

City of Boston



Dudley Square Vision Initiative

Transportation Action Plan

Prepared for:

Boston Transportation Department
Boston Redevelopment Authority

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DRAFT REPORT



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Executive Summary

The Boston Redevelopment Authority (BRA) in conjunction with the Boston Transportation Department (BTD) has retained Traffic Solutions to develop a Transportation Action Plan as part of the larger Dudley Square Vision initiative. The focus of this Transportation Action Plan was to improve traffic flow, create safe pedestrian and bicycle environment, optimize parking, facilitate bus transit operation, and enhance the character of the neighborhood.

The study approach included identifying issues on a short-term and long-term level. In the short-term, improvements can be made with relative ease, with a modest budget and staff, and within a relatively quick time frame. Conversely, the long-term level improvements require capital outlay, planning and design, as well as substantial construction efforts.

Traffic Solutions identified the critical transportation issues through meetings with community members, field visits, and an extensive data collection effort. The data collection included identification of current parking supply, utilization, and trends, as well as traffic volume counts at selected locations. The project study area is illustrated in Figure A.

Short-term parking analysis focused on identifying on-street and off-street parking availability, turnover rates, utilization patterns, and anticipated needs. It was determined that there is an overall supply of 950 spaces with the peak hour demand of approximately 800 spaces. While it may appear that there is sufficient availability of parking in the area, the demand for most desirable spaces exceeds capacity. Based on this analysis, modifications to the existing parking regulations were proposed, which would increase efficiency of the available parking.

Long-term parking analysis focused on future needs associated with anticipated development in the Dudley Square area. It is recommended that additional 600 spaces be constructed to support this development.

The short-term vehicular and pedestrian circulation improvements proposed in the Transportation Action Plan are relatively inexpensive to implement and will have an immediate effect on traffic operations, providing immediate benefit to the community. These short-term improvements comprise changes to the current parking regulations; intersection lane allocation; minor movement modifications and resultant traffic signal

phasing, timing, and coordination adjustments at six intersections in the vicinity of Dudley Square; pavement markings and signage upgrades; and accessibility compliance.

Prior to initiating this study, BTD has already performed optimization of traffic signal operation within and near the project area. Based on the preliminary findings, some recommendations, such as provision of accessible ramps have already been implemented as well

The long-term improvements proposed in the Transportation Action Plan include modification to travel patterns within Dudley Square and associated geometric alterations. These modifications result in improved traffic operation; provide shorter and safer pedestrian crossings; introduce bicycle lanes; and significantly reduce the amount of paved areas, providing unique opportunities for integrating streetscape concepts into design. The Transportation Action Plan contains recommended streetscape guidelines to ensure consistency and quality in design and construction across all of Dudley Square.

Finally, the Transportation Action Plan addresses issues associated with bus transit at Dudley Square. It outlines recommendations regarding follow-up actions that should be pursued jointly by the City of Boston and the MBTA in order to increase bus ridership. These recommendations include upgrades to customer information; improvements to bicycle access; and enhancements to Dudley Station amenities.

We would like to extend our appreciation to Vineet Gupta, Patrick Hoey, and Don Burgess of BTD and Dana Whiteside and Jim Fitzgerald of the BRA for their support, input and guidance on this project. Their contribution played a key role in shaping up the long-term vision of the Dudley Square neighborhood.

Executive Summary



Figure A: Dudley Square Study Area

Introduction

Dudley Square is in the midst of rapid revitalization. Infill and renovation projects are filling gaps in the urban fabric and replacing underutilized buildings and empty lots with institutional, municipal, housing and commercial uses. Groundbreaking for the new Police Station took place on October 15, 2009 and construction is currently underway. Planning efforts are underway for a mixed-use development adjacent to the new Police Station as well as redevelopment of the Ferdinand Building for a potential Department of Public Health Headquarters. A new housing project with a small retail component is being contemplated at Bartlett Yards in the vicinity of the Square. These new uses, both within and near the Square, will bring new activity to the Square – to its roads, sidewalks, shops, and open spaces.

To support these initiatives and to improve the quality of life of local residents and merchants, the Boston Transportation Department (BTD) in conjunction with the Boston Redevelopment Authority (BRA) has retained Traffic Solutions, LLC to perform a transportation study of the Dudley Square area. The purpose of the study is to develop a Transportation Action Plan as part of the larger Dudley Square Vision initiative. This Transportation Action Plan includes specific short-term and long-term recommendations to improve traffic flow, create safe pedestrian and bicycle environment, optimize parking, facilitate bus transit operation, and enhance the character of the neighborhood.

The project Study Area is bound by Melnea Cass Boulevard to the north, St. James St. to the south, Harrison Avenue to the east and Shawmut Avenue to the west. The materials presented in this study have been developed through an extensive community participation process. The study results and recommendations were presented to the Dudley Square Task Force at numerous meetings and reflect community input obtained at those meetings.

A. Parking

New uses will require more efficient utilization of parking resources or addition of new parking facilities. The study evaluates on-street and off-street parking requirements and provides short-term and long-term recommendations.

B. Vehicular and Pedestrian Circulation

Dudley Square serves a diverse cross section of users, including significant volumes of motorized and non-motorized traffic. Thousands of commuters pass through the Square on a daily basis. It is also a major commercial, municipal and institutional destination area. The Square roadways carry in the order of 20,000 vehicles per day with nearly 2,000 vehicles an hour passing through Dudley Square during the commuter peak periods. Pedestrian activity is intense with many pedestrians walking to and from buses, transferring between buses or walking to many destinations in and around Dudley Square. Bicyclists are frequently seen in the Square, and are a sensible mode for connections to the bus transit in the Square, the rail transit nearby, and the park and recreation resources of the Emerald Necklace and the Kennedy Greenway. The Transportation Action Plan identifies deficiencies in the vehicular/pedestrian network and contains short-term and long-term improvement recommendations.

C. Public Transit

Dudley Station, a major hub in the city's transit system, is a transit gateway to the rest of Roxbury and Dorchester, as the terminus to the MBTA's Silver Line and a major bus transfer node. It provides connections to the Orange Line with most bus routes that serve the Square continuing to Ruggles Station. The bus terminal, renovated in 1989, processes nearly 200 MBTA buses during the peak periods. While the MBTA's plans for upgrading or expanding its service are still evolving, the improvements proposed in the Transportation Action Plan are cognizant of the importance of the area as a transportation hub

Parking – Short Term

Issues

Dudley Square area is destination for a diverse group of users, including residents, retail patrons, visitors to a number of municipal/institutional facilities, MBTA bus riders, etc. As such, parking is at a premium. The most desirable parking spots fill up early in the morning and remain occupied for most of the day.

Figure 1 illustrates the current on-street parking regulations. There are a total of 552 on-street parking spaces in the Study Area. Much of the allowed curbside parking is unregulated with some areas posting two-hour restrictions. Due to this lack of regulation, there is a high degree of competition for most desirable parking locations. Much of valuable on street parking essential for local merchant operation is frequently occupied by commuters taking the MBTA buses into downtown Boston; some of two-hour parking spaces are occupied by “gypsy” cabs; the designated cab stand is underutilized.

There are also a number of off-street private and public surface parking lots in the area. These lots are illustrated in Figure 2. The off-street parking facilities add up to 398 spaces. Not all of these parking lots are utilized to their maximum capacity or efficiency. While some of the lots operate fully at capacity, others are underutilized due to either their remote location or the fact that their designated use does not match the current demand.

Modifying on-street and off-street parking regulations and reallocating spaces within some of these facilities would increase efficiency of their utilization.

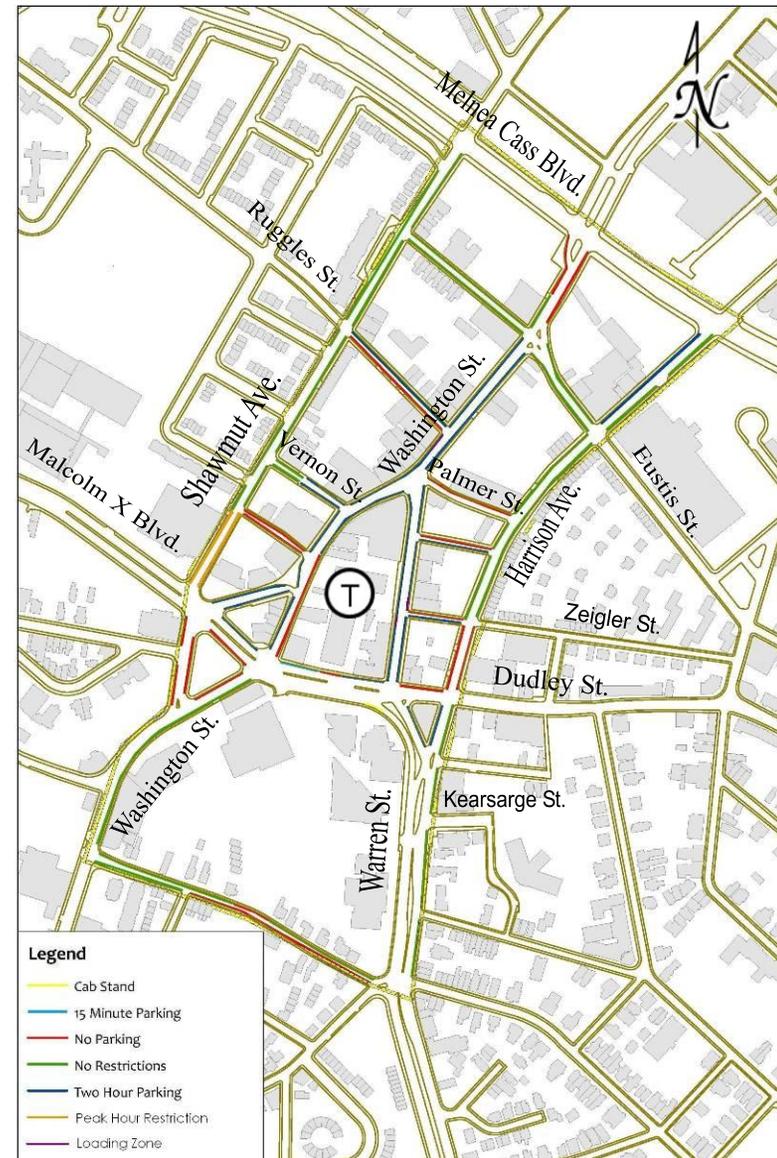


Figure 1: Current Parking Regulations

Parking – Short Term

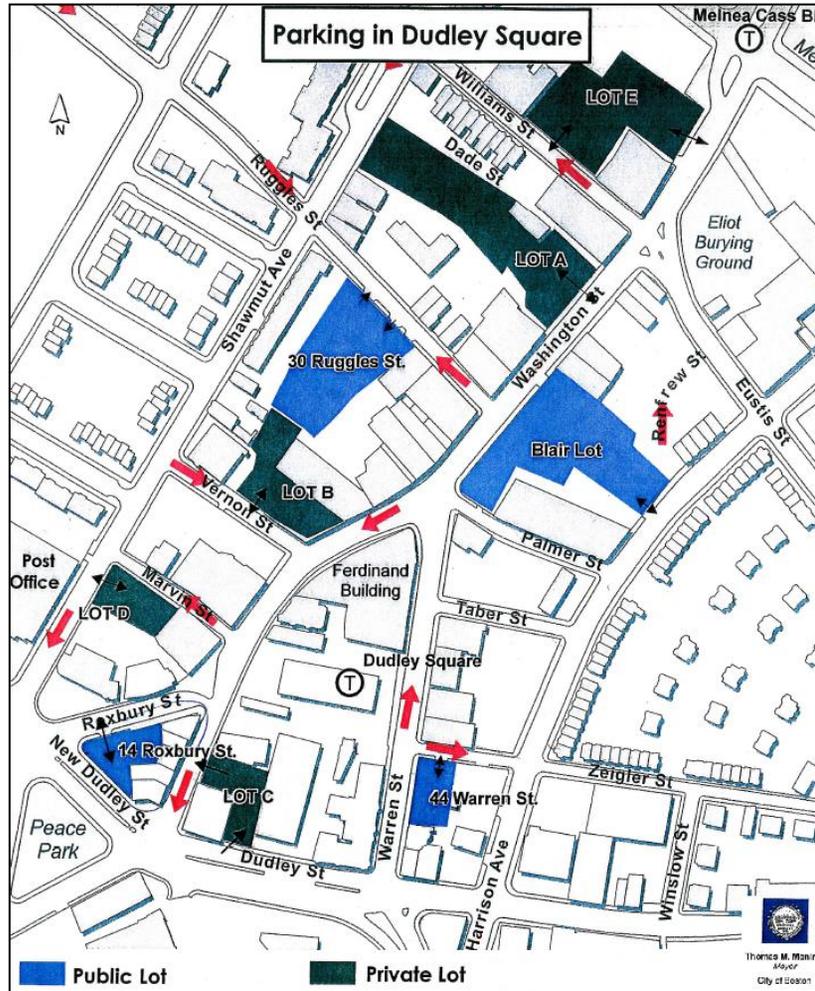


Figure 2: Off-Street Parking Facilities

Findings

Through an extensive inventory of on-street and off-street parking within the Dudley Square area Traffic Solutions identified parking availability and the current utilization rates. Several trends were observed:

- While many parking spaces get filled early in the morning, there is an overall surplus of on-street parking in the area as the total number of available parking spaces (950) exceeds the peak number of occupied spaces (800). Figure 3 shows parking utilization varying by time of day.
- A significant number of vehicles arriving early in the morning remain parked for seven to eight hours. As vehicles arrive later, their length of stay is diminished. The variations in length of stay depending on the time of day are illustrated in Figure 4.
- The greatest demand for parking is during late morning – early afternoon hours.
- The highest parking turnover occurs in mid-afternoon, with a large number of vehicles staying not longer than one to two hours. Figure 5 is an illustration of the parking turnover rates.

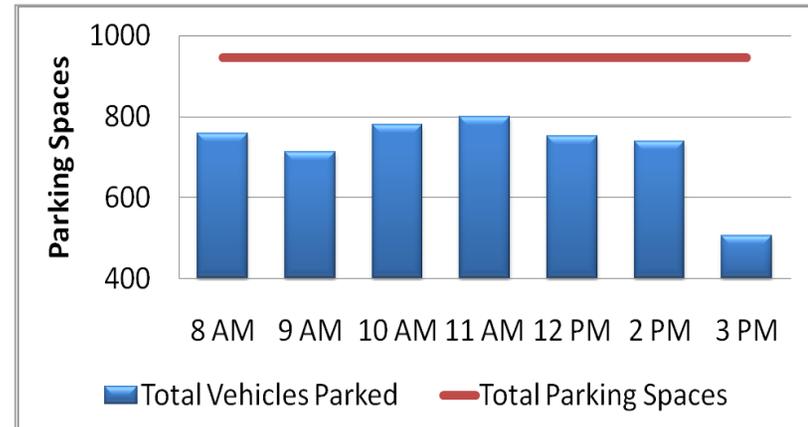


Figure 3: Current Parking Demand

Parking – Short Term

- Proposed Regulation: Two Hour Parking

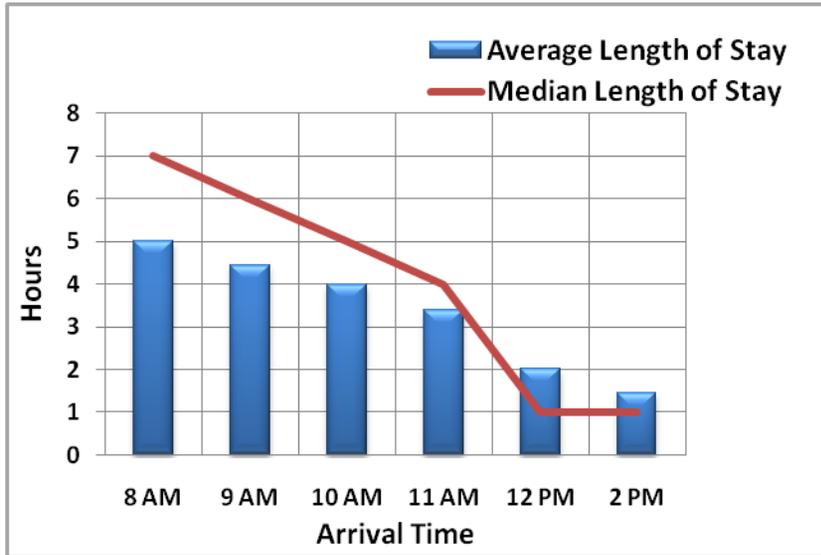


Figure 4: Parked Durations

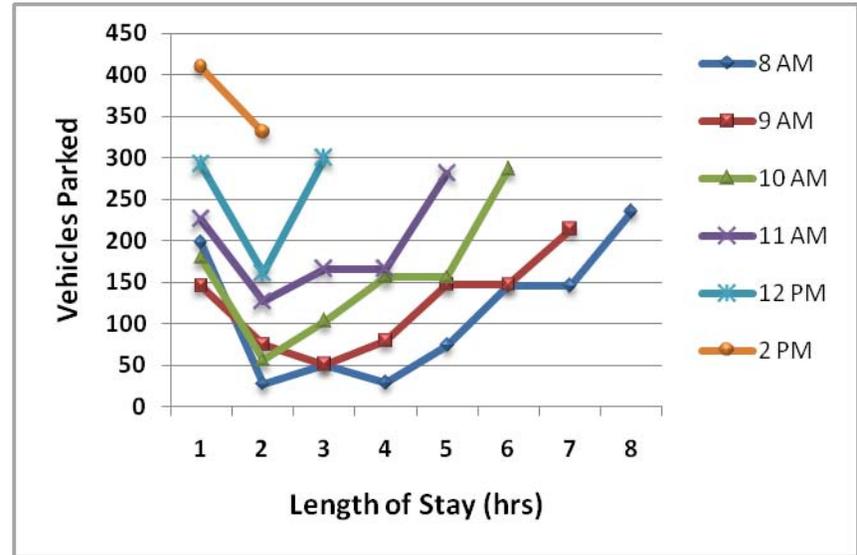


Figure 5: Parking Turnover

Recommendations

In order to maximize parking efficiency, the current regulations should be revisited for both on-street and off-street facilities. Modifications to these regulations will benefit all users in the Dudley Square area and will facilitate parking in the near term. The recommendations for on-street parking follow; they are also illustrated in Figure 6. Areas not listed are not proposed to be modified.

Shawmut Ave. between Melnea Cass Blvd. and Ruggles St.:

- Current Regulation: No Parking Restrictions
- Proposed Regulation: Residents Only Parking

Vernon St. between Shawmut Ave. and Washington St.:

- Current Regulation: No Parking Restrictions

Harrison Ave. between Melnea Cass Blvd. and Eustis St.:

- Current Regulation: Two Hour Parking (west side) / No Parking Restrictions (east side)

Harrison Ave. between Palmer St. and Zeigler St.:

- Current Regulation: No Parking Restrictions
- Proposed Regulation: Two Hour Parking

Warren St. between Harrison Ave. and Kearsarge St.:

- Current Regulation: No Parking Restrictions
- Proposed Regulation: Residents Only Parking

Washington St. between Shawmut Ave. and Dudley St (east side):

- Current Regulation: No Parking Restrictions
- Proposed Regulation: Two Hour Parking

Washington St. between Shawmut Ave. and Dudley St (west side):

- Current Regulation: No Parking

Parking – Short Term

- Proposed Regulation: Two Hour Parking

Roxbury St. between Shawmut Ave. and Washington St.:

- Current Regulation: Two Hour Parking
- Proposed Regulation: 15 Minute Parking

Warren St. south of MBTA Dudley Station Entrance (west side):

- Current Regulation: Two Hour Parking
- Proposed Regulation: Extend Loading Zone

Warren St. between Dudley St. and Harrison Ave. (west side):

- Current Regulation: Cab Stand
- Proposed Regulation: Two Hour Parking

Dudley St. west of Warren St. (north side):

- Current Regulation: Two Hour Parking
- Proposed Regulation: Cab Stand

In order for the proposed regulations to be effective, it is recommended that parking meters be installed in the two-hour parking zones. Continuous enforcement of the metered areas as well as the 15-minute parking zones is recommended. The comparison of existing on-street parking under current regulations to the proposed parking regulations is summarized in Table 1.

Table 1: On-Street Parking Summary			
Regulation	Number of Parking Spaces		
	Current	Proposed	Change
Two Hour Parking	175	225	50
15 Minute Parking	3	10	7
Peak Hour Restriction	5	0	-5
Residential Permit	0	104	104
Unrestricted	369	212	-157
Total On-Street Parking	552	551	-1

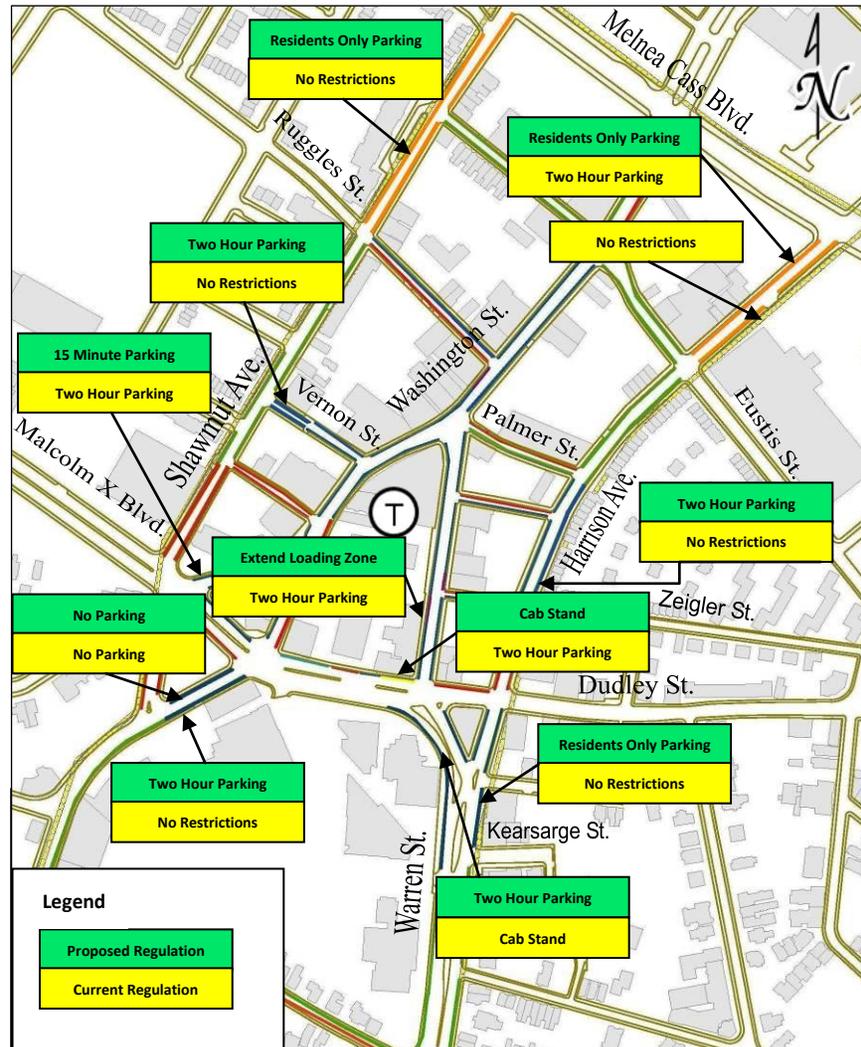


Figure 6: Proposed Parking Regulations

Parking – Short Term

Proposed changes to the use of the off-street facilities are summarized in Table 2. The referenced parking lots are shown above in Figure 2.

Table 2 Proposed Off-Street Parking Modifications			
Private	Spaces	Current Use	Recommendations
A ¹	70	Haley House, Café, Mayo Group, Brandy and Body Gym	Change 30 spaces to public use – Two-Hour Parking
B	30	Walgreens	No Change
C	24	Bank of America	No Change
D	16	General Public – Short Term	Paid Merchant Parking
E	60	Tropical Foods	No Change
Total	200		
Public			
Public	Spaces	Current Use	Recommendations
30 Ruggles	72	Two-Hour	No Change
14 Roxbury	12	Two-Hour	No Change
44 Warren	23	Two-Hour	No Change
Blair	91	Two-Hour	Provide 45 Long Term Spaces
Total	198		

¹ Public/Private Lot

The total on-street and off-street parking availability under current regulations is compared to the proposed regulations in Table 3.

Table 3: Combined On and Off-Street Parking			
Regulation	Current	Proposed	Change
Two Hour Parking	338	373	35
15 Minute Parking	3	10	7
Peak Hour Restriction	5	0	-5
Residential Permit	0	104	104
Private Use	200	170	-30
Unrestricted	404	292	-112
Total Parking Spaces	950	949	-1

Parking – Long Term

Issues

As identified through the parking survey, the total current demand for parking in the Dudley Square area is approximately 800 spaces. While the existing supply of 950 spaces provides adequate overall capacity, it is reasonable to expect that occasionally the demand may exceed parking availability. More importantly, as revitalization of Dudley Square triggers additional development in the area, parking needs are likely to increase beyond the existing supply levels and warrant long term expansion considerations.

Findings

To determine the long term parking needs, an analysis of anticipated future land uses was conducted. It was determined in consultation with the BRA and the BTD that the projected land use would include 200,000 square feet of additional office space and 150,000 square feet of retail space. Applying the rates from the Institute of Transportation Engineers Parking Generation Manual and making adjustments for potential non-automobile users such as public transit riders and local patrons accessing the projected land uses by walking or bicycling, it was determined that the parking needs associated with new development will amount to 522 spaces. Besides the future office and retail parking needs, the new Police Station will require an additional 80 spaces, for a total projected future demand of 602 spaces.

As outlined in the Parking - Short Term section, there is currently a peak demand for 800 spaces in the Dudley Square area. Combined with the estimated future needs of 602 spaces, it results in the future demand of 1402 spaces. The existing parking supply in the Dudley Square area consists of 552 on-street and 398 off-street spaces, for a total of 950 parking spaces. Comparison of future demand to the current supply suggests a parking shortage of 452 spaces.

Recommendations:

While the estimated future parking shortage is 452 spaces, limiting the new parking to that number would only address future development needs and would not provide a relief to the current parking situation in the Dudley Square area. In fact, allocating the current surplus to future needs would

put an additional stress on the parking situation. Accordingly, it is recommended that the long term parking addition include the entire future demand of approximately 600 spaces. Such an addition would not only address future development needs, but would also allow flexibility in developing long term improvement plans.

BRA is considering constructing a parking garage adjacent to the new Police Station. Located in the heart of Dudley Square, such structured parking, sized for approximately 600 vehicles, would accommodate the Police Station requirements, the future development needs, and any potential shortage in the existing parking supply. The site of the potential parking structure is conceptually illustrated in Figure 7.

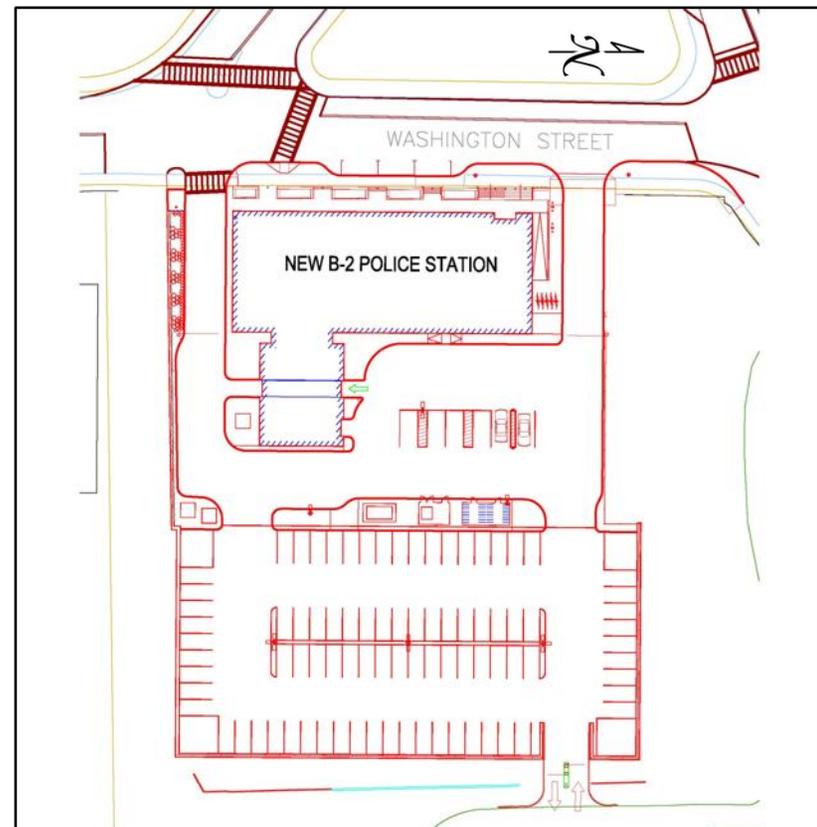


Figure 7: Potential Parking Garage Location

Vehicular and Pedestrian Circulation – Short Term

Issues:

Dudley Square roadways carry in the order of 20,000 vehicles per day with nearly 2,000 vehicles an hour passing through the area during the commuter peak periods. Pedestrian activity is intense with many pedestrians walking to and from buses, transferring between buses or walking to many destinations in and around Dudley Square. The roadways in the Study Area are shown in Figure 8.

The mixture of heavy vehicular and pedestrian activity combined with lack of clear travel lane delineation, inefficiencies in how certain movements are maintained, and lack of continuous accessible routes create an environment that is less than ideal for the many residents, businesses and visitors to the Dudley Square area. The City of Boston Transportation Department recently implemented traffic signal enhancements along the Dudley Street corridor, including timing and coordination optimization. These measures significantly improved intersection performance. However, signal modifications alone are just a first step in increasing traffic flow efficiency and improving the interface between vehicles and pedestrians. Additional modifications to lane utilizations and corresponding signal phasing adjustments would further enhance the intersection performance.

Findings:

The roadways and intersections within the Dudley Square area exhibit several deficiencies as listed below. Many of these deficiencies could be fixed in the near term with relative ease.

- Pavement markings in many areas either do not exist or are worn out.
- In several instances, drivers form multiple lanes even where there are no such designations. This happens at intersection approaches where roadways have sufficient width for another travel lane.
- Some movements carry very low traffic volumes and could be restricted, which would benefit traffic signal phasing.
- Several crosswalks could be realigned, resulting in shorter crossing distances.
- Many driveways and side streets lack crosswalks, thus deemphasizing pedestrian presence.

- Accessible ramps are missing at several locations.
- Directional signage is missing.
- In some areas parking at intersection approaches obstructs site distance.
- Intersection of Warren St. with Harrison Ave. experiences particularly severe congestion due to northbound Warren St. traffic having right-of-way, which requires southbound Harrison Ave. traffic to yield. This, in turn, causes southbound traffic to back up and occasionally create gridlock on Dudley St.

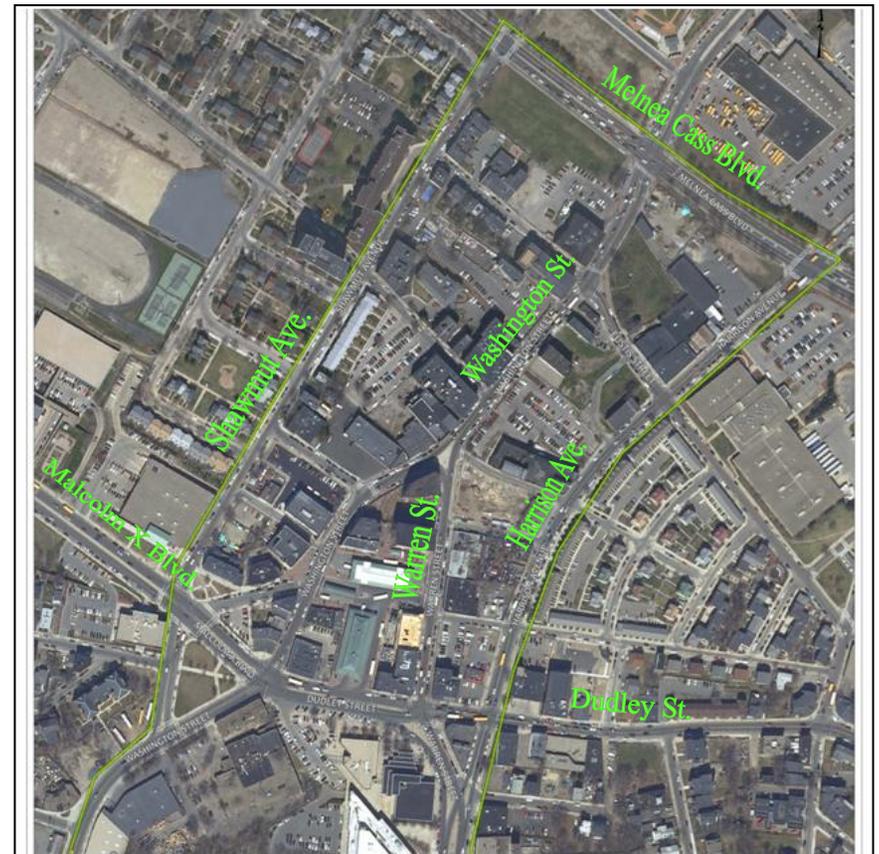


Figure 8: Study Area Roadways

Vehicular and Pedestrian Circulation – Short Term

Recommendations:

Dudley St. at Shawmut Ave. (Figure 9)

- Designate Shawmut Avenue northbound approach left lane as left turn only.
- Modify traffic signal phasing to provide protected left turn phase.
- Adjust traffic signal timing to provide more green time for the northbound Shawmut Avenue approach.
- Maintain pavement markings.



Dudley St. at Washington St. (Figure 10)

- Prohibit Washington St. northbound left turn onto Dudley St. (currently under 10 vehicles per hour).
- Modify traffic signal phasing to provide protected Dudley St. westbound left turn and to allow Washington St. northbound right turn to operate concurrently (overlap) with this movement.
- Realign crosswalk across the easterly approach on Dudley St. to shorten crossing distance.
- Introduce a crosswalk across the Police Station exit.
- Provide accessible ramps for the new crosswalk.
- Maintain pavement markings.



Vehicular and Pedestrian Circulation – Short Term

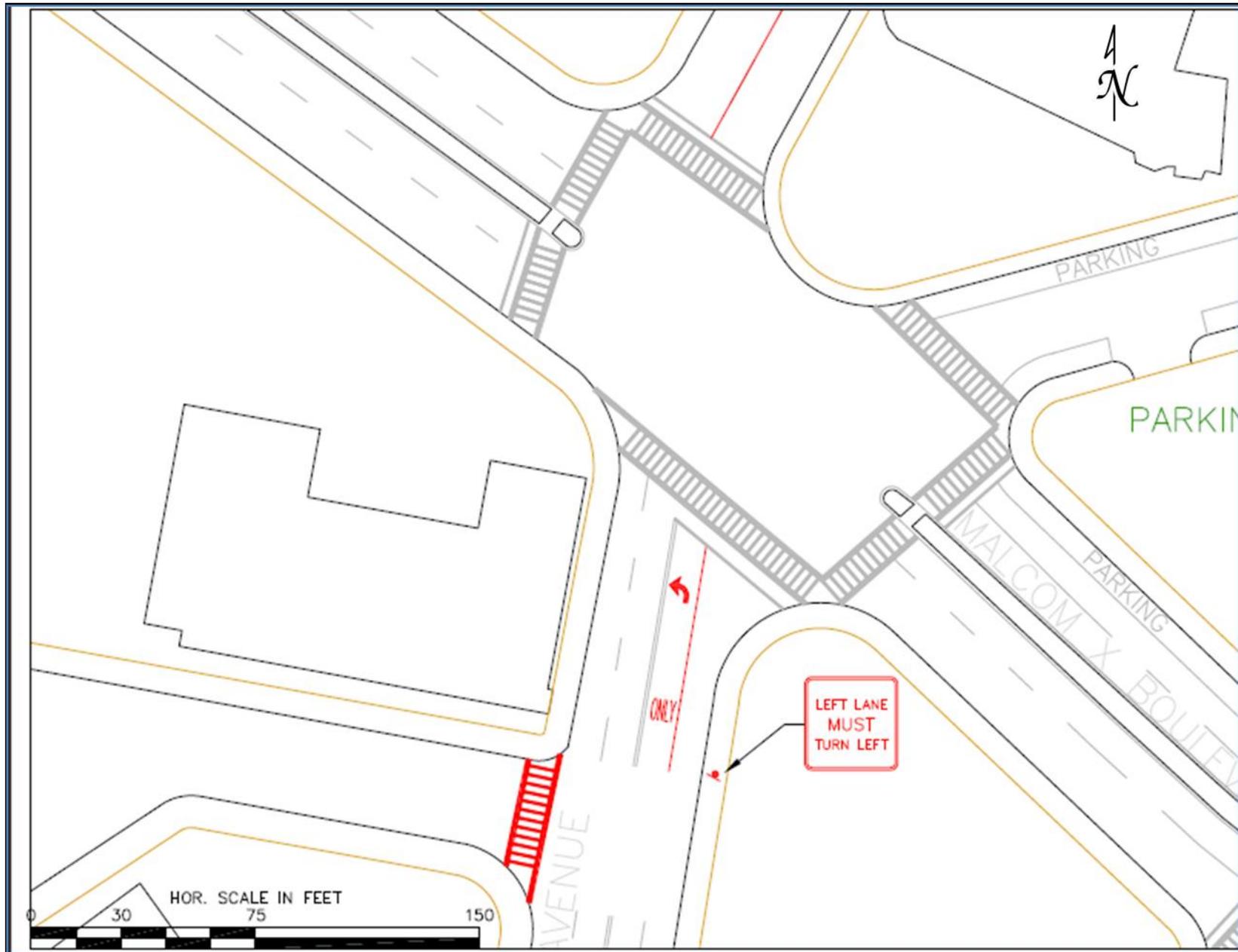


Figure 9: Dudley Street at Shawmut Avenue

Vehicular and Pedestrian Circulation – Short Term

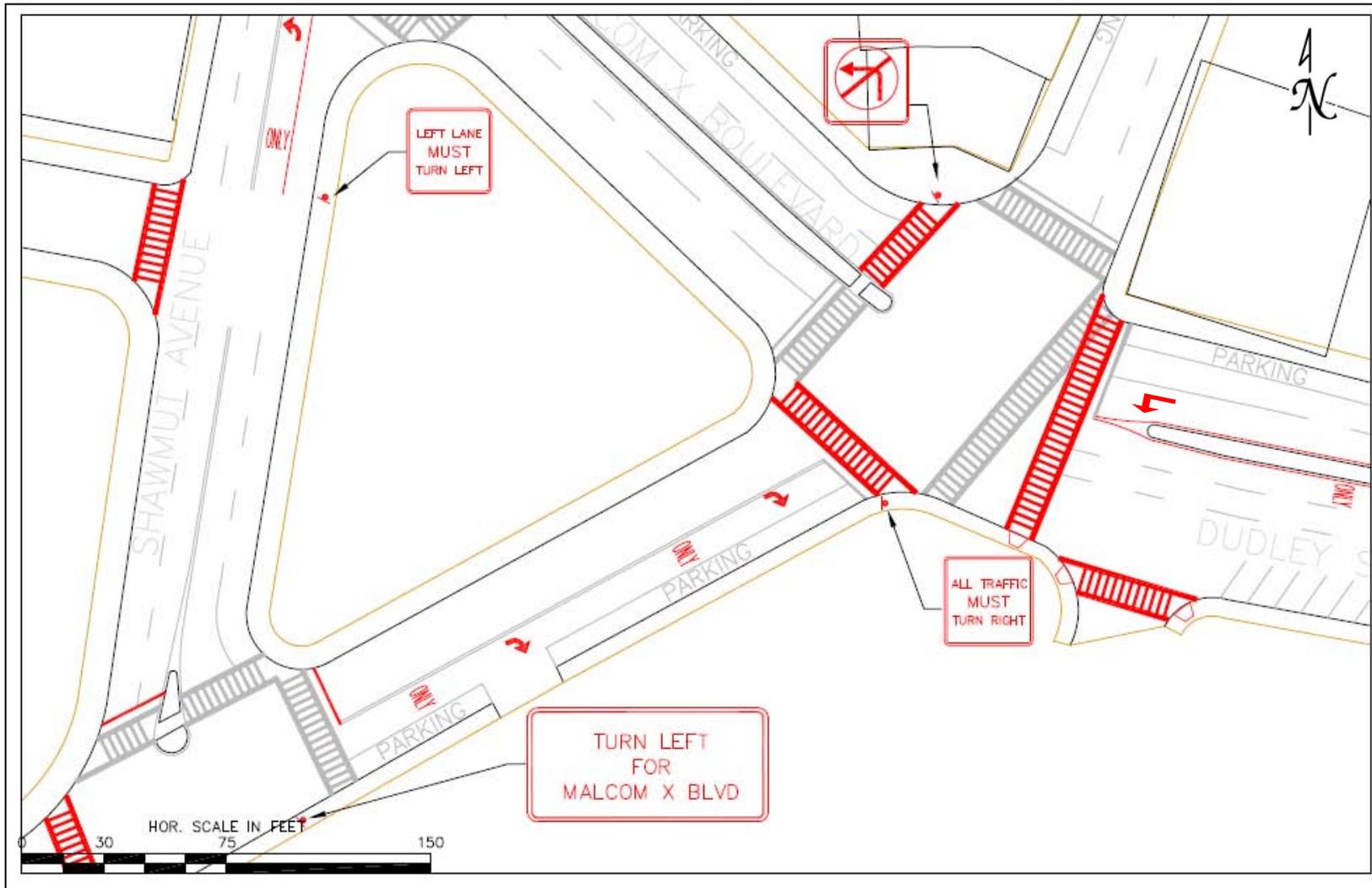


Figure 10: Dudley Street at Washington Street

Vehicular and Pedestrian Circulation – Short Term

Recommendations (continued):

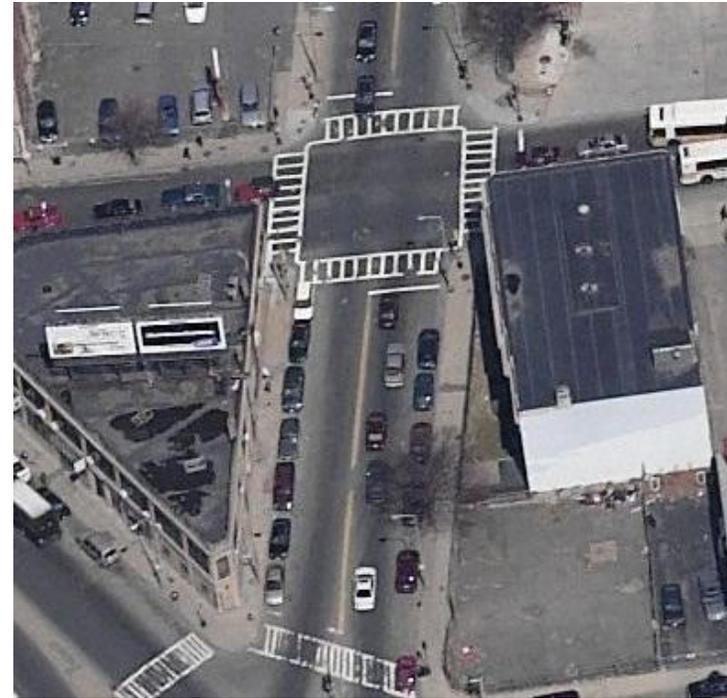
Dudley St. at Warren St. (Figure 11)

- Designate Dudley Street eastbound approach left lane as left turn only.
- Designate Warren Street northbound approach left lane as left turn only.
- Remove bus stop on the northerly side of westbound Dudley Street approach to provide second approach lane (as being used today).
- Install accessible ramps on the northeast, southeast, and southwest corners and at the splitter island.
- Realign crosswalk at the Warren Street northbound approach to bypass the existing delta island, which is too small for accessible ramps.
- Maintain pavement markings.



Dudley St. at Harrison Ave. (Figure 12)

- Prohibit Harrison Ave. southbound left turn (less than 30 vehicles per hour) and northbound left turn (less than 10 vehicles per hour).
- Restripe Harrison Avenue southbound approach to provide two lanes with right lane designated as right turn only.
- Modify traffic signal phasing to allow Harrison Ave. southbound right turn go concurrently (overlap) with Dudley St. eastbound approach.
- Maintain pavement markings.



Vehicular and Pedestrian Circulation – Short Term

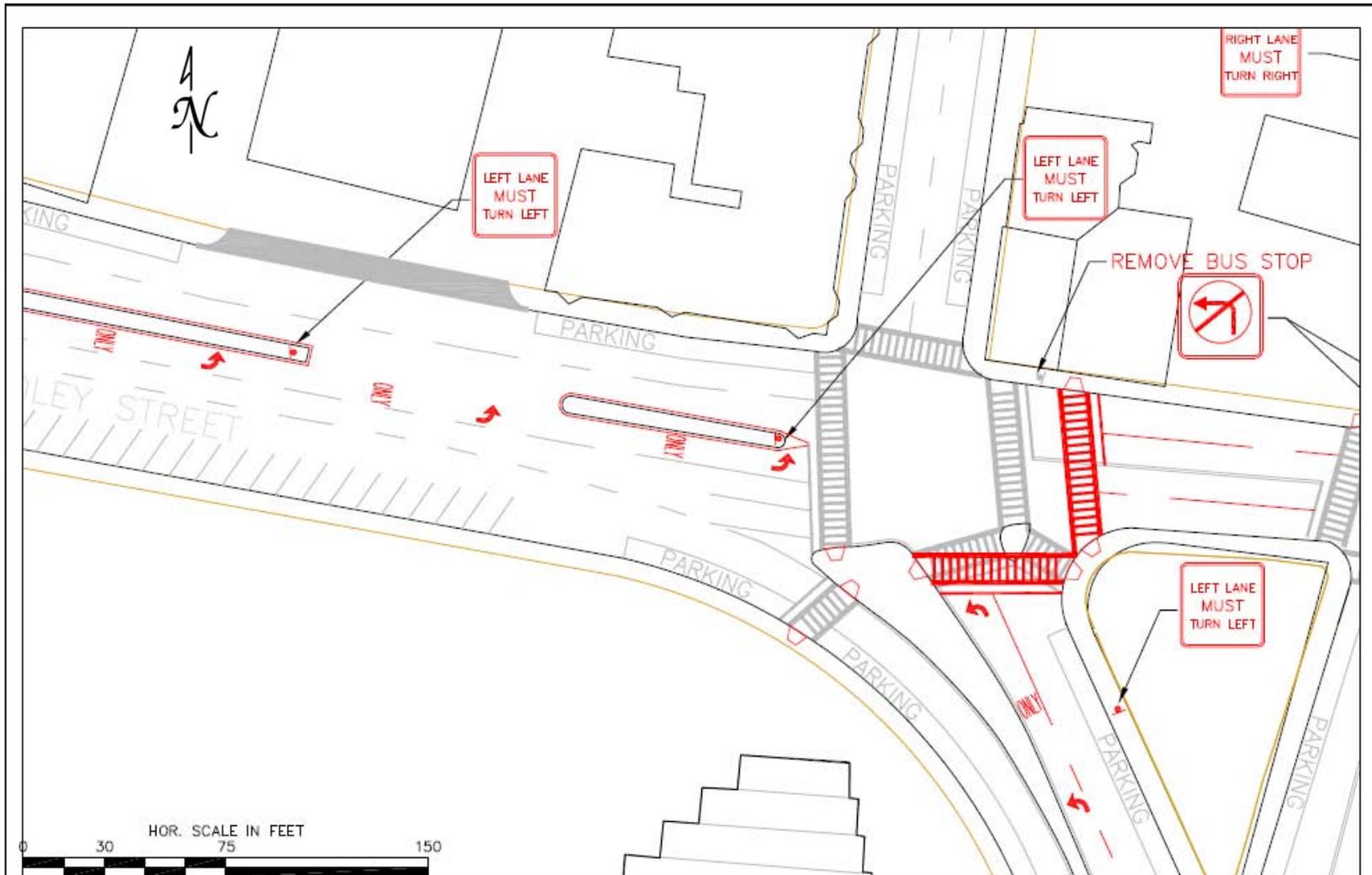


Figure 11: Dudley Street at Warren Street

Vehicular and Pedestrian Circulation – Short Term

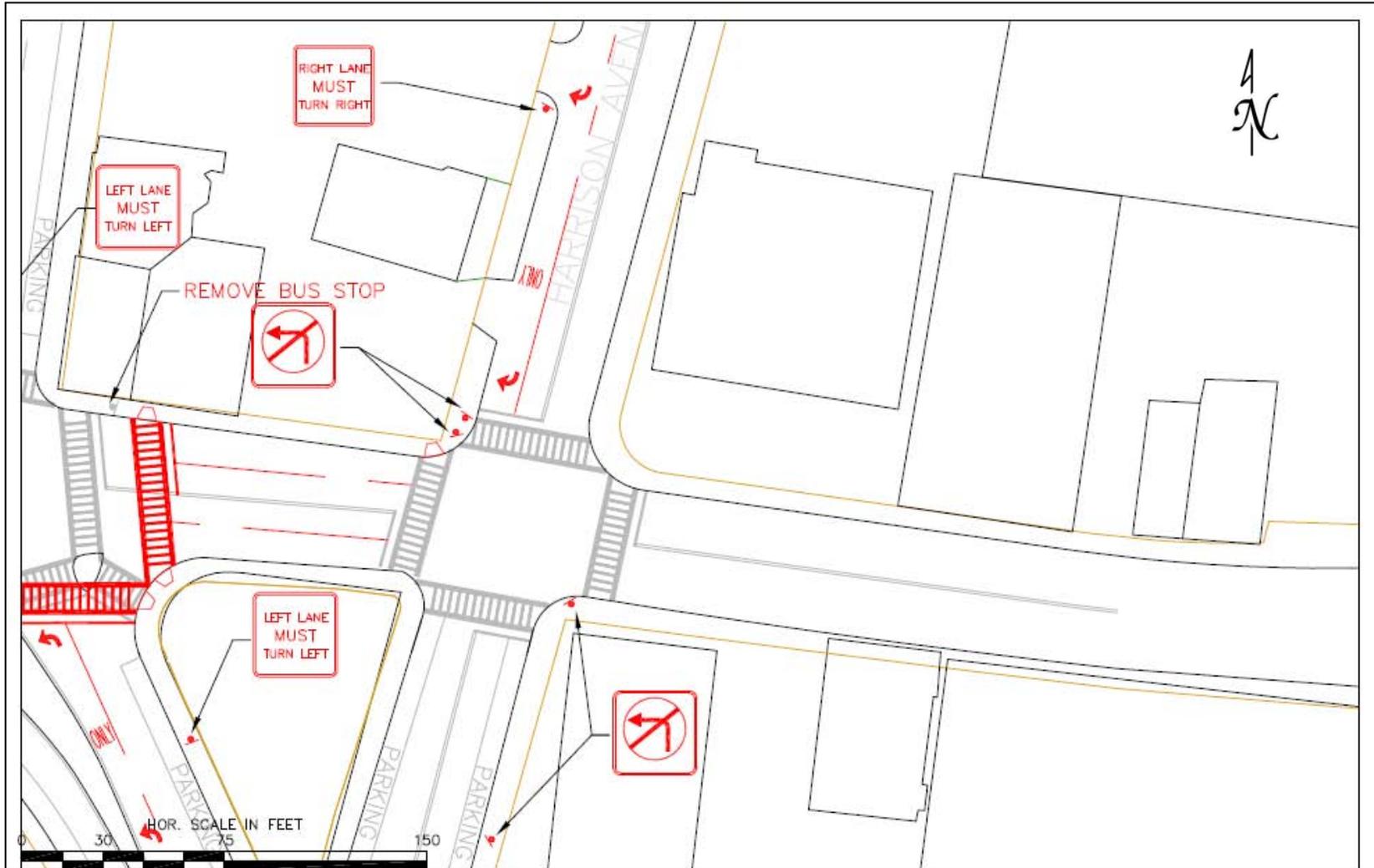


Figure 12: Dudley Street at Harrison Avenue

Vehicular and Pedestrian Circulation – Short Term

Recommendations (continued):

Warren St. at Harrison Ave. (Figure 13)

- Introduce stop sign to the Warren St. northbound approach. While not expected to improve the overall intersection performance, this would give right-of-way to the Harrison St. southbound movement and will eliminate backups towards Dudley St.
- Provide directional signage on the Warren St. northbound approach directing motorists continuing along Warren St. to stay in the left lane and traffic destined towards Harrison Ave. to use the right lane.
- Provide accessible path through the median on Warren St. and install accessible ramps.
- Maintain pavement markings.



Warren St. at Washington St. (Figure 14)

- Provide crosswalks and accessible ramps on all legs of the intersection.
- Provide stop lines for northbound Warren St. and southbound Washington St. traffic approaching crosswalks.
- Restrict parking within 20 feet of crosswalks to improve site distance.
- Maintain pavement markings.



Vehicular and Pedestrian Circulation – Short Term

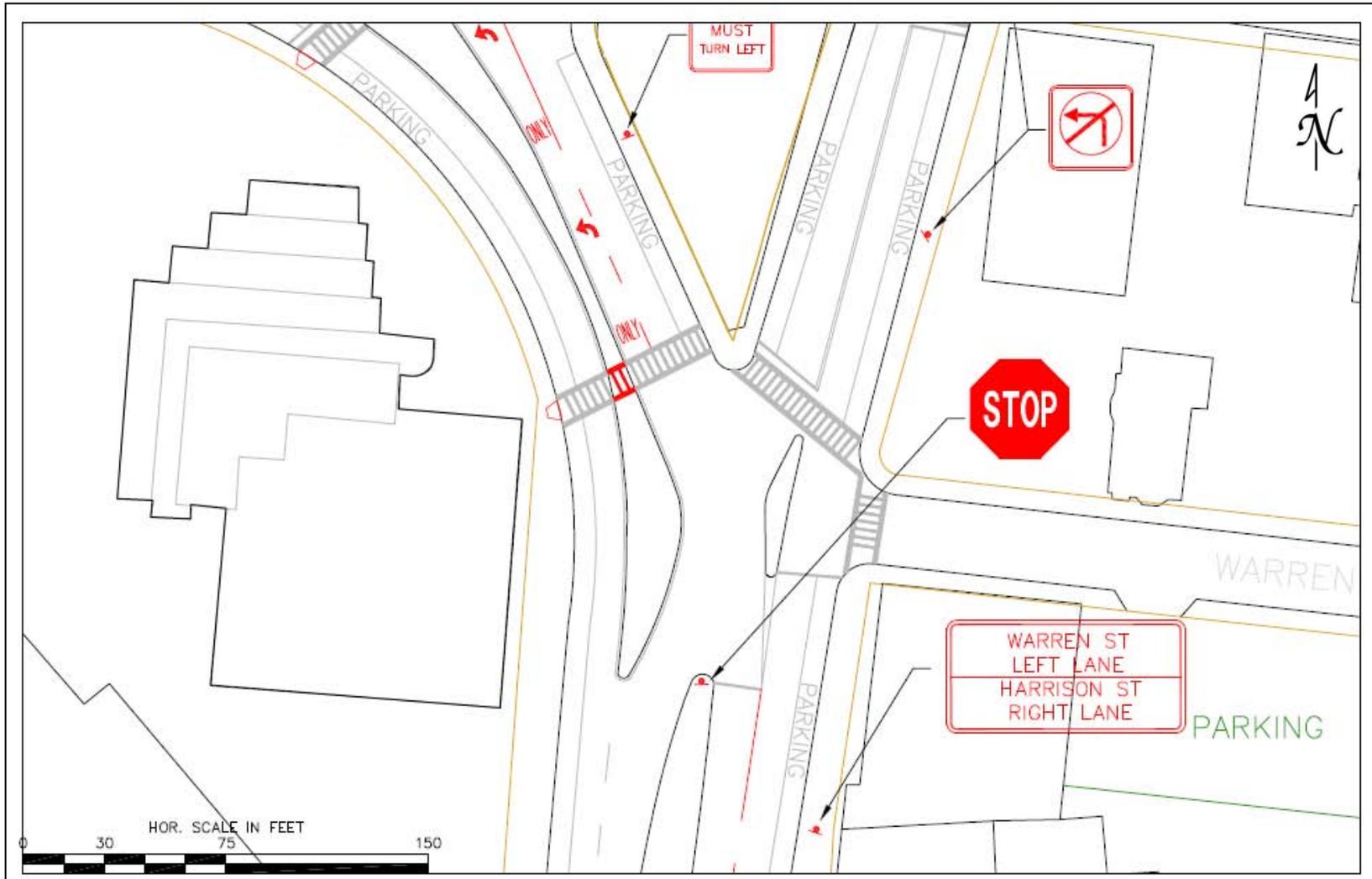


Figure 13: Warren Street at Harrison Avenue

Vehicular and Pedestrian Circulation – Short Term

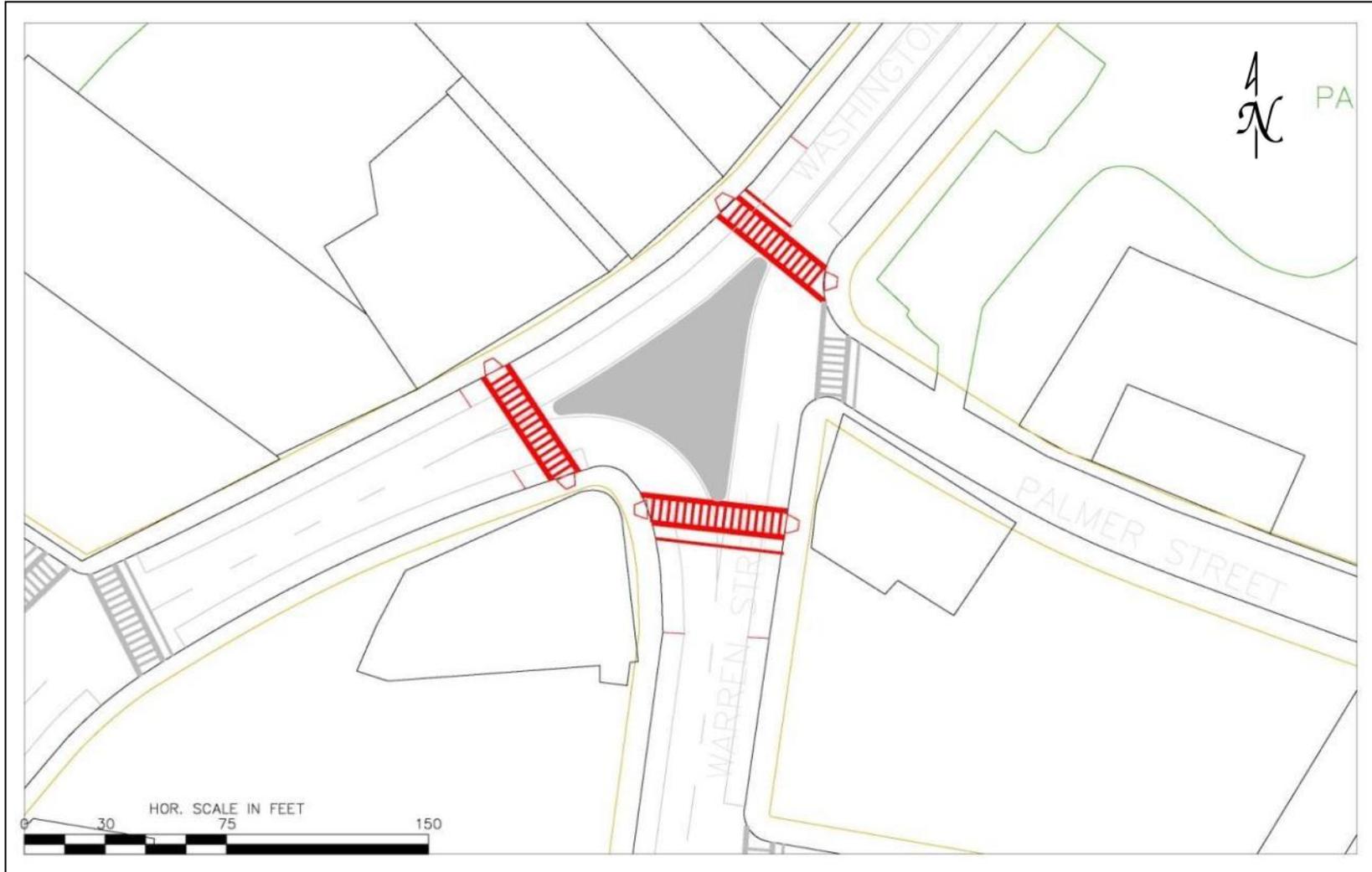


Figure 14: Warren Street at Washington Street

Vehicular and Pedestrian Circulation – Short Term

Recommendations (continued):

Shawmut Ave. and Harrison Ave. Corridors (Figure 15)

- Provide lane and centerline markings.
- Provide crosswalks at all intersections.
- Maintain pavement markings.

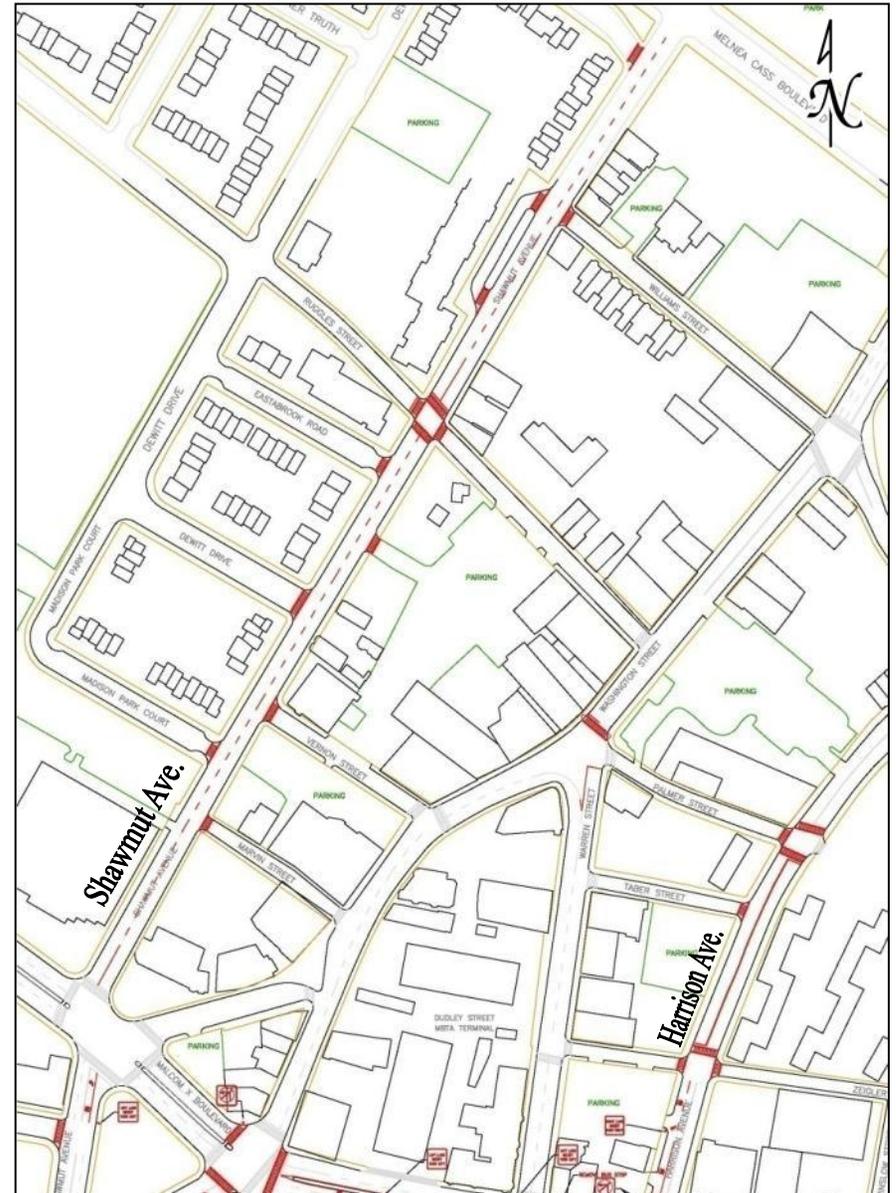


Figure 15: Shawmut Avenue & Harrison Avenue Corridors

Vehicular and Pedestrian Circulation – Short Term

Recommendations (continued):

The effectiveness of traffic operation is measured in terms of Level of Service (LOS). Levels of Service vary from LOS A (best) to LOS F (worst). LOS C is considered industry standard in unconstrained areas; however, in urban areas, where right-of-way is at a premium, achieving LOS C may not be practical. Many jurisdictions have adopted LOS D as a standard and sometimes even LOS E is viewed as acceptable.

The Highway Capacity Manual published by the Transportation Research Board defines the intersection LOS as a function of average vehicle control delay. The criteria for determining LOS are summarized in Table 4.

Table 4: Level of Service Criteria		
LOS	Average Delay (sec.)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10	≤ 10
B	11 - 20	10 - 15
C	21 - 35	16 - 25
D	36 - 55	26 - 35
E	56 - 80	36 - 50
F	> 80	> 50

The Levels of Service at major intersections within the Dudley Square Study Area are illustrated in Figure 16. These Levels of Service reflect the traffic signal upgrades recently implemented by the BTD as well as the short term recommendations described above.

As is evident from this illustration, most intersections within the Study Area will experience adequate overall LOS. It should be noted that these levels of service are based on average intersection delay during the busiest peak hour at that particular location. Individual approaches may operate at a higher or lower LOS.

The intersection of Warren Street and Harrison Avenue will continue to operate at LOS F. However, switching the operational right-of-way from northbound Warren Street to southbound Harrison Avenue will eliminate traffic backing up towards Dudley Street, which should improve the overall Dudley Street operation. Further operational improvements to this intersection are not possible without substantial reconfiguration, which is not practical in the near term. Such improvements are discussed further in the long term improvement section.

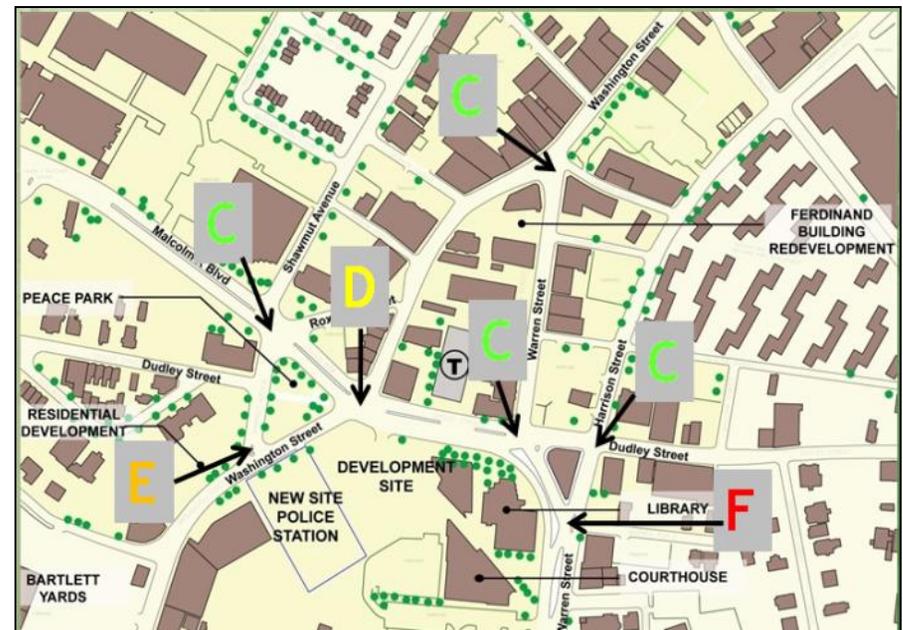


Figure 16: Intersection Levels of Service – Short Term

Vehicular and Pedestrian Circulation – Long Term

Issues:

The improvements described in the previous section will provide a relief to traffic in the Dudley Square area in the near term. However, these modifications will not adequately support future development in the area; neither will they provide an opportunity to revitalize Dudley Square and develop a cohesive environment that will enhance the overall character of the area. More drastic measures will be needed to accomplish those goals.

Findings:

The addition of future development as well as background growth in traffic associated with broader regional travel patterns will increase traffic volumes in the Dudley Square area. In order to understand the implications of this growth over the 5-year horizon, traffic volumes were projected assuming a 2% yearly growth in background traffic; 200,000 square feet of new office space; and 150,000 square feet of additional retail development. The resultant levels of service are illustrated in Figure 17. Similar to the previous discussion, these are average intersection levels of service with individual approach performances varying. It is assumed that the short term improvements are implemented.

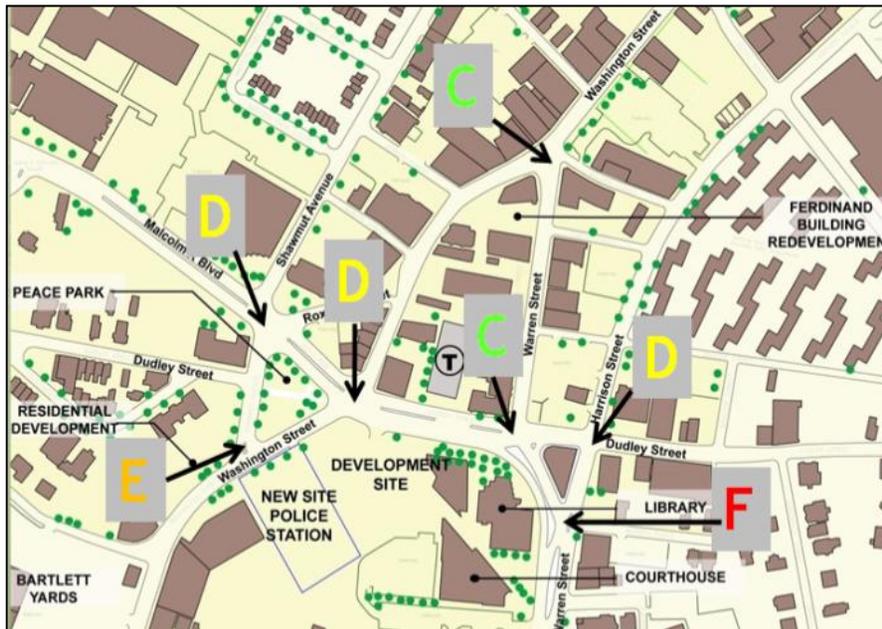


Figure 17: Intersection Levels of Service – 5-year Horizon

Major deficiencies are listed below:

- The main vehicular conflicts exist between east-west and north-south movements.
- The intersection of Warren Street and Harrison Avenue remains one of the main causes of vehicular congestion.
- The short block along Dudley Street between Warren Street and Harrison Avenue is insufficient for storing vehicular queues.
- Pedestrian crossing distances are long, resulting in an unfriendly pedestrian environment and requiring a significant portion of traffic signal cycle be allocated to pedestrians, thus putting an additional strain on vehicular operation.
- Angle parking on Dudley Street in the vicinity of the Police Station contributes to congestion and poses safety concerns with vehicles backing up into traffic. Moreover, these spaces are angled in the opposite direction from the flow of traffic, which further complicates the backing up maneuver.
- Parking on Dudley Street is not clearly delineated.
- A significant amount of pavement allocated to angle parking, Dudley Street median, and channelization contributes to an aesthetically unappealing environment in front of the Library.
- There are no provisions for bicyclists within Dudley Square.
- Streetscape elements are either lacking or inconsistent.



Vehicular and Pedestrian Circulation – Long Term

Recommendations:

In order to eliminate major vehicular conflicts, several alterations to the existing travel patterns are proposed. The first modification involves rerouting northbound Warren Street traffic as shown in Figure 18. As described previously, the conflict between the northbound Warren Street and southbound Harrison Avenue traffic is one of the main causes of congestion in the area. By prohibiting the northbound left turn at this intersection (projected at 662 vehicles per hour) and forcing all Warren Street northbound traffic to continue further up Harrison Avenue, this conflict will be eliminated. This would allow converting the current two-way block of Warren Street between Harrison Avenue and Dudley Street to one-way, thus essentially eliminating the intersection with Harrison Avenue. A significant portion of Warren Street northbound traffic destined towards downtown Boston (estimated at 310 vehicles per hour) would continue straight on Harrison Avenue. Local vehicles on Warren Street would be able to access their destination via a left turn onto Dudley Street and a right turn onto Warren Street.

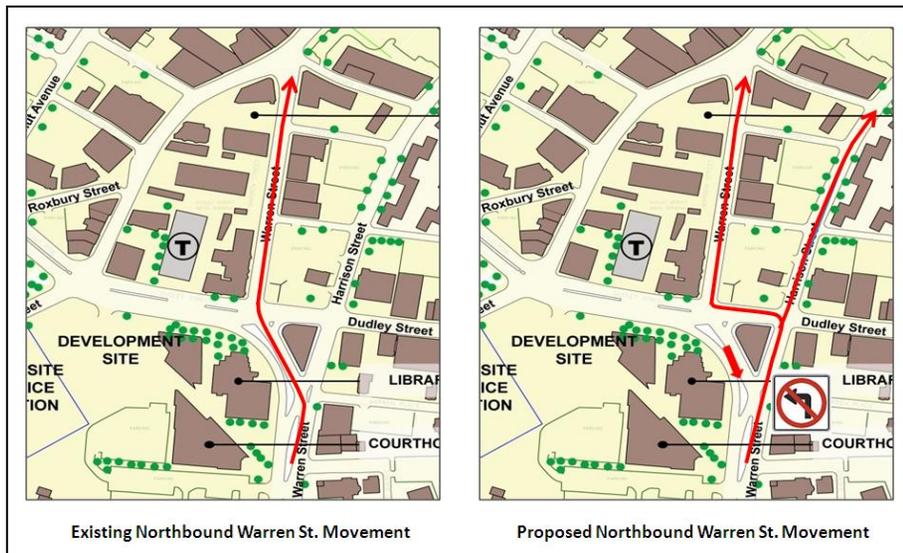


Figure 18: Northbound Warren Street Travel Pattern

The second travel path alteration involves the movement from westbound Dudley Street to northbound Harrison Avenue (forecasted at 221 vehicles per hour), shown in Figure 19. Currently these vehicles queue up in a short block between Warren Street and Harrison Avenue and compete for traffic signal green time with the northbound Warren Street and Harrison Avenue movements. The proposed modification would prohibit the left turn from Dudley Street onto Harrison Avenue and reroute this traffic to Warren Street. These vehicles would be able to continue to their destination via Washington Street or reconnect with Harrison Avenue at Eustis Street or Melnea Cass Boulevard.

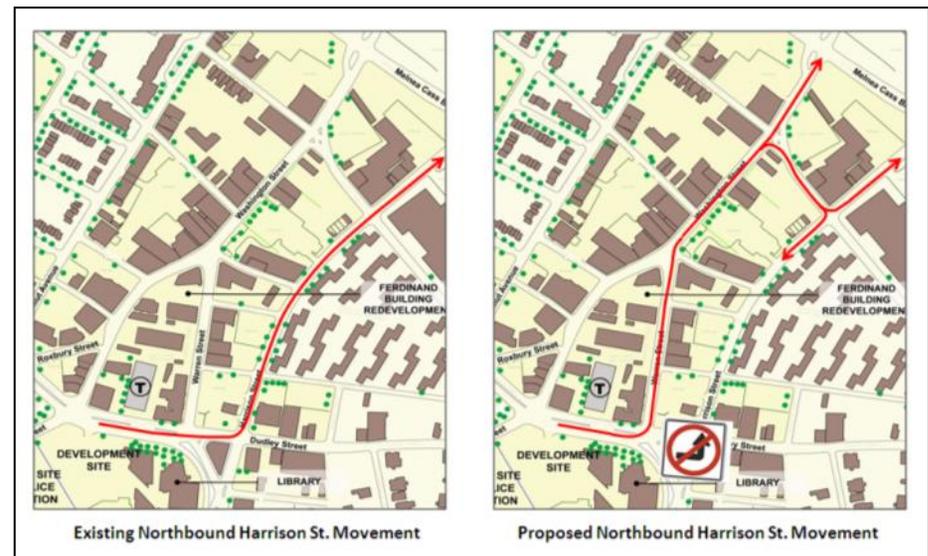


Figure 19: Dudley Street to Harrison Avenue Travel Pattern

Vehicular and Pedestrian Circulation – Long Term

Recommendations (continued):

These modifications result in elimination of the overlapping eastbound – northbound movements. Essentially traffic from the west heading north towards downtown Boston will use Warren Street while vehicles coming from the south on Warren Street with the similar destination will stay on Harrison Avenue.

The comparison of the existing travel patterns to the proposed modifications is illustrated in Figure 20. Traffic operation in the three major conflict areas would be significantly relieved due to the separation of these movements.



Existing Travel Patterns - Conflict Areas



Proposed Travel Patterns – Conflicts Removed

Figure 20: Major Areas of Vehicular Conflict

Vehicular and Pedestrian Circulation – Long Term

Recommendations (continued):

These travel pattern revisions provide an opportunity to drastically change the character of Dudley Square. The specific recommendations for each intersection are described in the following pages. The levels of service resulting from implementing these modifications are illustrated below in Figure 21.

The proposed roadway system associated with the travel pattern modifications is shown in Figure 22. Descriptions of specific improvements follow along with enlargements of individual intersection areas shown in Figures 23 through 28. Since the most significant changes occur at the Warren Street/Harrison Avenue intersection, the description of work starts at that location and progresses from east to west, or in the opposite order from the short term improvement descriptions.

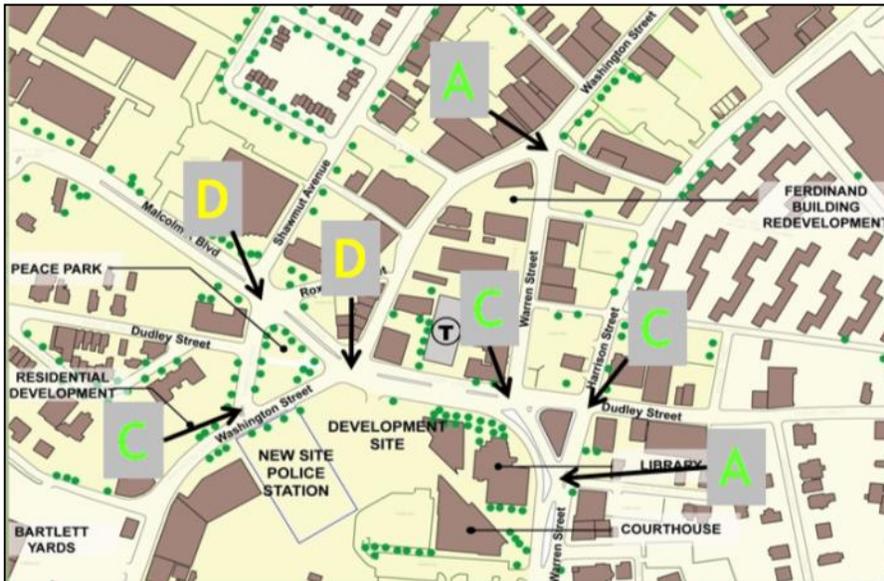


Figure 21: Intersection Levels of Service – Long Term

Besides improving vehicular operation, reconfiguration of traffic movements allows reducing the overall pavement widths, shortening pedestrian crossing distances, widening sidewalks, adding bicycle accommodations, and introducing urban design features consistent with the goals of the project.

Vehicular and Pedestrian Circulation – Long Term

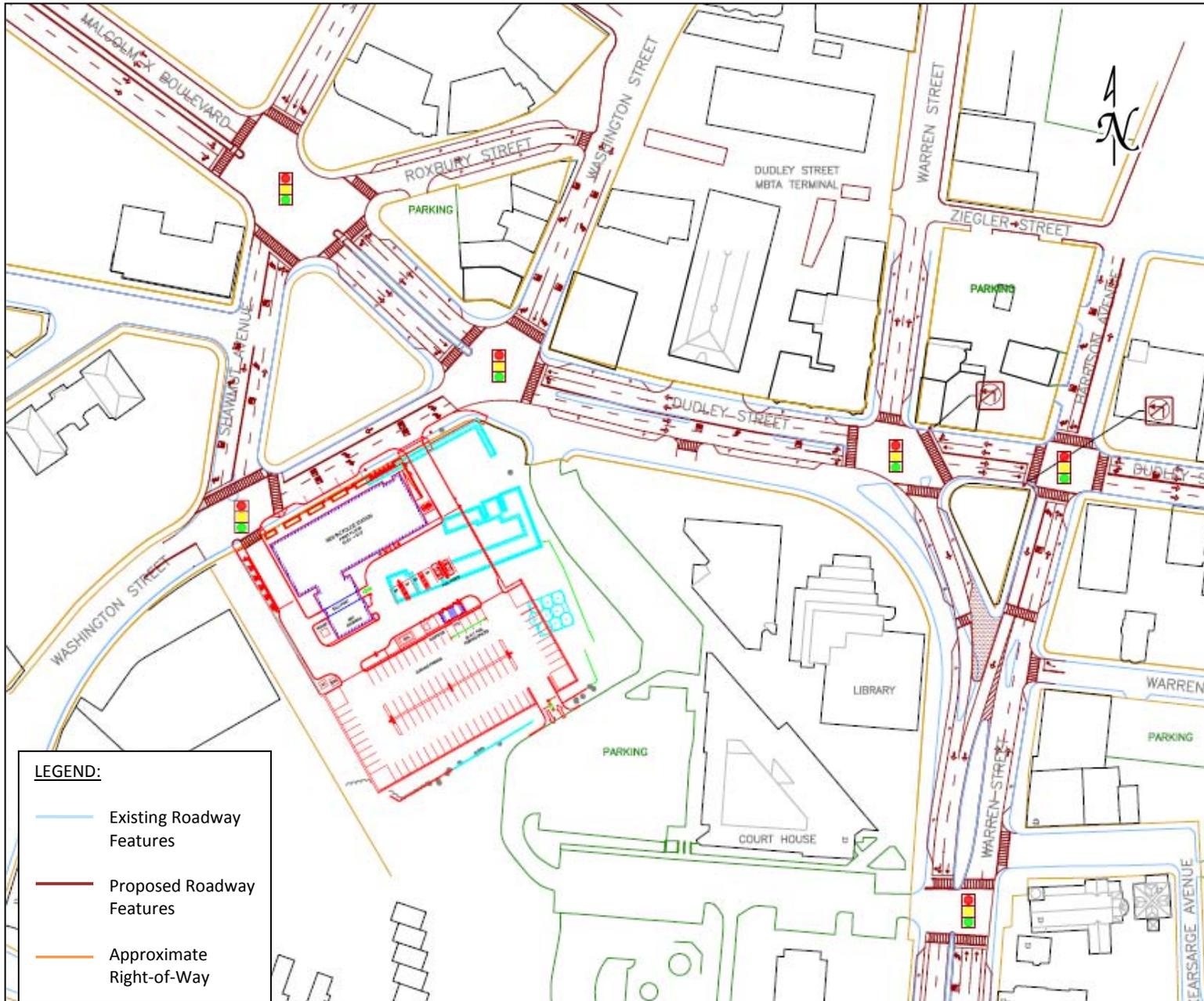


Figure 22: Proposed Roadway Modifications

Vehicular and Pedestrian Circulation – Long Term

Recommendations (continued):

Warren St. at Harrison Ave. (Figure 23)

- Prohibit northbound left turn on Warren St.
- Provide two northbound lanes continuing from Warren St. onto Harrison Ave.
- Maintain one southbound lane on Harrison Avenue and a single southbound lane on Warren St. from Dudley St. to form two lanes continuing south on Warren St.
- Extend island separating Warren St. and Harrison Ave. Consider providing a landscaped island designed according to sustainable principles, to create a center and focal point for the square. Sustainability features should include hearty and local plantings, paving and drainage designs which allow water to percolate into the soil. An island would also reduce the visual impact of a large area of asphalt in the intersection, and encourage cars to move slowly through.
- Provide parallel parking on both sides of Warren St.
- Maintain pedestrian crossings at Warren St. and Harrison Ave. north of Warren Place. Crossing lengths are significantly reduced from existing conditions.
- For bicycle provisions, please refer to the Bicycle Accommodation section.



Dudley St. at Harrison Ave. and Warren St. (Figure 24)

- Prohibit eastbound left turn from Dudley Street onto Harrison Avenue. Maintain two through eastbound lanes.
- Restripe Dudley St. east of Harrison Avenue to provide an exclusive left turn lane and a general purpose lane on the westbound approach and two eastbound lanes leaving the intersection.
- Provide two northbound lanes Harrison Ave. with an exclusive left turn lane and a general purpose lane.
- Restripe southbound Harrison Ave. approach to provide an exclusive right turn lane and a general purpose lane.
- Prohibit westbound left turn from Dudley Street onto Warren Street (not allowed currently). Maintain two through westbound lanes.
- Eliminate raised median on Dudley Street west of Warren Street.
- Narrowing Dudley Street significantly reduces pedestrian crossing distances and provides ample space in front of the Library to introduce urban design enhancement features.
- Eliminate Warren Street northbound approach and provide a single southbound lane. Narrowing this roadway significantly reduces pedestrian crossing distances and provides ample space in front of the Library to introduce urban design enhancement features.
- Provide parallel parking on both sides of Dudley Street west of Warren Street and on Warren Street.
- For bicycle provisions, please refer to the Bicycle Accommodation section.



Vehicular and Pedestrian Circulation – Long Term



Figure 23: Warren Street at Harrison Avenue

Vehicular and Pedestrian Circulation – Long Term

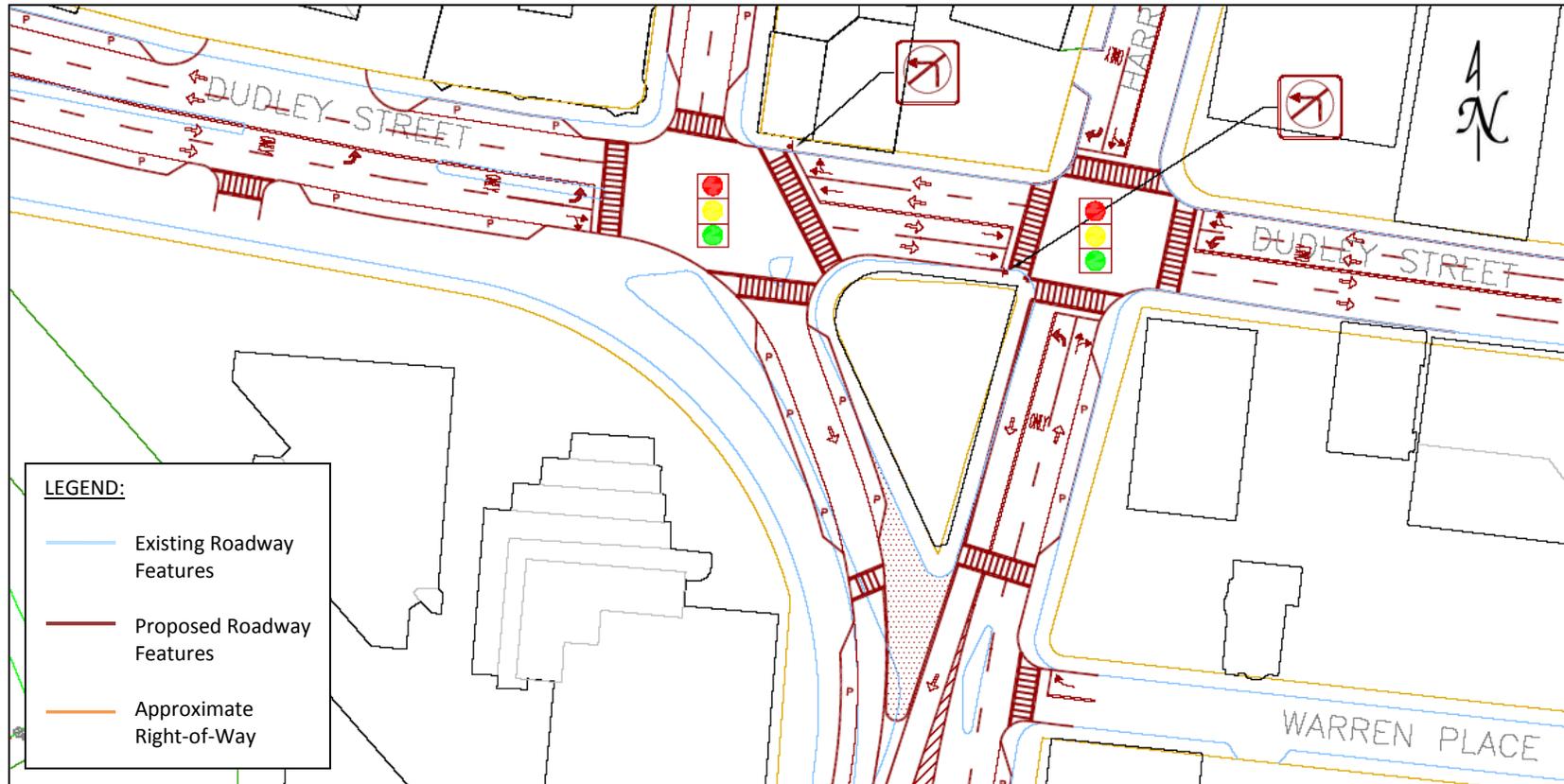


Figure 24: Dudley Street at Harrison Avenue and Warren Street

Vehicular and Pedestrian Circulation – Long Term

Recommendations (continued):

Dudley St. between Warren St. and Washington St. (Figure 25)

- Eliminate raised median.
- Maintain four-lane cross section with two eastbound and two westbound lanes.
- Provide an exclusive eastbound left turn lane.
- Eliminate angle parking and replace with parallel parking on both sides.
- Provide driveway on the eastbound (south) side of Dudley Street for future development. Driveway will be right in right out only. Provide crosswalk across the driveway.
- Narrowing Dudley Street significantly reduces pedestrian crossing distances and provides ample space in front of the Library and future development parcel to introduce urban design enhancement features.
- For bicycle provisions, please refer to the Bicycle Accommodation section.



Dudley St. at Washington St. and Shawmut Ave. (Figure 26)

- Similar to short term recommendations prohibit northbound left turn from Washington Street onto Dudley Street. Provide two right turn lanes operating concurrently (overlapping) with the Washington Street westbound movement.
- Provide two general purpose lanes on eastbound and westbound Dudley Street and provide parallel parking.
- Provide two general purpose eastbound lanes on Malcolm X Boulevard approach to Shawmut Avenue.
- Restripe southbound Washington Street approach to Dudley Street to provide three lanes: an exclusive right turn lane, a general purpose lane, and an exclusive left turn lane.
- Restripe southbound Shawmut Avenue approach to Dudley Street to provide three lanes: an exclusive left turn lane and two general purpose lanes.
- Provide two northbound approach lanes on Shawmut Avenue: an exclusive left turn lane and a general purpose lane.
- For bicycle provisions, please refer to the Bicycle Accommodation section.



Vehicular and Pedestrian Circulation – Long Term



Figure 25: Dudley Street at between Warren Street and Washington Street

Vehicular and Pedestrian Circulation – Long Term

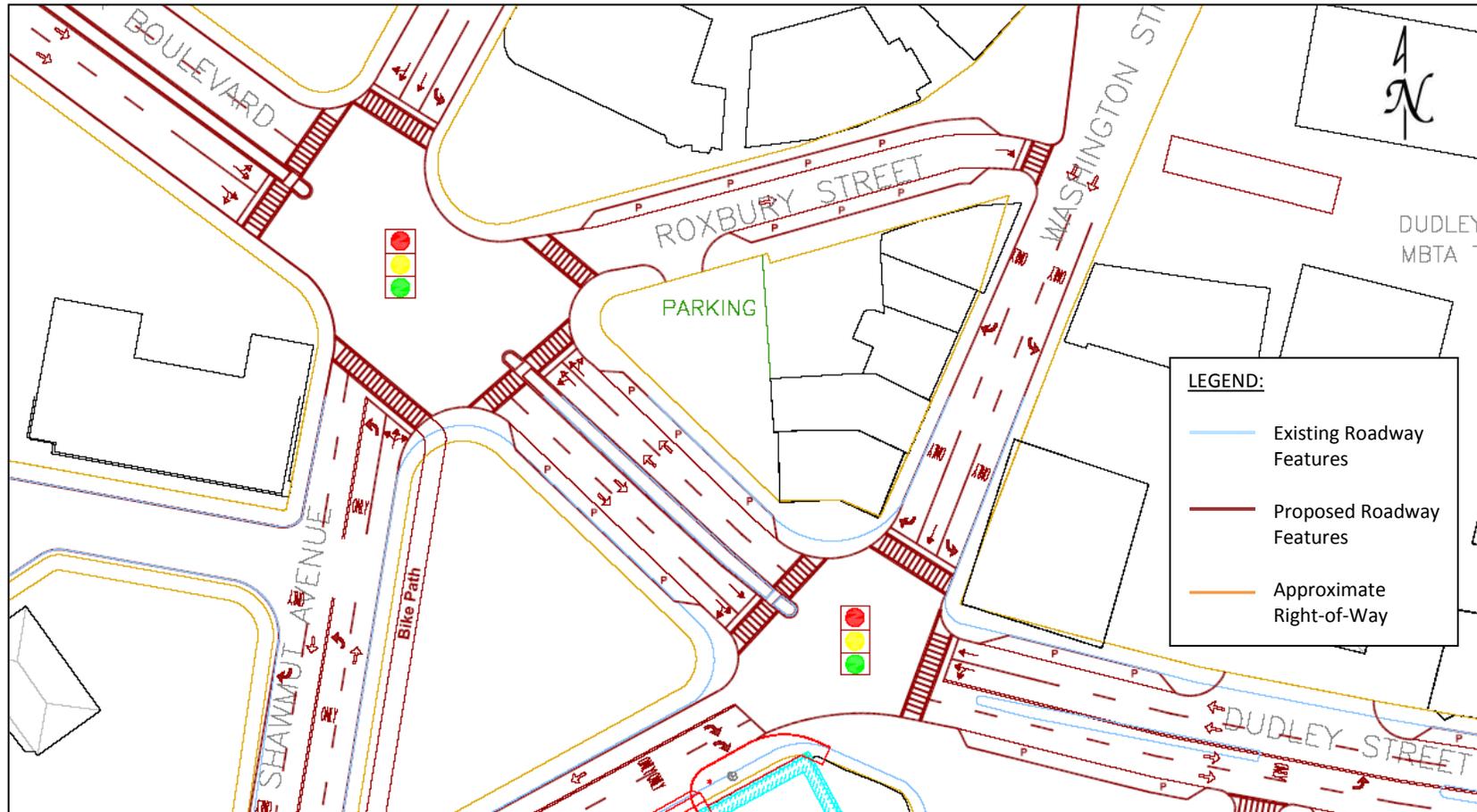


Figure 26: Dudley Street at Washington Street and Shawmut Avenue

Vehicular and Pedestrian Circulation – Long Term

Recommendations (continued):

Washington St. at Shawmut Ave. (Figure 27)

- Install traffic signals with emergency vehicle preemption.
- Similar to short term recommendations, provide signage directing northbound Washington Street motorists destined for Malcolm X Boulevard to turn left onto Shawmut Avenue.



Washington St. at Warren St. (Figure 28)

- Reduce the length of pedestrian crossings by introducing curb extensions, and add/improve crosswalks. The curb extensions may offer space for benches and/or trees as well. Stripe the crosswalks in a safety, “ladder” design.
- Introduce a green island designed according to sustainable principles, to create a center and focal point for the square. Sustainability features should include hearty and local plantings, paving and drainage designs which allow water to percolate into the soil. An island would also reduce the visual impact of a large area of asphalt in the intersection, and encourage cars to move slowly through.
- Apply a pattern or color (Duratherm or Streetprint) in the middle of the intersection, between the crosswalks, to enhance the aesthetics of the “square”.



Vehicular and Pedestrian Circulation – Long Term

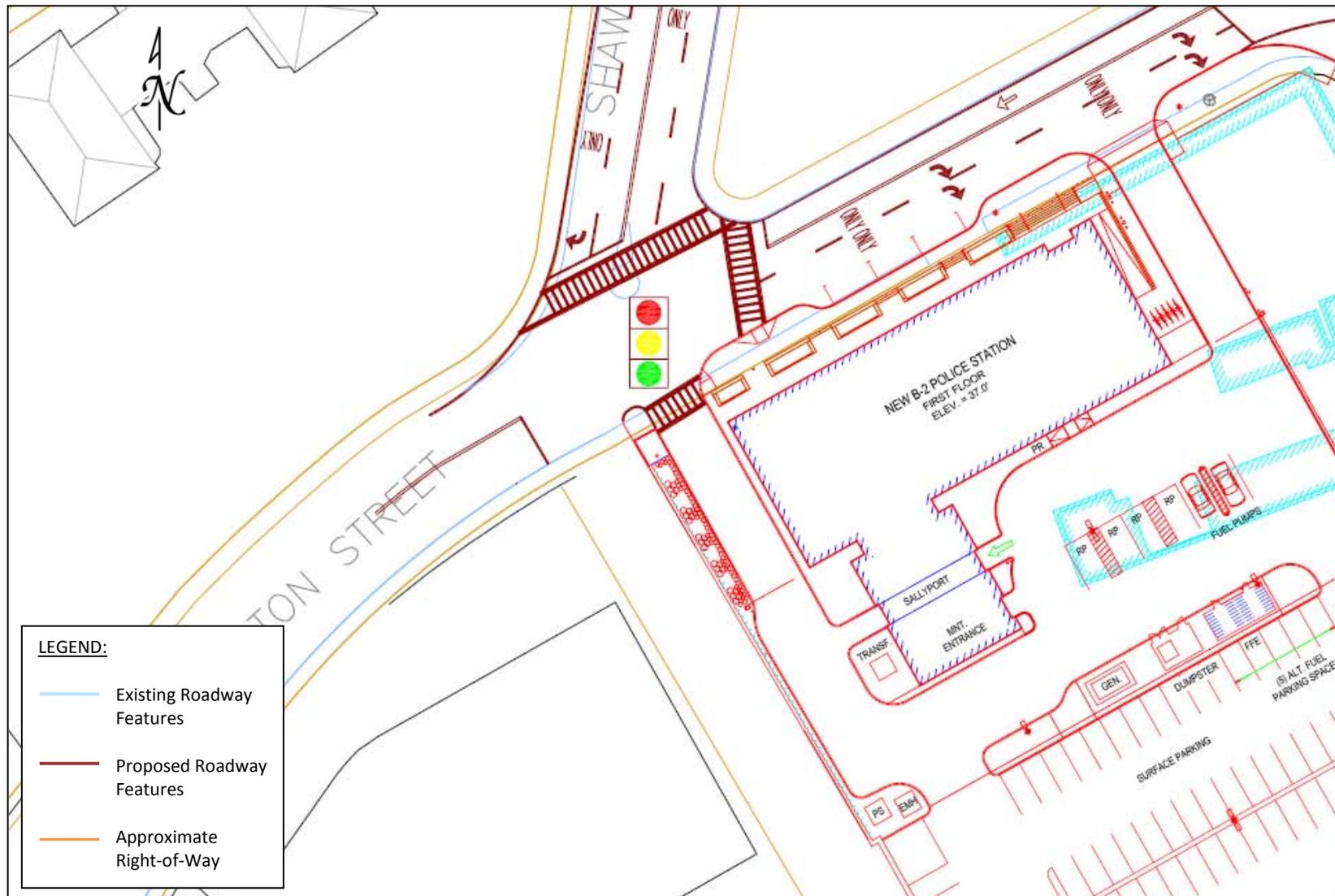


Figure 27: Washington Street at Shawmut Avenue

Vehicular and Pedestrian Circulation – Long Term



Figure 28: Washington Street at Warren Street

Vehicular Circulation – Future Considerations

During the development of long term improvement concepts, consideration was given to providing a new roadway connecting Warren Street to Washington Street behind the Court House. Such a roadway, referred to here as Cliff Road, would have multiple benefits; however, it would also have several significant outstanding issues before it could be considered anything more than a “vision”. This concept is illustrated in Figure 29.

Cliff Road would be a two-lane roadway with sidewalks which would begin at the signalized intersection of Warren Street with the current driveway to the Boys and Girls Club and the Court House parking area. It would proceed west towards Washington Street where it would terminate at a signalized intersection opposite Shawmut Avenue, just south of the new Police Station driveway.

Advantages of Cliff Road are:

- Provision of additional relief to the Dudley Street corridor. This roadway would be an attractive alternative for vehicles originating south of Dudley Square traveling north on Warren Street destined for Malcolm X Boulevard. The same would be true for the reverse movement from Malcolm X Boulevard to southbound Warren Street.
- Cliff Road would provide direct access to the future parking garage next to the new Police Station, as well vehicular and pedestrian access to the future mixed-use development parcel to be located south of Dudley Street between Washington and Warren streets.
- Cliff Road would also provide an additional access to the new Police Station.

Challenges associated with this concept include:

- Resolution of right-of-way issues. A portion of the right-of-way required for this roadway approaching Washington Street goes through private property.
- Access to the abutting business (Hurley Wire) and maintenance of its operations.
- Interface with the new Police Station and potential impact to its parking configuration.

- Extreme topography. Due to steep grades and the presence of ledge, the most practical and economical roadway alignment would result in a fairly sharp reverse curve.
- Potential impact to the future parking garage configuration. In order to avoid the steep hill and ledge, the roadway alignment would overlap with the footprint of the future structure, thus possibly increasing cost of the parking garage.

These are significant outstanding issues, which clearly require coordination with all of the involved parties. However, this roadway would provide considerable benefits that would warrant further consideration of the resolution of these concerns.



Vehicular Circulation – Future Considerations

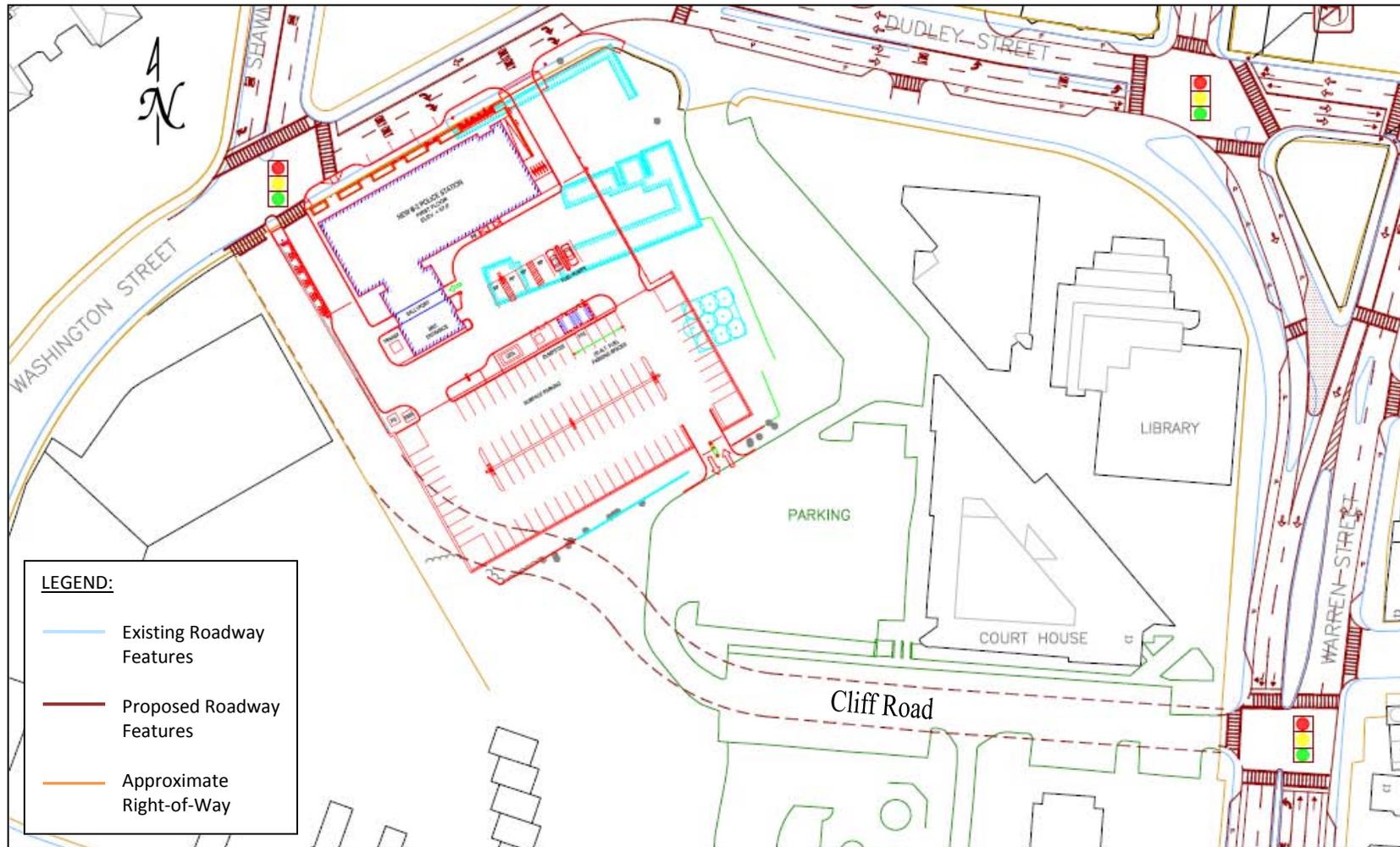


Figure 29: Potential Future Cliff Road Concept

Bicycle Accommodations

Issues:

Currently in Dudley Square there are no special bicycle accommodations. There is a high potential for attracting student cyclists, in addition to adult commuter bicyclists, because of the public library, the Boys and Girls Club adjacent to Warren Street, the Madison Park Technical Vocational High School, and the O'Bryant School of Math & Science along Malcolm X Boulevard. To capture the existing teenage cyclist population, and to encourage others, a safe bicycle travelway should be incorporated into the plan.

Findings:

Along Dudley Street, between Washington Street and Warren Street, there is adequate room in the ROW for bicycle lanes. Similarly, along Warren Street between Dudley Street and St. James Street there is room for bicycle lanes; the exception is a portion of Harrison Avenue between Warren Place and Dudley Street, where the roadway narrows. The block of Dudley Street west of Washington Street, bordering Judge Gourdin or "Peace" Park, and extending to Shawmut Avenue is also a difficult area in which to accommodate bicycle lanes. In the recommendations described below, bicycle lanes are accommodated in these tight areas by removing a small amount of on-street parking spaces (ten to fifteen spaces). Since the long term plans include construction of additional 600 parking spaces, the ability to provide bicycle lanes outweighs this minor reduction in on-street parking.

Malcolm X Boulevard and Dudley Street east of Harrison Avenue are beyond the scope of this project. The short block of Dudley Street, between Warren and Harrison, is too narrow to accommodate bicycle lanes and represents a gap in the network.

The approach to bicycle accommodation was discussed with the City's bicycle coordinator and the consultant for the city-wide bicycle program. The proposed improvements are a result of recommendations that came out of these discussions.

Recommendations:

Five-foot bicycle lanes would be provided in both directions along Dudley Street between Shawmut Avenue and Warren Street. In the block of Dudley Street/Malcolm X Boulevard between Shawmut Avenue and Washington Street, bike lanes would be accomplished by removing (approximately five) parking spaces along the edge of the park and possibly the center median. Removing the center median alone would not provide enough space for bicycle lanes, if the parking was maintained on both sides. Both parking lanes could only be maintained by substituting either a two-foot taking along the edge of the park or a less-than-five-foot sidewalk on the north side.

Bike lanes would then continue from Washington Street to Warren Street on Dudley Street. There, the eastbound bike lane would turn south onto Warren Street and continues to St. James Street, serving the library and Boys & Girls Club.

The short block of Dudley Street between Warren and Harrison is unable to accommodate dedicated bicycle lanes and would be marked with the outside lanes as shared lanes with "sharrows". A northbound bike lane on Warren Street would be accommodated in the block between St. James Street and Warren Place; the block along Harrison Avenue between Warren Place and Dudley Street would require removal of approximately six parking spaces on the east side of the street. The proposed bicycle accommodations are illustrated in Figure 30.

Initially, the portion of Warren Street adjacent to the library was considered for provision of a two-way bicycle facility. However, because northbound bicyclists would be going against southbound traffic (this portion of Warren Street is proposed to be a one-way roadway), this concept was dropped. Provision of a "contra-flow" bicycle lane, while possible, would be inappropriate at this location.

An option to consider in final design is a cycle track facility rather than a bike lane on Dudley Street/Malcolm X Boulevard from Washington Street to Warren Street. A bicycle track places a 5-foot bike lane next to the curb, and the parking alongside the travel lanes, with a 3-foot striped buffer separating the two. In this way, bicyclists are separated from moving traffic

Bicycle Accommodations

by parked cars. Bicycle tracks have recently been implemented in New York City with great success. Such a bicycle track may also continue southbound along Warren Street to the entrance to the Boys & Girls Club parking area, where it would transition to a five-foot bicycle lane at the intersection. Since bicycle track requires an extra 6 feet (two 3-foot buffer strips), available right-of-way width and roadway alignment would need to be carefully evaluated during the design while pursuing this concept further.



An example of a cycle track in use on the streets of New York City.

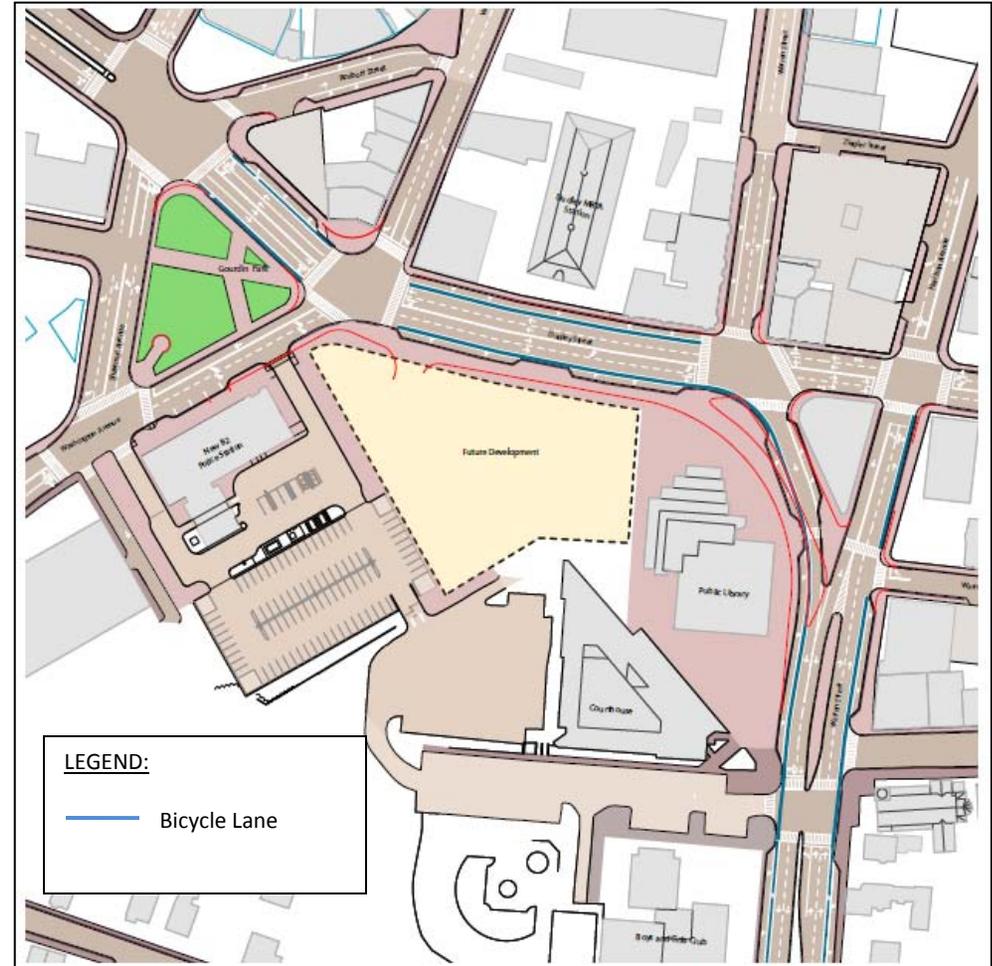


Figure 30: Proposed Bicycle Accommodations

Urban Design

Issues:

Dudley Square, at the foot of the Roxbury Highlands, is one of the heart-centers of Roxbury, a gateway to and a commercial destination within that historic Boston neighborhood. Dudley Square has a long story of evolution, beginning as the village core of Roxbury and continuing through the 20th century as an Orange Line hub and entertainment district that faced some setbacks after the urban renewal era. Recent efforts to complete the Dudley Vision are the leading edge of a new time for the Square, combined with the City of Boston's advance of a new B-4 police station in a new Dudley location plus a development proposal for the Ferdinand Building and adjacent sites at center of Dudley Square. This Dudley Square Transportation Action Plan will outline transportation improvements to support the community's vision for its future.

The structure of Dudley Square is bisected by Malcolm X Boulevard/Dudley Street, a street much wider than the rest in the neighborhood. To the north lies the commercial district and the MBTA bus hub, framed by Washington and Warren streets operating in a one-way pair with on-street parking. A mix of historic and contemporary buildings frame brick sidewalks of adequate width. Street trees are rare.

To the south is a concentration of institutional uses – Judge Gourdin or “Peace” Park, the Dudley Square branch of the Boston Public Library, the aforementioned police station, and a branch of the Boys and Girls Club. Recent demolition and brownfield remediation has led to identification of a new development parcel, planned for future commercial and mixed uses.

Dudley Street/Malcolm X Boulevard is quite wide and heavily trafficked, and because of these factors is perceived as a barrier, a challenge for pedestrians to cross, and a detraction from the quality of the environment. A key goal of this study will be to reduce the adverse impacts of this street, and create better connections from one side to the other.

Findings:

- Existing sidewalk pavement throughout the project area is generally in reasonable condition.
- Brick sidewalks installed on Warren and Washington streets in the core of Dudley Square no longer meet standards of accessible design, which call for a smooth walking surface with few joints.
- The sidewalk along the north side of Dudley/Malcolm X between Warren and Washington streets is too narrow given its heavy use.
- There are few street trees in the core of Dudley Square but there are opportunities to increase the number of street trees and those growing behind the sidewalk.
- Open spaces such as Peace Park and plazas near the Library or banks have few amenities such as furnishings, plantings, lighting or attractive paving.
- The lighting along Dudley/Malcolm X is out of date, and should be updated.
- Pedestrian street crossings are long and should be shortened wherever possible.

Recommendations:

The proposed plan would reduce the width of Malcolm X Boulevard/Dudley Street substantially between Shawmut Avenue and Warren Street. By reducing the street width, more space would be captured for pedestrians and bicycles, and also by removing medians and adding that space back into the sidewalk. Sidewalks are proposed to be widened, and bicycle lanes or tracks are also feasible along much of the Malcolm X Boulevard/Dudley Street/Warren Street corridor.

Within the commercial district north of Malcolm X Boulevard/Dudley Street, there are limited opportunities to recapture space from the street into the sidewalk. An exception is at Washington and Warren streets, where curb extensions, an island and pavement treatments may contribute to creating a strong center while facilitating pedestrian crossings. Please see discussion below.

Urban Design

Recommendations (continued):

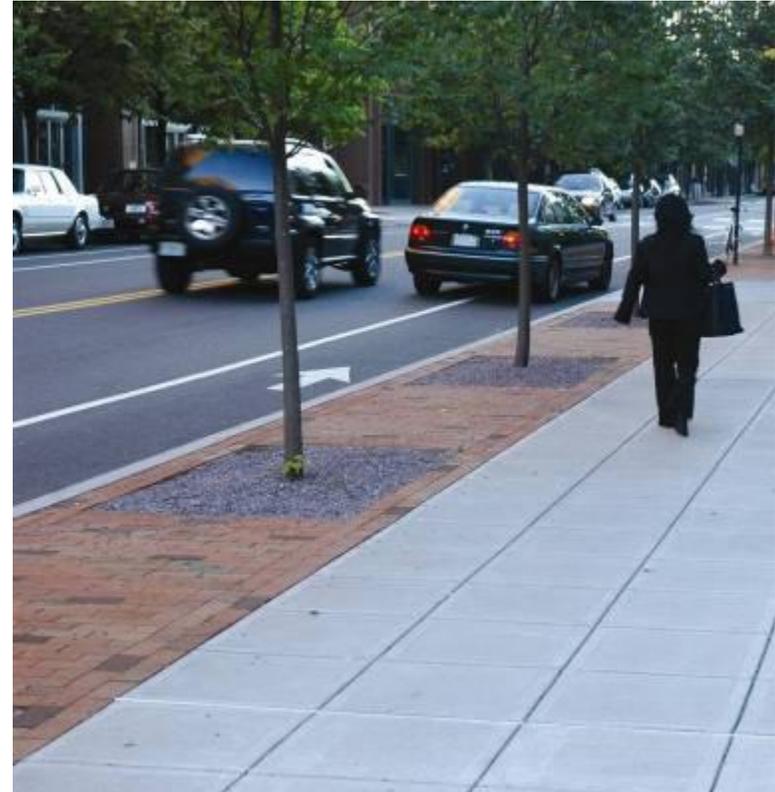
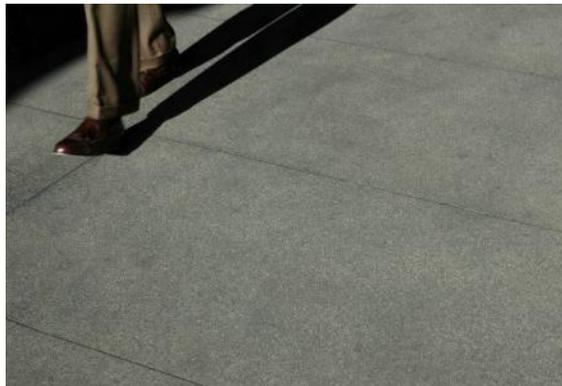
With more space on those sidewalks, there would be additional opportunities for new street trees, new paving and lights, and a coordinated look to sidewalk spaces across the district. This document includes streetscape guidelines to direct the design and construction of sidewalks with any City or private project undertaken, to ensure coordination and quality across all of Dudley Square.

Streetscape Guidelines

Paving

New standards in accessibility and Universal Design dictate that walkways and travelways along sidewalks be concrete for a smooth, durable surface. In order to maintain the presence of color, texture and pattern in the sidewalk environment, pavers are often used in the “accent strip” near the curb, a zone within which the furnishings and trees are installed to keep them out of the travelway. Brick is typically used in Boston’s accent strips, reminiscent of the brick sidewalks of yesterday and the brick buildings that remain.

Concrete may be specified to have a smoother finish, a dappled coloration similar to granite resulting from an exposed fine aggregate, and to have smaller joints, cut after curing with a saw rather than formed or tooled. These options are recommended.



Street Trees/Tree Canopy

Trees are important to a city’s environment, offering shade, improved air quality, and natural beauty. Trees both in and behind the sidewalk contribute to these environmental improvements. Trees in the sidewalk are the responsibility of the City and its Parks and Recreation Department. Trees behind the sidewalk are the responsibility of the property owner.

Urban Design

Recommendations (continued):

Street trees are fairly sparse throughout the project area, especially the commercial core along Washington and Warren streets. There are two contributing factors to this case; one, the sidewalks are typically fairly narrow, and two, often trees are not preferred in a retail districts due to the strong desire for retail visibility and less success in tree survival.

Figure 31 – Long Term Plan shows new street trees proposed as part of this plan, with a high concentration along the south edge of Dudley Street where there will be ample space to ensure their vitality. These trees should be planted within a continuous trench which may absorb rainwater run-off through permeable pavers. The paver strip would function as an accent strip to improve the aesthetics of the streetscape while also organizing trees and furnishings within a specific zone to minimize clutter. Trees are being added to Gourdin Park, as part of a separate project, and small plazas, both existing and created by this Plan (such as at Harrison Avenue and Warren St.), are opportunities for additional trees to be planted.

Street trees must be planted:

- In sidewalks with at least 7 foot-6 inches of width, excluding the curb; the larger the space available, the more likely the tree will survive.
- In tree pits a minimum of 3 feet by 8 feet
- At least 15 feet away from the nearest street light, to ensure adequate light reaches the sidewalk for pedestrians.



Figure 31: Streetscape Improvements

Urban Design

Lighting

Existing “shoebox” or “cobra” light fixtures along Dudley Street/Malcolm X Boulevard and Warren Street are out-of-date both in terms of aesthetics and function. Washington and Warren streets north of Dudley Street/Malcolm X Boulevard were updated with Washington or “acorn” fixtures in recent years, in keeping with many of the neighborhood commercial districts throughout the city. As part of this plan, “pendant” lights are recommended for Dudley Street/Malcolm X Boulevard and Warren Street, and Washington Street south of Dudley; Washington (or “acorn”) lights are recommended to be continued on Washington and Warren streets between Melnea Cass Boulevard and Dudley Street.

Pedestrian-scaled full-cut-off lights are recommended for plazas and park spaces.



Furnishings

Standard street furnishings work best as an interrelated family of pieces. To relate to the black-enameled metal finish of street light standards, a similar finish is recommended for other furnishings such as benches and bike racks.



Urban Design

Recommendations (continued):

Benches

- Black-enameled steel benches



Bike Racks

- The City's standard rack is recommended for installation throughout the sidewalks of Dudley Square, regularly spaced at curbside.

Bollards

- Bollards may be an option where additional pedestrian protection or separation is desired. Lighted bollards are particularly effective at creating an attractive pedestrian space at night. Those with a black-enameled finish would best match other selected furnishings in the palette.

Trash receptacles

- The City of Boston is using a new, standard trash receptacle – a solar-powered trash compactor whose brand name is “Big Belly”. Its covered enclosure is sleek and clean, and these elements should be spaced at regular intervals along all the sidewalks of Dudley Square.



Urban Design

Recommendations (continued):

Crosswalks

Raised pedestrian crossings along Washington and Warren streets crossing the small intersecting side streets would slow turning vehicles and enhance the ease of crossing for walkers, and are recommended to promote the pedestrian environment within the Dudley commercial area. “Duratherm” patterned crosswalks have been used throughout Boston in recent years and have proved durable and attractive to pedestrians. There is opportunity to create a custom “Duratherm” pattern for Dudley Square, most appropriately in conjunction with a local artist. Duratherm also has applications in the center of intersections, to use the patterning to create the sense of a public space. The intersection of Washington and Warren streets would benefit from such a treatment.



Art

There are public art pieces sprinkled around Dudley Square that communicate the strength of the community and its culture. More public art may be integrated throughout the streetscapes as enhancements are undertaken. Public artists should be included as part of design teams, to play a role in not only executing public art but also in identifying how art may be incorporated seamlessly into the design.

Other opportunities require less integration and coordination but are equally as successful. Artists may be commissioned to design furnishings such as bike racks, signboards or benches in an expressive way, or sculptures for plazas.



Urban Design

Recommendations (continued):

Buffers for parking lots or other private property

Where parking lots abut sidewalks and there is no building behind the sidewalk, the street space may be poorly defined. A landscaped edge offers a successful separation between the sidewalk and the parking lot, an attractive edge which enhances both. Trees and shrubs, fences, site walls, berms, and benches all may contribute to establishing a successful buffer and edge to a parking lot. Because such a buffer is typically located on private property, this guideline's implementation is dependent on the coordination with and cooperation of civic-minded property and business owners.

- Shrubs and trees
- Landscape wall (fencing may be effective too) set back from sidewalk
- Furnishings
- Berming



Public Transit

Issues:

Several of the MBTA’s most heavily patronized routes serve Dudley Square. The Silver Line with almost 15,000 daily boardings, has the highest ridership in the MBTA bus system, and five of the MBTA’s top six routes travel through Dudley Square.

- Seventeen MBTA bus routes serve Dudley Square
- More than 2,000 scheduled trips each weekday
- More than 30,000 people get on or off buses each weekday

Six routes account for more than 70% of all passenger boardings and alightings in Dudley Square on a typical weekday. These routes are:

- Route 749 / Silver Line – Dudley Station – Downtown Boston via Washington Street
- Route 28 – Mattapan – Ruggles via Dudley Station
- Route 23 – Ashmont – Ruggles via Washington
- Route 15 – Kane Square / Fields Corner - Ruggles
- Route 66 – Dudley Station – Harvard Square via Brookline and Allston
- Route 1 – Dudley Station – Harvard Square via Massachusetts Avenue



Table 5 shows the routes serving Dudley Station and total daily boardings and alightings.

Table 5: Bus Transit Characteristics at Dudley Square			
Route	Weekday Boardings and Alightings		Scheduled Weekday Trips
	Number	Percent	
749 (Silver Line)	6,662	22%	333
28	4,053	22%	240
23	3,768	13%	269
15	2,713	12%	219
66	2,334	9%	197
1	2,224	8%	229
44	1,620	7%	139
42	1,466	5%	123
45	1,461	5%	158
19	1,109	5%	77
41	893	4%	77
8	782	3%	106
14	617	3%	47
47	591	2%	97
25	112	2%	23
171	9	0%	2
170	6	0%	3
Total	30,420	100%	2,339

Public Transit

Findings:

A review of MBTA operating statistics shows that the MBTA routes serving Dudley Station tend to be crowded and unreliable. During the peak 30 minutes of service, about half of the routes entering or leaving Dudley Square were operating over capacity. The most crowding was observed on the Silver Line and Routes 1, 23, 19, 66, and 28. In addition, most routes arrive or leave late, with Routes 19, 66, 47, 8, 23, and 28 showing the worst on-time performance.

A number of factors contribute to poor reliability and on-time performance. In addition to traffic congestion throughout Roxbury and surrounding neighborhoods, several circulation options in Dudley Station itself also contribute bus congestion. These include the following:

- Buses entering the station from Malcolm X Boulevard and Dudley Street have to make a long counter-clockwise loop to serve the station and return to their routes.
- Buses exiting the station via the driveway on Dudley Street frequently encounter vehicle and pedestrian conflicts.
- Station layout and internal traffic patterns, combined with the high number of passengers transferring between buses, contribute to bus-pedestrian conflicts within Dudley Station.

The Central Transportation Planning Staff, which conducts transit planning on behalf of the MBTA, has proposed several traffic circulation changes in Dudley Square and within Dudley Station to address some of these concerns. These proposals were presented to the Boston Transportation Department and the study team for information purposes only and were not official recommendations from the MBTA. Further discussions between the City of Boston and the MBTA need to occur regarding bus operations in Dudley Station.

Recommendations:

Increase bus ridership

The routes serving Dudley Square already have some of the highest ridership in the MBTA system. Nevertheless, there may be opportunities to

increase bus ridership, especially as development in Dudley Square attracts new employees and visitors. In addition to the operational improvements identified above, elements that may expand ridership may include improved customer information, improvements to bicycle access, and enhanced customer amenities.

Improved customer information

The MBTA, in partnership with the Massachusetts Department of Transportation, is actively working to improve the availability of transit information for customers. The MBTA is testing alternatives for making real-time information about transit status readily available to the riding public. As an initial step, the MBTA is encouraging third-party developers to make transit information accessible via personal technology, like cell phones and other mobile devices. However, the MBTA recognizes that not all transit customers have access to smart-phone technology and plans also to make real-time service updates available at stations and at key bus stops.

Dudley Station, with its sizable transit ridership, would be an ideal location for testing and implementing such technology. The City of Boston should encourage the MBTA to develop an approach for disseminating real-time transit information to all customers – not just those with smart phones – via electronic message signs at key locations.



Improved bicycle access

This study recommends improving bicycle access throughout Dudley Square by introducing bicycle lanes and by installing bicycle racks. To

Public Transit

complement these improvements, making secure bicycle storage available at Dudley Station would encourage customers to use bicycles to access local bus routes and the Silver Line.

For example, the MBTA has installed secure bicycle “cages” at Alewife and Forest Hills stations to provide a convenient park-and-ride solution for cyclists. Bicycle parking at these stations is free with a special MBTA access card. The MBTA is also adding bicycle racks to buses throughout the system. The MBTA continues to expand its bicycle rack program, but none of the bus routes serving Dudley Station currently has bicycle racks. The City should encourage the MBTA to expand bicycle access to the transit routes serving Dudley Station.

Enhanced customer amenities

The design of Dudley Station incorporates architectural elements from the historic Dudley Orange Line station. While the station is visually striking, it does not provide basic customer service amenities consistent with a major bus terminal. In addition to the recommendations for secure bicycle storage and customer information discussed above, suggested improvements for Dudley Station include better weather protection and public rest rooms for customers.



Expanded Silver Line Service

Although the Silver Line currently has its southern terminal at Dudley Square, the City has recommended extending service beyond Dudley

Station to Mattapan Square and, potentially, Ashmont. Consistent with the City’s recommendation, the MBTA and MassDOT proposed to extend bus rapid transit south of Dudley Square with funding from the American Recovery and Reinvestment Act (ARRA).

The state conducted a public planning process during 2009 for upgrading existing bus Route 28 into Route 28X, between Mattapan Square and Ruggles Station. The project included the following elements:

- Exclusive busway in the median on Blue Hill Avenue between Washington Street and Mattapan Square
- Bus-only lane southbound on Warren Street from just south of Dudley Station to Quincy Street.
- Transit stations including heated shelters, CharlieCard vending machines, landscaping, and lighting.
- Upgraded traffic signals, including bus priority.
- Sixty-foot articulated buses.
- Consolidated stops along the route.

Ultimately the project did not achieve sufficient community support to move forward, and the state chose not to pursue ARRA funding for this project. Concerns included:

- Running buses in the median of Blue Hill Avenue would require removing recent streetscape improvements.
- Consolidating bus stops would improve operating efficiency but require community residents to walk farther to access service.
- Eliminating the median on Blue Hill Avenue was perceived as a hazard for pedestrians crossing the street.

Although MassDOT and the MBTA will not implement bus rapid transit service in the Route 28 corridor in the near future, this corridor still deserves attention from state transportation planners. The MBTA should make every effort to examine service alternatives in this heavily travelled corridor. Alternatives should be developed that improve community mobility while addressing concerns about safety, convenience, and urban design. The long term concepts presented in this study were developed with the goal of not precluding future considerations of such measures.