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Tolles-Parsons Senior Center
Transportation Study

Prepared for

Town of Wellesley, Massachusetts

Prepared by

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Summary

This study presents the traffic and parking impacts associated with the proposed Tolles-Parsons Senior Center (the Center) to be located at 494-496 Washington Street in Wellesley. This study is an update to the previous transportation study[1] produced during an earlier phase of the Center's development, when the project site was comprised of only 496 Washington Street, formerly the American Legion. The proposed Center site now includes one contiguous parcel at 494-496 Washington Street.

In response to comments received during the prior Project of Significant Impact (PSI) review process, the study area has been expanded to include two intersections on Atwood Street. Due to the hiatus since the last study, traffic volumes and associated analysis for all study intersections have been updated to reflect current year (2014) conditions.

Below is a summary of major findings in this study:

Traffic

- Between 100-150 weekday visitors are expected to participate in the new Center's programs and activities, with some visitors staying for more than one event. The current Council on Aging (COA) programming located at the Wellesley Community Center, 219 Washington Street, serves 40 to 50 visitors per day.
- The Center will have activities and programs scheduled between 9:00 a.m. and 4:00 p.m. on weekdays. Some minor "drop-in" activity may occur between 8:00 – 9:00 a.m. and 4:00 - 5:00 p.m., generated by a few friends getting together for coffee, a person stopping by to get some information, or a small walking group meeting at the Center.
- Eventually, the Center may have evening programs or host smaller group meetings, such as Town boards or committees. Parking for any future evening activities will be accommodated on-site. The Center will not be open on weekends.
- On a typical day, the peak hour of traffic activity generated by the Center will occur between 9:45 and 10:45 a.m.
- The new vehicle trips generated by the Center will not adversely impact study area intersections and the Center's two new driveways (one driveway for entering traffic and one for exiting traffic) will operate with acceptable delays.

Parking

- The Center will have 58 designated on-site parking spaces (plus one space for building service/delivery).

1 "Tolles-Parsons Senior Center: Transportation Study, Final Report", prepared for the Town of Wellesley by Howard/Stein-Hudson Associates, August 3, 2013.

- The Center's parking demand will vary throughout the day as visitors arrive and depart. The peak forecasted parking demand on a typical weekday is 56 spaces, with all Center parking accommodated on-site. Four parking demand scenarios were assessed:
    - Scenario 1A – Weekday with 150 visitors;
    - Scenario 1B – Weekday with 130 visitors;
    - Scenario 2 – Typical Wednesday during the school year; and
    - Scenario 3 – Funeral at St. Paul's Parish.
- Each scenario and its associated parking activity is described below.
    - Under Scenario 1A, with 150 daily visitors, the Center will have a peak parking demand of about 46 parking spaces, occurring during late morning and mid-afternoon. The Center's parking demand will be met entirely on-site.
    - Under Scenario 1B, which has a different mix of programs from Scenario 1A and about 130 daily visitors, the Center will have a peak parking demand of 56 parking spaces, occurring at about 10:00 a.m. to 11:00 a.m. and again from 1:00 p.m. to 2:00 p.m. The Center's parking demand will be met entirely on-site.
    - Under Scenario 2, a Wednesday during the school year, students at St. Paul's School are dismissed at noon. At that time, a sufficient number of public parking spaces on Washington Street will be available to serve the midday demand from St. Paul's school. Visitors to the Center will have sufficient parking available on-site and will not need to use parking on Washington Street.
    - The parking demand generated by a weekday funeral at St. Paul's Parish was evaluated under Scenario 3. On weekdays, funerals start mid-morning and attendees park along Washington Street for up to two hours. Because visitors to the Center will have sufficient parking available on-site and will not need to use Washington Street, the public parking along Washington Street will be available (as today) for funeral activity.
- Along the east curb of Washington Street between the St. Paul crosswalk and Morton Street, four public parking spaces will be removed to accommodate the Center's new driveway curb cuts and ensure safe sight line distance for drivers exiting the Center's driveway. Therefore, the number of public parking spaces on Washington Street (between Wellesley Avenue and Morton Street) will be reduced from 48 to 44 spaces.
- At various times of the day, some of the 48 existing public parking spaces on Washington Street (between Wellesley Avenue and Morton Street) are currently used by the Wellesley Police Department (WPD), St. Paul's Parish, and St. Paul's School. These public spaces have a two-hour time limit.

Pedestrians and Bicycles

- Most sidewalks in the study area are in excellent or good condition.
- While the Center is not expected to generate significant bicycle trips, two bicycle racks with capacity for four bicycles will be provided at the Center. The Center is located along the Town's Crosstown Trail (on Washington Street) and two blocks from Brook Path. These trails are part of the Town's larger network of the walking and biking trails.

Conclusions

The new vehicle trips generated by the Center will not adversely impact study area intersections and the Center's two new driveways (one driveway for entering traffic and one for exiting traffic) will operate with acceptable delays.

The Center will have 58 designated parking spaces (plus one space for building service/delivery). These spaces will satisfy the Center's parking needs and the Center will not impact parking activity associated with adjacent land uses.

Introduction

Background

In Wellesley, proponents of major construction projects are required to assess municipal impact on systems including water, sewer, storm drainage, electricity, traffic, pedestrian and bicycle safety, fire protection and safety, ,and refuse disposal. Based on Town of Wellesley guidelines, the Center project has been deemed a "Project of Significant Impact" (PSI). For such a project to proceed into construction, the Town requires a Special Permit issued by the Planning Board to the Applicant. Howard/Stein Hudson Associates (HSH) has been retained by the Town to evaluate the traffic and parking impacts associated with the Center. In this study, "the Applicant" refers to the Board of Selectmen and Permanent Building Committee.

This report has been prepared for the Applicant as part of the process to satisfy the Special Permit requirement; it focuses on existing traffic operations, future traffic impacts after the new Center is open, and the Center's projected parking activity. This report does not address transportation issues during the construction period.

Note that all figures are located at the end of the report.

Project Description

The Center will be a two-story 13,274 square foot facility with program and activity rooms, a main hall, a dining room, a kitchen, and office space for COA administration and support staff. The Center will have 58 designated parking spaces (plus one space for building service/delivery.) Traffic will arrive on-site via a one-way enter-only driveway from Washington Street and leave via a separate exit-only driveway onto Washington Street. (A site plan is presented later in **Figure 8**.)

Study Area

The study area was defined collaboratively with the Town's traffic consultant, BETA, and includes six intersections, as shown in **Figure 1**.

- Washington Street (Route 16)/State Street/Kingsbury Street;
- Washington Street (Route 16)/Wellesley Avenue/Brook Street;
- Washington Street (Route 16)/Central Street (Route 135)/Grove Street;
- Washington Street (Route 16)/Morton Street/WPD Driveway;
- Wellesley Avenue/Atwood Street/Dexter Road; and
- State Street/Atwood Street.

Under future Build conditions, the Center's two site driveways are also included as study intersections.

The primary travel routes to the Center include Kingsbury Street and Washington Street from the north and northeast, Wellesley Avenue from the east, Central Street from the west, Washington Street from the southwest, and Grove Street from the south.

Existing Conditions

Existing Site

Wellesley's COA currently operates in limited space at the Wellesley Community Center, located at 219 Washington Street. The proposed new Center would relocate the COA to a new facility at 494-496 Washington Street. The site is adjacent to St. Paul's Parish and School. Other nearby land uses on Washington Street include medical offices and the Wellesley Police Department. To the east, the rear of the site abuts a residential neighborhood on Atwood Street.

Existing Roadway Conditions

The study area includes the following roadways described below, categorized according to the Massachusetts Executive Office of Transportation Office of Transportation Planning classifications. Roadway geometry descriptions are based on field observations. An inventory of sidewalk conditions was also conducted and is presented in a later section.

Washington Street (Route 16), an urban principal arterial, runs east–west and connects to Natick in the west and Newton in the east. Within the study area, Washington Street generally consists of one travel lane in each direction, widening to two lanes at some intersection approaches. The second lane—along the eastbound side of the roadway in some areas—functions as a travel lane from 7:30 to 8:30 a.m. and a parking lane at other times. A sidewalk lines the south side of the roadway and some portions of the north side of the roadway. Within the study area, signalized intersections are located at Kingsbury Street/State Street, Wellesley Avenue, and Central Street/Grove Street. A grade-separated railroad runs along or near the north side of Washington Street within the study area.

State Street, a local street, runs northwest–southeast between Washington Street (Route 16) and Wellesley High School (WHS), where the roadway continues as Rice Street. State Street consists of one travel lane in each direction. Sidewalks are provided on both sides of the roadway, except for the east side near Washington Street

Kingsbury Street, an urban minor arterial, runs north–south between Worcester Street (Route 9) and Washington Street (Route 16). The roadway consists of 1 travel lane in each direction. Kingsbury Street is right-in, right-out only at Route 9; extra turn lanes are provided at some intersections. Sidewalks are provided along both sides of Kingsbury Street.

Wellesley Avenue is an urban principal arterial (as Route 135) west of Great Plain Avenue/Seaver Street and an urban minor arterial east of that intersection. The road begins at Washington Street to the west and continues to Cedar Street in the east. Within the study area, Wellesley Avenue consists of one travel lane in each direction, with shoulders on both sides of the roadway. Sidewalks are also provided on both sides of the roadway.

Morton Street is a local residential street that runs east-west between Washington Street and Atwood Street and dead ends at Brook Path, a walking/biking trail. The roadway consists of one travel lane in each direction. Sidewalks are provided on both sides of the street between Washington Street and Atwood Street. No sidewalks exist between Atwood Street and Brook Path.

Brook Street is a local residential street that runs east–west between Wellesley Avenue and Great Plain Avenue. The roadway consists of one travel lane in each direction. Sidewalks are generally provided on one side of the roadway, although some sections have sidewalks on both sides.

Central Street is an urban arterial (as Route 135) that runs east-west from the Wellesley/Natick border to the intersection with Washington Street, where it ends. In Wellesley, Central Street has two travel lanes in each direction and a sidewalk along the south side of the roadway. Route 135 continues as Washington Street, Wellesley Avenue, and Great Plain Avenue to the Wellesley/Needham border.

Grove Street, a local street, runs north–south from the Post Office cul-de-sac to the Wellesley/Needham border. The roadway has one travel lane in each direction. Between the Post Office and Washington Street, a parking lane and sidewalk are provided on each side of the street. South of Washington Street to Spring Street, parking is provided on both sides of the street.

Atwood Street, a local street, runs north–south from Wellesley Avenue to State Street. The roadway has one travel lane in each direction with minimal pavement markings. Two and four hour parking is designated along both sides of the road sporadically. There are sidewalks located on both sides of the road at all locations.

State Street, a local street, runs east-west from Washington Street to Atwood Street, and continues toward the Wellesley High School as Smith Street and Rice Street. The roadway has one travel lane in each direction with a storage lane added to the eastbound approach to State Street/Washington Street. No parking is available on either sides of the road. There are sidewalks located on both sides of the road at all locations.

Existing Intersection Conditions

The following descriptions of the study area intersections include geometry and pedestrian accommodations.

Signalized Intersections

Washington Street (Route 16)/State Street/Kingsbury Street is a signalized, four-approach intersection. The Washington Street eastbound approach consists of two shared lanes. The Washington Street westbound approach consists of two shared lanes. The State Street northbound approach consists of one general use lane and one exclusive right-turn lane. To the north of the intersection, the Kingsbury Street southbound approach crosses a bridge over a railroad; it consists of one shared lane. Sidewalks are provided along all roadways except for the east side of State Street south of the intersection. The brick crosswalks, which are provided across all approaches, are in good condition, although the solid white transverse lines are faded from tire wear. Right turns on red are not permitted from any of the approaches.

Washington Street (Route 16)/Wellesley Avenue/Brook Street is a signalized, three-approach intersection. The Wellesley Avenue westbound approach consists of an exclusive left-turn lane and an exclusive right-turn lane. The Washington State northbound approach consists of an exclusive through lane and an exclusive right-turn lane. The southbound approach on Washington Street consists of one left-turn/through lane and one exclusive though lane. Brook Street is a minor two-way northbound approach located east of Washington Street. Brook Street is stop-controlled and has one shared lane for left and right turns onto Wellesley Avenue. South of the intersection on Washington Street is Wakelin Way, a one-way entrance driveway to Town Hall. Sidewalks are provided along all roadways sections and are in good condition. Right turns on red are not permitted from Washington Street northbound.

Washington Street (Route 16)/Central Street (Route 135)/Grove Street is a signalized, five-approach intersection. The eastbound Central Street (Route 135) approach has one exclusive through lane and one shared-use though/right turn travel lane. No left turn is allowed from Central Street onto Grove Street. The westbound Washington Street approach has one shared through/right lane to Central Street and Grove Street and one left lane to Grove Street and the continuation of Washington Street. The northbound Washington Street approach has two right turn lanes for turns onto Grove Street and the continuation of Washington Street.

The northbound and southbound Grove Street approaches have one shared-used lane. Sidewalks are provided along all roadways. Right turns on red are not permitted from any of the approaches.

Unsignalized Intersections

Washington Street (Route 16)/Morton Street/WPD Driveway is an unsignalized, slightly skewed four approach intersection. The Wellesley Police Department eastbound approach consists of one shared-use stop-controlled lane. The Morton Street westbound approach consists of one shared use stop-controlled lane. Both the northbound and southbound Washington street approaches consist of one shared-use free lane. Sidewalks are provided along all roadways and crosswalks are provided along the eastbound, westbound, and northbound approaches.

State Street/Atwood Street is an unsignalized intersection with three approaches. The State Street eastbound approach consists of one shared-use lane. The State Street westbound approach consists of one shared-use lane. The Atwood Street northbound approach consists of one shared-use stop-controlled lane. Sidewalks are provided along all roadways and one crosswalk is provided along the northbound approach.

Wellesley Avenue/Atwood Street/Dexter Road is an unsignalized intersection with four approaches. The Wellesley Avenue eastbound and westbound approaches consist of one general-use lane. The Dexter Road northbound approach consists of one general-use stop-controlled lane. The Dexter Road is a dead-end residential road with minimal vehicular traffic. The Atwood Street southbound approach consists of one general-use stop-controlled lane. Sidewalks are provided on both sides of every approach. Crosswalks are provided across the eastbound, northbound, and southbound approaches.

Existing Traffic Conditions

This section presents the traffic data collected for this study and the existing intersection level of service analysis for the study intersections, and discusses the study team's observations of pedestrian activity at key study intersections.

Intersection Volumes

BETA provided the study team with Year 2012 intersection volumes for the intersections of Washington Street/State Street/Kingsbury Street, Washington Street/Wellesley Avenue/Brook Street, and Washington Street/Central Street/Grove Street. Peak period intersection counts were collected at the Washington Street/WPD Driveway/Morton Street on Thursday, May 23, 2013. Intersection counts were collected at State Street/Atwood Street and Wellesley Avenue/Atwood Street/Dexter Road on September 10, 2014.

(Note that it is acceptable to adopt traffic count data that are less than three years old for transportation analysis provided that an annual growth rate is used to estimate current year volumes. To estimate Year 2014 volumes from the Year 2012 and Year 2013 data, a 1% annual growth rate was applied.)

It is standard practice to multiply count data by seasonal adjustment factors to obtain average annual volumes. To account for seasonal variation in Wellesley traffic, the study team assessed the seasonal adjustment per MassDOT's weekday seasonal adjustment factor for Group 6 (Urban Arterials, Collectors, and Rural Highways). The seasonal adjustment factors for May, June, and September are 0.91, 0.90, and .92, respectively. Because application of these factors would have yielded volumes 9% to 10% lower than the actual counts, the study team conservatively chose not to apply any seasonal adjustments and to use the higher count data for analysis. Intersection volumes were balanced appropriately between closely spaced intersections.

Figure 2 and **Figure 3** show existing peak hour turning volumes for the study area intersections.

Automatic Tube Recorder Counts

An automatic traffic recorder (ATR) is a device that continuously records the passage and speed of vehicles on a roadway for a given period of time. The study team obtained weekday ATR data at on Washington Street, west of Morton Street both in 2009 (during an earlier phase of this study) and in September 2014. The study team also collected ATR data on Atwood Street, west of Morton Street, in September 2014. BETA, the Town's traffic consultant for this study, provided a data from a 2002 ATR count on Atwood Street,

For Washington Street and Atwood Street, respectively, **Table 1** and **Table 2** summarize the key data from these observations, including average daily traffic (ADT), K-factor, average speed and 85th percentile speed (85% of all vehicles travel at or below this speed).

Traffic volumes on Washington Street, currently about 15,500 vehicles per day, have remained virtually unchanged since 2009. This is similar to trends observed in many areas of eastern Massachusetts over the past several years. Although the annual growth in traffic volumes has been negligible since 2009, a 1% annual growth rate has been applied to all study area volumes to estimate future conditions, resulting in a conservative (higher impact) evaluation. The average travel speed on Washington Street decreased from 26 mph to 25 mph and the 85th percentile speed has decreased from 33 mph to 29 mph, indicating fewer vehicles are exceeding the 30 mph speed limit.

On Atwood Street, the ADT is 1,060 vehicles, exhibiting an increase of about 1% per year since 2002. The average travel speed has increased from 23 mph to 24 mph, while the 85th percentile speed has decreased from 30 mph to 28 mph.

Table 1. Roadway Data – Washington Street, west of Morton Street

Characteristic	Year 2009			Year 2014		
	Eastbound	Westbound	Total	Westbound	Westbound	Total
Weekday ADT	7,880	7,880	15,760	7,130	8,340	15,470
K-factor	-	-	0.07	-	-	0.07
Average Speed	25	26	26	24	27	25
85th percentile speed	32	32	33	28	31	29
Average annual change in volume 2009 to 2014 = -0.3% per year						

ADT = Average Daily Traffic
K-factor = The proportion of daily traffic occurring during the peak hour; based on daily and p.m. peak hour volume data.

Table 2. Roadway Data – Atwood Street, west of Morton Street

Characteristic	Year 2002			Year 2014		
	Eastbound	Westbound	Total	Westbound	Westbound	Total
Weekday ADT	470	470	940	480	580	1,060
K-factor	-	-	na	-	-	0.08
Average Speed	na	na	23	23	24	24
85th percentile speed	na	na	30	28	28	28
Average annual change in volume 2002 to 2014 = +1.0% per year						

ADT = Average Daily Traffic
K-factor = The proportion of daily traffic occurring during the peak hour; based on daily and p.m. peak hour volume data.

Intersection Operations

The criterion for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay incurred by vehicles at intersections and along intersection approaches.

The study team calculated average delay and associated LOS at study area intersections using Trafficware's Synchro 6 software, which also evaluates the impact on traffic operations from closely spaced intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's *2010 Highway Capacity Manual* (HCM).

Level of service and delay (in seconds) are determined based on intersection geometry and available traffic data for each intersection. BETA provided the intersection signal timing and phasing used in this analysis. **Table 3** summarizes the delay and LOS thresholds for signalized and unsignalized intersections, as defined in the HCM. LOS A defines the most favorable condition, with minimum traffic delay. LOS F represents the worst condition (unacceptable), with significant traffic delay. The threshold at LOS E/LOS F indicates that the intersection or intersection approach is theoretically at capacity. LOS D is generally considered acceptable in for a study area such as this.

Table 3. Intersection Level of Service Criteria

Level of Service	Average Stopped Delay (sec./veh.)	
	Signalized Intersection	Unsignalized Intersection
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Table 4 and **Table 5** show the existing a.m. and p.m. intersection LOS results for the study area intersections. Complete Synchro reports are in Appendix A.

The intersection of Washington Street/State Street/Kingsbury Street operates at overall LOS D and LOS C during the a.m. and p.m. peak hours, respectively. The only individual approach that operates below LOS D is the State Street northbound left/through lane, which operates at LOS E during the a.m. peak hour.

While during each peak period the overall intersection of Washington Street/Wellesley Avenue/Brook Street operates at LOS C, during the a.m. peak hour the Washington Street northbound through lane operates at LOS E and the Brook Street northwest bound left/right unsignalized lane operates at LOS F. All approaches operate at LOS D or better during the p.m. peak hour.

The overall intersection of Washington Street/Central Street/Grove Street operates at LOS E during the a.m. peak hour and LOS D during the p.m. peak hour. During the a.m. peak hour, the Central Street eastbound approach operates at LOS F. The Grove Street northbound approach and the Washington Street northeastern bound approach both operate at LOS E during the a.m. peak hour. During the p.m. peak hour, the Grove Street northbound approach operates at LOS E.

Table 4. Existing Conditions (2014) Capacity Analysis Summary, a.m. Peak Hour

Intersection/Movement	LOS	Delay (seconds)	V/C Ratio	95th Percent Queue (feet)
Signalized Intersections				
Washington Street (Route 16)/ State Street/Kingsbury Street	**D**	**36.7**		
Washington EB left/thru | thru/right	C	33.8	0.70	301
Washington WB left/thru/right	C	28.6	0.49	177
State NB left/thru	E	76.0	0.90	#260
State NB right	D	39.3	0.09	32
Kingsbury SB left/thru/right	C	25.7	0.59	#369
Washington Street (Route 16)/ Wellesley Avenue/Brook Street	**C**	**30.1**		
Wellesley WB left	C	26.5	0.64	392
Wellesley WB right	B	19.2	0.15	80
Washington NB thru	E	66.0	0.99	#948
Washington NB right	A	9.0	0.71	587
Washington SB left/thru | thru	C	23.5	0.56	220
Brook NWB left/right (unsignalized leg)	F	>50.0	0.68	98
Washington Street (Route 16)/ Central Street/Grove Street	**E**	**67.6**		
Central EB thru | thru/right	F	>80.0	>1.00	#623
Washington WB left	D	35.8	0.47	232
Washington WB thru/right	B	18.0	0.59	432
Grove NB left/thru/right	D	51.6	0.83	#276
Grove SB left/thru/right	D	36.4	0.27	68
Washington NEB right | right/hard right	E	57.8	0.94	#477
Unsignalized Intersections				
Washington Street (Route 16)/ Morton Street/WPD Driveway				
Driveway EB left/thru/right	D	32.2	0.19	17
Morton WB left/thru/right	D	30.5	0.20	18
Washington NB left/thru/right	A	0.2	0.01	0
Washington SB left/thru/right	A	0.0	0.00	0
State Street/Atwood Street				
State EB thru/right	A	0.0	0.26	0
State WB left/thru	A	1.3	0.03	2
Atwood NB left/right	C	18.0	0.39	45
Wellesley Avenue/Atwood Street/Dexter Road				
Wellesley EB left/thru/right	A	2.9	0.12	10
Wellesley WB left/thru/right	A	0.1	0.00	0
Dexter NB left/thru/right	D	31.3	0.13	11
Atwood SB left/thru/right	D	32.3	0.23	22

# = 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after two cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
Gray shading indicates LOS E or LOS F.
EB = eastbound, WB=westbound, NB=northbound, SB=southbound

Table 5. Existing Conditions (2014) Capacity Analysis Summary, p.m. Peak Hour

Intersection/Movement	LOS	Delay (seconds)	V/C Ratio	95th Percent Queue (feet)
Signalized Intersections				
Washington Street (Route 16)/ State Street/Kingsbury Street	**C**	**31.1**		
Washington EB left/thru | thru/right	C	31.3	0.60	216
Washington WB left/thru/right	C	30.8	0.62	281
State NB left/thru	D	48.7	0.53	185
State NB right	D	40.1	0.09	38
Kingsbury SB left/thru/right	C	23.0	0.49	307
Washington Street (Route 16)/ Wellesley Avenue/Brook Street	**C**	**27.8**		
Wellesley WB left	C	28.7	0.73	476
Wellesley WB right	B	18.9	0.13	77
Washington NB thru	D	38.5	0.74	#633
Washington NB right	A	3.4	0.30	143
Washington SB left/thru | thru	C	33.7	0.83	#478
Brook NWB left/right (unsignalized leg)	C	24.6	0.30	31
Washington Street (Route 16)/ Central Street/Grove Street	**D**	**36.9**		
Central EB thru | thru/right	D	40.0	0378	266
Washington WB left	D	52.0	0.85	#579
Washington WB thru/right	C	22.5	0.72	#570
Grove NB left/thru/right	D	49.9	0.81	#295
Grove SB left/thru/right	D	35.4	0.32	107
Washington NEB right | right/hard right	C	30.4	0.39	169
Unsignalized Intersections				
Washington Street (Route 16)/ Morton Street/WPD Driveway				
Driveway EB left/thru/right	C	19.3	0.03	2
Morton WB left/thru/right	C	18.7	0.07	6
Washington NB left/thru/right	A	0.3	0.01	1
Washington SB left/thru/right	A	0.2	0.01	0
State Street/Atwood Street				
State EB thru/right	A	0.0	0.13	0
State WB left/thru	A	0.8	0.01	1
Atwood NB left/right	B	11.6	0.12	10
Wellesley Avenue/Atwood Street/Dexter Road				
Wellesley EB left/thru/right	A	1.2	0.04	3
Wellesley WB left/thru/right	A	0.0	0.00	0
Dexter NB left/thru/right	A	0.0	0.00	0
Atwood SB left/thru/right	C	21.6	0.24	23

# = 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after two cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
Gray shading indicates LOS E or LOS F.
EB = eastbound, WB=westbound, NB=northbound, SB=southbound

At the unsignalized intersection of Washington Street/Morton Street/WPD Driveway, all approaches operate at LOS D or better during each peak hour.

At the unsignalized intersection of State Street/Atwood Street, all moves operate at LOS C or better during each peak hour.

During the a.m. peak hour at the Wellesley Avenue/Atwood Street/Dexter Road intersection the minor approaches of Atwood and Dexter experience LOS D due to the high volume on Wellesley Avenue. During the p.m. peak hour, all approaches operate at LOS C or better.

Crash History

The study team has assessed the crash history at the study area intersections. The last three complete years (2011-2013) of data were compiled by the WPD and summarized in **Table 6**.

Crash rates for the study area intersections were calculated and compared to the district averages for signalized intersections. In MassDOT District 6, where the Project site is located, the average number of crashes is 0.76 crashes per million entering vehicles (MEV) at signalized intersections and 0.56 crashes per MEV at unsignalized intersections. Typically, intersections with higher than average crash rates should be studied further by the jurisdictional agency.

No fatalities occurred at any intersection, but one of the six locations has an average crash rate greater than the District average. The intersection of Washington Street/Kingsbury Street/State Street has a crash rate of 0.79, with 12 of the 22 crashes reported in the three-year period categorized as an angle collision. The highest number of annual crashes occurred in 2012. It should be noted that during most of 2012, the Rockland Street Bridge (the next bridge north of Kingsbury Street over the MBTA tracks) was closed for construction with traffic detours in place. There were only three crashes that occurred during 2013, which may be due to the end of construction on Rockland Street.

Crash data for all intersections are included in **Appendix A**.

Table 6. Crash History at Study Area Intersections, 2011-2013

	Washington/ Kingsbury/ State	Washington/ Wellesley/ Brook	Washington/ Grove/ Central	Washington/ Morton/ WPD Drive	State/ Atwood	Wellesley/ Atwood/ Dexter
Year						
2011	9	0	3	4	1	1
2012	10	0	0	6	0	0
2013	3	3	0	0	1	1
Manner of Collision						
Single Vehicle Crash	2	1	0	1	1	0
Angle	12	0	1	1	0	1
Rear-end	3	0	2	3	1	0
Head-on	2	2	0	0	0	1
Sideswipe	3	2	0	2	0	0
Unknown/Other	0	0	0	1	0	0
Crash Severity						
Property Damage	17	2	2	6	2	1
Personal Injury	5	1	1	1	0	1
Fatality	0	0	0	0	0	0
Hit and Run	0	0	0	0	0	0
Unknown	0	0	0	0	0	0
Weather Conditions						
Clear	16	2	3	6	2	2
Cloudy	2	1	0	1	0	0
Rain	4	0	0	2	0	0
Snow	0	0	0	1	0	0
Unknown	0	0	0	0	0	0
Road Conditions						
Dry	18	3	3	7	2	2
Wet	4	0	0	2	0	0
Snow	0	0	0	1	0	0
Slush	0	0	0	0	0	0
Unknown	0	0	0	0	0	0
Time of Day						
6:00-9:00 a.m.	5	1	1	0	0	0
9:00 a.m.-3:00	12	1	0	5	1	1
3:00-6:00 p.m.	3	0	1	2	0	1
6:00 p.m.-6:00	2	1	1	3	1	0
Day of the Week						
Monday	2	0	0	1	0	0
Tuesday	2	1	0	0	0	1
Wednesday	5	1	0	5	0	0
Thursday	5	1	2	0	1	1
Friday	3	0	0	4	1	0
Saturday	4	0	1	0	0	0
Sunday	1	0	0	0	0	0
Summary						
Total Crashes	**22**	**3**	**3**	**10**	**2**	**2**
Crash Rate[1)]	**0.79**	**0.08**	**0.08**	**0.50**	**0.25**	**0.11**
District Average	**0.76** signalized	**0.76** signalized	**0.76** signalized	**0.56** unsignalized	**0.56** unsignalized	**0.56** unsignalized

1) Crashes per million entering vehicles (MEV)

Existing Parking Conditions

The portion of the 494-496 Washington Street project site at 496 Washington Street was formerly the location of an American Legion post, with parking for about 15 to 20 vehicles. Even after demolition of the Legion building in August 2009, the site continues to be used informally for parking by visitors to the adjacent St. Paul's Parish and school during masses, funerals, and school drop-off/pick-up periods.

On-street public parking is available on Washington Street to both the east and the west of the site. A total of 48 marked on-street parking spaces (no meters) are provided between the intersections of Wellesley Avenue and Morton Street. All of these spaces are signed for two-hour parking. **Figure 4** shows on-street parking on Washington Street within the study area. (While additional on-street parking exists along Washington Street north of Morton Street, the focus for this study is the segment between Wellesley Avenue and Morton Street.)

These 48 on-street public spaces are used primarily by parkers from St. Paul's Parish and St. Paul's School, with some minor use from other adjacent uses. In both 2009 and 2012, BETA, working for the Town, evaluated parking conditions on Washington Street and in the American Legion Lot. HSH did similar observations of parking activity in 2013 and 2014. Information from these observations and conversations with representatives at St. Paul's Parish and School are summarized below.

St. Paul Parish

St. Paul Parish has weekday masses at 6:45 a.m. and 9:00 a.m. In 2009, observations showed that the 9:00 a.m. mass generated a parking demand of up to 13 vehicles along Washington Street. On weekdays that coincide with special holy days, the morning mass parking demand is likely higher. For example, depending on the calendar year, up to nine holy days of obligation fall on weekdays that are not already recognized holidays. In 2012, BETA observed 53 parked vehicles associated with the 9:00 a.m. morning mass on Ascension Day, a holy day of obligation.

In addition to masses, about 40 to 50 funerals occur annually at St. Paul Parish, with between 40 and 300 attendees. In the last year, about 25% of funerals occurred on Saturday mornings, with the rest on weekdays. Weekday funerals start at 9:00 a.m., 10:00 a.m., or 11:00 a.m. and have an associated parking demand along Washington Street between 8:00 a.m. and 12:00 p.m., depending on the start time. Note that funeral timing and attendance are unpredictable.

The study team discussed funeral activity with the Chief and Deputy Chief of Police. The police stated that they have never seen cars double parked on Washington Street or any other street near Washington Street during funerals, no matter the size of the funeral. In the event of a large funeral, the funeral home may ask for an escort from the church to the funeral or the funeral home may hire a police detail. It is very rare for the funeral home to hire a police detail - three times per year at most. There are times when the police learn of a large funeral and send an officer to assist as a matter of public safety and to help traffic flow.

When there is a funeral at St. Paul's, the funeral home places "Funeral-No Parking" signs along Washington Street prior to the funeral. In most cases, this is done only on the east side of Washington Street from Wellesley Avenue to the former American Legion site. For larger funerals, these signs are also placed in the parking spaces on the west side of Washington Street. The signs are put out immediately after the St. Paul school drop-off period, which prevents the spaces from being used by vehicles not participating in the funeral. Because all the Center's parking demand will be accommodated on-site, no Center parking will occur along Washington Street.

The police representatives stated they are confident that there will be no problem accommodating the Center activity and funerals, large or small, and emphasize that communication between the St. Paul and COA will be important.

In the near future, St. Paul Parish and St. John the Evangelist Parish (located at 9 Glen Road, Wellesley) will be joined in a pastoral collaborative under a plan developed by the Catholic Archdiocesan Pastoral Commission. The two churches will ultimately share a pastor (and other staff) but each will retain its own identity and building. As of now, weekday masses continue at St. Paul's (6:45 a.m. and 9:00 a.m.) and St. John's (7:00 a.m.). Eventually, the collaborative plan may cause changes to the daily mass schedule, but the impact, if any, to parking demands at each parish cannot be quantitatively assessed at this time.

St. Paul School

The school has an enrollment of about 185 students in grades pre-K through 8th. A few students walk, but most are driven to school by parents. Although the Town is required to provide busing to any student in the district that lives two or more miles away from the school, no students at St. Paul have used this service in the last ten years. School starts at 7:55 a.m. and is dismissed at 2:30 p.m., with early dismissal (12:00 p.m.) on Wednesdays, consistent with Wellesley public schools.

St. Paul School does not provide any on-site drop-off/pick-up areas, but relies on use of public streets adjacent to the school. Parents cannot enter the school's parking lot during the drop-up or pick-up periods. The 20 school staff members park on-site.

On June 10, 2014, the study team made observations on Washington Street and Atwood Street during the school's drop-off and school pick-up periods as detailed below. Note that all 16 students in the 8th grade class were not in school during these observations. The intersection counts used for the Atwood Street traffic analysis, however, were collected in September 2014, when all grades were present. Therefore, the traffic analysis contained in later sections of this report incorporates full activity at the school.

Morning Drop-off Period

On Washington Street, the west side on-street parking spaces (Morton Park side) were not used by parents, although two spaces were occupied by non-parent cars. The crosswalk in front of St. Paul Parish was activated one time for Wellesley High School students (not St. Paul students) crossing at 7:30 a.m. Twelve parent cars used spaces on the east side of Washington Street between 7:40 a.m. and 8:20 a.m. Ten vehicles parked and parents walked their student to the school. Two vehicles dropped off students. The American Legion lot was well-utilized space by parents both for parking and dropping off. Sixteen vehicles parked and parents walked their student to the school and another six vehicles dropped off students in the lot and then immediately left. The first car arrived in the American Legion Lot at 7:20 a.m. and seven remained at 8:20 a.m. The lot was also used as a turn-around for some parents who parked on Washington Street and wanted to reverse direction.

On Atwood Street, traffic volumes were generally light. Up until 7:30 a.m. the majority of traffic was teachers arriving and parking in the lot. Many teachers brought students with them. At 7:37 a.m., traffic cones were placed at the entrance of the St. Paul parking lot, prohibiting parents from entering the lot. Between 7:40 - 7:55 a.m., parents would pull up on the school side of Atwood Street and drop off in front of the school stairs. No more than three cars were queued at a time. After 7:55 a.m., when the bell rang, a few cars were parked beyond the school on the east side of Atwood Street. These parents walked their students into the building, presumably because they needed to be signed in.

Afternoon Pick-up period

On Washington Street, the utilization was similar to the morning period. At 2:00 p.m. the west side of the street had two non-parent parked cars. One parent arrived at 2:23 p.m., waited for their student, and left at 2:36 p.m. Along the east side of Washington Street, one car was parked at 2:00 p.m. By 2:30 p.m. (dismissal bell) five cars were parked along this curb. In the American Legion lot, two cars were parked at 2:00 p.m. By 2:30 p.m., 14 cars were parked in the lot. The maximum number of cars observed in the lot after dismissal was 17. By 3:00 p.m., only seven remained in the lot. When students were dismissed, some came out to find their parents and leave immediately, while others played in the Church's front yard while parents chatted. The pedestrian crosswalk signal on Washington Street was activated six times in the afternoon but only twice for St. Paul School students.

Along Atwood Street, a few cars started queuing up on the west (school) side at 2:03 p.m., but the majority of cars arrived between 2:20 and 2:30 p.m. These cars queues on the school side of the street back toward Morton Street. The longest observed queue was 15 cars. By 2:42 p.m., all students had been picked up and no queue remained. Between 2:20 and 2:40 p.m., however, Atwood Street was congested. A parent minivan was observed attempting to turn around on Atwood Street and blocked through traffic, including an emergency vehicle, for two minutes. Between 2:30 and 2:40 p.m., Wellesley Avenue was backed up and there was a constant queue of three to seven cars on the Atwood Street approach. Atwood Street was also busy with through traffic driving towards Wellesley Ave. The combination of cars queues along the school side, through traffic, and the dismissal of students, caused Atwood Street to be busy for about 15-20 minutes. By 2:45 p.m., there were no queued vehicles on Atwood Street, either by the school or at the Wellesley intersection.

Other Parkers on Washington Street

Occasional parking from other uses sometimes occurs along Washington Street. Although not directly observed, it has been anecdotally noted that during the WPD afternoon shift changes at about 4:00 p.m. some officers park on Washington Street near the station until space becomes available in the department lot. Occasionally, visitors to the police station park on Washington Street.

A medical office building is located at 486 Washington Street, on the corner of Morton Street. This building has about 35 parking spaces. Another smaller medical office building is located at 490 Washington Street and has parking for about 15 vehicles.

Aside from specific St. Paul parking activity along Washington Street, observations from BETA in 2009 noted an average of seven on-street occupied spaces, most likely attributable to the WPD and the medical building uses. As discussed in later sections of this report, the Center will accommodate all associated parking demand on-site, and will not add to the parking activity along Washington Street.

Existing Pedestrian Conditions

Pedestrian conditions in the study area are important, because the Center will be within walking distance for able-bodied senior citizens living at Morton Circle, the Wellesley Green condominiums, and the Glen Grove apartments.

Sidewalk Conditions

The study team conducted an inventory of sidewalk conditions within 600 feet of the Center site in 2009. Sidewalk conditions were classified according to the following four categories:

Excellent. No deterioration observed.

Good. Minimal deterioration, such as cracking, heaving, sinking, and intrusion or encroachment of vegetation observed.

Fair. Some deterioration observed, including more severe cracking, heaving, sinking, and intrusion or encroachment of vegetation, as well as presence of patching. No serious hazardous walking impediments observed.

Poor. Severe deterioration observed, making walking conditions hazardous or prohibitive.

The overall condition of sidewalks is generally excellent or good, although a section on Wellesley Avenue and some sidewalks in Morton Park are categorized as fair. The sidewalk conditions are shown in **Figure 5.** A detailed description of sidewalk conditions is contained in **Appendix A**.

Existing Washington Street Signalized Crosswalk

A pedestrian signal with crosswalk currently operates on Washington Street at the entrance to St. Paul's Church. The crosswalk provides direct access to the main entrance at St. Paul's Parish and School. When the pushbutton is pressed, traffic on Washington Street is controlled to a stop by flashing yellow lights. Based on the evaluation of signal characteristics listed in **Table 7,** the signal provides adequate time for pedestrians—even those who walk slower than average—to safely cross the street.

Table 7. Washington Street Pedestrian Signal Characteristics

Characteristic	Measurement
Width of Washington Street crosswalk	38 feet
Length of pedestrian signal	17 seconds
Required walking speed to cross Washington Street	2.2 feet per second or faster
Average walking speed of general population[1]	3.5 feet per second
Recommended design walking speed where elderly/young children constitute 20% of population[2]	3.0 feet per second
Recommended design walking speed where elderly/young children constitute 100% of population[2]	2.9 feet per second

Sources:

1) Manual of Uniform Traffic Control Devices (MUTCD), Federal Highway Administration, 2009.
2) Highway Capacity Manual (HCM), Transportation Research Board, 2000.

Future Conditions

For transportation impact analyses, it is standard practice to evaluate two future conditions: a No-Build Condition (without the proposed project) and a Build Condition (if the project is built). Typically, these conditions are projected to a future date five years from the Existing Conditions year. For this evaluation of the Center, Year 2019 was designated as the future year.

2019 No-Build Conditions

2019 No-Build Volumes

No-Build traffic conditions are independent of the proposed new Center and include existing traffic and new traffic resulting from general background growth and identified new projects in the area.

The general background growth rate, which the Town established as 1% per year, accounts for changes in demographics, auto usage, and auto ownership. It also accounts for non-specific, minor changes in land use within the study area. A 1% annual growth rate was applied to the existing intersection volumes over five years, to account for background growth by 2019.

The study team discussed planned development projects with the Planning Department and has incorporated future traffic increases anticipated from the following projects:

- ***Wellesley High School (WHS)*** – The traffic study[2] performed as part of the Town's permitting process for the new WHS quantified the new vehicle trips generated by increased student and staff activity. Enrollment is forecasted to increase from 1,300 current students to a peak of about 1,600 students by 2017. The net increase in WHS peak-hour vehicle trips projected for 2017 was incorporated into the 2019 No-Build volumes.
- ***Belclare, 576 Washington Street*** – In 2013, construction started on the Belclare, a luxury condominium development on the site of the former Wellesley Inn. Scheduled for completion in 2015, the development includes 30 units and 9,500 sf of commercial space. The new trips from this project were incorporated into the 2019 No-Build volumes.

2019 No-Build Traffic Operations

The 2019 Future Conditions analysis for both the No-Build and the Build scenarios uses the methodology described in the Existing Conditions analysis. Future No-Build traffic volumes are shown in **Figure 6** and **Figure 7** for the a.m. and p.m. peak hours, respectively. The resulting intersection operations results are shown in **Table 8** and **Table 9.** Complete Synchro reports are provided in **Appendix A**.

Under No-Build conditions, with additional volume due to background growth, one intersection and several approaches will experience changes in forecasted levels of service as presented below:

During the a.m. peak hour, at the Washington Street/State Street/Kingsbury Street intersection, the State Street northbound approach will worsen to LOS F, as compared to LOS E under Existing Conditions.

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[2] *Wellesley High School Transportation Study,* prepared for the Town of Wellesley by Howard/Stein-Hudson Associates, January 7, 2009.

During the a.m. peak hour, at the Washington Street/Wellesley Avenue/Brook Street intersection, the Washington northbound approach will worsen to LOS F, as compared to LOS E under Existing Conditions.

During the a.m. peak hour, the overall operation of Washington Street/Central Street/Grove Street will worsen to LOS F, as compared to LOS E under Existing Conditions. The Grove Street northbound approach will worsen to LOS E from LOS D. During the p.m. peak hour, the Washington Street westbound left lane will worsen to LOS E from LOS D.

At the Washington Street/Morton Street/WPD Driveway intersection, the Morton Street and WPD Driveway will worsen from LOS D to LOS E during the a.m. peak hour.

At the State Street/Atwood Street intersection, the Atwood Street northbound approach will worsen from LOS C to LOS E during the a.m. peak hour.

At the Wellesley Avenue/Atwood Street/Dexter Street intersection, the minor approaches of Atwood Street and Dexter Street will both worsen from LOS D to LOS E.

All other approaches will not experience a change in level of service under No-Build conditions.

Table 8. No-Build Conditions (2019) Capacity Analysis Summary, a.m. Peak Hour

Intersection/Movement	LOS	Delay (seconds)	V/C Ratio	95th Percent Queue (feet)
Signalized Intersections				
Washington Street (Route 16)/ State Street/Kingsbury Street	**D**	**53.0**		
Washington EB left/thru | thru/right	D	36.0	0.76	331
Washington WB left/thru/right	C	29.9	0.55	194
State NB left/thru	F	>80.0	>1.00	#375
State NB right	D	39.4	0.09	34
Kingsbury SB left/thru/right	D	38.2	0.84	#590
Washington Street (Route 16)/ Wellesley Avenue/Brook Street	**D**	**38.2**		
Wellesley WB left	C	27.1	0.66	425
Wellesley WB right	B	19.0	0.15	85
Washington NB thru	F	>80.0	>1.00	#1037
Washington NB right	B	10.8	0.76	740
Washington SB left/thru | thru	C	25.6	0.61	237
Brook NWB left/right (unsignalized leg)	F	>50.0	0.86	134
Washington Street (Route 16)/ Central Street/Grove Street	**F**	**>80.0**		
Central EB thru | thru/right	F	>80.0	>1.00	#679
Washington WB left	D	38.1	0.53	256
Washington WB thru/right	C	20.4	0.65	480
Grove NB left/thru/right	E	59.0	0.85	#322
Grove SB left/thru/right	D	36.7	0.29	74
Washington NEB right | right/hard right	E	74.0	>1.00	#505
Unsignalized Intersections				
Washington Street (Route 16)/ Morton Street/WPD Driveway				
Driveway EB left/thru/right	E	39.1	0.26	24
Morton WB left/thru/right	E	37.2	0.26	25
Washington NB left/thru/right	A	0.2	0.01	1
Washington SB left/thru/right	A	0.0	0.00	0
State Street/Atwood Street				
State EB thru/right	A	0.0	0.34	0
State WB left/thru	A	1.8	0.06	4
Atwood NB left/right	E	39.0	0.71	130
Wellesley Avenue/Atwood Street/Dexter Road				
Wellesley EB left/thru/right	A	4.0	0.16	15
Wellesley WB left/thru/right	A	0.2	0.01	0
Dexter NB left/thru/right	E	46.3	0.22	20
Atwood SB left/thru/right	E	41.8	0.35	36

# = 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after two cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
Gray shading indicates a change in operation to LOS E or LOS F from the Existing Conditions.
EB = eastbound, WB=westbound, NB=northbound, SB=southbound

Table 9. No-Build Conditions (2019) Capacity Analysis Summary, p.m. Peak Hour

Intersection/Movement	LOS	Delay (seconds)	V/C Ratio	95th Percent Queue (feet)
Signalized Intersections				
Washington Street (Route 16)/ State Street/Kingsbury Street	**C**	**32.4**		
Washington EB left/thru | thru/right	C	33.2	0.66	241
Washington WB left/thru/right	C	32.1	0.67	309
State NB left/thru	D	49.7	0.56	195
State NB right	D	40.3	0.10	42
Kingsbury SB left/thru/right	C	23.8	0.52	327
Washington Street (Route 16)/ Wellesley Avenue/Brook Street	**C**	**31.8**		
Wellesley WB left	C	29.4	0.75	511
Wellesley WB right	B	18.8	0.14	81
Washington NB thru	D	43.8	0.82	#710
Washington NB right	A	3.4	0.31	152
Washington SB left/thru | thru	D	40.8	0.90	#550
Brook NWB left/right (unsignalized leg)	D	27.6	0.35	38
Washington Street (Route 16)/ Central Street/Grove Street	**D**	**43.5**		
Central EB thru | thru/right	D	42.1	0.81	283
Washington WB left	E	74.0	0.98	#649
Washington WB thru/right	C	25.6	0.78	#665
Grove NB left/thru/right	D	54.5	0.81	#322
Grove SB left/thru/right	D	36.0	0.33	113
Washington NEB right | right/hard right	C	32.0	0.43	178
Unsignalized Intersections				
Washington Street (Route 16)/ Morton Street/WPD Driveway				
Driveway EB left/thru/right	C	23.0	0.06	5
Morton WB left/thru/right	C	21.5	0.09	8
Washington NB left/thru/right	A	0.4	0.01	1
Washington SB left/thru/right	A	0.2	0.01	1
State Street/Atwood Street				
State EB thru/right	A	0.0	0.14	0
State WB left/thru	A	0.8	0.02	1
Atwood NB left/right	B	11.9	0.13	11
Wellesley Avenue/Atwood Street/Dexter Road				
Wellesley EB left/thru/right	A	1.2	0.04	3
Wellesley WB left/thru/right	A	0.0	0.00	0
Dexter NB left/thru/right	A	0.0	0.00	0
Atwood SB left/thru/right	C	23.9	0.28	27

# = 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after two cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
Gray shading indicates a change in operation to LOS E or LOS F from the Existing Conditions.
EB = eastbound, WB=westbound, NB=northbound, SB=southbound

2019 Build Conditions

For Build Conditions, the traffic activity associated with the new Senior Center is added to No-Build Conditions. The site plan for the Center is shown in **Figure 8**. The Center will be a two-story facility with program and activity rooms, a main hall, a dining room, a kitchen, and office space for COA administration and support staff. The building will have approximately 13,274 sf (sf). The Center will have 58 on-site parking spaces (plus one space for building service/delivery). Access to and egress from the site will occur via two curb-cuts on Washington Street; traffic will enter the site via an enter-only driveway and leave via an exit-only driveway.

Activity at the New Center

For traffic impact studies, it is standard practice to estimate the number of new trips from a project based on trip generation rates found in the Institute of Transportation Engineers *Trip Generation* manual. While data for many common land uses are included in this manual, senior center data are not available; the most comparable land use is a recreational center.

Because the types of programs and visitor characteristics of a recreational center are quite different from the proposed Center, however, the trip generation rates for the recreational center were not adopted for this study. Instead, a detailed assessment of the Center, supported by data from other local senior centers, was conducted to develop a trip activity profile specific to the Center. This information was used to estimate peak-hour vehicle trips for intersection analysis and to estimate parking demand throughout the day, presented in a later section.

The Council on Aging currently operates in the Wellesley Community Center (located at 219 Washington Street) and has one room dedicated to senior programs with access to additional rooms through a reservation system with the Community Center. On a typical day, the COA has about 40 to 50 visitors. Based on a June 2009 survey of users, 66% of visitors drive alone, 22% carpool, 6% take the bus, 4% take a taxi or are dropped off, 2% walk, and 0% bicycle.

The Applicant expects that the new Center will generate more trips because of its expanded selection of programs. While participation at the new Center will depend on a variety of factors, the Applicant estimates it could generate up to 150 visitors per day, with some visitors staying for more than one activity. While visitor arrival and departure times will depend on the daily schedule of events at the center, a typical schedule is presented in **Table 10**.

The Center will have activities and programs scheduled between 9:00 a.m. and 4:00 p.m. on weekdays. Informal drop-in times (for coffee or information) may be available after 8:00 a.m. and before 5:00 p.m. The drop-in activity is expected to be minor and will not generate many new vehicle trips. Eventually, the Center may have evening programs or host smaller group meetings, such as Town boards or committees. Parking for any future evening activities will be accommodated on-site. The Center will not be open on weekends. In addition to daily visitors, it has been assumed that five employees and volunteers will be on-site at the Center each day.

Table 11 shows the numbers of persons arriving and departing the Center by time of day.

Table 10. Typical Weekday Activity Schedule for Tolles-Parsons Center

Time	Activity	Estimated Program Participants
9:00 – 10:00 a.m.	Walking – outdoors/lounge	13
9:30 – 10:30 a.m.	Coffee hour – lounge	8
9:30 – 10:30 a.m.	Tai-Chi Dance/Exercise Room	8
9:30 – 11:00 a.m.	Community Service Bears	7
9:30 – 11:30 a.m.	Scrabble/Cards – Game Room	8
10:00 – 11:30 a.m.	Creative Writing	15
10:00 – 11:00 a.m.	Spanish	8
10:30 – 11:00 a.m.	Chess	6
10:30 – 11:00 a.m.	Better Balance	18
11:00 a.m. – 12:30 p.m.	Quilting	10
11:30 a.m. – 1:00 p.m.	Lunch	25
1:00 – 3:00 p.m.	Bridge	18
1:30 – 2:30 p.m.	Poetry/Book Club	14
1:00 – 2:00 p.m.	French Class	8
2:00 – 3:00 p.m.	Zumba	20
1:00 – 4:00 p.m.	SHINE – Wellness Room	8
1:30 – 3:30 p.m.	Painting	12
Total		206

Note that the number of program participants is larger than the number of daily visitors, because some participants stay for one activity and some stay for two.

Table 11. Scenario 1A – Center Person Trips by Time of Day

Time Period	Persons Entering	Persons Exiting	Persons at Center (at end of time period)
8:45–9:15 a.m.	15	0	15
9:15–9:45 a.m.	25	0	40
9:45–10:15 a.m.	19	15	44
10:15–10:45 a.m.	18	20	42
10:45–11:15 a.m.	12	4	50
11:15–11:45 a.m.	10	8	52
11:45 a.m.–12:15 p.m.	6	8	50
12:15–12:45 p.m.	6	10	48
12:45–1:15 p.m.	10	10	48
1:15–1:45 p.m.	10	15	48
1:45–2:15 p.m.	17	15	50
2:15–2:45 p.m.	0	15	35
2:45–3:15 p.m.	2	15	22
3:15–3:45 p.m.	0	15	7
3:45–4:15 p.m.	0	7	0
Total	**150**	**150**	

Travel Mode Shares

Travel mode share is the distribution of person trips among the available travel modes such as automobile, transit, walking, and bicycling. Based on a survey of existing Wellesley COA visitors in June 2009, the study team developed mode shares for the Center. Because the new Center will be located closer to senior housing at Morton Circle, Wellesley Green, and Glen Grove than the existing center, the walk share was increased from 2% to 4%. While the Center is not expected to generate significant bicycle trips, two bicycle racks with capacity for four bicycles will be provided at the Center.

The rate of carpooling activity was assumed to increase from 22% to 25% on a typical day in the new Center, because the wider variety of programs is likely to attract more couples and mutual friends to visit the Center together.

Transit service in Wellesley includes the COA shuttle bus, available to seniors to make trips within Wellesley and the Metro West Regional Transit Authority's (MWRTA) Route 8. Route 8 operates on Washington Street in front of the Center site, with peak period service to commuter rail stations in Wellesley and at Woodland (MBTA Green Line). During the day, the route provides a link through the Wellesley commercial area to the Woodland Station to the east and the Natick Mall in the west. While the transit mode share at the new Center will likely be higher than the existing 6% observed at the COA, the share was not increased because it would have reduced the associated vehicle trips in the traffic analysis, thereby lowering the projected traffic impacts. This assumption provides a most conservative (higher impact) evaluation of traffic.

Comparative Data

To verify that the assumptions made by the study team relative to traffic activity and parking demand are reasonable, observations at two relatively new senior centers in Belmont (opened in 2009) and Needham (opened in 2013) were conducted in mid-September 2014. The Belmont Beech Street Center and Needham Center at the Heights are both larger buildings and can schedule more concurrent activities than the proposed Tolles-Parsons Center. The choice of programs at the Center, however, will be similar to those offered at Belmont and Needham.

At the Belmont Center, observations of travel mode shares, vehicle trips, and parking activity were made on Tuesday, September 16, 2014. Similar observations were made at the Needham Center on Tuesday, September 23, 2014. The existing and forecasted mode shares and auto occupancies are shown in **Table 12.** Comparative values as observed at the Belmont and Needham centers are also shown.

Table 12. Mode Shares and Vehicle Occupancy Rates

Location	Vehicle Share			Transit Share	Walk/ Bicycle Share	Average Vehicle Occupancy (AVO)[1)]
	Drive Alone	Carpool	Drop Off			
Wellesley						
Existing COA	66%	22%	4%	6%	2%	1.14
Tolles-Parsons Center	61%	25%	4%	6%	4%	1.17
Comparative Data						
Belmont Beech Street Center	77%		2%	4%	16%/1%	1.16
Needham Center at the Heights	74%		2%	9%	13%/2%	1.12

1) Average Vehicle Occupancy (AVO)

The walk share for the new Center is estimated to be 4%, which is lower than the 16% and 13% observed at Belmont and Needham, respectively. Because the area surrounding the new Center has fewer residences than areas near the other centers, the expected walk share will be lower. Correspondingly, the vehicle share is higher for the Center, resulting in a conservative (higher impact) evaluation of both traffic and parking.

Average vehicle occupancy rates are similar for all locations. The carpooling share and associated AVO is expected to increase in Wellesley with the new Center because the wider variety of programs will likely attract more couples and mutual friends to visit the Center together.

Table 13 summarizes the key observations related to parking and vehicle activity.

The centers in Belmont and Needham provide on-site parking at a rate of about 3.1-3.2 spaces/1,000 sf. The Tolles-Parsons Center will provide parking at a higher rate of 4.5 spaces/1,000 sf. The Belmont center, with about 50% more building space than Tolles-Parsons, exhibited parking accumulation and vehicle trips similar to that forecast for the smaller Tolles-Parsons. The Needham center, again with 50% more building space, exhibited less parking and vehicle trip activity than forecast for Tolles-Parsons. These larger facilities are showing activity levels both similar to (Belmont) and lower than (Needham) those forecasted for Tolles-Parsons. These data indicate that the trip generation assumptions made for this study result in a conservative assessment (higher impact) of both traffic and parking activity. Therefore, the trip generation methodology and assumptions remain unchanged from earlier iterations of this study.

Table 13. Vehicle and Parking Activity

Location	Building Size (sf)	On-site parking capacity (spaces)	Spaces/ 1,000 sf	Peak parking accumulation (vehicles)	Vehicle trips during peak hour [1]		
					Enter	Exit	Total
Tolles-Parsons Center	13,300	58	4.5	56	36	35	71
Belmont Beech Street Center	19,900	62	3.1	60	43	39	82
Needham Center at the Heights	20,000	65	3.2	39	20	12	32

1) The vehicle trips during peak hour for the Tolles-Parsons Center are discussed in more detail in the next section.

Roadway Impacts

While several scenarios for parking impacts have been developed for the Center and discussed in later sections, only one scenario was chosen for traffic analysis purposes. For this scenario, it has been assumed that 150 visitors per day will use the Center (designated as Scenario 1A). The visitor arrival and departure pattern assumes participation rates and lengths of stay consistent with that number of visitors.

Based on the number of visitors by time of day and mode shares, the number of vehicle trips by time of day was estimated and summarized in **Table 14**.

Table 14. Center Vehicle Trips by Time of Day

Time Period	Vehicles Entering	Vehicles Exiting
8:45–9:15 a.m.	19	2
9:15–9:45 a.m.	22	3
9:45–10:15 a.m.	18	16
10:15–10:45 a.m.	18	19
10:45–11:15 a.m.	10	4
11:15–11:45 a.m.	9	7
11:45 a.m.–12:15 p.m.	5	8
12:15–12:45 p.m.	7	6
12:45–1:15 p.m.	10	10
1:15–1:45 p.m.	10	10
1:45–2:15 p.m.	17	16
2:15–2:45 p.m.	2	14
2:45–3:15 p.m.	4	14
3:15–3:45 p.m.	2	14
3:45–4:15 p.m.	2	11
Total	**153**	**153**

Vehicle trips include auto trips for drive alone and carpool, bus trips, and drop-off trips.
The gray shading indicates the peak one hour of traffic activity, with 36 entering vehicles and 35 exiting vehicles.
Volumes include employee trips.

Most new vehicle trips will be generated during the Center's daytime program hours and not overlap with the typical a.m. and p.m. peak commuting hours in Wellesley[3]. The study team, however, adopted a conservative (higher impact) methodology where the peak hour volume of Center traffic, forecasted to occur between 9:45 and 10:45 a.m., was added to both the a.m. and p.m. peak hours to simulate a "highest impact" condition for Year 2019 traffic operations.

Vehicle Trip Distribution

A trip distribution pattern identifies the various travel paths for vehicles arriving at a destination and the corresponding departure travel paths. The Center is generally located near the geographic center of the Town of Wellesley. In the 2009 study, the distribution pattern for trips to the Center was developed based on a review of population data for the six census tracts in Wellesley. The distribution was retained for this current study and is shown in **Table 15**. Based on U.S. Census 2010 data, Wellesley has an overall population of 27,818 persons. Of these, approximately 19%, or about 5,260 persons are age 60 or over.

Table 15. Vehicle Trip Distribution and Travel Routes

Area of Residence within Wellesley	Percent	Travel Route to/from Center
Southeast	13%	100% via Washington St. from the northeast
Northeast	13%	100% via Kingsbury St. from the north
South	16%	50% via Washington St. from the northeast 50% via Wellesley Ave. from the east
Northwest	20%	100% via Central St. from the west
West	16%	100% via Central St. from the west
Southwest	22%	50% via Wellesley Ave. from the east 25% via Grove St. from the south 25% via Washington St. from the southwest
Total	100%	

The resulting trip distribution pattern is mapped in **Figure 9**. Using the distribution pattern in **Figure 9** and the vehicle trips by time of day (shown in **Table 14**), the Center's new peak hour trips were estimated and are shown in **Figure 10**.

2019 Build Traffic Operations

Future 2019 Build Conditions traffic volumes are shown in **Figure 11** and **Figure 12** for the a.m. and p.m. peak hours, respectively. The resulting intersection operations results are shown in **Table 16** and **Table 17**. Complete Synchro reports are provided in **Appendix A.**

[3] 7:30 to 8:30 a.m. and 5:00 to 6:00 p.m.

Table 16. Build Conditions (2019) Capacity Analysis Summary, a.m. Peak Hour

Intersection/Movement	LOS	Delay (seconds)	V/C Ratio	95th Percent Queue (feet)
Signalized Intersections				
Washington Street (Route 16)/ State Street/Kingsbury Street	**D**	**53.5**		
Washington EB left/thru | thru/right	D	37.0	0.78	340
Washington WB left/thru/right	C	30.2	0.56	197
State NB left/thru	F	>80.0	>1.00	#375
State NB right	D	39.4	0.09	34
Kingsbury SB left/thru/right	D	39.1	0.85	#600
Washington Street (Route 16)/ Wellesley Avenue/Brook Street	**D**	**44.4**		
Wellesley WB left	C	27.1	0.66	425
Wellesley WB right	B	19.1	0.16	90
Washington NB thru	F	>80.0	>1.00	#1082
Washington NB right	B	11.6	0.77	767
Washington SB left/thru | thru	C	25.8	0.63	249
Brook NWB left/right (unsignalized leg)	F	>50.0	0.88	138
Washington Street (Route 16)/ Central Street/Grove Street	**F**	**>80.0**		
Central EB thru | thru/right	F	>80.0	>1.00	#692
Washington WB left	D	38.3	0.54	258
Washington WB thru/right	C	21.0	0.66	501
Grove NB left/thru/right	E	59.5	0.85	#325
Grove SB left/thru/right	D	36.7	0.29	74
Washington NEB right | right/hard right	F	>80.0	>1.00	#526
Unsignalized Intersections				
Washington Street (Route 16)/ Morton Street/WPD Driveway				
Driveway EB left/thru/right	E	40.2	0.26	25
Morton WB left/thru/right	E	38.3	0.27	25
Washington NB left/thru/right	A	0.2	0.01	1
Washington SB left/thru/right	A	0.0	0.00	0
State Street/Atwood Street				
State EB thru/right	A	0.0	0.34	0
State WB left/thru	A	1.8	0.06	4
Atwood NB left/right	E	39.2	0.72	131
Wellesley Avenue/Atwood Street/Dexter Road				
Wellesley EB left/thru/right	A	4.0	0.16	15
Wellesley WB left/thru/right	A	0.2	0.01	1
Dexter NB left/thru/right	E	47.6	0.22	20
Atwood SB left/thru/right	E	43.1	0.36	37
Washington Street (Route 16)/North Site Driveway (Exit Only)				
Site Driveway WB left/right	D	33.2	0.23	21
Washington NB thru	A	0.0	0.47	0
Washington SB thru	A	0.0	0.38	0
Washington Street (Route 16)/South Site Driveway (Enter Only)				
Washington NB thru	A	0.0	0.48	0
Washington SB thru	A	0.7	0.03	2

# = 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after two cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
Gray shading indicates a change in operation to LOS E or LOS F from No-Build Conditions.
EB = eastbound, WB=westbound, NB=northbound, SB=southbound

Table 17. Build Conditions (2019) Capacity Analysis Summary, p.m. Peak Hour

Intersection/Movement	LOS	Delay (seconds)	V/C Ratio	95th Percent Queue (feet)
Signalized Intersections				
Washington Street (Route 16)/ State Street/Kingsbury Street	D	53.5		
Washington EB left/thru | thru/right	D	37.0	0.78	340
Washington WB left/thru/right	C	30.2	0.56	197
State NB left/thru	F	>80.0	>1.00	#375
State NB right	D	39.4	0.09	34
Kingsbury SB left/thru/right	D	39.1	0.85	#600
Washington Street (Route 16)/ Wellesley Avenue/Brook Street	D	44.4		
Wellesley WB left	C	27.1	0.66	425
Wellesley WB right	B	19.1	0.16	90
Washington NB thru	F	>80.0	>1.00	#1082
Washington NB right	B	11.6	0.77	767
Washington SB left/thru | thru	C	25.8	0.63	249
Brook NWB left/right (unsignalized leg)	F	>50.0	0.88	138
Washington Street (Route 16)/ Central Street/Grove Street	F	>80.0		
Central EB thru | thru/right	F	>80.0	>1.00	#692
Washington WB left	D	38.3	0.54	258
Washington WB thru/right	C	21.0	0.66	501
Grove NB left/thru/right	E	59.5	0.85	#325
Grove SB left/thru/right	D	36.7	0.29	74
Washington NEB right | right/hard right	F	>80.0	>1.00	#526
Unsignalized Intersections				
Washington Street (Route 16)/ Morton Street/WPD Driveway				
Driveway EB left/thru/right	C	23.8	0.06	5
Morton WB left/thru/right	C	22.3	0.10	8
Washington NB left/thru/right	A	0.5	0.02	1
Washington SB left/thru/right	A	0.2	0.01	1
State Street/Atwood Street				
State EB thru/right	A	0.0	0.14	0
State WB left/thru	A	0.8	0.02	1
Atwood NB left/right	B	11.9	0.13	11
Wellesley Avenue/Atwood Street/Dexter Road				
Wellesley EB left/thru/right	A	1.2	0.04	3
Wellesley WB left/thru/right	A	0.0	0.00	0
Dexter NB left/thru/right	A	0.0	0.00	0
Atwood SB left/thru/right	C	24.4	0.28	28
Washington Street (Route 16)/North Site Driveway (Exit Only)				
Site Driveway WB left/right	C	22.6	0.16	14
Washington NB thru	A	0.0	0.39	0
Washington SB thru	A	0.0	0.50	0
Washington Street (Route 16)/South Site Driveway (Enter Only)				
Washington NB thru	A	0.0	0.40	0
Washington SB thru	A	0.5	0.02	1

# = 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after two cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
Gray shading indicates a change in operation to LOS E or LOS F from No-Build Conditions.
EB = eastbound, WB=westbound, NB=northbound, SB=southbound

Under Build conditions, no intersection or approach will experience a change in level of service designation with the additional volume generated by the Center.

The two new Center site driveways will be unsignalized. At both driveways, all traffic on Washington Street passing by the driveways will operate LOS A. At the south driveway (enter only), traffic turning into the site will operate at LOS A during both peak periods. Traffic exiting the northern driveway will be controlled by a stop sign and operate at LOS D and LOS C during the a.m. and p.m. peak hours, respectively. The longest queue associated with exiting the driveway is less than one vehicle length (maximum 21 feet). Because the exiting queues will not affect internal circulation or maneuverability on the Center site, the peak hour levels of service and associated delays are acceptable.

These results indicate that the Center will not adversely affect traffic operations in the study area.

Future Parking Supply and Demand

Supply

The Center will have 58 on-site parking spaces (plus one space for building service/delivery). Along Washington Street, between Morton Street and Wellesley Avenue, there are 48 public parking spaces. Public parking along Washington Street (two-hour time limit) is available to all drivers in the area.

Under Build Conditions, four public parking spaces on Washington Street will likely be removed to accommodate the Center's new driveway curb cuts.

Parking Demand

A standard source for parking demand data is the ITE *Parking Generation* manual. This book is a reference for compiled parking data. However, as with trip generation, parking generation data for senior centers is not specifically included. The most similar land use included in the manual is Recreational Community Center (Land Use Code 495). This type of center is similar to a YMCA; these facilities include classes and clubs for adults and children; a day care, meeting rooms, swimming pools, and athletic facilities. Furthermore, each of the five study sites had an average of 20 employees. Because this type of facility is not comparable to a senior center, the ITE *Parking Generation* manual was not used to evaluate the Center.

Instead, parking demand characteristics were derived based on the trip generation data developed for the Center under a variety of scenarios, described in the following section.

Figure 13 - Figure 17 graphically show the parking demand at the Center's on-site lot and along Washington Street over the course of the day for each scenario.

In the graphs, solid orange bars represent the parking demand from the Center over the course of the day. St. Paul's Parish and School parking demand is shown as red bars for mass vehicles and blue bars for school vehicles. As discussed under the Existing Conditions section, it is estimated that 13 parked vehicles are associated with a typical 9:00 a.m. morning mass at St. Paul's Parish.[4] The green bars represent other general parkers on Washington Street, estimated to be seven vehicles throughout the day.

Scenario 1A and Scenario 1B

See **Figure 13** and **Figure 14** for the projected hour-by-hour parking demand in the Center's on-site lot under these two scenarios.

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[4] As noted under Existing Conditions, the morning mass parking demand is likely higher on weekdays that coincide with special holy days (up to nine weekdays per year).

Under Scenario 1A, the number of daily visitors is 150 persons (see **Table 10**). In reality, a typical day is likely to include about 100 visitors, but to assess a "highest impact" condition, the parking demand generated by the Center for Scenario 1A is based on 150 visitors.

For Scenario 1A, the peak parking demand generated by the Center is forecast at 46 spaces. All Center vehicles will be accommodated in the on-site lot. No Center vehicles will need to park along Washington Street.

Under Scenario 1B, which reflects a different daily schedule of Center programs and 130 daily visitors, all Center vehicles can be accommodated in the on-site lot.

With the new Center, St. Paul School parents will no longer be able to park in the former American Legion lot and will need to use public parking spaces along Washington Street. **Figure 15** shows the reassignment of parent vehicles to parking spaces Washington Street. As shown, sufficient parking capacity will exist on Washington Street to serve the St. Paul parent demand during the morning drop-off and afternoon pick-up periods.

Scenario 2 – Typical Wednesday during the school year

See **Figure 16** for the projected hour-by-hour parking demand along Washington Street under this scenario.

In Wellesley, public elementary schools are dismissed at noon on Wednesdays - about 36 days between September and June. St. Paul's School also follows this practice. St. Paul parents will arrive for noontime dismissal as the Center is starting lunch and afternoon programs.

The parking demand shows that sufficient public parking along Washington Street will available during the noontime dismissal period.

Scenario 3 – Funeral at St. Paul Parish

As observed by BETA in May 2012, the parking occupancy during a large funeral was about 62 vehicles. (Assuming an auto occupancy of about 2.0 persons per auto, the funeral likely had about 130 attendees.) **Figure 17** shows the parking demand when such a funeral occurs. During large funerals, parkers use all curbside capacity (both legal and illegal spaces, as directed by funeral coordinators) effectively increasing the curbside parking capacity along Washington Street. (The graph reflects 37 funeral-related vehicles legally parked on Washington Street, between Morton Street and Wellesley Avenue. Additional funeral parking occurs further north and south on Washington Street, some in illegal spaces.)

Because the parking demand associated with the Center will be accommodated on-site, the parking spaces along Washington Street will continue, as today, to be available for funeral activity.

Sight Distance

Sight distance analysis, which includes measurement of a driver's sight line to other vehicles, was conducted following methodologies from the American Association of State Highway and Transportation Officials' (AASHTO) Policy on Geometric Design of Highways and Streets and the MassHighway Project Development and Design Guide manual.

The Stopping Sight Distance (SSD) measurements from the Washington Street approaches to the Center's north (egress) driveway indicate that there is sufficient distance for an approaching driver on Washington Street to see a vehicle pulling out of the driveway and react to avoid an accident.

Additional sight distance information is provided in Appendix A.

Roadway and Parking Impacts

Roadway Impacts

The Town's PSI guidelines define an impacted roadway segment as:

1. A signalized intersection approach having 20 or more peak-hour, project-related trips and an increase in daily or peak-hour volume of 5% or more, or

2. An unsignalized intersection approach having 20 or more peak-hour, project-related trips and having a minor street approach peak-hour volume of 50 or more vehicles per hour (vph). These PSI guidelines state that for…

> "…signalized impacted intersections, and any unsignalized impacted intersection having 50 or more peak-hour vehicle trips on any minor approach, there shall be no degradation in the overall level of service designation to a level below the level of C and, if an impacted intersection is projected to operate at an overall level of service lower than C in a design year no-build alternative, then the proposed development shall not degrade the level of service designation below the projected design year no-build levels; and with respect to unsignalized impacted intersections having fewer than 50 peak-hour vehicle trips on any minor approach, the Applicant shall undertake an evaluation to identify any specific circumstances requiring further action or mitigation."

Table 16 identifies the traffic thresholds for identifying impacted roadways and shows that none of the study intersections meet these thresholds. These thresholds are assessed for the comparison between No-Build and Build traffic volumes. Because no traffic operation impacts are anticipated with the Center, no traffic mitigation measures are proposed.

Table 18. Impacted Roadway Determination

Threshold	Location Deemed an Impacted Roadway?
Signalized intersection with net new approach volume increase >20 vph and approach volume increase >5.0% for daily or peak-hour conditions	No
Unsignalized intersection with net new approach volume increase > 20 vph and minor street approach volume > 50 vph	No
Overall LOS change to below LOS C.	No

Parking Impacts

The Center will have 58 on-site parking spaces (plus one space for building service/delivery). The peak forecasted parking demand on a typical weekday is 56 spaces; all Center parking demand will be accommodated on-site. The Center will not impact parking activity associated with adjacent land uses. See discussion under the Parking Supply and Demand section.

No additional parking mitigation is required.

Figure 1. Study Area

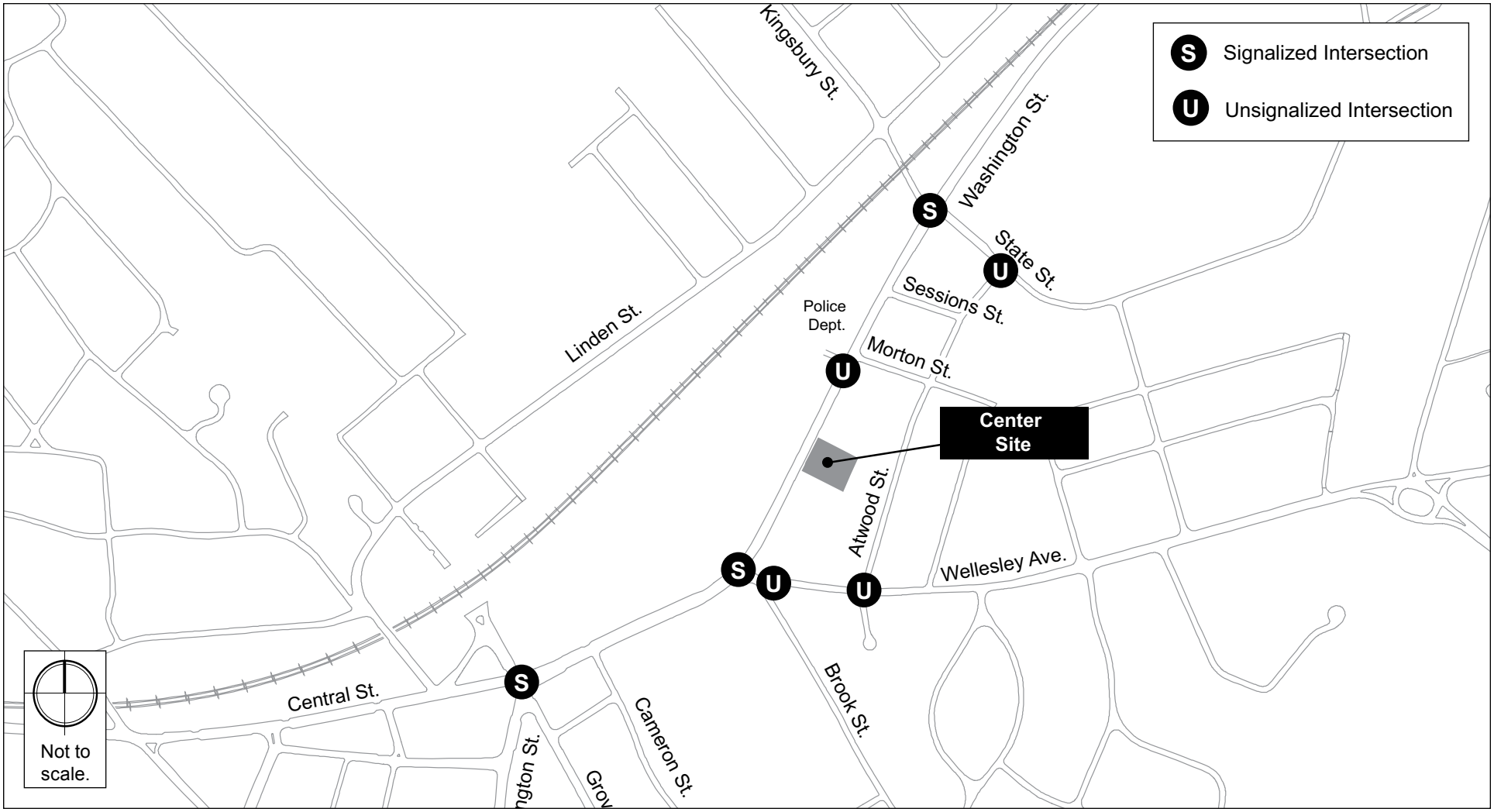


Figure 2. Existing Conditions (2014) Intersection Volumes, a.m. Peak Hour (8:00-9:00 a.m.)

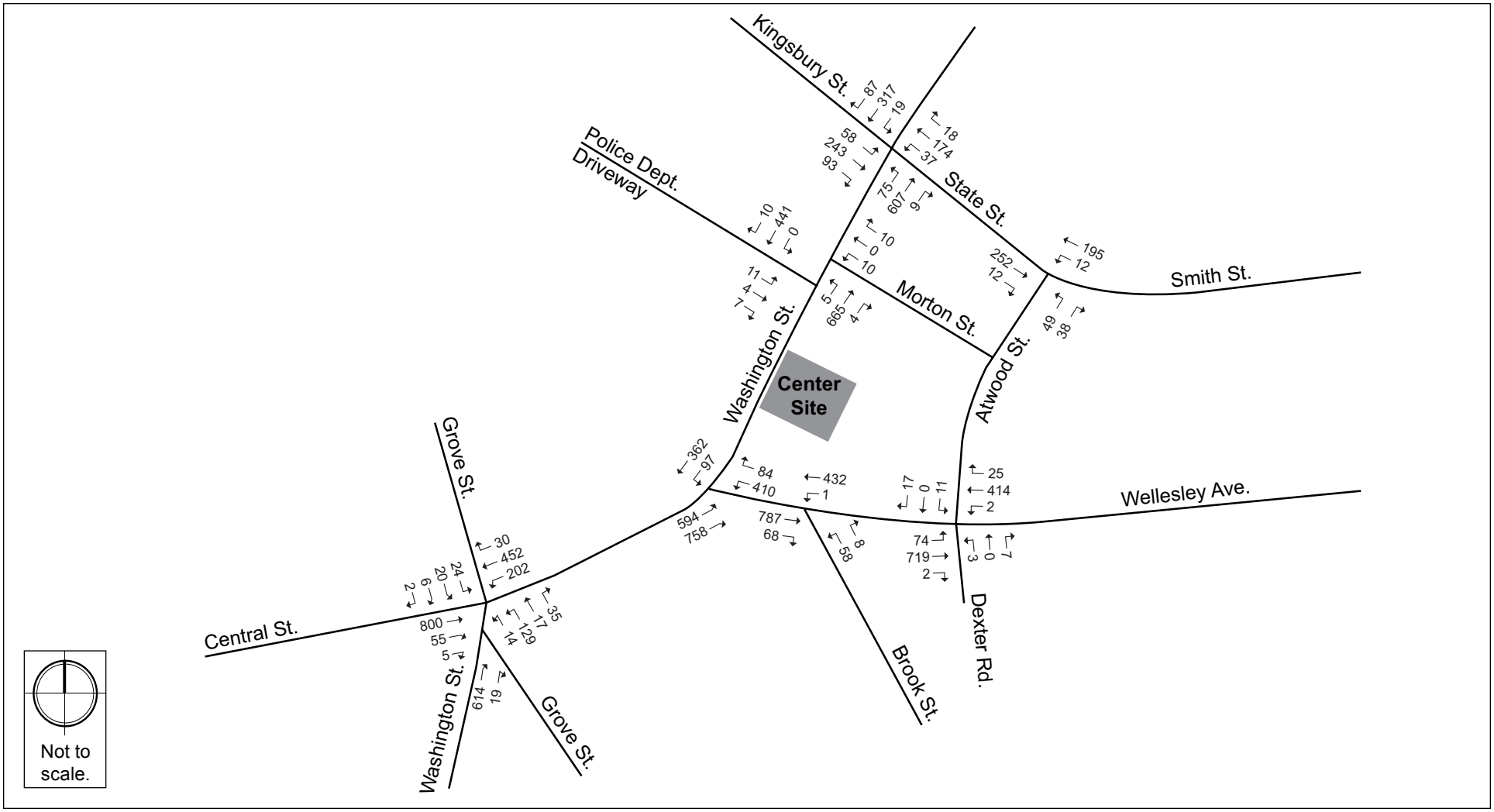


Figure 3. Existing Conditions (2014) Intersection Volumes, p.m. Peak Hour (5:00-6:00 p.m.)

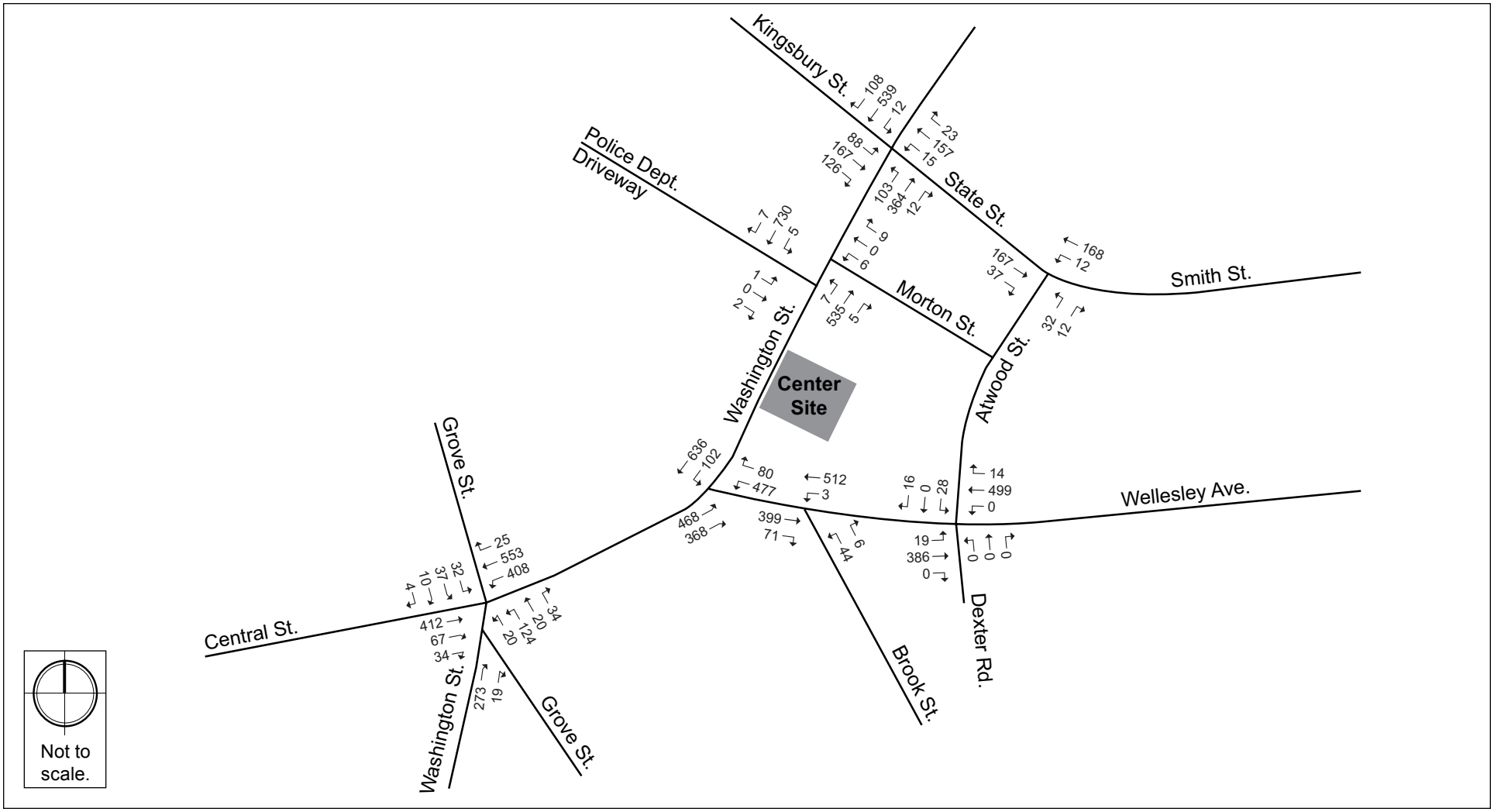


Figure 4. Existing On-Street Parking on Washington Street

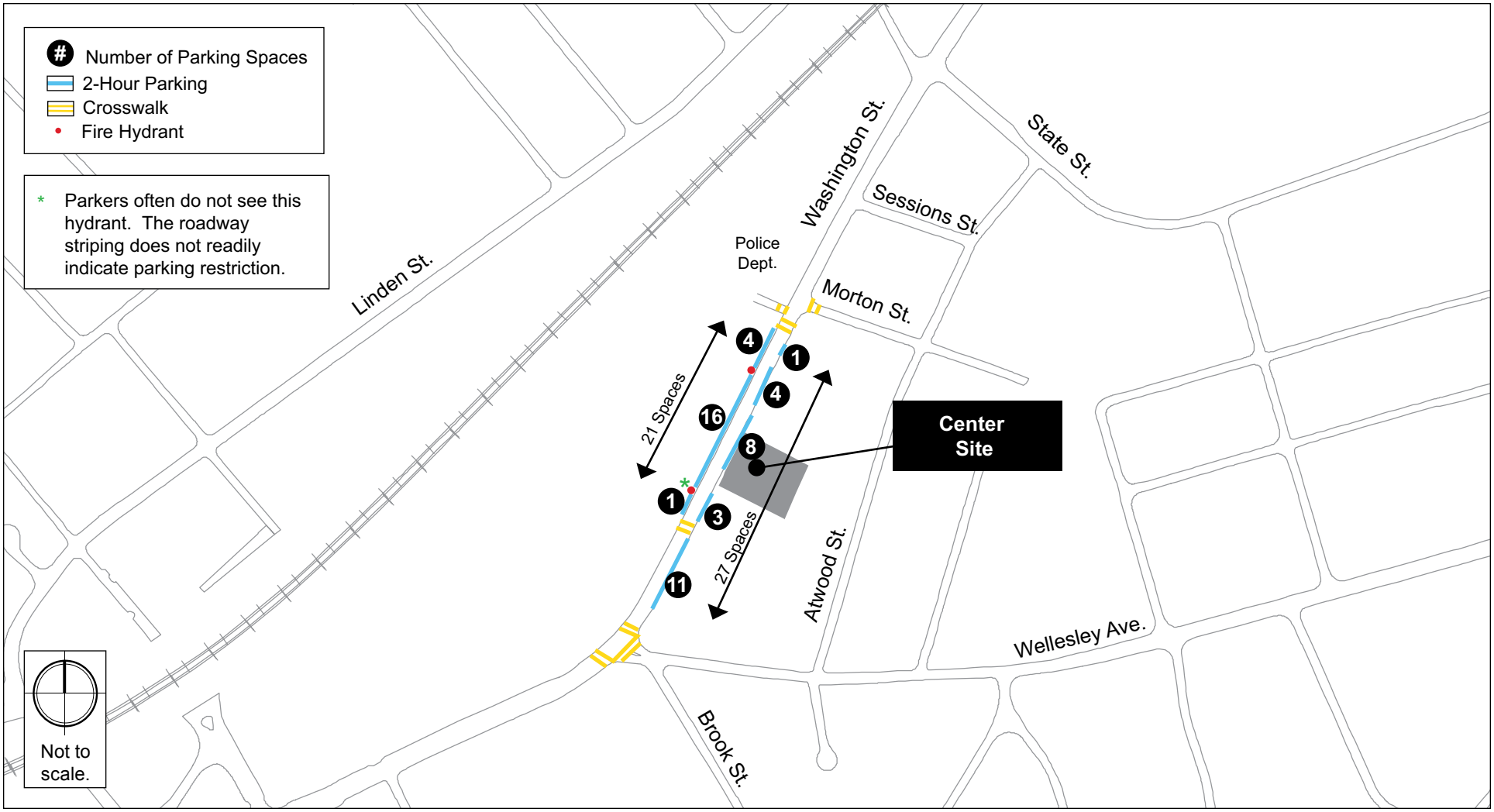


Figure 5. Sidewalk Conditions

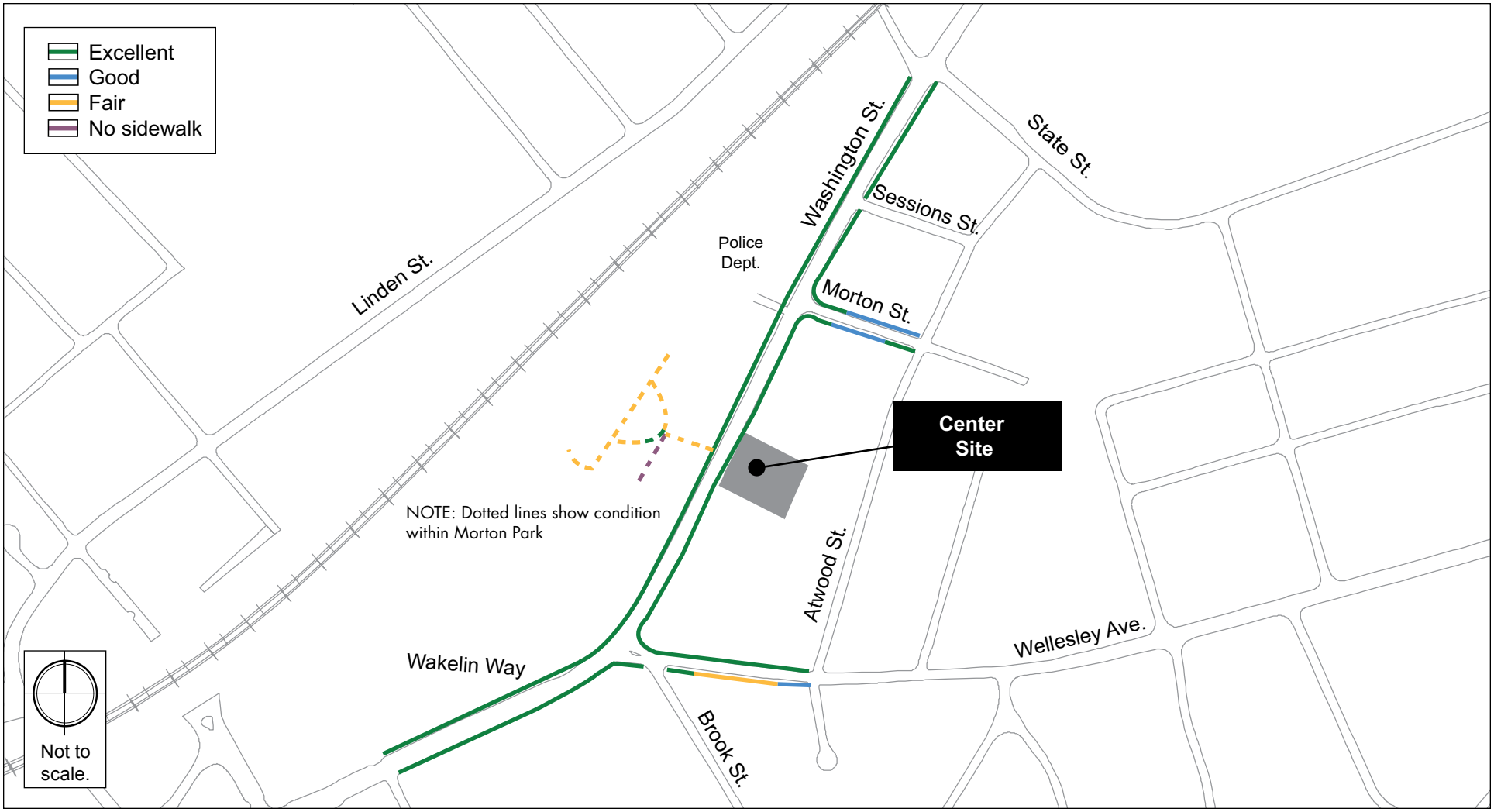
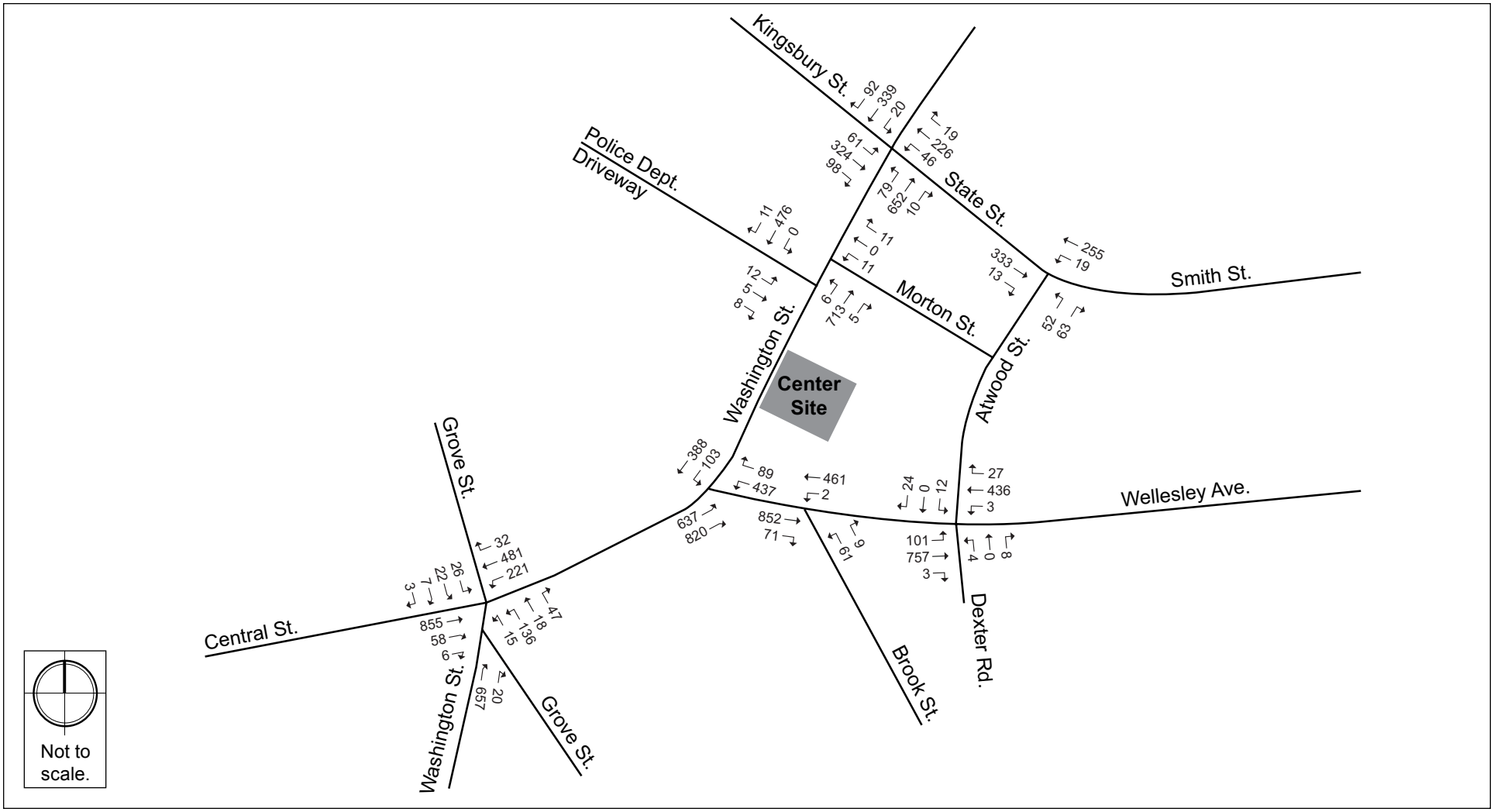


Figure 6. No-Build Conditions (2019) Intersection Volumes, a.m. Peak Hour



Not to scale.

Figure 7. No-Build Conditions (2019) Intersection Volumes, p.m. Peak Hour

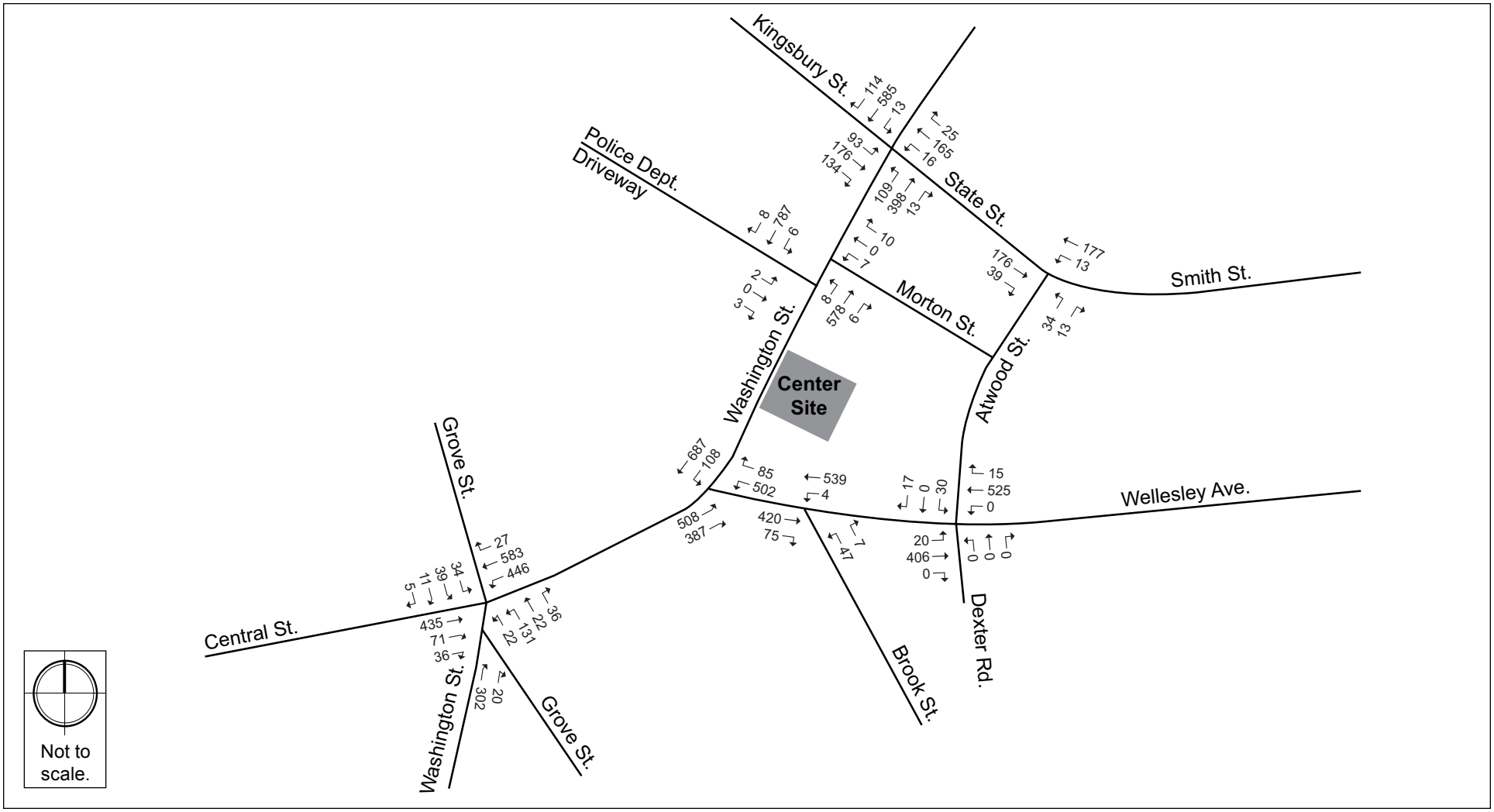
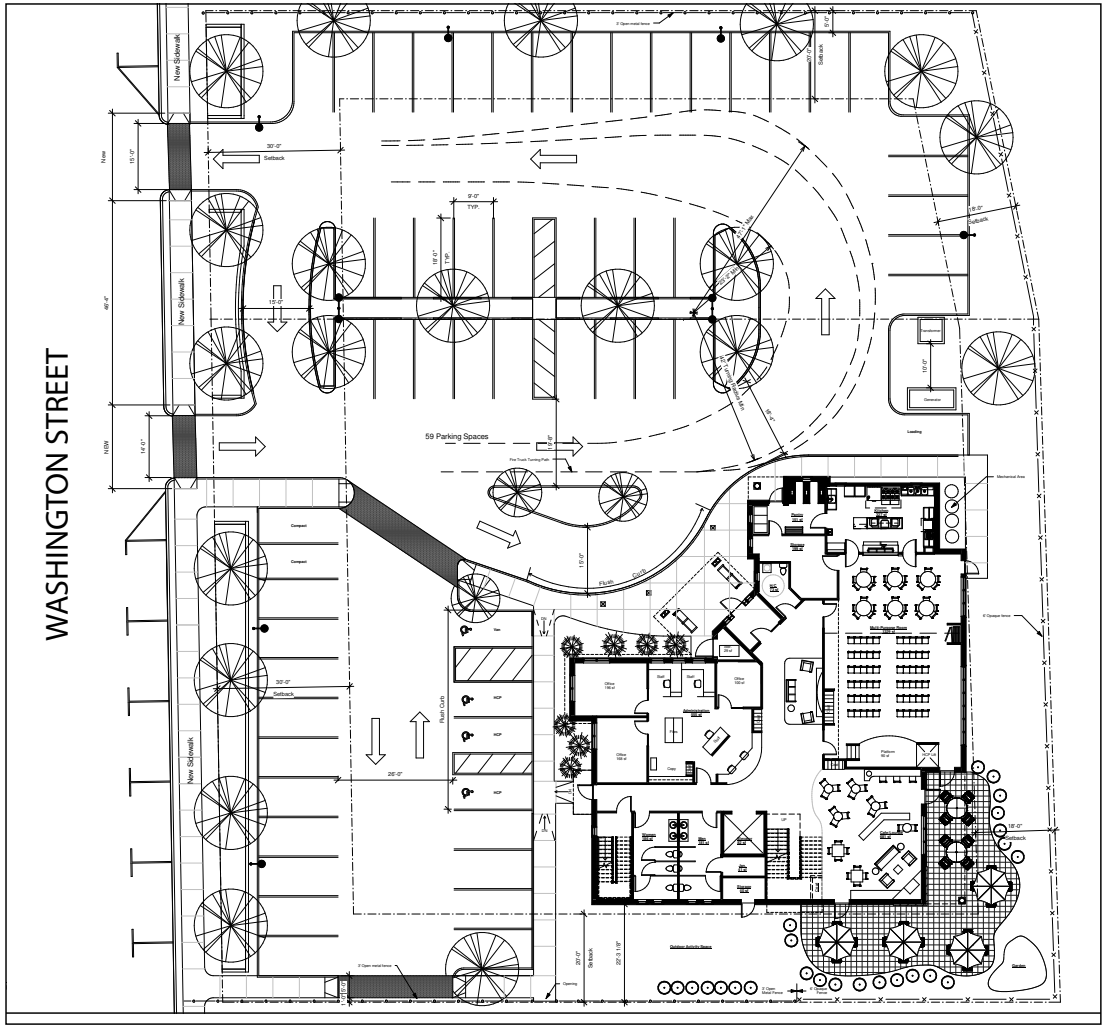


Figure 8. Tolles-Parsons Center Site Plan



Not to scale.

Figure 9. Vehicle Trip Distribution

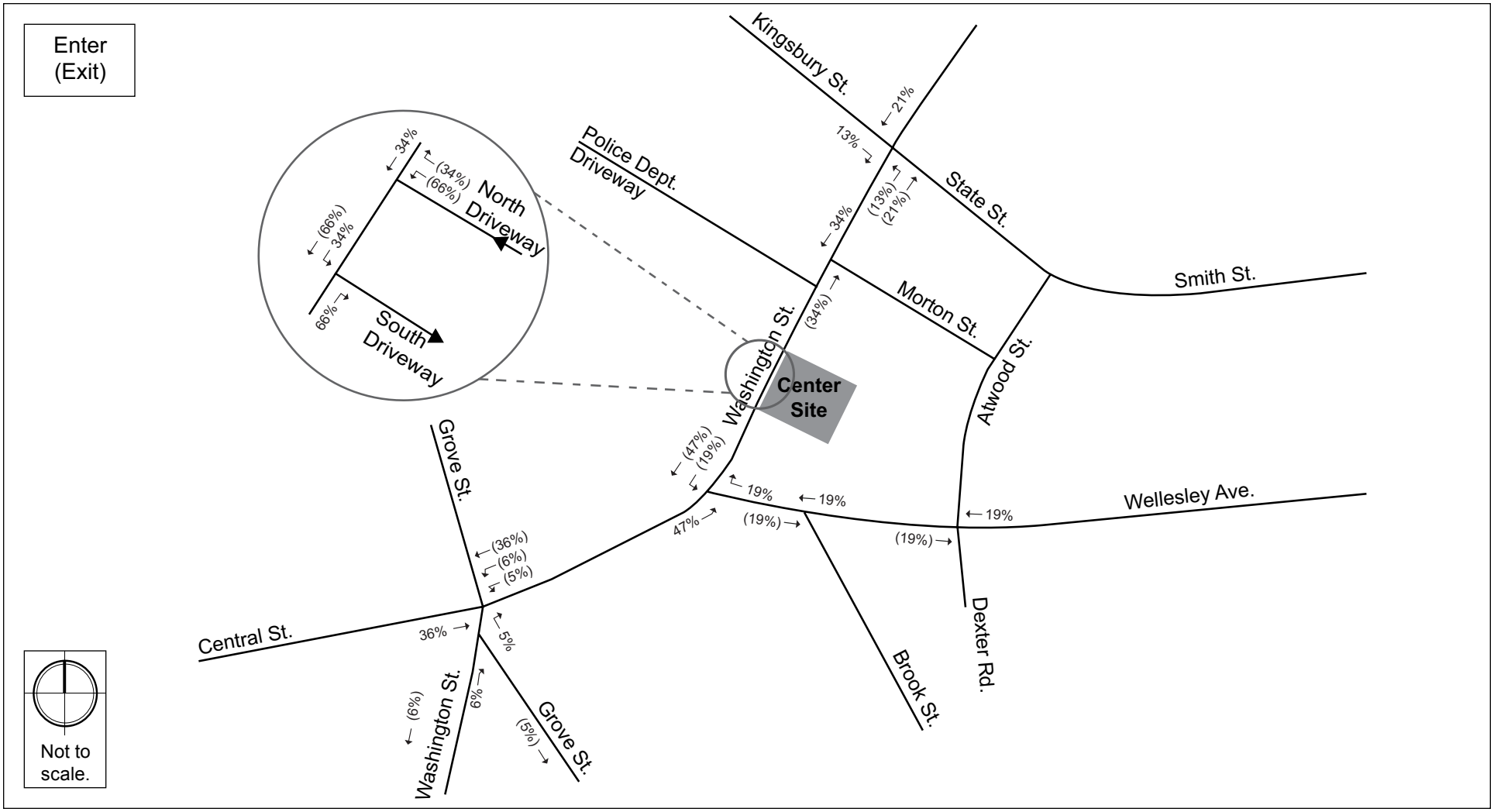


Figure 10. Project Generated Vehicle Trips, Peak Hour (10:45-11:45 a.m.)

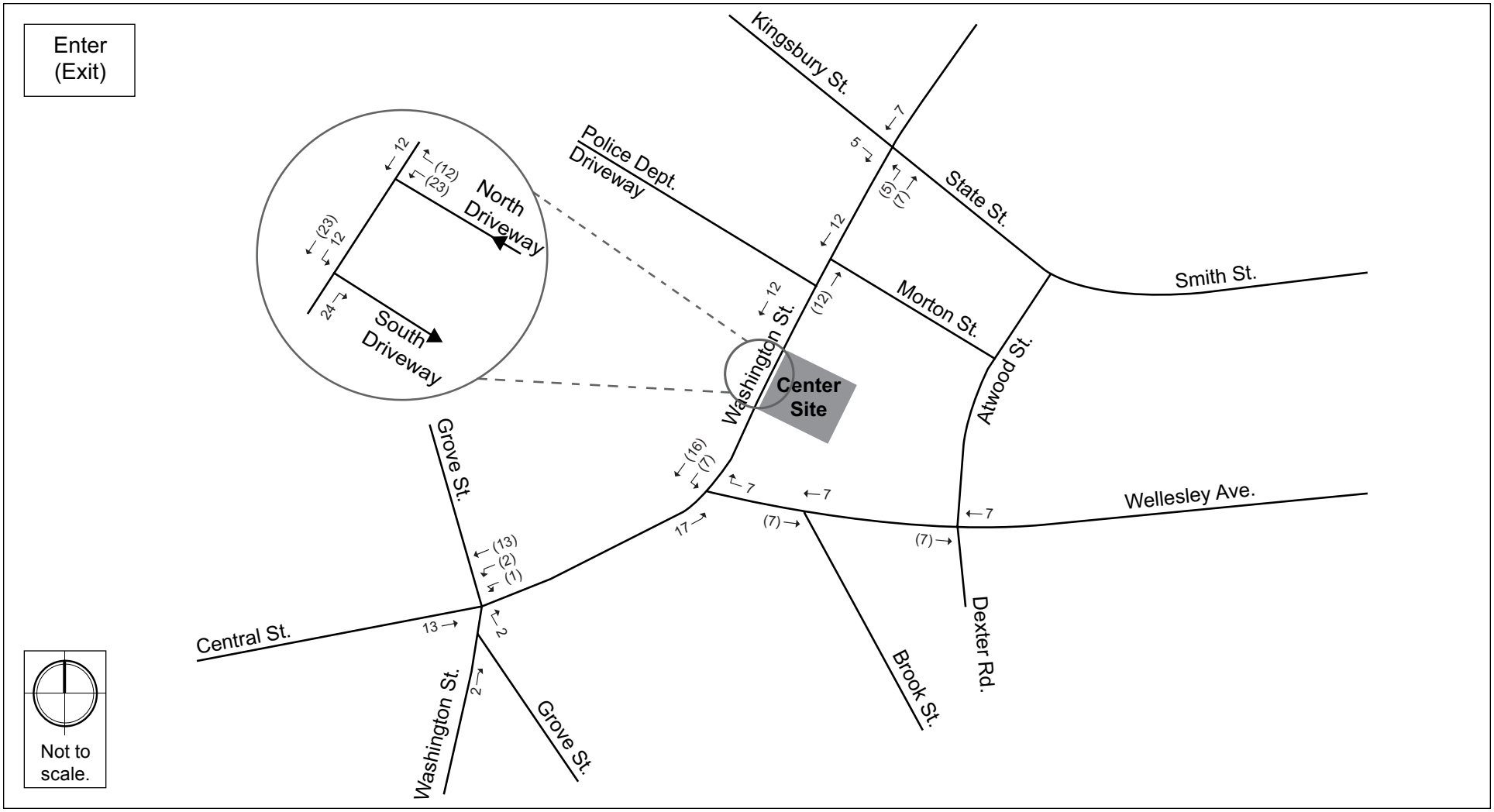
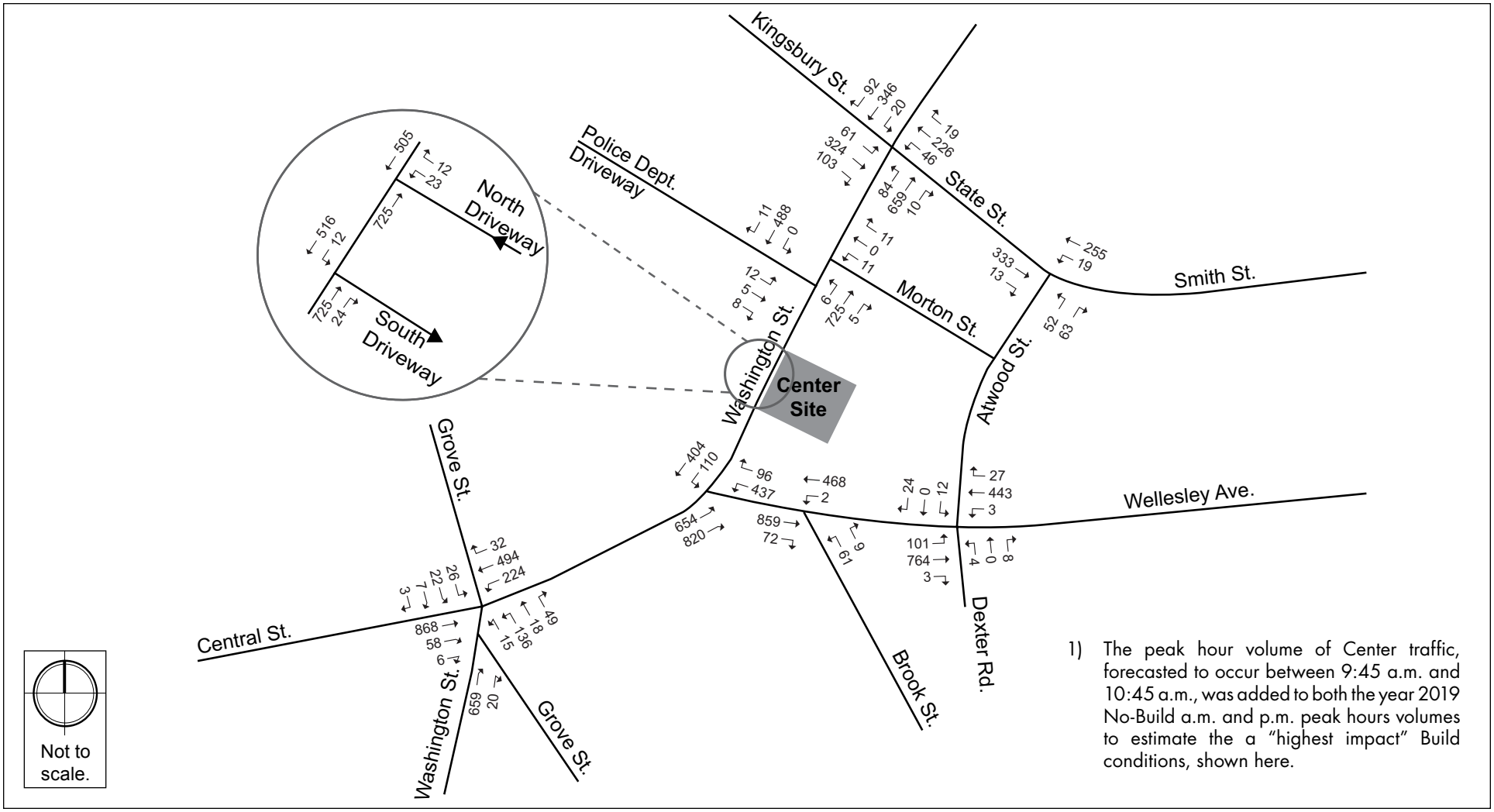
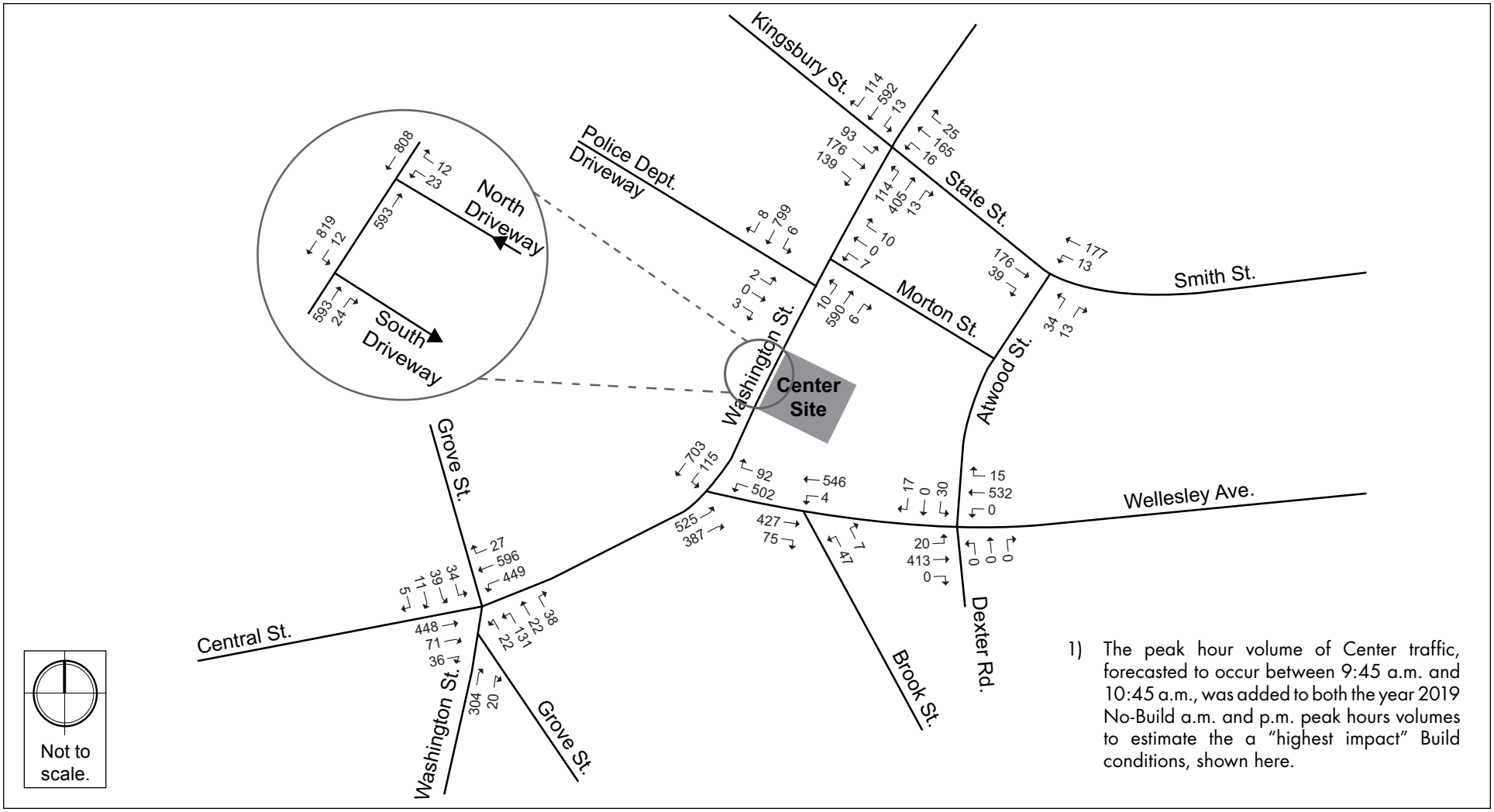


Figure 11. Build Conditions (2019) Intersection Volumes, a.m. Peak Hour [1)]



1) The peak hour volume of Center traffic, forecasted to occur between 9:45 a.m. and 10:45 a.m., was added to both the year 2019 No-Build a.m. and p.m. peak hours volumes to estimate the a "highest impact" Build conditions, shown here.

Figure 12. Build Conditions (2019) Turning Movement Volumes, p.m. Peak Hour [1)]



1) The peak hour volume of Center traffic, forecasted to occur between 9:45 a.m. and 10:45 a.m., was added to both the year 2019 No-Build a.m. and p.m. peak hours volumes to estimate the a "highest impact" Build conditions, shown here.

Figure 13. Tolles-Parsons Center Parking Demand – Scenario 1A – Typical Weekday

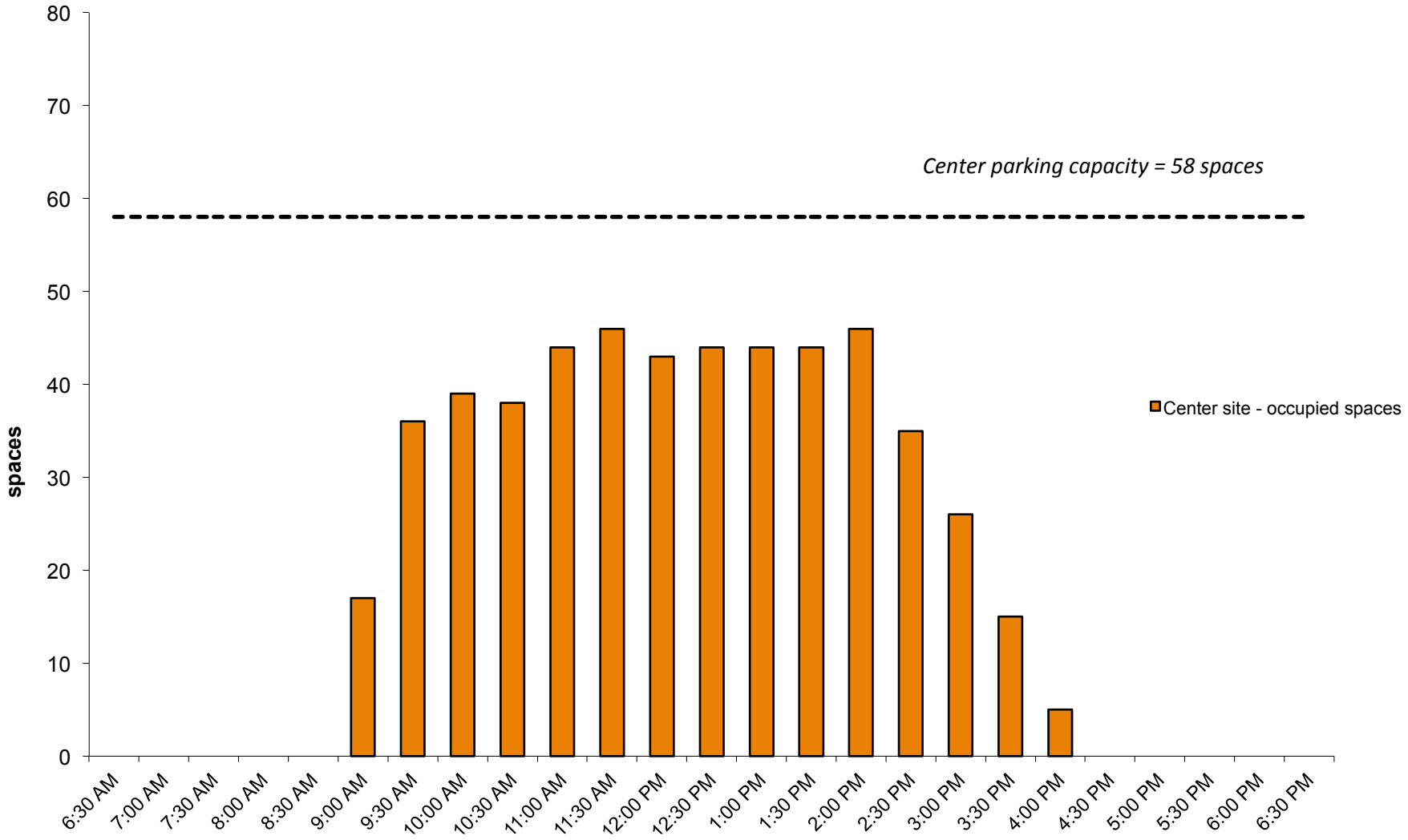


Figure 14. Tolles-Parsons Center Parking Demand – Scenario 1B – Typical Weekday

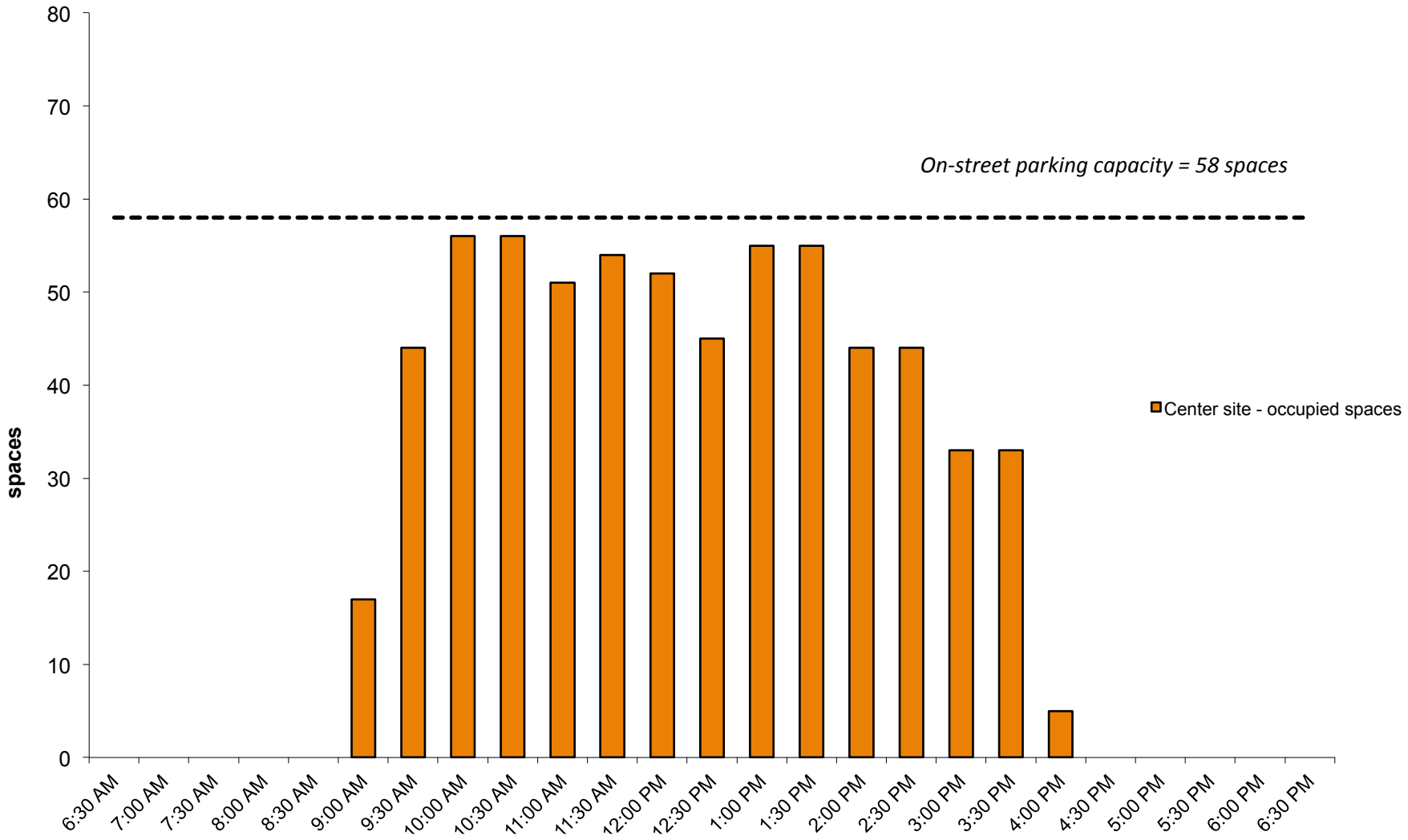


Figure 15. Washington Street Parking Demand – Scenario 1A and 1B – Typical Weekday

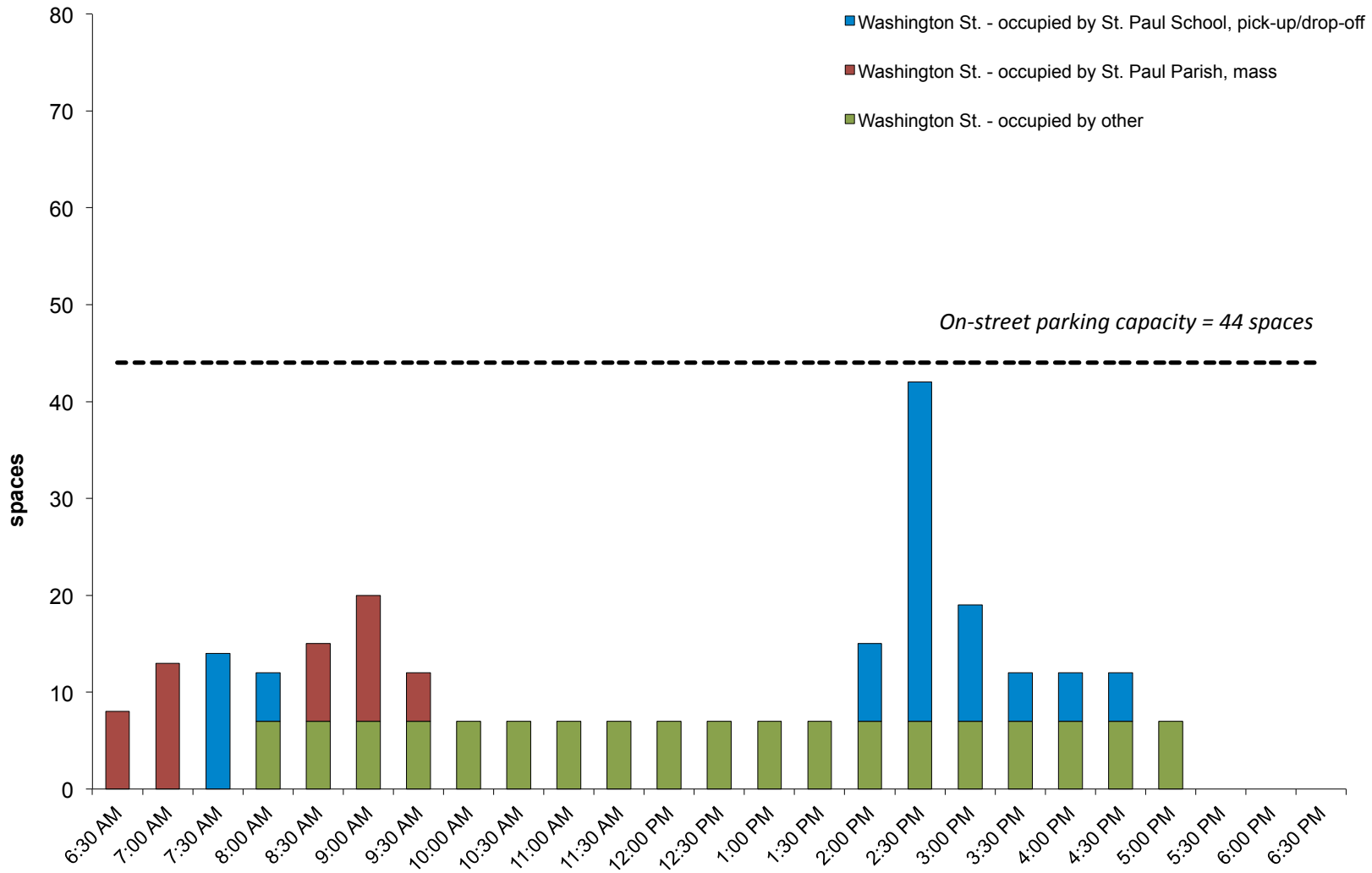


Figure 16. Washington Street Parking Demand – Scenario 2 – Wednesday (early school dismissal)

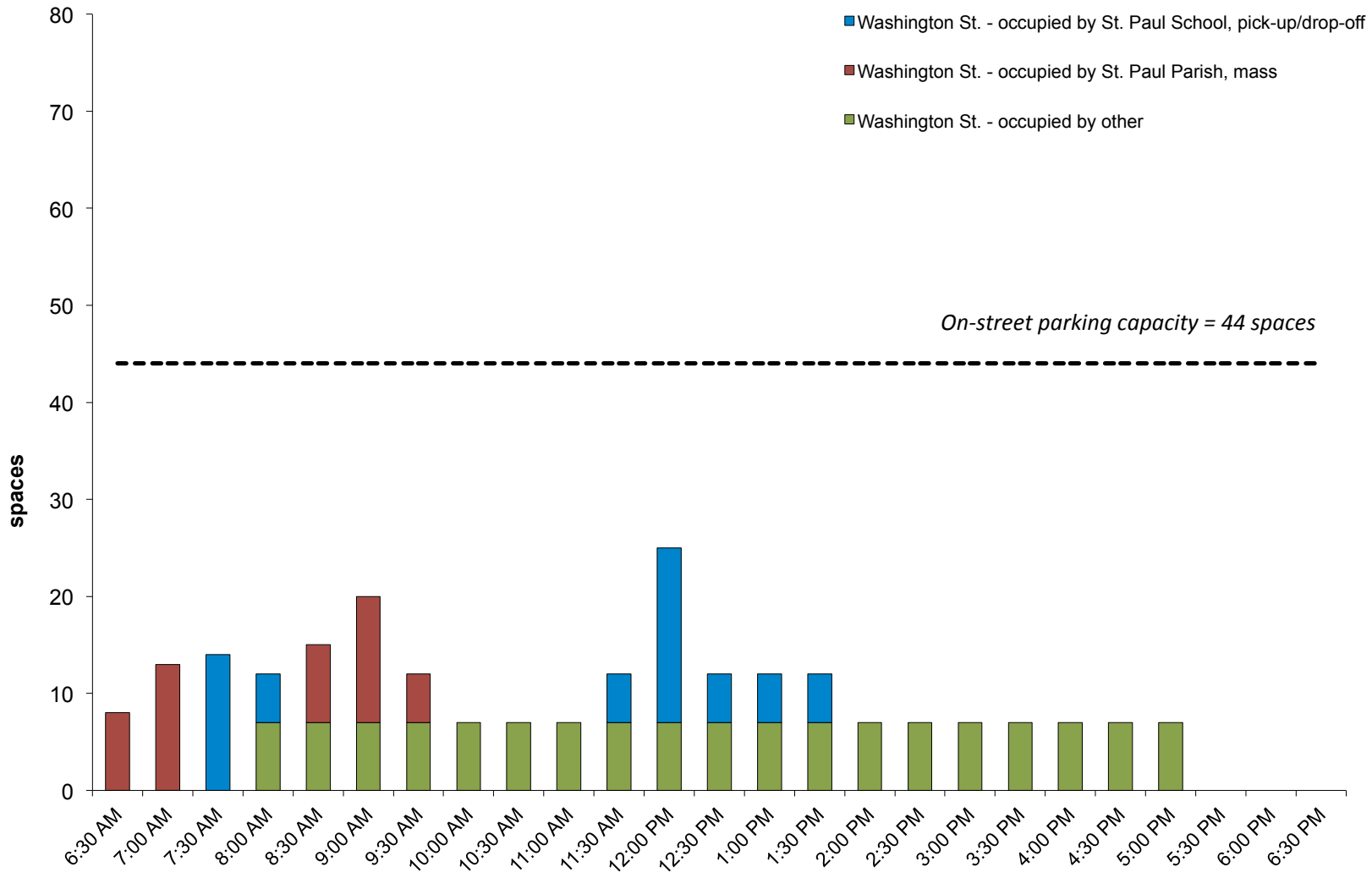
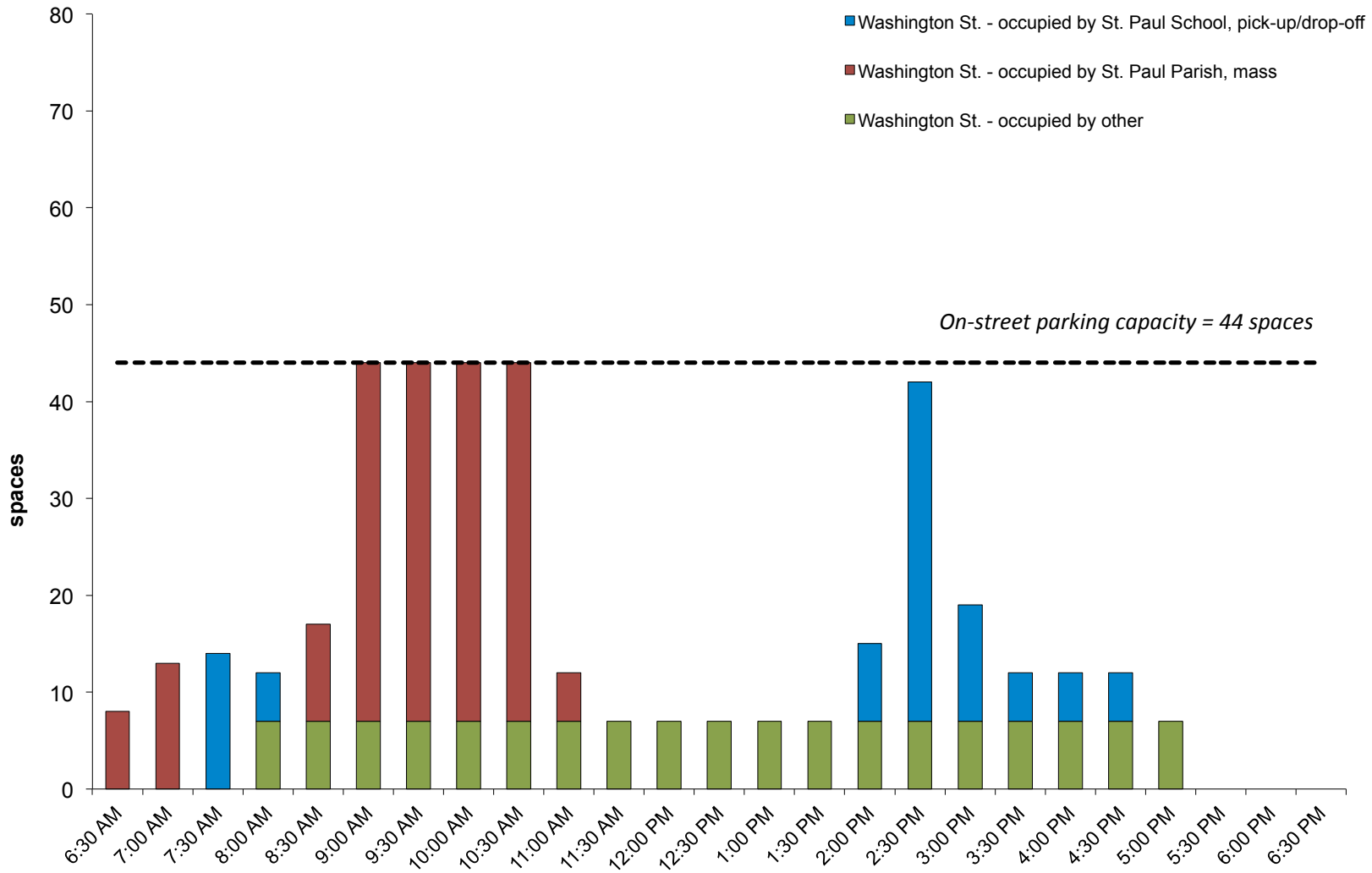


Figure 17. Washington Street Parking Demand – Scenario 3 - Weekday with Funeral at St. Paul



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