



## MEMORANDUM

To: John Strzalka  
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48 East Flagler Street PH 105  
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From: Lisa Juan, P.E. *Lisa Juan*  
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Date: June 11, 2021

**Subject: 178 Main Street – Sturbridge Plaza  
Shared Parking Analysis**

The purpose of this memorandum is to summarize the shared parking analysis prepared for the redevelopment of the JCPenney within Sturbridge Plaza located at 178 Main Street in Sturbridge, Massachusetts. Per previous communication, it is understood that the 157,900 square feet of the Sturbridge Plaza is currently under parked. Sturbridge Plaza consists of 151,900 square feet of retail, 2,000 square feet of bank, and 4,000 square feet of fitness center. The proposed redevelopment of the JCPenney consists of 19,000 square feet of fitness center (Planet Fitness) space, 10,000 square feet of retail space (soft goods retailer), and 23,500 square feet of other retail space. A shared parking analysis, consistent with the methodology outlined in the Institute of Transportation Engineers (ITE’s) *Parking Generation Manual, 5<sup>th</sup> Edition* and Urban Land Institute’s (ULI) *Shared Parking, 3<sup>rd</sup> Edition*, was prepared for the proposed redevelopment. The following sections summarize the shared parking analysis.

### EXISTING PROGRAM

As noted above, Sturbridge Plaza consists of 157,900 square feet of retail, 2,000 square feet of bank, and 4,000 square feet of fitness center. Per the Sturbridge Zoning Bylaws, Chapter 21 – Off Street Parking, Loading and Drive Thru Standards (the “Code”), the total amount of parking spaces required is 776 as shown in **Table 1**. Currently, there are a total of 638 existing parking spaces, 614 standard parking spaces and 24 accessible handicap parking spaces.

Table 1 – Existing Program Parking Code Requirements					
Use	Land Use Description	Town of Sturbridge Parking Requirement	Intensity	Occupants	Required Parking
JCPenney	Retail	1 space per 200 SF	52,500 SF		263
Shaw's Grocery	Retail	1 space per 200 SF	42,000 SF		210
Everybody Fitness	Fitness Center	1 space per 4 occupants based upon the maximum allowable occupancy	4,000 SF	42	11
Walgreens	Retail	1 space per 200 SF	7,000 SF		35

Table 1 – Existing Program Parking Code Requirements					
Use	Land Use Description	Town of Sturbridge Parking Requirement	Intensity	Occupants	Required Parking
Job Lot	Retail	1 space per 200 SF	30,390 SF		152
Tractor Supply	Retail	1 space per 200 SF	20,010 SF		100
TD Bank	Bank	1 space per 400 SF	2,000 SF		5
<b>Total Intensity</b>			<b>157,900 SF</b>	<b>Total Parking Required</b>	<b>776</b>

### DEVELOPMENT PROGRAM

The proposed development will consist of the following:

- 19,000 square feet of fitness center space (Planet Fitness)
- 10,000 square feet of retail space (soft goods retailer)
- 23,500 square feet of retail space

#### Required Parking spaces

Based upon the land uses and development intensities associated with the project, the criteria outlined within the Code specifies adequate parking to support various land uses within the town without the creation of excessive paved areas. This required amount of parking spaces assumes that the land uses are standalone developments with no opportunity for shared parking. **Table 2** provides the parking accommodation required for each land use. According to the Town’s Code, the required amount of parking spaces with the redevelopment program is 698.

Table 2 – Development Program Parking Code Requirements					
Use	Land Use Description	Town of Sturbridge Parking Requirement	Intensity	Occupants	Required Parking
Planet Fitness	Fitness Center	1 space per 4 occupants based upon the maximum allowable occupancy	19,000 SF	65	17
Retail	Retail	1 space per 200 SF	33,500 SF		168
Shaw's Grocery	Retail	1 space per 200 SF	42,000 SF		210
Everybody Fitness	Fitness Center	1 space per 4 occupants based upon the maximum allowable occupancy	4,000 SF	42	11
Walgreens	Retail	1 space per 200 SF	7,000 SF		35
Job Lot	Retail	1 space per 200 SF	30,390 SF		152
Tractor Supply	Retail	1 space per 200 SF	20,010 SF		100

Table 2 – Development Program Parking Code Requirements					
Use	Land Use Description	Town of Sturbridge Parking Requirement	Intensity	Occupants	Required Parking
TD Bank	Retail	1 space per 200 SF	42,000 SF		5
<b>Total Parking Required</b>					<b>698</b>

**ITE PARKING GENERATION MANUAL METHODOLOGY**

Land uses were grouped as accurately as possible into land use categories created by the *ITE Parking Generation Manual, 5<sup>th</sup> Edition*. The purpose of identifying the land uses existing in the Sturbridge Plaza is to disclose the inputs for the existing and proposed conditions in the parking model, which uses ITE Parking Ratios, as opposed to parking requirements set by the Town. The peak parking demand for the uses is determined based on the ITE formulas or rates, as applicable, to calculate parking demand. The rates are based for various land uses based on empirical data and observations of existing sites. **Table 3** provides the parking accommodation required for each existing land use for a weekday and Saturday. **Table 4** depicts the parking accommodation required for the redevelopment program. According to the ITE Parking General Manual Methodology, the required amount of parking spaces with the redevelopment program is 781.

Table 3 – Existing Program ITE Parking Generation Requirements						
Land Use Description	ITE Land Use	ITE Code	Intensity	Weekday (Monday – Thursday)	Saturday	
JCPenney	Shopping Center	820	52,500 SF	179*	185*	
Shaw's Grocery	Supermarket	850	42,000 SF	119*	153*	
Everybody Fitness	Health/ Fitness Club	492	4,000 SF	56**	16*	
Walgreens	Pharmacy/ Drugstore without Drive- Through Window	880	7,000 SF	15**	--	
Job Lot	Shopping Center	820	30,390 SF	146*	124*	
Tractor Supply	Shopping Center	820	20,010 SF	130*	95*	
TD Bank	Drive-in Bank	912	2,000 SF	8**	--	
<b>Total Parking Required</b>				<b>653</b>	<b>573</b>	

\*Non-December

\*\*Parking Demand for Weekday (Monday-Friday)

<b>Land Use Description</b>	<b>ITE Land Use</b>	<b>ITE Code</b>	<b>Intensity</b>	<b>Weekday (Monday – Thursday)</b>	<b>Saturday</b>
Fitness Center	Health/ Fitness Club	492	19,000 SF	106	261
Retail	Shopping Center	820	33,500 SF	150*	132*
Shaw's Grocery	Supermarket	850	42,000 SF	119*	153*
Everybody Fitness	Health/ Fitness Club	492	4,000 SF	56**	16*
Walgreens	Pharmacy/ Drugstore without Drive-Through Window	880	7,000 SF	15**	--
Job Lot	Shopping Center	820	30,390 SF	146*	124*
Tractor Supply	Shopping Center	820	20,010 SF	130*	95*
TD Bank	Drive-in Bank	912	2,000 SF	8**	--
<b>Total Parking Required</b>				<b>730</b>	<b>781</b>

\*Non-December

\*\*Parking Demand for Weekday (Monday-Friday)

## ULI SHARED PARKING METHODOLOGY

### Background

First published in 1984, with a second edition printed in 2005, ULI, National Parking Association (NPA), and International Council on Shopping Centers (ICSC) released a third edition of Shared Parking in 2020. The book and accompanying Excel spreadsheet-based parking demand model use case study data derived from hundreds of surveys of parking utilization to offer guidance on estimating peak and hourly parking demand for a typical weekday and weekend day for thirty-two different land use categories. Peak parking demand ratios based on gross leasable area, dwelling units, hotel rooms/keys, and theater seats were determined, seasonal/monthly adjustment were established, and, most import, the fluctuation in hourly parking accumulation patterns over the course of a weekday and weekend day for the various land use categories were researched.

Under the practice of shared parking, where a variety of different parking user groups have open and equal access to a supply of spaces, the overall number of parking spaces provided in a mixed-use development can be reduced because not all land uses' parking activities peak at the same time. Sturbridge Plaza is a classic example of a mixed-use development that shares the supply of spaces provided for its customers and employees. The mix of retail, grocery store, health clubs, and bank uses provide opportunity for shared, and therefore reduced parking, given their different patterns of activity. The following presents the results of a shared parking demand analysis for the develop program proposed for Sturbridge Plaza.

### ULI/NPA Parking Demand Ratios

Like the Town of Sturbridge's off-street parking requirement and ITE's land use-based parking demand ratios that were presented earlier, ULI/NPA shared use calculations are based on peak weekday and weekend day parking demand ratios. **Table 5** below summarizes those ratios for the existing and

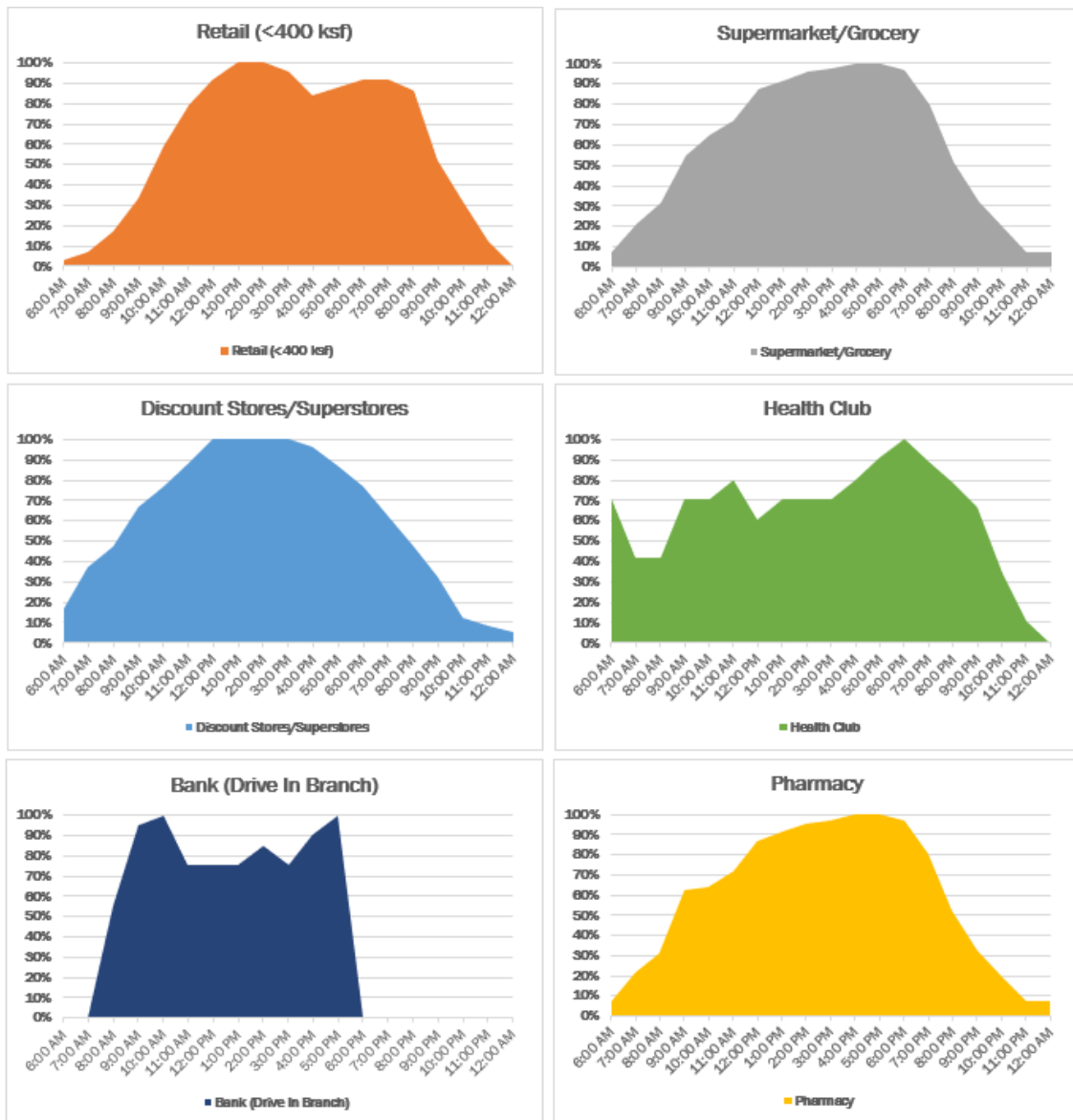
proposed land uses for Sturbridge Plaza and include guest/visitor, employee, and total peak demand estimates.

**Table 5 – ULI/NPA Peak Parking Demand Ratios**

Summary by Land Use Type	Peak Parking Demand Ratios					
	Weekday			Weekend Day		
	Guest/Visitor	Employee	Total	Guest/Visitor	Employee	Total
Retail (<400 ksf)	2.90	0.70	3.60	3.20	0.80	4.00
Discount Super Store	3.40	0.85	4.25	3.80	0.95	4.75
Supermarket/Grocery	4.00	0.75	4.75	4.00	0.75	4.75
Pharmacy	3.00	0.40	3.40	3.00	0.40	3.40
Health Club	6.60	0.40	7.00	5.50	0.25	5.75
Bank	3.50	2.50	6.00	3.00	1.75	4.75

**Hourly Parking Accumulation Patterns**

The demand ratios presented in **Table 5** are reflective of the peak period of parking activity generated by each land use. As will be noted, different land uses generate different patterns of activity over the course of a day and their period of peak demand may occur at different times of the day. Therefore, the key to different land use activities’ ability to share a fixed supply of parking spaces without conflict is an understanding of the hourly parking accumulation patterns that are associated with the different land use types. **Figure 1** below presents the weekday hourly parking accumulation patterns as a percentage of the peak hour for the retail, grocery, discount store, health clubs, pharmacy, and bank that exist and/or are proposed for Sturbridge Plaza as published by the ULI/NPA. Somewhat similar patterns have been researched and published for a weekday day but are not illustrate here.



**Figure 1 – Representative Weekday Hourly Parking Accumulation Patterns**

## Capture and Synergy

Before the peak parking demand ratios are applied to the hourly parking accumulation patterns, two additional adjustments must be considered. The first addresses travel mode split. It has been argued that the case studies used to develop the ULI/NPA Shared Use parking demand ratios are based on stand-alone suburban land uses. Capturing the parking demand and accumulation patterns associated with an existing, stand-alone bank, for example, is much more accurate when compared to recording bank parking activity in a dense and mixed-use urban environment. Therefore, the parking demand ratios in **Table 5** would need to be reduced to account for local or regional data on travel mode (drive, carpool, transit, walk, etc.). However, with regards to the analysis of Sturbridge Plaza, and given the absence of public transit services, no reductions for travel mode split have been applied.

The second ULI/NPA Shared Use adjustment attempts to reflect the synergy between different land uses in a mixed-use environment and the difference between primary and secondary trip purposes. Patrons to a mix use commercial center may conduct a variety of trip purposes during one trip. In the case of Sturbridge Plaza, Kimley-Horn suggests that trips to a health club and to the grocery store are primary trip purposes while the trips to the bank, pharmacy, and discount superstore are secondary trip purposes. For example, having completed their workout or grocery shopping, some percentage of health club members or grocery store shoppers might cash a check at the bank, pick up a prescription from the pharmacy, or see what's on sale at the discount retail outlet. In effect, one parking action may relate to two or more trip purposes. Therefore, the parking demand associated with the secondary trip purposes is already accounted for in the primary trip. For Sturbridge Plaza Kimley-Horn assumed, based on past experience, that 10% of retail parking demand (excluding the grocery store), 10% of pharmacy demand, and 30% of bank demand is already accounted for when the grocery and health club parking demand were estimate.

### Seasonal/Monthly Adjustments

The Shared Use Model also includes adjustments to reflect seasonal variations in parking demand. Two examples of typical seasonal adjustments are for office, which is influenced by summer vacations, and retail, which is impacted by November and December holiday shopping. For purposes of this analysis, and given the primarily retail focus of Sturbridge Plaza, Kimley-Horn did not make any adjustments/reductions for peak or off-peak season/month parking factors.

### Summary of Findings

**Figures 2 and 3** illustrate using color coding the hourly parking demand for the different land use activities proposed for Sturbridge Plaza for a typical weekday and weekend day, respectively while **Figure 4** summarizes the total hourly parking demand for each day with blue representing a typical weekday and red representing and typical weekend day.

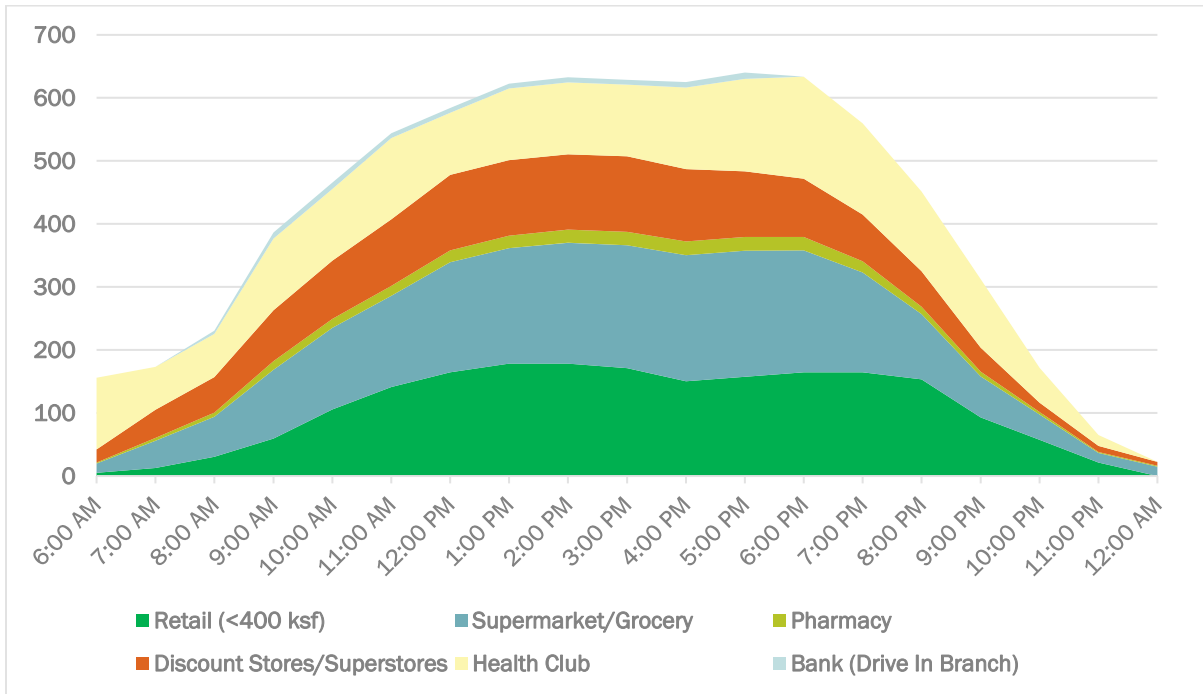


Figure 2 – Weekday Hourly Parking Accumulation by Land Use Type (# of Occupied Spaces)

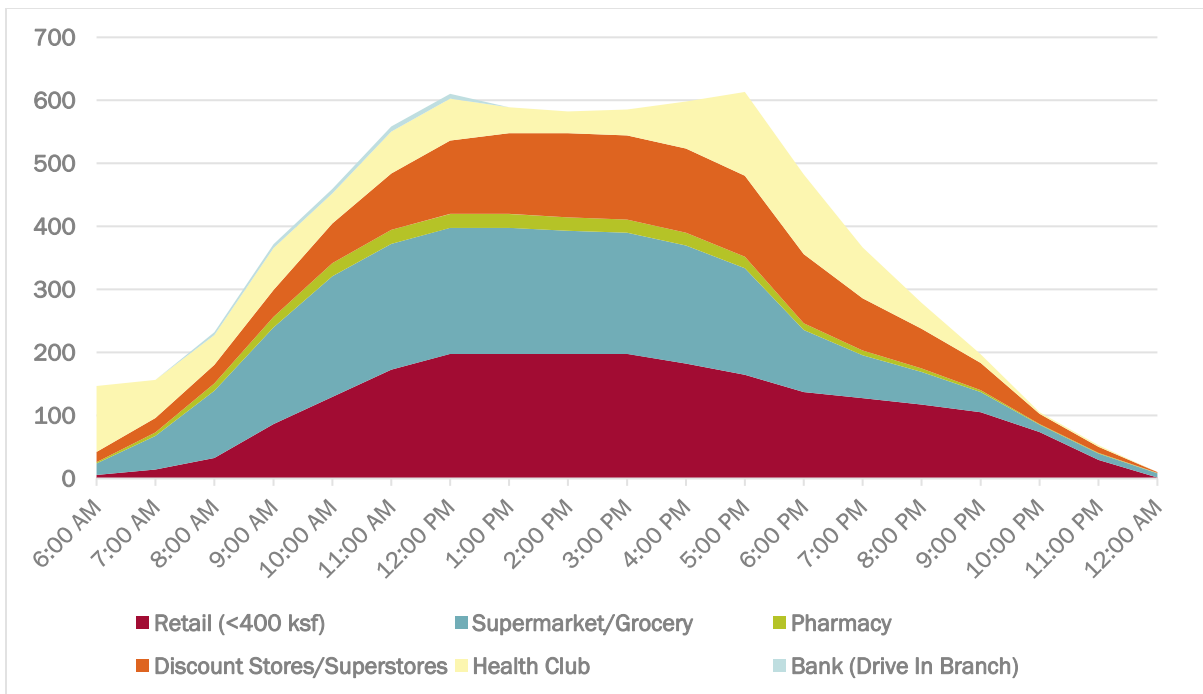
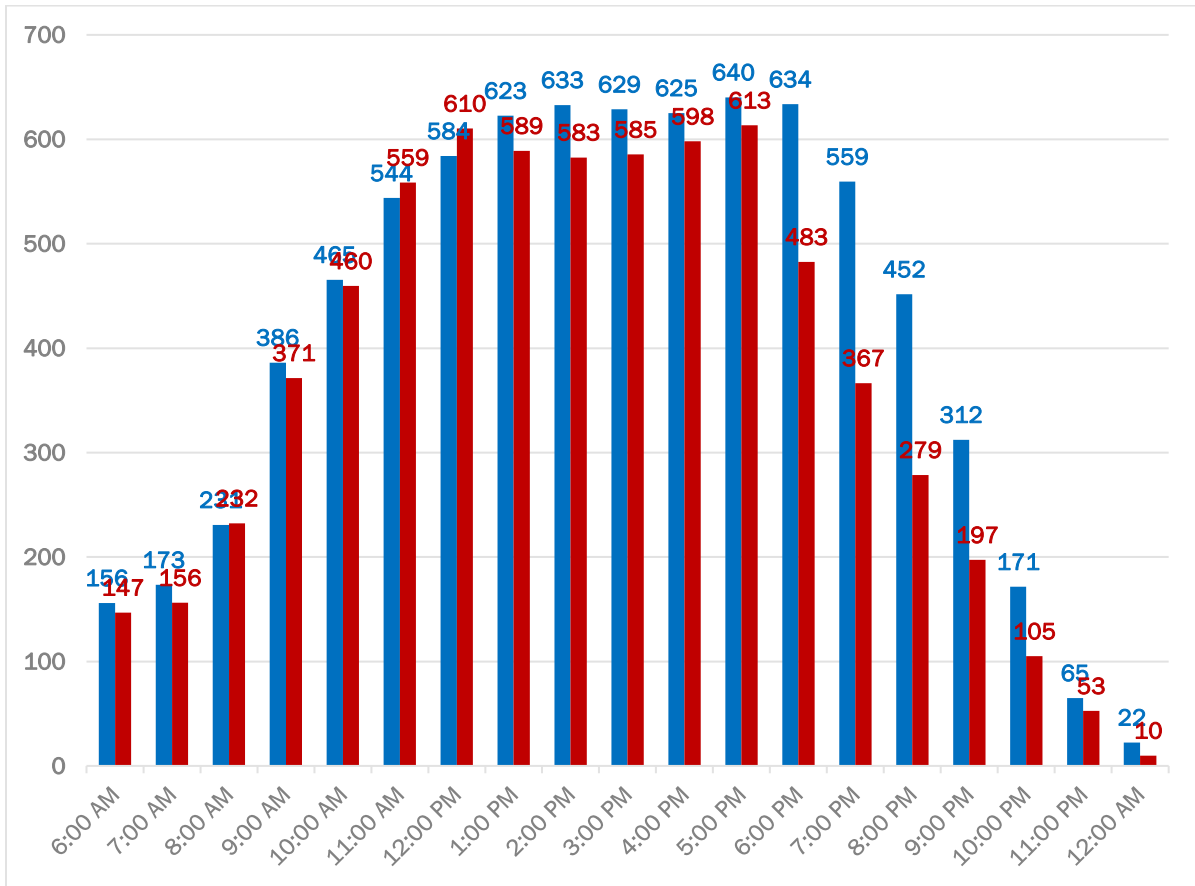


Figure 3 – Weekend Day Hourly Parking Demand by Land Use Type (# of Occupied Spaces)





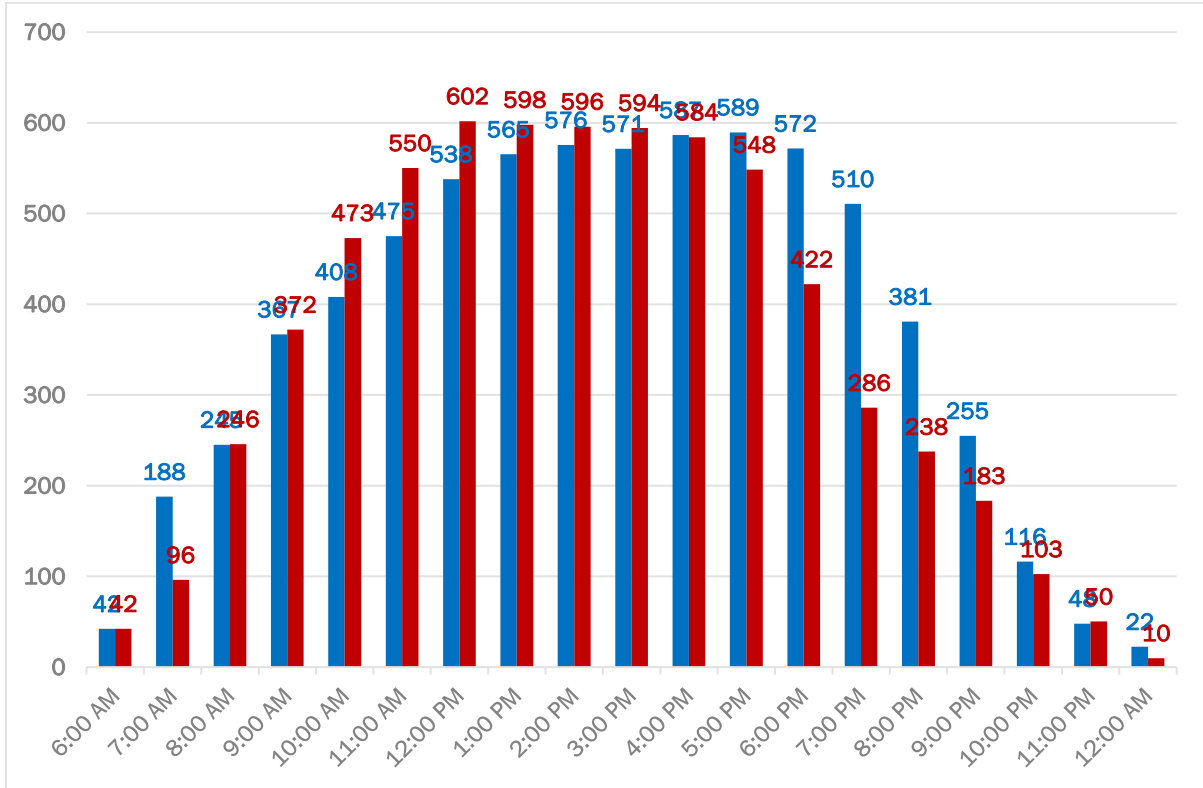
**Figure 4 – Summary of Total Weekday (Blue) and Weekend Day (Red) Hourly Parking Demand (# of Occupied Spaces)**

Based on the layering of hourly parking demand generated by the different land use activities, the peak period of activity that would occur at Sturbridge Plaza on a typical weekday would equal 640 occupied spaces at 5:00 PM and the peak on a typical weekend day would equal 613 occupied spaces.

**Health Club Member and Employee Population-based Parking Demand Estimates**

While recommended ULI/NPA parking demand ratios are based on the density of the particular land use, Sturbridge’s off-street parking requirements for health club do include a calculation based on the number of club members and employees. It is understood that the existing 4,000 SF Everybody Fitness references 42 club members and employees for purposes of calculating the Sturbridge’s parking requirements while the proposed 19,000 SF Planet Fitness anticipates 65 (62 members and 3 employees). Presuming that all members and employees drive and drive alone, the combined peak parking demand for health club using population data would be 107 vehicles/spaces (42 plus 65). This is considerably less than the 162 peak health club parking demand estimated using the ULI/NPA ratios. Therefore, when combined with the square foot-based parking demand calculations presented previously under **Figure 4** above, the hourly and peak parking demand under the proposed Sturbridge Plaza development program would decline (see **Figure 5** below). Using this methodology, the peak

parking demand would equal 602 occupied spaces at noon on a weekday and 589 spaces at 5 PM on a weekend day.



**Figure 5 – Summary of Total Weekday and Weekend Day Hourly Parking Demand using Health Club Population Data**

## RECOMMENDATIONS

Based on the Town’s Code, evaluating each land use independent of one another, will require 698 parking spaces to be provided. When using the methodology from ITE’s land use-based parking demand, 781 parking spaces will be required. However, evaluating the site based upon the parking demand distributions and characteristics contained within the ULI’s *Shared Parking, 3<sup>rd</sup> Edition*, the highest peak-hour parking demand was calculated to be 640 parking spaces. The parking demand estimates based on health club member and employee population generated a lower estimate when compared with ULI Shared Use and the highest peak-hour parking demand was calculated to be 602 parking spaces. The shared parking analysis corresponds to a 13.8 percent (13.8%) reduction from the Town of Sturbridge’s parking requirement of 698 parking stalls.

There is a total of 638 existing parking spaces and compared to the parking demand estimates based on health club member and employee population, the highest peak-hour parking demand was calculated to be 602 parking spaces. This suggest that a surplus of 36 spaces would exist at Sturbridge Plaza even during the peak hour of a busy weekday.

[https://kimleyhorn-my.sharepoint.com/personal/lisa\\_juan\\_kimley-horn\\_com/Documents/\\_Boston\\_office/\\_mktg/Sturbridge Plaza in Sturbridge, MA - Parking Study/Sturbridge Plaza Shared Parking Memo\\_06112021.docx](https://kimleyhorn-my.sharepoint.com/personal/lisa_juan_kimley-horn_com/Documents/_Boston_office/_mktg/Sturbridge_Plaza_in_Sturbridge,_MA_-_Parking_Study/Sturbridge_Plaza_Shared_Parking_Memo_06112021.docx)