approximately 21 persons plus the music staff. The expanded enrollment and associated increased staff will be gradually phased enrollment to allow monitoring and adjustment of the traffic management policies as necessary to ensure efficient use of the on-site parking supply. Enrollment increase of 20 students, bringing total enrollment to 85 children, is projected to occur over an approximate 6-month period; this enrollment level will also result in an increase of 4 staff for a total staffing level of 16 persons. Subsequent enrollment increase of 21 students, bringing total enrollment from 85 children to a maximum of 106 children, is projected to occur over an approximate 6-month period; this enrollment level will also result in an increase of 5 staff for a total staffing level of 21 persons.

## **SUPPLEMENTAL COUNTS AND PROJECTED PARKING DEMAND**

Supplemental video-based parking observations at Artisan's Newton campus were conducted for the period November 6 to November 9, 2018 between the hours of 7 AM and 7 PM. These data are included in the **Attachments** and supplement prior reported April 2018 counts documented in the MDM June 25, 2018 memorandum. **Exhibit 2** summarizes the typical range of peak parking demand activity at the Site for this period, indicating the following trends:

- *AM Peak Drop-Off Period:* Morning parking demands are highly consistent from day to day with a typical peak demand of 15 vehicles, of which 7 are staff-related and 8 are parent/guardian vehicles. Parking vacancies typically occur in the rear/lower parking lot with 8 to 10 vacant spaces until 9 AM.
- *Midday Peak Parking Demand:* Parking demands at the campus vary from 18 to 20 vehicles between the hours of 9 AM and 1 PM, of which 15 are staff-related and between 3 and 5 are visitor and parent/guardian vehicles. Between 1 PM and 5 PM parking demand is lower and typically ranges from 13 to 16 vehicles, leaving most of the front spaces available/vacant and between 8 and 11 spaces vacant in the lower lot. Parking demands during the 1 PM to 5 PM periods are mostly associated with staff vehicles, again leaving ample spaces to accommodate a reasonable increase in staff if enrollment were to increase.
- *PM Pick-Up Period Demand:* Evening parking demands during the peak pick-up period between 5 PM and 6 PM are highly consistent from day to day with a typical peak demand of 14 to 17 vehicles, of which 6 to 8 are parent/guardian vehicles. Parking vacancies are typically in the rear/lower parking lot with a reserve of 7 or more vacant spaces through 7 PM.

In summary, peak parking demands during morning and evening pick-up/drop-off periods consistently range from 14 to 17 vehicles (inclusive of staff) with parent/guardian vehicles accounting for a demand of 6 to 8 vehicles during these periods. The five (5) front/upper



parking spaces are regularly full during these periods, requiring use of up to 4 of the rear/lower lot spaces for the balance of pick-up/drop-off activity. Vacancies of 7 or more spaces regularly occur in the lower lot during these periods, allowing sufficient reserve for additional staff and/or pick-up/drop-off activity beyond current levels.

### *Projected Parking Demand Estimates*

Projected parking demand increases at the Artisan Newton campus are estimated assuming phased implementation of enrollment and staffing as defined under Artisan Programming above, i.e., at 85-student enrollment and at 106-student enrollment. Two scenarios are considered for these enrollment levels, with calculations provided in the **Attachments**:

(a) *Existing Artisan Practices*. Projected peak parking activity at the Artisan Newton campus assumes no change in current Artisan practices under which parking demands are simple extrapolated from current observed arrival patterns. The **Attachments** contain associated hourly peak parking demands which indicate the following trends:

- **85 Student Enrollment:** Peak AM parking activity of 19 vehicles and PM parking activity of 22 vehicles, indicating that current Artisan practices can adequately support increased enrollment to 85 students during peak pick-up/drop-off periods. However, parking activity between 9 AM and 1 PM ranges from 24 to 27 spaces, indicating the need to implement a PMP to reduce potential parking demands between 9 AM and 1 PM.
- **106 Student Enrollment:** Peak AM parking activity of 24 vehicles and PM parking activity of 28 vehicles, and midday peak activity of 35 vehicles. This indicates that the need to implement a PMP to reduce potential parking demands beyond 9 AM in the morning.

(b) *Implementation of a Parking Management Plan (PMP)*. The projected parking activity assuming implementation of a PMP as outlined in the subsequent section of this evaluation. The PMP aims to substantially reduce staff parking activity and also substantially enhances pick-up/drop-off operations to reduce parent/guardian parking duration. The **Attachments** contain associated hourly peak parking demands which indicate the following trends:

- **85 Student Enrollment:** Peak pick-up/drop-off parking activity is projected at 16 vehicles or less, leaving substantial parking vacancies (8 or more spaces) during these periods. Midday peak demands are projected at 20 spaces or less.
- **106 Student Enrollment:** Peak pick-up/drop-off parking activity is projected at 17 vehicles prior to 9 AM and 21 vehicles or less after 5 PM. Midday demands are projected at 23 vehicles or less.

## PARKING MANAGEMENT PLAN

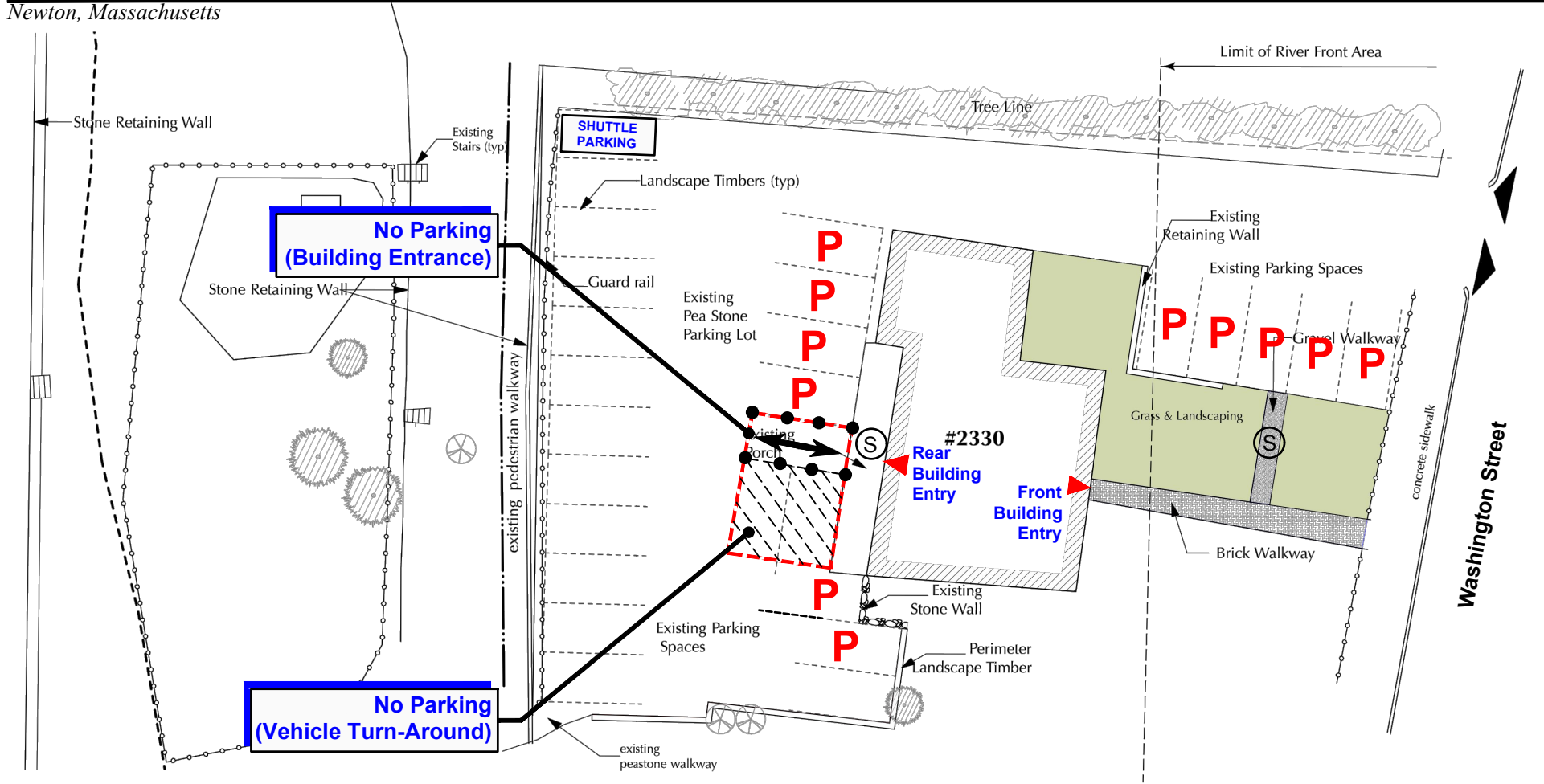
Parking management policies and practices will be implemented by the Applicant to ensure sufficient on-site parking is available to support school operations throughout the week including special provisions to be implemented to facilitate peak pick-up/drop-off period operations and student circulation. Key aspects of the Parking Management Plan are annotated on **Exhibit 3** and include the following elements:

### *Staff Parking Policies and Incentives*

- *Artisan Staff Parking Policies and Incentives.* Prior to enrollment of more than 65 students, Artisan shall implement as a requirement of employment that a minimum of eight (8) staff agree to utilize a private shuttle service to/from the MBTA Woodland Station (as described below) as part of the normal daily commute to the property. Artisan shall further incentivize participating staff by offering pre-paid monthly parking passes for the Woodland Station lot for employees choosing to drive and park; or alternatively a transit subsidy equivalent to the monthly cost of a MBTA pass for employees choosing to use public transportation for their commute. This policy and requirement of employment for participating staff will effectively reduce the on-site parking demands by a net minimum of 7 spaces relative to existing observed utilization (8 staff vehicles minus one parked shuttle and the property).

Artisan shall further increase the minimum number of staff required to utilize the private shuttle service to ten (10) following employment of 15 or more staff at the Site and a minimum of twelve (12) following employment of 20 or more staff at the Site. This policy and requirement of employment for participating staff will effectively reduce the on-site parking demands by a net minimum of 9 to 11 spaces relative to existing observed utilization (10 to 12 staff vehicles minus one parked shuttle and the property).





North  
 Scale: Not to Scale

- P** = Reserved for pick-up/drop-off use only  
 7:30 - 9 AM ; 4:30 - 6 PM
- (S)** = Staff Assistance Location

Site Plan Source: Hresko Associates, Inc.  
 Exhibit 3

- *Private Staff Shuttle.* Prior to enrollment beyond the current 65-student cap, Artisan will purchase or lease a minimum 12-person capacity van that will be operated by a designated staff member to shuttle staff to/from the Woodland MBTA Station parking lot. The shuttle schedule will include two morning pick-ups at Woodland Station to accommodate each full-time staff shift and two afternoon drop-offs to accommodate the return to Woodland Station for these shifts. The van shall be parked at the Site in a designated space to the rear of the building in the lower parking lot.

### ***Additional Building Entry, Parking Designation and Staffing***

- *Rear Building Entrance.* Currently, Artisan utilizes a single front building entry for child drop-off-pick-up. Artisan will activate the rear building entrance with appropriate staff and biometric security features that will allow students and their parents/guardians immediate building access from the lower parking field. This feature will vastly improve drop-off/pick-up efficiency, eliminating the need for parents/guardians that currently park to the rear of the building to traverse the site to access the front building entrance when dropping off or retrieving children.
- *Pick-up/Drop-off Parking Designation.* A total of eleven (11) parking spaces will be designated for pick-up/drop-off use only for the peak AM (7:30 AM to 9:00 AM) and peak PM (5:00 PM to 6:00 PM) periods. These shall comprise five (5) spaces nearest the front building entry and six (6) spaces in the lower parking area immediately adjacent to the building and rear entrance. Remaining spaces shall be for general use to either augment the designated spaces as required or to accommodate authorized staff, special instructors for the music program or visitors. The proximity of these spaces to the building and entrances will minimize conflicts with vehicle circulation within the Site, allowing direct building access.
- *Staff Assistance.* Each of the two building entrances will be staffed during peak pick-up/drop-off periods (7:30 to 9:00 AM and 5:00 to 6:00 PM) to facilitate child pick-up/drop-off, including accompanying a child directly from a vehicle to the school and thereby reducing the amount of time a vehicle is parked.

### ***Special Event Programming and Restrictions***

- *Special Event/Conference Scheduling.* Special event programming including special holiday events, etc. that would require extended parent/guardian stays with parking demands in excess of on-site parking supply will be controlled with a pre-arranged off-site parking arrangement.



## *Plan Implementation and Monitoring*

- *Periodic Monitoring.* Artisan proposes to increase enrollment and related staffing in a gradual, phased manner in order to assure that the objectives of the Parking Management Plan are being met and that ample on-site parking capacity is available to support school operations. Artisan shall conduct monitoring and reporting of Site parking demands at the following thresholds for reporting to the City and prior to increasing enrollment beyond each specified phase:
  - At 6 months from issuance of Special Permit to a maximum of 85 student enrollment.
  - At 1 year from issuance of Special Permit to a maximum of 106 student enrollment.

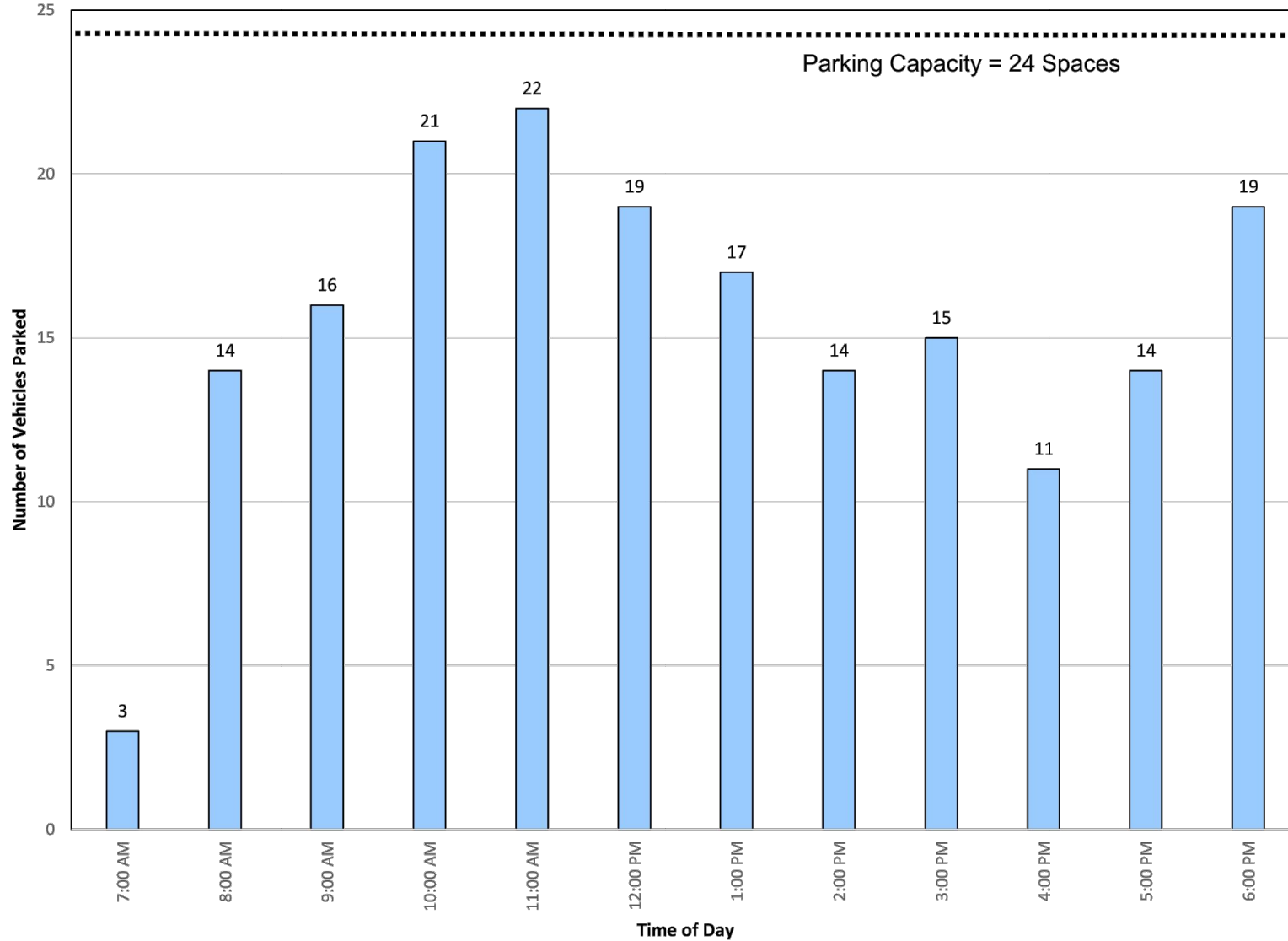
Monitoring shall include video-based accumulation data for rear/lower lot and front/upper lot parking over a 5-day weekday period under normal Site operations and specified enrollment level between the hours of 7 AM and 7 PM. Additionally, Artisan shall maintain a log of daily shuttle use from inception of the service and average daily ridership shall be tabulated and reported as part of the monitoring reports to the City.

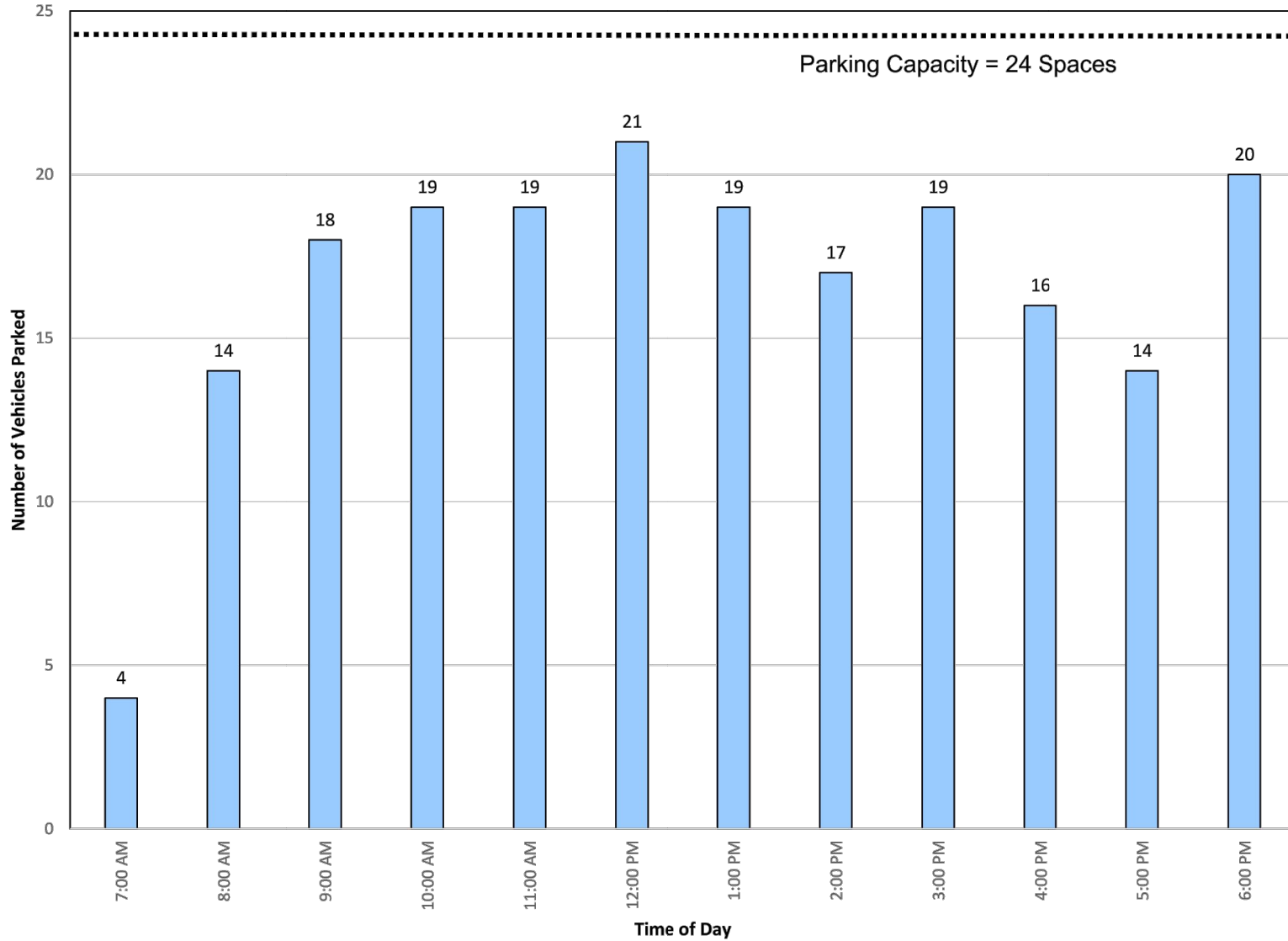
- *Plan Review and Consultation with City Planning Department.* Following the initial (6-month) monitoring period, and prior to further enrollment expansion beyond 85 children, Artisan will consult with the City of Newton Planning Department to review the results of the monitoring of the Parking Management Plan. Artisan shall subsequently consult with the City of Newton Planning Department to review the results of the monitoring of the Parking Management Plan following issuance of the second report at maximum enrollment of 106 students.

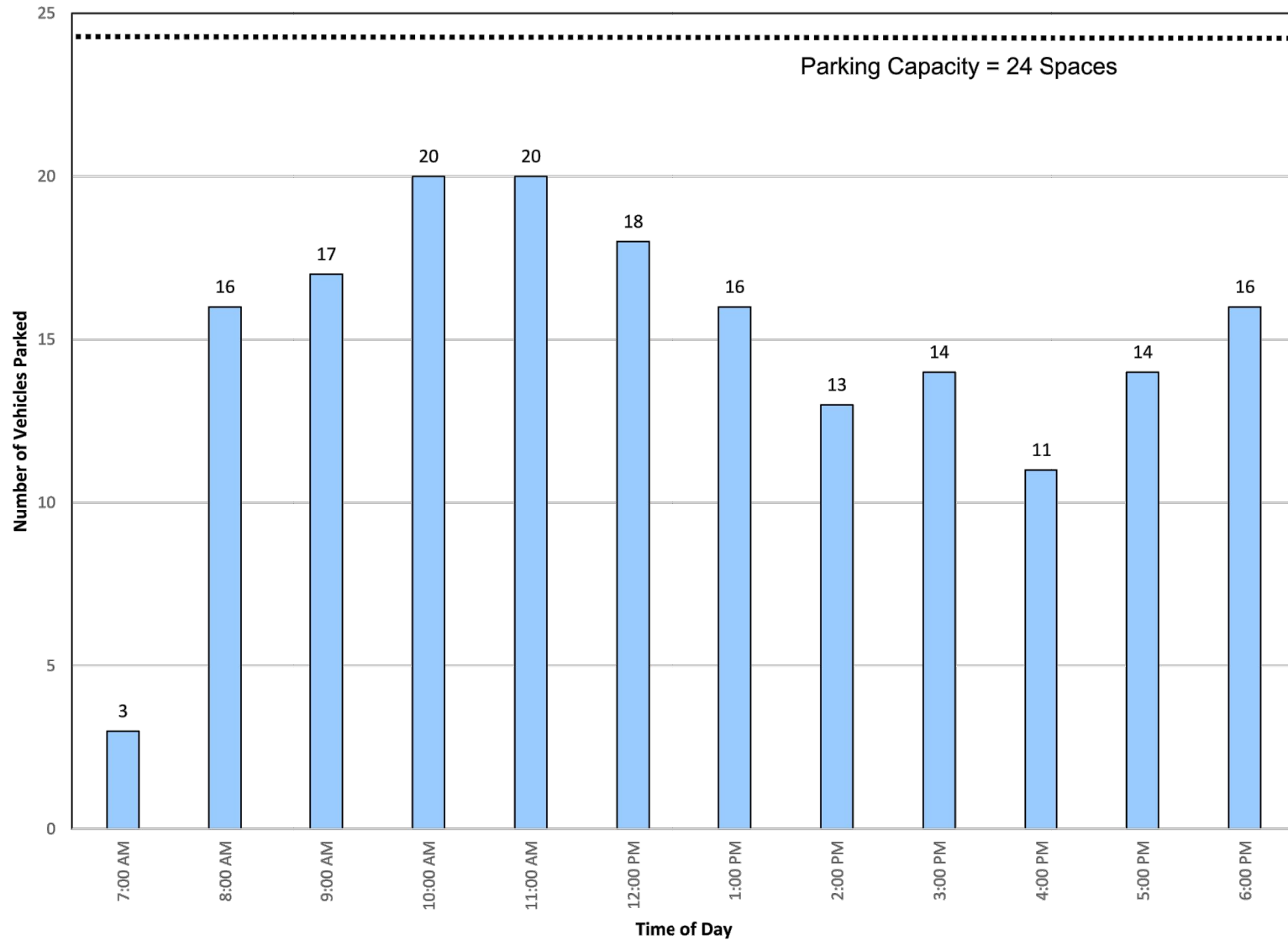
# ATTACHMENTS

- Parking Observations – November 2018
- Parking Demand Calculations

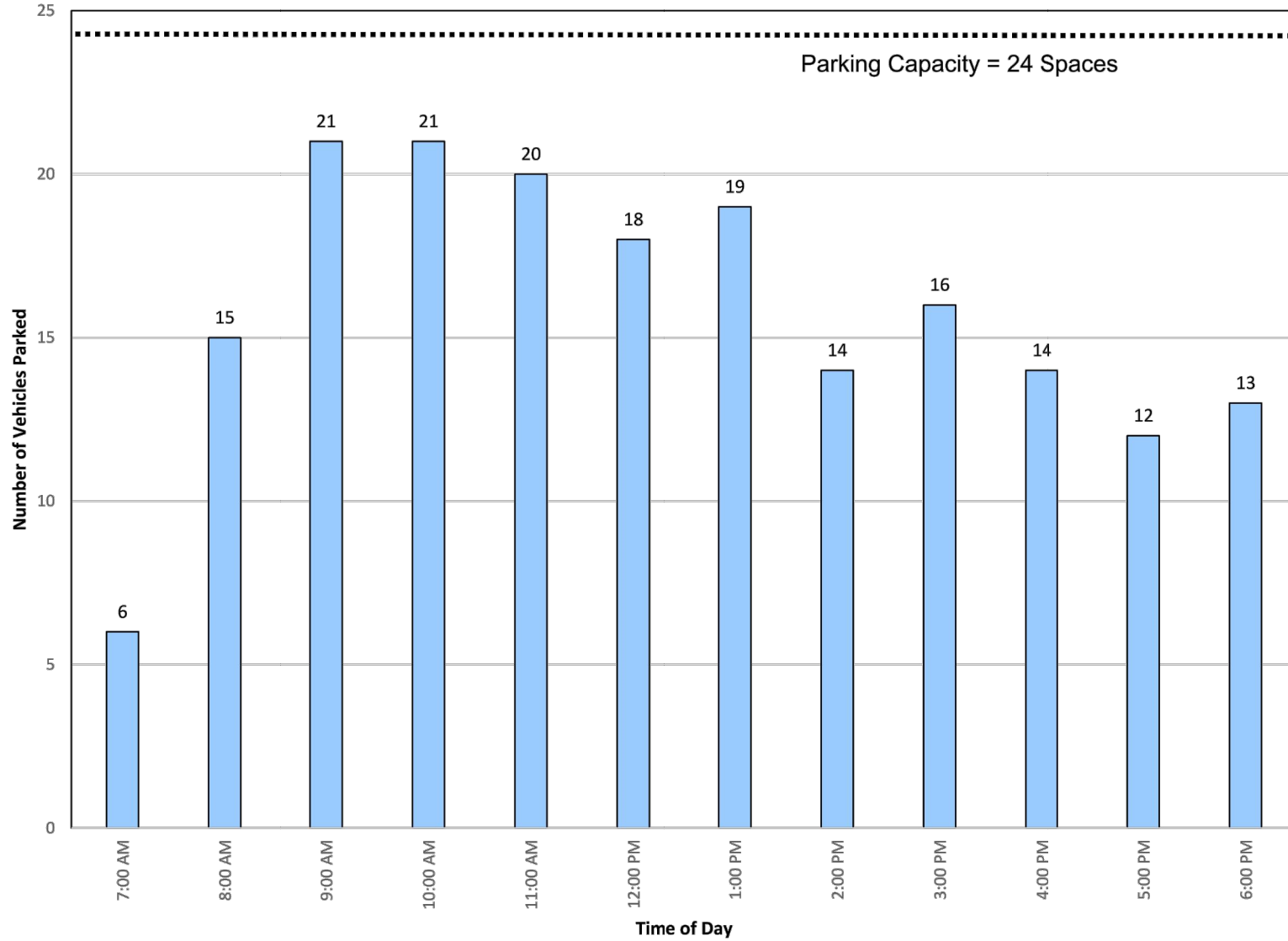
□ Parking Observations – November 2018









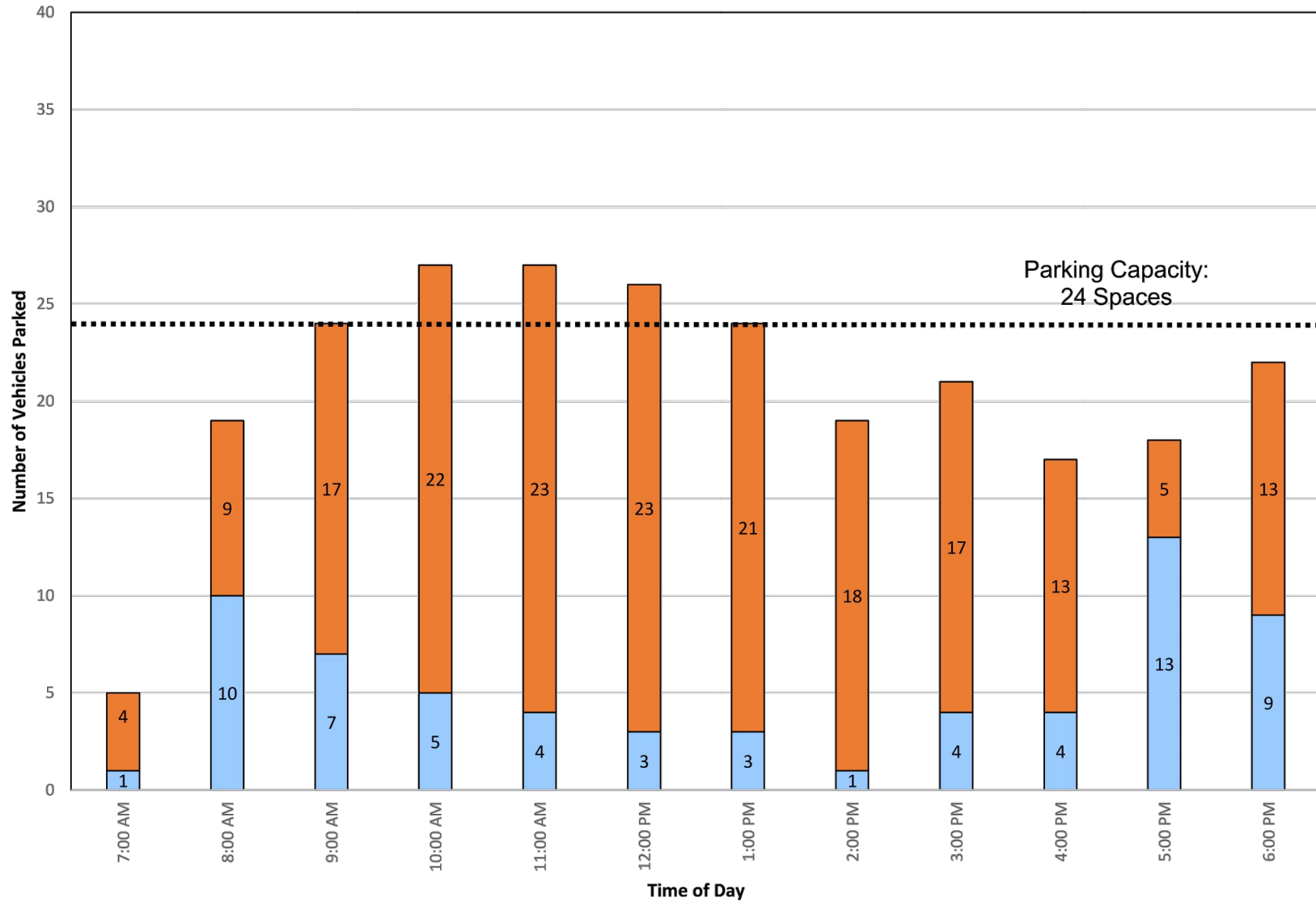


### Observed Hourly Parking Demand - Artisan, Newton

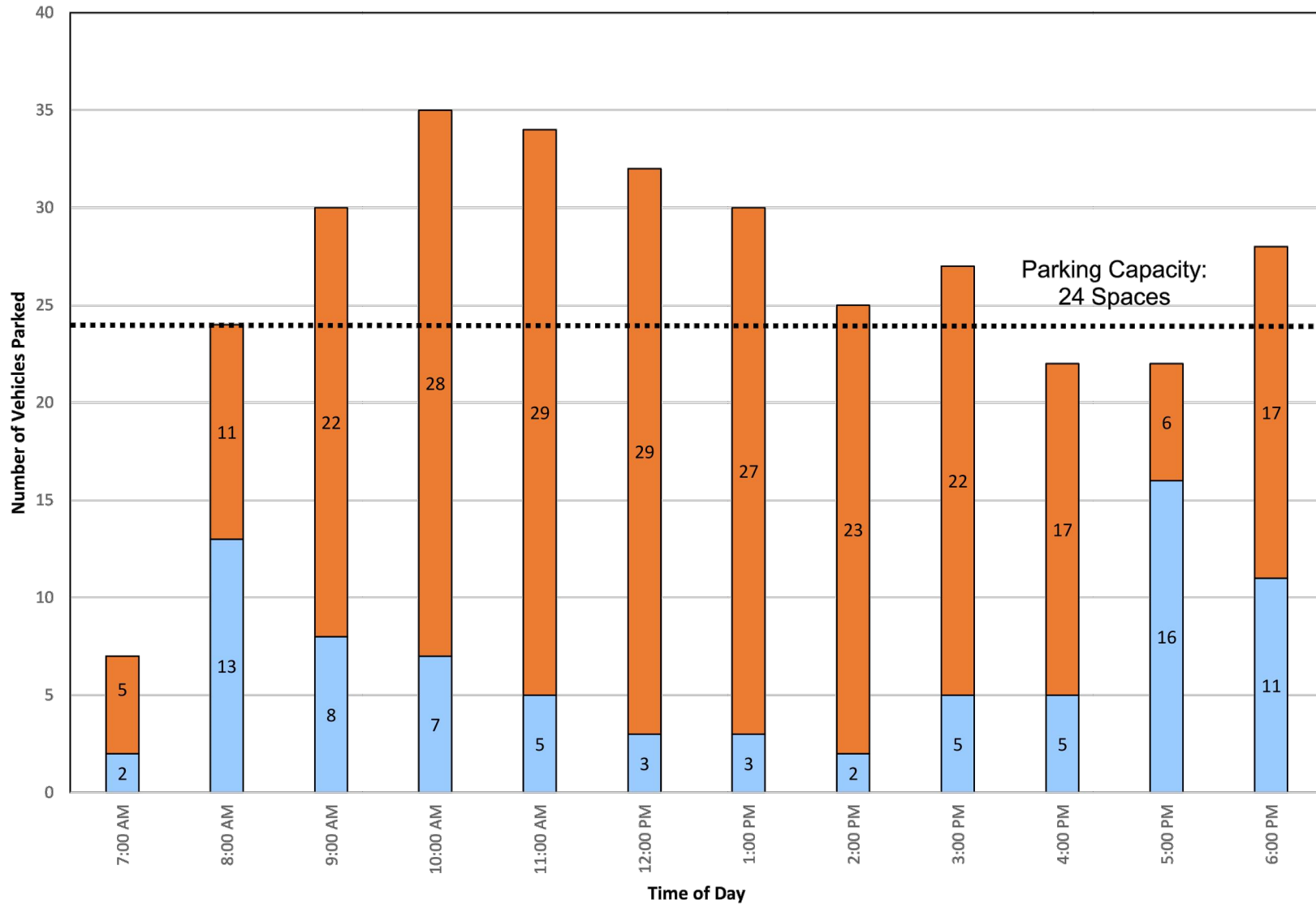
	Tuesday, November 6	Wednesday, November 7	Thursday, November 8	Friday, November 9	Average	
7:00 AM	3	4	3	6	4	
8:00 AM	14	14	16	15	15	
9:00 AM	16	18	17	21	18	
10:00 AM	21	19	20	21	20	
11:00 AM	22	19	20	20	20	
12:00 PM	19	21	18	18	19	
1:00 PM	17	19	16	19	18	
2:00 PM	14	17	13	14	15	
3:00 PM	15	19	14	16	16	
4:00 PM	11	16	11	14	13	
5:00 PM	14	14	14	12	14	
6:00 PM	19	20	16	13	17	

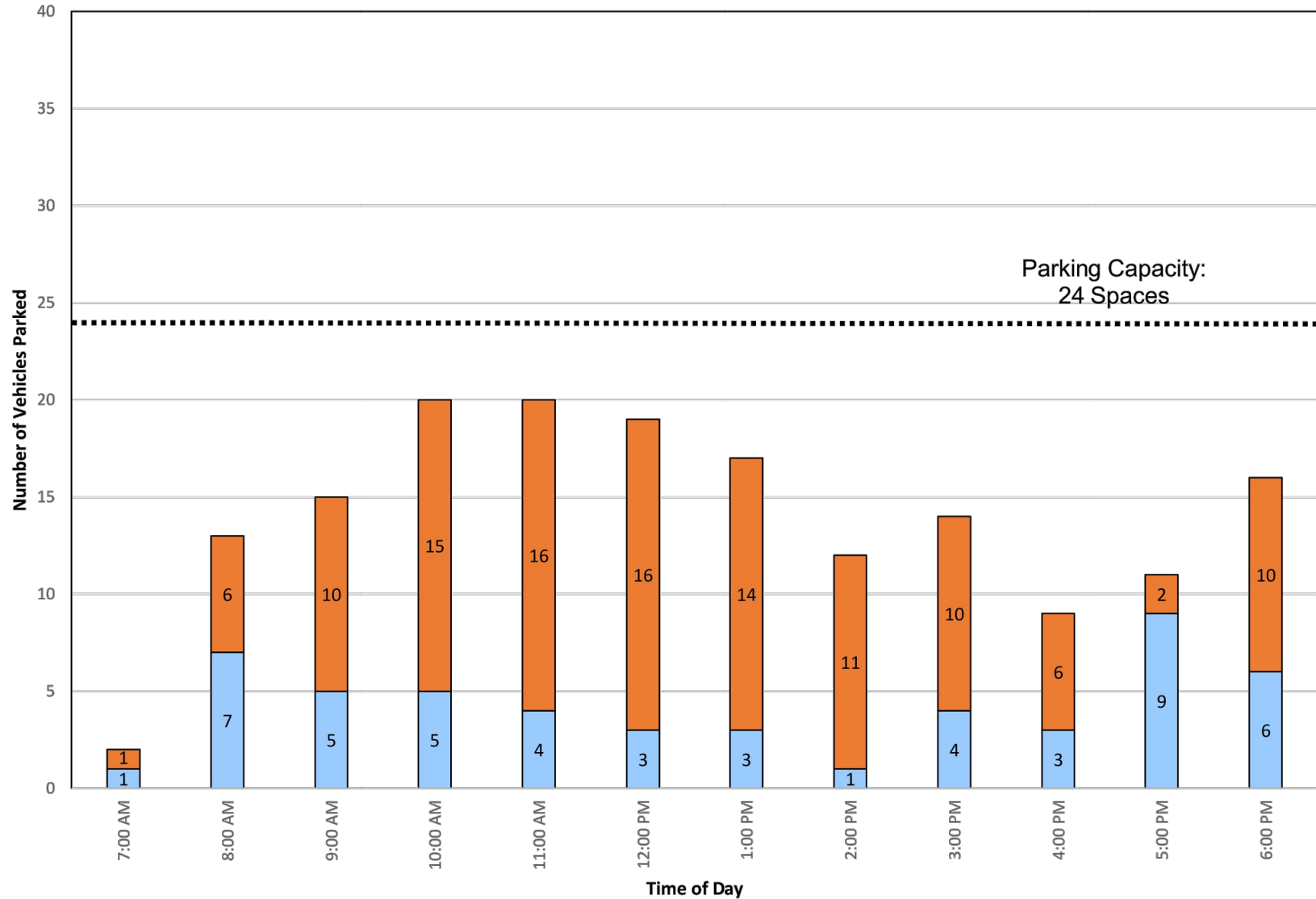
## □ Parking Demand Calculations

Projected Parent Parking (No Staff, up to 85 from 65)      Projected Staff Parking Only (16)

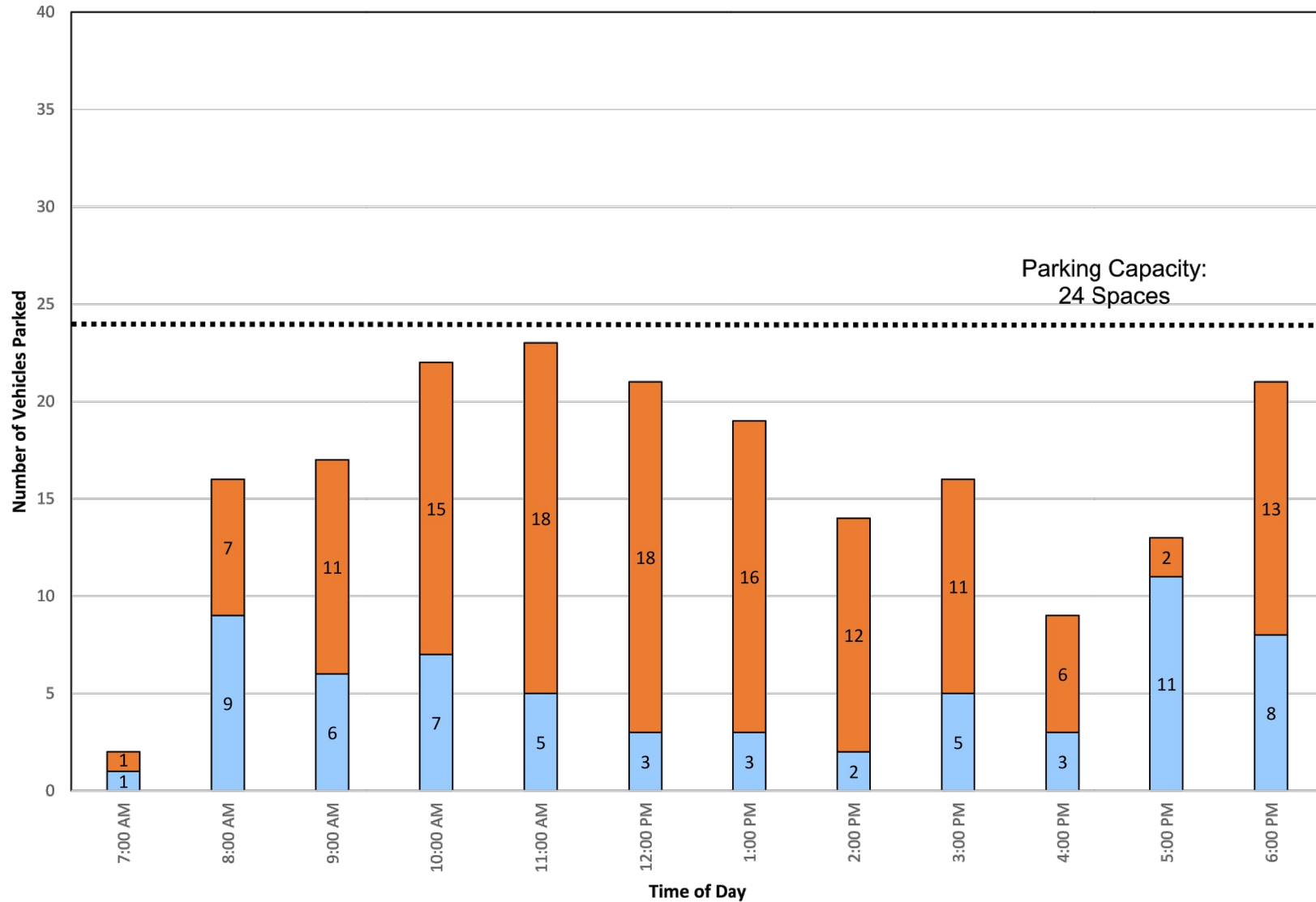


Parking Capacity:  
24 Spaces









	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Hourly Parent Parking (No Staff from April 2018)	Projected Parent Parking (No Staff, up to 85 from 65)	Projected Parent Parking (No Staff, up to 106 from 65)	Calculated Staff Parking Only (12)	Projected Staff Parking Only (16)	Projected Staff Parking Only (21)	Projections Sum (16 Staff, 85 Students)	Projections Sum (21 Staff, 106 Students)	8 Staff Committed to Shuttle	12 Staff Committed to Shuttle	16 Staff Parking (w/ Shuttle Bus)	21 Staff Parking (w/ Shuttle Bus)	85 Student Parent Parking (PMP Implemented)	106 Student Parent Parking (PMP Implemented)
7:00 AM	1	1	2	3	4	5	7	7	-3	-4	1	1	1	1
8:00 AM	8	10	13	7	9	11	19	24	-3	-4	6	7	7	9
9:00 AM	5	7	8	13	17	22	24	30	-7	-11	10	11	5	6
10:00 AM	4	5	7	15	20	26	25	33	-7	-11	13	15	5	7
11:00 AM	3	4	5	17	23	29	27	34	-7	-11	16	18	4	5
12:00 PM	2	3	3	17	23	29	26	32	-7	-11	16	18	3	3
1:00 PM	2	3	3	16	21	27	24	30	-7	-11	14	16	3	3
2:00 PM	1	1	2	14	18	23	19	25	-7	-11	11	12	1	2
3:00 PM	3	4	5	13	17	22	21	27	-7	-11	10	11	4	5
4:00 PM	3	4	5	10	13	17	17	22	-7	-11	6	6	3	3
5:00 PM	10	13	16	4	5	6	18	22	-3	-4	2	2	9	11
6:00 PM	7	9	11	10	13	17	22	28	-3	-4	10	13	6	8

- 1 Observed Site activity from Tuesday, April 10th, 2018. Staff was instructed to park offsite for the day.
- 2 Calculated first phase projection of parent activity by multiplying observed parent trips by a ratio of 85/65
- 3 Calculated final phase projection of parent activity by multiplying observed parent trips by a ratio of 106/65
- 4 Site activity observed in November, 2018 was averaged, then the observed parent activity was subtracted out to obtain a staff activity estimate
- 5 Calculated first phase projection of staff activity by multiplying estimated trips by a ratio of 16/12
- 6 Calculated final phase projection of staff activity by multiplying estimated trips by a ratio of 21/12
- 7 Sum of 2 and 5
- 8 Sum of 3 and 6
- 9 Representation of hourly parked cars removed from site assuming 8 staff members commit to using the shuttle service provided in the PMP
- 10 Representation of hourly parked cars removed from site assuming 12 staff members commit to using the shuttle service provided in the PMP
- 11 Projected site staff parked vehicles (including space for the shuttle) with 16 staff in first phase (5 minus 9)
- 12 Projected site staff parked vehicles (including space for the shuttle) with 21 staff in final phase (6 minus 10)
- 13 Calculated expected first phase parent activity after PMP implementation. Assumes reduction from 10 minutes of processing time for parents to 8 minutes, which reduces 95th percentile vehicles on site from 16 to 11. (Multiply 2 by 11/16)
- 14 Calculated expected final phase parent activity after PMP implementation. Assumes reduction from 10 minutes of processing time for parents to 8 minutes, which reduces 95th percentile vehicles on site from 16 to 11. (Multiply 3 by 11/16)

**Drop-Off/ Pick-Up Queue Analysis,  
Artisan Childcare Center (106 Students)  
Washington Street, Newton, MA**

Period: Weekday Evening Peak Hour - Pick-up  
 Input Rate (q) 48 Vehicles/60 Min  
 Service Rate (u) 6 Vehicles/60 Min = 10.00 Minutes/Vehicle  
 No. Servers 11  
 k 100

<u>n</u>	<u>p(n)</u>	<u>Cdist</u>	
0	0.00031	-	
1	0.002484	0.00	
2	0.009934	0.01	
3	0.026492	0.04	
4	0.052984	0.09	
5	0.084774	0.18	
6	0.113032	0.29	
7	0.129179	0.42	
8	0.129179	0.55	
9	0.114826	0.66	
10	0.091861	0.76	
11	0.066808	0.82	
12	0.048588	0.87	
13	0.035336	0.91	
14	0.025699	0.93	
15	0.01869	0.95	
16	0.013593	0.96	<b>Max Q</b>
17	0.009886	0.97	
18	0.00719	0.98	
19	0.005229	0.99	
20	0.003803	0.99	

n = Number of Queued Vehicles  
 P(n)= probability of n queued vehicles  
 Cdist= Cumulative probability of n queued vehicles or less

**Assumptions**

1. Average customer service time is based on empirical data for existing Medfield Day Care Centers.
2. Average arrival for peak hour is based on entering trip generation.
3. Queuing algorithm based on M/M/S model, per Introduction to Operations Research, 6th Ed., Hillier & Lieberman, 1995 P. 686-689.

**Drop-Off/ Pick-Up Queue Analysis,  
Artisan Childcare Center (106 Students)  
Washington Street, Newton, MA**

Period:                      Weekday Evening Peak Hour - Pick-up  
 Input Rate (q)              48              Vehicles/60 Min  
 Service Rate (u)            7.5            Vehicles/60 Min =              8.00            Minutes/Vehicle  
 No. Servers                  11  
 k                                  100

<u>n</u>	<u>p(n)</u>	<u>Cdist</u>	
0	0.001642	-	
1	0.010507	0.01	
2	0.033624	0.05	
3	0.071731	0.12	
4	0.11477	0.23	
5	0.146905	0.38	
6	0.156699	0.54	
7	0.143268	0.68	
8	0.114614	0.79	
9	0.081503	0.88	
10	0.052162	0.93	
11	0.030349	0.96	<b>Max Q</b>
12	0.017658	0.98	
13	0.010273	0.99	
14	0.005977	0.99	
15	0.003478	1.00	
16	0.002023	1.00	
17	0.001177	1.00	
18	0.000685	1.00	
19	0.000399	1.00	
20	0.000232	1.00	

n = Number of Queued Vehicles  
 P(n)= probability of n queued vehicles  
 Cdist= Cumulative probability of n queued vehicles or less

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