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Tolles-Parsons Senior Center Transportation Study

FINAL REPORT

Prepared for

Town of Wellesley, Massachusetts

Prepared by

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August 5, 2013



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Table of Contents

| | |
|--|-----------|
| Summary | 1 |
| Introduction..... | 4 |
| Background | 4 |
| Project Description | 4 |
| Study Area..... | 5 |
| Existing Conditions..... | 5 |
| Existing Site | 5 |
| Existing Roadway Conditions | 5 |
| Existing Intersection Conditions | 6 |
| Signalized Intersections | 7 |
| Unsignalized Intersection..... | 7 |
| Existing Traffic Conditions | 8 |
| Intersection Volumes | 8 |
| Intersection Operations | 8 |
| Crash History | 12 |
| Existing Parking Conditions..... | 14 |
| St. Paul Parish..... | 14 |
| St. Paul School..... | 15 |
| Other Users | 15 |
| Existing Pedestrian Conditions..... | 16 |
| Sidewalk Conditions | 16 |
| Existing Washington Street Signalized Crosswalk..... | 16 |
| Future Conditions | 17 |
| 2018 No-Build Conditions | 17 |
| 2018 No-Build Traffic Operations..... | 18 |
| 2018 Build Conditions..... | 21 |
| Activity at the Center | 21 |
| Mode Share | 25 |
| New Vehicle Trips | 26 |
| Vehicle Trip Distribution..... | 26 |
| 2018 Build Traffic Operations | 27 |
| Future Parking Supply and Demand | 30 |
| New Signalized Crosswalk | 32 |
| Sight Distance | 32 |
| Roadway and Parking Impacts | 33 |
| Roadway Impacts | 33 |
| Parking Impacts..... | 34 |

List of Tables

| | | |
|-----------|--|----|
| Table 1. | Intersection Level of Service Criteria..... | 9 |
| Table 2. | Existing Conditions (2013) Capacity Analysis Summary, a.m. Peak Hour | 10 |
| Table 3. | Existing Conditions (2013) Capacity Analysis Summary, p.m. Peak Hour | 11 |
| Table 4. | Crash History at Study Area Intersections, 2010–2012 | 13 |
| Table 5. | Washington Street Pedestrian Signal Characteristics | 17 |
| Table 6. | No-Build Conditions (2018) Capacity Analysis Summary, a.m. Peak Hour | 19 |
| Table 7. | No-Build Conditions (2018) Capacity Analysis Summary, p.m. Peak Hour | 20 |
| Table 8. | Typical Weekday Schedule Activities..... | 22 |
| Table 9. | Scenario 1A – Program Duration and Participation | 24 |
| Table 10. | Scenario 1A - Program Visitor Trips by Time | 25 |
| Table 11. | Mode Shares and Vehicle Occupancy Rates | 25 |
| Table 12. | Center Vehicle Trips by Time of Day | 26 |
| Table 13. | Vehicle Trip Distribution and Travel Routes | 27 |
| Table 14. | Build Conditions (2018) Capacity Analysis Summary, a.m. Peak Hour..... | 28 |
| Table 15. | Build Conditions (2018) Capacity Analysis Summary, p.m. Peak Hour | 29 |
| Table 16. | Impacted Roadways Determination | 33 |

List of Figures

| | | |
|------------|---|----|
| Figure 1. | Study Area..... | 35 |
| Figure 2. | Existing Conditions (2013) Intersection Volumes, p.m. Peak Hour (8:00–9:00 a.m.)..... | 36 |
| Figure 3. | Existing Conditions (2013) Intersection Volumes, p.m. Peak Hour (5:00–6:00 p.m.) | 37 |
| Figure 4. | Existing On-Street Parking on Washington Street | 38 |
| Figure 5. | Sidewalk Conditions..... | 39 |
| Figure 6. | No-Build Conditions (2018) Intersection Volumes, a.m. Peak Hour | 40 |
| Figure 7. | No-Build Conditions (2018) Intersection Volumes, p.m. Peak Hour | 41 |
| Figure 8. | Tolles-Parsons Center Site Plan | 42 |
| Figure 9. | Vehicle Trip Distribution | 43 |
| Figure 10. | Project Generated Vehicle Trips, Peak Hour (10:45 – 11:45 a.m.)..... | 44 |
| Figure 11. | Build Conditions (2018) Intersection Volumes, a.m. Peak Hour | 45 |
| Figure 12. | Build Conditions (2018) Intersection Volumes, p.m. Peak Hour | 46 |
| Figure 13. | Combined Parking Demand at Center, Washington Street, and WPD Lot - Scenario 1A - Weekday with 150 visitors | 47 |
| Figure 14. | Combined Parking Demand at Center, Washington Street, and WPD Lot - Scenario 1B - Weekday with 130 visitors | 48 |
| Figure 15. | Combined Parking Demand at Center, Washington Street, and WPD Lot - Scenario 2 - Typical Wednesday during School Year | 49 |
| Figure 16. | Combined Parking Demand at Center, Washington Street, and WPD Lot - Scenario 3 - Weekday with Funeral at St. Paul Parish | 50 |

Appendix A (Bound Separately)

Automatic Traffic Recorder (ATR) Data (2009)

Peak Hour Traffic Data (Washington Street/Morton Street/Police Driveway)

Synchro Reports

Existing, No Build, and Build Conditions

Crash Data (2010-2012)

Washington/State/Kingsbury

Washington/Wellesley/Brook

Washington/Grove/Central

Washington/Morton Street/Police Driveway

Sight Distance Data

Summary

This study presents the traffic and parking impacts associated with the proposed Tolles-Parsons Senior Center (the Center) to be located at 496 Washington Street in Wellesley. This study is an update to the previous transportation study¹ produced during an earlier phase of the Center's development. The two primary reasons for revising the transportation study are to 1) update the 2009 traffic counts and 2) incorporate the recent plan for 22 additional Center parking spaces to be located in an expanded Wellesley Police Department (WPD) parking lot. In this study, Site 1 refers to the Center site at 496 Washington Street and Site 2 refers to the expanded WPD parking lot at 485 Washington Street.

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) 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. 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.
- On a typical day, the peak hour of traffic activity generated by the Center will occur between 10:45 and 11:45 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 56 designated parking spaces: 34 on-site parking spaces at Site 1 and 22 spaces reserved in the expanded WPD parking lot, Site 2. (The new Site 2 lot will have 22 spaces for Center use and nine additional spaces for WPD use.)
- The Center's parking demand will vary throughout the day as visitors arrive and depart. Four parking demand scenarios were assessed:

¹ "Tolles-Parsons Senior Center: Transportation Study, Final Report", prepared for the Town of Wellesley by Howard/Stein-Hudson Associates, September 3, 2009.

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.

- Under each scenario, parking demand for all Center visitors will be met either on-site or at the expanded WPD parking lot.
- Under Scenario 1A, with 150 daily visitors, the Center will have a peak parking demand of about 50 parking spaces, occurring at about 11:00 a.m. The Center’s peak parking demand will be met with on-site spaces of Site 1 and use of the expanded WPD lot on Site 2.
- 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. The Center’s parking demand will be met with the on-site spaces and use of the expanded WPD parking lot.
- 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.
- The parking demand generated by a weekday funeral at St. Paul’s Parish was evaluated under Scenario 3. About 50 to 60 funerals occur annually, with between 40 and 300 attendees. Typically, funerals occur mid-morning and attendees park along Washington Street between about 9:00 a.m. and 11:00 a.m. Because the major peak parking demand for funerals occurs before the Center’s on-site parking lot is completely occupied with Center visitors, most public parking along Washington Street will be available (as they are today) for funeral activity.
- 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 WPD, St. Paul’s Parish, and St. Paul’s School. These public parking spaces have a two-hour time limit.
- Several public parking spaces on Washington Street may need to be removed to accommodate the Center’s new driveway curb cuts and a new pedestrian signal. For analysis purposes in this study, it is estimated that eight spaces will be removed from Washington Street (between Wellesley Avenue and Morton Street). However, the final number and location of which parking spaces will be removed is dependent on the separate engineering study of the new Washington Street pedestrian signal.
- On weekends/holidays, when the Center is not opened, the Center’s 34 parking spaces on-site and 22 spaces at the expanded WPD lot would be available for the parking demand generated by St. Paul activities.

Pedestrians and Bicycles

- To provide a safe walking environment between the WPD parking lot at Site 2 and the Center at Site 1, the Town will be installing a new signalized pedestrian crossing on Washington Street.

The new signal will replace the existing pedestrian signal on Washington Street at St. Paul Parish/School and be located further north on Washington Street. The new pedestrian signal location will conveniently serve pedestrians destined to/from both the Center and St. Paul's Parish/School. The existing crosswalk (unsignalized) at Washington Street near the WPD will be removed. The exact location and type of the new pedestrian signal is being determined through a separate engineering study.

- Most sidewalks in the study area are in excellent or good condition.
- While the Center is not expected to generate significant bicycle trips, a bicycle rack will be provide 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.

Conclusion

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 56 designated parking spaces: 34 on-site parking spaces at Site 1 and 22 spaces reserved in the expanded WPD parking lot, Site 2. These 56 spaces will satisfy the Center's parking needs and the Center will not impact parking activity associated with adjacent land uses.

Introduction

Background

In January 2007, the Wellesley Board of Selectmen in alliance with the Wellesley Council on Aging (COA) appointed the Senior Study Committee to evaluate the support and service needs of Wellesley's senior residents. COA currently operates in the basement of the Wellesley Community Center (WCC) at 219 Washington Street. After studying all available options to expand the COA's operation at WCC, the Committee chose to study the feasibility of constructing a freestanding senior center at the former American Legion site at 496 Washington Street. After a period of additional assessment, the Board of Selectmen reaffirmed, in spring 2012, that a senior center was a major priority for the Town.

In Wellesley, proponents of major construction projects are required to conduct impact assessment to municipal systems such as water, sewer, drainage, electricity, and traffic. 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 Senior Center Building Committee 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, at Site 1, will be a two-story, 14,500 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 56 designated parking spaces: 34 on-site parking spaces at Site 1 and 22 spaces reserved in the expanded WPD parking lot, Site 2. Access to Site 1 will be provided on Washington Street via an enter-only driveway on the northern side of the Center site. Traffic will circulate one-way through the site and leave via an exit-only driveway onto Washington Street. The exit-only driveway will be located approximately where the former American Legion site driveway remains today.

Access and egress to the Center's designated spaces at the WPD parking lot will be via the existing WPD Driveway, which will be widened as part of the parking lot expansion project.

Study Area

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

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

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.

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

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 496 Washington Street, the former American Legion site. 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 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.

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 through 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 roadway 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 through/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 Intersection

Washington Street (Route 16)/Morton Street/WPD Driveway is an unsignalized, slightly skewed four-approach intersection. The WPD 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.

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

In the earlier traffic study, intersection volume data were collected in May and June of 2009. Because of the time lapse since the earlier study, more recent peak hour data were obtained from both new counts and BETA Group, engineering consultants for the Town. New peak period intersection counts were collected at the Washington Street/WPD Driveway/Morton Street on Thursday, May 23, 2013. BETA Group provided the study team with Year 2012 intersection volumes for the remaining study intersections. To estimate Year 2013 volumes from the Year 2012 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 and June are 0.91 and 0.90, 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.

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

The May 2013 intersection count data and automatic traffic recorder (ATR) counts collected in 2009 during an earlier phase of this study are shown in **Appendix A**.

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 Group provided the intersection signal timing and phasing used in this analysis. **Table 1** 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 an urban environment, such as the Project study area, and below theoretical operating capacity.

Table 1. 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 2 and **Table 3** 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.

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

Table 2. Existing Conditions (2013) Capacity Analysis Summary, a.m. Peak Hour

| Intersection | LOS | Delay (seconds) | V/C Ratio | 95 th Percentile Queue (feet) |
|--|----------|-----------------|-----------|--|
| Signalized Intersections | | | | |
| Washington Street (Route 16)/ State Street/Kingsbury Street | D | 36.2 | | |
| Washington EB left/thru thru/right | C | 33.5 | 0.70 | 297 |
| Washington WB left/thru/right | C | 28.4 | 0.48 | 175 |
| State NB left/thru | E | 74.5 | 0.89 | #255 |
| State NB right | D | 39.3 | 0.09 | 33 |
| Kingsbury SB left/thru/right | C | 25.4 | 0.58 | #354 |
| Washington Street (Route 16)/ Wellesley Avenue/Brook Street | C | 29.5 | | |
| Wellesley WB left | C | 28.5 | 0.64 | 386 |
| Wellesley WB right | B | 19.3 | 0.14 | 77 |
| Washington NB thru | E | 62.7 | 0.98 | #937 |
| Washington NB right | A | 9.1 | 0.70 | 571 |
| Washington SB left/thru thru | C | 23.2 | 0.56 | 218 |
| Brook NWB left/right (unsignalized leg) | F | >50.0 | 0.66 | 93 |
| Washington Street (Route 16)/ Central Street/Grove Street | E | 66.3 | | |
| Central EB thru thru/right | F | >80.0 | >1.00 | #615 |
| Washington WB left | D | 35.6 | 0.47 | 230 |
| Washington WB thru/right | B | 17.8 | 0.59 | 426 |
| Grove NB left/thru/right | E | 64.5 | 0.83 | #274 |
| Grove SB left/thru/right | D | 37.4 | 0.27 | 68 |
| Washington NEB right right/hard right | E | 56.2 | 0.93 | #470 |
| Unsignalized Intersections | | | | |
| Washington Street (Route 16)/ Morton Street/WPD Driveway | | | | |
| Driveway EB left/thru/right | D | 31.4 | 0.19 | 17 |
| Morton WB left/thru/right | D | 29.7 | 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 |

= 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.

Grey shading indicates LOS E or LOS F.

EB = eastbound, WB=westbound, NB=northbound, SB=southbound

Table 3. Existing Conditions (2013) Capacity Analysis Summary,
 p.m. Peak Hour

| Intersection | LOS | Delay (seconds) | V/C Ratio | 95 th Percentile Queue (feet) |
|--|----------|-----------------|-----------|--|
| Signalized Intersections | | | | |
| Washington Street (Route 16)/ State Street/Kingsbury Street | C | 31.0 | | |
| Washington EB left/thru thru/right | C | 31.2 | 0.59 | 214 |
| Washington WB left/thru/right | C | 30.7 | 0.61 | 278 |
| State NB left/thru | D | 48.5 | 0.52 | 184 |
| State NB right | D | 40.1 | 0.09 | 38 |
| Kingsbury SB left/thru/right | C | 22.9 | 0.48 | 304 |
| Washington Street (Route 16)/ Wellesley Avenue/Brook Street | C | 28.1 | | |
| Wellesley WB left | C | 31.6 | 0.72 | 470 |
| Wellesley WB right | B | 19.1 | 0.13 | 76 |
| Washington NB thru | D | 37.9 | 0.73 | #623 |
| Washington NB right | A | 3.4 | 0.30 | 141 |
| Washington SB left/thru thru | C | 33.0 | 0.83 | #471 |
| Brook NWB left/right (unsignalized leg) | C | 24.2 | 0.30 | 31 |
| Washington Street (Route 16)/ Central Street/Grove Street | D | 38.9 | | |
| Central EB thru thru/right | D | 44.6 | 0.77 | 263 |
| Washington WB left | D | 50.7 | 0.84 | #573 |
| Washington WB thru/right | C | 22.9 | 0.72 | 553 |
| Grove NB left/thru/right | E | 59.9 | 0.81 | #294 |
| Grove SB left/thru/right | D | 36.4 | 0.32 | 107 |
| Washington NEB right right/hard right | C | 30.2 | 0.38 | 168 |
| Unsignalized Intersections | | | | |
| Washington Street (Route 16)/ Morton Street/WPD Driveway | | | | |
| Driveway EB left/thru/right | C | 19.1 | 0.03 | 2 |
| Morton WB left/thru/right | C | 18.6 | 0.07 | 6 |
| Washington NB left/thru/right | A | 0.5 | 0.02 | 1 |
| Washington SB left/thru/right | A | 0.3 | 0.01 | 0 |

= 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.

Grey shading indicates LOS E or LOS F.

EB = eastbound, WB=westbound, NB=northbound, SB=southbound

Crash History

In the 2009 study, crash history data were collected for the then-current last three year period, including years 2005-2008. Because of the time lapse since the earlier study, more recent crash data were obtained from the WPD. The study team assessed the crash history at the study area intersections. The last three complete years (2010-2012) of data were compiled by the WPD and summarized in **Table 4**.

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 0.58 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 two of the four locations have an average crash rate greater than the District average as described below:

- The intersection of Washington Street/Kingsbury Street/State Street has a crash rate of 0.87, with 14 of the 25 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. It is recommended that the Town of Wellesley evaluate the Year 2013 crash data when available and determine if the upward trend in the number of annual crashes is an anomaly caused by the detour or part of a continuing trend.
- The intersection of Washington Street/Morton Street/Police Driveway has a crash rate of 0.68 with six of the 14 crashes reported in the three-year period categorized as rear-end collisions. It is possible that the rear-end collisions are caused by drivers stopping quickly for 1) exiting emergency vehicles from the police station or 2) pedestrians in the unsignalized crosswalk, which is south of the WPD Driveway. (Note that the Town will be installing a new signalized pedestrian crossing on Washington Street, as discussed in a later section. In combination with the new signalized crosswalk, the existing crosswalk south of WPD Driveway/Morton Street will be removed.) It is recommended that the Town of Wellesley continue to evaluate the annual crash data at this location to see if the new crosswalk affects the number of future annual crashes.

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

Table 4. Crash History at Study Area Intersections, 2010–2012

| | Washington/ Kingsbury/State | Washington/ Wellesley/Brook | Washington/ Grove/Central | Washington/ Morton/Police Driveway |
|--------------------------------------|--------------------------------|--------------------------------|------------------------------|---------------------------------------|
| Year | | | | |
| 2010 | 6 | 6 | 6 | 4 |
| 2011 | 9 | 0 | 3 | 4 |
| 2012 | 10 | 0 | 0 | 6 |
| Manner of Collision | | | | |
| Single Vehicle Crash | 4 | 1 | 0 | 2 |
| Angle | 14 | 0 | 1 | 2 |
| Rear-end | 4 | 4 | 2 | 6 |
| Head-on | 2 | 0 | 1 | 0 |
| Sideswipe | 1 | 1 | 4 | 3 |
| Unknown/Other | 0 | 0 | 0 | 1 |
| Crash Severity | | | | |
| Property Damage Only | 23 | 5 | 7 | 12 |
| Personal Injury | 2 | 1 | 2 | 1 |
| Fatality | 0 | 0 | 0 | 0 |
| Hit and Run | 0 | 0 | 0 | 0 |
| Unknown | 0 | 0 | 0 | 1 |
| Weather Conditions | | | | |
| Clear | 17 | 4 | 7 | 9 |
| Cloudy | 5 | 2 | 1 | 3 |
| Rain | 5 | 1 | 1 | 1 |
| Snow | 1 | 1 | 0 | 1 |
| Unknown | 1 | 0 | 0 | 0 |
| Road Conditions | | | | |
| Dry | 20 | 4 | 6 | 11 |
| Wet | 5 | 1 | 3 | 2 |
| Snow | 0 | 1 | 0 | 1 |
| Slush | 0 | 0 | 1 | 0 |
| Unknown | 0 | 0 | 1 | 0 |
| Time of Day | | | | |
| 6:00–9:00 a.m. | 4 | 1 | 1 | 1 |
| 9:00 a.m.–3:00 p.m. | 11 | 3 | 5 | 5 |
| 3:00–6:00 p.m. | 6 | 3 | 1 | 5 |
| 6:00 p.m.–6:00 a.m. | 3 | 0 | 3 | 3 |
| Day of Week | | | | |
| Monday | 4 | 1 | 1 | 1 |
| Tuesday | 3 | 0 | 1 | 0 |
| Wednesday | 5 | 2 | 0 | 5 |
| Thursday | 4 | 0 | 4 | 2 |
| Friday | 3 | 0 | 2 | 4 |
| Saturday | 4 | 2 | 1 | 1 |
| Sunday | 2 | 1 | 0 | 1 |
| Summary | | | | |
| Total Crashes | 25 | 6 | 9 | 14 |
| Intersection Crash Rate * | 0.87 | 0.16 | 0.25 | 0.68 |
| District Average Crash Rate * | 0.76 | 0.76 | 0.76 | 0.58 |

* Crashes per million entering vehicles (MEV)

Existing Parking Conditions

The 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 north and the south 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 Group, working for the Town, evaluated parking conditions on Washington Street and in the American Legion Lot. Parking activity information from 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 Group observed 53 parked vehicles associated with the 9:00 a.m. morning mass on Ascension Day, a holy day of obligation.

In addition to scheduled masses, about 50 to 60 funerals occur annually, customarily taking place on weekdays and Saturdays. Typically, funerals occur mid-morning and attendees park along Washington Street between about 9:00 a.m. and 11:00 a.m. Because the major peak parking demand for funerals occurs before the Center's on-site parking lot is completely occupied with Center visitors, most public parking along Washington Street will be available (as they are today) for funeral activity. During large funerals, all legal parking spaces and often many illegal spaces along Washington Street are occupied.

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 serves about 200 students from 110 families in 14 communities. No bus service is provided. A few students walk, but most are driven to school by parents. 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 morning drop-off period is short, about 7:45 a.m. to 8:00 a.m. Parents can drop off students on the west curb of Atwood Street via a moving queue. Vehicles must be traveling southbound on Atwood Street to drop off students on the right-hand side. No drop-off is permitted on the east side of the street, because students would be required to cross the street. No parking is allowed on Atwood Street. On the Washington Street side of the school, some parents stop and drop-off their child or park and escort their child to the school. Fourteen vehicles were observed parked in the American Legion lot and along Washington Street during the drop-off period. This parking activity is short-lived and vehicles are gone before 8:00 a.m.

During the afternoon pick-up period, parents arrive prior to the dismissal at 2:30 p.m., and a few linger after dismissal. About 15% of students participate in an after-school program and are picked up at about 6:00 p.m. and about 15% participate in after-school activities, such as band or chorus.

In the May 2012 survey, a total of 35 vehicles were parked in the American Legion lot and along Washington Street for the 2:30 p.m. school pick-up. Parking duration is short-lived, lasting less than 15 minutes. The school also hosts a few events (such as grandparents' day, open house, etc.) throughout the year, during which visitors use the public parking spaces along Washington Street.

The 20 school staff members park on-site.

Other Users

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 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, the BETA Group survey noted an average of seven on-street occupied spaces, most likely attributable to the WPD and the medical building uses. Note that the future expansion of the WPD Lot will provide nine more spaces specifically for the WPD and may eliminate this use of Washington Street during shift changes.

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. Additionally, some visitors will park at the expanded WPD lot and walk to the Center along Washington Street sidewalks.

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 5**, the signal provides adequate time for pedestrians—even those who walk slower than average—to safely cross the street.

Table 5. 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 2018 was designated as the future year.

2018 No-Build Conditions

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 2018.

The study team also incorporated future traffic increases anticipated from the following specific projects:

- **Wellesley High School (WHS)** – The traffic study² 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 2018 No-Build volumes.
- **494 Washington Street** – In 2009, the property owner of 494 Washington Street, adjacent to the Center site, had proposed replacing the existing structure with eight new condominium units. While this proposal has not progressed, the estimated new vehicles trips have been incorporated into the 2018 No-Build volumes. The new peak-hour trips estimates were based on information in the *ITE Trip Generation Manual*, for Land Use Code 230, Residential Condominiums/Townhouse (Note that these trip were estimated during the earlier 2009 Center study and are based on the 8th edition of the Trip Generation Manual).

Because the proposed Center site at 496 Washington Street is currently vacant, no associated trip activity was included under the Year 2018 No-Build volumes. Future trips associated with the proposed redevelopment of the Wellesley Inn site are included in the background growth rate.³

2018 No-Build Traffic Operations

The 2018 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 6** and **Table 7**. Complete Synchro reports are provided in **Appendix A**.

Under No-Build conditions, with additional volume due to background growth, two intersections will experience changes in forecasted levels of service as presented below:

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 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.

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

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

³ As estimated by HSH Associates, the new vehicle trips generated by the proposed Wellesley Inn redevelopment will increase traffic volumes on Washington Street by less than one percent.

Table 6. No-Build Conditions (2018) Capacity Analysis Summary, a.m. Peak Hour

| Intersection | LOS | Delay (seconds) | V/C Ratio | 95 th Percentile Queue (feet) |
|--|----------|-----------------|-----------|--|
| Signalized Intersections | | | | |
| Washington Street (Route 16)/ State Street/Kingsbury Street | D | 52.2 | | |
| Washington EB left/thru thru/right | D | 35.2 | 0.74 | 320 |
| Washington WB left/thru/right | C | 29.6 | 0.54 | 189 |
| State NB left/thru | F | >80.0 | >1.00 | #374 |
| State NB right | D | 39.4 | 0.09 | 15 |
| Kingsbury SB left/thru/right | D | 36.8 | 0.82 | #572 |
| Washington Street (Route 16)/ Wellesley Avenue/Brook Street | D | 35.7 | | |
| Wellesley WB left | C | 29.0 | 0.66 | 421 |
| Wellesley WB right | B | 19.1 | 0.15 | 84 |
| Washington NB thru | F | >80.0 | >1.00 | #998 |
| Washington NB right | B | 11.0 | 0.76 | 715 |
| Washington SB left/thru thru | C | 25.2 | 0.60 | 232 |
| Brook NWB left/right (unsignalized leg) | F | >50.0 | 0.82 | 127 |
| Washington Street (Route 16)/ Central Street/Grove Street | F | >80.0 | | |
| Central EB thru thru/right | F | >80.0 | >1.00 | #676 |
| Washington WB left | D | 37.6 | 0.51 | 247 |
| Washington WB thru/right | C | 20.1 | 0.64 | 472 |
| Grove NB left/thru/right | E | 67.8 | 0.85 | #320 |
| Grove SB left/thru/right | D | 37.4 | 0.29 | 74 |
| Washington NEB right right/hard right | E | 73.5 | >1.00 | #505 |
| Unsignalized Intersections | | | | |
| Washington Street (Route 16)/ Morton Street/WPD Driveway | | | | |
| Driveway EB left/thru/right | E | 37.2 | 0.25 | 23 |
| Morton WB left/thru/right | E | 35.3 | 0.25 | 23 |
| Washington NB left/thru/right | A | 0.2 | 0.01 | 1 |
| Washington SB left/thru/right | A | 0.0 | 0.00 | 0 |

= 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 7. No-Build Conditions (2018) Capacity Analysis Summary, p.m. Peak Hour

| Intersection | LOS | Delay (seconds) | V/C Ratio | 95 th Percentile Queue (feet) |
|--|----------|-----------------|-----------|--|
| Signalized Intersections | | | | |
| Washington Street (Route 16)/ State Street/Kingsbury Street | C | 31.9 | | |
| Washington EB left/thru thru/right | C | 32.4 | 0.64 | 230 |
| Washington WB left/thru/right | C | 31.6 | 0.65 | 298 |
| State NB left/thru | D | 49.5 | 0.55 | 193 |
| State NB right | D | 40.3 | 0.10 | 42 |
| Kingsbury SB left/thru/right | C | 23.7 | 0.52 | 324 |
| Washington Street (Route 16)/ Wellesley Avenue/Brook Street | C | 30.8 | | |
| Wellesley WB left | C | 32.4 | 0.74 | 505 |
| Wellesley WB right | B | 18.9 | 0.14 | 80 |
| Washington NB thru | D | 41.3 | 0.78 | #673 |
| Washington NB right | A | 3.5 | 0.31 | 150 |
| Washington SB left/thru thru | D | 37.8 | 0.88 | #520 |
| Brook NWB left/right (unsignalized leg) | D | 27.1 | 0.35 | 37 |
| Washington Street (Route 16)/ Central Street/Grove Street | D | 43.2 | | |
| Central EB thru thru/right | D | 46.8 | 0.80 | 280 |
| Washington WB left | E | 64.2 | 0.93 | #613 |
| Washington WB thru/right | C | 26.2 | 0.77 | #655 |
| Grove NB left/thru/right | E | 59.6 | 0.81 | #322 |
| Grove SB left/thru/right | D | 36.7 | 0.33 | 113 |
| Washington NEB right right/hard right | C | 31.9 | 0.42 | 178 |
| Unsignalized Intersections | | | | |
| Washington Street (Route 16)/ Morton Street/WPD Driveway | | | | |
| Driveway EB left/thru/right | C | 21.8 | 0.06 | 5 |
| Morton WB left/thru/right | C | 20.4 | 0.09 | 7 |
| Washington NB left/thru/right | A | 0.4 | 0.01 | 1 |
| Washington SB left/thru/right | A | 0.2 | 0.01 | 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 the Existing Conditions.

EB = eastbound, WB=westbound, NB=northbound, SB=southbound

2018 Build Conditions

For Build Conditions, the traffic activity associated with the new Senior Center is added to that under No-Build Conditions. The site plan for the Center is shown in **Figure 8**. The Center will include 14,500 square feet and have 56 designated parking spaces: 34 on-site parking spaces at Site 1 and 22 spaces reserved in the expanded WPD parking lot, Site 2. The site will have one enter-only driveway and one exit-only driveway.

Activity at the 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, along with evaluation of 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.

A profile of trip activity at the Center was developed based on knowledge of the current Wellesley COA, the projected schedule of activity at the new Center, and interviews with administrators at three other senior centers that have operations comparable to the proposed Center and are located in communities with characteristics similar to Wellesley.

Table 8 shows a daily schedule taken from recent calendars at the existing Wellesley Center and the other three centers.

Key information on the Wellesley COA and facilities in Franklin, Marshfield, and Winchester is presented below:

- **Wellesley COA** – Wellesley has a population of about 24,900 residents. The Council on Aging currently operates in the Wellesley Community Center and has one room dedicated to senior programs. 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, and 2% walk.

Table 8. Typical Weekday Schedule Activities

| Wellesley COA at current location ¹ | |
|---|------------------------|
| 9:00 a.m. | Walking |
| 9:30 a.m. | Better Bones |
| | Wii |
| 10:00 a.m. | Art 4 Fun |
| 11:30 a.m. | Poetry Class |
| 11:00 a.m. | Balance |
| 11:45 a.m. | Lunch |
| 12:30 p.m. | Bridge |
| Franklin Senior Center/COA | |
| 9:00 a.m. | Sew What Quilting Bee |
| | Walking Club |
| 10:00 a.m. | Yoga |
| | Scrabble Club |
| | Knitting Class |
| 10:30 a.m. | Chair Massage |
| 11:00 a.m. | Zumba Dance Aerobics |
| 1:00 p.m. | Advanced Line Dancing |
| Marshfield Center/COA | |
| 9:00 a.m. | Floor Yoga |
| 9:30 a.m. | Breakfast Club |
| 10:00 a.m. | T'ai Chi Class |
| | Craft Class |
| 12:00 p.m. | Lunch |
| 1:00 p.m. | Pinochle |
| Winchester Jenks Center | |
| 9:30 a.m. | Exercise Class |
| | Art Group |
| 10:30 a.m. | Men's Discussion Group |
| 11:30 a.m. | Weight Watchers |
| 11:30 a.m. | Eating Together |
| 1:00 p.m. | Texas Hold'em Poker |
| | Ballroom Dancing |
| | Bingo |

1) These activities are for the existing COA center. With the new Center, programs and activities will be expanded. An example day at the new Center is shown in Table 9.

- **Franklin Senior Center/COA** – Franklin, a town of about 30,200 residents, has a 16,000-sf senior center. On a typical day, between 100 and 150 people visit the center. The center has 90 parking spaces, although the original plan for the building included 120 spaces. Of the 90 spaces, 25 are designated for handicapped parkers. About 85% of visitors drive or carpool, 10% to 15% use a bus service, and a few visitors walk in good weather. Visitors often complain about the lack of parking. Although additional parking spaces are available at an adjacent elementary school, visitors do not often use them because of the distance and steep terrain.
- **Marshfield COA** – Marshfield, a town of about 24,300 residents, has a 12,400-sf senior center in a suburban setting. On a typical day, this center has between 100 and 150 visitors. The center has about 105 parking spaces, nine of which are designated for handicapped drivers. Visitors complain that not enough handicapped-accessible spaces are provided in the lot. Most visitors drive or carpool, about 10% ride the senior bus, and no visitors walk. When multiple major activities occur, visitors complain about having to park too far away from the building, but parking capacity seems adequate. The parking lot is shared with youth baseball fields, but game times do not typically overlap with the center’s activities.
- **Winchester COA** – Winchester has a population of about 20,800 residents. The Jenks Senior Center is centrally located near Town Hall and the high school. While an adjacent Town-owned parking lot has about 155 spaces, only 27 are designated for the Jenks Center. Use of the other lot spaces requires a resident or employee parking permit, which must be purchased through the Town. The permit parking spaces are mostly occupied with local employees during weekdays and are not available to center visitors. Some on-street parking is available to center visitors, but the spaces are also used by the nearby church and high school. On a typical day, this center has about 150 visitors, most of who drive; many carpool because of the limited parking. A small percentage walks to the center.

While about 40 to 50 people already visit the existing Wellesley COA on a typical weekday, the Applicant expects that the 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—a rate consistent with observations at the centers discussed above. Visitor arrival and departure times will depend on the daily schedule of events at the center.

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.

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 (Scenario 1A). The visitor arrival and departure pattern assumes participation rates and lengths of stay consistent with that number of visitors.

Scenario 1A assumes that half of the 150 daily visitors participate in one activity and half stay for two activities.

In addition to the 150 daily visitors, it has been assumed that five employees and volunteers will be on-site at the Center each day. **Table 9** lists sample programs and number of participants anticipated at the Center, as provided to the study team by the Wellesley COA.

Table 10 shows by time of day the number of visitors arriving at and departing from the Center.

Table 9. Scenario 1A – Program Duration and Participation

| Program Times | Sample Program | Estimated Program Participants |
|----------------------------|-------------------------|---------------------------------------|
| 9:30–11:00 a.m. | Community Service Bears | 15 |
| 9:45–10:45 a.m. | Zumba | 25 |
| 10:00 a.m.–12:00 p.m. | Spanish | 15 |
| 11:00 a.m.–12:00 p.m. | Better Balance | 20 |
| 11:45 a.m.–1:00 p.m. | Lunch | 40 |
| 12:45–1:45 p.m. | Chi Gong | 20 |
| 1:00–4:00 p.m. | SHINE | 5 |
| 1:00–3:00 p.m. | Quilting Group | 15 |
| 2:00–3:00 p.m. | Board Games | 15 |
| 2:00–3:30 p.m. | Drama Club | 15 |
| 2:30–4:00 p.m. | Poetry | 15 |
| Total daytime participants | | 200 ¹⁾ |

1) Note that the 200 program participants reflect 150 visitors, because it is assumed that half of the participants stay for one activity and half stay for two activities.

Table 10. Scenario 1A - Program Visitor Trips by Time

| Time Period | Visitors Entering | Visitors Exiting | Visitors at Center (at end of time period) |
|-----------------------|-------------------|------------------|--|
| 8:45–9:15 a.m. | 0 | 0 | 0 |
| 9:15–9:45 a.m. | 20 | 0 | 20 |
| 9:45–10:15 a.m. | 35 | 0 | 55 |
| 10:15–10:45 a.m. | 0 | 0 | 55 |
| 10:45–11:15 a.m. | 25 | 20 | 60 |
| 11:15–11:45 a.m. | 12 | 15 | 57 |
| 11:45 a.m.–12:15 p.m. | 0 | 15 | 42 |
| 12:15–12:45 p.m. | 12 | 0 | 54 |
| 12:45–1:15 p.m. | 12 | 15 | 51 |
| 1:15–1:45 p.m. | 0 | 15 | 36 |
| 1:45–2:15 p.m. | 20 | 0 | 56 |
| 2:15–2:45 p.m. | 0 | 0 | 56 |
| 2:45–3:15 p.m. | 14 | 15 | 55 |
| 3:15–3:45 p.m. | 0 | 35 | 20 |
| 3:45–4:15 p.m. | 0 | 20 | 0 |
| Total | 150 | 150 | |

Mode Share

Mode share is the distribution of person trips among the available travel modes such as automobile, transit, and walking. 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%. The rate of carpooling activity was assumed to increase from 22% to 25% on a typical day, because the wider variety of programs is likely to attract more couples and mutual friends to visit the Center together. The existing and future mode shares and auto occupancies are shown in **Table 11**. Transit service is the COA shuttle bus available to seniors to make trips within Wellesley, as well as to nearby medical facilities. Because only a small number of visitors is expected to arrive via bicycle, bicycle mode shares are not included in the table. A bicycle rack will be provided at the Center.

Table 11. Mode Shares and Vehicle Occupancy Rates

| | Vehicle Share | | | Transit Share | Walk Share | Average Vehicle Occupancy (AVO) ¹⁾ |
|-----------------------|---------------|---------|----------|---------------|------------|---|
| | Drive Alone | Carpool | Drop Off | | | |
| Existing COA | 66% | 22% | 4% | 6% | 2% | 1.14 |
| Tolles-Parsons Center | 61% | 25% | 4% | 6% | 4% | 1.17 |

¹⁾ AVO is based on vehicle occupancy of 1.0 for drive alone and 2.0 persons for carpools.

New Vehicle Trips

Based on the number of visitors by time of day (**Table 10**) and the mode shares (**Table 11**), the number of vehicle trips by time of day was estimated and summarized in **Table 12**.

Table 12. Center Vehicle Trips by Time of Day

| Time Period | Vehicles Entering | Vehicles Exiting |
|-----------------------|-------------------|------------------|
| 8:45–9:15 a.m. | 5 | 0 |
| 9:15–9:45 a.m. | 17 | 2 |
| 9:45–10:15 a.m. | 29 | 3 |
| 10:15–10:45 a.m. | 0 | 0 |
| 10:45–11:15 a.m. | 24 | 20 |
| 11:15–11:45 a.m. | 12 | 15 |
| 11:45 a.m.–12:15 p.m. | 2 | 16 |
| 12:15–12:45 p.m. | 12 | 1 |
| 12:45–1:15 p.m. | 12 | 15 |
| 1:15–1:45 p.m. | 2 | 14 |
| 1:45–2:15 p.m. | 17 | 2 |
| 2:15–2:45 p.m. | 0 | 0 |
| 2:45–3:15 p.m. | 15 | 16 |
| 3:15–3:45 p.m. | 3 | 29 |
| 3:45–4:15 p.m. | 2 | 20 |
| 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 Wellesley⁴. The study team, however, adopted a conservative (highest impact) methodology where the peak hour volume of Center traffic, forecasted to occur between 10:45 and 11:45 a.m., was added to both the a.m. and p.m. peak hours to simulate a “highest impact” condition for Year 2018 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 13**. 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.

⁴ 7:30 to 8:30 a.m. and 5:00 to 6:00 p.m.

Table 13. Vehicle Trip Distribution and Travel Routes

| Area of Residence | 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**. Some visitors will park in the Center's on-site lot and some will park in the reserved spaces at the WPD parking lot.

Using the distribution pattern in **Figure 9** and the vehicle trips by time of day (shown in **Table 12**), the Center's new peak hour trips were estimated and are shown in **Figure 10**.

2018 Build Traffic Operations

Future 2018 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 14** and **Table 15**. Complete Synchro reports are provided in **Appendix A**.

Table 14. Build Conditions (2018) Capacity Analysis Summary,
a.m. Peak Hour

| Intersection | LOS | Delay (seconds) | V/C Ratio | 95 th Percentile Queue (feet) |
|---|----------|-----------------|-----------|--|
| Signalized Intersections | | | | |
| Washington Street (Route 16)/ State Street/Kingsbury Street | D | 52.5 | | |
| Washington EB left/thru thru/right | D | 36.0 | 0.76 | 328 |
| Washington WB left/thru/right | C | 29.6 | 0.54 | 189 |
| State NB left/thru | F | >80.0 | >1.00 | #374 |
| State NB right | D | 39.4 | 0.09 | 34 |
| Kingsbury SB left/thru/right | D | 37.6 | 0.83 | #582 |
| Washington Street (Route 16)/ Wellesley Avenue/Brook Street | D | 41.4 | | |
| Wellesley WB left | C | 29.0 | 0.66 | 421 |
| Wellesley WB right | B | 19.3 | 0.16 | 90 |
| Washington NB thru | F | >80.0 | >1.00 | #1046 |
| Washington NB right | B | 11.8 | 0.76 | 741 |
| Washington SB left/thru thru | C | 25.4 | 0.62 | 244 |
| Brook NWB left/right (unsignalized leg) | F | >50.0 | 0.84 | 131 |
| Washington Street (Route 16)/ Central Street/Grove Street | F | >80.0 | | |
| Central EB thru thru/right | F | >80.0 | >1.00 | #682 |
| Washington WB left | D | 37.8 | 0.52 | 250 |
| Washington WB thru/right | C | 20.7 | 0.66 | 491 |
| Grove NB left/thru/right | E | 68.1 | 0.85 | #323 |
| Grove SB left/thru/right | D | 37.4 | 0.29 | 74 |
| Washington NEB right right/hard right | E | 74.3 | >1.00 | #508 |
| Unsignalized Intersections | | | | |
| Washington Street (Route 16)/ Morton Street/WPD Driveway | | | | |
| Driveway EB left/thru/right | E | 40.1 | 0.35 | 36 |
| Morton WB left/thru/right | E | 39.5 | 0.27 | 26 |
| Washington NB left/thru/right | A | 0.2 | 0.02 | 1 |
| Washington SB left/thru/right | A | 0.0 | 0.00 | 0 |
| Washington Street (Route 16)/ North Site Driveway (Enter only) | | | | |
| Washington NB thru/right | A | 0.0 | 0.48 | 0 |
| Washington SB left/thru | A | 0.7 | 0.02 | 2 |
| Washington Street (Route 16)/ South Site Driveway (Exit only) | | | | |
| Site Driveway WB left | E | 37.2 | 0.13 | 11 |
| Site Driveway WB right | C | 17.7 | 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 level of service from No-Build conditions.

EB = eastbound, WB=westbound, NB=northbound, SB=southbound

Table 15. Build Conditions (2018) Capacity Analysis Summary,
p.m. Peak Hour

| Intersection | LOS | Delay (seconds) | V/C Ratio | 95 th Percentile Queue (feet) |
|---|----------|-----------------|-----------|--|
| Signalized Intersections | | | | |
| Washington Street (Route 16)/ State Street/Kingsbury Street | C | 32.2 | | |
| Washington EB left/thru thru/right | C | 33.1 | 0.66 | 238 |
| Washington WB left/thru/right | C | 31.7 | 0.65 | 302 |
| State NB left/thru | D | 49.5 | 0.55 | 193 |
| State NB right | D | 40.3 | 0.10 | 42 |
| Kingsbury SB left/thru/right | C | 23.8 | 0.52 | 328 |
| Washington Street (Route 16)/ Wellesley Avenue/Brook Street | C | 32.0 | | |
| Wellesley WB left | C | 32.4 | 0.74 | 505 |
| Wellesley WB right | B | 19.0 | 0.15 | 86 |
| Washington NB thru | D | 43.2 | 0.81 | #707 |
| Washington NB right | A | 3.5 | 0.31 | 150 |
| Washington SB left/thru thru | D | 39.9 | 0.90 | #548 |
| Brook NWB left/right (unsignalized leg) | D | 27.8 | 0.36 | 38 |
| Washington Street (Route 16)/ Central Street/Grove Street | D | 44.2 | | |
| Central EB thru thru/right | D | 47.3 | 0.81 | 287 |
| Washington WB left | E | 67.0 | 0.95 | #617 |
| Washington WB thru/right | C | 27.1 | 0.79 | #679 |
| Grove NB left/thru/right | E | 60.1 | 0.81 | #323 |
| Grove SB left/thru/right | D | 36.8 | 0.33 | 113 |
| Washington NEB right right/hard right | C | 32.1 | 0.43 | 178 |
| Unsignalized Intersections | | | | |
| Washington Street (Route 16)/ Morton Street/WPD Driveway | | | | |
| Driveway EB left/thru/right | C | 25.0 | 0.20 | 18 |
| Morton WB left/thru/right | C | 22.7 | 0.10 | 8 |
| Washington NB left/thru/right | A | 0.8 | 0.03 | 2 |
| Washington SB left/thru/right | A | 0.2 | 0.01 | 1 |
| Washington Street (Route 16)/ North Site Driveway (Enter only) | | | | |
| Washington NB thru/right | A | 0.0 | 0.39 | 0 |
| Washington SB left/thru | A | 0.3 | 0.01 | 1 |
| Washington Street (Route 16)/ South Site Driveway (Exit only) | | | | |
| Site Driveway WB left | C | 23.7 | 0.8 | 6 |
| Site Driveway WB right | B | 14.3 | 0.02 | 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 level of service 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 northern (enter only) site driveway, traffic turning into the site will operate at LOS A during both peak periods. Traffic exiting the southern driveway will be controlled by a stop sign and operate at LOS E and LOS C during the a.m. and p.m. peak hours, respectively. The exiting right turns will operate at LOS C and LOS B 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 11 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 56 designated parking spaces: 34 on-site parking spaces at Site 1 and 22 spaces reserved in the expanded WPD parking lot, Site 2. (The new Site 2 lot will have 22 spaces for Center use and nine additional spaces for WPD use.) Between Morton Street and Wellesley Avenue, there are 48 public parking spaces on Washington Street. Public parking along Washington Street (two-hour time limit) is available to all drivers in the area.

Under Build Conditions, however, several public parking spaces on Washington Street may need to be removed to accommodate the Center's new driveway curb cuts and a new pedestrian signal. The final number and location of which parking spaces will be removed on Washington Street is dependent on the separate engineering study of the new Washington Street pedestrian signal. (Note that in the following assessment of parking demand, it has been assumed that eight parking spaces will be removed on Washington Street, between Morton Street and Wellesley Avenue.)

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 16 graphically show the parking demand over the course of the day for each scenario. The graphs present the parking supply and demand at the on-site Center lot, along Washington Street, and at the WPD lot. Solid orange bars on the graph 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. The green bars represent other general parkers on Washington Street, estimated to be seven vehicles throughout the day.

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.⁵ Note that during the weekday 9:00 a.m. mass, the public parking along Washington Street will be mostly available (as it is today) for morning masses.

Scenario 1A and Scenario 1B

Under Scenario 1A, the number of daily visitors is 150 persons (see **Table 10**). Staff at other established centers interviewed for this study reported that a maximum of 150 visitors are served daily at those centers. 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 50 spaces. When the parking lot at the Center reaches capacity, estimated to occur late in the morning, arriving visitors will need to park at the WPD lot. As visitors leave the Center's parking lot, spaces again become available for successive visitors. Under Scenario 1A, all Center vehicles will be accommodated at the on-site lot or the WPD lot. No Center vehicles will need to park on 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 and the expanded WPD lot.

Scenario 2

In Wellesley, public elementary schools are dismissed at noon on Wednesdays. 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 graph for Scenario 2, **Figure 15**, shows that with a typical schedule at the Center, public parking along Washington Street will be near capacity during the noontime dismissal period. The availability of spaces at the expanded WPD lot, however, will serve the Center's parking demand during this period. No Center vehicles will need to park on Washington Street.

Scenario 3

About 50 to 60 funerals occur annually at St. Paul Parish, with between 40 and 300 attendees. Typically, funerals occur mid-morning and have an associated parking demand along Washington Street between 9:00 a.m. and 11:00 a.m. Note that funeral timing and attendance are

⁵ 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).

unpredictable. The WPD estimates that the largest funerals occur about 5 times per year. Because of the church's limited on-site parking, major funerals cause traffic disruption on Washington Street.

As observed by BETA Group 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 16** 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 33 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.) Because the peak parking demand for funerals occurs before the Center's on-site lot is completely occupied with Center visitors, the parking along Washington Street will continue, as today, to be mostly available for funeral activity. As additional Center visitors arrive during the funeral, they will park at the expanded WPD lot.

New Signalized Crosswalk

To provide a safe walking environment between the WPD lot and the Center, the Town will be installing a new signalized pedestrian crossing on Washington Street. The new signal will replace the existing pedestrian signal on Washington Street at St. Paul Parish/School and be located further north on Washington Street. The new pedestrian signal location will conveniently serve pedestrians destined to/from both the Center and St. Paul's Parish/School. The exact location of the new pedestrian signal is being determined through a separate engineering study

In combination with the new signalized crosswalk, the existing crosswalk at Washington Street, just south of WPD Driveway/Morton Street will be removed. Pedestrian counts of this crosswalk in May 2013 showed that, during the a.m. peak period fewer than four persons per hour used this crosswalk. During the p.m. peak period, about one person per hour used the crosswalk. These are extremely low pedestrian volumes that can be serviced by the new signalized crosswalk.

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 south (exiting) 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. Similarly, the SSD on the Washington Street approaches to the WPD driveway are also sufficient.

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 16. Impacted Roadways 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 |

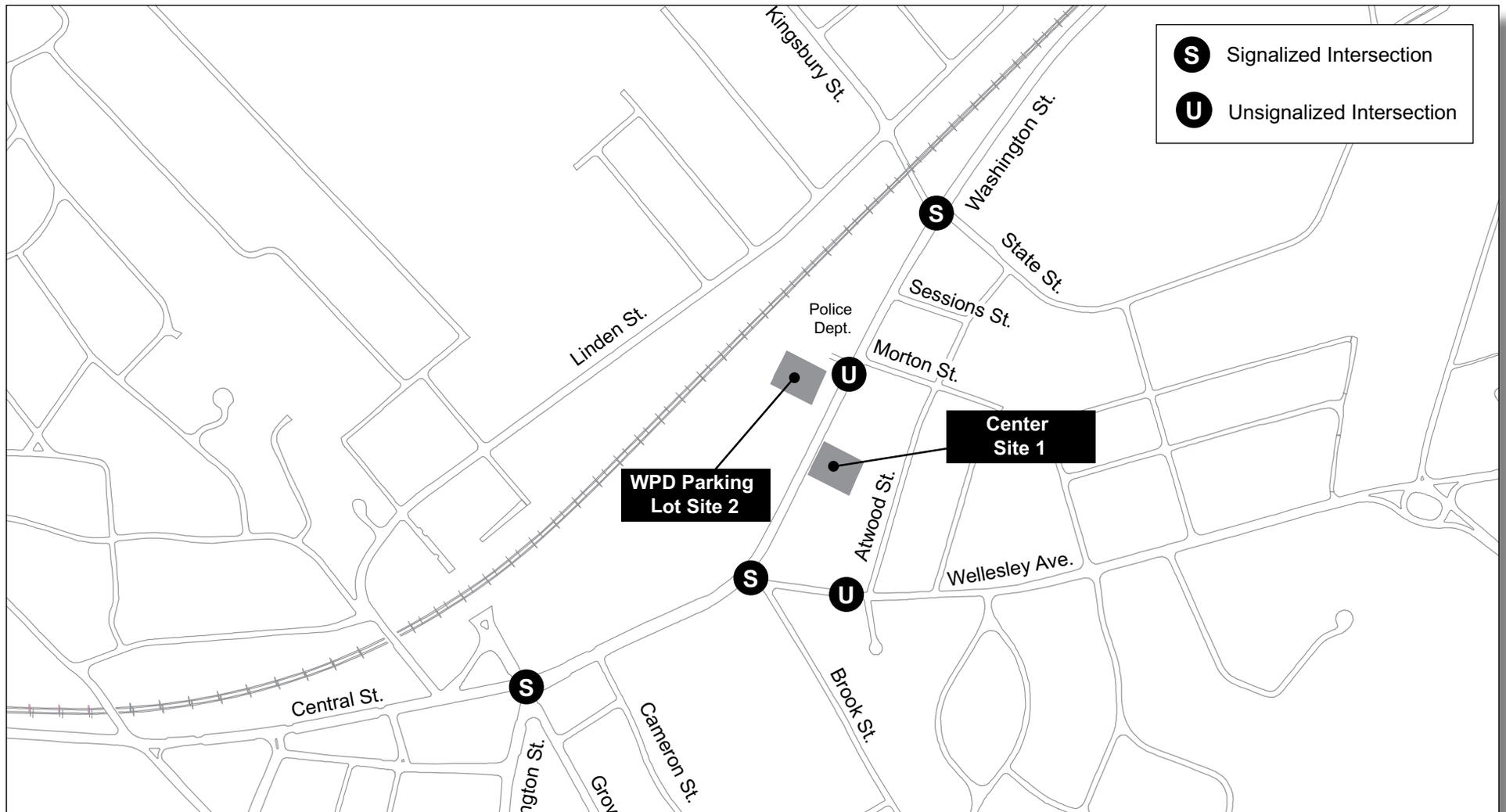
Parking Impacts

The Center will have 56 designated parking spaces: 34 on-site parking spaces at Site 1 and 22 spaces reserved in the expanded WPD parking lot, Site 2. These 56 spaces will satisfy the Center's parking needs and the Center will not impact the parking activity associated with adjacent land uses. See discussion under the Parking Supply and Demand section.

No additional parking mitigation is required.



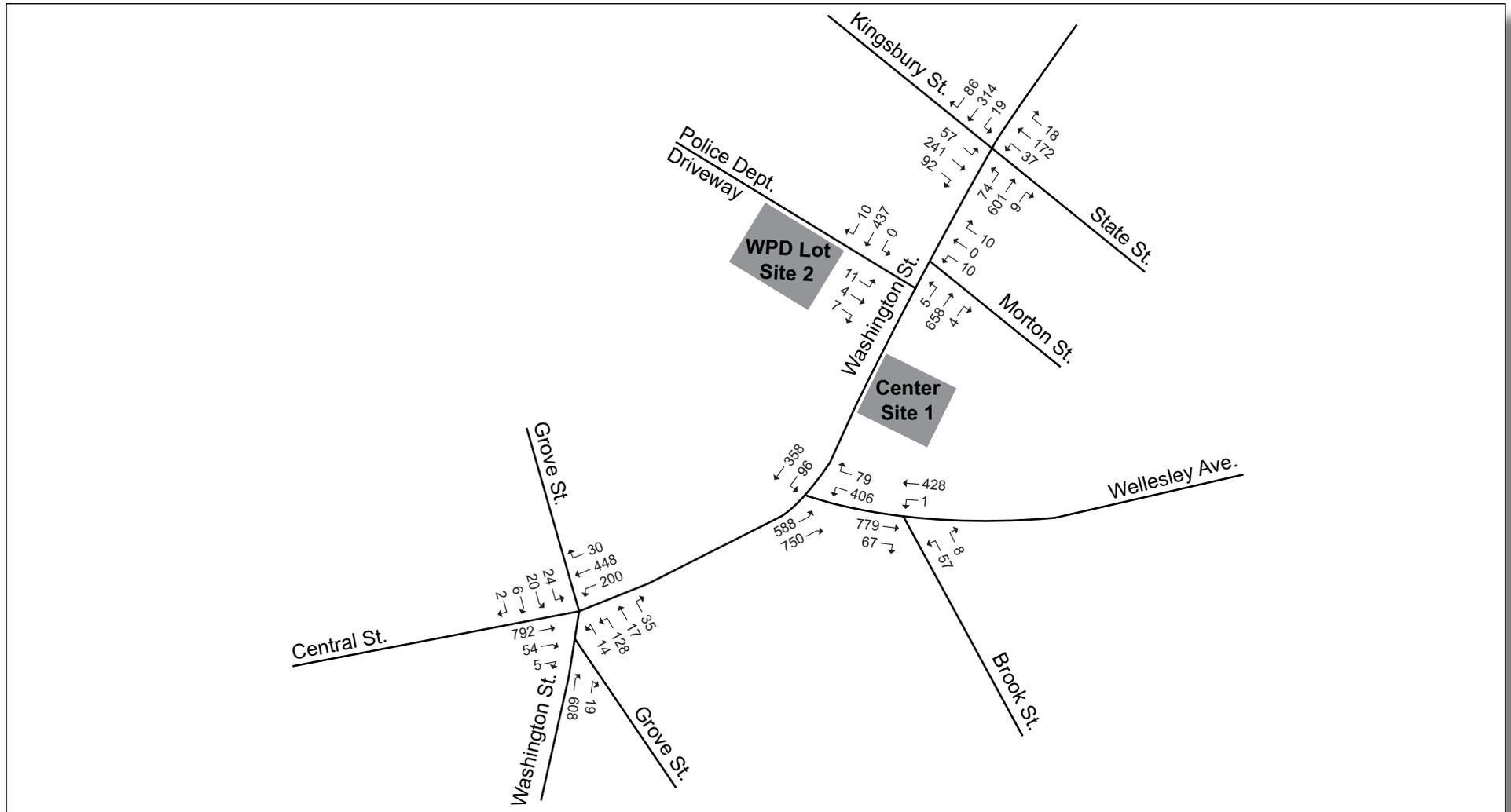
Figure 1. Study Area



Not to scale.



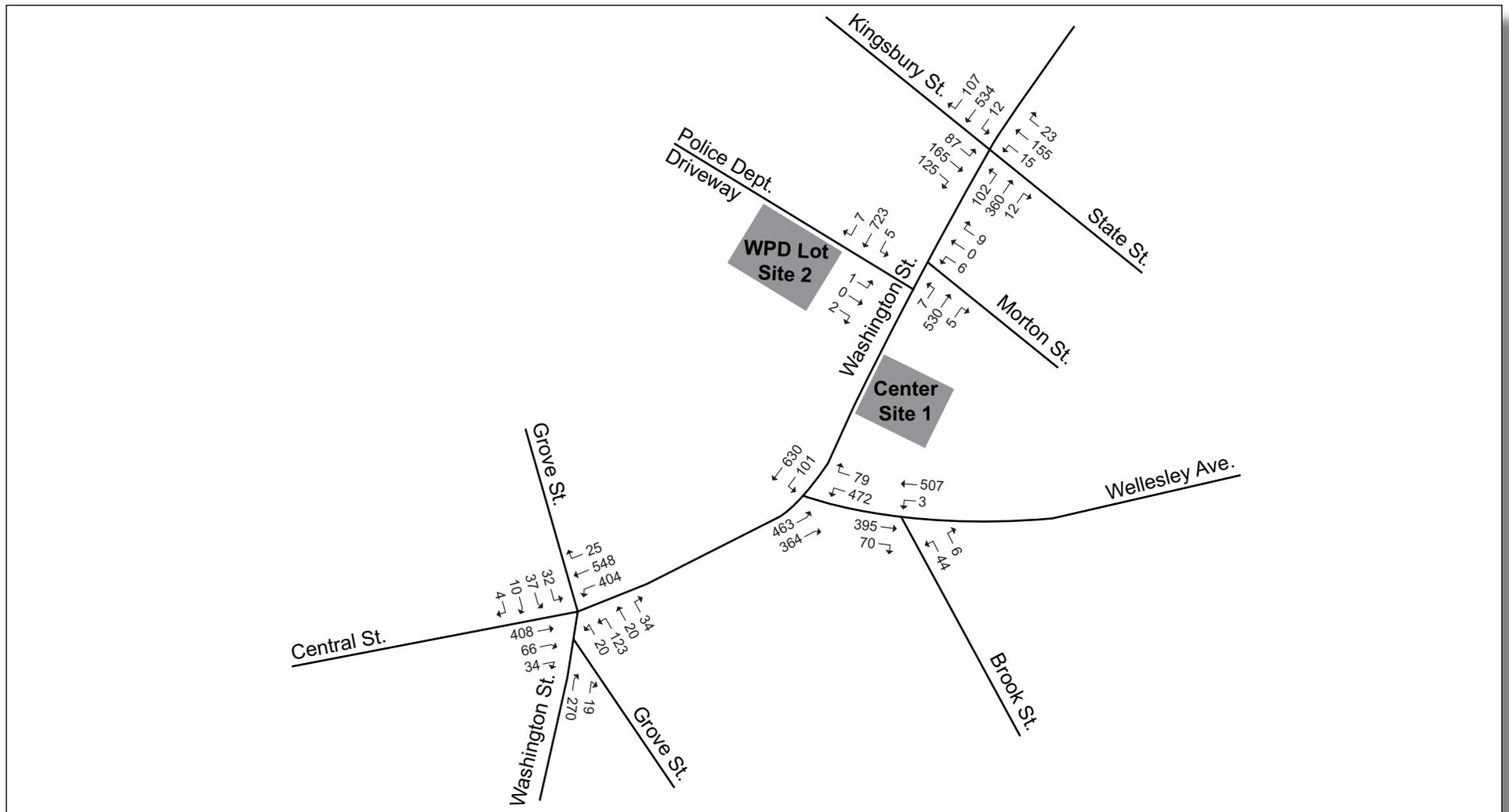
Figure 2. Existing Conditions (2013) Intersection Volumes, a.m. Peak Hour (8:00-9:00 a.m.)



Not to scale.



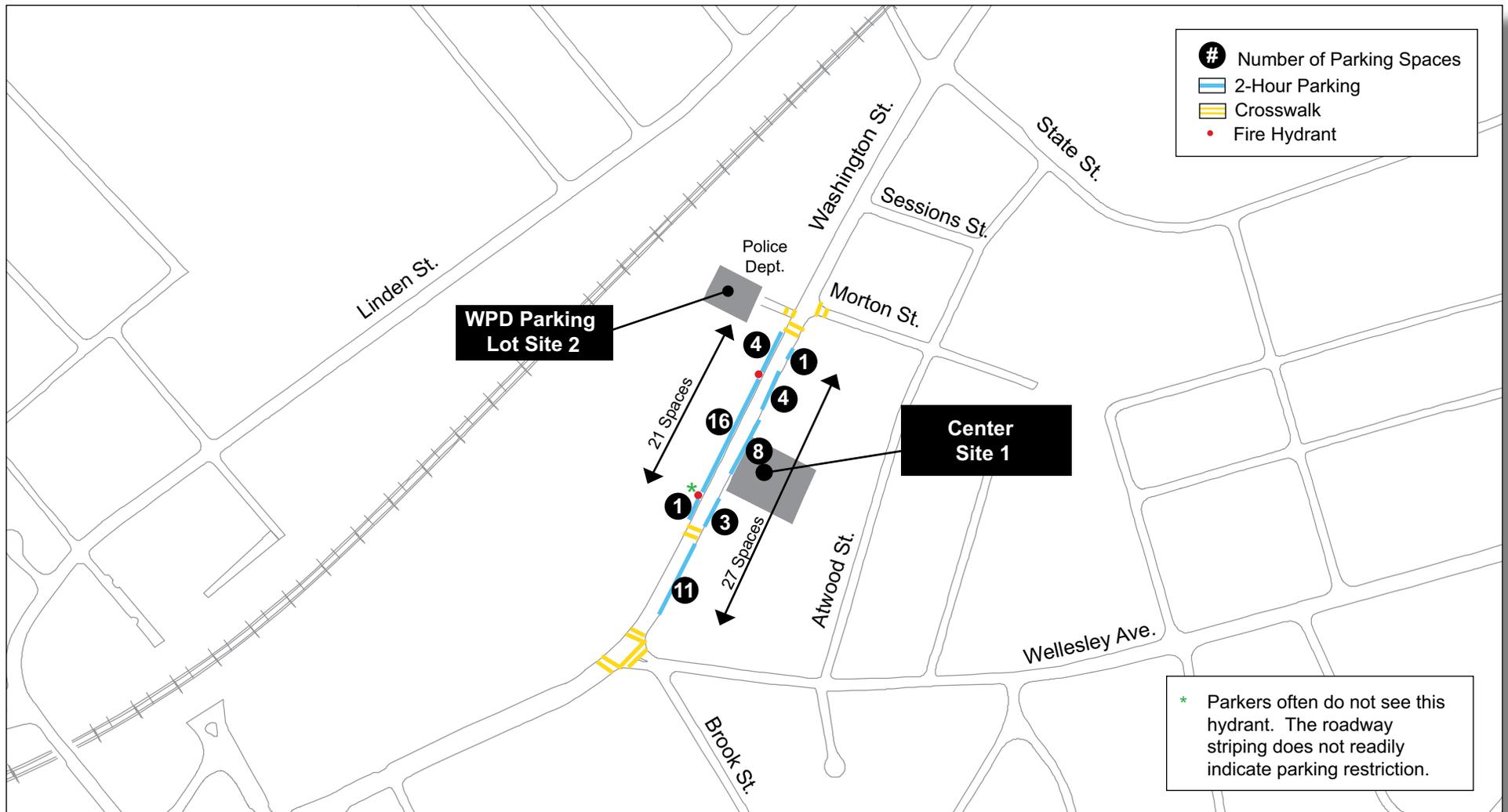
Figure 3. Existing Conditions (2013) Intersection Volumes, p.m. Peak Hour (5:00-6:00 p.m.)



Not to scale.



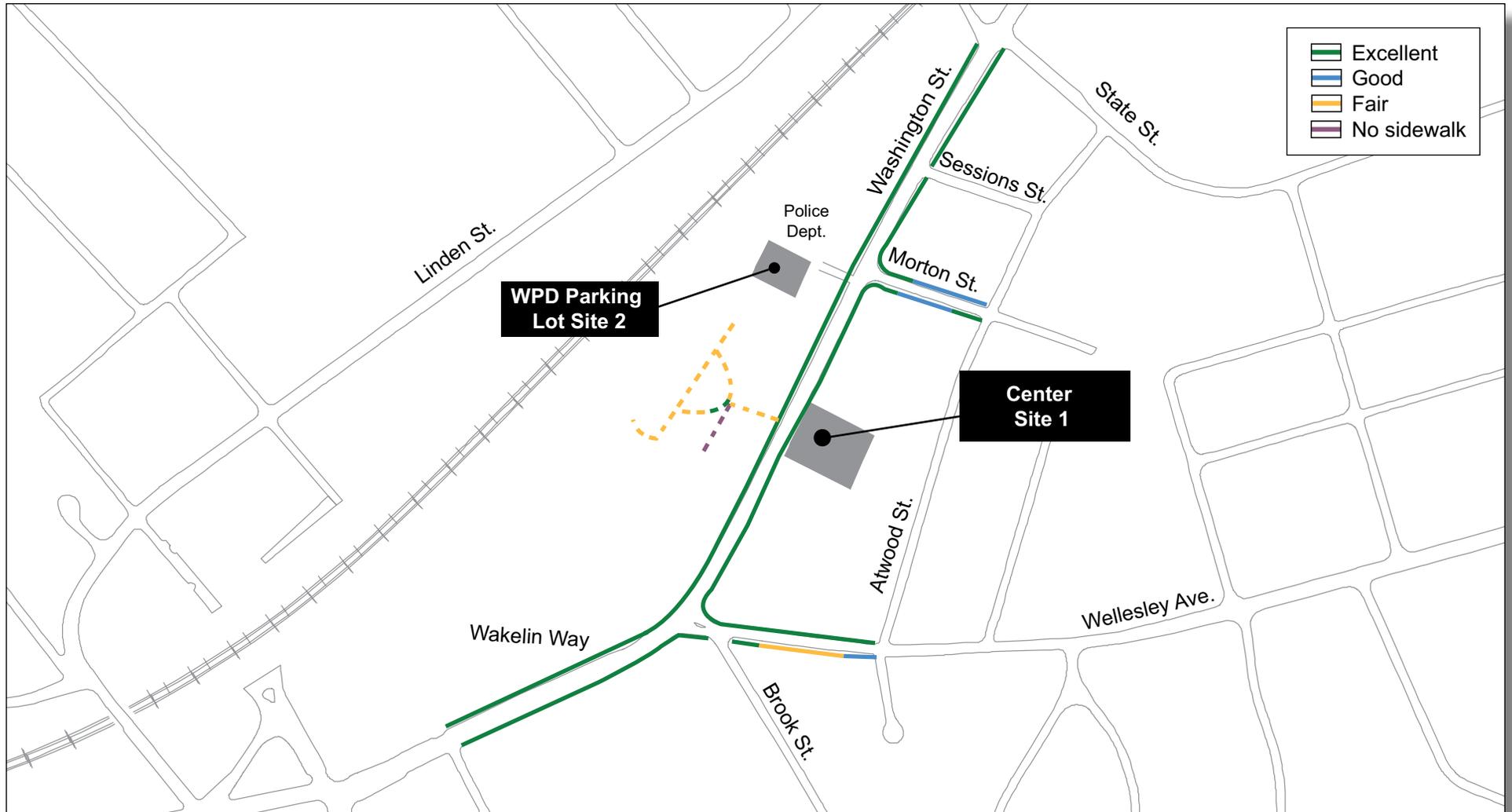
Figure 4. Existing On-Street Parking on Washington Street



Not to scale.



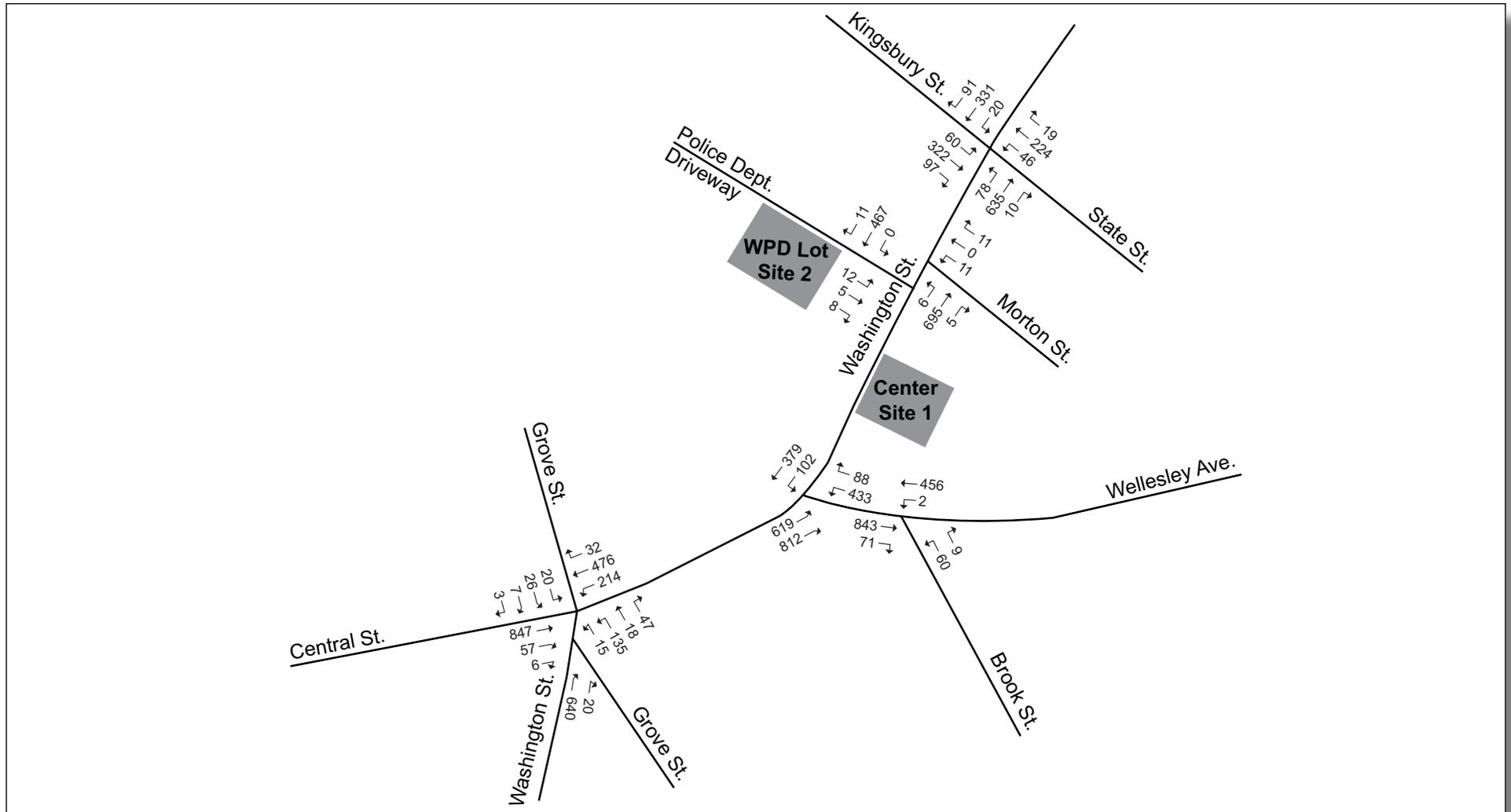
Figure 5. Sidewalk Conditions



Not to scale.



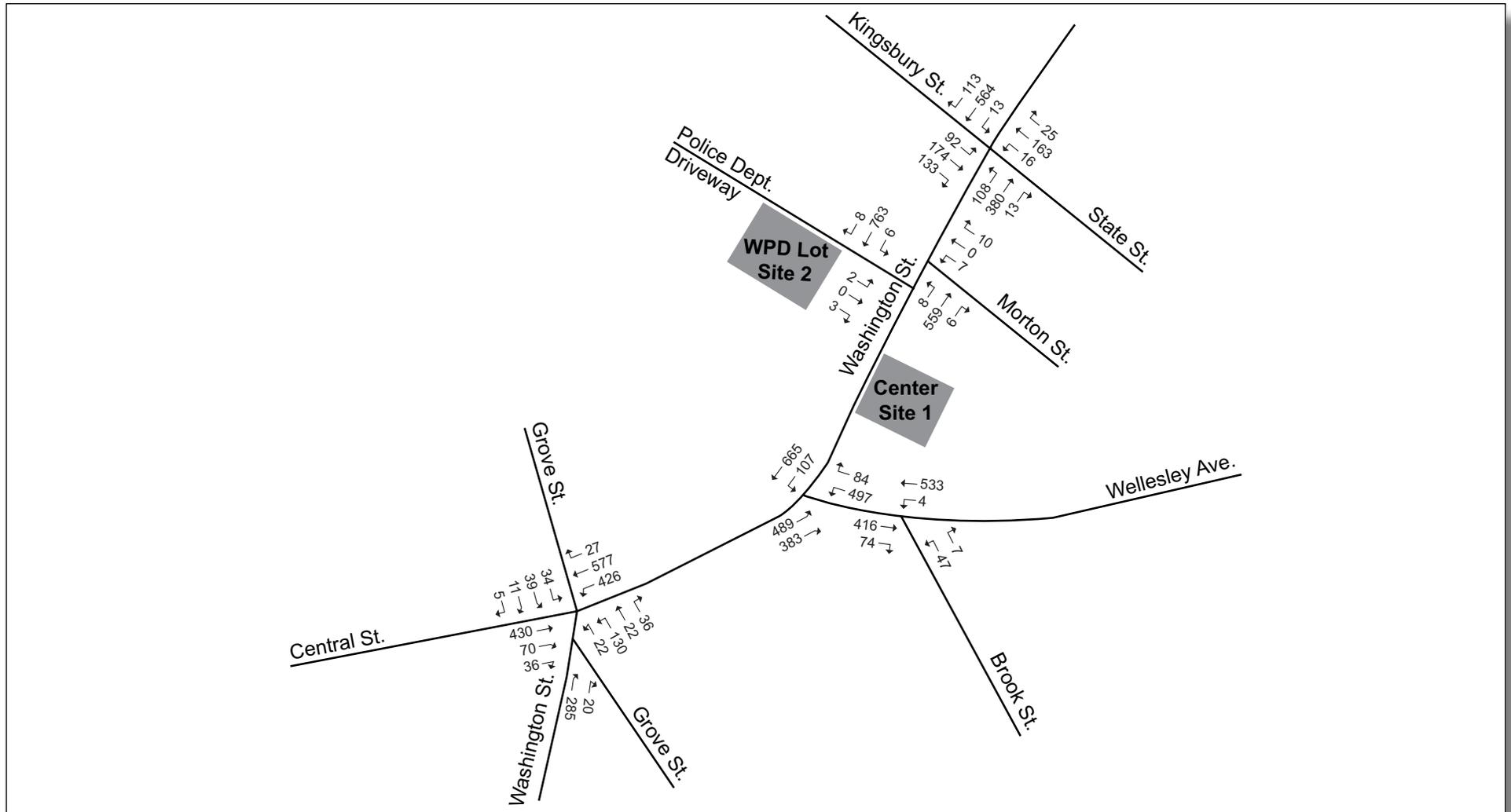
Figure 6. No-Build Conditions (2018) Intersection Volumes, a.m. Peak Hour



Not to scale.



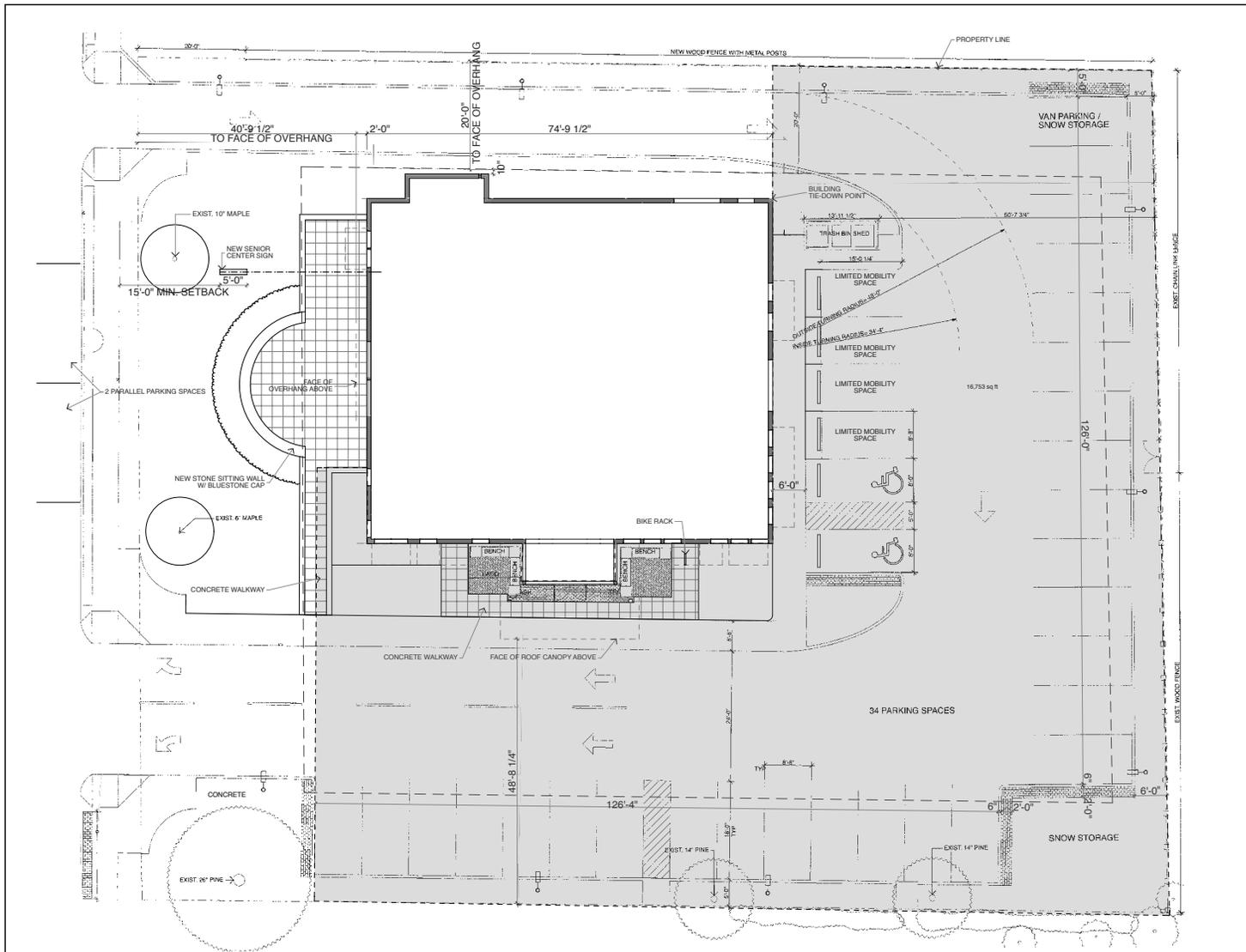
Figure 7. No-Build Conditions (2018) Intersection Volumes, p.m. Peak Hour



Not to scale.



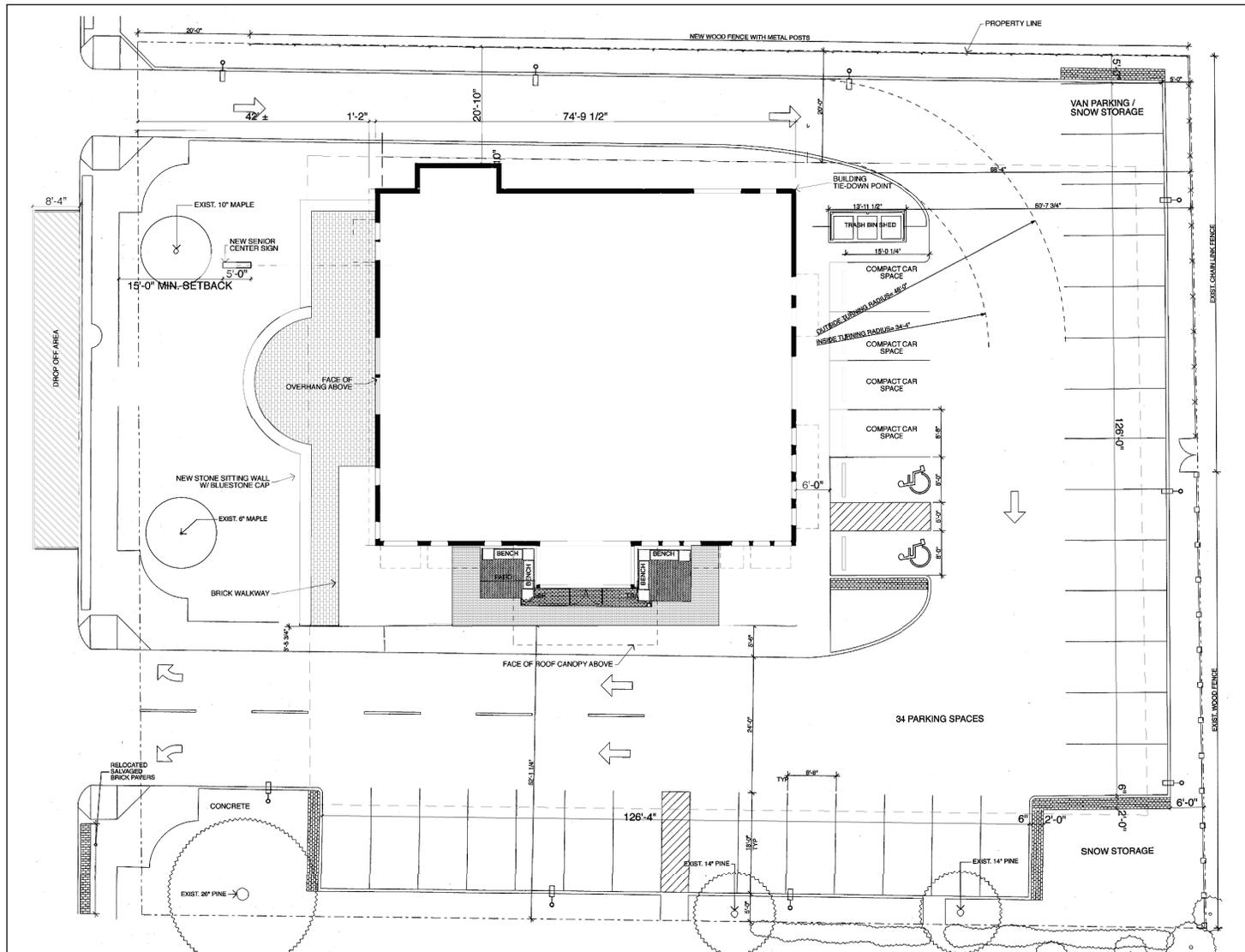
Figure 8. Tolles-Parsons Center Site Plan



Not to scale.



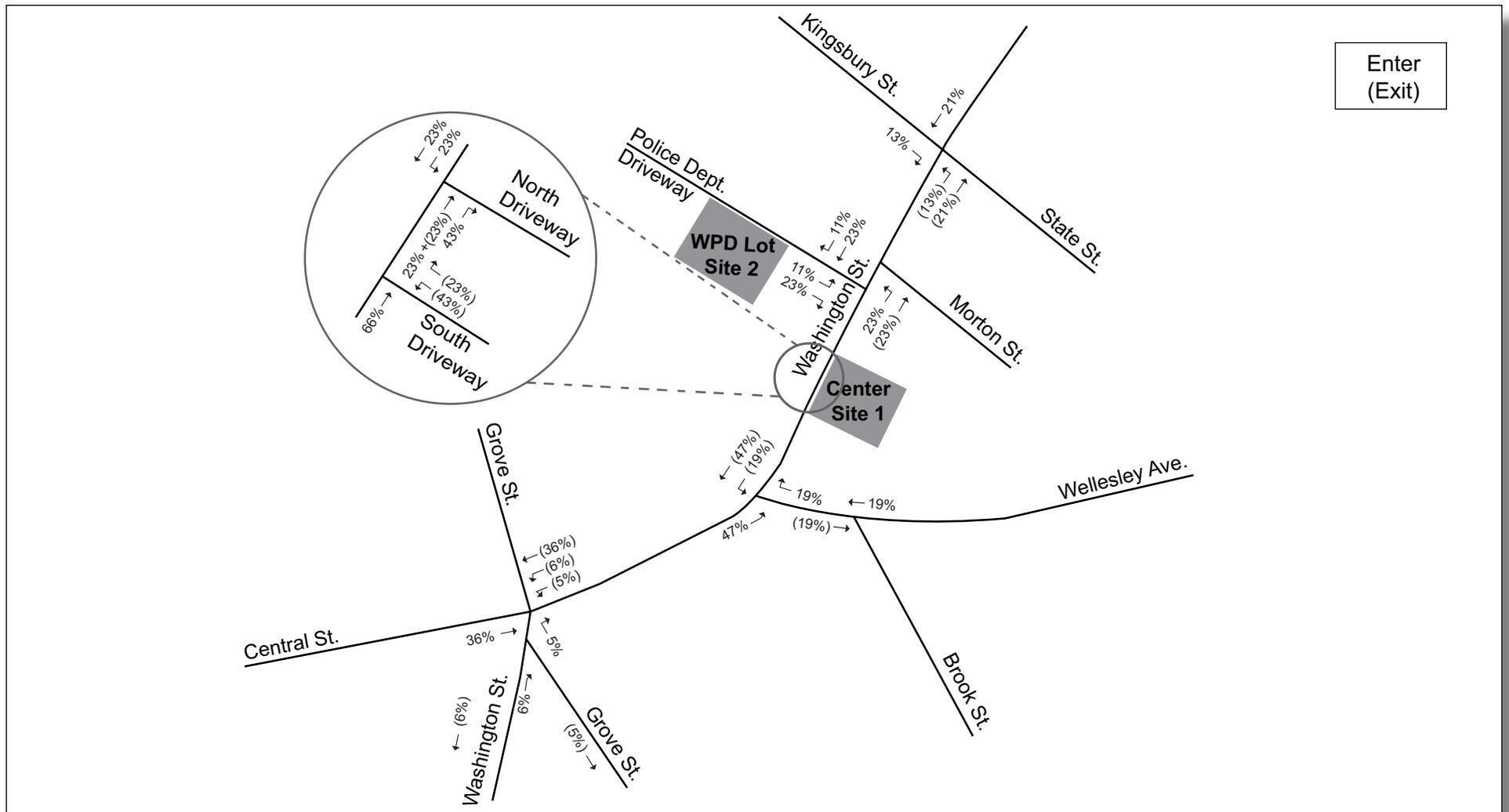
Figure 8. Tolles-Parsons Center Site Plan



Not to scale.



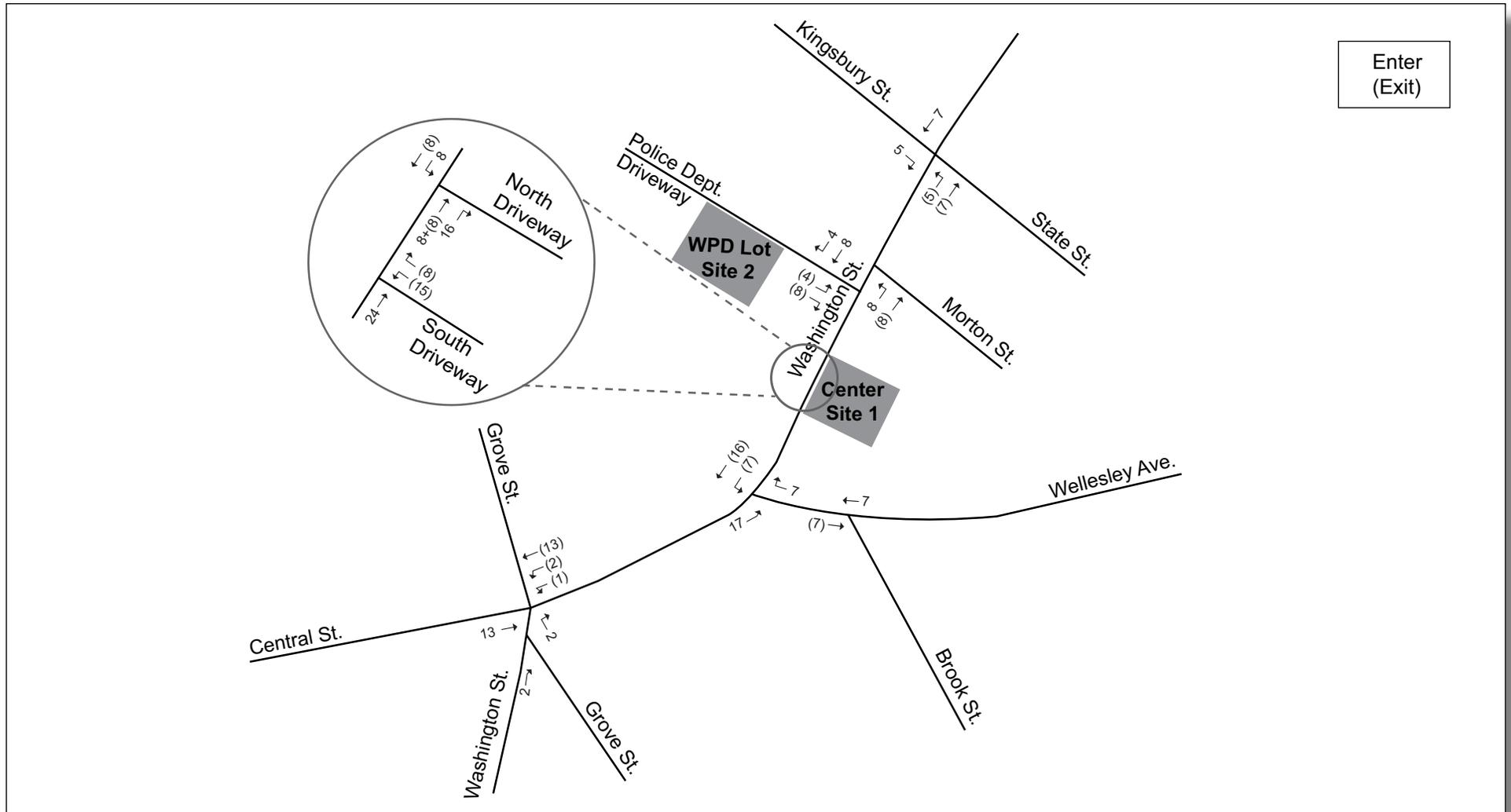
Figure 9. Vehicle Trip Distribution



Not to scale.



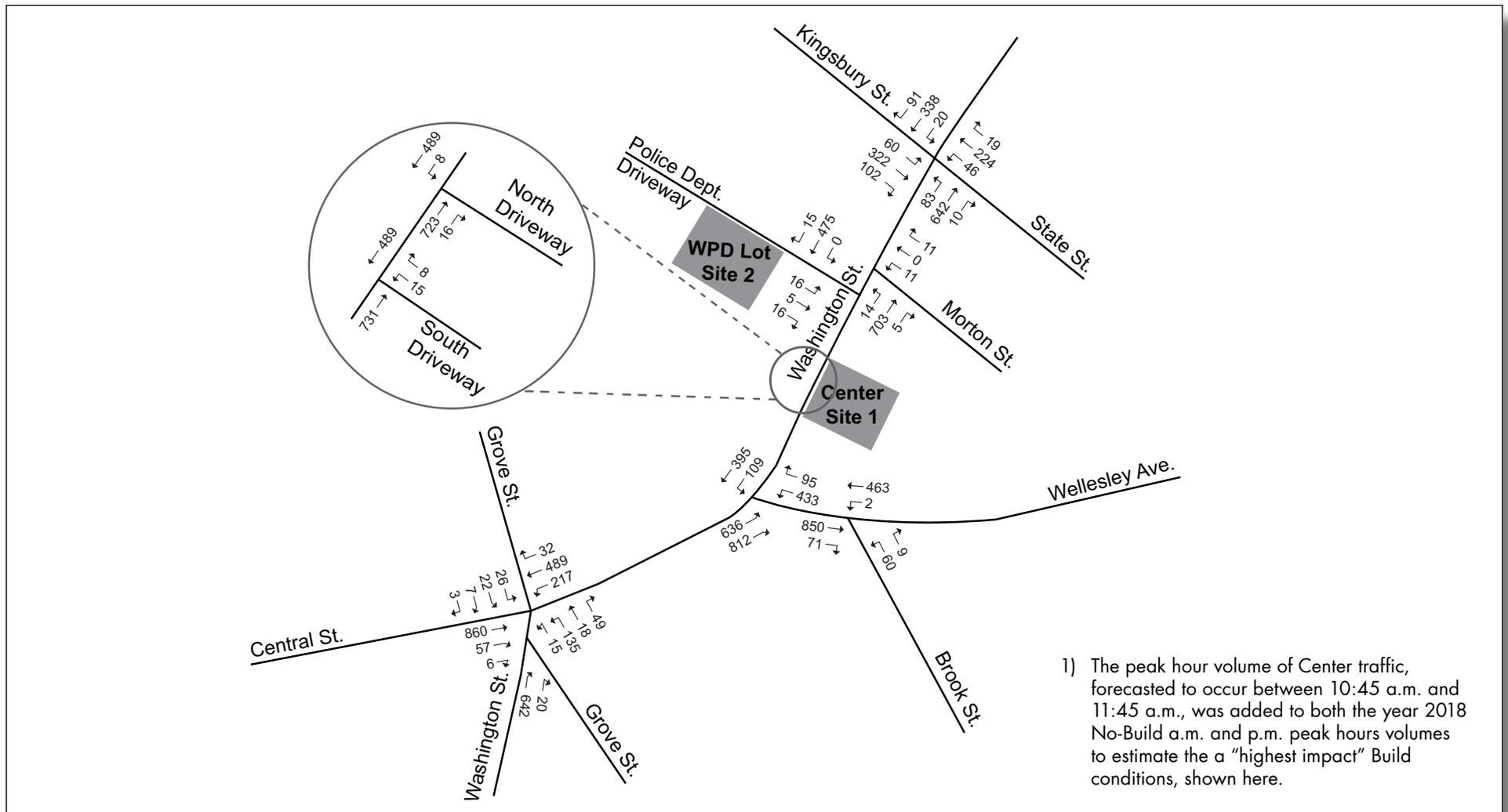
Figure 10. Project Generated Vehicle Trips, Peak Hour (10:45-11:45 a.m.)



Not to scale.



Figure 11. Build Conditions (2018) Intersection Volumes, a.m. Peak Hour ¹⁾



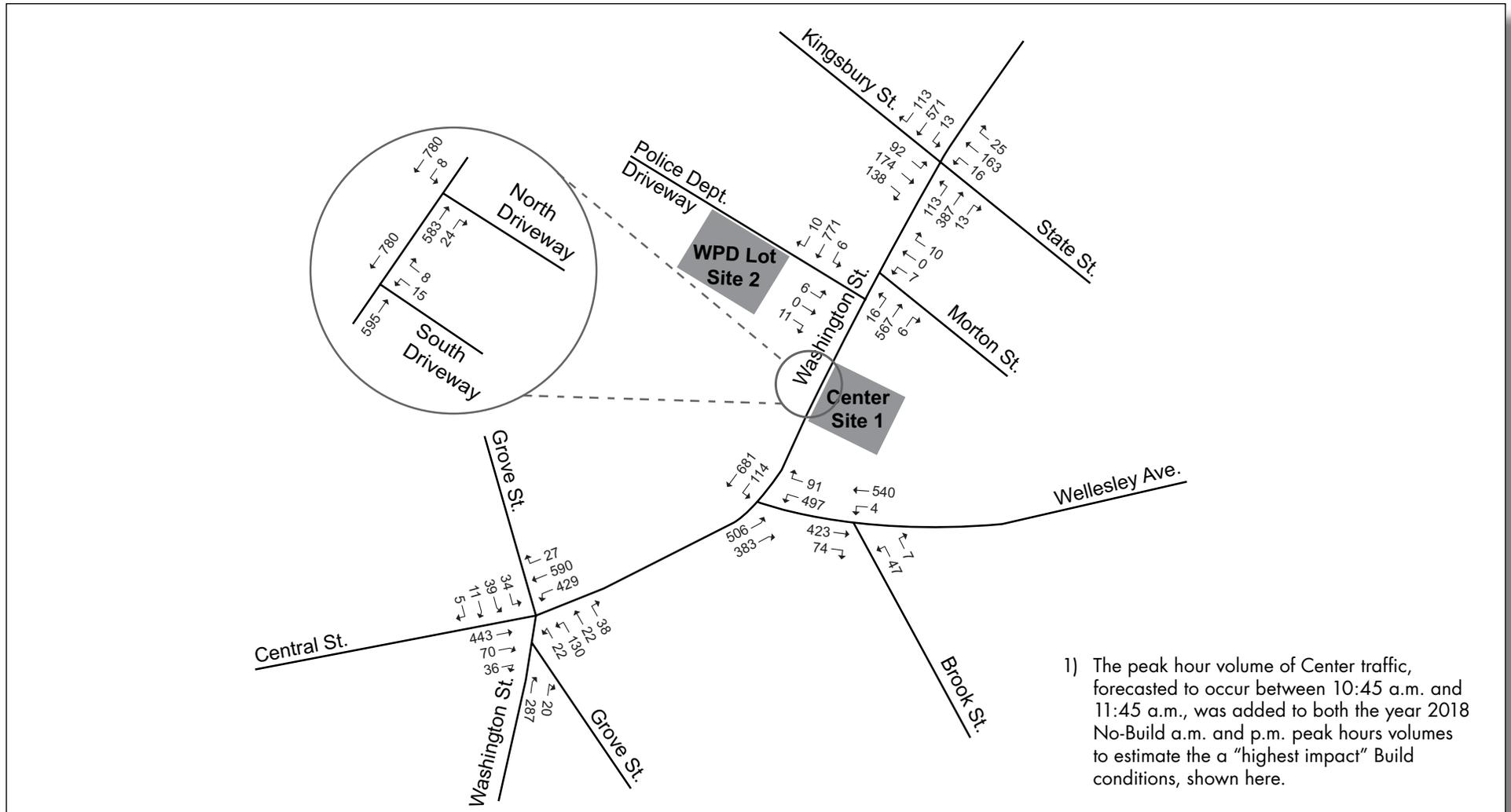
1) The peak hour volume of Center traffic, forecasted to occur between 10:45 a.m. and 11:45 a.m., was added to both the year 2018 No-Build a.m. and p.m. peak hours volumes to estimate the a "highest impact" Build conditions, shown here.



Not to scale.



Figure 12. Build Conditions (2018) Turning Movement Volumes, p.m. Peak Hour ¹⁾



Not to scale.



Figure 13. Parking Demand by Time of Day at Center, Washington Street, and WPD Lot Scenario 1A - Weekday with 150 Visitors

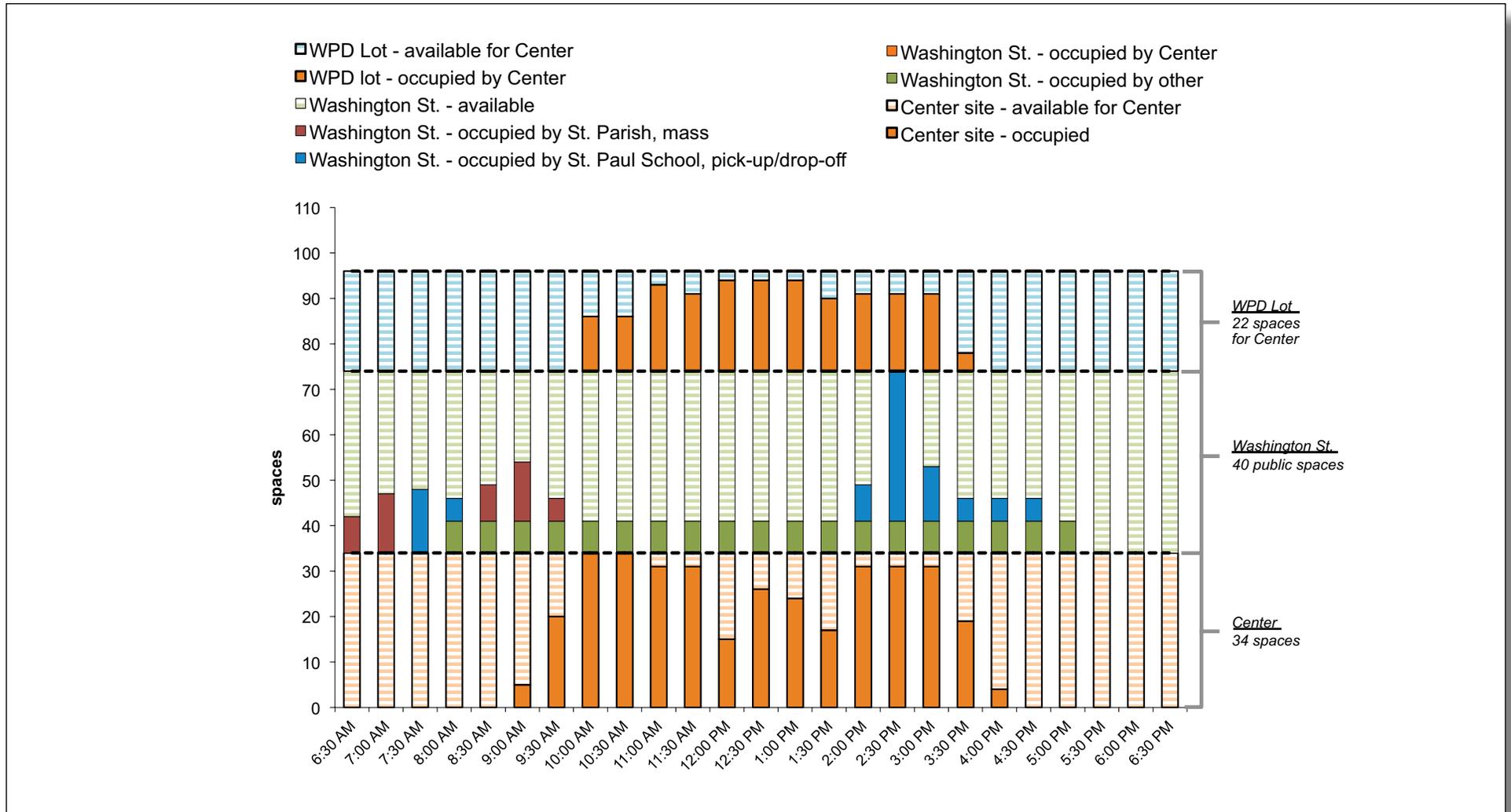




Figure 14. Parking Demand by Time of Day at Center, Washington Street, and WPD Lot Scenario 1B - Weekday with 130 Visitors

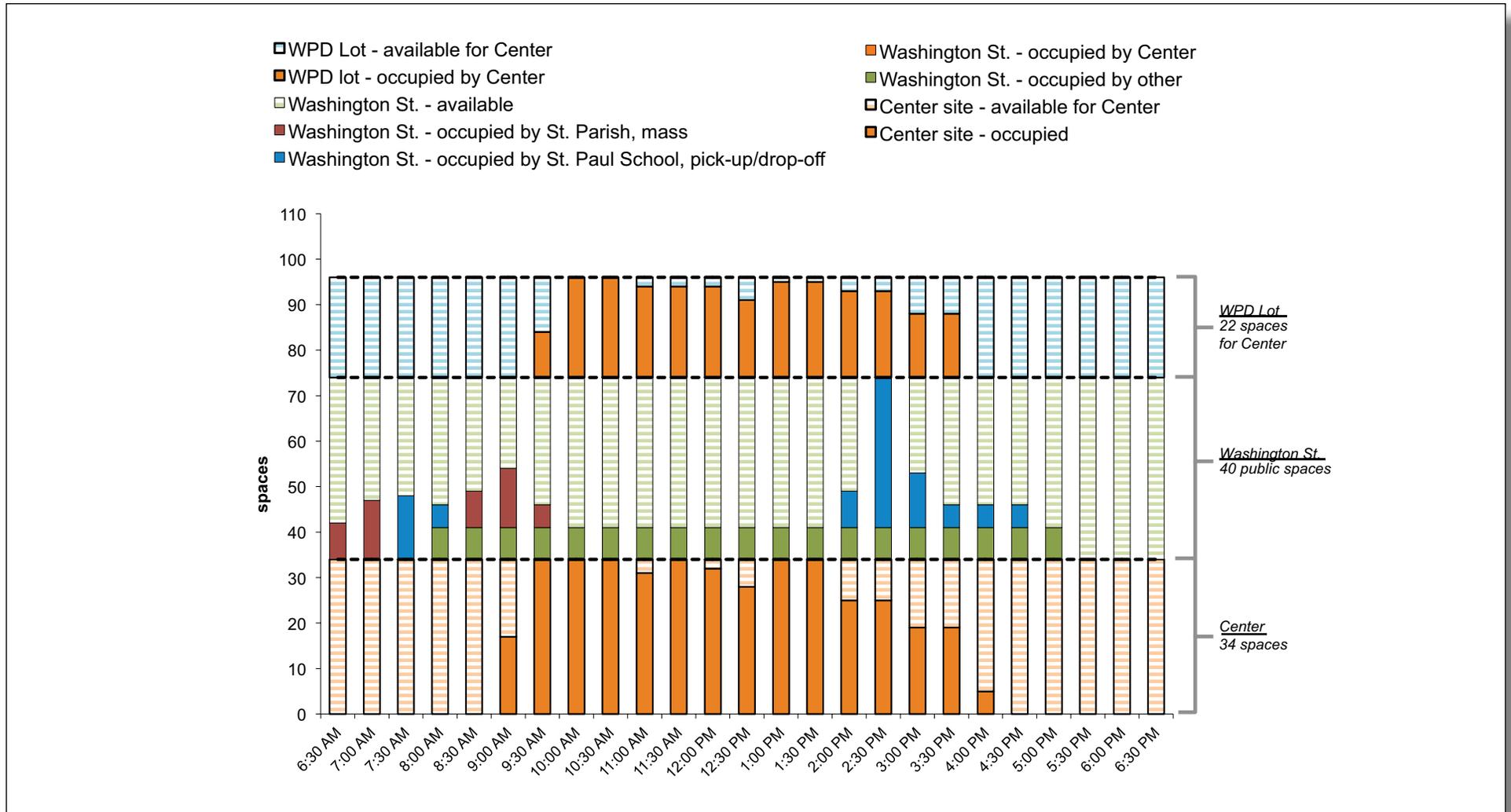




Figure 15. Parking Demand by Time of Day at Center, Washington Street, and WPD Lot Scenario 2 - Typical Wednesday During School Year

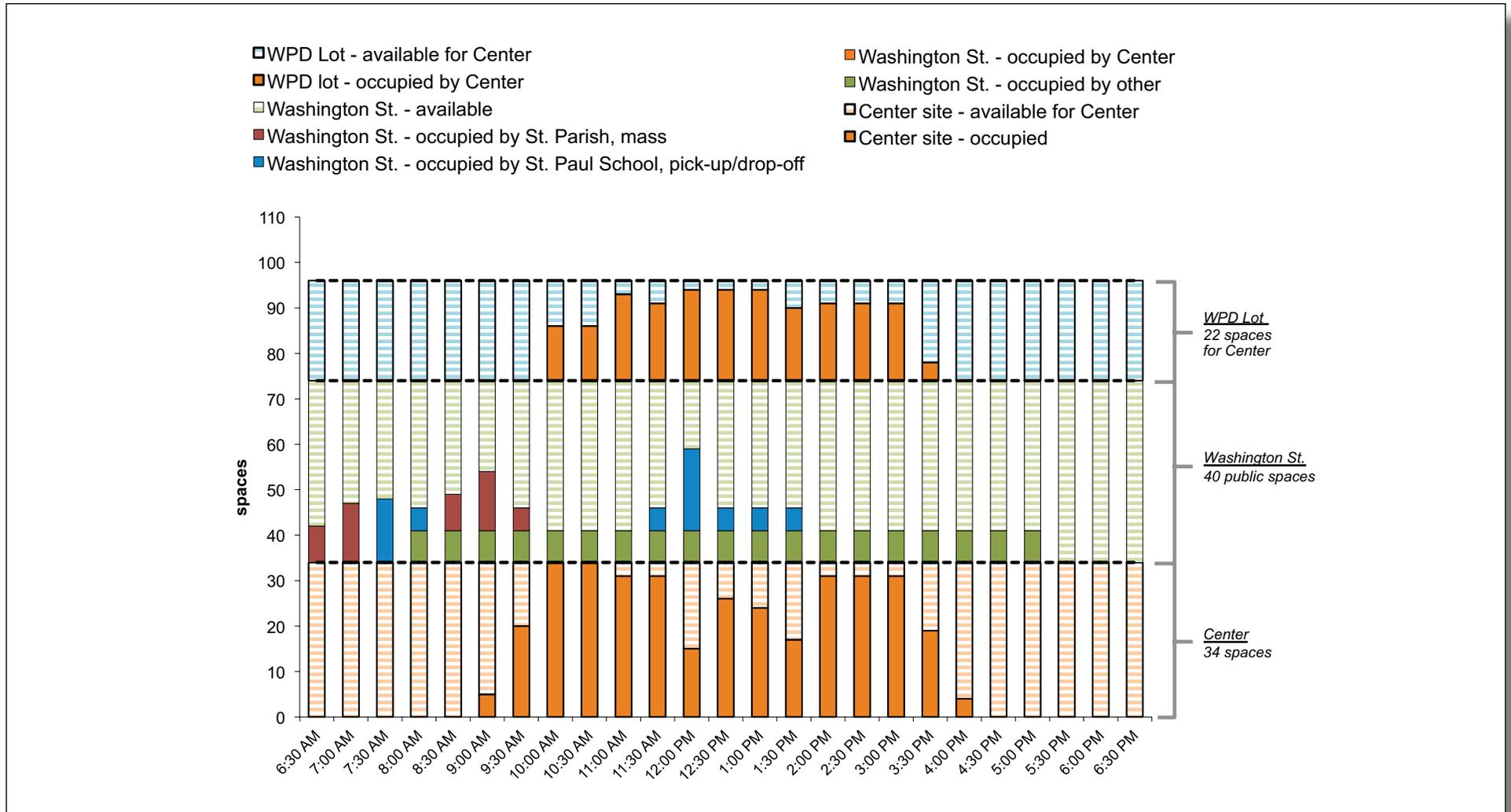
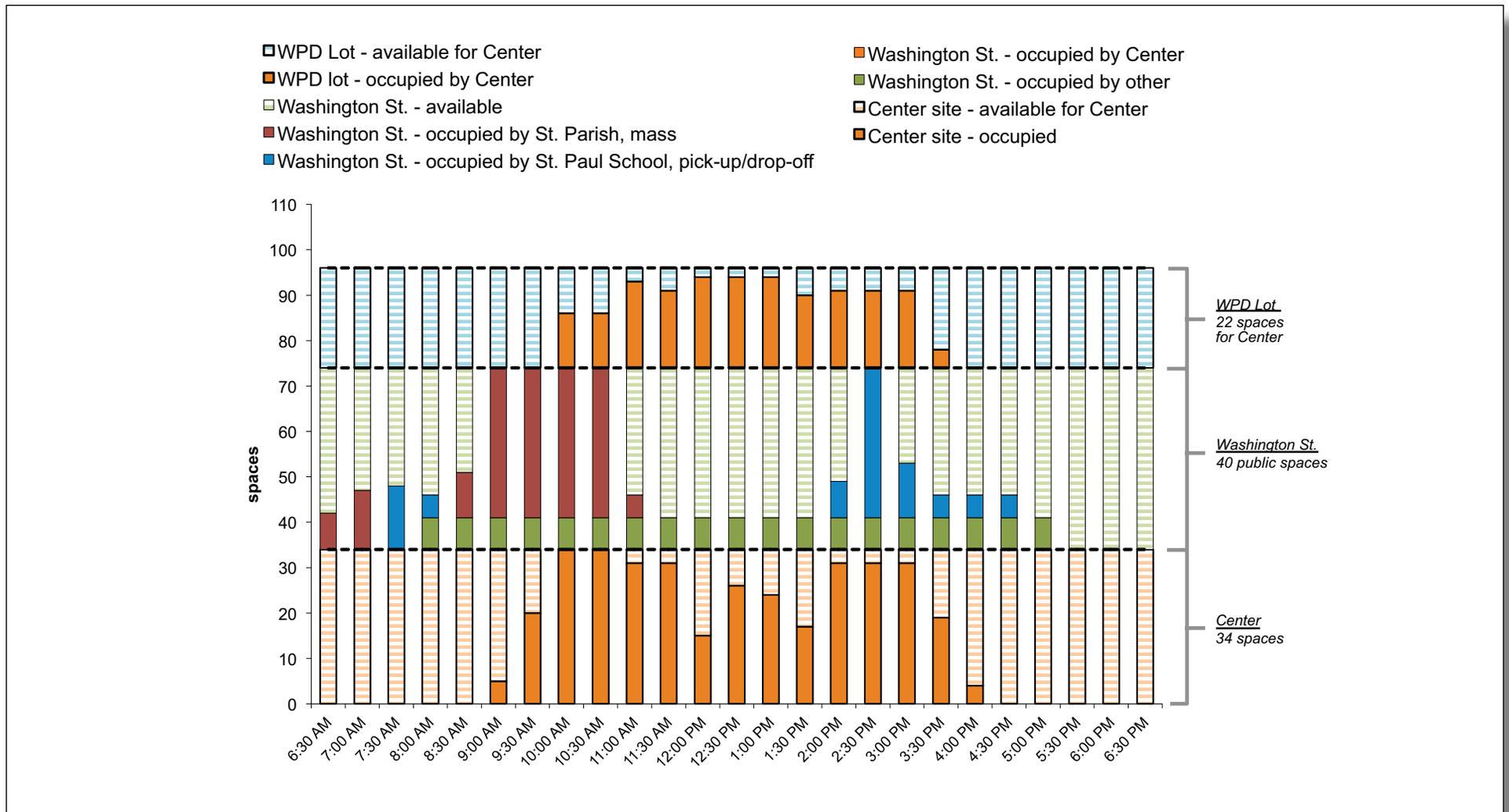




Figure 16. Parking Demand by Time of Day at Center, Washington Street, and WPD Lot Scenario 3 - Weekday with Funeral at St. Paul Parish



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