VFW Parkway/ Providence Highway Corridor Action Plan

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MAPC

VFW Parkway/Providence Highway Corridor Action Plan

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Abstract

The VFW Parkway/Providence Highway Corridor Action Plan addresses goal areas such as safety, capacity management and mobility, system preservation, and economic vitality. The study focuses on one of the automobile-centric corridors where improvements are needed to accommodate people walking or biking or using assistive mobile devices and to improve the quality of life of the neighborhoods. This report presents details of the analyses of existing conditions, assesses safety and operational problems in the corridor, and makes short- and long-term recommendations for implementing improvements. The concepts provide the Massachusetts Department of Transportation, the Town of Dedham, City of Boston, the Massachusetts Bay Transportation Authority, and other stakeholders an opportunity to review conceptual options for addressing deficiencies in the corridor before committing design and engineering funds to a roadway improvement project. The recommendations, if implemented, should result in benefits, such as increased safety for all users, enhanced walking and biking accommodations, more efficient traffic operations, and reduced congestion.

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Executive Summary

ES.1 BACKGROUND

The Massachusetts Office of Travel and Tourism awarded a grant to the Town of Dedham to fund a study of the Veterans of Foreign Wars (VFW) Parkway and Providence Highway in West Roxbury and Dedham. This section of the roadway was designed primarily as a relatively high-speed vehicle corridor; however, the existing and future potential development adjacent to the corridor requires an evaluation of the corridor's design to address safety and multimodal transportation needs. The vision and goals of the study were to transform the corridor to make it safe for people to walk and bike to shops, schools, transit stations, and recreational areas, and support current and future development.

The corridor, shown in Figure 1 in Chapter 3, is 1.7 miles in length. The road is named VFW Parkway in Boston and then changes to Providence Highway in Dedham. The study limits are from the intersection of Bridge Street and Spring Street and VFW Parkway in Boston to the Marine Rotary at Washington Street in Dedham.

The Central Transportation Planning Staff (CTPS) and the Metropolitan Area Planning Council (MAPC), working in conjunction with a technical team and an advisory committee, identified the corridor weaknesses, strengths, needs, and developed short- and long-term improvements within the roadway's right-of-way to address them. Both the technical team and advisory committee consisted of a multidisciplinary staff from state and municipal agencies. Public participation and community engagement efforts were instrumental throughout the study.

ES.2 EXISTING CONDITIONS

VFW Parkway and Providence Highway in Boston and Dedham is a two-way, four-lane principal arterial, state-designated truck route, and part of the National Highway System program. The study segment is under the jurisdiction of the Massachusetts Department of Transportation (MassDOT). This roadway serves regional and local traffic and the land uses surrounding the corridor is a mixture of large-scale mall, small and large businesses (auto dealerships, car shops, restaurants, and retail services), and residential. The width of the right-of-way varies between 84 feet and 114 feet, with the narrower section on VFW Parkway and the wider section on Providence Highway.

Chapter 4 presents the data collection efforts. The MassDOT, Town of Dedham, City of Boston, MAPC, Massachusetts Bay Transportation Authority (MBTA), and CTPS provided the data used to assess the existing conditions and identify

problems in the corridor. The data included driving, walking, and biking volumes; speeds of vehicles; crashes from 2015–19; bus ridership and service from fall 2019; signal timing and layouts; and community survey data.

Data and technical analyses were performed to assess the safety, traffic operations, and level of service provided for all users. The existing conditions presented in Chapter 5 indicated that community perception of existing conditions is not close to their vision for the corridor and it needs improvements. People driving through the corridor complain about high volumes of traffic, congestion, aggressive drivers, poor safety, and difficulty crossing the corridor. People walking or biking feel unsafe in the corridor and find it difficult to navigate. Marine Rotary and VFW Parkway and Spring Street intersections are the choke points, are difficult to navigate, and are high-crash locations. Based on the data, information from community engagement efforts, and analysis of the existing conditions, the corridor weaknesses, strengths, and needs were identified and are presented in Chapter 6. The top five in each category is presented below.

ES.2.1 Corridor Weaknesses

- Automobile-centric corridor that is unsafe for people walking and biking
- Lack of walking and biking facilities; difficult corridor to navigate by people walking and biking
- High vehicle speeds, which present safety concerns for people walking and biking and motorists
- High number of crashes—VFW Parkway and Spring Street intersection, Marine Rotary
- Minimal use of existing resources such as open spaces, Charles River, and Mother Brook

ES.2.2 Corridor Strengths

- Opportunities for multimodal transportation (walking, biking, driving, riding the bus, and using assistive mobile devices)
- Opportunities for recreational resources and activities such as access and connections to the Charles River, Mother Brook, and open space
- Connections to economic opportunity—major commercial corridor—Dedham Mall, Dedham Center, and businesses along VFW Parkway
- Opportunities to improve livability and quality of life of surrounding neighborhoods—access to neighborhoods and apartments complexes
- Opportunities to transform a relatively wide right-of-way to service current and future needs

ES.2.3 Corridor Needs

- Transform corridor to meet needs of people walking, using assistive mobile devices, riding bicycles, riding the bus, and driving
- Upgrade corridor infrastructure to improve safety for all users
- Redesign roadway and intersections to calm traffic and reduce high-vehicle speeds
- Construct a welcoming streetscape/landscape to enhance placemaking and presence that is safe and attractive to all modes
- Redesign roadway to improve connections to economic opportunity, recreational areas, and trails such as the Charles River and Mother Brook

ES.3 IMPROVEMENTS

Because of the changing character, context, and varying needs along the corridor, the roadway was divided into three segments to incorporate the character and context into the development of the long-term improvement concepts. The three segments are described in detail in Chapter 3.

ES.3.1 Long-Term Improvements

The long-term improvements to transform the corridor into a route for everyone are presented in Chapter 7 for the study intersections and the three roadway segments. The transformation redesigned the roadway to create a four-lane divided roadway (two lanes in each direction) with a median and space for people walking or biking on either side of the Providence Highway and VFW Parkway. The space for people walking or biking could be used as a shared-use path or separated into sidewalk and bike lanes. A street buffer with trees was introduced to separate people walking or biking from the traffic lanes and to provide a welcoming environment.

ES.3.2 Short-Term Improvements

The short-term improvement concepts, which typically require minimal design and engineering efforts and often lesser funding resources, were developed to transform the corridor to address current needs. The goals of implementing these short-term improvements are to modify the existing roadway features to improve safety for people walking, biking, riding the bus, or using assistive mobile devices. The short-term improvement concepts are listed below.

- Adding more crosswalks to make it safer and easier for people to cross the highway

- Shortening crosswalk distances to improve safety
- Reducing lane widths and tightening the rotary to create space for walking and biking modes
- Installing accessible pedestrian signals with countdown timers to facilitate crossing
- Upgrading the existing sidewalks and curb ramps to MassDOT standards
- Installing bike detection capabilities, bike boxes, bike signals, and signs and markings to increase safety.
- Retiming traffic signals to reduce congestion and pedestrian wait times.
- Narrowing width of travel lanes to calm traffic and reduce speeds
- Converting the 10-foot shoulders in either direction of the roadway into separated bike lanes with physical barriers separating the bike lanes from vehicular travel lanes

ES.4 BENEFITS

Through this study, the technical team has collected data, performed technical analysis, conducted public forums and surveys, and obtained feedback on task products to identify corridor needs and develop short- and long-term improvement concepts to address safety, mobility, and traffic operations. The long-term improvements to transform the corridor into a route for everyone may take some time to implement, so the short-term improvements were developed to transform the corridor to address current and immediate needs. If implemented, the improvement concepts in this report would transform the automobile-centric corridor into a road that connects people to places and meets the needs of local residents, businesses, and people who walk, bicycle, use assistive mobile devices, drive, and ride the bus.

Chapter 1—Introduction

1.1 BACKGROUND

The Massachusetts Office of Travel and Tourism awarded the town of Dedham a grant to fund a study of the Veterans of Foreign Wars (VFW) Parkway and Providence Highway in West Roxbury (Boston) and Dedham. The study area for this corridor is from the intersection of Route 109/Spring Street and VFW Parkway in West Roxbury (Boston) to the Marine Rotary at Washington Street in Dedham. This section of the roadway was designed primarily as a relatively high-speed vehicle corridor. The existing development, future potential development, and redevelopment adjacent to the corridor requires a relook at the corridor's design to address safety and multimodal transportation needs.

A roadway corridor study is a logical way to address regional safety needs and multimodal transportation since it evaluates a roadway corridor comprehensively, considering the needs of people who walk, bike, drive, use public transportation, use assistive mobile devices, and roadway abutters. An additional key aspect to conducting a study of the corridor is public involvement; getting public input is essential in developing successful improvements. This study uses this approach to analyze the issues and develop improvements.

The Central Transportation Planning Staff (CTPS) and the Metropolitan Area Planning Council (MAPC), in conjunction with a technical team and an advisory committee, developed short- and long-term recommendations for improvements within the roadway's right-of-way. Both the technical team and advisory committee consist of a multidisciplinary staff from state and municipal agencies and state legislators.

1.2 VISION, GOALS, AND OBJECTIVES

The intent of this study is to improve the roadway corridor so that it is safe for people to walk and bike to shops, schools, transit stations, and recreational areas, and support existing and future development. We accomplished this by identifying the corridor weaknesses, strengths, and needs and then by developing and evaluating improvement concepts to address the needs. Public participation and community engagement efforts were instrumental throughout the study.

Chapter 2—Community Engagement Efforts

2.1 ADVISORY COMMITTEE

A technical team made up by staff from the Town of Dedham, City of Boston, Central Transportation Planning Staff (CTPS), and Metropolitan Area Planning Council (MAPC) was created to lead and conduct this study. This technical committee, as part of this study process, then established an advisory committee composed of state legislators, municipal officials, and adjacent property owners. The Advisory Committee also includes representatives from the Massachusetts Department of Transportation (MassDOT) Highway Division, the Department of Conservation and Recreation (DCR), the Army Corp of Engineers, the Massachusetts Bay Transportation Authority (MBTA), the City of Boston, and the Town of Dedham. These stakeholders advised the technical team about the study areas and data sources; helped identify transportation-related problems; and helped develop multimodal transportation solutions and recommendations. The Town of Dedham, City of Boston, MassDOT or other entities such as DCR or Army Corp of Engineers will implement the recommendations from this study; therefore, it is important that these recommendations reflect those entities' experiences and align with MassDOT design standards. Appendix A contains the comments and feedback from the advisory committee.

The technical team developed vision, goals, and objectives for the study, created the study schedule, organized community engagement efforts, and coordinated data collection efforts. The team also defined the problems and needs and reviewed the technical analyses and study documents. The team met biweekly to coordinate activities and review study progress.

2.2 COMMUNITY ENGAGEMENT

MAPC led the community engagement task and worked with CTPS, the technical team, and advisory committee on public forums, focus groups, and community surveys. MAPC staff drafted a comprehensive community engagement plan that considered the community demographics, previous projects, study goals, and existing stakeholder relationships.

Based on the analysis, the purpose of engagement was to

- **Engage** stakeholders of the study area in identifying existing problems and crowdsourcing potential solutions;
- **Facilitate** a conversation with stakeholders about their vision for the future of the area and identify potential tradeoffs between their vision and identified solutions; and

- **Educate** residents about any identified tradeoffs and **empower** them to set their own priorities for the area's future.

The community engagement plan had the following general milestones to guide engagement activities:

- corridor vision using an online survey or online open house to obtain public input on how they envision the corridor
- corridor problems and needs—using data and analysis results to report on corridor needs and problems and request feedback from the communities
- draft recommendations—developing improvement concepts and requesting feedback on the draft recommendations
- final report—publication of the final report and a press release

Table 1 summarizes the different engagement opportunities used in this project.

Table 1
Community Engagement Opportunities

Event	Date	Attendance
Boston Trailer Park engagement		
Kick-off Forum	March 11, 2021	250 registrants, 187 participants
Community Survey	December 2020–March 2021	1,361 responses
Business Focus Groups	June 15, June 16 2021	10 participants
Second Community Forum	June 30, 2021	180 registrants, 126 participants

MAPC engaged groups that have not traditionally been active in planning processes along the corridor. MAPC provided these groups with spaces where they would feel more empowered to participate (for example, by bringing the conversation to them and by translating materials into multiple languages), and through an approach that focused on raising all voices to support the study goals. The community engagement effort included a digital component that used Qualtrics and Zoom. These platforms allowed input from those who were less likely to attend a traditional open house or public meeting because of work schedules, childcare needs, or transportation limitations. Furthermore, state and federal recommendations for limiting gatherings to promote public health due to the COVID-19 pandemic required the use of various digital platforms for community engagement.

For the Kick-off Forum, the technical team gave a presentation of the corridor's existing conditions and then gathered feedback from participants using Poll Everywhere and in facilitated breakout rooms. At the final forum, the technical team presented the draft short- and long-term concepts for review and hosted a facilitated Q&A with participants for each section. A PDF of the draft concepts was made available to participants on the project website before the forum began. For the focus groups, the technical team provided an overview of the drafted concepts and then facilitated a discussion with participants. Feedback gathered during these engagement opportunities was analyzed and coded by topic using Excel. Each topic was then summarized to capture the main sentiments identified in the analysis.

In addition, a social media strategy was developed for the study, which included a study website, social media outreach (Twitter, Facebook, etc.), and a Constant Contact email campaign to promote events such as open houses, meetings, surveys, and report publication. Appendix A includes a summary of the community survey and the drafted community engagement plan.

2.3 SUMMARY OF BREAKOUT ROOM DISCUSSIONS

Biking

The corridor is generally considered inhospitable and dangerous to bicyclists. Many want at least more bike paths, but most advocate for separated paths (from cars and people walking). Most indicate that the main concern about biking in the corridor has to do with safety and advocated for protected and multiuse paths. Many also felt that increasing bike safety and infrastructure along the corridor could also help create connections to local amenities and open spaces, but had concerns about the ability to cross the corridor. In terms of where lanes should go, most participants indicated that a protected bike lane through the length of the corridor would be preferable.

Driving

Most participants agreed that, while biking and walking were certainly harder to do in the area, the corridor was also difficult and confusing to drive through. One area that many participants mentioned were the rotaries on either end, particularly the rotary with the cut through. Many participants also expressed the feeling that the corridor was designed for cars (even if it does not work well for drivers).

Walking

Like biking, most participants felt that the corridor was very difficult and unsafe for pedestrians. Many people framed walking around the corridor in terms of getting to the businesses, crossing the corridor to other neighborhood, or trying

to access the riverfront. Some of the most commonly cited concerns included fast traffic, poor timing of lights, and insufficient pedestrian infrastructure (specifically sidewalks). Several people noted that there had been some deaths in the area (assuming they are referring to pedestrian deaths). The Dedham Mall was mentioned multiple times by participants as a particularly negative place for walking.

Taking the Bus
Participants had fewer comments about public transit than expected (but also the number of public transit users who attended the forum was low if the poll response is to be believed). One of the most common refrains is that getting to and from the bus stops is extremely difficult.

Vehicular Traffic
Regarding traffic, many participants focused on the speed at which cars drive and the number of cars there are on the corridor at any given point. Most participants who mentioned traffic in their comments indicated that some form of traffic calming should be implemented in the corridor. A few also indicated that cars seem to speed more at night (for example, drag racing). Generally, participants felt that the pace of traffic, primarily from increased speeds, prevent them from accessing the roadway in a meaningful way.

Safety of Users
Safety seemed to be the most pervasive (and urgent) concern regarding the corridor. When talking about people who bike or walk, nearly every participant indicated that safety was their primary concern. Safety also featured prominently in participants' forward-thinking visions, with several indicating that safety "must" be a priority or should be one of the first things focused on during any actual intervention.

Open Space
Open space, or at least an increase in greenery, featured prominently in participants' ideas for the corridor's future. Connections to the Charles River area, specifically for access to the water or via a shared path, as well as to Millennium Park came up frequently. Several participants also suggested more greenery/green landscaping along the corridor, both by businesses and properties off the actual road and down the median or center of the corridor. In general, most participants framed open/green space around the corridor as a potential or as a way to make the experience of travelling through the corridor more enjoyable.

Connectivity
The best summary of this topic is the very first comment ("So I'm visioning that this area…"). In general, participants wanted to see connections to the surrounding area (specifically the river) and to other neighborhoods in Dedham and West Roxbury and felt that currently there were little to no connections to either of those locations. Even though many participants thought of the potential connections that could occur, many also felt that the roadway actively inhibits meaningful connections even from one end of the roadway to the other (several particularly called out the notion that the roadway divides Dedham's neighborhoods). Lastly, several participants indicated that new apartment complexes will need to have improved access and that the roadway could better facilitate connections to businesses that exist in the area already

Infrastructure
The general consensus is that the area's infrastructure is in need of an upgrade. Participants specifically discussed the size of the area's shoulders (too small), the width of driving lanes (too wide), and the quality of the rotaries (occurred frequently enough that they were coded separately in the rotary tab). For future infrastructure changes, many people indicated that they wanted either all modes separated or a shared-use path separated from the roadway for people walking and biking.

Marine Rotary
Most participants had significant problems with the two rotaries in the study area (and corresponding advice for each). These problems ranged from simple inconvenience to actual life and death danger. Marine rotary, specifically, was mentioned quite often by participants as a significant problem for the area. In particular, participants felt that it was very dangerous to drive through (let along walk/bike through) and that it was confusingly signed and designed.

Vision
No participants who provided comments in the breakout rooms felt that the corridor was anywhere near their vision for the area. Specific elements of the vision are described in some other tabs. In general, participants wanted a corridor with more placemaking and presence that was safe and accessible for users of many different modes and facilitated access to existing and surrounding resources.

Trails/Paths
Many participants indicated that they wanted to see a path or trail network of some sort along the corridor, specifically by the river. Several also indicated that this path should be multiuse or shared between bikes and pedestrians. In addition, several participants felt that the path could facilitate links to outside of

the area (for example, Millennium Park). In terms of how they would use it, many participants indicated that they would use it as a recreational resource while some stated they would use it to for commuting.

Economic Development

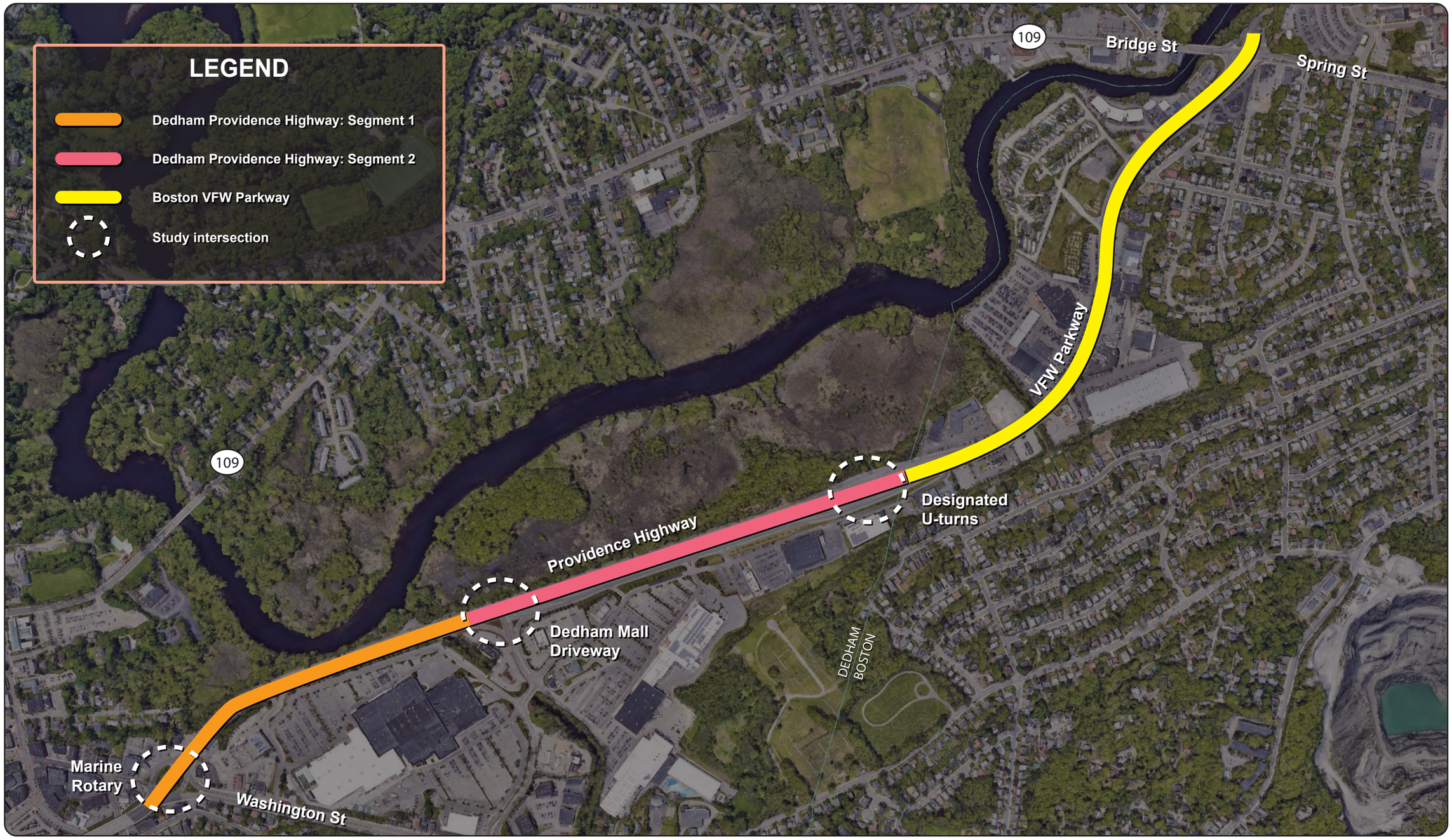
Though not as common as some of the other identified themes, some participants felt that improving the corridor should also involve improvements to businesses (and their buildings) in the area. The Dedham Mall was specifically mentioned as an area in need of improvement. Though perhaps not specific to economic development, another issue that participants brought up was the negative impact of the quality and presence of billboards along that area, considering them to be eyesores. In addition, several participants felt that increasing the connections in and around the corridor would also benefit the local businesses in Dedham and West Roxbury.

Chapter 3—Roadway and Intersections Characteristics

3.1 ROADWAY CHARACTERISTICS

3.1.1 The Study Corridor and its History

The Veterans of Foreign Wars (VFW) Parkway/Providence Highway study corridor is an important segment of the regional roadway system southwest of Boston. The corridor shown in Figure 1 is 1.7 miles in length, with the northernmost 0.7 miles in Boston and the southern one-mile section in Dedham. The road is named VFW Parkway in Boston and then changes to Providence Highway in Dedham. Because the corridor is long and its character varies along it, it was segmented into three to reflect the varied contexts and allow these contexts to be considered in the needs assessment and improvement concepts.



CTPS

Figure 1
Study Area

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

The northern limit of the corridor study is the intersection with Spring Street to the east, main street of West Roxbury, and Route 109 to the west, a major arterial serving numerous suburban communities to the southwest. VFW Parkway continues to the north as a heavily used element of the Department of Conservation and Recreation (DCR) parkway system. The southern limit of the corridor is the connection with Washington Street at Marine Rotary. South of Marine Circle, Providence Highway continues as a divided highway to Rhode Island and is designated as US Route 1 south of Interstate 95/Route 128.

In the 1920s the federal government became a partner with the states in funding the construction of roadways at a higher standard suitable for long distance travel. The emerging system of designated US highways benefited from this state-federal partnership. US 1 extended from Fort Kent, Maine, to Key West, Florida, and a path through Boston appears on a 1927 state road map. However, a Boston map of 1927 shows only an alignment under consideration through West Roxbury that ends abruptly at the Dedham line. By 1939, with the national emphasis on public works during the Great Depression, a Texaco Road map shows the entire corridor being complete. Marine Rotary is shown as a large rotary, an innovation allowing traffic to flow through the junction without stopping. In the late 1960s the heavily travelled US 1 lanes were cut through Marine Rotary, the configuration that exists today.

Another innovation to speed traffic along was to reduce the number of side streets or curb cuts along the route. Many jurisdictions saw in their parkway systems the available land to build these new, higher-grade roads. In 1939, US 1 followed the landscaped VFW Parkway and the Emerald Necklace parkways to the Boston University Bridge and then Memorial Drive on its way to Maine. Storrow Drive and Tobin Bridge were built in the early 1950s and the US 1 designation was transferred to these newer, limited access roadway systems. It was not until the 1990s, however, that the US 1 designation was transferred from the VFW Parkway to the Southeast Expressway.

3.1.2 Present Roadway Characteristics

VFW Parkway/Providence Highway is a two-way, four-lane principal arterial, state-designated truck route, and part of the National Highway System program. The study corridor is under the jurisdiction of the Massachusetts Department of Transportation (MassDOT). The posted speed limit is 45 mph throughout the corridor. This roadway serves regional and local traffic, and the land uses surrounding the corridor are a mixture of large-scale mall, small and large businesses (auto dealerships and car shops, restaurants, and retail services), and residential. The right-of-way varies between 84 feet and 114 feet wide, with the narrower section on northern VFW Parkway and the wider section on

southern Providence Highway. Figures 2 and 3 show the roadway cross sections for the three segments and study intersections.

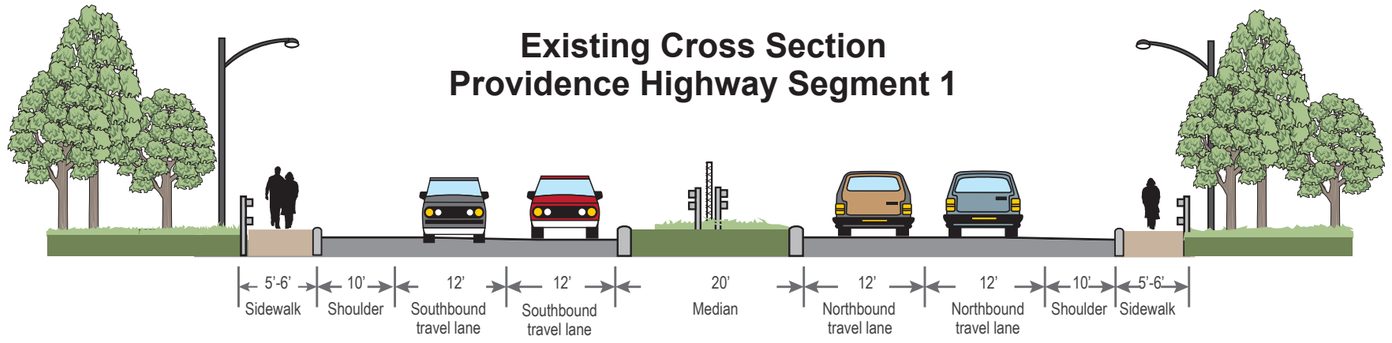
3.1.3 Providence Highway Segment 1

Providence Highway Segment 1 extends from Marine Rotary to the Dedham Mall Driveway, about 0.5 miles long. Figures 1 and 2 show roadway segment and its cross section. It has a variable right-of-way width between 90 and 100 feet wide. There are four lanes in the segment, two in either direction of roadway. The travel lanes are separated by a 10–20-foot median with double-sided guardrails in the center. The Dedham Mall is located on the east side of the roadway and Charles River to the west side. There are five-foot sidewalks and 10-foot shoulders on either side of the roadway. The sidewalks are in poor condition, overgrown with weeds, and do not meet current MassDOT standards. In addition, there are no bicycle facilities and safe crossing areas in the segment, making it unsafe for people walking, biking, or using assistive mobile devices such as wheelchairs.

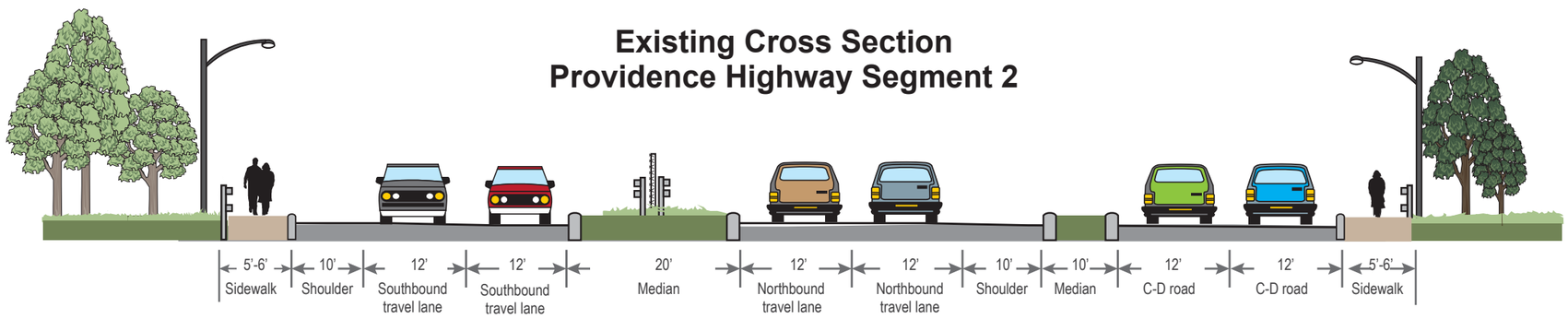
3.1.4 Providence Highway Segment 2

Providence Highway Segment 2 extends from the Dedham Mall Driveway to the designated U-turn intersection, about 0.5 miles long. It has a variable right-of-way width between 135 and 180 feet wide. There are six lanes in the segment, two general purpose lanes in either direction of roadway (four lanes in total) and additional two northbound lanes (mall access road) paralleling the general-purpose lanes on the right-hand side for accessing the mall properties as well as for making U-turns. The travel lanes are separated by a 20-foot median with double-sided guardrails in the center. Figures 1 and 2 show the roadway segment and its cross-sectional dimensions. There are five-foot sidewalks and 10-foot shoulders on either side of the roadway. As in Segment 1, the sidewalks are in poor conditions, overgrown with weeds, and do not meet current MassDOT standards. There are no bicycle facilities, crosswalks, and pedestrian signals in the segment. The absence of safe walking and biking facilities in the segment, in combination with a very wide roadway, make it unsafe and unfriendly for people walking, biking, or using assistive mobile devices.

Existing Cross Section
Providence Highway Segment 1



Existing Cross Section
Providence Highway Segment 2



Existing Cross Section
VFW Parkway Segment

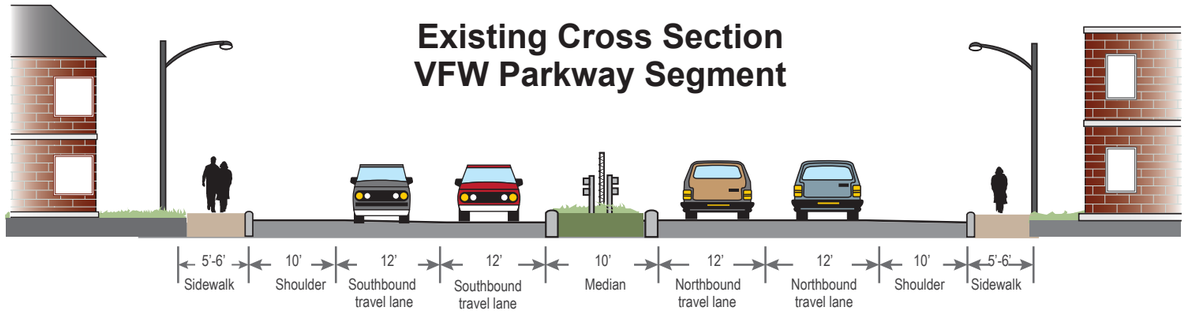


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Figure 2
Roadway Cross Sections

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

3.1.5 VFW Parkway Segment

The VFW Parkway segment is in the City of Boston and it extends from the designated U-turn intersection to the Route 109/Spring Street intersection, about 0.7 miles long. This segment of the corridor is lined with commercial and residential land uses on both sides of the corridor. Recent field visits showed some parcels unused and advertising for new owners, while new businesses were being built on other parcels. Some multifamily housing was under construction closer to Spring Street.

There are four lanes in the segment, two lanes in either direction of roadway, separated by 8–10-foot median with double-sided guardrails and fencing in the center to prevent people walking from crossing the parkway. Figures 1 and 2 show the picture of roadway in the segment, along with its cross-sectional dimensions. The right-of-way width varies between 84 and 90 feet wide. There are sidewalks and 10-foot shoulders on either side of the roadway. As in the other segments, the sidewalks are in poor condition, overgrown with weeds in some sections, and do not meet current MassDOT standards. A few retailers have improved the sidewalks in front of their establishments to newer standards.

In addition, there are no bicycle facilities, crosswalks, and pedestrian signals in the segment, which make it unsafe and unfriendly for people walking, biking, or using assistive mobile devices. The land uses in the segment are a mixture of commercial business and residential uses. Traffic circulation and access to properties in the segment are poor because of a lack of openings in the median. The issue creates circuitous traffic circulation (U-turns) at the adjacent intersections contributing to the congestion and high number of crashes at the intersection of Route 109/Spring Street.

3.2 STUDY INTERSECTIONS

Several cross streets and driveways intersect Providence Highway and VFW Parkway, which creates safety and operations issues for people driving, walking, biking, or using assistive mobile devices. There are four signalized intersections in the corridor, equipped with fully or semi-actuated traffic-control systems; however, these systems require updating the existing signal timings and phasing plans to accommodate walking and biking modes at a minimum. The following section describes the geometry, traffic and control, and land uses surrounding the signalized intersections. Figure 3 shows the aerial photos of the intersections.

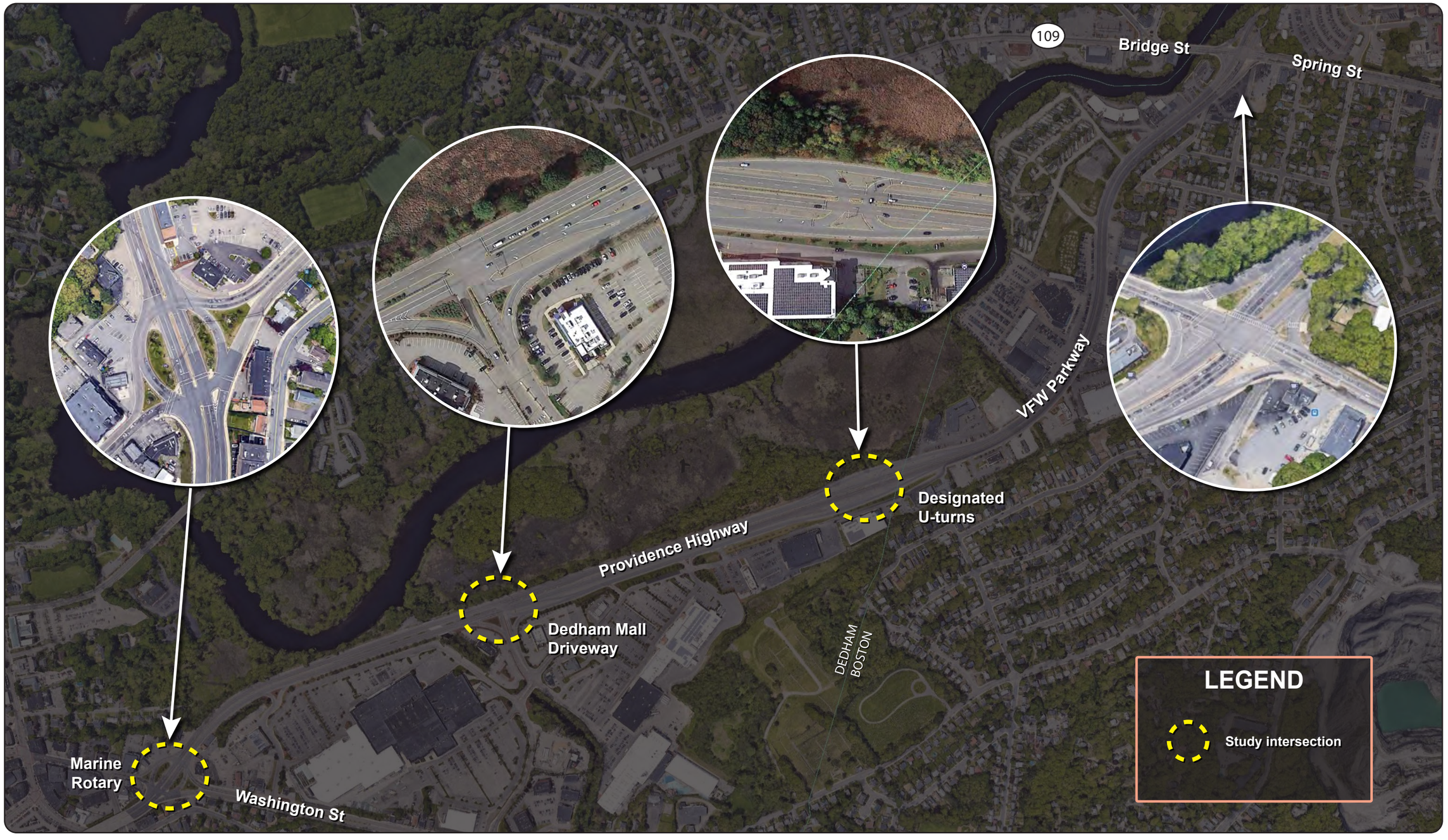

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Figure 3
Study Intersections

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

3.2.1 Marine Rotary

The southern limit of the project corridor is the Marine Rotary (Figures 1 and 3) and includes the southern approach via a 330-foot bridge over Harris and High Streets. This bridge was reconstructed in 2009 and replaced an earlier structure. South of the bridge is a signalized intersection with Eastern Avenue (this intersection is not part of the study corridor but is being incorporated in the traffic modeling effort). The new bridge south of Marine Rotary has narrow shoulder lanes, but the northbound barrel widens to accommodate a third, slip (right-turn-only) lane. The roadway shoulders north of Marine Rotary are slightly wider, and in the southbound direction becomes a right-turn-only lane approaching Marine Rotary.

Washington Street northeast of Marine Rotary has two travel lanes in each direction and parking and bus stop curb space on both sides from where the rotary access ends and transitions to straight roadway. Washington Street southwest of Marine Rotary has only one lane in each direction and no parking. Dedham Square is located along Washington Street, approximately 700 feet southwest of Marine Rotary.

The circulating lanes of Marine Rotary functions today as a pair of left turn lanes. Any vehicle making a left turn, either to leave or to enter Providence Highway will need to travel in the circulating lanes. Traffic is controlled in three signal phases and the pedestrian walk signal phases are concurrent—concurrent pedestrian phasing allows pedestrians to cross simultaneously with parallel through traffic and can therefore reduce pedestrian delay, but conflicts may arise between pedestrians and turning vehicles. There are sidewalks installed, but with limited crossing opportunities and no bicycle facility is provided at the rotary.

3.2.2 Dedham Mall Driveway Intersection

A half-mile north of the Marine Rotary is a signalized entrance to the Dedham Mall, shown in Figures 3 and 4. This is a “T” intersection with the mall circulation road departing Providence Highway towards the east. There is no commercial activity west of Providence Highway between Marine Circle and the Boston city line. A curb cut on the west side of Providence Highway allows DCR to maintain the Mother Brook flood control outlet.

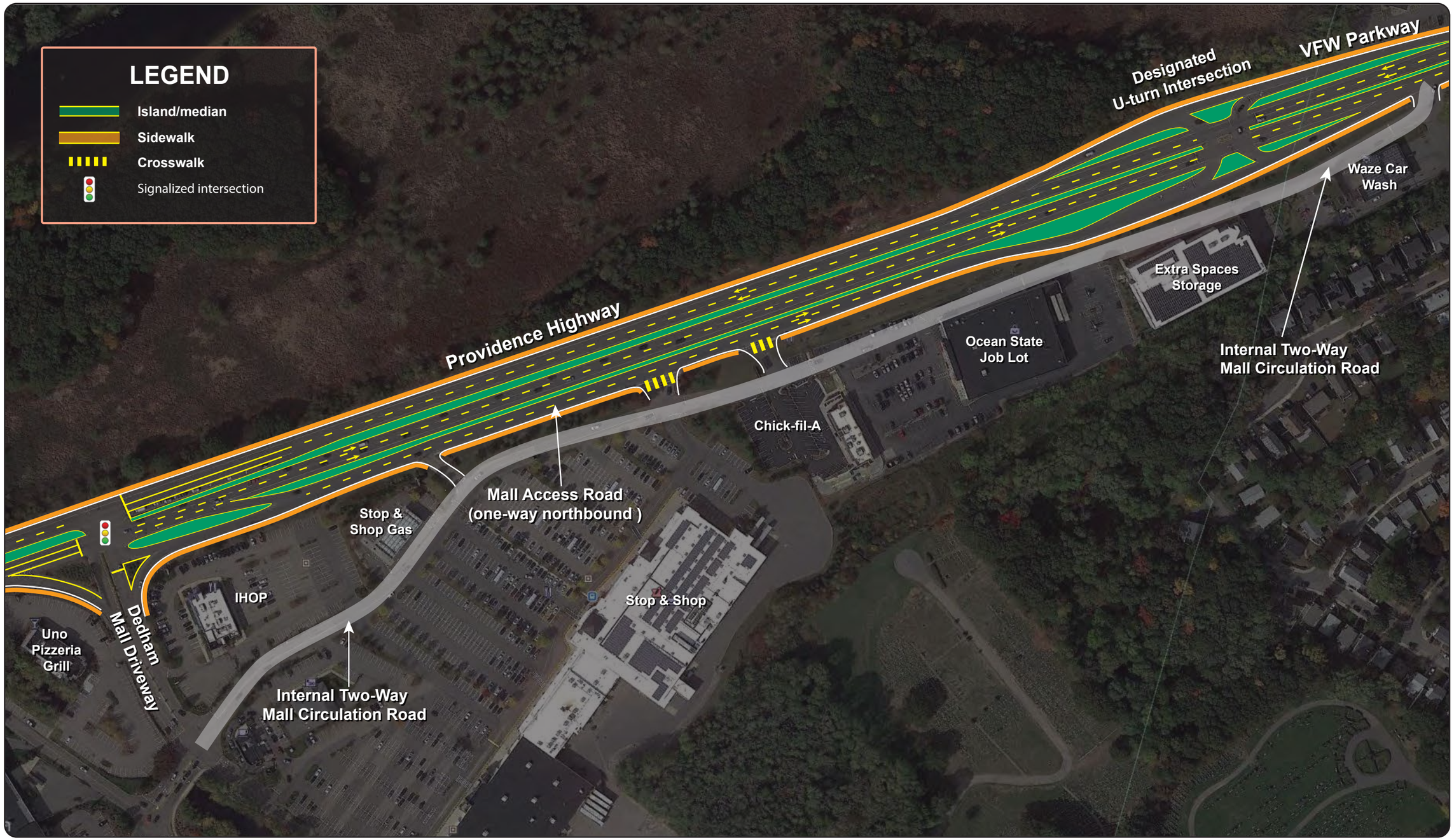

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Figure 4
Providence Highway, Mall Access Road, and Internal Two-Way Mall Circulation Road

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

A distinguishing feature of this intersection is the entrance to a northbound mall access road, which parallels the northbound Providence Highway barrel for a half-mile, merging with the main barrel just north of the Boston city line. This road has several right-turn-only connections with the mall parking areas. There are three ways to enter the mall access road:

- a high-speed exit from northbound Providence Highway,
- a U-turn from southbound Providence Highway, and
- an unsignalized right-turn lane leaving at the mall entrance.

3.2.3 Mall Access Road Connections

Between its start at the Dedham Mall driveway and its northbound merge with Providence Highway at the U-turn intersection, one-half mile to the north there are three access points that connect with retail parking areas (Figure 4). The first connection is 600 feet north of the mall entrance. It is one-way and leads to a parking area close to the Shop & Shop grocery store, which anchors the north end of the Dedham Mall. The second and third connections are a two-way pair of lanes 500 feet further north at the edge of Dedham Mall. These lanes meet a two-way parking circulation road that connects the Dedham Mall to the south with other commercial establishments to the north, including Chick-fil-A and Ocean State Job Lot. The northmost access point is a two-way connection that leads directly to the Chick-fil-A parking area.

3.2.4 Signalized U-turns Intersection

About 300 feet before its merge with the northbound Providence Highway, the mall access road connects with a pair of signalized lanes that enable traffic on Providence Highway to reverse direction (Figures 3 and 4). This U-turn system is located at the Boston city line, the point where Providence Highway becomes VFW Parkway. Southbound VFW Parkway traffic can use this feature to return to Boston. Northbound traffic on Providence Highway that wants to reverse direction needs to enter the mall access road via the high-speed exit just north of the signalized Dedham Mall driveway intersection (Figure 3). Signs at this exit indicate the U-turn opportunity. The northbound to southbound U-turn also allows traffic that leaves the commercial area on the mall access road to reach the southbound Providence Highway lanes.

Traffic at the U-turn system is controlled in two signal phases. There is no pedestrian crossing at this location, however, there are two sidewalks along the study corridor, one on the west side of the southbound lanes and one on the east side of the northbound mall access road. The internal two-way mall area circulation road merges with the northbound Providence Highway just 125 feet

north of the high-speed merge with the mall access road near Waves Car Wash, shown in Figures 3 and 4. There is no crosswalk striping and the granite curb forces people walking, biking, or using assistive mobile devices to use the narrow shoulder lane to reach an accessible sidewalk farther north.

3.2.5 VFW Parkway, Spring Street, and Bridge Street Intersection

The northern limit of the project corridor is the intersection of VFW Parkway with Spring Street going northeast and Bridge Street (Route 109) going southwest. As shown in Figure 3, the Charles River is immediately west of the intersection and is the boundary between Boston and Dedham. This is the beginning of Route 109, which is called Bridge Street in Dedham. MassDOT and the City of Boston are developing a plan to improve this intersection separate from this planning process. The project has been moved to 2026 on the Boston Metropolitan Planning Organization's Transportation Improvement Program. Traffic operations at this intersection, however, are reflected in this study.

The character of VFW Parkway changes dramatically at this point. As the VFW Parkway continues into Boston through the landscaped DCR reservation with trees in the median and buffers separating people walking from travel lanes in either direction of the road. A sign in the median indicates that no trucks are allowed. There is, however, an industrial area that requires travel for approximately 0.4 miles on this section of the parkway. Each of the four approaches to this intersection has an exclusive right-turn lane with a yield sign. Each approach also has a signalized left-turn-only lane. VFW Parkway has two through lanes in each direction. The intersecting Route 109 and Spring Street each have only one through lane.

Chapter 4—Data Collection

The Massachusetts Department of Transportation (MassDOT) Highway Division, Town of Dedham, City of Boston, and Central Transportation Planning Staff (CTPS) provided the data used to assess the existing conditions and identify problems in the corridor. The data included driving, walking, biking volumes, and speeds of vehicles that were collected in November 2020 during the pandemic, and community engagement input data (from community surveys).

4.1 CRASH DATA

MassDOT, City of Boston, and the Town of Dedham provided the crash data that occurred in the corridor from January 1, 2015, to December 31, 2019. The crash data include the manner of collision, crash severity, weather, ambient light, and road surface conditions. In addition, the crash data include police crash reports with diagrams and narratives useful for constructing collision diagrams for identifying crash patterns and operational problems in the corridor. Appendix B contains the crash data.

4.2 TRAFFIC VOLUME AND SPEED DATA

MassDOT collected the traffic data for the study. The data included automatic traffic recorder (ATR) counts collected during a five-day period from Wednesday, November 18, 2020, to Sunday, November 22, 2020. The ATR counts were used to estimate average daily traffic volumes. Vehicle spot speeds and traffic mix (light and heavy vehicles) were also collected as part of the ATR counts.

In addition to the ATR counts, MassDOT collected turning-movement counts (TMC) at selected intersections in the study area on Thursday, November 19, 2020, and on Saturday, November 21, 2020. The TMC were performed during the weekday AM peak travel period (6:00 AM to 9:00 AM), weekday PM peak travel period (3:00 PM to 6:00 PM), and weekend Saturday peak period (11:00 AM to 2:00 PM). The TMC were used to evaluate intersection traffic operations performance during the peak hours. Appendix C contains the ATR, TMC, and spot speed data.

The data were collected during the; the volumes were expected to be lower than normal. Adjustments were made by comparing the November 2020 counts to April 2018 counts taken in the corridor for the MassDOT project number 607759, Signal and Intersection Improvements, at VFW Parkway and Spring Street and March 2018 counts taken in the corridor for development of the Parkway Apartments.

4.3 PEDESTRIAN AND BICYCLE DATA

Pedestrian and bicycle counts were collected at the intersections during the same time the TMC were taken. Most of the intersections in the corridor do not have crosswalks or pedestrian signals to facilitate safe crossings. In addition, there are no bike lanes in the corridor; people biking use the shoulder or share lanes with vehicles, but the high speeds of vehicles make it unsafe for them. Therefore, we expected the volumes of people walking or biking to be very low and not reflective of the people expected to walk or bike in the corridor if there were safe facilities. Other factors include cold November weather and high traffic volumes during peak periods.

4.4 SIGNAL TIMING AND LAYOUT INFORMATION

MassDOT provided intersection layouts, existing signal timings, as-built traffic signal plans, and signal-phase sequences for the signalized intersections. CTPS conducted field visits to verify modifications to the intersection layouts and signal timing plans. CTPS also conducted field visits to identify recent modifications to the intersection layouts.

4.5 TRANSIT DATA

Service and ridership data for the four bus routes (Routes 34, 34E, 35, and 52) operated by the Massachusetts Bay Transportation Authority (MBTA) that serve the Dedham Mall and other nearby retail locations were used to evaluate the existing bus service performance. The data obtained from MBTA were collected in fall 2019.

4.6 PROJECTS AND DEVELOPMENT

CTPS searched the MassDOT project information database for planned and programmed projects in the corridor. The Town of Dedham and City of Boston were also consulted for planned development for the corridor. Relevant information from those projects and development such as traffic counts, projections, and recommendations were used in this study.

Chapter 5—Existing Conditions

5.1 DAILY TRAFFIC VOLUMES AND DISTRIBUTIONS

Figure 5 shows the average daily traffic volumes through the corridor. It shows that the traffic volume throughout the corridor is between 26,000 to 36,000 vehicles per day. The majority of traffic have destinations outside of the study area. Figure 6 shows the daily hourly distributions of the weekday volumes. The peak periods are from 1:00 PM to 6:00 PM in both northbound and southbound directions. The PM peak period traffic has much higher volumes as nonworking related trips such as shopping also coincide with rush hour work related trips.

5.2 TURNING MOVEMENT VOLUMES

Figure 7 shows the turning movement volumes at the selected intersections during the weekday AM and PM peak hours and weekend Saturday PM peak hour. Peak hours in the corridor were recorded as 7:30 AM to 8:30 AM in the morning and 4:00 PM to 5:00 PM in the afternoon and 1:00 PM to 2:00PM on Saturday. Appendix C contains the turning movement data.

5.3 WALKING AND BIKING VOLUMES

Table 1 cites the observed walking and biking volumes. The low walking and biking volume are due primarily to the absence of safe walking and biking facilities. Most of the walking and biking trips occur at the VFW Parkway at Spring Street and Marine Rotary intersections, where walking facilities are located. Many of the intersections located between the Spring Street and Marine Rotary intersections do not even have crosswalks or pedestrian signals to facilitate safe crossings. Other contributing factors include cold November weather, high vehicle speeds, and high traffic volumes during peak periods.

Table 2
Peak Period Pedestrian Volumes

Intersection	Pedestrian Volumes	Bicycle Volumes	Total
VFW Parkway at Spring Street	123	49	172
Bridge Street at Riverside Drive	119	59	178
VFW Parkway at Waves Driveway	17	6	23
Designated U-turns	11	8	19
Providence Highway at Mall Driveway	0	0	0
Providence Highway at Ivy Lane	0	0	0
Marine Rotary	43	5	48

Source: Central Transportation Planning Staff.
Note: The walking and biking volumes are for these peak periods: weekday AM = 6:00 AM to 9:00 AM; weekday PM = 3:00 PM to 6:00 PM; weekend PM 11:00 AM to 2:00 PM.

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Figure 5
Average Weekday Traffic Volumes

VFW Parkway/Providence Highway
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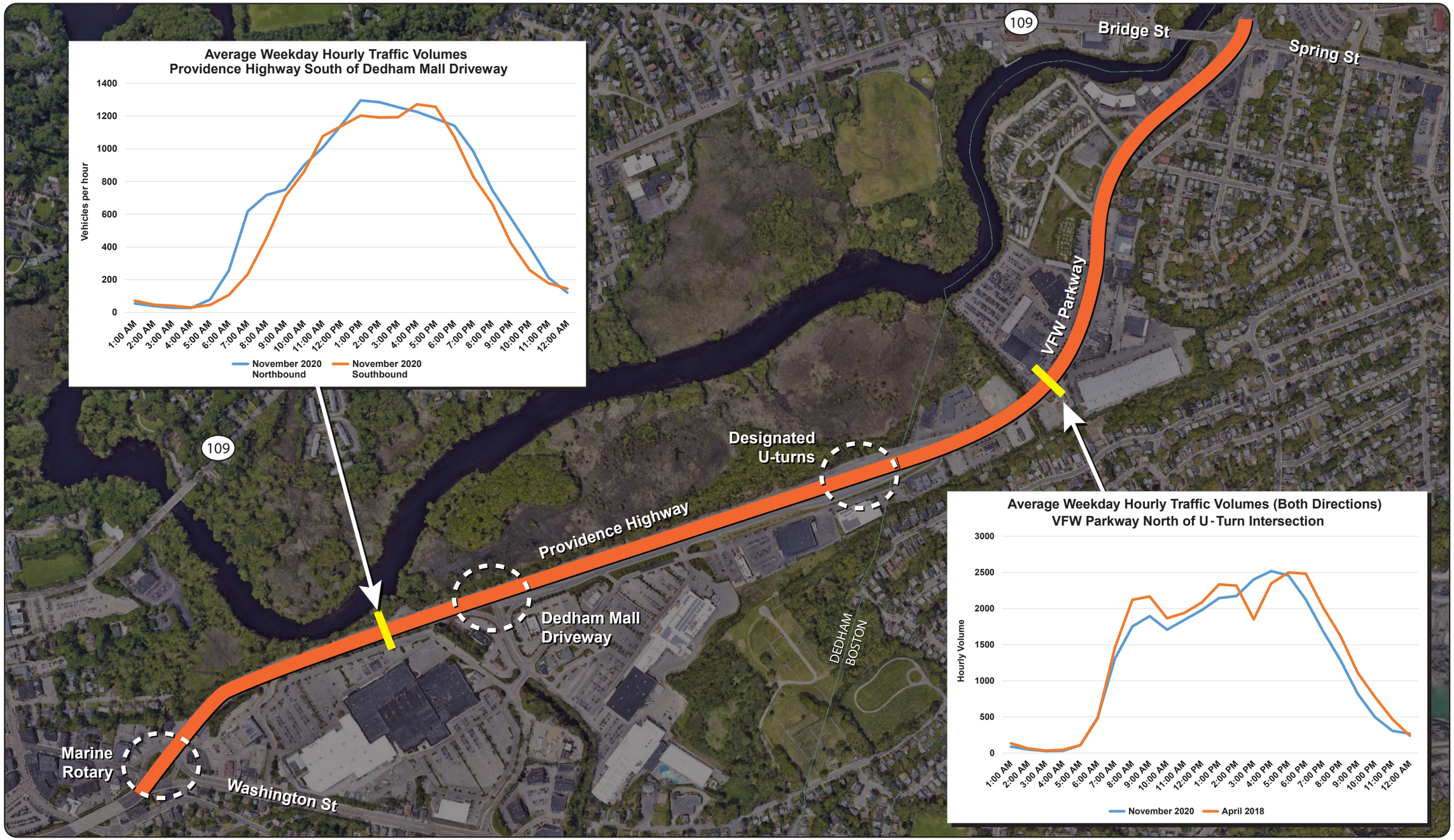

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Figure 6
Comparisons of Traffic Volume Distributions by Direction and Year

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

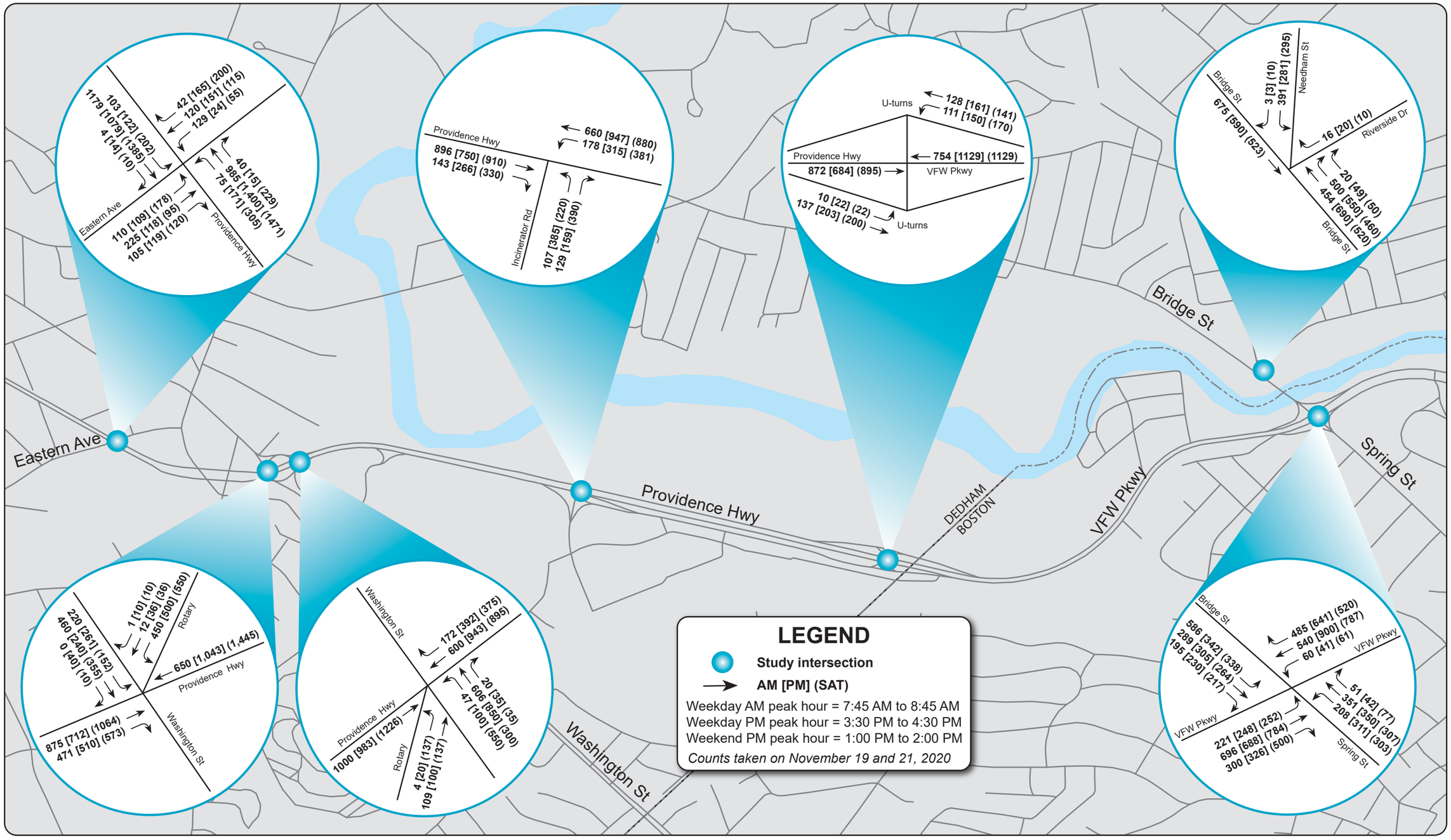

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Figure 7
Intersection Turn Movement Volumes

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

5.4 SPOT SPEEDS

The Massachusetts Department of Transportation collected vehicle travel speeds and volumes at two locations on the corridor. Figure 8 summarizes the speed data and compares them with the posted speed regulations present in the corridor. The spot speed data show that the average speeds are consistent with the posted speed limits. The data show that the 85th percentile speeds were higher than the posted speed limits. In other words, the 85th percentile speeds are speeds that 15 percent of the drivers sampled exceeded while driving in the corridor. Appendix C includes the speed data.

5.5 TRANSIT SERVICES

5.5.1 Services

Dedham Mall and other nearby retail locations are served by four bus routes operated by the Massachusetts Bay Transportation Authority (MBTA). Routes 34, 34E, and 35 operate full daily schedules. The three full-service routes all operate on Washington Street on the east side of the mall complex. Route 34E stops only on Washington Street on its route between Forest Hills and Walpole. Routes 34 and 35 turn into the mall complex, stop at the Old Navy store at the southern part of the complex, and then end their routes at Stop & Shop at the north end of the complex. The only bus service operating on Providence Highway west of the mall complex is Route 52.

Figure 9 shows these four bus routes schematically and indicates the bus stops that could be used for travel to or from the mall complex. The bus stop at 106 Washington Street is significant because it is the closest stop to the mall complex that is served by both bus routes 34 and 34E. Combining the 43 daily inbound buses starting in Walpole with the 67 inbound buses starting at Stop & Shop provides a total of 110 weekday buses to Forest Hills serving this stop.

During the midday of weekdays these two routes operate every half hour in each direction and inbound departures at 106 Washington Street are approximately every 15 minutes and more frequent during the AM peak. The high frequency of service between this point and Forest Hills makes bus service an attractive mode choice for nearby residential areas and along the entire corridor. Only three southbound and two weekday northbound trips operate on Route 52, which extends through Newton to Watertown. The first bus stop is at Spring Street, at the north end of the study corridor.

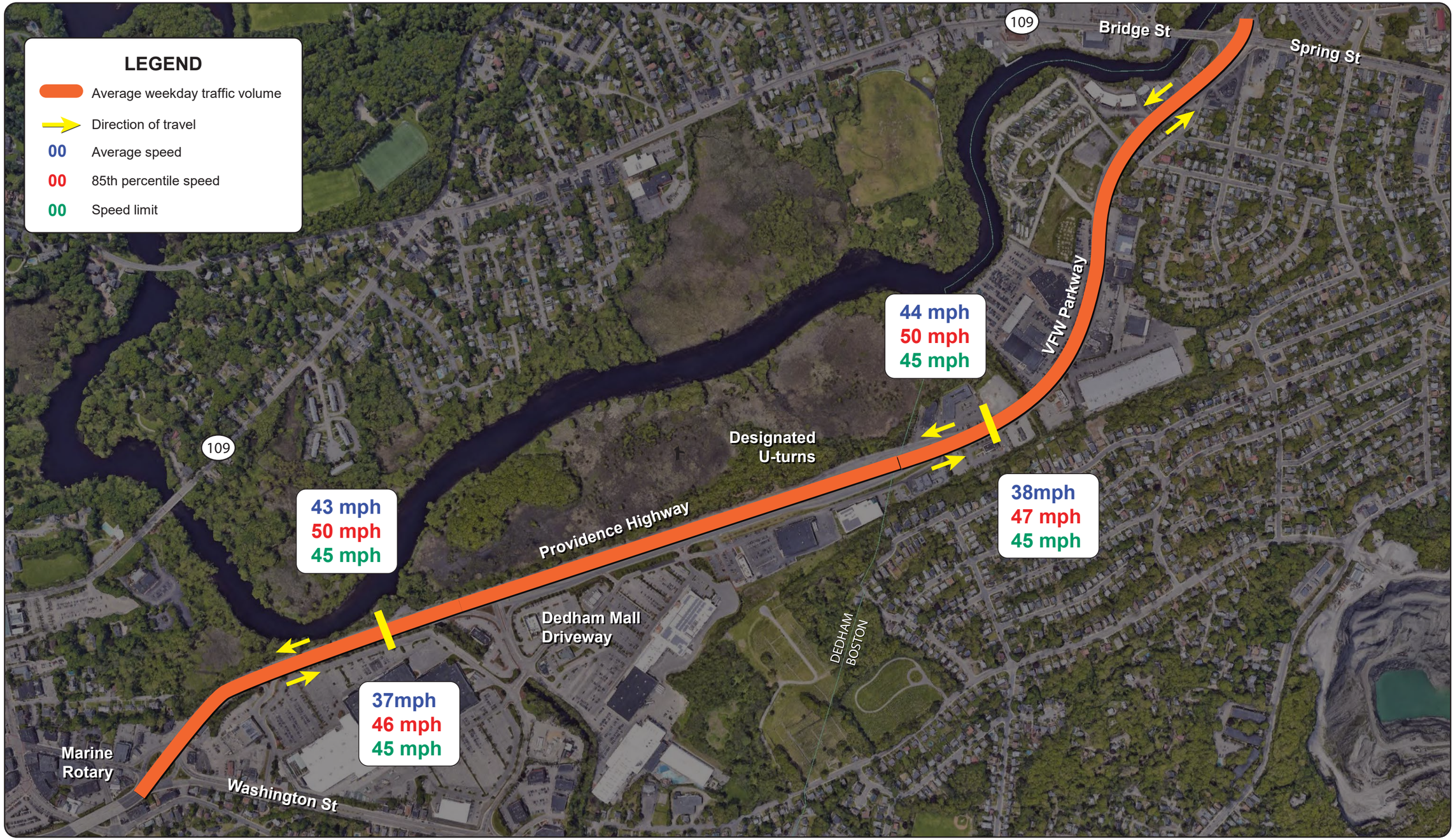

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Figure 8
Corridor Spot Speeds

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

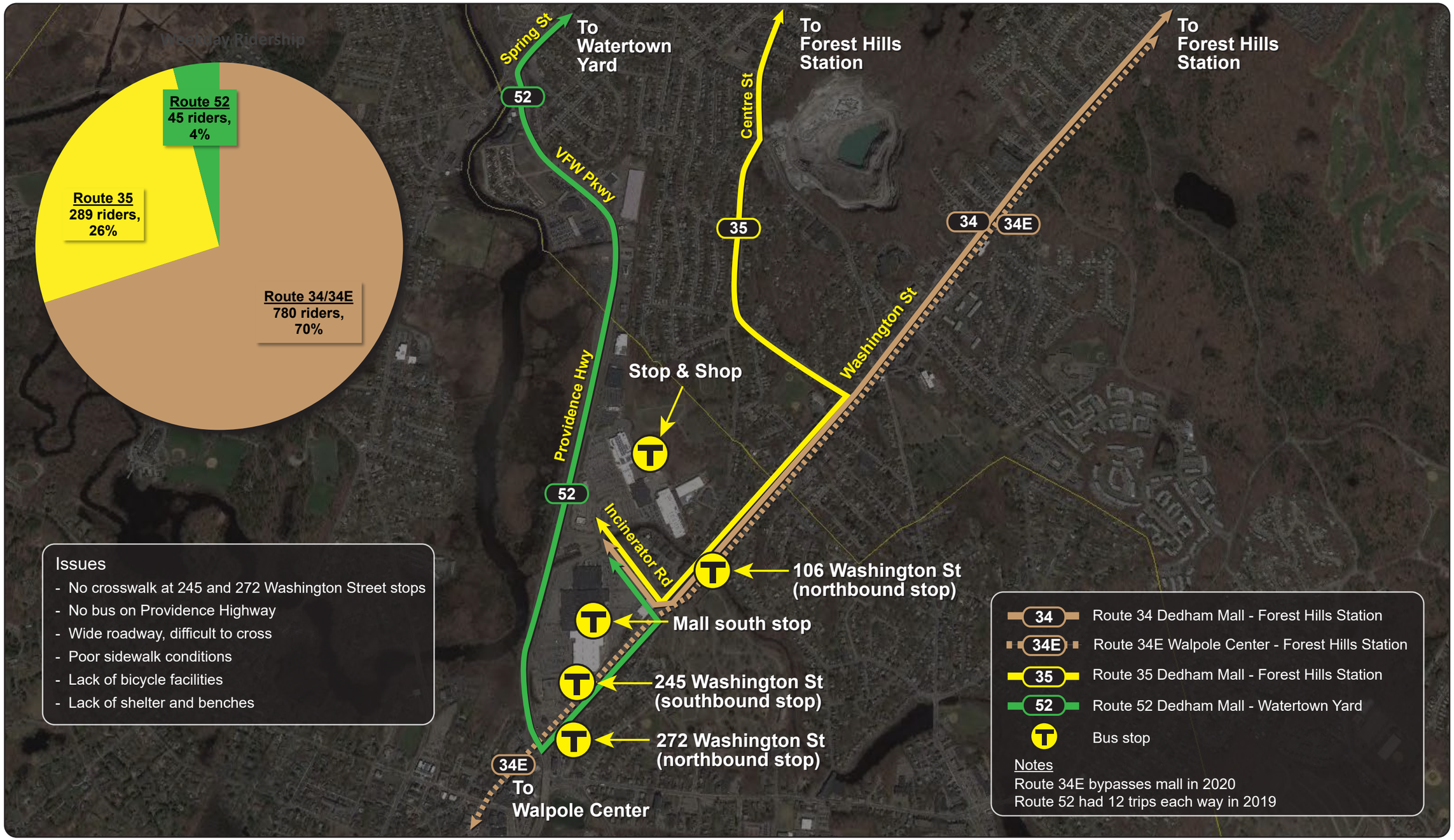

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Figure 9
Weekday Passengers at or Near the Dedham Mall
Fall 2019 Weekday Boardings and Alightings
Fall 2020 Weekday Bus Trips

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

5.5.2 Weekday Ridership

The four bus routes shown in Figure 9 allow for four distinct round trips between the mall complex and regional destinations. These round trips and their 2019 weekday ridership are shown schematically in the pie chart. The four service destinations in descending order of ridership are:

- Forest Hills via Washington Street using routes 34 and 34E
- Forest Hills via West Roxbury using route 35
- Watertown Yard via Providence Highway, VFW Parkway, and Spring Street using route 52

The four travel routes had a total of 534 weekday boardings and 580 alightings at the mall area stops in fall of 2019. About 70 percent of these riders were using bus routes 34 and 34E traveling towards or away from Forest Hills with 413 weekday alightings at or near the mall complex and 367 boardings in the reciprocal direction. Route 34E now bypasses the mall complex as it serves the distant end point in Walpole. In 2019, however, some operations of route 34E circulated in the mall complex. All riders using this service today must use the bus stops on Washington Street. Much of the ridership on route 34E is traveling between Walpole, Norwood, Westwood, and downtown Dedham to Forest Hills. These riders do not use the mall area bus stops and are not considered in this study.

Routes 35 and 34 both operate between Forest Hills and the mall complex, but route 35 travels via Centre Street in West Roxbury. This route typically requires approximately 10 more minutes to reach Forest Hills, but it does serve a moderately developed corridor, which includes high schools, shopping centers, and multi-unit housing. There were 142 alightings and 147 boardings of bus route 35 at the mall area stops in 2019. Bus route 52 operates only on weekdays and service at the mall complex has recently been reduced from 12 weekday trips to only two or three, as indicated in Figure 5. The 20 boardings and 25 alighting counted in 2019 were for the earlier 12-daily-bus schedule.

MBTA ridership surveys show that 73 percent of riders on buses 34 and 34E are traveling between home and work. This fraction is calculated using all boardings along the routes in both directions. The number of riders going to jobs at the mall complex is not known, but many users of these buses are making radial trips to Forest Hills and changing to the Orange Line. Work trips make up 62 percent of the trips on bus 35, which serves a major mixed-use corridor.

5.5.3 Weekend Ridership

For the three routes with daily service, there are a total of 141 weekday trips each direction. Total service on these routes is reduced to 90 trips on Saturdays and 72 trips on Sundays. Total ridership (boardings plus alightings) at the mall area bus stops were 867 on Saturdays and 500 on Sundays in 2019. This was approximately 9.6 riders per bus trip on Saturdays and 6.9 on Sunday. The three routes with daily service had a total of 1,114 riders on a typical weekday, for an average of 7.9 riders per weekday trip. The higher average ridership per bus on Saturdays suggests a relative level of popularity of the bus mode for mall patrons on the popular Saturday shopping day.

5.6 COMMUNITY PERCEPTION OF THE CORRIDOR

Stakeholder participation was a crucial part of this study, and the users of the corridor are among the most important stakeholders. Hence, a number of methods were used to engage the community in planning for improvements to the corridor. They included online survey, focus group meetings, advisory committee meetings, and social media platforms. Figures 10 through 13 are graphical displays of the responses to the online community survey, highlights of which are listed below.

- Eighty-five percent of the respondents to the survey believe the existing conditions are not close to their vision for the corridor and it needs improvements.
- People driving through the corridor complain about high volumes of traffic, congestion, aggressive drivers, poor safety, and difficulty crossing the corridor.
- More than 50 percent of people driving feel safe in the corridor, while approximately 80 percent of people walking or biking feel unsafe in the corridor.
- People driving identified Marine Rotary and VFW Parkway and Spring Street intersections as the choke points and difficult to navigate. People driving have very little complaints navigating the segment in between the two choke points.
- People walking or biking consider the corridor as very unsafe.
- People walking or biking consider the corridor very difficult to navigate.

Some notable conclusions drawn from the surveys are summarized below.

- Only 15 percent of the respondents rated the corridor as close to their vision. Sixty percent of the respondents indicated that the corridor needs

improvements to transform the corridor to their vision. Twenty-two percent indicated that the corridor is far from the vision.

- Driving through the corridor is perceived as safe by 56 percent of the respondents, while walking or biking through the corridor is perceived as safe by less than 10 percent of the respondents. Similarly, only 30 percent of the respondents consider taking a bus as a safe mode.
- Some of the biggest challenges facing users are high vehicle speeds, high volumes of vehicles, difficulty turning into or out of side streets and driveways, and wide roadway, which are very difficult to cross.
- The biggest challenges facing pedestrians and bicyclists are poor sidewalk conditions, lack of bicycle facilities, long pedestrian wait times, lack of ADA-compliant curb ramps, and gaps in bicycle and pedestrian network.

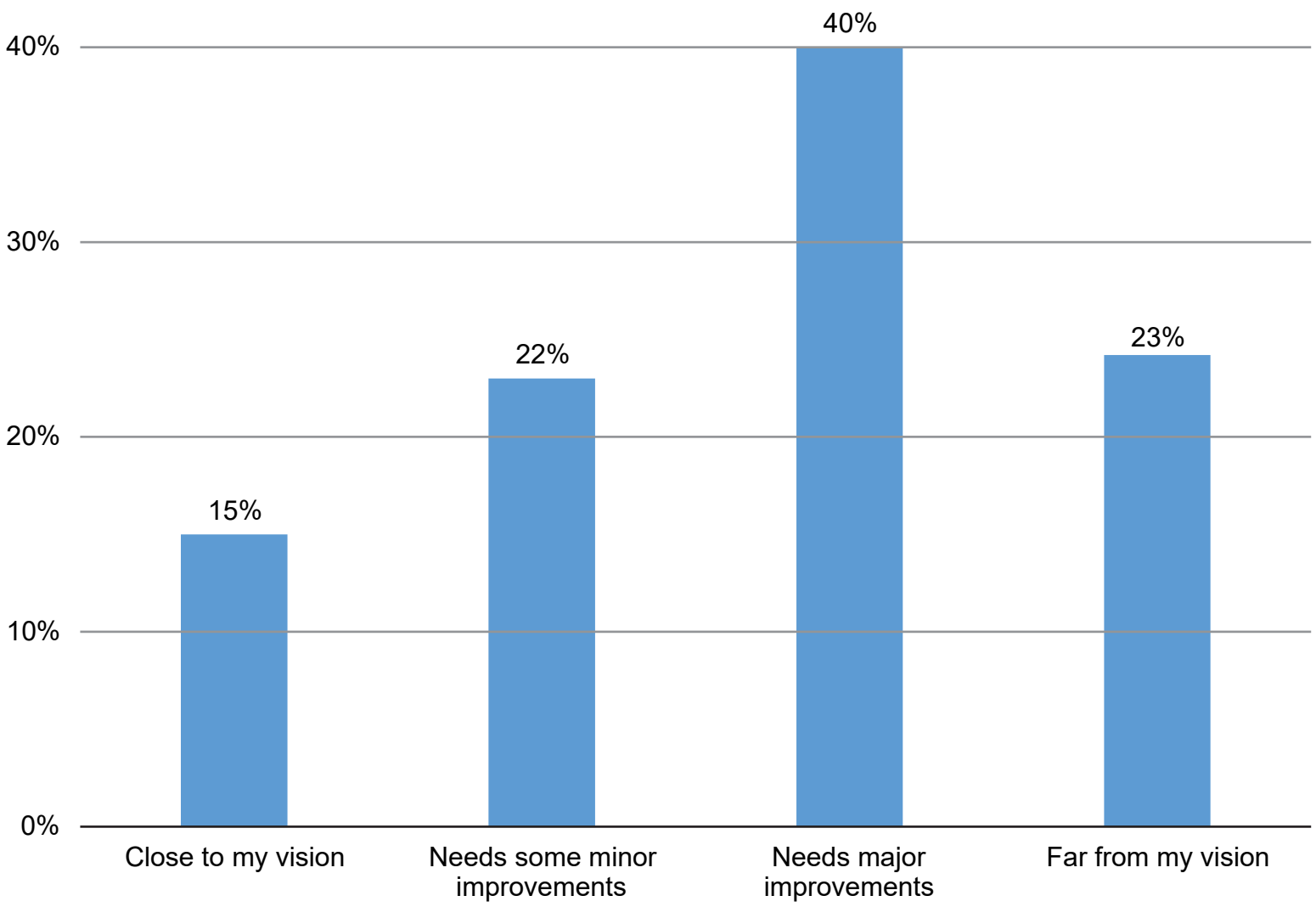

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Figure 10
Vision for Corridor

VFW Parkway/Providence Highway
Corridor Action Plan
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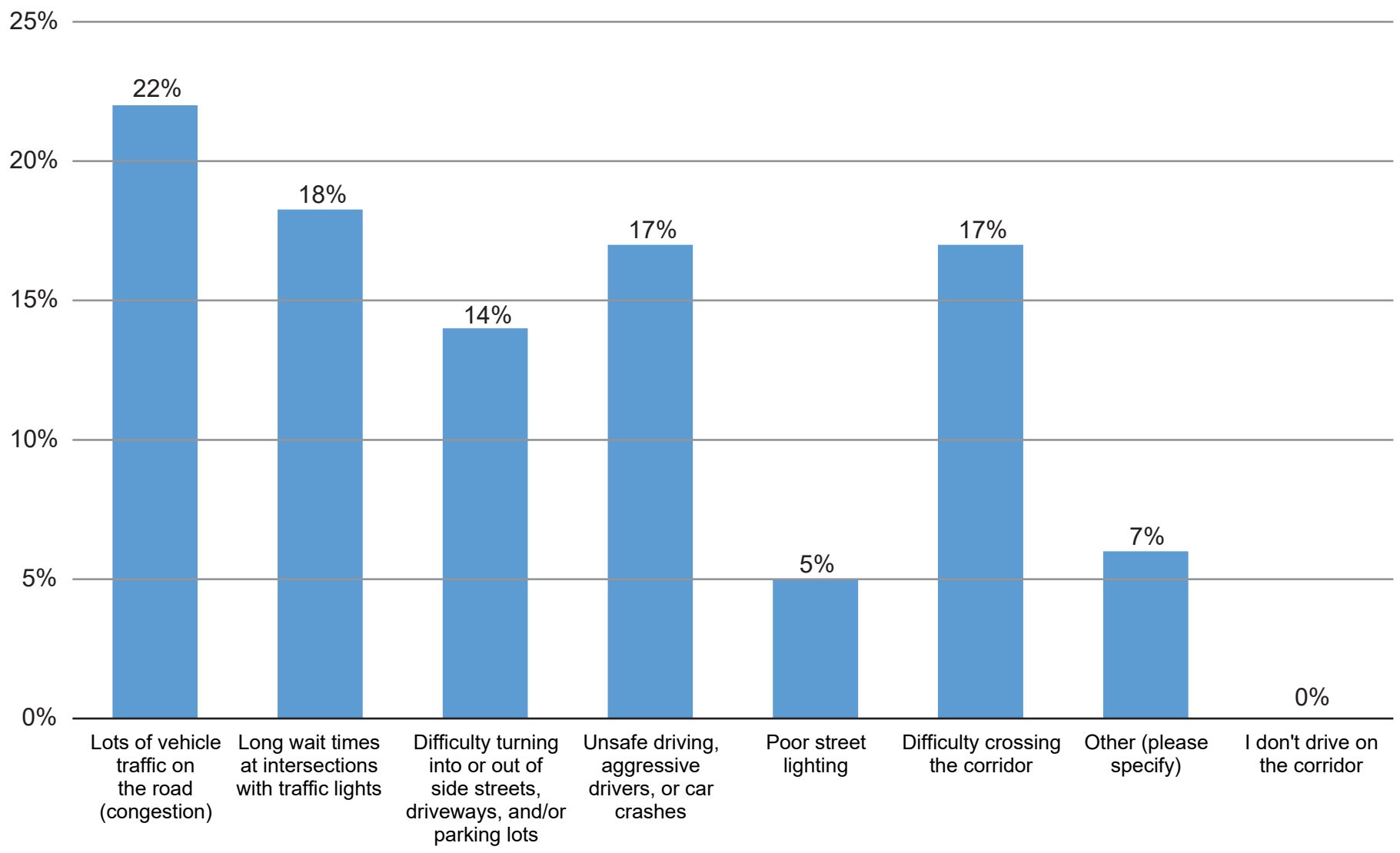

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Figure 11
Biggest Challenges Driving Around this Area

VFW Parkway/Providence Highway Corridor Action Plan
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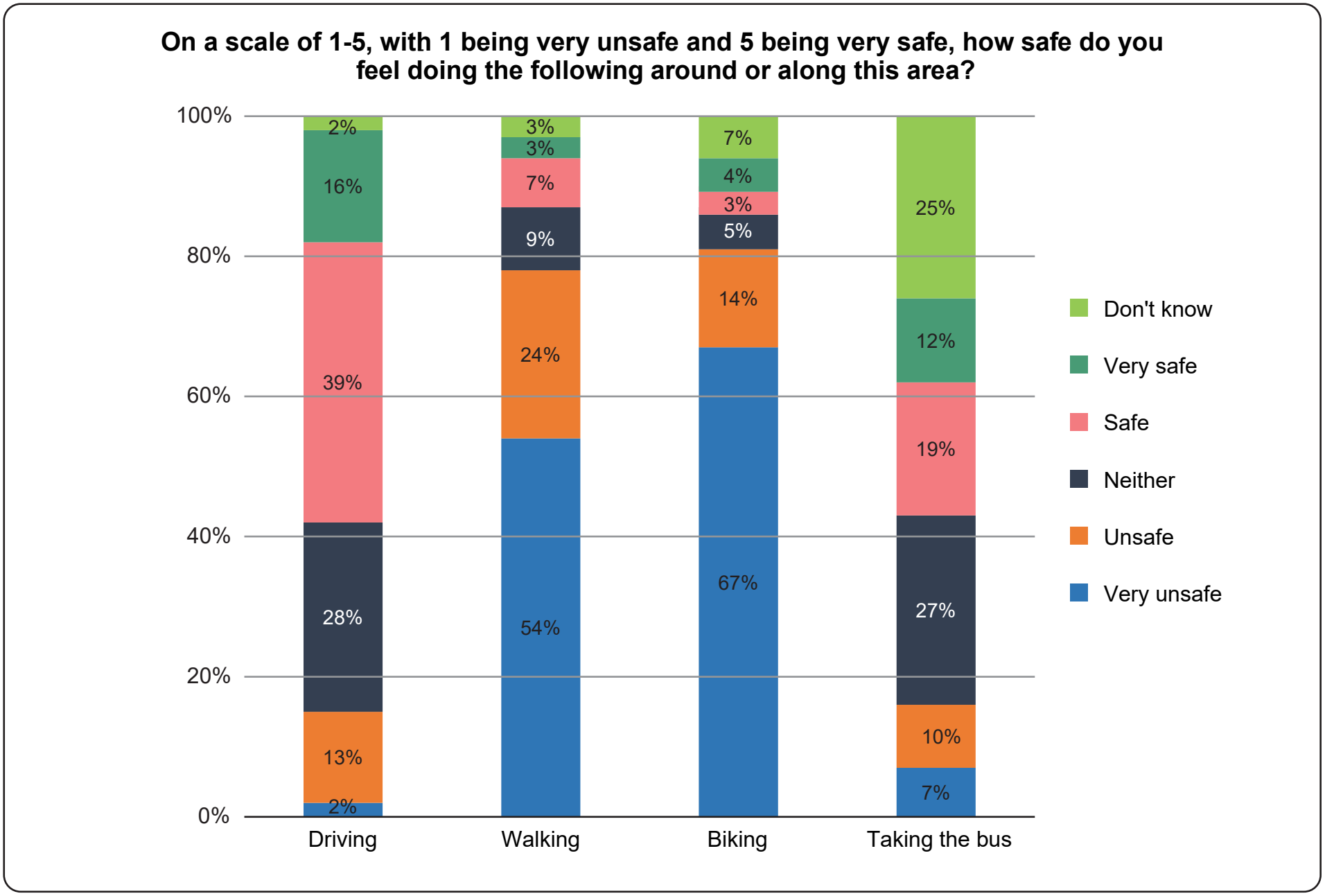

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Figure 12
Safety Experience by Mode of Transportation

VFW Parkway/Providence Highway Corridor Action Plan
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Driving

Walking or Biking

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Figure 13
Level of Difficulty Navigating the Corridor
Driving Versus Walking or Biking

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

5.7 SAFETY EVALUATION

5.7.1 Crash Summaries

During the five-year analysis period (2015–19), 217 crashes were recorded in the corridor. Table 2 presents a summary of the crash characteristics, while Figure 14 shows the crashes at the intersections selected for study. Some characteristics of the crashes include the following:

- one fatal crash at the Marine Rotary
- approximately 50 percent of the crashes occurred at Marine Rotary
- the injury rate was very high; 30 percent of crashes resulted in injury to at least one of the involved parties
- twenty-seven percent of all crashes were angle crashes
- thirty-nine percent of all crashes were rear-end crashes
- seven percent of all crashes were single vehicle crashes
- twenty-seven percent of crashes took place during peak period (defined as 6:00 AM to 9:00 AM and 3:00 PM to 6:00 PM)
- five crashes involved people walking or biking

Table 3
Corridor Crash Statistics (Five-Year Summary: 2015–19)

Statistics Period	2015	2016	2017	2018	2019	5-Year Total
Total number of crashes	30	55	41	42	49	217
Severity: Property damage only	22	38	25	37	37	159
Severity: Possible injury	3	2	4	2	6	17
Severity: Non-incapacitating	3	9	5	3	4	24
Severity: Incapacitating	1	1	0	0	0	2
Severity: Fatality	0	0	0	0	1	1
Severity: Not reported/unknown	1	5	7	0	1	14
Collision type: Single vehicle	5	3	6	5	5	24
Collision type: Rear-end	10	22	15	11	27	85
Collision type: Angle	3	19	8	16	12	58
Collision type: Head-on	2	1	1	1	0	5
Collision type: Sideswipe, same direction	6	8	8	6	5	33
Collision type: Sideswipe, opposite direction	4	1	1	3	0	9
Collision type: Not reported/unknown	0	1	2	0	0	3

Statistics Period	2015	2016	2017	2018	2019	5-Year Total
Involved people walking	1	1	1	0	0	3
Involved people biking	0	0	0	0	2	2
Occurred during weekday peak periods*	6	15	11	11	16	59
Wet or icy pavement conditions	10	10	4	6	12	42
Dark conditions (lit or unlit)	6	16	8	15	10	55

Source: Central Transportation Planning Staff.
* Peak periods are defined as weekday 6:00–9:00 AM and 3:00–6:00 PM.

5.7.2 Collision Diagrams

To further investigate safety and operational problems, collision diagrams were constructed for the major intersections in the corridor. These diagrams are based on police crash reports for the five-year period with descriptions of how and where those crashes occurred. Approximately 50 percent of the crashes occurred at the Marine Rotary. The Marine Rotary collision diagram is shown in Figure 15. Many rear-end, angle, and sideswipes occurred at the rotary. Appendix B presents the collision diagrams for other intersections in the corridor. In addition, Appendix B contains tables that list all of the crashes in each of the collision diagrams along with information such as crash date and time, number of involved vehicles, number of injured persons, severity of the crash, manner of collision type, road surface conditions, weather conditions, and most harmful events.

5.7.3 Pedestrian and Bicycle Crashes

Based on the police data from 2015–19, three pedestrian crashes were identified in the corridor: two on the VFW Parkway segment and one on the Providence Highway segment. In addition, there were two bicycle crashes, one each on Providence Highway at Marine Rotary and Eastern Avenue. One of the bicycle crashes involved an injury.

5.8 TRAFFIC OPERATIONS CONDITIONS

Traffic operations analyses consistent with the Highway Capacity Manual (Sixth Edition) methodologies were used to assess traffic conditions at signalized and unsignalized intersections and to rate the level of service (LOS) from A to F. LOS A represents the best operating conditions (little to no delay), while LOS F represents the worst operating conditions (long delay). LOS E represents operating conditions at capacity (the limit of acceptable delay). Table 3 presents the control delays (standards for comparison) associated with each LOS for signalized and unsignalized intersections.

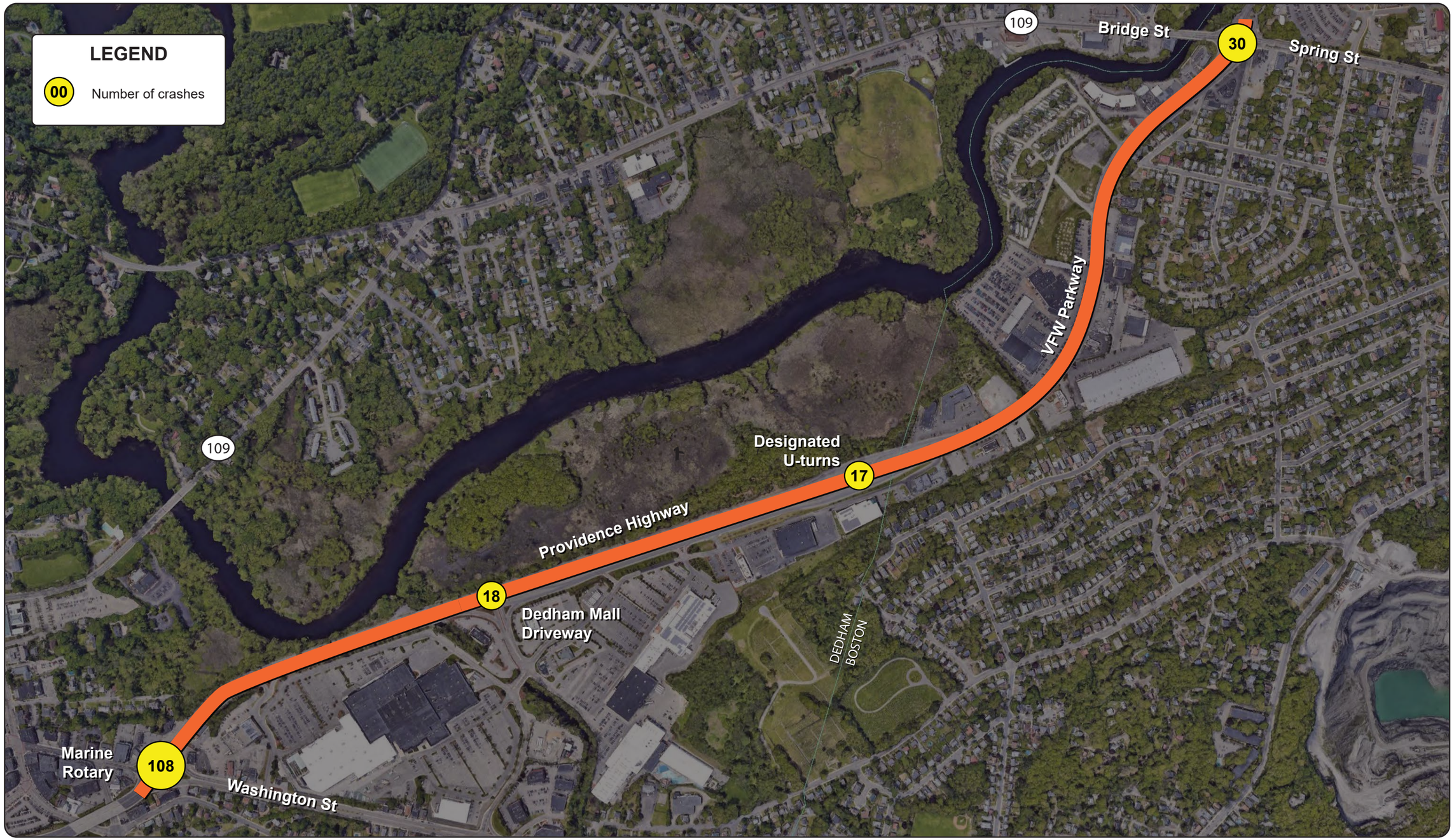

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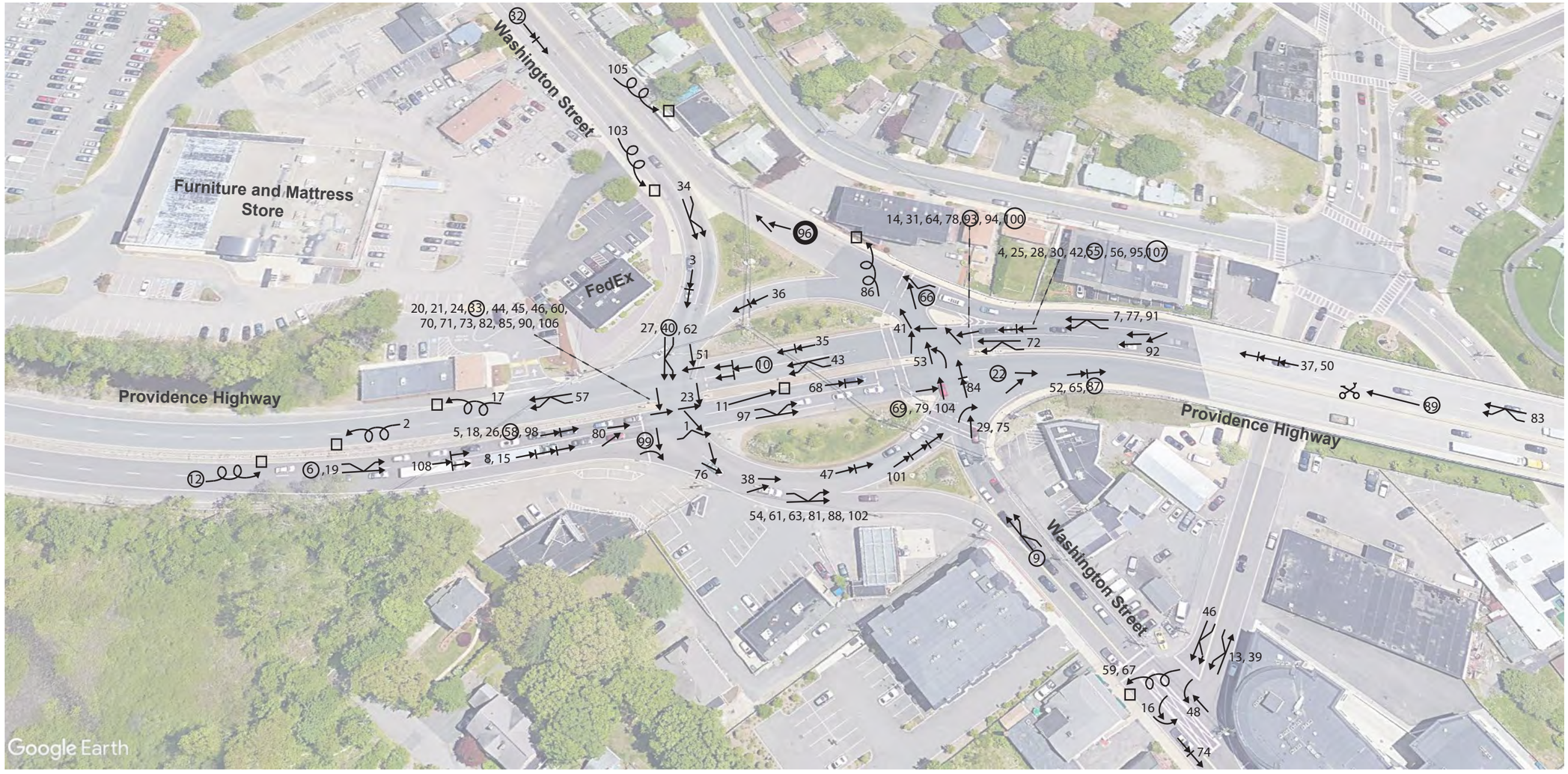
Figure 14
Intersection Crashes (2015–19)

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham



SYMBOLS		TYPES OF CRASH		CRASH INDEX AND SEVERITY
Moving Vehicle	Parked Vehicle	Head On	Sideswipe	#, (#), (#)
Backing Vehicle	Fixed Object	Angle	Out of Control	# Property Damage Only Crash Index Number
Non-Involved Vehicle	Bicycle	Rear End		(#) Injury Crash Index Number
Pedestrian	Animal			(#) Fatal Crash Index Number

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Figure 15
Marine Rotary: Collision Diagram (2015–19)

VFW Parkway/Providence Highway
Corridor Action Plan
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Table 4
Intersection Level-of-Service Criteria

Level of Service	Signalized Intersection Control Delay (seconds per vehicle)	Unsignalized Intersection Control Delay (seconds per vehicle)
A	<10	<10
B	10–20	10–15
C	20–35	1–25
D	35–55	25–35
E	55–80	35–50
F	> 80	> 50

Source: Highway Capacity Manual, Sixth Edition.

The turning movement volumes, intersection layouts, signal timing data, and Synchro traffic analysis software were used to assess the capacity and quality of traffic flow at the intersections. Figures 16 through18 show the results of LOS analysis for the weekday AM and PM and weekend PM peak periods, respectively. Appendix D contains tables showing the results of the existing conditions LOS analysis and traffic queue lengths. Many of the intersections in the study area operate at acceptable levels of service; the problem intersections are listed below.

- The Route 109/Spring Street intersection on the north end of the corridor. This intersection operates unsatisfactorily during the weekday AM and PM peak hours and weekend Saturday PM peak hour. During those times the LOS is F with delays exceeding 80 seconds per vehicle.
- Marine Rotary operates well during the weekday AM and PM peak hours and weekend Saturday PM peak hour with LOS D or better.
- Dedham Mall Driveway operates satisfactorily during weekday AM and PM peak periods with LOS C or better. However, it experiences congestion during weekend Saturday peak hour with LOS F and delays exceeding 80 seconds per vehicle

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Figure 16
Existing Conditions: Weekday AM Peak-Hour Levels of Service and Delay

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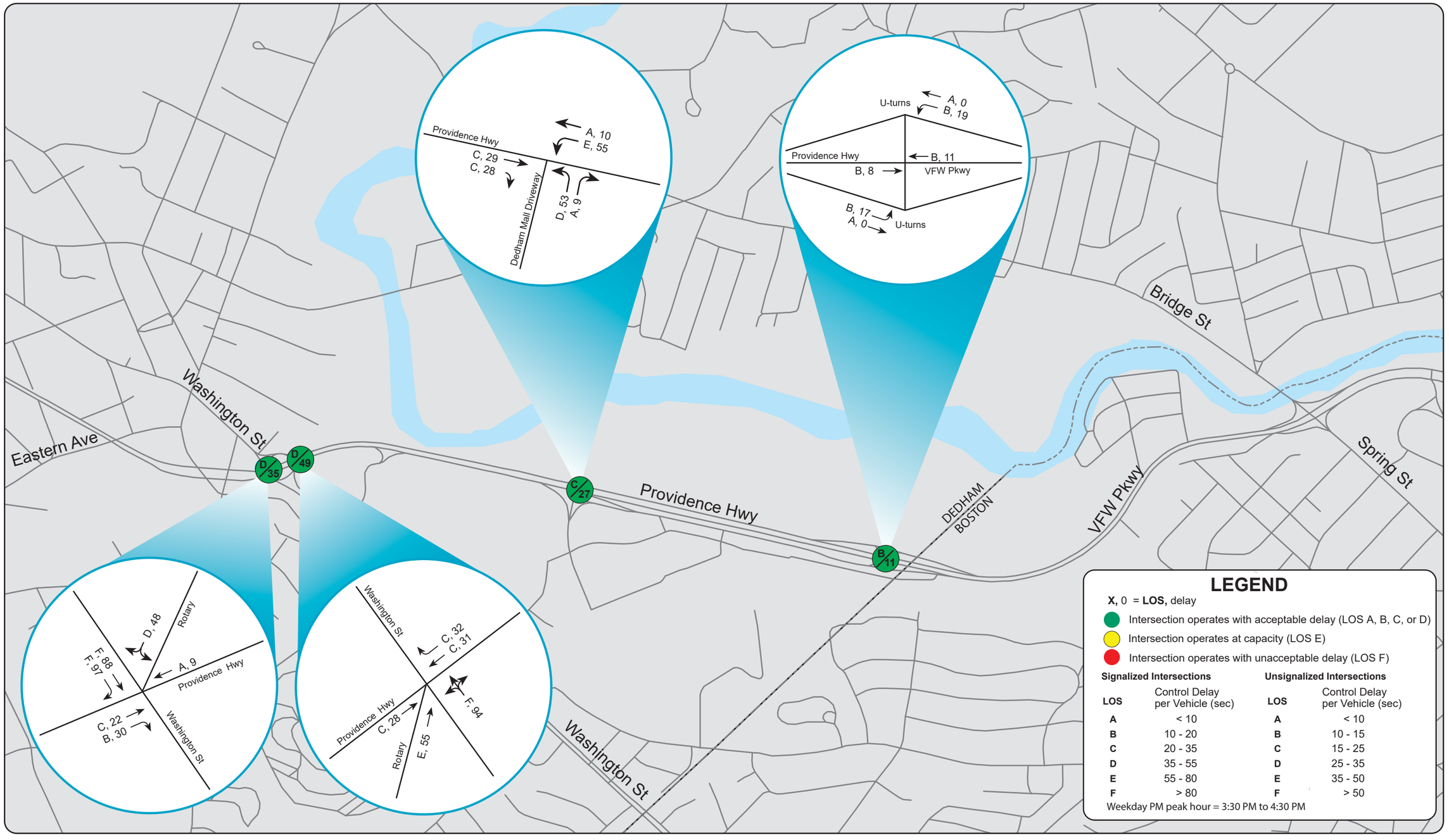

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Figure 17
Existing Conditions: Weekday PM Peak-Hour Levels of Service and Delay

VFW Parkway/Providence Highway
Corridor Action Plan
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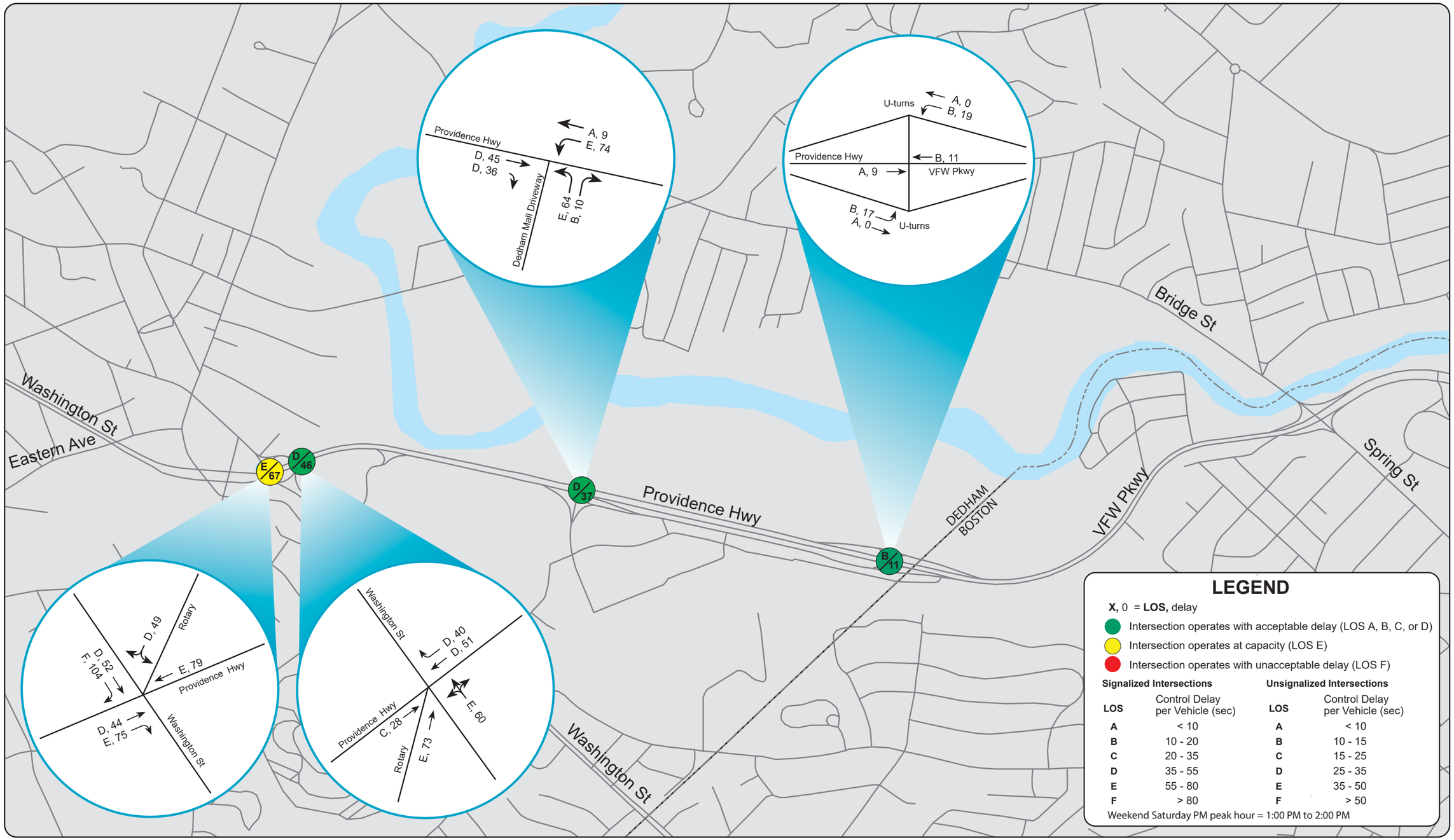

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Figure 18
Existing Conditions: Weekend Saturday PM Peak-Hour Levels of Service and Delay

VFW Parkway/Providence Highway
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5.9 WALKING AND BIKING CONDITIONS

5.9.1 Walking

Only two of the intersections in the corridor include pedestrian signals, curb ramps, or crosswalks—VFW Parkway at Spring Street and Marine Rotary. Both intersections feature at least one pedestrian signal in need of repair. The Spring Street intersection on the north end of the corridor completely lacks pedestrian detectable warning plates, which indicate where the roadway begins and the sidewalk ends for visually impaired people. The Marine Rotary at the south end of the corridor also lacks several pedestrian detectable warning plates, but the more glaring concern at that intersection is the complete lack of crossing infrastructure—curb ramps and a marked crosswalk—at the north Washington Street crossing with pedestrian signals.

Many of the sidewalks along the corridor are narrow, include uneven surfaces, and are overgrown by vegetation. Each of these characteristics makes it difficult for people walking or using assistive mobility devices to travel safely and comfortably. The multitude of driveways along Providence Highway introduce conflict points between vehicles and pedestrians. The lack of opportunities for people crossing the streets between the Route 109/Spring Street intersection and Marine Rotary severely limits travel for people walking.

Guardrails, which block people from crossing the street, separate the two lanes of northbound traffic from the two lanes of southbound traffic. The lack of pedestrian signals, crosswalks, and curb ramps at the two locations without guardrails—Dedham Mall driveway and U-turn intersections—mean that people walking must remain on one side of the roadway for the entirety of the 1.7-mile corridor, unless they attempt to cross at these intersections, where pedestrian infrastructure is not present.

The quality of pedestrian travel is largely affected by the roadway infrastructure, such as whether there are sidewalks and crosswalks present or pedestrian signals that allow people enough time to cross an intersection. To reflect the complex relationship between people walking and the travel environments, MPO staff have developed a pedestrian level-of-service (PLOS) tool, which grades a given roadway on its quality of walking travel, and whether it reflects these objectives: safety, system preservation, capacity management and mobility, and economic vitality.[1] Based on the tool, the study corridor was rated *poor* in terms of safety, *poor* in terms of system preservation, *poor* in terms of economic vitality, and *fair* in terms of capacity management and mobility. Overall, the assessment

[1] Ryan Hicks and Casey-Marie Claude, *Pedestrian Level-of-Service Memorandum*, Technical Memorandum to the Boston Region Metropolitan Planning Organization, January 19, 2017.

indicates that the roadway needs improvements to safely accommodate people walking. The ratings from this pedestrian assessment tool are in Appendix D.

5.9.2 Biking

There is no biking infrastructure along Providence Highway between the Route 109/Spring Street intersection and Marine Rotary, although bike lanes are present directly north of the intersection along the Department of Conservation and Recreation's VFW Parkway. The majority of the VFW Parkway and Providence Highway includes a wide shoulder where people biking would have sufficient space for travel, but the lack in continuity of the shoulder would force them to share a travel lane with vehicle traffic where the shoulder disappears. In addition, the many driveways along VFW Parkway introduce conflict points between vehicles and people biking, and the wide vehicle travel lanes along the roadway encourage drivers to speed, negatively impacting the sense of safety and comfort of people biking.

The quality of bicycle travel is largely affected by the character of the roadway, safety, and security, such as speed of vehicles, travel time, comfort and convenience, and freedom to maneuver. The bicycle level-of-service (BLOS) tool is intended to help users and planners assess the infrastructure to facilitate bicycle travel. The approach is similar to the PLOS tool in that it grades locations with features that are suitable or unsuitable for people biking—areas well suited for bicycle travel are awarded high scores and areas unsuitable for bicycle travel are awarded low scores. In addition, the BLOS ratings correlate with the objectives emphasized for PLOS. Based on the BLOS tool, the study corridor was rated *poor* in terms of safety, *poor* in terms of system preservation, and *poor* in terms of economic vitality, and capacity management and mobility. Overall, the assessment indicates that the roadway needs improvements to accommodate people biking. The ratings from this bicycle assessment tool are in Appendix D.

Chapter 6—Needs Assessment

Based on the data collected, information from the community engagement efforts with the public, focus groups, advisory committee, and analysis of the existing conditions, the following weaknesses, strengths, and needs of the corridor were identified.

6.1 CORRIDOR WEAKNESSES

- Automobile-centric corridor unsafe for people walking and biking
- Minimal use of existing resources such open spaces, Charles River, and Mother Brook
- Lack of walking or biking facilities (separated bike lanes/shared-use or multiuse paths)
- Wide roadway; difficult to cross
- Lack of safe crossing areas/opportunities for people walking or biking
- Gaps in pedestrian and bicycle travel network
- Poorly located crosswalks
- Poor sidewalk conditions
- Difficult corridor to navigate by people walking or biking
- High vehicle speeds, which present safety concerns for people walking, biking or driving
- Long waits at signalized intersection for people walking
- Unwelcoming streetscape/landscape
- Localized traffic congestion—at Veterans of Foreign Wars (VFW) Parkway at Spring Street intersection and Marine Rotary
- Confusing and difficult to navigate through Marine Rotary
- High number of crashes (VFW Parkway and Spring Street intersection, Marine Rotary)
- Outdated traffic signal timings and signal equipment
- Minimal transit service
- Access to and from bus stops extremely difficult and unsafe
- Poor street lighting

6.2 CORRIDOR STRENGTHS

- Opportunities for multimodal transportation (walking, biking, driving, riding the bus, and using assistive mobile devices)
- Opportunities for recreational resources and activities such as access and connections to the Charles River, Mother Brook, and open space
- Connections to economic opportunity
- Major commercial corridor—Dedham Mall, Dedham Center, and businesses along VFW Parkway
- Access to the West Roxbury Veteran's Administration Medical Center
- Opportunities to improve livability and quality of life of surrounding neighborhoods; access to neighborhoods and apartments complexes
- Vital link in the regional transportation system, such as connections to the Interstate 95/Route 128 and local street system (Route 109, Washington Street, Spring Street, Needham Street)
- Opportunities to transform a relatively wide right-of-way to service current and future needs

6.3 CORRIDOR NEEDS

- Transform corridor to meet needs of people walking, using assistive mobile devices, biking, riding the bus, and driving.
- Upgrade corridor infrastructure to improve safety for all users
- Introduce new walking and biking facilities and connections to neighborhoods
- Add separation (buffer) between walking and biking facilities and vehicles
- Redesign roadway and intersections to calm traffic and reduce high-vehicle speeds
- Narrow width of roadway to make it easier for people walking, biking, and using assistive mobile devices to cross the streets
- Introduce new safe crossing areas along the corridor for people walking or biking
- Equip intersections with accessible pedestrian signals and ADA-compliant curb ramps to enhance crossing experience
- Construct a welcoming streetscape/landscape to enhance placemaking and presence that is safe and attractive to all modes
- Redesign Marine Rotary and the VFW Parkway/Spring Street intersection to reduce crashes and congestion

- Retime traffic signals to provide adequate time for pedestrian crossings, reduce crashes, and minimize congestion
- Improve transit services by adding more convenient bus stops and safe access to existing stops
- Redesign roadway to improve connections to economic opportunity, recreational areas and trails such as the Charles River and Mother Brook
- Improve signage and wayfinding
- Improve street lighting

Chapter 7—Long-Term Improvements

The corridor needs long-term improvements to transform it into a route for people walking, biking, driving, riding the bus, and using assistive mobility device. Long-term improvements typically require design and engineering efforts and larger funding resources. The time frame categorized as *long-term* is typically greater than five years and can be as long as 15 years. The goals of implementing these long-term improvements are to modernize an automobile-centric corridor into a roadway that connects people to places and provides safe access to schools, recreational areas, neighborhoods, and transit; to increase safety for people who walk, bicycle, or ride the bus; and to support livable communities and economic vitality.

Because of the changing character, context, and varying needs along the corridor, it was divided into three segments to incorporate the character and context into the development of the long-term improvement concepts. The three segments are Providence Highway segments 1 and 2 and Veterans of Foreign Wars (VFW) Parkway; all three segments have been described in detail in Chapter 3.

Planners typically use a planning model to forecast traffic volumes based on changes in the transportation network or land use. For this study, CTPS used the Boston Region MPO's transportation model, which was recently adopted for the development of the regions Long-Range Transportation Plan. This model's socioeconomic components are derived from forecasts produced by the Metropolitan Area Planning Council. Using this model, staff projected that between now and 2040, traffic volume on Providence Highway/VFW Parkway would grow by approximately one percent.

Staff grew the existing peak-hour turning movement volumes by one percent to test the impact of future traffic conditions that would result from proposed improvements. Figures 19 through 21 show the Level of Service (LOS) and delays of study intersections with the long-term improvements. Appendix D contains tables showing the results of future conditions, including the LOS, delays, and traffic queue lengths. The following are the long-term improvement concepts.

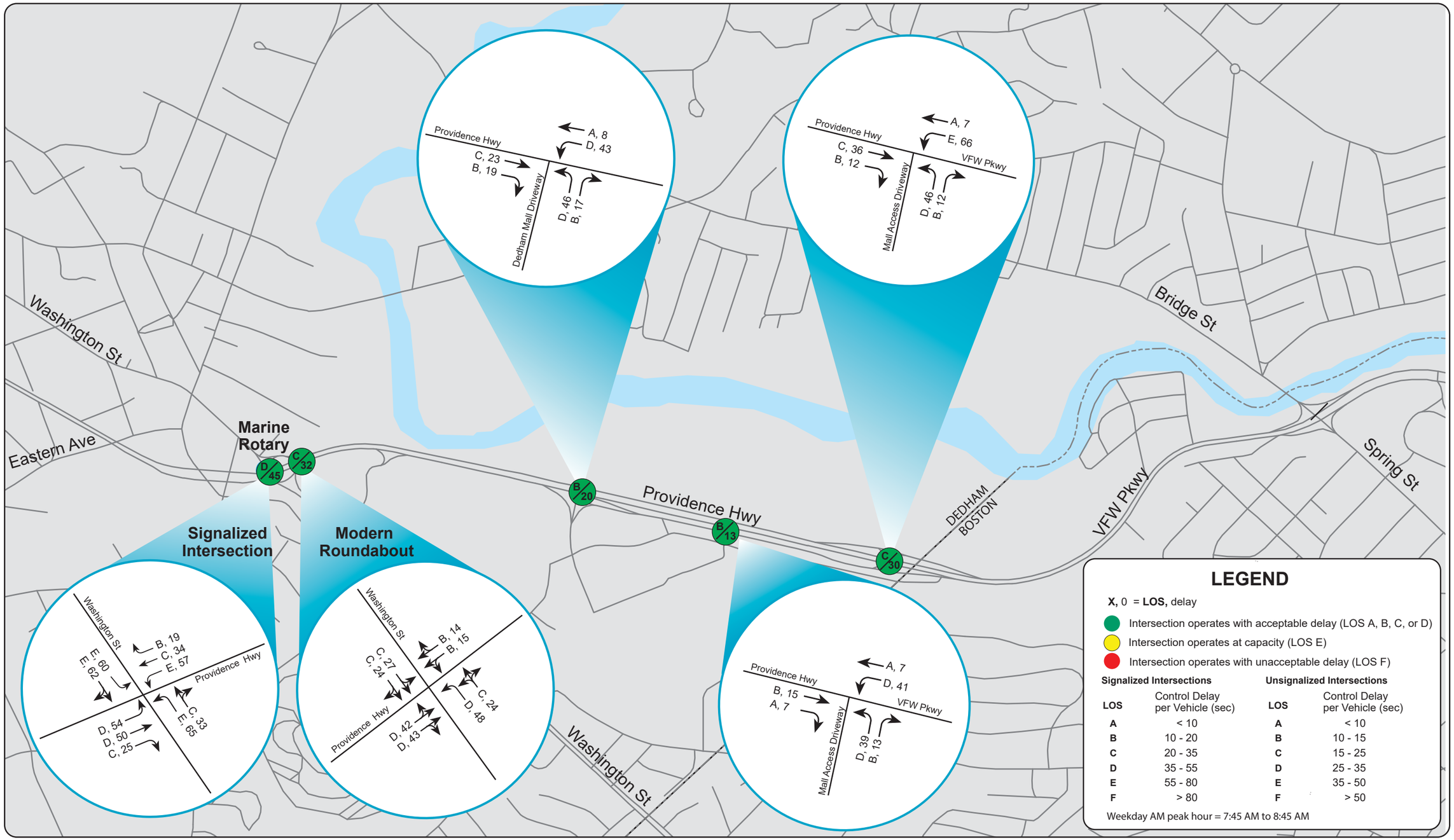

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Figure 19
Long-Term Improvements: Weekday AM Peak-Hour Levels of Service and Delay

VFW Parkway/Providence Highway
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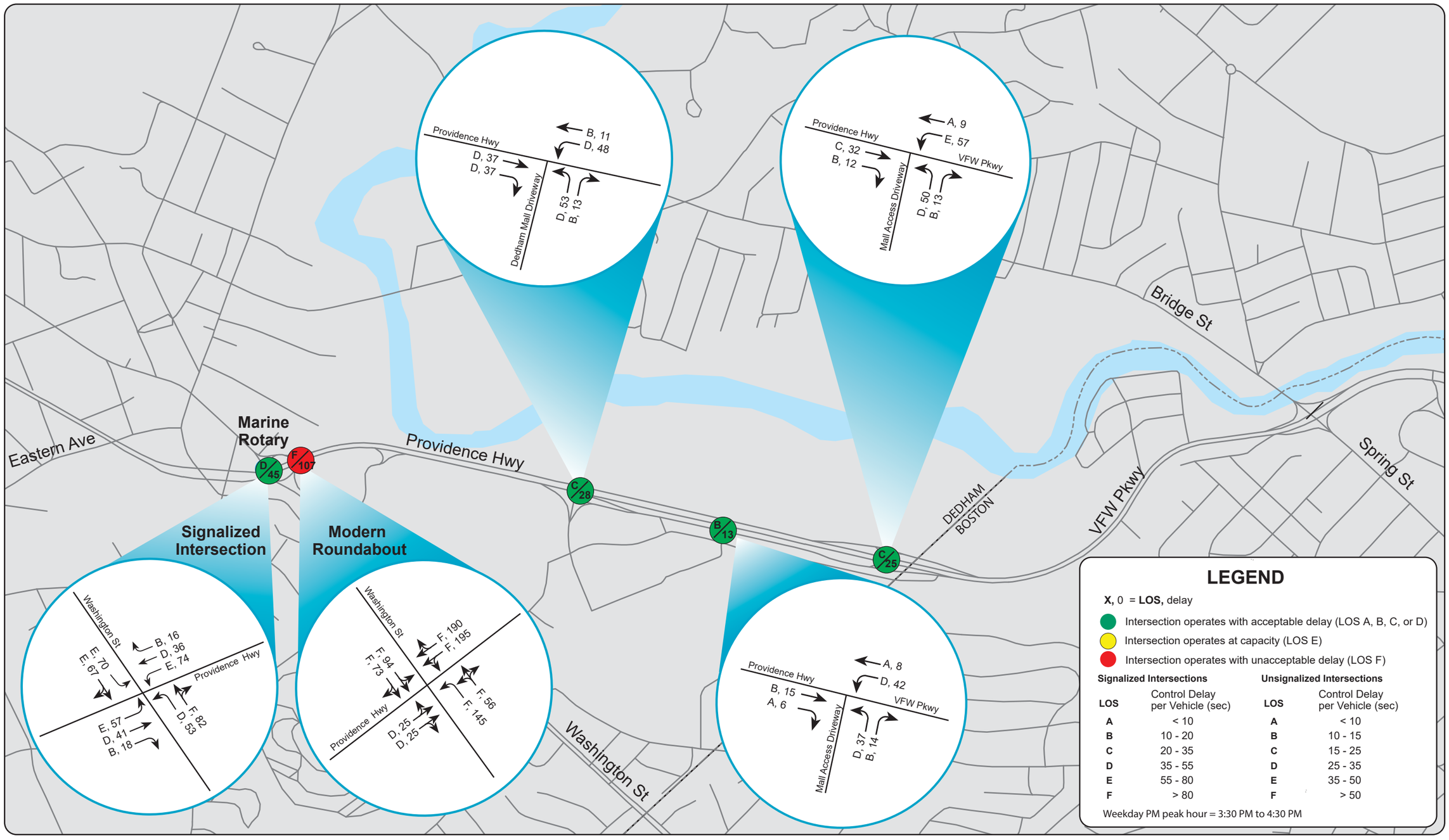

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Figure 20
Long-Term Improvements: Weekday PM Peak-Hour Levels of Service and Delay

VFW Parkway/Providence Highway
Corridor Action Plan
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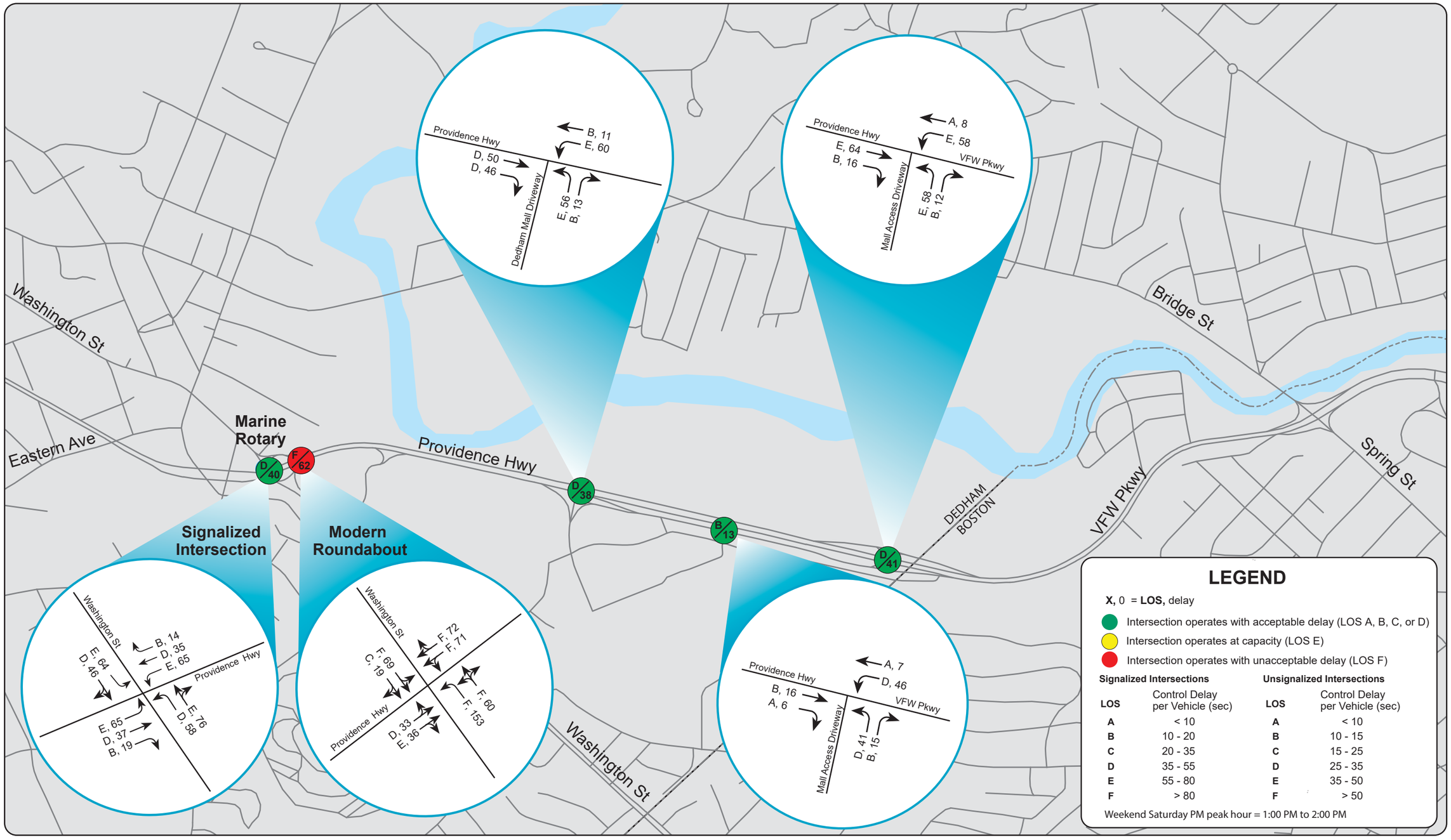

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Figure 21
Long-Term Improvements: Weekend Saturday PM Peak-Hour Levels of Service and Delay

VFW Parkway/Providence Highway
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7.1 MARINE ROTARY

7.1.1 Concept 1—Modern Roundabout

Figure 22 shows the modern roundabout design concept for the Marine Rotary. It is a two-lane roundabout with a smaller inscribed circle, about 66 feet wide. Its smaller size provides more space for accommodating people walking or biking safely and forces drivers to slow down to 25 mph. The concept includes sidewalks and separated bike lanes that meet the Massachusetts Department of Transportation standards. The roundabout concept also streamlines traffic at the intersection and removes much of the confusion with the existing signalized rotary. Analysis indicates that Concept 1 would not operate satisfactorily during weekday PM peak hours and weekend Saturday PM peak hours because high volume traffic results in LOS F for the overall intersection. This shortcoming could be remedied by adding slip lanes for the high-volume right turns, but doing so would reduce safety for people walking or biking because of conflicts with right-turning traffic.

7.1.2 Concept 2—Signalized Intersection

Figure 23 shows the signalized intersection concept for the Marine Rotary. It is much smaller in size than the existing signalized rotary and saves space for walking and biking accommodations. This concept also simplifies traffic flow at the intersection and provides safer crossing areas and is friendlier for people walking or biking. Analysis indicates that the signalized intersection would perform satisfactorily during AM and PM peak hours with overall intersection LOS D.

7.2 PROVIDENCE HIGHWAY SEGMENT 1

Figures 24 and 25 show the improvement concepts for the Providence Highway Segment 1 highlighted in the dark green color. There is no safe accommodation for people walking or biking in the segment. We developed two concepts for the Providence Highway Segment 1.

7.2.1 Concept 1

In Concept 1 (Figure 21), the existing roadway cross section was redesigned to create a four-lane roadway (two lanes in each direction). This concept has a shoulder and a space for people walking or biking on either side of the Providence Highway. It also has a median with trees to provide a welcoming environment. The space for people walking or biking could be used as a shared-use path or separate them into sidewalk and bike lane.

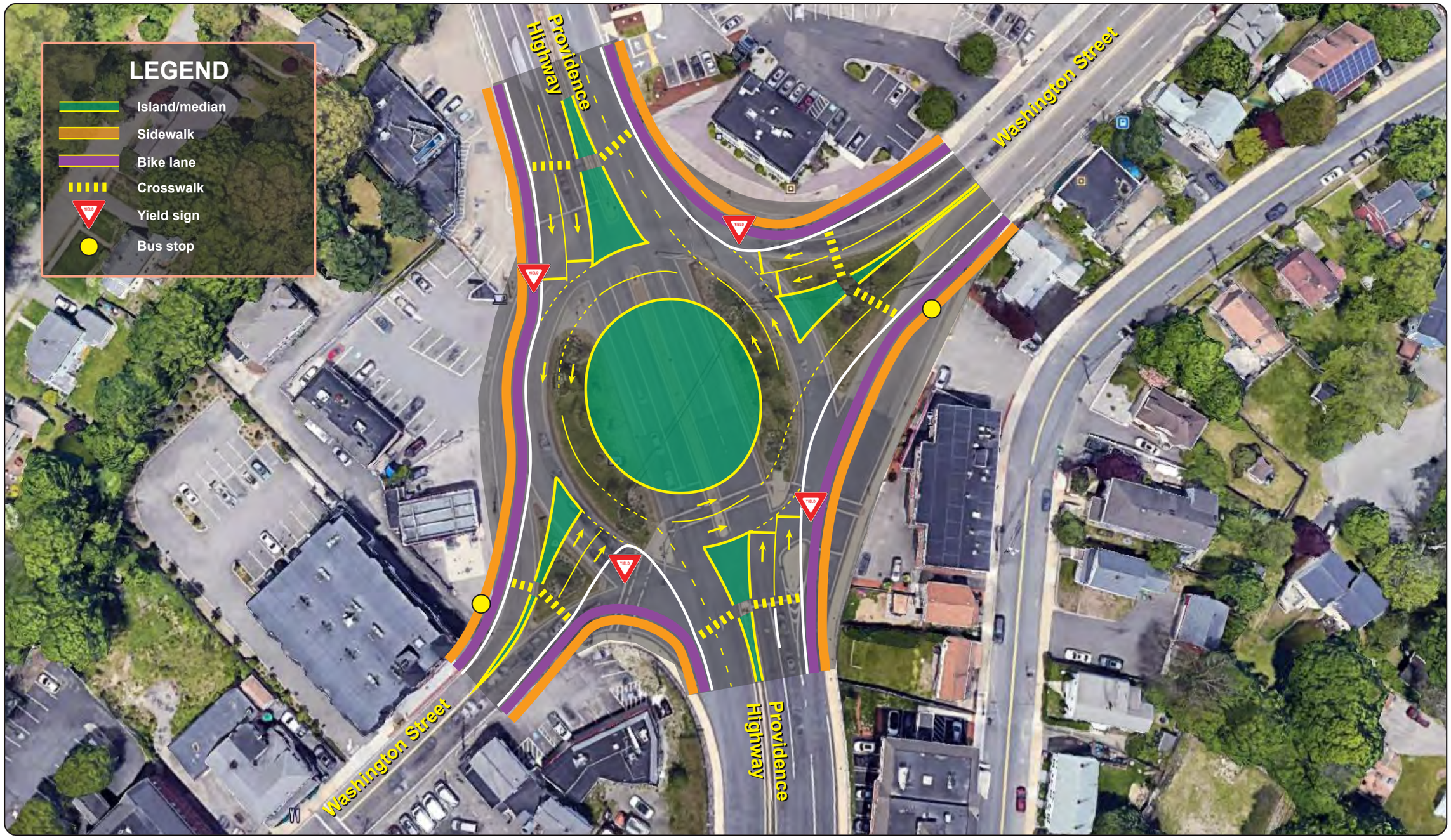

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Figure 22
Marine Rotary
Long-Term Improvements: Concept 1

VFW Parkway/Providence Highway
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Boston and Dedham

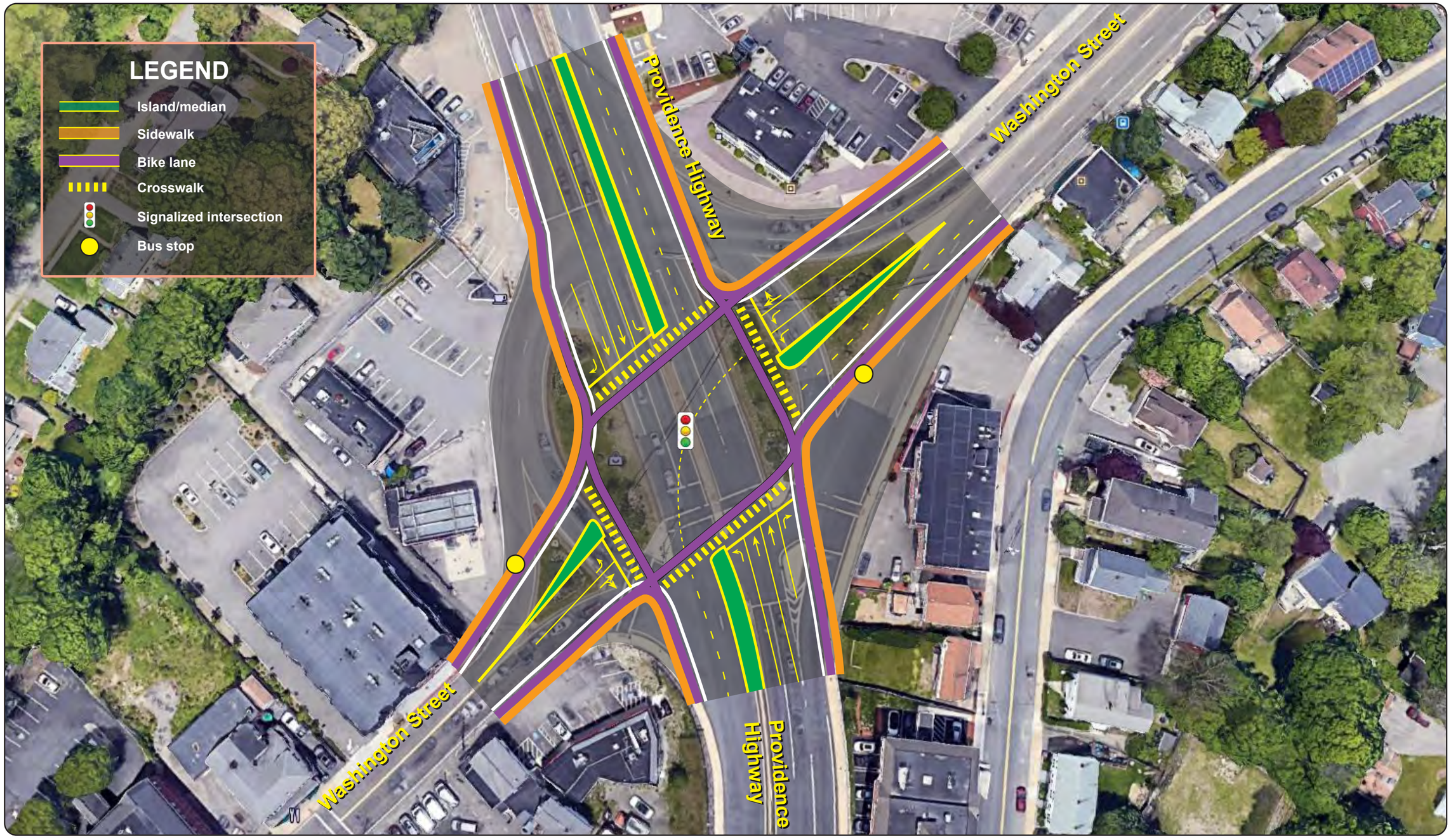

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Figure 23
Marine Rotary
Long-Term Improvements: Concept 2

VFW Parkway/Providence Highway
Corridor Action Plan
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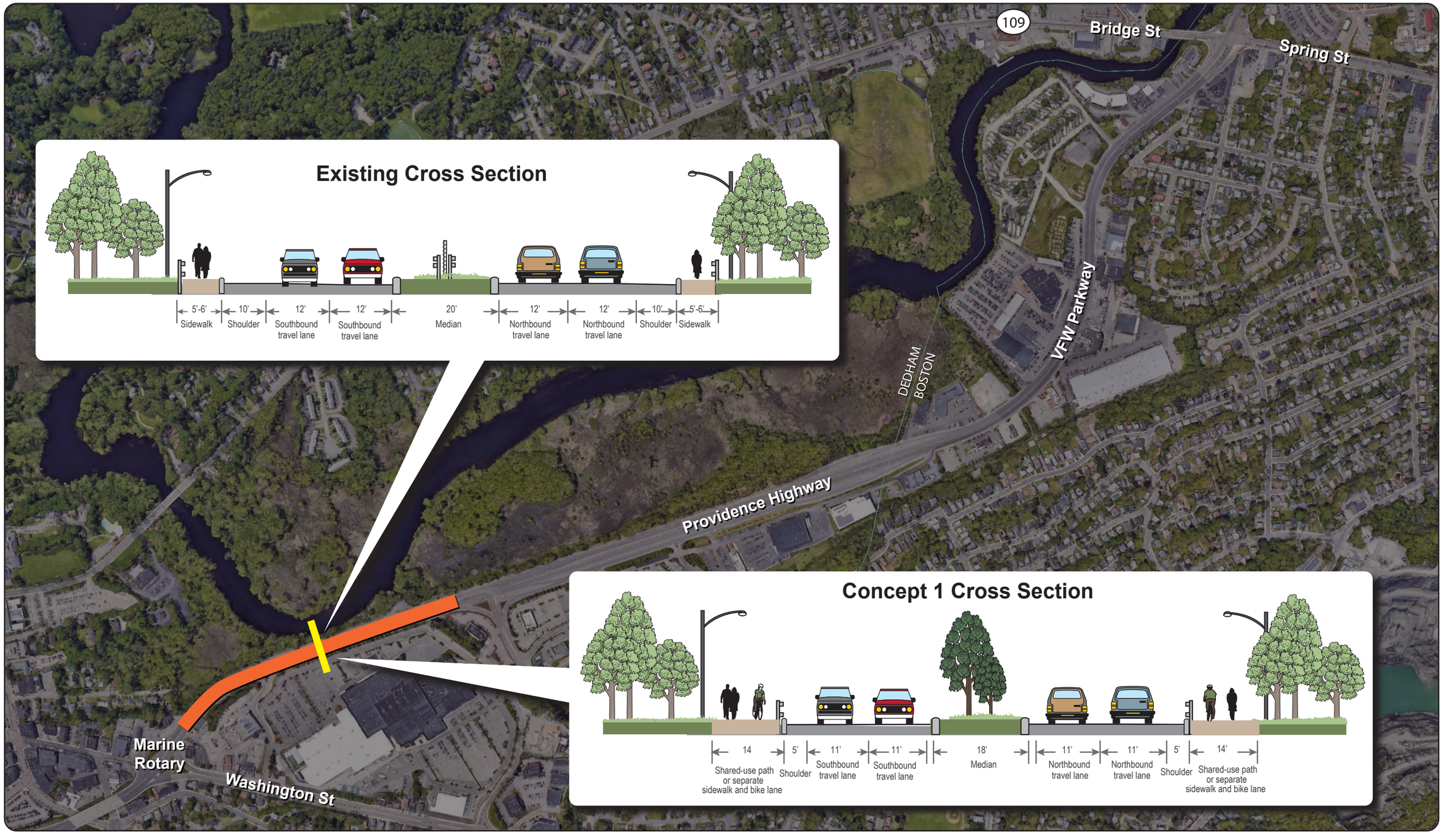

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Figure 24
Providence Highway Segment 1
Long-Term Improvements: Concept 1

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

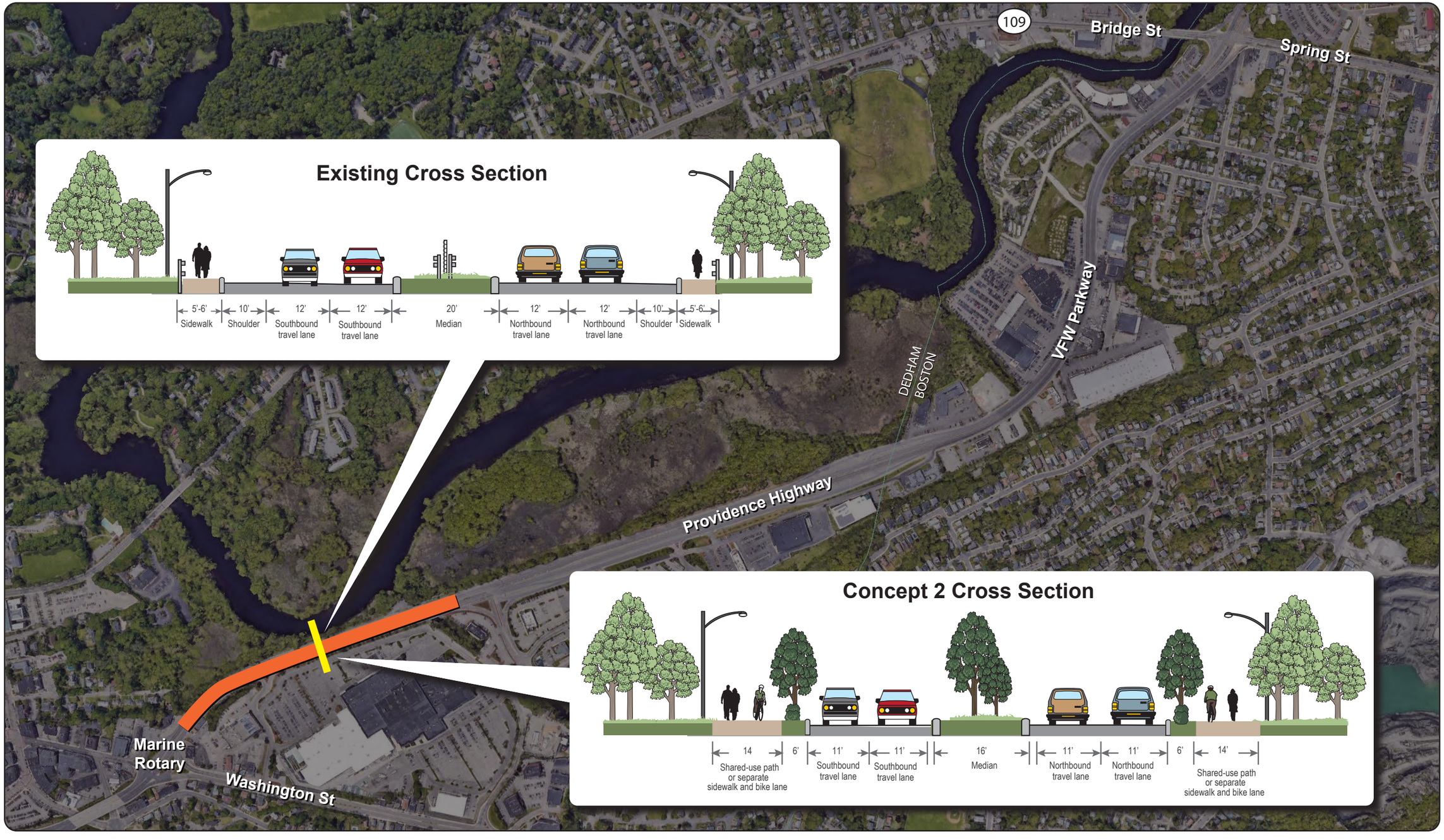

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Figure 25
Providence Highway Segment 1
Long-Term Improvements: Concept 2

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

7.2.2 Concept 2

Concept 2 is similar to Concept 1 except we replaced the shoulder with a tree buffer to narrow the roadway to calm traffic and reduce speeds. Concept 2 offers all the benefits of Concept 1, in addition to calming traffic.

7.3 PROVIDENCE MALL DRIVEWAY INTERSECTION

Figure 26 shows the improvement concept for the Dedham Mall driveway intersection. The mall access and U-turn road are eliminated in the long-term improvement concept as they make it difficult and unsafe for people walking or biking to cross Providence Highway. Under this concept, all traffic is on the Providence Highway and drivers access the mall directly from Providence Highway. It simplifies traffic movements at the intersection, adds crosswalks, wheelchair ramps, and space to accommodate people walking, biking, or using assistive mobile devices. Analyses indicate that this concept would operate satisfactorily during peak hours.

7.4 PROVIDENCE HIGHWAY SEGMENT 2

7.4.1 Concept 1

Figures 27 and 28 show the Providence Highway Segment 2, highlighted in the light green color and the two concepts that were developed for the segment. Concept 1 (Figure 27) is a four-lane road with space for walking and biking on either side of the road. This concept is consistent with the ones in Segment 1. It has tree buffers and shoulders to separate people walking and biking from vehicular traffic. In addition, the transformation makes it a friendlier roadway with space to accommodate all users.

7.4.2 Concept 2

Concept 2 (Figure 28) for the Providence Highway Segment 2 is also similar to Concept 1 except that the shoulder in Concept 1 is replaced with a tree buffer to narrow the roadway to calm traffic and reduce speeds. Concept 2 offers all the benefits of Concept 1, in addition to traffic calming.

7.4.3 Additional Improvements for Mall Access

Because the mall access and U-turn road were eliminated in Concepts 1 and 2, a new signalized intersection midway between the Dedham Mall driveway and the U-turn intersection was added to further enhance access to and from the Dedham Mall, provide more crossing opportunities for people walking or biking, calm traffic, and reduce speeds. Figure 29 shows all three intersections in the segment. Analysis indicates that the midblock intersection would operate well

during peak periods with LOS C or better. In addition, its operations would not affect traffic operations at the adjacent intersections.

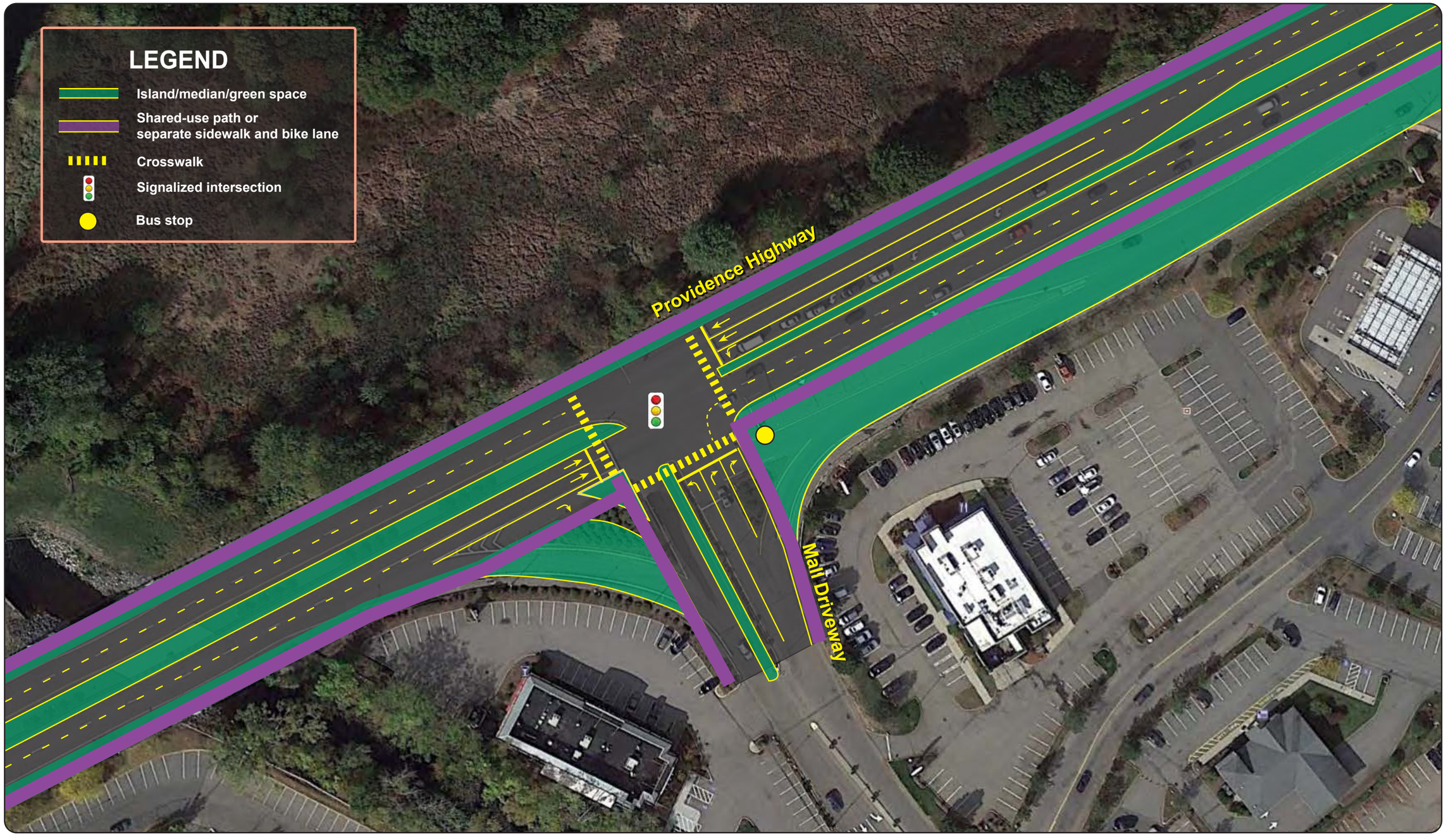

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Figure 26
Dedham Mall Driveway Intersection
Long-Term Improvement Concept

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

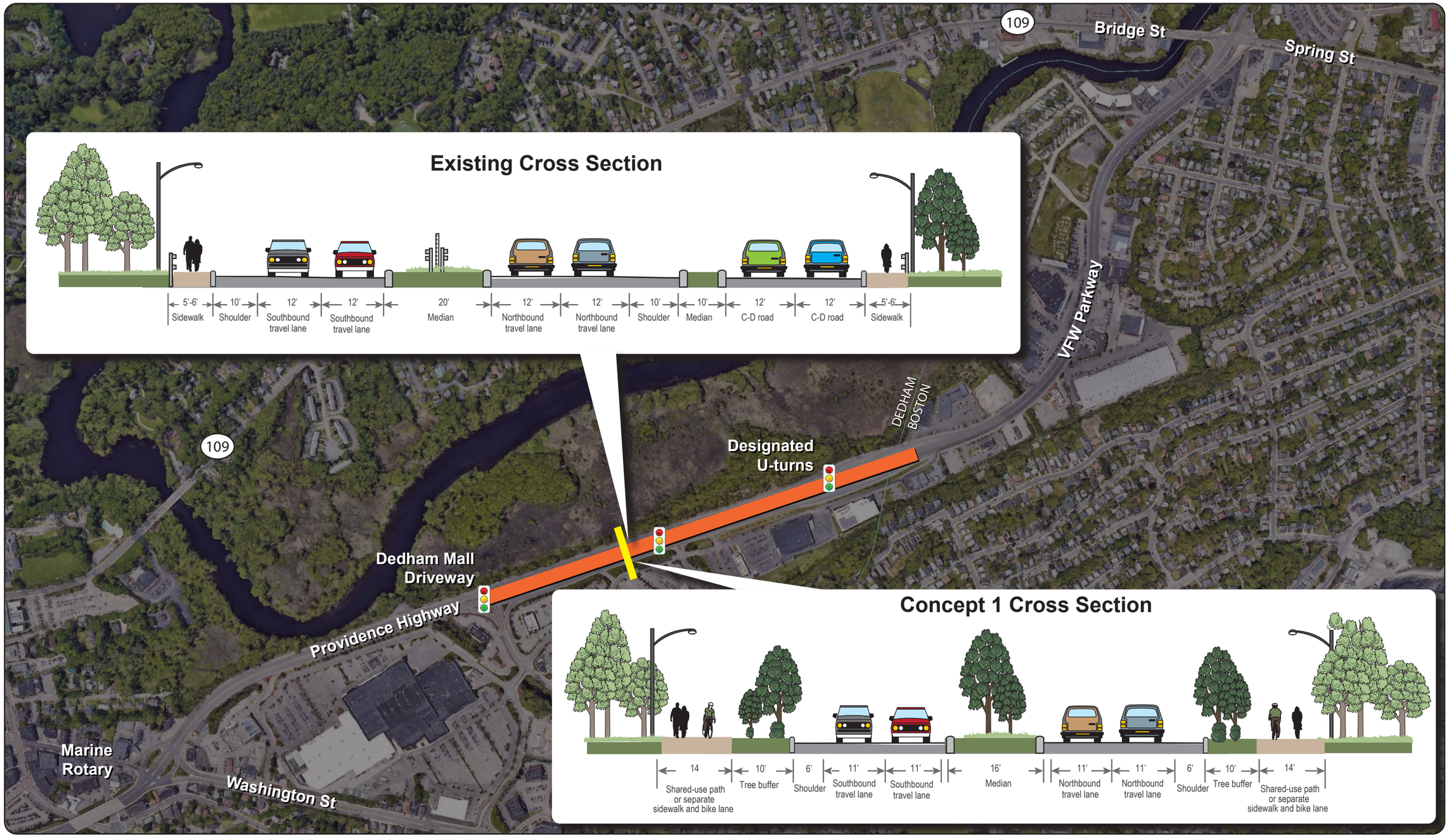

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Figure 27
Providence Highway Segment 2
Long-Term Improvements: Concept 1

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

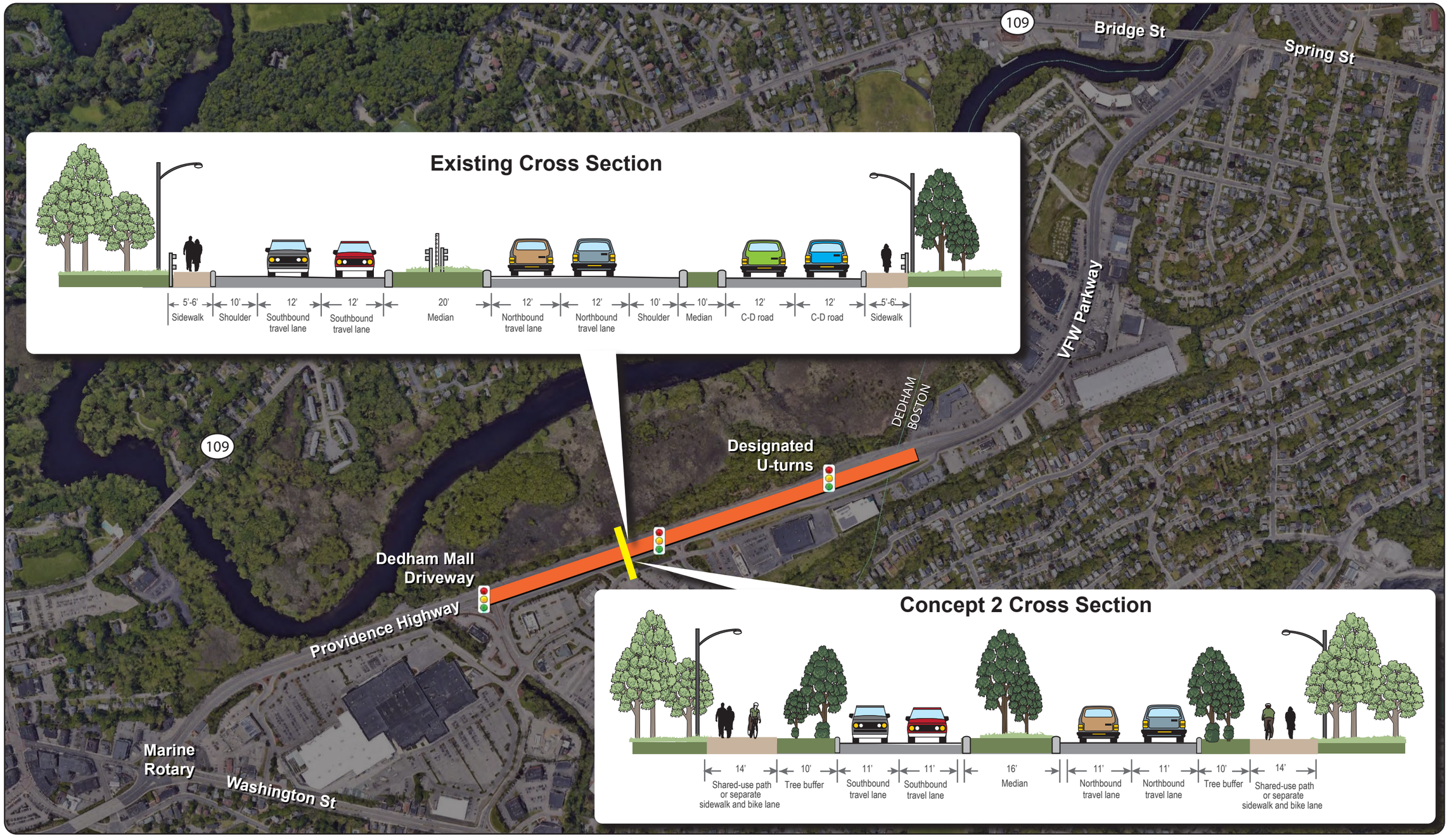

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Figure 28
Providence Highway Segment 2
Long-Term Improvements: Concept 2

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

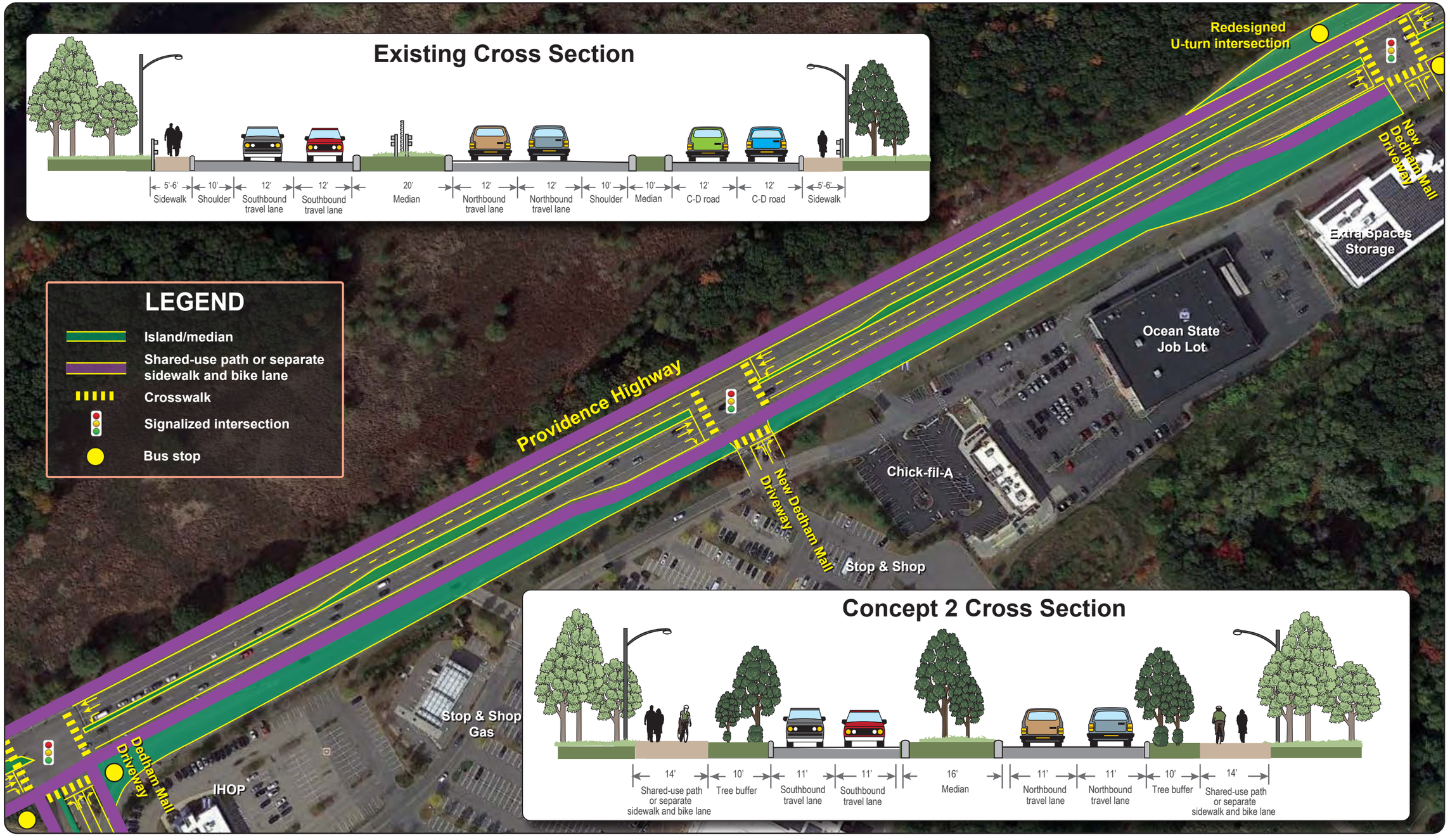

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Figure 29
Providence Highway Segment 2
Long-Term Improvements: Concept 2, Midblock Improvements

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

7.5 U-TURN INTERSECTION

Figure 30 shows the improvement concept for the U-turn intersection. It is a signalized T-intersection. The new layout simplifies traffic movements at the intersection, adds crosswalks, wheelchair ramps, space to accommodate people walking or biking, in addition to other upgrades, including accessible pedestrian signals, detection for bicycles, bus stops for Route 52 bus service. This concept builds on putting all traffic on Providence Highway or VFW Parkway. In addition, it provides a connection to the Mall's internal road system. Analyses indicate that the improvement concept for the U-turn intersection would operate satisfactorily during peak hours with LOS D or better.

7.6 VFW PARKWAY SEGMENT

Figures 31 and 32 show the improvement concept for VFW Parkway segment highlighted in the olive-green color. It consists of two travel lanes, walking and biking facilities, and a tree buffer in each direction. In addition, it includes a median with trees and openings at two locations: A Street and near the McDonald's restaurant. The openings are to be controlled by traffic signals to allow turn maneuvers at the new A Street intersection and a new midblock crossing, to provide additional opportunities for people walking or biking to cross VFW Parkway near the restaurant. The opening at A Street is expected to reduce the circuitous traffic circulation in the segment and congestion at the Spring Street intersection. The concept also includes adding three bus stop locations in the segment for the Route 52 bus to service.

7.7 PEDESTRIAN LOS WITH IMPROVEMENTS

MPO staff evaluated what the future PLOS of the corridor would be if the recommendations from this study were implemented. Appendix D contains results of the PLOS scorecard analyses. Based on the assessment, the study corridor was rated *good* in terms of meeting the MPO's goals for safety, system preservation, capacity management and mobility, and economic vitality because of the prioritization of safe accommodations for people who walk and for improving the connectivity of the pedestrian network, opportunities for safe crossing areas, closing gaps in the sidewalk network, and for reducing pedestrian crossing distances and wait times.

7.8 BICYCLE LOS WITH IMPROVEMENTS

MPO staff evaluated what the future BLOS of the corridor would be if recommendations from this study were implemented. Appendix D contains results of the BLOS scorecard analyses. Based on the assessment, the corridor was rated *excellent* in terms of meeting the MPO's goals for safety, system preservation, capacity management and mobility, and economic vitality because

of the prioritization of safe accommodations for people who bike, and for improving the connectivity of the bicycle network. The separated bike lanes or shared-used paths, tree buffers, and bike detection would provide welcoming environment for people biking.

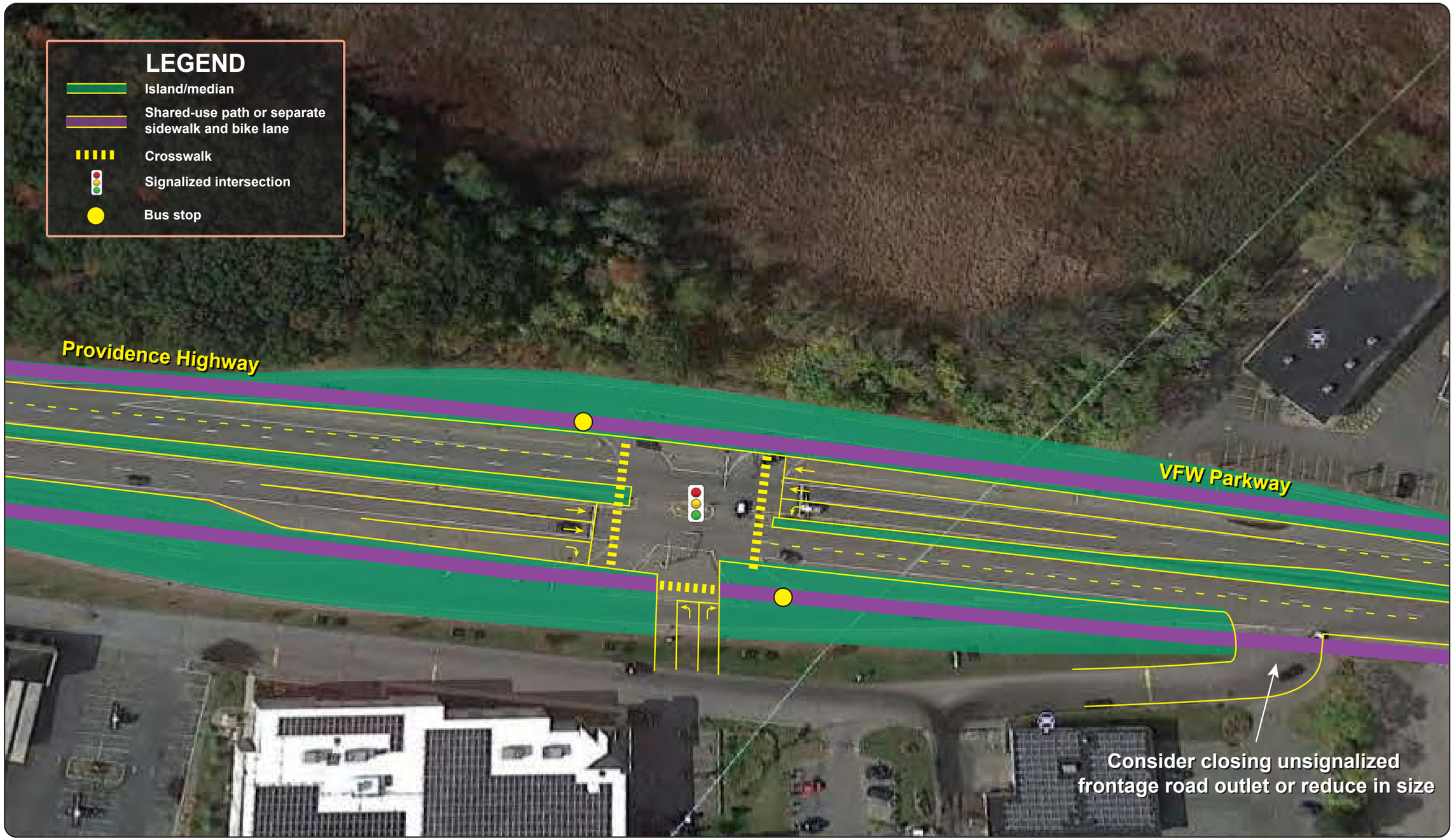

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Figure 30
U-Turn Intersection
Long-Term Improvement Concept

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

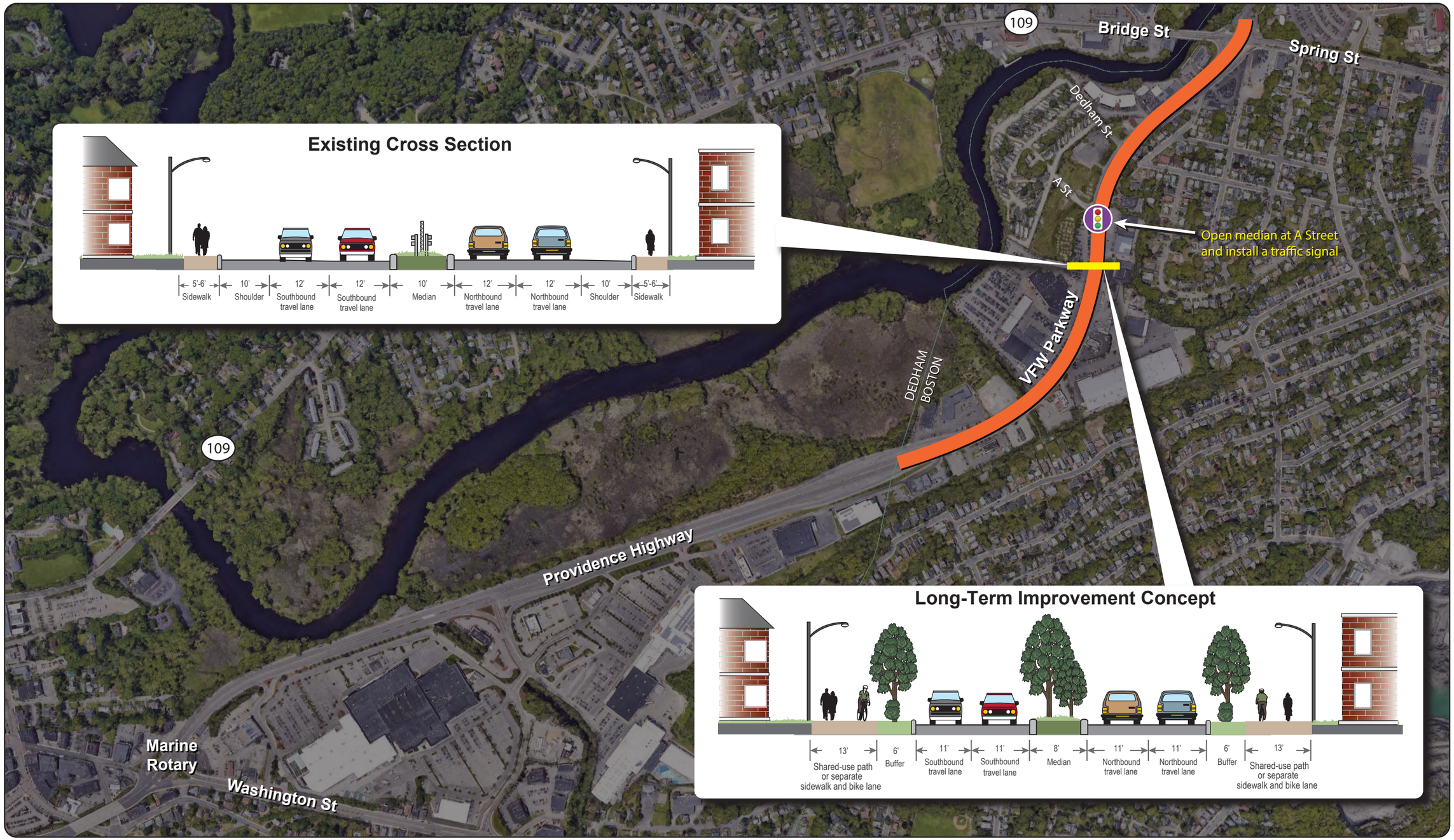

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Figure 31
VFW Parkway Segment
Long-Term Improvement Concept

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

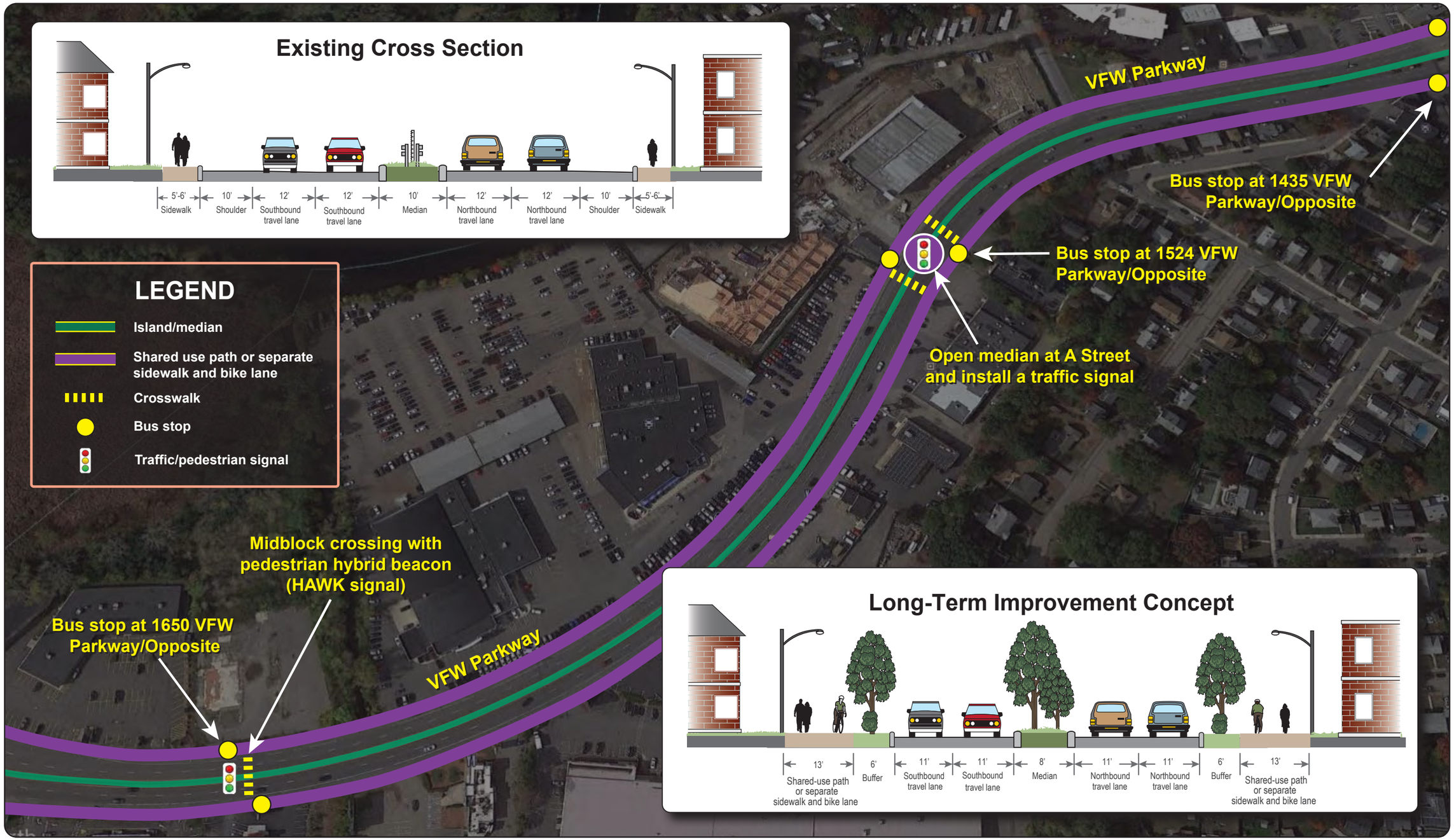

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Figure 32
VFW Parkway Segment
Long-Term Improvement Concept: Additional Improvements

VFW Parkway/Providence Highway
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Chapter 8—Short-Term Improvements

The long-term improvements to transform the corridor into a route for everyone would take some time to implement. Therefore, the short-term improvements, which typically require minimal design and engineering efforts and often lesser funding resources, were developed to transform the corridor to address current needs. The time frame categorized as *short-term* is typically fewer than five years. The goals of implementing these short-term improvements are to modify the existing roadway features to improve safety for people walking, biking, riding the bus, or using assistive mobile devices; connect people to places; provide safe access to schools, recreational areas, neighborhoods, and transit stops; and to support economic vitality. Figures 33 through 35 show the LOS for the short-term improvements described below.

8.1 MARINE ROTARY

Figure 36 shows the short-term improvements at the Marine Rotary, which are listed below.

- Adding more crosswalks to make it safer and easier for people walking, biking, or using assistive mobile devices to cross at the rotary
- Shortening crosswalk distances to improve safety
- Reducing lane widths and tightening the rotary to create space for walking and biking modes. These facilities could be a raised separated bike lane or shared-use path
- Installing accessible pedestrian signals and countdown timers to facilitate crossing
- Upgrading the existing sidewalks and curb ramps to Massachusetts Department of Transportation (MassDOT) standards
- Installing bike detection capabilities, bike boxes, bike signals, and signs and markings to increase safety
- Retiming traffic signals to reduce congestion and pedestrian wait times
- Adding new signs and removing redundant signs to clarify turn maneuvers

These improvements would make walking, biking, and crossing at Marine Rotary safer and easier; however, it would increase delay to automobiles. Analysis

indicates that with the short-term improvements, Marine Rotary would operate at LOS F during peak hours.

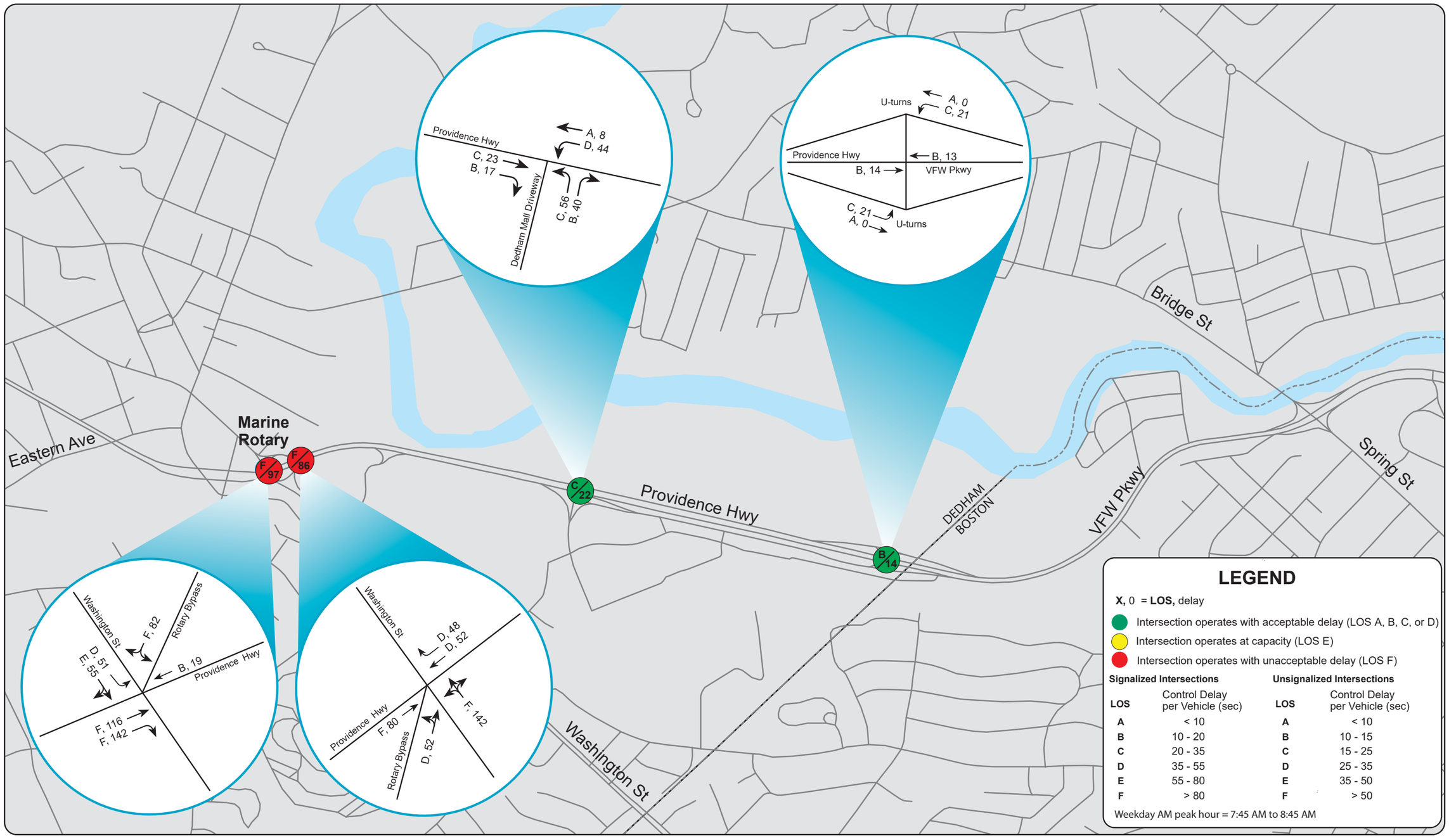

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Figure 33
Short-Term Improvements: Weekday AM Peak-Hour Levels of Service and Delay

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

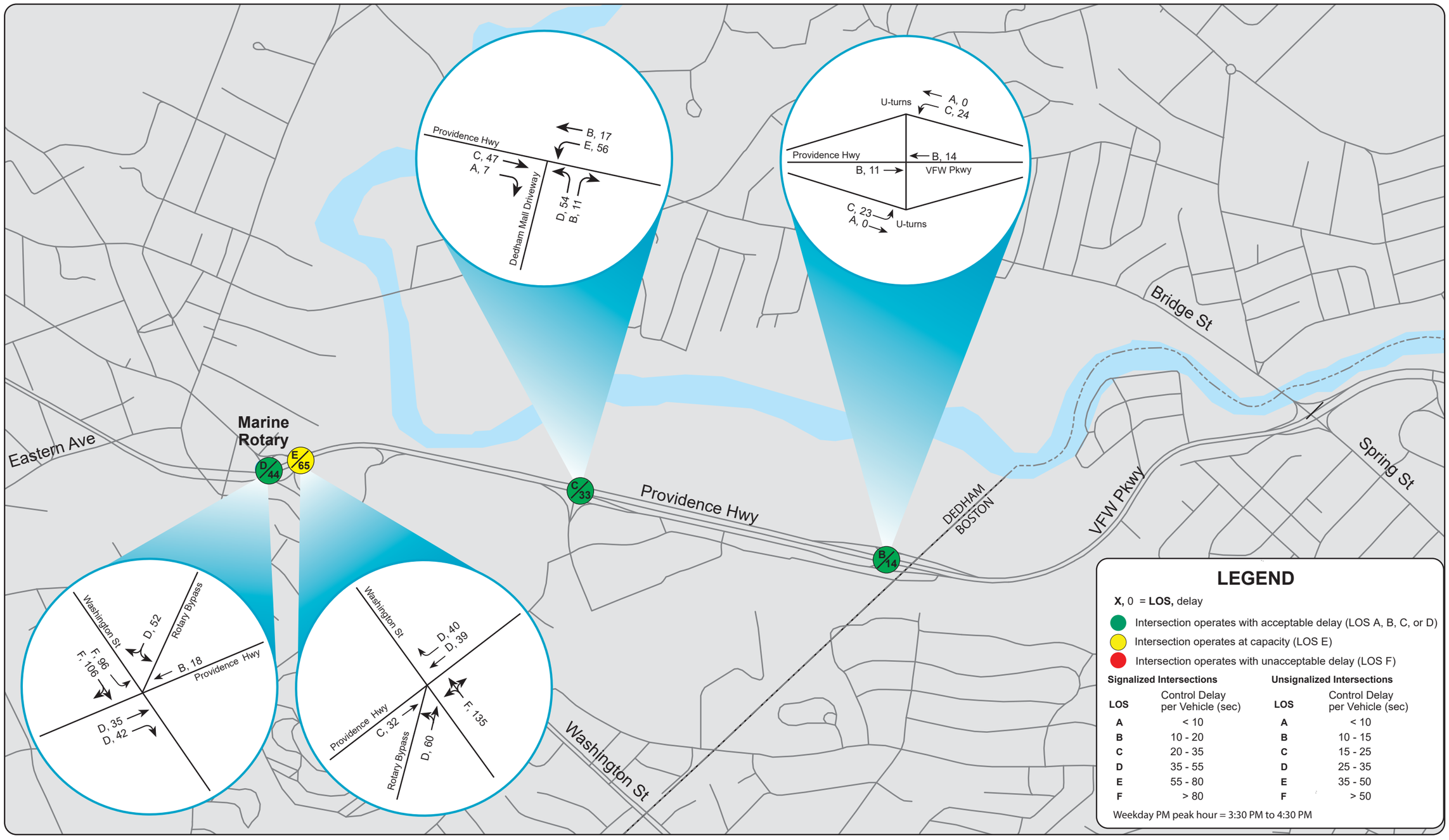

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Figure 34
Short-Term Improvements: Weekday PM Peak-Hour Levels of Service and Delay

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

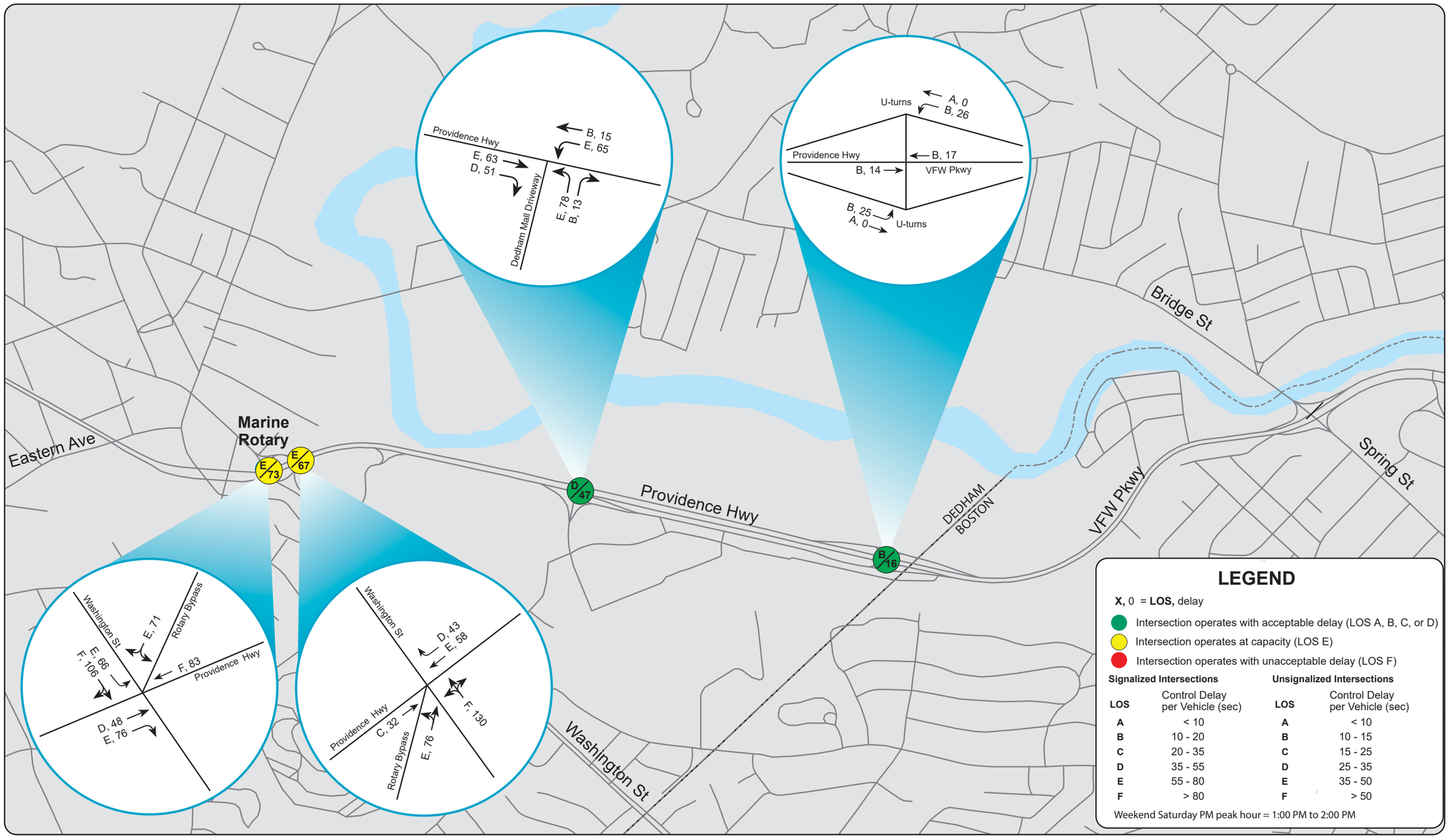

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Figure 35
Short-Term Improvements: Weekend Saturday PM Peak-Hour Levels of Service and Delay

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

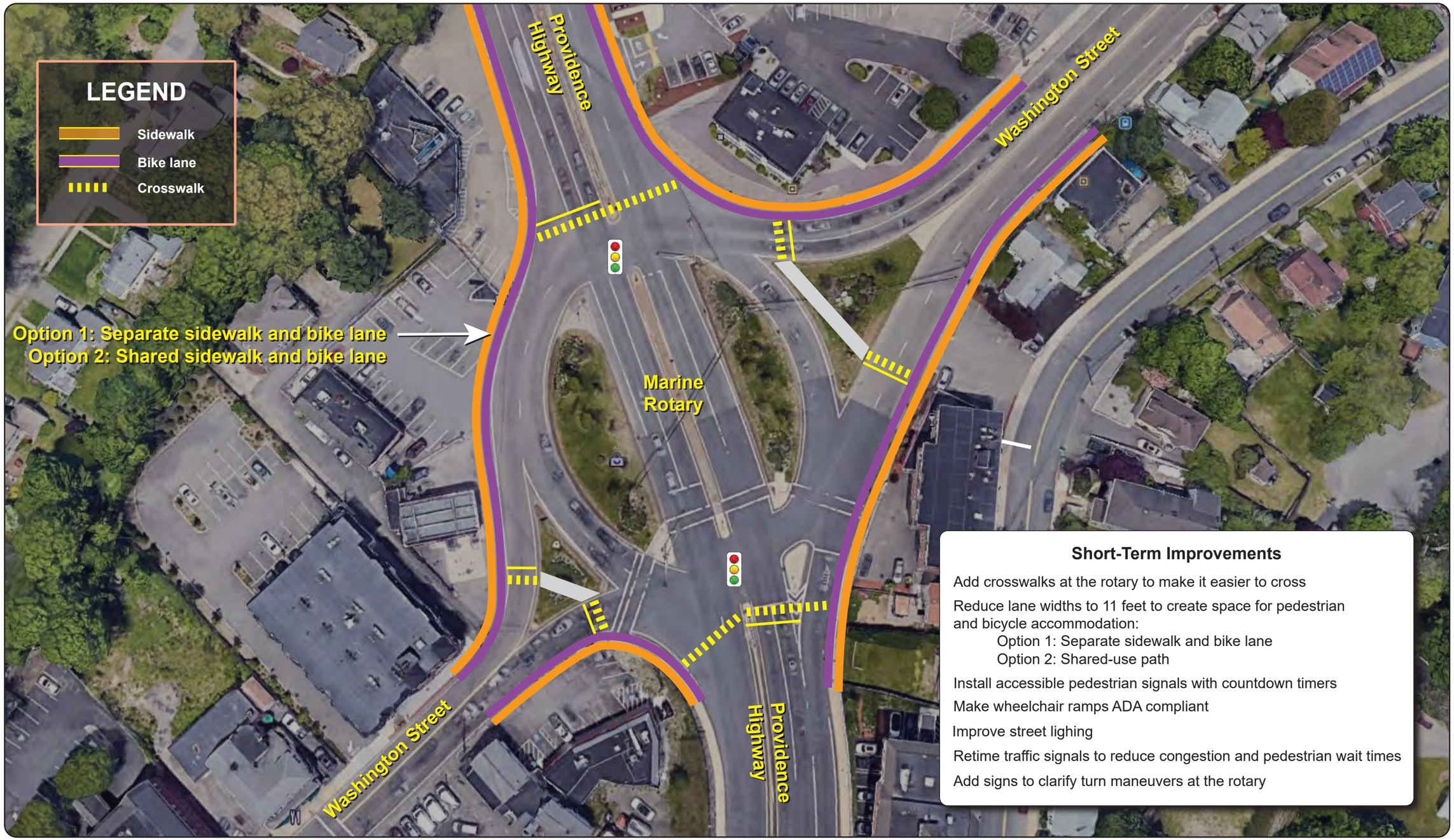

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Figure 36
Marine Rotary
Short-Term Improvements

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

8.2 PROVIDENCE HIGHWAY SEGMENT 1

Figure 37 shows the short-term improvements recommended for the Providence Highway Segment 1 to safely accommodate people walking or biking and calm traffic to reduce high speeds of vehicles. The short-term improvements are listed below.

- Upgrading sidewalks and curb ramps to MassDOT standards
- Narrowing width of travel lanes to calm traffic and reduce speeds
- Converting the 10-foot shoulders in either direction of the roadway into separated bike lanes with physical barriers separating the bike lanes from vehicular travel lanes
- Adding signs to alert motorists of the presence of people walking or biking
- Improving street lighting at intersections and areas where people walking and biking cross the road

8.3 PROVIDENCE MALL DRIVEWAY INTERSECTION

Figure 38 shows the short-term improvements at the Dedham Mall driveway intersection. The short-term improvements are listed below.

- Upgrading the existing sidewalks and curb ramps to MassDOT standards
- Adding crosswalks and accessible pedestrian signals to make it safer for people walking or biking to cross the intersection
- Installing bike detection capabilities, bike boxes, bike signals, and signs and markings to increase safety for people biking and alert drivers of the presence of bicycles
- Extending the separated bike lanes through the intersection with minimal vehicle conflicts

Analysis indicated the short-term improvements would operate satisfactorily. During peak hours, it would operate at LOS D or better.

8.4 PROVIDENCE HIGHWAY SEGMENT 2

Figure 39 shows the short-term improvements on Providence Highway Segment 2 to safely accommodate walking or biking. The short-term improvements are described below.

- Upgrading poor sidewalks and wheelchair ramps to MassDOT standards
- Narrowing widths of travel lanes to calm traffic

- Converting the 10-foot shoulder on the west side of the roadway and the right lane of the mall access road into separated bike lanes with barriers
- Adding crosswalks at the signalized intersections to improve safety of people crossing Providence Highway

The improvements in Segment 2 are consistent with those in Segment 1 and would operate very well together.

Short-Term Improvements

Revamp sidewalks and wheelchair ramps to ADA standards

Convert 10-foot shoulders into separated bicycle lanes

Improve street lighting

Reduce speed limit to 35 mph (safety of pedestrians and bicycles)

Add signs to alert motorists of the presence of pedestrians and bicycles

LEGEND

- Island/median
- Sidewalk
- Bike lane

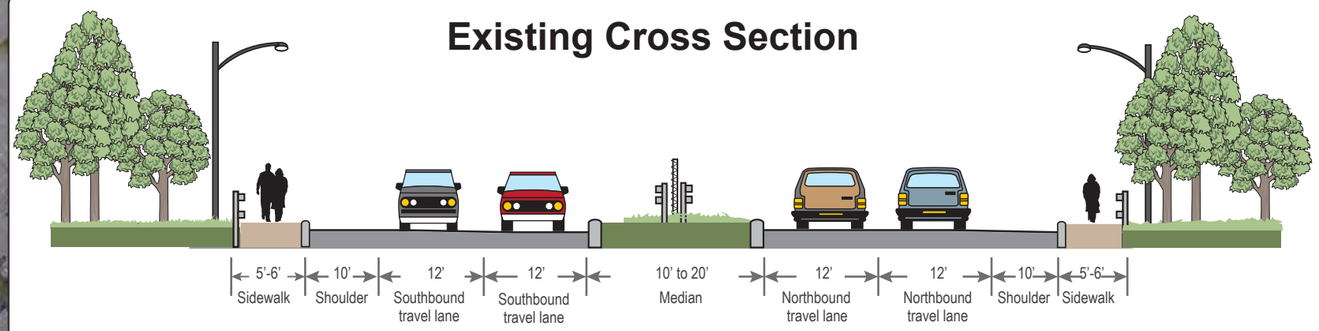
Providence Highway

Dedham Mall Driveway

Ivy Lane

Marine Rotary

Existing Cross Section



Short-Term Improvements

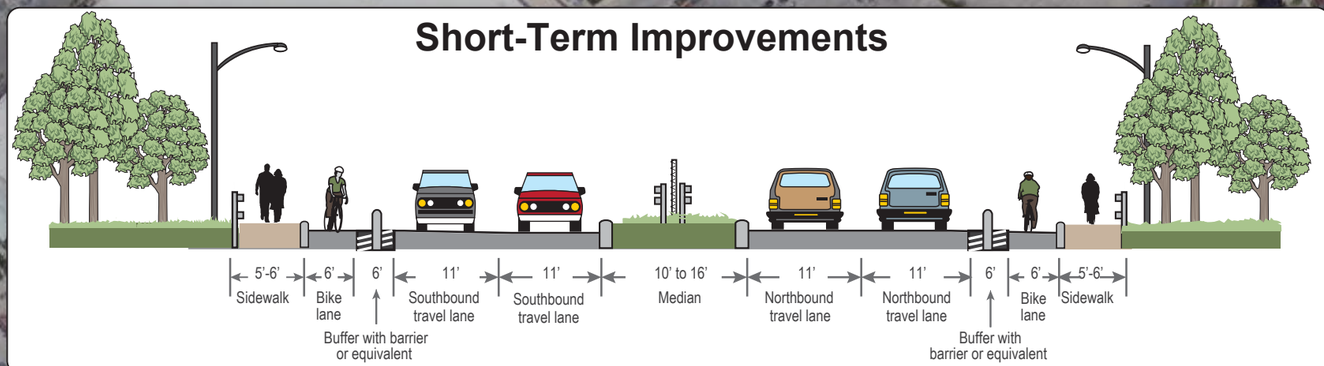


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Figure 37
Providence Highway Segment 1
Short-Term Improvements

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

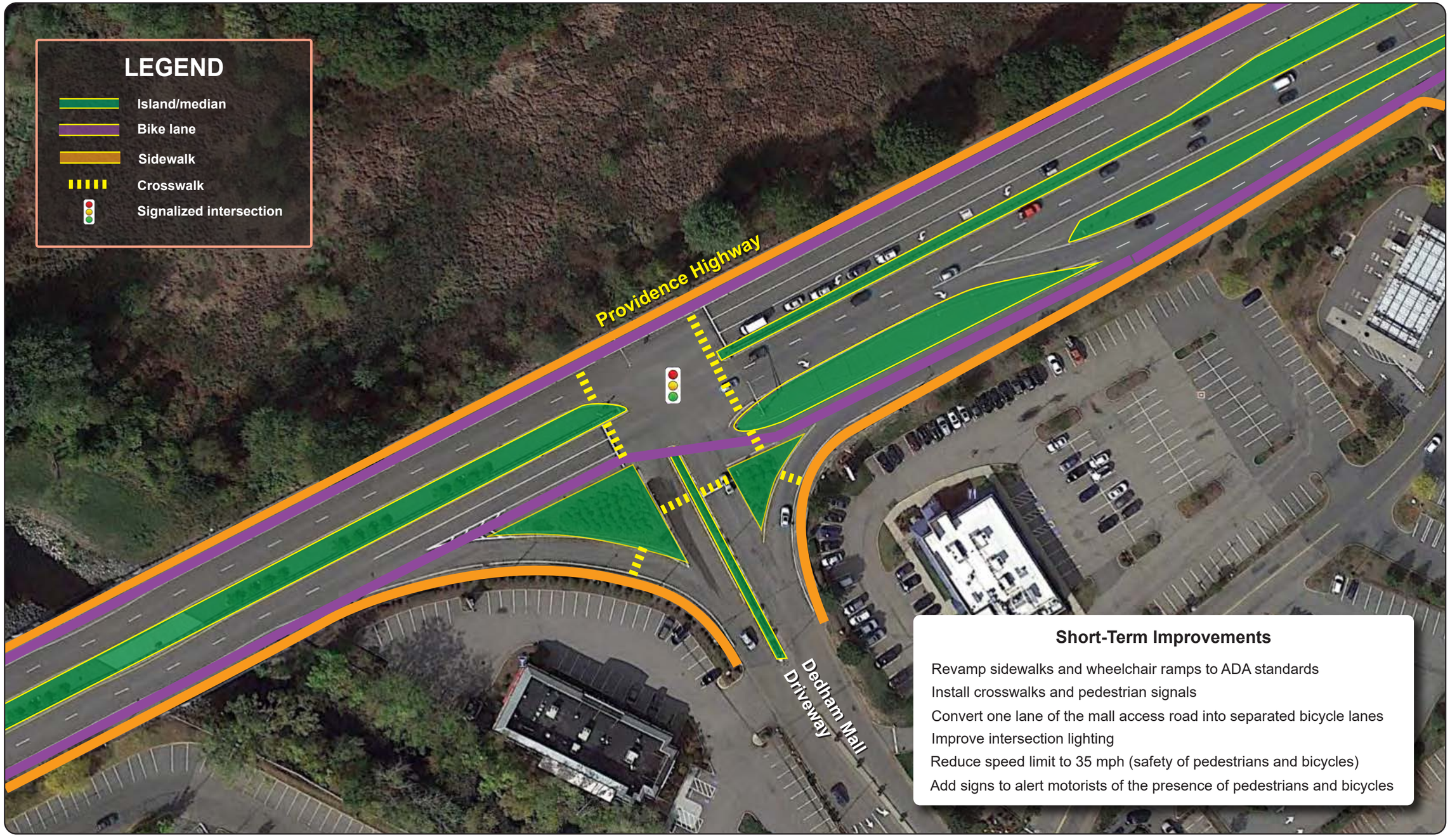

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Figure 38
Dedham Mall Driveway Intersection
Short-Term Improvements

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

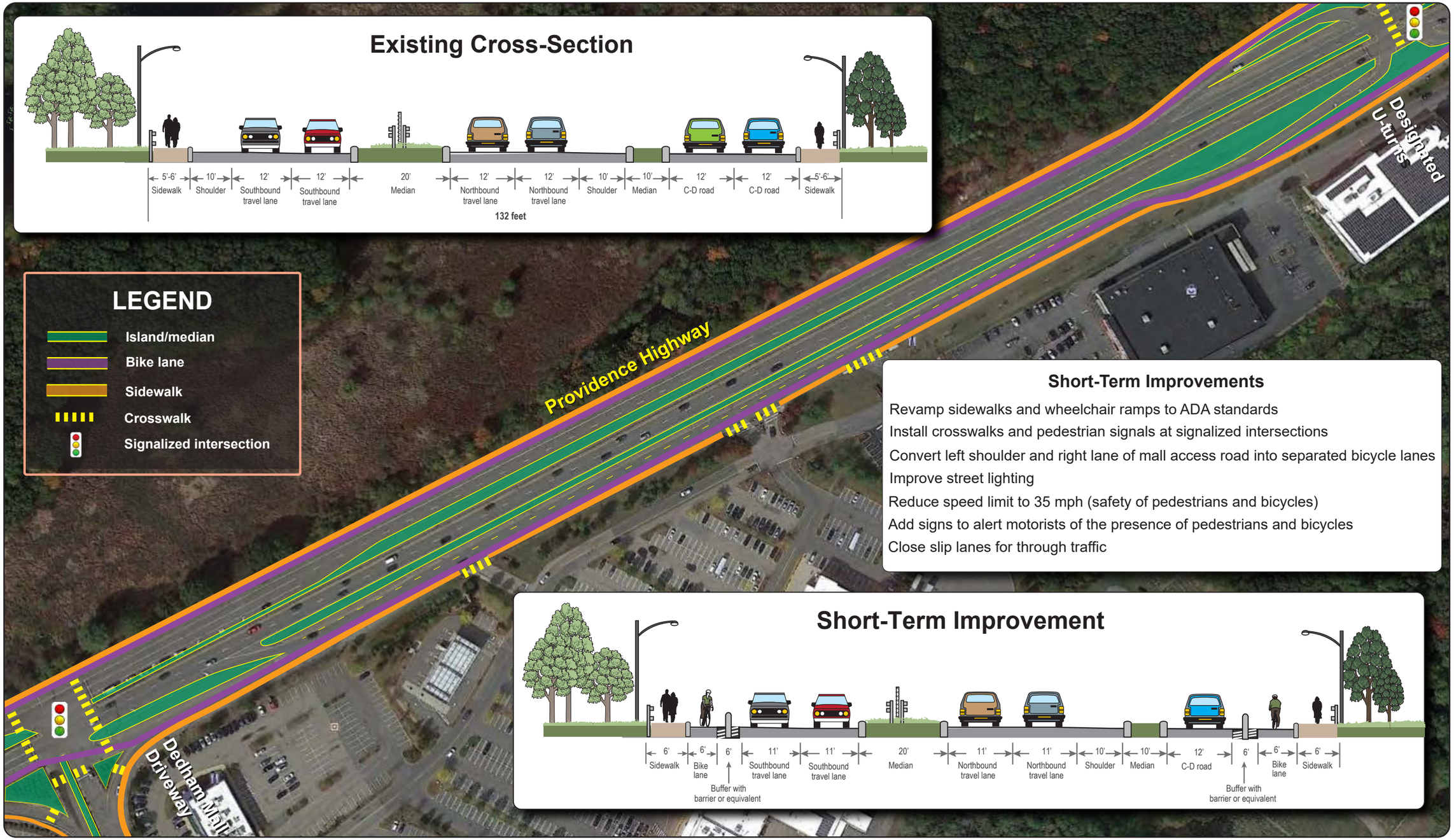

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Figure 39
Providence Highway Segment 2
Short-Term Improvements

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

8.5 U-TURN INTERSECTION

Figure 40 shows the short-term improvements for the U-turn intersection. The short-term improvements are also listed below.

- Upgrading the sidewalks to MassDOT standards
- Adding a crosswalk with pedestrian signals to make it safer and easier for people walking or biking to cross Veterans of Foreign War (VFW) Parkway and Providence Highway
- Extending the bike lanes through the intersection with minimal conflicts with vehicular traffic
- Installing bike detection capabilities, bike boxes, bike signals, and signs and markings to increase safety for users
- Closing the slip lanes for through traffic to improve safety and reduce speeding
- Adding signs to alert motorists of the presence of people walking or biking.

Analysis indicates that with the short-term improvements, the U-turn intersection would operate satisfactorily with overall LOS B.

8.6 VFW PARKWAY SEGMENT

Figure 41 shows the short-term improvements for VFW Parkway segment. They are similar to those of the Providence Highway.

- Revamping the sidewalks and curb ramps to MassDOT standard
- Reducing the widths of the travel lanes to narrow the roadway to reduce speeds of vehicles
- Converting the 10-foot shoulders into separated bike lanes with physical barriers separating bicycles from vehicle traffic
- Adding bus stops to the segment to serve businesses and residential apartments in the segment
- Improving street lighting, especially at the intersections
- Adding signs to alert motorists of the presence of people walking or biking

Although the short-term improvements increase safety for people walking or biking, they would not have significant impact on the traffic operations at the intersection of VFW Parkway and Spring Street. A separate project is addressing the safety and operation needs of the intersection.

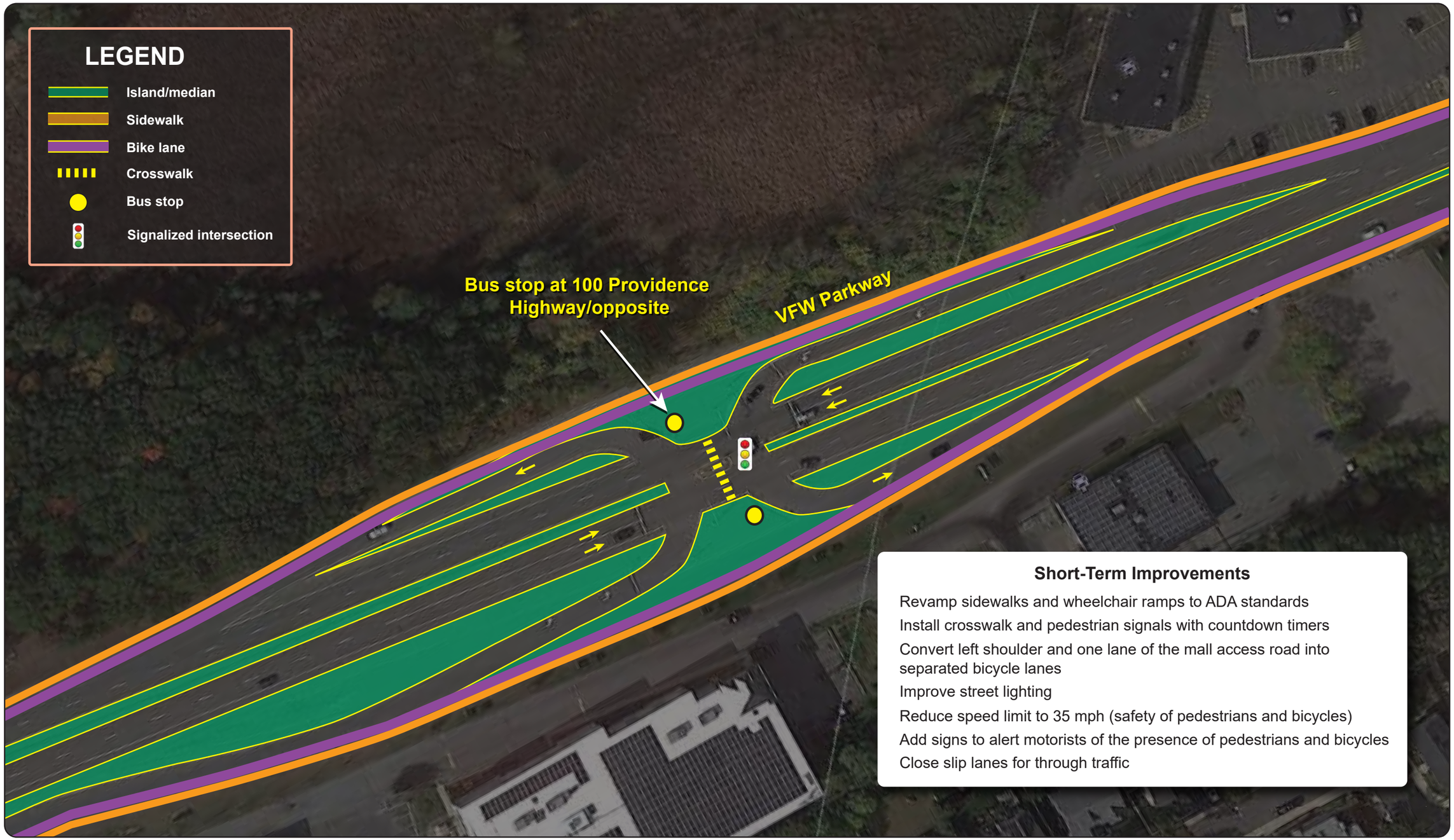

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Figure 40
U-Turn Intersection
Short-Term Improvements

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

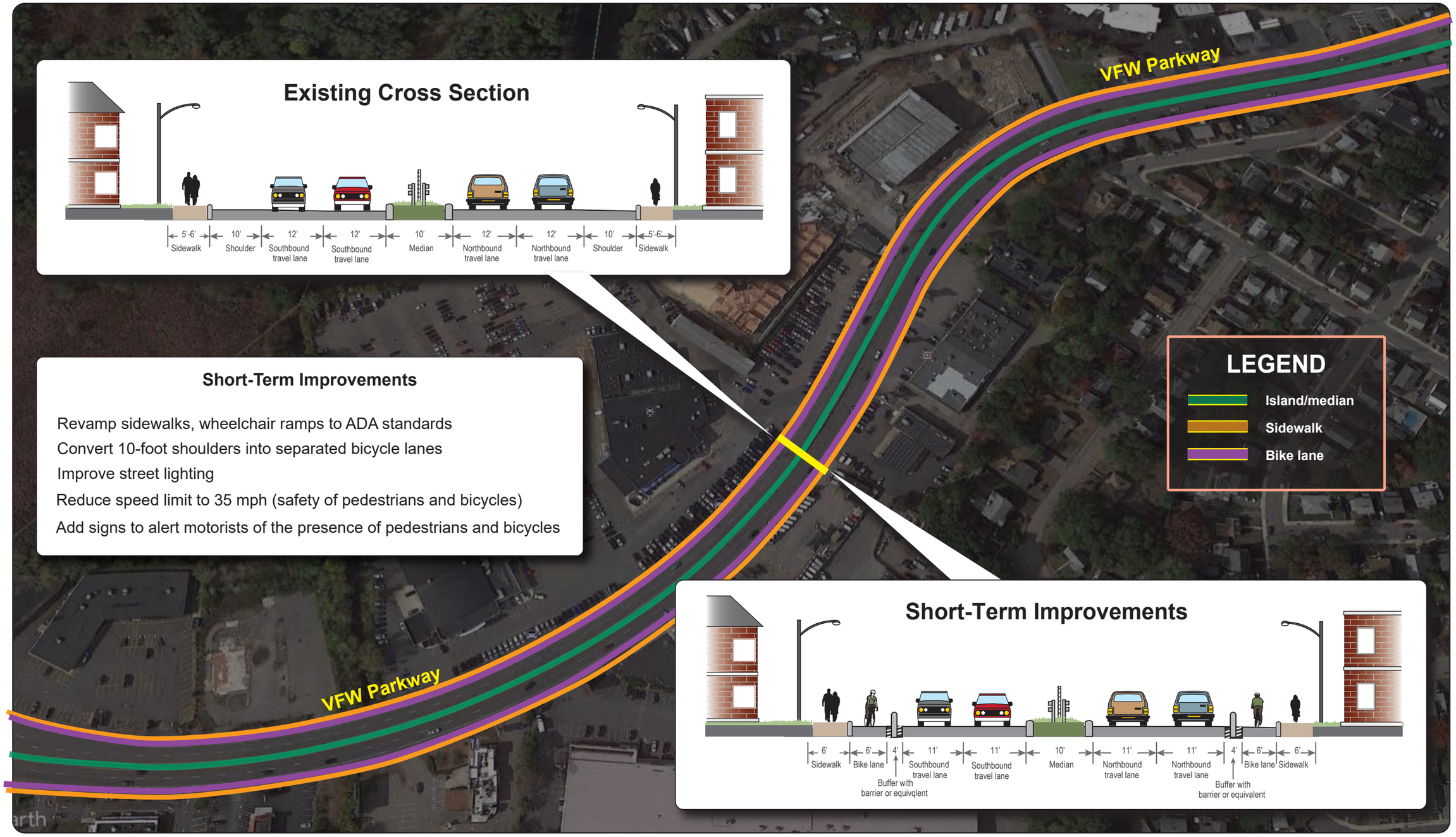

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Figure 41
VFW Parkway Segment
Short-Term Improvements

VFW Parkway/Providence Highway
Corridor Action Plan
Boston and Dedham

Chapter 9—Conclusions

9.1 PROJECT SIGNIFICANCE

Through this study, the technical team has collected data, performed technical analysis, conducted public forums and surveys, and obtained feedback on task products to identify corridor needs and develop short- and long-term improvement concepts to address safety, mobility, and traffic operations. The concepts developed in this study provide the Massachusetts Department of Transportation (MassDOT), the Town of Dedham, City of Boston, the Massachusetts Bay Transportation Authority (MBTA), and other stakeholders an opportunity to review conceptual options for addressing deficiencies in the corridor before committing design and engineering funds to a roadway improvement project.

If implemented, the improvement concepts in this report would yield the following benefits:

- transform the automobile-centric corridor into a road that connects people to places and meets the needs of local residents, businesses, and people who walk, bicycle, use assistive mobile devices, drive, and ride the bus
- transform the road to provide safe access to schools, recreational areas, neighborhoods, transit areas, and other destinations
- transform the road to improve travel choices and connectivity for walking and biking modes by closing gaps in the sidewalk and bicycle networks
- improve safety at high-crash locations in the corridor
- transform the corridor to support the vision of connecting the neighborhoods to places and promoting multimodal transportation

The long-term improvements to transform the corridor into a route for everyone may take some time to implement, so the short-term improvements were developed to transform the corridor to address current and immediate needs.

9.2 PROJECT IMPLEMENTATION

Successful implementation of the improvements would require cooperation between the MassDOT Highway Division, Town of Dedham, City of Boston, MBTA, and other stakeholders to ensure that safety and operations are addressed and MassDOT's standards guide the design of roadway elements. In addition, it is important for stakeholders to evaluate the improvement concepts

with all road users in mind. MassDOT has jurisdiction of the road and would be responsible for implementing renovations to the roadway.

9.3 PROJECT DEVELOPMENT

Project development is the process that takes transportation improvements from planning concept to construction. This process will depend on cooperation between MassDOT, Town of Dedham, City of Boston, Metropolitan Area Planning Council, Massachusetts Planning Organization (MPO), and other stakeholders. This planning study provides the necessary information for the project proponents to initiate the project notification and review process. After completing these initial steps, the proponents can start preliminary design and engineering and begin working with the MPO to program funding for the project in the Transportation Improvement Program. Appendix E contains an overview of the project development process.

9.4 PROJECT FUNDING

Projects from this study can use funds from a variety of funding categories. It should be noted that there is competition among many projects for the available funds; the priority of each project determines whether it is assigned to a funding category and programmed in the TIP.

9.4.1 Federal-Aid Highway Program

The Federal-Aid Highway Program dollars come through several Federal Highway Administration funding programs, each of which has unique requirements. Table 5 shows these programs, which come from the Fixing America's Surface Transportation Act and fund projects in the federal fiscal years 2021–25 TIP.

9.4.2 Chapter 90

The Chapter 90 program entitles municipalities to reimbursement for capital improvement projects for highway construction, preservation, and improvement that create or extend the life of capital facilities. The funds can be used for maintaining, repairing, improving, or constructing town and county ways and bridges that qualify under the State Aid Highway Guidelines issued by the Public Works Commission. Items eligible for Chapter 90 funding include roadways, sidewalks, right-of-way acquisition, shoulders, landscaping and tree planting, roadside drainage, street lighting, and traffic control devices. A municipality seeking Chapter 90 reimbursement for a project must complete a Chapter 90 Project Request Form and an Environmental Punch List for each proposed project and submit it to the appropriate MassDOT District Office.

Table 5
FAST Act Program Funding Categories

FAST Act Program	Eligible Uses
Congestion Mitigation and Air Quality Improvement (CMAQ)	A wide range of projects to reduce congestion and improve air quality in nonattainment and maintenance areas for ozone, carbon monoxide, and particulate matter
Highway Safety Improvement Program (HSIP)	Implementation of infrastructure-related highway safety improvements
National Highway Performance Program (NHPP)	Improvements to interstate routes, major urban and rural arterials, connectors to major intermodal facilities, and the national defense network; replacement or rehabilitation of any public bridge; and resurfacing, restoring, and rehabilitating routes on the Interstate Highway System
Surface Transportation Block Grant Program (STBGP) [formerly the Surface Transportation Program (STP)]	A broad range of surface transportation capital needs, including roads; transit, sea, and airport access; and vanpool, bicycle, and pedestrian facilities
Transportation Alternatives Program (TAP)	A set-aside from the STBGP that funds the construction of infrastructure-related projects (for example, sidewalk, crossing, and on-road bicycle facility improvements)
Metropolitan Planning	Facilities that contribute to an intermodal transportation system, including intercity bus, pedestrian, and bicycle facilities
National Highway Freight Program (NHFP)	Projects that improve the efficient movement of freight on the National Highway Freight Network

FAST = Fixing America's Surface Transportation Act.
Source: Federal Highway Administration

9.4.3 MassWorks Infrastructure Program

The MassWorks Infrastructure Program provides a one-stop shop for municipalities and other eligible public entities seeking public infrastructure funding to support economic development and job creation and retention, housing development at density of at least four units to the acre (both market and affordable units), and transportation improvements to enhancing safety in small, rural communities. The MassWorks Infrastructure Program is administered by the

Executive Office of Housing and Economic Development, in cooperation with the Department of Transportation and Executive Office for Administration & Finance.

9.4.4 Public-Private Partnership

Public-private partnerships in transportation are contractual relationships typically between a state or local government, which are the owners of most transportation infrastructure, and a private company or developer. Such partnerships can involve mitigation measures to accommodate traffic from a development to ensure a sufficient level of service and compliance with local requirements, including level of service and scope of analysis. Costs associated with traffic impact assessment and mitigation planning are typically covered by the developer.