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# Route 9 Enhancement Study and Plan

## Recommendations

DRAFT FOR REVIEW PURPOSES

**September 20, 2016**



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Prepared for  
The Town of Wellesley Planning Board

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## Purpose

The Route 9 Enhancement Study and Plan is comprised of two distinct phases. Phase 1 consisted of an inventory and assessment of existing conditions and the identification of issues and opportunities. Accepted by the Town of Wellesley's Planning Board on March 7, 2016, an [Issues and Opportunities](#) report identified major issues and opportunities along the Route 9 corridor. The identified issues and opportunities were compiled from a wide range of sources including the *Inventory and Assessment of Existing Conditions* report, recently completed studies prepared for the Town of Wellesley, fieldwork, Stakeholder feedback, a Public Forum held as part of Phase 1, and an on-line survey. This report outlined issues and opportunities within ten key topic areas:

Traffic	Water Management and Natural Resources
Roadway Design	Natural Gas Leaks
Pedestrians and Bicyclists	Maintenance
Specific Sites	Corridor Aesthetics and Identity
Public Transportation	Governmental Collaboration

Phase 1 purposely did not reach conclusions or provide recommendations for the Town of Wellesley. Rather, the *Issues and Opportunities* report serves as a framework to facilitate further discussion and analysis as well as help develop goals and recommendations for Phase 2 of the Route 9 Enhancement Study and Plan. Using the ten key topic areas as a framework, Phase 2 further develops and prioritizes the Town of Wellesley's goals and recommendations for the corridor, addressing issues and capitalizing on opportunities. The recommendations in this report are for the Town to consider when determining improvements along the Route 9 corridor. The following table summarizes the recommendations for each of the ten key topic areas. An implementation-based report, this plan identifies actions necessary to implement goals and recommendations while taking funding sources and ease of implementation into consideration.

The efficient operation of the Route 9 corridor is critical to the vitality of the Town of Wellesley. It is important to be aware that since Route 9 is a state road and under jurisdiction of the Massachusetts Department of Transportation (MassDOT), many of the recommendations outlined in this report will require collaboration and approval from this agency. Implementing the goals and recommendations is expected to benefit both residents and businesses as well as create more vibrancy and activity along a corridor where vehicular travel dominates the landscape.

This plan proposes refocusing Route 9 from its role as a regional traffic conduit to strengthening its role as a residential roadway. The recommendations in this plan are intended to designate a safe and sustainable roadway that supports multiple modes of travel. Traffic and safety improvements and design principles are outlined to accomplish this. In sum, by addressing specific issues created primarily by traffic impacts and reinforcing the corridor's assets, Wellesley's local identity can advance.

## Key Topic Areas and Recommendations

<b>1</b>	<b>TRAFFIC</b>
1.a.	Implement Traffic Signal Enhancements that Benefit Pedestrians and Bicyclists
1.b.	Install Dilemma-Zone Detection Systems at Signalized Intersections
1.c.	Utilize Speed Monitoring Trailers or Signs to Inform Drivers of their Speeds
1.d.	Develop Ongoing Data Collection and Monitoring Programs
<b>2</b>	<b>ROADWAY DESIGN</b>
2.a.	Install and Reconstruct Sidewalks along the Entire Length of Route 9 to the Extent Feasible
2.b.	Adjust Guardrail Placement where Feasible and Warranted
2.c.	Improve Guardrail Aesthetics by Working with MassDOT to Develop a Consistent Specification for the Route 9 Corridor
2.d.	Install Pedestrian Crossing Signs at Crosswalks
2.e.	Ensure ADA Compliance by Working with MassDOT to Develop a Transition Plan and Utilize MassDOT's Curb Ramp Assessment Tool
2.f.	Clearly Mark Crosswalks at Signalized Intersections
2.g.	Add Medians at Intersections with Crosswalks
2.h.	Create an Access Management Plan to Enable Safe Access for Pedestrians and Bicyclists
2.i.	Apply for Green Community Designation to be Eligible for Green Community Grant Funds to Install LED Lights
2.j.	Install LED Streetlights for Route 9 as Part of a Town-Wide LED Streetlight Retrofit
2.k.	Explore the Installation of Pedestrian Scale Lighting
2.l.	Consider Realigning the Placement of Light Poles in the Event of Relocation
<b>3</b>	<b>PEDESTRIANS AND BICYCLISTS</b>
3.a.	Work with MassDOT to Explore Opportunities for Dedicated and Separate Bicycle and/or Multi-Modal Paths
3.b.	Expand and Connect the Wellesley Trails Network in the Vicinity of Route 9
3.c.	Implement a Vision Zero Program
3.d.	Expand Safe Routes to School (SRTS) Programs
<b>4</b>	<b>SPECIFIC SITES</b>
4.a.	Route 9/Kingsbury Street Intersection Reconfiguration
4.b.	Route 9 Reconstruction Project
4.c.	Prioritize Intersections and Sites for Improvements
<b>5</b>	<b>PUBLIC TRANSPORTATION</b>
5.a.	To Encourage the use of Public Transportation, Explore Designating Bus Stops along Route 9 to Serve the MWRTA's Bus Route 1

<b>6</b>	<b>WATER MANAGEMENT AND NATURAL RESOURCES</b>
6.a.	Advocate that MassDOT be Required to Adhere to the Same Standards of Stormwater Management as the Town
6.b.	Work with MassDOT and Developers to Institute Low Impact Development (LID) Techniques along Route 9 to Improve Stormwater Management
6.c.	Advance the Boulder Brook Culvert Project
6.d.	Make Improvements to Identified Locations with Drainage Issues
<b>7</b>	<b>NATURAL GAS LEAKS</b>
7.a.	Review and Advocate for Adopted and Pending Legislation
7.b.	Ensure all Gas Leaks along Route 9 are Fixed Prior to Paving
7.c.	Lead Coordination of Roadway Work
7.d.	Review MAPC's Study of Natural Gas Leaks
<b>8</b>	<b>MAINTENANCE</b>
8.a.	Develop a Comprehensive Maintenance Plan for the Route 9 Corridor
8.b.	Annually Prioritize a Top List of Specific Maintenance Issues and Convey to MassDOT
8.c.	Develop a Sidewalk Maintenance Plan
8.d.	Require Landscaping Operations and Maintenance Plans for Large Commercial Developments
8.e.	Establish a Restoration and Preservation Plan for Historic Features
8.f.	Adhere to Effective Coordination and Timing of Projects
8.g.	Implement Adopt-A-Highway Programs
8.h.	Organize Community-Run Cleanup Events and Programs
8.i.	Utilize Inmate Work Programs
<b>9</b>	<b>CORRIDOR AESTHETICS AND IDENTITY</b>
9.a.	Develop a Tree Protection Plan for the Route 9 Corridor
9.b.	Install LED Street Lights with Attention to Aesthetics
9.c.	Explore Placement of Overhead Wires Underground
9.d.	Ensure Prevention of Double Poles
9.e.	Pursue the Installation of Multimodal Wayfinding Signs
9.f.	Identify Historically Significant Features
9.g.	Establish Gateways at the East and West Entrances of Route 9
9.h.	Support and Encourage Use of New Roadway Technologies
<b>10</b>	<b>GOVERNMENTAL COLLABORATION</b>
10.a.	Develop a Working Strategy among Wellesley's Residents, Business Community, Town Government, and the State
10.b.	Undertake a Comprehensive Public Outreach Campaign

## TOPIC AREA 1 TRAFFIC

### **Recommendation**

#### **1.a. Implement Traffic Signal Enhancements that Benefit Pedestrians and Bicyclists**

Signal timing can have a positive effect on the safety and efficiency of a corridor. Appropriately designed, operated, and maintained, traffic signals can provide for the smooth flow of traffic and reduce accidents for vehicles, pedestrians, and bicyclists. Although traffic signals along Route 9 are under the jurisdiction of MassDOT, the Town can work with the State to encourage implementation of various traffic signal enhancements intended to benefit pedestrians and bicyclists at existing signalized crossing locations along Route 9. These enhancements include:

##### Installing Countdown Signals

Install countdown signals that provide pedestrians with information about the amount of time remaining at a crossing interval. According to the Manual of Uniform Traffic Control Devices (MUTCD), countdown pedestrian signal indications should be used at traffic signals wherever warranted. Using WALK/DON'T WALK pedestrian signal indications at signal locations are important in many cases; when vehicle signals are not visible to pedestrians, when signal timing is complex (e.g., there is a dedicated left-turn signal for drivers), and for wide streets.

##### Locating Pedestrian Pushbuttons

Pushbuttons should be easily available for pedestrians. They should be easily activated and conveniently located near each end of the crosswalk, between the edge of the crosswalk line and the side of a curb ramp.

### **Recommendation**

#### **1.b. Install Dilemma-Zone Detection Systems at Signalized Intersections**

A technology that can both improve intersection safety and reduce congestion is the installation of Dilemma-Zone Detection Systems<sup>1</sup> at signalized intersections. Dilemma-Zone Detection Systems modify traffic control signal timing by reducing the number of drivers that may have difficulty deciding whether to stop or proceed during a yellow phase. For safety purposes, the timing of the yellow phase may be adjusted to allow a vehicle to pass through the intersection. As a result, the potential for vehicles to illegally continue into an intersection during the red phase is reduced. The decision to adjust the timing of the yellow phase is based on observed vehicle locations and speeds of the detection system's equipment (e.g.; cameras and radar).

Dilemma-Zone Detection Systems:

- Reduce the frequency of crashes. Specifically, rear-end crashes associated with unsafe stopping and angle crashes due to illegally continuing into the intersection during the red phase.
- Reduce the overall delay at an intersection by managing the frequency at which vehicles stop.

There are plans to install a Dilemma-Zone Detection System at the Route 9 and Kingsbury Street intersection. Other signalized intersections along the Route 9 corridor should be evaluated for Dilemma-Zone Detection Systems and, if deemed warranted, be installed.

## Recommendation

### 1.c. Utilize Speed Monitoring Trailers or Signs to Inform Drivers of their Speeds

MassDOT has the authority to designate speed limits over every road in Massachusetts. [Chapter 90, Section 18](#) of the Massachusetts General Laws (MGL) requires posted speed limits to be established through the issuance of special speed regulations. On State Highways, MassDOT is responsible for conducting an engineering study to establish a speed regulation on state highways.

A requirement to establishing speed regulations and posting speed limits is to conduct a comprehensive engineering study at each location where speed control is considered. The purpose of this study is to establish a speed limit that is safe, reasonable, and self-enforcing. An important step of this study is to measure the prevailing speeds of drivers on a particular section of a roadway under ideal conditions. The speed at or below which 85 percent of drivers travel passing a given point – frequently referred to as the 85<sup>th</sup> percentile speed - is the principle value used for establishing speed control and is the national standard for establishing safe speed limits. The [MassDOT Procedures for Speed Zoning on State and Municipal Roadways](#) contains additional information regarding engineering studies and establishing posted speed limits.

The majority of Route 9 is signed for 50 mph with the exception of the vicinity between the Fire House and Oakland Street where the signed speed limit is for 40 mph for both eastbound and westbound traffic. The figure below and the straight line diagrams from MassDOT's Massachusetts Route Log Application provided in *Appendix A* illustrate the changes in speed limits along Route 9 in both directions.

#### Posted Speed Limits along Route 9



Sources: Google and Bing

Drivers approaching a speed monitoring awareness trailer temporarily set up alongside a roadway will see the posted speed limit displayed, as well as their vehicle's speed as detected by a radar gun within the trailer. Trailers can also record the total number of vehicles and their average speeds during the times they are monitoring traffic. Determining where to place a trailer can be based on previous accident and speeding locations as well as requests from the public. Speed monitoring signs serve the same purpose as a trailer except that the location is permanent. Both speed monitoring trailers and

signs are educational devices that promote driver awareness and safe travel and are proven to reduce driving speeds. Coordination and approval from MassDOT would be necessary if the Town were interested in having a speed monitoring trailer or sign on Route 9.

*Speed Monitoring Trailer*



Source: Town of Plymouth Police Department

*Speed Monitoring Sign*



Source: Radarsign.com

## Recommendation

### 1.d. Develop Ongoing Data Collection and Monitoring Programs

Placing permanent or temporary sensors along the Route 9 corridor to monitor traffic conditions and obtain modal counts should be explored. Video monitoring should be considered to analyze traffic patterns and better understand interactions between vehicles, pedestrians, and bicycles. [Miovision](#), which has been used by MassDOT, is an example of one such company.

Data collection and monitoring is important for various reasons which include:

- Measuring pedestrian and bicycle patterns on sidewalks and at intersections.
- Establishing before and after counts to substantiate new investments in roadway projects.

With this information, the Town will be in a stronger position to recommend projects that will improve the efficient and safe movement of all modes along the Route 9 corridor.

## Best Practice

[Eco-Counter](#), a Montreal-based company, produces counters which automatically count pedestrians and bicyclists using detectors and publically displays the information on a monitor in 'live-time.' An Eco-Totem counter is located on Broadway in Cambridge. The number of bicycle trips recorded by this Eco Totem counter can be [tracked live remotely](#). The company also manufactures portable, real-time displays which can be used to promote bike to school or work programs.

*Totem Bike Counter (Cambridge)*



Source: City of Cambridge.gov

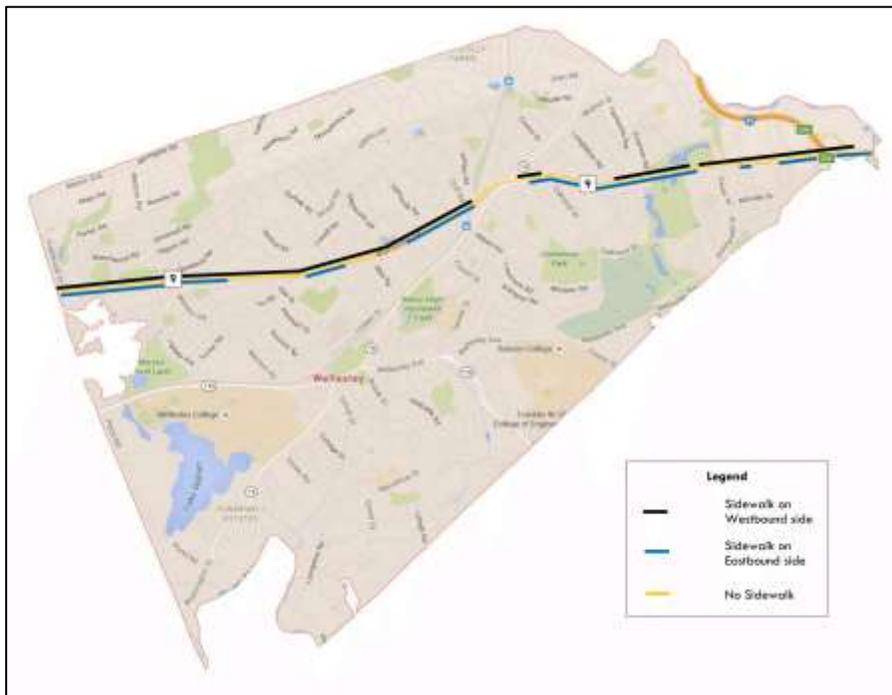
## TOPIC AREA 2 ROADWAY DESIGN

### Recommendation

#### 2.a. Install and Reconstruct Sidewalks along the Entire Length of Route 9 to the Extent Feasible

Sidewalks play a key role in providing critical connections, help create a sense of place, and encourage pedestrian activity. Sidewalks must be safe and accessible for all users and have unobstructed pathways. According to the figure below, approximately 85 percent of the westbound side of Route 9 has sidewalk coverage whereas the eastbound side is covered to a lesser extent (approximately 70 percent). Coverage along the eastbound side is sporadic. Sidewalk coverage along the westbound side of Route 9 is fairly consistent with the exception of a section between Cliff Road and Longfellow Road. It should be noted that instead of pedestrians and bicyclists can utilize a 'carriage road' as well as the Route 16 bridge on and off ramps which run parallel to Route 9.

#### Estimated Sidewalk Coverage along Route 9



Sources: Google and Bing

Note: Sidewalk coverage illustrated does not designate sidewalk condition, only if a sidewalk is present.

New sidewalks should be added and old sidewalks replaced in a comprehensive manner along both sides of Route 9 to the extent feasible. Comprehensive sidewalk coverage will encourage safe walking and an alternative for bicyclists to ride either in the shoulder or travel lane. The Town should develop priority locations to add or reconstruct sidewalks.

According to MassDOT's *Project Development and Design Guide* (2006), the minimum width for a sidewalk is 5 feet excluding the width of the curb. MassDOT's *Project Development and Design Guide* states that if a sidewalk is not buffered from vehicular traffic, then the desirable total width for a curb-attached sidewalk is 6 feet in residential areas and 8 feet in commercial areas (15.4 Sidewalks-Clearances).

## **Recommendation**

### **2.b. Adjust Guardrail Placement where Feasible and Warranted**

An important safety feature, the primary purpose of guardrails is to prevent vehicles from leaving a roadway and from colliding with objects that have a greater crash severity potential than the guardrail itself. By redirecting vehicles in a controlled manner, guardrails along a road edge reduce the number of fatalities and serious injuries. However, since guardrails introduce an additional potential object to crash into, their placement should be carefully considered.

The standard guardrail types used by MassDOT are W-Beam or Thrie Beam. W-Beam is usually on the right side (shoulder side) of the roadway but may also be used on the left side (median side) of the roadway, provided there is sufficient impact deflection clearance. In areas where additional coverage is necessary, Thrie Beam guardrail is used. W-Beam and Thrie Beam guardrails are typically constructed from standard galvanized steel and have a corrugated face. The details of MassDOT's standard guardrail types can be found in Section 4, Highway Guard Rail and Fences, of [MassDOT Construction Standard Details](#) (June 2014).

*Thrie Beam Guardrail (foreground) and W-Beam Guardrail (background)*



Route 9 at Willow Street looking west.  
Source: Google

The installation of guardrails needs to follow specific criteria, or warrants, that justifies their installation. MassDOT follows the criteria in AASHTO's *A Policy on Geometric Design of Highways and Streets* (2011) to evaluate whether the installation or removal of a guardrail may be warranted. The Roadside Design Guide also provides detailed information on the selection, design, and installation of guardrails. Guardrails should only be installed where, after careful review, a warrant requires their installation. Once it is determined whether to install a guardrail, design procedures, as detailed in the Roadside Design Guide, need to be followed to ensure the guardrail is installed appropriate for the location. It is important to note that there is no 'one size fits all' approach regarding the installation of guardrails<sup>1</sup>.

Guardrails have been placed along the Route 9 corridor with vehicles in mind, not pedestrians. This is why, in many cases, guardrails are not located between the sidewalk and the roadway to protect pedestrians. The Town should collaborate with MassDOT to do a comprehensive overview of the guardrails along the Route 9 corridor. This overview should evaluate whether the guardrails are sited in the most effective locations. Moving forward, Wellesley should:

- Advocate for placement of guardrails between the roadway and sidewalk where feasible and warranted as well as based on existing and anticipated pedestrian activity.
- If a guardrail is not placed between the roadway and the sidewalk, a landscaped buffer should be planted.

<sup>1</sup> *Town of Weston Guardrail Overview Report*, Nitsch Engineering, July 2016.  
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**Recommendation**

**2.c. Improve Guardrail Aesthetics by Working with MassDOT to Develop a Consistent Specification for the Route 9 Corridor**

The Town should work with MassDOT to develop a consistent specification for the Route 9 corridor. There are alternative guardrail types that serve the same safety functions, but are considered more aesthetically pleasing compared to W-Beam and Thrie Beam. Two examples of alternative guardrail types are Cor-Ten and Poly-Coated.

Cor-Ten is a weathering steel that rusts to a natural brown finish and had a more subdued look compared to galvanized steel guardrails. Poly-Coated guardrails are essentially painted over galvanized steel via a powder coating process. This type of guardrail can be coated in a wide variety of colors (e.g., gray, brown, green).

It is recommended that maintenance and costs be evaluated prior to investing in any new guardrail type. If the Town is interested in trying a new guardrail type, a small test area should be designated along the corridor for evaluation as a pilot.

*Cor-Ten Guardrail*



*Route 20 (Boston Post Road) in Wayland (westbound)  
Source: Google*

*Poly-Coated Guardrail*



*Soldiers Field Road in Boston (westbound)  
Source: Premier Fence*

**Recommendation**

**2.d. Install Pedestrian Crossing Signs at Crosswalks**

Considered one of the most common signs used to promote pedestrian safety, pedestrian crossing signs provide visual cues for drivers to decrease speeds and look for pedestrians in crosswalks. Pedestrian crossing signs should be installed close to traffic lights and crosswalks. Solar powered flashing crossing signs that are activated by pedestrians prior to crossing should be considered as an option.

*Pedestrian Crossing Sign*



*Dearborn Street and Route 9 (eastbound) in Wellesley*

## **Recommendation**

### **2.e. Ensure ADA Compliance by Working with MassDOT to Develop a Transition Plan and Utilize MassDOT's Curb Ramp Assessment Tool**

ADA guidelines require all pedestrian crossings be accessible to people with disabilities by providing curb ramps. Curb ramps also benefit people pushing strollers, grocery carts, suitcases, or bicycles. While there are a variety of standard curb ramp designs, curb ramps must include ADA compliant detectable warning strips to alert people who have visual impairments that they are about to enter a roadway. The detectable strips are critical for visually impaired pedestrians to find the location and direction of crosswalks.

#### MassDOT Transition Plans

MassDOT is undertaking a comprehensive re-evaluation of its policies, programs, services, and facilities to determine the extent to which individuals with disabilities may be restricted in their access to these services and activities. [MassDOT's ADA/Section 504 Transition Plan](#) guides the planning and implementation of necessary program, activity, and facility modifications over the next several years.

In the near future, MassDOT and the Federal Highway Administration will be hosting workshops designed to guide municipalities to develop effective ADA transition plans. The workshops will provide resources supporting municipal compliance activities through a federal and state focus on the public right-of-way. Evaluation, collection strategies, transition plans, and funding opportunities will be addressed in these workshops.

#### MassDOT's Curb Ramp Assessment Tool

It is critical to ensure that curb ramps and sidewalks provide accessible and usable paths of travel for pedestrians with disabilities, especially those in wheelchairs. In an effort to achieve this goal, MassDOT developed a Curb Ramp Assessment Tool which collected information and images of approximately 26,000 pedestrian curb ramps on roadways over which MassDOT has jurisdiction. The data is helping MassDOT to prioritize locations where sidewalks need to be brought up to ADA standards for access.

MassDOT has collected data for almost 200 ramps along Route 9 in Wellesley using the Curb Ramp Assessment Tool. The Town should work with MassDOT to evaluate information from this tool to identify locations where sidewalks should be brought up to ADA standards in order to improve access along the Route 9 corridor. This data can also be utilized to assist Wellesley to develop a prioritization plan as part of a Complete Streets program.

MassDOT is interested in working with municipalities to develop their own ADA Self Evaluation and Transition Plans. MassDOT has applied for a federal Innovation Grant that will enable the agency to continue development of the Curb Ramp Assessment Tool so that it may be shared with all municipalities in an effort to assist them to develop their own ADA Self Evaluation and Transition Plans. If awarded, MassDOT will be looking for several municipalities to pilot the program.

## **Recommendation**

### **2.f. Clearly Mark Crosswalks at Signalized Intersections**

Crosswalks give a clear indication to pedestrians as to where they should cross Route 9 as well as alert drivers of pedestrian crossings. Well designed and maintained crosswalks serve a variety of functions that include: reducing vehicle speeds, improving pedestrian visibility, and creating safer walking environments. Crossings along Route 9 are neither high visibility nor well-maintained.

Crosswalks should be enhanced at the signalized intersections along the Route 9 corridor (entrance to Sun Life Financial and Harvard Pilgrim Health Care, Oakland Street, Cliff Road, Kingsbury Street, and Overbrook Drive). Clearly marked crosswalks will promote safe pedestrian travel across the corridor, as well as help provide connectivity to adjacent neighborhoods.

Measures to implement this recommendation include:

- Stripe crosswalks using the continental style or “ladder” design.
- Contrast the surface treatment with the asphalt by painting crosswalks in a color, pattern, texture, or material (e.g., brick pavers) that stands out against the street.

*Example of a Continental Style or “Ladder: Design Crosswalk*



*Boston, Massachusetts  
Source: US DOT/FHWA*

- Crosswalk markings should consist of non-skid, reflectorized thermoplastic. On new pavement, thermoplastic markings should be recessed when possible so that the surface of the marking is flush with the pavement to reduce maintenance needs and provide a smooth, accessible surface.

The recent design work by MassDOT at the Route 9 and Kingsbury Street intersection sets a precedent for such crosswalk design.

### **Recommendation**

#### **2.g. Add Medians at Intersections with Crosswalks**

Medians can be used to both improve pedestrian crossings and provide opportunities to add landscaping. Medians with crosswalks can serve as safe refuges since they reduce crossing distances by enabling pedestrians to cross roadways in two stages. They can also be designed to absorb stormwater. While this may not be feasible at all intersections, examples include Kingsbury Street and Overbrook Drive.

### **Recommendation**

#### **2.h. Create an Access Management Plan to Enable Safe Access for Pedestrians and Bicyclists**

Several commercial properties along Route 9 have wide driveways in and out of their parking lots which serve as conflict points between vehicles and pedestrians/bicyclists. These areas are primarily concentrated along the eastern and western ends of the corridor and in the vicinity of Cedar Street.

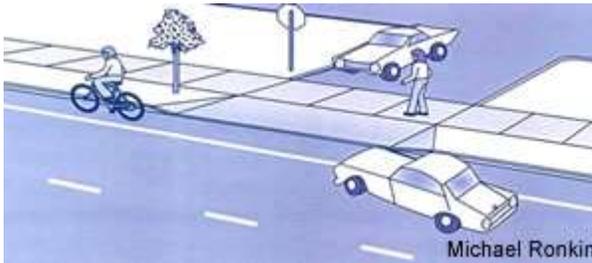
As vehicles pull out of parking lots, they often pull into the sidewalk blocking the pedestrian/bicyclist right-of-way. This can result in a situation where a driver may not see a pedestrian/bicyclist leading to a potential accident. The presence of these conflict points can discourage pedestrians and bicyclists from using the Route 9 corridor. An access management plan is intended to improve safety for pedestrians/bicyclists and enhance traffic flow along the roadway.

Access management techniques can be applied to new developments or as retrofits to existing facilities. According to MassDOT, “access management applies roadway and land use techniques in order to preserve the safety, function, and capacity of transportation corridors. The objective is to ensure roadway safety and efficient operations while providing reasonable access to the adjacent land uses. Access management can also improve the environment for pedestrians, bicycles, and motor vehicles in all settings and on all roadway types by reducing and consolidating driveway conflict points.” [Chapter 15, Access Management](#), of MassDOT’s *Project Development and Design Guidebook*, provides guidelines that address access management techniques and land use controls.

<sup>2</sup> MassDOT’s *Project Development and Design Guidebook*, Chapter 15 – Access Management, p 15-1, 2006.

Two measures to implement this recommendation include:

- Providing continuous and clearly delineated pedestrian/bicycle zones across driveways to encourage drivers to yield to pedestrians, as shown in the image below.



Source: <http://guide.saferoutesinfo.org/engineering/sidewalks.cfm>

- Reviewing legal agreements with owners of adjoining properties to explore the feasibility of sharing private driveways.

One good example of the application of access management techniques along Route 9 was the recent addition of a landscaped median between the sidewalk and parking lot and changes to the parking lot layout at the Dunkin Donuts property east of Overbrook Drive (westbound side).



Source: Bing - July 2015



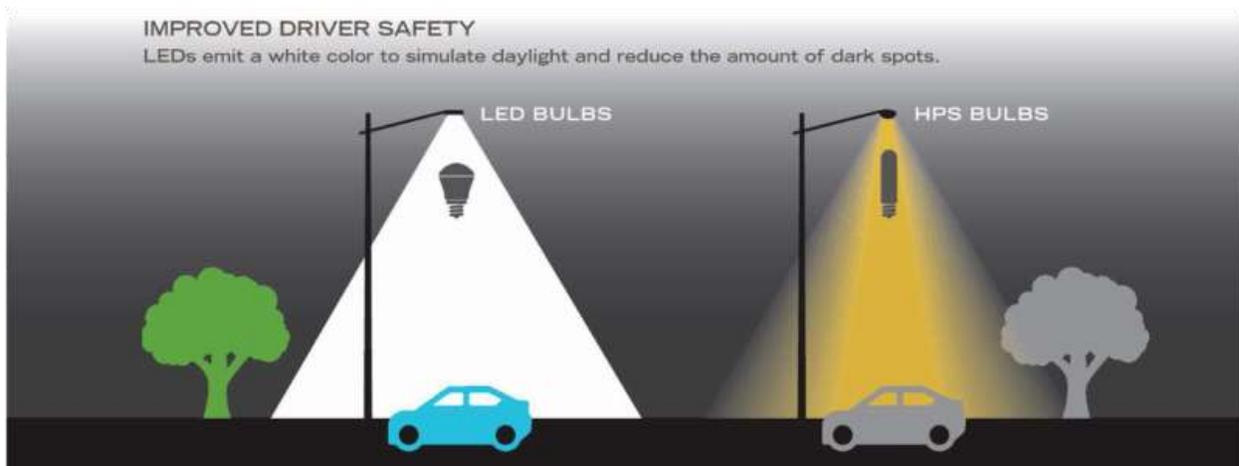
Source: Google - August 2013

## Recommendation

### 2.i. Apply for Green Community Designation to be Eligible for Green Community Grant Funds to Install LED Lights

All of the approximately 250 streetlights along the Route 9 Corridor in Wellesley are owned and operated by the Wellesley Municipal Light Plant (MLP) and are high-pressure sodium ranging from 150-400 watts. The MLP has \$230,000 in approved capital funds to complete a LED (Light-Emitting Diode) retrofit of all existing Route 9 streetlights. The MLP plans to purchase LED fixtures based on a competitive bid.

The benefits of LED lighting include improved safety through enhanced visibility and uniform light quality which contributes to the overall safety of drivers, pedestrians, and bicyclists. LED streetlights can significantly lower municipal electricity consumption and energy bills as well as reduce carbon emissions. LED lights last longer than traditional lighting technologies, meaning they require less overall maintenance, which lowers operating costs. Field tests have shown that, on average, replacing high-pressure sodium street lights with LED lighting can result in energy savings up to 39 percent<sup>3</sup>. LED lighting may also reduce light pollution due to their ability to focus light at targeted areas<sup>4</sup>. In addition, good streetscape lighting lends character to a street, and provides a sense of place and civic pride.



Source: City of Hamilton Ohio's LED Streetlight Master Plan

A funding opportunity the Town of Wellesley can pursue to convert its streetlights along the Route 9 Corridor to LED technology is to first apply for Green Community designation and then apply for a Green Community Grant. [Green Communities](#) is a program managed by the Department of Energy Resources (DOER). While it can take approximately a year to attain Green Community designation, once designated, a municipality is eligible to apply for grants for innovative programs that reduce energy usage as well as invest in renewable energy projects. These can range up to \$250,000 and the conversion of streetlights to LED is eligible. While the MLP does have plans to complete a LED retrofit of all existing Route 9 streetlights, attaining Green Community designation could allow for future funding opportunities. It is important to note that Green Community designation is currently being explored by the Town.

<sup>3</sup> Based on field data from MAPC's projects, MAPC has seen savings between 50-70% based on differences between the energy use of existing wattages and the replacement LED wattages.

<sup>4</sup> Pacific Northwest National Laboratory. (June 2013). Demonstration of LED Street Lighting. Prepared for the U.S. Department of Energy. Retrieved from: [http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/2013\\_gateway-msslc\\_kc.pdf](http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/2013_gateway-msslc_kc.pdf)

Currently 155 municipalities in Massachusetts are designated as Green Communities. Several municipalities have utilized funds from this program to fund conversion of streetlights to LED technology. These municipalities include Acton, Arlington, Concord, Dedham, Gloucester, Lincoln, Melrose Salem, Sudbury, and Watertown. Some of these communities, like Melrose, have used Green Communities funding for a portion of the retrofit cost and then used a municipal bond or third-party financing for the remainder of the cost.

To be designated a Green Community and receive funding, a municipality is required to commit to reducing municipal energy consumption by 20 percent over five years in addition to meeting specific criteria. Although Wellesley was designated by the EPA in 2012 as the first [Green Power Community](#) in Massachusetts, it does not yet have Green Community designation<sup>5</sup>.

### **Recommendation**

#### **2.j. Install LED Streetlights for Route 9 as Part of a Town-Wide LED Streetlight Retrofit**

As 250 streetlights represents a relatively small project, the MLP will be working with the Board of Selectmen regarding the feasibility of a town-wide retrofit. By including the rest of the Town's lights, Wellesley could access third-party financing that would facilitate a retrofit with no upfront cost. Tax Exempt Lease Purchasing (TELP) is the recommended method for paying for LED projects upfront, as it does not affect a municipality's bond rating or debt levy. In most cases, funding comes in the form of a low-cost or market-rate loan that is repaid with project savings over a period of 5-7 years. Municipalities in Massachusetts which have done this include Arlington, Gloucester, Hamilton, Salem, Sharon, Wenham, Winchester, and Winthrop.

If pursuing a town-wide LED streetlight retrofit, it is recommended to hire a professional designer. The designer can perform an inventory assessment of all lights, which includes capturing GPS location, wattage, and other factors relevant to the retrofit design and maintenance. With an accurate inventory and spatial data about the existing streetlights, the designer can then calculate how much illumination different types and wattages of lights will provide along the roads. This information is vital for a municipality to make the final selection of its LED streetlights to install. Additionally, the designer can calculate precise project costs, savings, and paybacks, referred to as an Investment Grade Audit (IGA). The IGA can be used to secure TELP financing.

To execute a town-wide LED streetlight retrofit, the Town has two options:

1) Design & Public Works Construction; or 2) Performance Contracting

##### 1) Design & Public Works Construction

The Town could hire a designer to perform an inventory assessment of the streetlights, design the replacement based on desired light levels, produce an IGA, and, if desired, oversee the installation process. Designs do not typically require stamping by a Professional Engineer, so this service may be procured as a traditional service under M.G.L. c.30B.

The Town could use its own labor for installation, but is not required to. A number of MLPs have used their own labor for installation, such as Reading Municipal Light, Westfield Gas & Electric, and Chicopee Electric Light. Due to limited crews, the projects tend to be phased over a few years. However, hiring an electrical contractor could facilitate installation in as little as a few months. In addition to the MLPs mentioned, the in-progress examples of this option are: Andover, Brockton, Leominster, Warren, Watertown, and Wayland.

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<sup>5</sup> In order to attain Green Power Community designation, at least three percent of the electricity must be generated from renewable resources (e.g., wind, solar, geothermal). Wellesley's current community "green power" usage is at 4.12 percent and has a participation rate of 11 percent. Participation rate is the percentage of residents and business choosing to use green power for a portion of their electricity use.

## 2) Performance Contracting

All designer services, IGA, equipment procurement, and installation services can be procured together through a performance contract, under M.G.L. c.25A §11I or §11C. Often called “turn-key” delivery, an energy services company (ESCO) is responsible for all phases of the project. Under the performance contract, the ESCO guarantees savings and performs annual measurement and verification (M&V). The savings guarantee and M&V add value to complex energy efficiency projects, but are generally considered unnecessary for streetlight retrofits. Under this option, it is unlikely that the Town could use its own labor for installation. The ESCO provides the financing and carries the credit and performance risks as well. A variety of options are available, including leasing, depending on the contract<sup>6</sup>. Arlington, Fall River, Gloucester, Hamilton, Melrose<sup>7</sup>, New Bedford, Northampton, Salem, Sharon, Somerville, Wenham, and Winchester are examples of municipalities which have implemented streetlight TELP projects using ESCOs.

### Procuring Designer or ESCO Services - MAPC LED Street Light Program

Municipalities in Massachusetts have the option to use a collective procurement model to purchase street light fixtures, as well as design and installation services. MAPC assists municipalities with LED street light procurement through an aggregated procurement program. This procurement program involves vendor qualification, development of a street lighting study, and pricing for a comprehensive LED retrofit through a performance contract. Participation greatly reduces administrative time by each municipality and can result in lower prices and increased competition. For further information, refer to <http://www.mapc.org/led-street-lighting> and MAPC’s report, [Retrofit Streetlights with LEDs](#). MAPC has organized five collective procurements on behalf of a total of 27 municipalities that included over 30,000 streetlights.

### ***Recommendation***

#### **2.k. Explore the Installation of Pedestrian-Scale Lighting**

Explore the installation of pedestrian-scale lighting to illuminate crosswalks, sidewalks, and bus stops. In addition to being decorative, pedestrian-scale lighting conveys to drivers that they should manage their speeds and watch for pedestrians, in turn facilitating their safe movement.

### ***Recommendation***

#### **2.I. Consider Realigning the Placement of Light Poles in the Event of Relocation**

In the event that a light pole needs to be relocated, consider placing the pole so it aligns with other light poles along Route 9. This will provide a consistent aesthetic look that reinforces sightlines and direction of travel.

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<sup>6</sup> <http://energy.gov/eere/ssl/financing-options>

<sup>7</sup> The City of Melrose recently implemented a townwide [Streetlight LED Conversion Project](#). During the installation, residents were able to follow the LED conversion progress on an interactive map which was updated daily.

## **TOPIC AREA 3**

### **PEDESTRIANS AND BICYCLISTS**

#### ***Recommendation***

##### **3.a. Work with MassDOT to Explore Opportunities for Dedicated and Separate Bicycle and/or Multi-modal Paths**

While the fog line can serve as a recognized accommodation for bicyclists, both MassDOT and the Town are hesitant to encourage bicycle use on Route 9 given vehicle volumes and speeds. However there may be opportunities to accommodate dedicated and separate bicycle and/or multi-modal paths along some areas of Route 9. The Town should work with MassDOT to explore the feasibility of advancing these connections.

#### ***Recommendation***

##### **3.b. Expand and Connect the Wellesley Trails Network in the Vicinity of Route 9**

###### Crosstown Trail

The Crosstown Trail starts at the Wellesley/Natick town line, accesses the Morses Pond Area, and then follows the Cochituate Aqueduct. The Crosstown Trail crosses Route 9 at Overbrook Drive, not at the aqueduct. Although expensive, an overpass or underpass could allow for continuous trail access across Route 9. The feasibility of implementing either an overpass or an underpass (e.g., using the aqueduct tunnel) should be explored further, perhaps by the future developer of 900 Worcester Street.

###### Town Forest and MassBay Community College

Explore expanding Wellesley's trail network to connect to Town Forest and MassBay Community College.

Costs and land rights issues related to expanding and/or connecting the Wellesley trails network should be reviewed as part of this recommendation.

#### ***Recommendation***

##### **3.c. Implement a Vision Zero Program**

Vision Zero is a multi-national road traffic safety project that aims to achieve a highway system with no fatalities or serious injuries in road traffic. Vision Zero is a strategy to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, and equitable mobility for all. The concept of Vision Zero originated in Sweden in 1997, when it was adopted as the official road policy by the Swedish parliament. Since that time, Vision Zero has been widely credited by significantly reducing fatal and serious crashes.

Implementing a Vision Zero program can be started by collaborating with the [Massachusetts Vision Zero Coalition](#). In addition to implementing Vision Zero in Boston, the Massachusetts Vision Zero Coalition advocates for the adoption of Vision Zero throughout the state. This new and growing coalition includes community-based organizations, nonprofits, businesses, civic groups and individuals representing communities across the state. Members of the coalition include the Boston Cyclists Union, LivableStreets Alliance, Lyft, Transportation for Massachusetts, and WalkBoston.

## Best Practice

In December 2015, the City of Boston launched Vision Zero. Boston's Vision Zero approach to ending fatalities from traffic crashes is based on making streets safer for everyone with a special focus on slowing traffic speeds and improving street crossings. [Boston's Vision Zero website](#) contains information including the Vision Zero Action Plan and Core Principles of Vision Zero. Of note, Boston recently launched an interactive [Vision Zero safety concerns map](#). The public is encouraged to use this map by selecting specific locations and submitting comments about their safety concerns. Their responses will be collectively reviewed to inform future Vision Zero efforts. The safety concerns map allows the City of Boston to take proactive steps to improve safety at locations where the public has noted dangerous conditions. The online tool is a critical step toward achieving Vision Zero. It is also worth noting that the Cambridge City Council unanimously passed a [resolution](#)<sup>8</sup> to formally adopt Vision Zero in March 2016.

### Safety Concerns Map – Issues Identified at Huntington Avenue and Tremont Street



Source: City of Boston's Vision Zero Safety Concerns Map

## Recommendation

### 3.d. Expand Safe Routes to School (SRTS) Programs

The [Safe Routes to School \(SRTS\)](#) program promotes healthy alternatives for children and parents in their travel to and from school. The program educates students, parents and community members on the value of walking and bicycling for travel. SRTS practitioners run education and encouragement programs with families and schools as well as advocate for strong municipal policies to support safe walking and bicycling. The most successful SRTS programs incorporate the Six E's: evaluation, education, encouragement, engineering, enforcement, and equity.

SRTS programs can help to reduce traffic congestion and air pollution near schools, while increasing the health, safety, and physical activity of elementary and middle school students. In addition to launching SRTS educational campaigns in elementary and middle schools, participating communities can also use SRTS funds for infrastructure enhancements surrounding schools. These enhancements can include pedestrian and bicycle crossing improvements, secure bicycle parking, and sidewalk improvements.

According to the Massachusetts SRTS website, partner SRTS schools in Wellesley are the Bates Elementary School, Joseph E. Fiske Elementary School, and the Schofield Elementary School. SRTS programs should be expanded to the John D. Hardy Elementary, Sprague Elementary, and the Wellesley Middle Schools. All three schools have connectivity either across or along Route 9.

<sup>8</sup> Resolution starts on page 54.

## **TOPIC AREA 4**

### **SPECIFIC SITES**

#### **Recommendation**

##### **4.a. Route 9/Kingsbury Street Intersection Reconfiguration**

MassDOT is planning a roadway resurfacing project for the entire span of Route 9 in Wellesley<sup>9</sup>. Using NHS (National Highway System) funds, this project will focus on pavement resurfacing only (referred to as curb-to-curb). Based on recommendations from past Route 9 studies as well as addressing the Town's longstanding interest in reconfiguring this intersection due to public safety concerns, MassDOT expanded the scope of their resurfacing project to include the reconfiguration of this intersection.

MassDOT and Wellesley collaborated to advance an intersection design that will signalize the turnaround at the existing median. At Town Meeting on April 11, 2016, Wellesley voted to approve \$600,000 of Town funds towards this project, approximately 50 percent of the cost to improve the intersection. Improvements to the Route 9/Kingsbury Street intersection are anticipated to commence in the near future, and the resurfacing of the entire corridor is expected to be finalized in 2017. The estimated cost for the entire roadway resurfacing project is \$7.3 million.

In working on the design for this project, MassDOT incorporated design improvements, many of which are addressed in this report. These design improvements include dilemma-zone detection signal technology, installation of sidewalks, and the designation of dedicated bus stops for the MWRTA (MetroWest Regional Transit Authority) Route 1 bus. This collaboration has resulted in an intersection design which will be safer for all modes of travel.

It should be noted that the concept of a footbridge across Route 9 has been raised several times by residents as part of the Phase 1 planning process. While there are cost and technical issues (e.g., to be ADA compliant there needs to be enough room for approach ramps), it is not completely unrealistic to implement a footbridge at this location or others sites along the Route 9 corridor. In addition to reducing some vehicular traffic, a footbridge could serve as an impetus for Wellesley to become a model pedestrian and bicycling community.

#### **Recommendation**

##### **4.b. Route 9 Reconstruction Project**

Currently a conceptual project, the Route 9 Reconstruction project<sup>10</sup> will involve the resurfacing of Route 9 from Dearborn Street to the Natick town line, an approximate project length of 4.8 center miles. The roadway work will include milling and resurfacing, wheelchair ramp upgrades, sidewalk repairs and improvements, signal improvements, new reflectorized lines, and recessed roadway deflectors. Funds to bring this project to 25 percent design or for construction have not yet been identified by MassDOT. When the Route 9 Reconstruction project is underway, there will be additional opportunities for curb relocation, sidewalk widening, and incorporation of landscaping elements.

#### **Recommendation**

##### **4.c. Prioritize Intersections and Sites for Improvements**

Develop a schedule to prioritize intersection and site improvements along the corridor. As part of the Phase 1 planning process, Kingsbury Street, Oak Street/Westgate Road, and Route 16 (Washington Street), were consistently identified as the top three intersections that should receive priority for intersection improvements. 900 Worcester Street and the Boulder Brook Culvert were identified as specific sites for improvements.

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<sup>9</sup> MassDOT ID number 608180 – referred to as Wellesley - Resurfacing on Route 9, From Limit of Add-A-Lane to East of Overbrook Intersection

<sup>10</sup> MassDOT ID number 607340

## TOPIC AREA 5 PUBLIC TRANSPORTATION

### *Recommendation*

#### **5.a. To Encourage the use of Public Transportation, Explore Designating Bus Stops along Route 9 to Serve the MWRTA's Bus Route 1**

MWRTA Bus Route 1 (Woodland Shuttle) traverses the Route 9 corridor. In spite of strong ridership, there are currently no permanent bus stops along the Route 9 corridor in Wellesley. While the MWRTA plans to designate permanent and protected pick-up/drop-off locations for passengers in the vicinity of the Kingsbury Street intersection, additional pick-up/drop-off locations along the Route 9 corridor should be considered. MWRTA's Bus Route 1 currently operates as a flag down service along Route 9 in Wellesley. Designating bus stops will encourage increased utilization of this bus route.

MWRTA Bus Route 1's ridership should be reviewed on a regular basis to ensure that this route is operating to its fullest potential and determine whether there may be any need for improvements or accommodations. The integration of MWRTA Bus Routes 1 and 8 at Weston Road should also be considered in order to maximize ridership.

Bus stops should be:

- Well-signed and visible.
- Free from obstructions (e.g., sign posts) in the sidewalk area where passengers embark and disembark.
- Placed in turnouts and not interfere with travel lanes.
- Provided equally on both the westbound and eastbound sides of Route 9.
- Accessible and cleared of snow during the winter.

*MWRTA Route 1 Bus Stop in Natick*



*Oak Street and Route 9 (eastbound)*

## **TOPIC AREA 6**

### **WATER MANAGEMENT AND NATURAL RESOURCES**

Stormwater is precipitation (rain or snow) that is not naturally absorbed into the ground and “runs off” impervious surfaces such as paved streets, parking lots, driveways, and sidewalks before draining into waterways or waterbodies. Along the way, stormwater runoff can pick up pollutants such as chemicals, dirt, and debris as it travels – untreated - into waterways or waterbodies, contaminating them. The larger the impervious surface area, the more stormwater runoff volume and pollutants impact waterways and waterbodies. Stormwater issues are also created when drainage systems and culverts do not work properly and cause flooding, as a result.

Stormwater runoff is the leading source of pollution to Massachusetts surface waters and groundwater, including recreational and drinking water sources. According to the [Town's Drinking Water Consumer Awareness Report for the Year 2014](#), 78 percent and 22 percent of Wellesley's water comes from local well supplies and the Massachusetts Water Resources Authority (MWRA) respectively. Specifically, Wellesley's local water supply is comprised of ten wells. Four wells tap into the Waban Brook alluvial aquifer (near Moses Pond) and six wells tap into the Rosemary Brook alluvial aquifer. According to the report, the susceptibility of Wellesley's groundwater capture zones is high. Managing stormwater pollution and flooding will significantly protect Wellesley's water and natural resources, particularly, highly sensitive resources including Boulder Brook/Moses Pond, Abbot Pond, and Rosemary Brook.

#### ***Recommendation***

##### **6.a. Advocate that MassDOT be Required to Adhere to the Same Standards of Stormwater Management as the Town**

The Town of Wellesley is subject to the [National Pollutant Discharge Elimination System \(NPDES\)](#) Municipal Separate Storm Sewer System (MS4) permit for Massachusetts. This permit was newly reissued in April 2016 by the U.S. Environmental Protection Agency. Permit coverage includes municipally-owned or operated stormwater drainage systems and their drainage areas, which includes any impervious surfaces (roads, building rooftops, walkways/sidewalks, driveways, etc.) draining to the system. This reissued permit includes more stringent requirements than the 2003 NPDES permit, such as enhanced education programming, water quality monitoring and pollutant control, and system and drainage area mapping.

While MassDOT is currently subject to the 2003 MS4 permit, the EPA Region 1 website explicitly states that an individual permit will soon be issued for MassDOT with a draft available in the near future. The Town should advocate that when this new permit is issued, MassDOT should be required to adhere to the same standards of stormwater management as the Town.

#### ***Recommendation***

##### **6.b. Work with MassDOT and Developers to Institute Low Impact Development (LID) Techniques along Route 9 to Improve Stormwater Management**

The primary principle of Low Impact Development (LID) is to implement better site design strategies that minimize impervious cover and keep water onsite to replenish the local watershed. For example LID techniques include rain gardens, natural swales, and trees. The Town should work with MassDOT to institute LID techniques along the corridor to improve stormwater management. In addition, the Town should incentivize and/or mandate that LID techniques are used in all redevelopment/development proposals. MAPC's [Low Impact Development Toolkit](#) contains additional information.

**Recommendation**

**6.c. Advance the Boulder Brook Culvert Project**

Drainage improvements along Route 9 Boulder Brook Culvert is a pending MassDOT project<sup>11</sup>. When complete, the drainage improvements will reduce instances of flooding in the neighborhood located proximate to Boulder Brook and Morses Pond primarily between Overbrook Drive and Russell Road. Although 25 percent design plans were submitted in 2013, there has been no design activity since and the project is not on the State’s Transportation Improvement Program (TIP) list of projects. When this project advances, MassDOT should utilize the Commonwealth’s River and Stream Crossing Standards to ensure that the culvert improvement accommodates fish passage.

*Loci Map of the Boulder Brook Culvert Project*



**Recommendation**

**6.d. Make Improvements to Identified Locations with Drainage Issues**

Areas susceptible to roadway flooding have also been identified along the Route 9 corridor include the vicinity of Town Forest, the Route 16 overpass, and between Shaw Road and Sprague Road.

<sup>11</sup> MassDOT ID number 606530

## TOPIC AREA 7

### NATURAL GAS LEAKS

Natural gas is sent to homes and businesses through pipes underneath streets for heating. Over time, these pipes can corrode and leak natural gas into the ground, where it percolates up into the atmosphere. Natural gas is primarily methane, a greenhouse gas. It has been determined that over a 20 year period methane is more than 80 times more potent than carbon dioxide as a greenhouse gas, making it a significant contributor to global warming. Natural gas leaks are estimated to account for 10 percent of all greenhouse gases emitted in the state.

In addition to increasing the rate of global warming, methane negatively impacts human health, especially among those with compromised respiratory systems, by polluting the air and contributing to poor air quality. Escaping natural gas also harms the natural environment by suffocating the root systems of plants and trees, which can result in their death. Leaks are also expensive to consumers, who bear the entire cost of the escaped gas. Statewide, unaccounted-for gas exceeds 8 billion cubic feet per year and is valued at 50 million dollars – all paid for by utility customers.

According to National Grid data reported to the Department of Public Utilities in its 2014 Annual Service Quality Report, Wellesley has 201 unrepaired gas leaks. Of this number, at least 18 are along Route 9. According to the non-profit organization HEET (Home Energy Efficiency Team), the cost to fix an average gas leak is \$2,500.

#### **Recommendation**

##### **7.a. Review and Advocate for Adopted and Pending Legislation**

#### Adopted Legislation

##### [Bill H.4568, An Act Relative to Energy Diversity](#)

In August 2016, Governor Charlie Baker signed into law an energy bill which for the first time will require the Massachusetts Department of Public Utilities (DPU) and the Department of Environmental Protection (DEP) to evaluate the environmental impact of thousands of leaks throughout the state, and develop a plan for repairing leaks that are determined to be causing significant damage. Utility companies regularly survey pipelines for potentially explosive leaks, but until now, they have not been required to address environmental damage from gas leaks. In conjunction with DEP, the DPU will be developing regulations to determine what the environmental impacts are how they are calculated. The Town should submit comments on these regulations once they are available for public comment.

#### Pending Legislation

There are two pending bills in the Massachusetts legislature designed to address the issue of gas leaks:

##### [Bill H.2870](#) - *An Act Relative to Protecting Consumers of Gas and Electricity from Paying for Leaked and Unaccounted for Gas*

This bill would prohibit utilities from passing the cost of wasted gas onto consumers, incentivizing utilities to fix gas leaks as quickly and cost effectively as possible. When a similar bill was passed in Texas, 55 percent of gas leaks were repaired within three years.

##### [Bill H.2871](#) - *An Act Relative to Gas Leak Repairs During Road Projects*

This bill would require that whenever a street is already open for construction, gas companies check and repair all gas leaks. Repairing leaks before repaving is not only less expensive for utilities, it also decreases the chance a street will need to be reopened afterward for pipeline repairs. As a result, future street repaving needs, costs to the municipality, and disruption to nearby residents and businesses will all be reduced.

Thirty-one municipalities, including Wellesley, have already passed resolutions supporting one or both of these bills. On February 29, 2016, the [Town of Wellesley passed a resolution](#) in support of both bills.

**Recommendation**

**7.b. Ensure all Gas Leaks along Route 9 are Fixed Prior to Paving**

National Grid has programmed a gas main lining project for calendar year 2017 along Route 9 in Wellesley. It is imperative that there be ongoing coordination between the Town, MassDOT, and National Grid to coordinate all roadway work. The ideal time for National Grid to make utility repairs and upgrades along the Route 9 corridor would be when MassDOT's reconstruction project has commenced and the roadway is 'open.'

**Recommendation**

**7.c. Lead Coordination of Roadway Work**

While it may not be necessary for Wellesley to invest in a centralized database tool, the municipality can act as a 'project manager' to coordinate the needs of utilities to conduct roadway work and the state's responsibility to perform resurfacing or reconstruction work with sufficient lead time.

**Recommendation**

**7.d. Review MAPC's Study of Natural Gas Leaks**

The U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration recently awarded MAPC a federal grant to study natural gas leaks in the region and to assess the approaches municipalities can take to accelerate improvements to the system. In partnership with HEET, MAPC is leading a one-year project to perform independent surveys of gas leaks and collect municipal street repair planning and utility collaboration practices from cities and towns in the MAPC region. By combining leak survey data with municipal coordination practices, MAPC seeks to chart an improved course for municipalities and utilities to work together to reduce methane leakage. MAPC expects to release results from the project, including best practices for street repair planning and utility coordination, during the summer of 2016.

Once released, the Town should review this report. The report's recommendations and best practices should provide further guidance regarding the identification of gas leaks and collaboration with utilities for their repair.

## **TOPIC AREA 8 MAINTENANCE**

Since Route 9 is a State road, overall maintenance of the roadway and its right-of-way is the responsibility of the State<sup>12</sup>. These maintenance responsibilities include: guardrails, landscaping, medians, pavement markings, paving, sidewalks, signage, snow removal, street sweeping, and traffic signals. The Town of Wellesley is responsible for maintaining streetlights along the Route 9 corridor.

While MassDOT District 6 does have a maintenance plan in place, the agency is significantly understaffed and does not have the capacity to effectively implement its maintenance plan. Consequently, MassDOT reacts primarily to complaints resulting in maintenance being carried out on a piecemeal basis. This has resulted in a lack of overall maintenance for the Route 9 corridor. However, there are measures the Town, residents, property owners, and businesses could implement to improve the corridor. In turn, a successful maintenance plan will ensure the safe and efficient operation of the Route 9 corridor.

### **Recommendation**

#### **8.a. Develop a Comprehensive Maintenance Plan for the Route 9 Corridor**

A comprehensive maintenance plan should be developed that will ensure the appropriate maintenance of existing infrastructure as well as the implementation of planned improvements for Route 9. The maintenance plan should:

- Continually examine immediate and future funding sources.
- Program, plan, design, and execute road improvements.
- Establish a public relations component to communicate goals and objectives.
- Inform residents who to contact regarding specific maintenance issues (e.g., MassDOT or the Town)
- Strive to achieve a standard and coordinated level of care.

### **Recommendation**

#### **8.b. Annually Prioritize a Top List of Specific Maintenance Issues and Convey to MassDOT**

With feedback from residents, property owners and businesses, the Town should annually develop a top list of specific maintenance issues and convey them to MassDOT as part of the comprehensive maintenance plan. Subsequently, Wellesley should work with MassDOT to resolve the identified maintenance issues.

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<sup>12</sup> A right-of-way is a type of easement granted or reserved over land for transportation purposes –such as for a highway. MassDOT holds right-of-way wider than the Route 9 roadway itself for several reasons. The extra land is used for public sidewalks, utilities, street lights, and traffic signals. State highway layout information and access to view and download image files of State Highway Layout (SHLO) Plans is available on-line. These maps show the approximate location of state highway layout plans and state highway alteration plans. While these plans are not intended to be used to precisely locate the baseline or the sidelines of highway layouts, they do indicate what is under MassDOT jurisdiction. These plans, maintained by MassDOT's Survey Office, are available on-line at: <http://services.massdot.state.ma.us/maptemplate/statehighwaylayouts>

### **Recommendation**

#### **8.c. Develop a Sidewalk Maintenance Plan**

A maintenance plan for sidewalks along the Route 9 corridor should be developed and supported with adequate financing. Whether the Town or the State is responsible for clearing and maintaining sidewalks (e.g. trash removal and snow clearance) is open to debate. The responsible parties need to be identified and included as part of a maintenance plan.

### **Recommendation**

#### **8.d. Require Landscaping Operations and Maintenance Plans for Large Commercial Developments**

Require landscaping operations and maintenance plans for commercial developments along the Route 9 corridor, particularly in the eastern and western gateways.

### **Recommendation**

#### **8.e. Establish a Restoration and Preservation Plan for Historic Features**

Following an inventory and assessment of the condition of historic features along Route 9, a separate restoration and preservation plan should be advanced. This restoration and preservation plan should take into account Route 9's historic features, including but not limited to the public works projects that created walls, bridges, and retaining walls as well as stairs, grassy medians, and wrought iron railings – features which are integral to the character of Route 9 and the Town as a whole.

Examples of historic features along the Route 9 corridor include, but are not limited to:

- Wrought iron railings in Wellesley Hills (along the southern side of Route 9 adjacent to Elm Park).
- Stone walls west of Rockland Street and near Standish Road.
- Retaining walls near Longfellow Road, Oakland Street, and Westgate Road.
- Grassy medians near Bancroft Road and east of Kingsbury Street.
- Bridges and staircases at Cliff Road and Weston Road.

A successful example of a past preservation effort along the Route 9 corridor is the reconstruction of the Route 9 underpass at Washington Street. Completed about a decade ago, the preservation of this stone work has served as a significant benefit to the Town.

### **Best Practices**

The neighboring Towns of Natick and Framingham require landscaping and maintenance plans for commercial developments. While it is recognized there are differences in zoning and land use between municipalities, Natick's Landscaping Operations and Maintenance Plan and Framingham's process for Site Plan Review are included as best practices. Wellesley could review both in detail and potentially adopt components of either plan to enhance their own.

#### Town of Natick – Landscaping Operations and Maintenance Plan

The Town of Natick requires a Landscaping Operations and Maintenance Plan for new commercial developments. For reference, the Landscaping Operations and Maintenance Plan along with the Modification of Site Plan and Special Permit and Highway Overlay District Special Permit for MathWorks is included in *Appendix B*.

Codified in Natick's Zoning By-Laws (Section 320), Highway Overlay Districts are districts which overlay nonresidential zoning districts abutting major arterial highways, such as Route 9. The language for landscaping requirements for developments in Highway Overlay Districts is also included in *Appendix B*.

### Town of Framingham – Site Plan Review

Most development along Route 9 in Framingham is by Planning Board Special Permit which has conditions that are derived through an extensive site plan review process. Conditions are imposed and then overseen by the Planning Board and Building Commissioner. Typically these conditions involve specific landscaping plans and operational maintenance standards.

Through site plan review (Section VI.F of the Zoning By-Laws), Framingham requires landscaping and sidewalks for properties that front a public way. For reference, the Town of Framingham’s Planning Board decision for a Wendy’s drive-thru facility is included in *Appendix C*. Landscaping and maintenance requirements for the project are summarized on pages 12-13. Framingham also has codified Highway Overlay District Regulations as part of their Zoning By-Laws (Section III) which are also included in *Appendix C*.

### **Recommendation**

#### **8.f. Adhere to Effective Coordination and Timing of Projects**

Effective long-term maintenance will ensure that improvements, once made, will remain permanent and advance long-term cost savings. For example, to ensure project longevity and effective investments, underground work (e.g.; culverts, placement of overhead utility lines underground) should take place prior to any at-grade roadway work. The fact that MassDOT currently does not utilize a centralized database to coordinate roadway reconstruction and utility work underscores the need for effective coordination.

### **Best Practice**

#### Centralized Database Tool – COBCUS (City of Boston Utility Coordination Software)

Use of the City of Boston’s COBCUS (City of Boston Utility Coordination Software) centralized database tool is an example of a best practice that facilitates the effective coordination of roadway reconstruction and utility work. Essentially a reservation system, COBCUS enables streamlined coordination with utility companies, private contractors, and other agencies to develop a resurfacing and reconstruction program that does not conflict with the various major programs each agency plans to perform. All entities, including the City of Boston, must reserve their future work in the COBUCS program. No permits are issued without the project first being submitted through the COBUCS program for review, including utility work and roadway resurfacing or reconstruction.

The COBUCS tool allows for major utility companies and the City of Boston to establish long-term capital programs that can be successfully coordinated allowing all work to take place without the need to cut into newly paved roadways. Since August of 2009, the COBUCS program has assisted the City in avoiding over 1,700 conflicting utility projects that may have otherwise caused excavation on a newly paved roadway. Currently, the City of Boston is one of the few cities in the country that mandates all entities wishing to perform excavation work to use a coordination program for clearance prior to obtaining a permit.

## **Recommendation**

### **8.g. Implement Adopt-A-Highway Programs**

If Wellesley wants to designate specific areas along Route 9 for clean up or roadway enhancements, they will need to work with MassDOT. Specific programs offered by MassDOT include Adopt-a-Highway, Adopt-a-Visibility Site, or Sponsor a Highway. According to MassDOT, these three volunteer programs combined have removed about 98,000 tons of litter from Massachusetts highways and roadways in 2013.

#### Adopt-A-Highway

[Adopt-A-Highway](#) is a public service program that utilizes volunteer teams to pick-up litter along state roadways in Massachusetts. Each volunteer team "adopts" a two mile section of highway and is responsible for removing litter at least once a month between April 15th and November 15th. This program provides an opportunity for environmentally conscious groups and corporations to participate in keeping Massachusetts roads litter-free. Adopt-A-Highway groups must have at least six members.

#### Adopt-A-Visibility Site

The [Adopt-A-Visibility Site](#) program is designed to encourage environmentally conscious school, business, and community groups to assist in beautifying their community by supplying volunteer resources to upgrade and maintain high visibility areas and off-ramps on state highways. MassDOT provides safety training and guidelines, safety vests, and plastic litter bags for clean-up projects. Volunteers usually remove litter, mow and trim vegetation, as well as manage plantings.

Participants of this program usually include local interest groups such as garden clubs, environmental clubs, chambers of commerce, youth groups and landscape companies. An increasing number of businesses have chosen to participate in Adopt-A-Visibility Site programs. The area of responsibility is smaller under this program compared to the Adopt-A-Highway or Sponsor-A-Highway programs. Adopt-A-Visibility Sites require permit agreements with MassDOT where a benefactor (e.g., a private company) will be responsible for the maintenance of landscaping. One example is at Squire Road and Brown Circle in Revere as shown in the image above. The landscaped median Kingsbury Street could be a good candidate for an Adopt-A-Visibility Site program.

*Adopt-A-Visibility Site  
Squire Road and Brown Circle  
Revere, Massachusetts*



*Source: Google*

#### Sponsor-A-Highway

The [Sponsor-A-Highway](#) program provides civic-minded companies an opportunity to enhance Massachusetts's roadways by 'sponsoring' segments of highways. Companies who utilize this program pay a fee to (Sponsor-A-Highway) SAHI or Adopt-A-Highway Litter Removal Service of America (AAHLRSA) to perform litter removal in two-mile portions of a roadway. Sponsor-funded maintenance providers conduct 24 clean-ups per year.

In recognition of volunteer efforts, MassDOT installs signs recognizing the adopting group for their contribution and work toward keeping the roadway clean. Since these signs can be distracting to drivers and contribute to sign clutter, the Town could look into other ways to recognize the volunteers who may choose to participate in Adopt-A-Highway programs along Route 9.

## **Recommendation**

### **8.h. Organize Community-Run Cleanup Events and Programs**

Organize a cleanup group for homeowners along Route 9. A Homeowner's Association or similar group could assist with assembling such a group.

## **Best Practices**

### Boston Shines

[Boston Shines](#) is a neighborhood cleanup program in the City of Boston and includes streets, sidewalks, parks, school yards, or city properties. Each year, volunteers (e.g., residents, business volunteers, public organizations, public agencies) participate in a citywide clean up and beautification event by planting flowers, sweeping, raking, and picking up trash. Boston Shines takes place over three weekends in the spring and focuses on four service areas: physical service, university engagement, youth development, and expanding volunteer opportunities that help unite neighbors and communities. The City of Boston is responsible for picking up the trash and supplies when the cleanup is over.

### Valley Pride Day

Intended to be a fun community effort, Valley Pride Day is an annual litter clean up day throughout New Hampshire's Mount Washington Valley and western Maine that takes place the first Saturday of May. On this day, community members clean litter from stretches of road between 8:30am-11:30am. Afterwards, there is a celebration with food, prizes, and entertainment. Valley Pride Day completed its 16<sup>th</sup> year. Several tons of trash are collected each year.

## **Recommendation**

### **8.i. Utilize Inmate Work Programs**

The state relies on inmate work crews to remove litter along highways. According to MassDOT, between 1,900 and 2,700 inmate crews perform this service<sup>13</sup>. Using inmate labor saves tax dollars and allows projects to advance that would have otherwise been postponed. The Norfolk County Correctional Center does offer a Community Service program. Notification of residents in the area prior to inmate work crews performing clean-up services and additional supervision of inmate work crews is recommended.

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<sup>13</sup> [Roadside Litter Persists in Mass. What's the Solution?](#), ecoRI News, September 8, 2013.

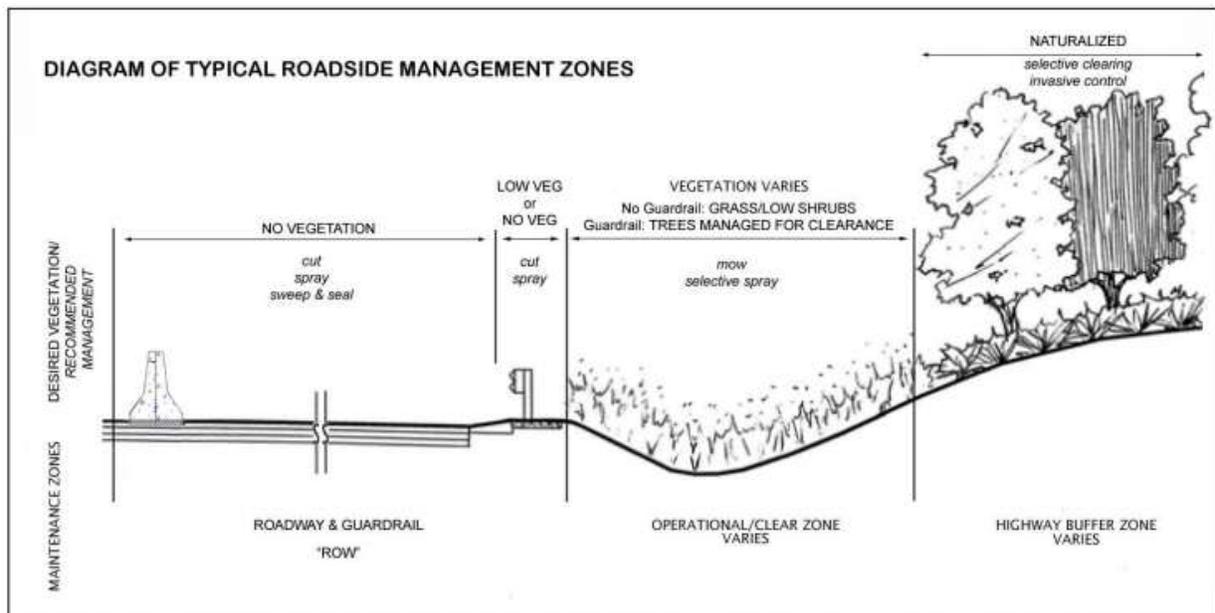
## TOPIC AREA 9 CORRIDOR AESTHETICS AND IDENTITY

MassDOT controls vegetation along state roads and highways in compliance with the Rights of Way Management Regulations ([333 CMR 11.00](#)) as promulgated by the Massachusetts Department of Agricultural Resources (MDAR). MassDOT is primarily responsible for mowing and periodic tree maintenance along the Route 9 corridor in Wellesley.

MassDOT is required to submit a Vegetation Management Plan (VMP) covering a five year period. The purpose of the VMP is to establish MassDOT's vegetation management practices, provide guidelines for Integrated Vegetation Management, and ensure that work is in compliance with the Rights of Way Management Regulations. Subject to approval of the VMP by MDAR, MassDOT is also required to prepare an annual Yearly Operational Plan (YOP). The YOP provides information about the vegetation management program to be carried out for that year.

According to MassDOT's 2014-2018 VMP: *The primary objective of roadside vegetation management is to provide safe use of and access to roadways, sidewalks and facilities, and to preserve the integrity of highway infrastructure. Integral to achieving this primary objective is providing stormwater control through proper management and use of plant material, maintaining slope stabilization, protecting habitat and resource area, preserving and enhancing the scenic quality of the roadside, and controlling invasive and noxious plants. Uncontrolled roadside vegetation can impede normal maintenance operations, obstruct motorists' line of vision, block safe access to roadways and sidewalks, and can cause damage to structures such as median barriers, pavements, shoulders, guard posts, drainage lines, and waterways. Uncontrolled invasive species exacerbate maintenance problems and cause degradation of right of way land and of abutting land (p 1).*

MassDOT approaches vegetation management based on three zones: Roadway and Guardrail Zone, Operational/Clear Zone, and Highway Buffer Zone as depicted in the following illustration:



Source: MassDOT - Vegetation Management Plan - 2014-2018

### Roadway & Guardrail Zone

Guardrails, curbs, sidewalks, median barriers, and medians comprise this zone. Work in this area is specific to the needs of maintaining the roadway and roadway infrastructure. The management goal for this zone is to keep hard surfaces (i.e., curbs, sidewalks, median barriers) free of vegetation. With an area free of vegetation, sight distance requirements can be met and visibility enhanced. In addition, a vegetation free area will promote safe vehicle and pedestrian access, proper stormwater drainage, and the preservation of infrastructure.

### Operational/Clear Zone

The Operational/Clear Zone extends from the end of the Roadway and Guardrail Zone to a 20-30 foot setback. Controlling vegetation, maintaining signage visibility, and allowing for stormwater drainage and infiltration are the primary management goals for this zone.

### Highway Buffer Zone

The Highway Buffer Zone extends from the edge of the Operational/Clear Zone to the right-of-way limit. This area is typically not managed except for tree cutting and controlling invasive plant species. Maintaining and preserving a self-sustaining plant community, a protective buffer for wetlands and water bodies, and providing stormwater and habitat benefits are the primary management objectives for this zone.

In addition to purifying air, enhancing aesthetics, and improving environmental conditions, research has determined that trees and landscaping are central both to health and psychological well-being<sup>14</sup>. Tree lined streets greatly enhance the appearance and comfort of a corridor and can serve to calm traffic by narrowing the apparent width of the roadway. Trees and landscaping provide numerous environmental, economic, and social benefits as outlined in the table below<sup>15</sup>.

*Benefits of Street Trees and Landscaping*

Environmental	Economic	Social
Produces oxygen	Reduces demand on infrastructure (e.g., sewer, energy)	Improves streetscape aesthetics
Filters air pollution (e.g., remove carbon dioxide and UV radiation)	Reduces building heating/cooling costs	Improves public health (e.g., physical, mental)
Improves air quality	Increases property values	Fosters civic pride and identity
Reduces stormwater runoff		Can slow traffic
Abates noise		
Creates habitat for plants and animals		
Improves soil quality		
Heat absorption		

In spite of the positive benefits of trees and landscaping, they face a variety of dangers. For example, roots can be damaged by construction, severed by concrete, or impeded by sidewalks, curbs, gutters, and street pavement. Trees and landscaping are vulnerable to insects, diseases, invasive plants, and severe weather events – all of which could be exacerbated by climate change.

<sup>14</sup> [The \(Pretty Much Totally\) Complete Health Case for Urban Nature](#), City Lab, Eric Jaffe, October 20, 2015.

<sup>15</sup> [Sustaining America's Urban Trees and Forests](#), United States Department of Agriculture, June 2010.

## **Recommendation**

### **9.a. Develop a Tree Protection Plan for the Route 9 Corridor**

The Town and MassDOT should collaborate to inventory and assess the health of trees along Route 9. A tree protection plan designed to maintain and monitor the health of trees should be developed following the inventory and assessment. The overall goal of a tree protection plan is to provide a consistent and healthy tree canopy along the Route 9 corridor.

The tree protection plan should address appropriate planting and replacement of trees as deemed necessary. As landscaping can supplement tree planting and conceal land uses (e.g., parking lots) without obstructing sight lines, landscaping should also be incorporated as part of the plan. It is important that trees establish a rhythm and create a consistent, inviting character along the corridor. For seasonal interest and overall longevity, various tree species are encouraged. A tree protection plan will enable Wellesley and MassDOT to make informed decisions on where to focus resources. An effective plan should yield considerable efficiencies such as facilitating maintenance work and ultimately helping to manage costs.

The environmental benefits of trees and landscaping equates to significant economic benefits. In addition to enabling Wellesley to think more strategically about the health and sustainability of trees, assessing their value can help bring attention to their importance and economic value. For example, the U.S. Forest Service offers a free software program referred to as [i-Tree](#). By using GIS, satellite imagery, and algorithms, i-Tree enables municipalities to produce detailed inventories of their tree canopies and quantify their environmental and monetary value. It should be noted that MassDOT does not have a tree inventory and does not have immediate plans to develop one.

## **Best Practices**

A 2014 [i-Tree analysis of Austin, Texas](#) determined that the city's estimated 33.8 million trees save the city nearly \$19 million annually in reduced building-energy use and approximately \$5 million in reduced carbon emissions. The i-Tree analysis concluded that trees and landscaping is worth \$3 million per year due to their reduction of air pollution and nearly \$12 million per year in the amount of carbon the trees remove<sup>16</sup>.

The [City of Tampa 2011 Urban Forest Analysis](#) concluded that trees save the city nearly \$35 million annually in reduced costs for public health, stormwater management, energy savings, prevention of soil erosion, along with other savings<sup>17</sup>. [Portland, New York City, Milwaukee](#), and [Atlanta](#) are among the cities that have also quantified the benefit of street trees.

The University of South Florida has [begun mapping individual trees](#). In addition to providing dimensional information; stormwater interception, energy conservation, the estimated annual payoff is calculated for each tree.

## **Recommendation**

### **9.b. Install LED Street Lights with Attention to Aesthetics**

The spacing, color, intensity, and glare of LED lighting should all be carefully taken into consideration prior to installation. It is important to note that the MLP's bid specification for LED fixtures will require street lights to minimize light pollution or be "dark sky" compliant.

It should be noted that replacing existing aluminum (silver colored) lights with different colored poles and fixtures (e.g., black or green) is costly and, if for aesthetic purposes only, not considered to be cost beneficial. That said, if funds were made available, the MLP would be willing to make these changes.

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<sup>16</sup> [What are Trees worth to Cities?](#), CityLab, Laura Bliss, April 21, 2016.

<sup>17</sup> [City of Tampa 2011 Urban Forest Analysis](#), September 2013.

## Recommendation

### 9.c. Explore Placement of Overhead Wires Underground

Since the cost to underground overhead wires is very expensive<sup>18</sup>, the Town should stay apprised of any potential grant or funding opportunities to do this work. The Town should require any significant commercial or redevelopment projects to include placing overhead wires underground along their site frontage. If Wellesley is strongly interested in undergrounding overhead wires, adding a surcharge to utility bills to cover this expense could be explored.

The Edison Electric Institute (EEI), a Washington-based association of shareholder-owned electric companies, conducted a 2012 study on the undergrounding of overhead power lines, [Out of Sight, Out of Mind](#), and concluded that the most significant obstacle to converting above-ground systems to underground systems is cost, which is about five to 10 times the cost to install overhead lines. EEI polled electric customers concerning their willingness to pay for undergrounding and concluded that the majority of customers have a limited tolerance for higher costs for utility services to pay for undergrounding. Brookline, Chelmsford, Duxbury, Newton, and Randolph have all completed limited projects to bury their overhead wires<sup>19</sup>.

In addition to improving aesthetics, undergrounding overhead wires are less vulnerable to high winds, falling trees, ice, and snow. The removal of overhead wires can allow tree canopies to grow and removal of telephone poles can enhance safety by improving sight lines. Potential drawbacks to undergrounding overhead lines include susceptibility to flooding and lightning. It should be noted that the reliability benefits between overhead and underground wires are currently not much different.

As shown in the figure below, approximately half of the Route 9 corridor is contains overhead wires, with slightly more along the westbound side. Overhead wires are concentrated in the eastern and western sections of the corridor.

*Estimated Overhead Wire Coverage along Route 9*



<sup>18</sup> MLP broadly estimates that placing overhead wires underground could cost between \$10 and \$20 million. This estimate just includes utility costs and does not include costs for excavating manholes and duct banks.

<sup>19</sup> [CBS Boston. Patrick: \\$1 Trillion to Bury Power Lines Underground. 10/31/11.](#)

## **Recommendation**

### **9.d. Ensure Prevention of “Double Poles”**

“Double poles” occur when utility companies fail to remove obsolete utility poles after they have been replaced and lines attached to them (power, cable, phone, etc.) are transferred to the new pole. The presence of “double poles”, a new utility pole and an obsolete utility pole typically side-by-side for prolonged periods is not aesthetically-pleasing and presents safety concerns. While “double poles” are currently not an issue along the Route 9 corridor, MLP should continue to work proactively with utility companies to ensure their prevention.

State law currently requires utility companies that own the poles to remove them within 90 days. However, there is no strong enforcement mechanism and the poles are not always removed. Legislation was recently passed that, in addition to requiring utility companies to create a timeframe for removing “double poles”, they are required to file an annual report to the state which inventories “double poles”, summarizes the average number of days between the erection of a second pole and the takedown of the original obsolete utility pole, and provide a timeline for the projected removal of existing “double poles”<sup>20</sup>. Upon receipt and review of the 2016 annual report, the state may endeavor to propose a fine structure for failure to remove outstanding “double poles”. It is important to note that this legislation only pertains to “abandoned” poles (e.g., poles that have no utilities attached).

## **Recommendation**

### **9.e. Pursue the Installation of Multimodal Wayfinding Signs**

MassDOT is responsible for furnishing adequate directional and informational signage on the state highway system. General guidance for this responsibility is found in Chapter 85, Sections 2 and 2D<sup>21</sup> of the General Laws of Massachusetts. MassDOT also uses a standardized a Guide Sign Policy ([MassDOT Guide Sign Policy for Secondary State Highways \(2005 edition\)](#)) for use on all secondary state highways, and other roads and streets (except for expressways and freeways) within Massachusetts<sup>22</sup>. The purpose of the Guide Sign Policy is to outline the current standards and guidelines for the design and application of guide signs (designated as the D6-, D8-, and G-series). These signs are consistent with the principles and standards established in the MUTCD. The Guide Sign Policy directs and informs drivers of intersecting routes, to direct them to cities, towns, or other important destinations, and to provide this information in the most simple and consistent manner possible.

Since Route 9 is controlled by MassDOT, Wellesley’s ability to dictate signage along Route 9 is limited whether mounted on sign poles or overhead on mast arms. Signage proposed by the Town will need to be coordinated and approved by MassDOT. The philosophy of MassDOT’s Guide Sign Policy, consistent with that of the MUTCD, is that only signs directing drivers to well defined geographical locations should be permitted on the state highway system. It should be noted that, in rare instances, exceptions have been made which allow special types of signing on the state highway system.

*Existing Wayfinding Signage  
in Wellesley Hills*



<sup>20</sup> [The Commonwealth of Massachusetts, House Bill 4565, Section 239.](#)

<sup>21</sup> [MGL Chapter 85, Section 2 – Traffic Signs or Devices: Erection and Maintenance: Rules and Regulations](#)  
[MGL Chapter 85, Section 2D – Signs on State Highways: Indicating Availability of Certain Services](#)

<sup>22</sup> <http://www.massdot.state.ma.us/highway/Departments/TrafficandSafetyEngineering/PoliciesandDesignGuidelines/GuideSignPolicyforSecondaryStateHighways.aspx>

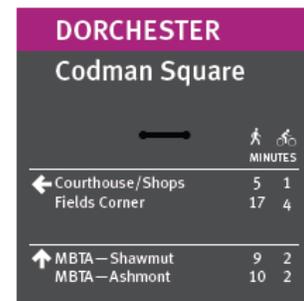
In addition to serving as a way to ‘brand’ or identify a community, multimodal wayfinding signs provide directions that enable vehicles, pedestrians, and bicyclists to locate destinations (e.g., commuter rail stations, Linden Square, MassBay Community College, Wellesley College, Wellesley Hills, Wellesley Square). Wayfinding signage can include distance information and times to walk or bike to specific destinations. It should be noted that the Town of Wellesley already has wayfinding signage in the Wellesley Hills neighborhood which could be expanded.

Where appropriate, the installation of multimodal wayfinding signage at streets approaching and intersecting with Route 9 not under state jurisdiction should be considered.

### Best Practices

The Cities of Springfield, Pittsfield, and Boston have all recently implemented wayfinding signs. The City of Springfield is in the midst of implementing a wayfinding program as part of an initiative to improve public health and make the downtown a more attractive destination for pedestrians. The signage is funded by a grant from the Centers for Disease Control and State Department of Public Health. The City of Pittsfield has installed signage as part of a two mile walk referred to as the ‘Downtown Loop’, a program created to encourage healthier lifestyles. The City of Boston recently installed a wayfinding system for Dorchester’s Codman Square neighborhood. This wayfinding program is designed to highlight resources as well as encourage walking and bicycling.

*Wayfinding Signs in Springfield, Pittsfield, and Boston (left to right)*



Sources: *The Reminder, Springfield Unveils New Wayfinding Program, 4/28/16; Pedestrian Infrastructure: Strategies for Improving Pedestrian Safety through Low-Cost Traffic Calming, WalkBoston, 2015.*

## Recommendation

### 9.f. Identify Historically Significant Features

Ensure preservation and publicly recognize sites along Route 9 that are of historic significance through interpretive signage or a sidewalk medallion program. Sidewalk medallions are ornamental emblems that are set or stamped into sidewalks along a streetscape, usually at intersection corners. These medallions can be bronze, tile, or precast concrete.

## Best Practices

### Points of Light Monument

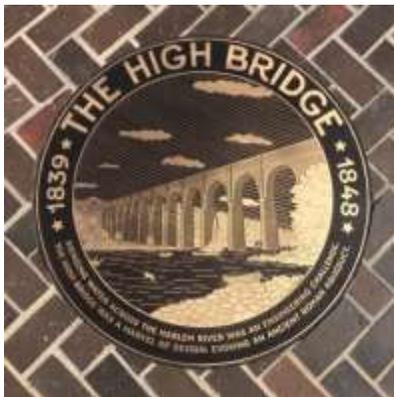
Located on sidewalks in downtown Washington, D.C., The Points of Light Monument honors the service of pioneers who have transformed the nation and world in the country's volunteer movements (e.g., Susan B. Anthony, Dr. Martin Luther King, Jr.). To date, 33 medallions have been installed in city sidewalks. The pathway of bronze circular medallions will eventually stretch one mile and include 70 medallions. Each medallion includes portraits of the honorees, descriptions of their activities, and inspirational quotes. Each medallion has a corporate sponsor.



Sources: Sierra Club and theageofgrace.com

### The High Bridge: Historic Medallions

Nine 36 inch cast bronze historical medallions, depicting a timeline of New York City's High Bridge, were commissioned by the New York City Department of Parks and Recreation. The High Bridge is the oldest standing bridge in New York City and currently serves as a pedestrian walkway connecting Manhattan and the Bronx.



Source: andrewslefevre.wordpress.com

**Recommendation**

**9.g. Establish Gateways at the East and West Entrances of Route 9**

Gateways, or defined access points, should be developed for both the east and west entrances of Route 9. Well-defined gateways serve as welcoming entries to the Town as well as a source of pride and identity. Many of the recommendations outlined in this report (e.g., wayfinding signage, landscape design, identification of historic features) serve to establish successful gateways, which should be considered priority locations. Gateways can be either physically constructed or natural in their design. The Town should work with the developer 900 Worcester Street to advance a gateway for the west entrance of Route 9.

**Recommendation**

**9.h. Support and Encourage Use of New Roadway Technologies**

New roadway technologies are currently under development which could potentially be implemented in the future. While the implementation of these new technologies is several years away, the Town should be open to their use. These technologies could include installing thin photovoltaic panels on roads to power streetlights and buildings or enhanced traffic signal systems that can identify when a pedestrian is crossing a roadway. Other technologies, referred to as Dynamic Wireless Power Transfer (DWPT), could involve exploring options that can transmit electricity to charge electric cars while they are driving<sup>23</sup>. Since the Town is responsible for the transmission and supply of electricity to its residents and businesses, there is potential to earn revenue from these types of technologies.

**TOPIC AREA 10  
GOVERNMENTAL COLLABORATION**

**Recommendation**

**10.a. Develop a Working Strategy among Wellesley’s Residents, Business Community, Town Government, and the State**

The resolve to plan the future of the Route 9 corridor needs to be the result of a working strategy among Wellesley’s residents, business community, Town government, and the state. The recommendations outlined in this plan build the foundation for cooperative action based on continued involvement and collaboration. The working strategy will develop and advocate for recommendations as well as pursue funding opportunities.

**Recommendation**

**10.b. Undertake a Comprehensive Public Outreach Campaign**

To raise awareness of the importance to make successful and long lasting changes along the Route 9 corridor, a comprehensive and inclusive public outreach campaign is a crucial step. To help build support, a public outreach campaign should outline proposed programs, benefits to residents and businesses, and convey anticipated challenges.

<sup>23</sup> [Coming Soon to France: Hundreds of Miles of Solar-Powered Roads](#), Julian Spector, CityLab, 2/9/16.

## Complete Streets

The Town of Wellesley should pursue steps to develop Complete Streets policies and programs. Complete Streets practices will assist the Town with advancing recommendations that will improve the Route 9 corridor outlined in the previous section. This section contains resources and identifies best practices to implement Complete Streets policies and programs.

According to MassDOT, a *Complete Street is one that provides safe and accessible options for all travel modes – walking, biking, transit and vehicles – for people of all ages and abilities. Complete Streets improvements may be large scale such as corridor wide improvements or focused on the needs of a single mode*<sup>24</sup>.

The benefits of Complete Streets include:

- Improved Health
- Improved Safety
- Increased Economic Development
- Reduced Personal Transportation Costs
- Reduced Congestion
- Improved Environment and Air Quality
- Improved Connections

When implementing Complete Streets policies or programs, municipalities need to take into account not only vehicles but also pedestrians, bicyclists and public transportation access as part of the planning, design and operational procedures undertaken for construction or renovation of streets. It is important to note that many Complete Streets considerations are low-cost and may be as straightforward as restriping existing crosswalks or improving markings for all road users. Implementation of Complete Streets can promote and improve public health, reduce traffic congestion, make places safer and more livable, as well as reduce environmental impacts.

According to Smart Growth America/National Complete Street Coalition, a *Complete Streets approach integrates the needs of people and place in the planning, design, construction, operation, and maintenance of transportation networks. In doing so, streets become safer for people of all ages and abilities and better support overall public and economic health. Complete Streets redefines what a transportation network looks like, which goals a transportation agency is going to meet, and how a community prioritizes its transportation spending. The Complete Streets approach breaks down the traditional separation between planning and designing for driving, transit, walking, and bicycling.*<sup>25</sup>

### Massachusetts' Complete Streets Funding Program

Authorized by the 2014 Transportation Bond Bill, the Complete Streets Funding Program offers Massachusetts municipalities incentives to adopt policies that promote safe and accessible roadways. Specifically, MassDOT has initiated a funding program for cities and towns that have enacted Complete Streets policies. After attending a training and adopting a Complete Street policy, municipalities can apply for two funding sources: technical assistance to develop a prioritization plan (up to \$50,000) and construction funding (up to \$400,000, not including design as an expense). The two-year pilot program has been extended for five years in the state's 2017-2021 Capital Investment Plan.

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<sup>24</sup> MassDOT Complete Streets Funding Program PowerPoint and Complete Streets Funding Program Guidance, 2015.

<sup>25</sup> The Best Complete Streets Policies of 2015, Smart Growth America/National Complete Street Coalition, p 1.

In addition to funding, MassDOT offers training and design guidance as part of this program. [MassDOT's Complete Streets website](#) and [interactive web portal](#) is designed to assist municipalities through the policy development, prioritization planning, and project approval steps of a Complete Streets application process. Moreover, a [Complete Streets Funding Program Guidance](#) document outlines program requirements, a model policy guidance and scoring system, in addition to types of eligible infrastructure. The [Complete Streets Funding Program Guidance](#) document describes the full requirements of the program, including guidance on best practices in Complete Streets Policy development and implementation.

According to the document, designing complete streets contributes toward the safety, health, economic viability and quality of life in a community by providing safer, more accessible and comfortable means of travel between home, school, work, recreation, and retail destinations for all modes. In sum, integrating Complete Streets principles in policy and practice helps to advance more livable communities.

The creation of Complete Streets encourages an active transportation lifestyle and is supported by the United States Centers for Disease Control and the Massachusetts Department of Public Health as a way to decrease obesity and reduce risk for chronic diseases (heart disease, arthritis, diabetes, etc.). Also inherent in the development of a Complete Street is meeting the most current accessibility guidelines outlined by the Americans with Disabilities Act (ADA) and the Massachusetts Architectural Access Board (AAB), which are upheld by Code of Massachusetts Regulations 521 (521 CMR).

Complete Streets improvements may be large scale, such as corridor-wide improvements that include a separated bicycle lane, new crosswalks and new bus stops; or small scale incremental improvements, such as a new bus shelter to encourage transit use. Other Complete Street project examples include improved street lighting, minor changes to traffic signal timings, new bicycle or pedestrian facilities, median refuge islands, or improved connection to transit.

The design of a Complete Street should be context sensitive and incorporate improvements or treatments that fit with the need and within the character of a community. The FHWA defines context sensitive solutions as a *collaborative, interdisciplinary approach that involves all stakeholders in providing a transportation facility that fits its setting. It is an approach that leads to preserving and enhancing scenic, aesthetic, historic, community, and environmental resources, while improving or maintaining safety, mobility, and infrastructure conditions.*

The following are considered eligible infrastructure elements as part of MassDOT's Complete Streets Funding Program. All of these elements have been identified as issues and opportunities as part of the Route 9 Phase 1 Enhancement Plan. These elements include:

Street lighting	ADA/AAB compliant curb ramps
Intersection improvements	Pedestrian buffer zones
Pedestrian signal timing	Pedestrian refuge islands
New sidewalks, sidewalk widening, and/or repairs	Crosswalks
New or improved crossing treatments at intersections	Accessible pedestrian signals
Pavement markings or signage that provides guidance for alternative modes	Designated bicycle lanes

## Massachusetts' Complete Streets Policies

Adopting a Complete Streets policy is the first step in planning, designing, operating, and maintaining streets that are safe, convenient, and comfortable for all users and modes of travel<sup>26</sup>. According to Smart Growth America/National Complete Streets Coalition, the *policy elements refine a community's vision for transportation, provide for many types of users, complement community needs and establish a flexible approach necessary for an effective Complete Streets process and outcome*. A Complete Streets policy directs decision-makers and stakeholders to consistently incorporate complete streets principles.

[The Best Complete Streets Policies of 2015](#), a report prepared by Smart Growth America/National Complete Streets Coalition, reviewed and scored each Complete Streets policy adopted in 2015 and recognized 16 municipalities nationwide for Complete Streets policies. Seven of these municipalities were in Massachusetts. The seven municipalities, including links to their adopted Complete Streets policies, are [Ashland](#), [Framingham](#), [Longmeadow](#), [Lynn](#), [Natick](#), [Norwell](#) and [Weymouth](#). Framingham's and Natick's Complete Streets policies are also included in Appendix D. The table below identifies all 27 Complete Street policies adopted in Massachusetts.

### **Complete Streets Policies Adopted in Massachusetts**

MUNICIPALITY	ENACTMENT DATE	TYPE OF MEASURE	2010 POPULATION
1. Acton*	7/28/14	Policy Approved by BoS/PB	22,599
2. Beverly*	3/9/15	Policy Approved by CC	40,286
3. Boston*	N/A	Design Manual Guide	636,479
4. Cambridge*	1992-2013	Exists in Multiple Plans	106,471
5. Everett*	3/10/14	Resolution Approved by CC	42,567
6. Framingham*	1/6/15	Policy Approved by BoS	70,068
7. Holyoke*	12/16/14	City Ordinance	40,135
8. Lawrence	12/8/15	Policy Approved by CC	77,657
9. Littleton*	12/16/13	Policy Approved by BoS	9,132
10. Lowell	2015	Policy Approved by CC	108,522
11. Lynn	12/15/15	Policy Approved by CC	91,589
12. Marlborough	10/19/15	Policy Approved by CC	39,414
13. Maynard*	11/5/13	Resolution Approved by BoS	10,106
14. Middleton*	11/18/14	Policy Approved by BoS	8,987
15. Natick	3/23/15	Policy Approved by BoS	33,760
16. Northampton*	2005	Transportation Plan	28,549
17. Norwell	5/13/15	Policy Approved by BoS	10,574
18. Reading*	7/29/14	Policy Approved by BoS	24,747
19. Plymouth	5/7/13	Policy Approved by BoS/PB	56,468
20. Salem*	6/28/14	Policy Approved by CC	41,340
21. Somerville*	5/8/14	City Ordinance	75,754
22. Spencer	9/28/15	Policy Approved by BoS	11,766
23. Springfield	10/6/15	Resolution Approved by BoS	153,703
24. Stoughton*	10/7/14	Policy Approved by BoS	26,962
25. Waltham	9/18/14	Departmental Administrative Policy	61,918
26. Westwood	10/1/15	Policy Approved by BoS	14,876
27. Weymouth	11/9/15	Policy Approved by PB	55,419

POPULATION TOTAL: 1,939,262 (29.6% of state's 6,547,629 residents) Cities in Bold

\* listed on the Smart Growth America/National Complete Streets Coalition website

CC = City Council ---- BoS = Town Board of Selectmen ---- PB = Planning Board

12/16/15

Source: MassDOT, Complete Streets Funding Program PowerPoint

<sup>26</sup> [MGL Chapter 90I, Section 1](#).

### Complete Streets Directives

MassDOT's [Healthy Transportation Policy Directive \(P-13-0001\)](#) and [Engineering Directive E-14-006](#) provide more specific guidance on Complete Streets design standards. Included in *Appendix E*, these Directives require MassDOT projects to be designed and built so that all MassDOT customers have access to safe and comfortable healthy transportation options at all MassDOT facilities and in all the services [MassDOT] provides, and add specific design requirements related to sidewalk presence, sidewalk width, and bicycle accommodation<sup>27</sup>.

### Illustrative Examples of Specific Complete Streets Components

Below are renderings of roadway components that contain illustrative examples of Complete Streets improvements:

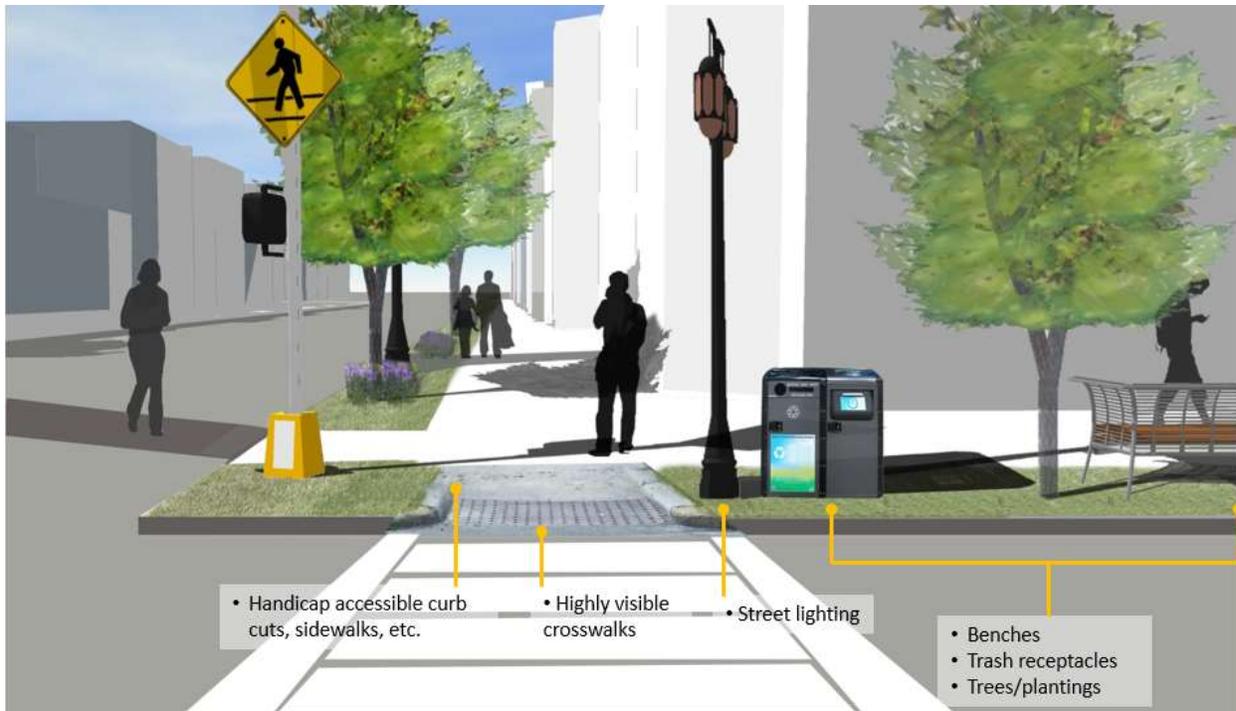
#### *Massachusetts Ave in Arlington*



*Source: MassDOT, Complete Streets Funding Program PowerPoint*

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<sup>27</sup> Complete Streets Funding Program Guidance, MassDOT, 2015, p 1.  
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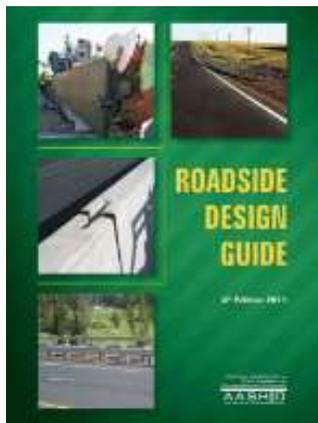
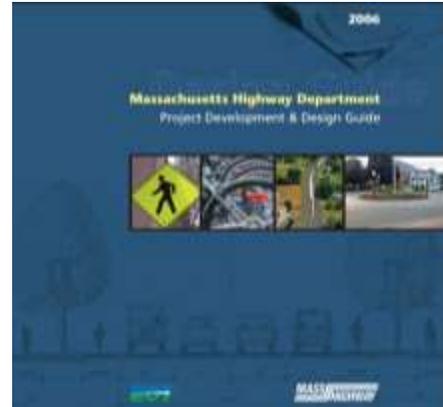
Source: MAPC

### Complete Streets Resources

The design guidance, standards, and recommendations outlined in the following resources should be used in the implementation of Complete Streets and design/infrastructure changes along the Route 9 corridor.

#### *Project Development and Design Guidebook, MassDOT, 2006*

In 2006, MassDOT adopted a Complete Streets approach with the release of the [Project Development and Design Guidebook](#) and is the guiding design manual for roadway projects under MassDOT jurisdiction or oversight. The [Project Development and Design Guidebook](#) takes a flexible and accommodating approach to the construction and design of roadways in Massachusetts. By integrating multi-modal planning and design into every chapter, the Design Guide strives to support a transportation system providing seamless, functional and safe access for all users. The Design Guidebook explicitly incorporates community setting as a design factor, and supports early planning and coordination with all stakeholders to create safe and attractive roads.



#### *Roadside Design Guide*

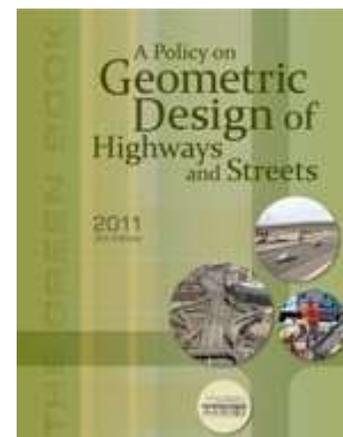
*American Association of State Highway and Transportation Officials (AASHTO), 2011*

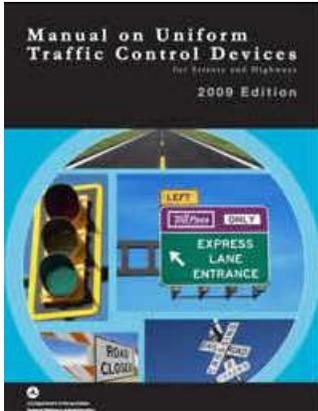
The Roadside Design Guide presents a synthesis of current information and operating practices related to roadside safety. The guide is intended to be used as a resource document from which individual highway agencies can develop standards and policies.

#### *A Policy on the Geometric Design of Highways and Streets*

*American Association of State Highway and Transportation Officials (AASHTO), 6<sup>th</sup> Edition, 2011*

Commonly referred to as the “Green Book,” this manual contains the current design research and practices for highway and street geometric design. The document provides guidance for highway engineers and designers who endeavor to make unique design solutions that meet the needs of highway users while maintaining the integrity of the environment. The “Green Book” is also intended to be used as a comprehensive reference manual to assist in the administrative, planning, and educational efforts pertaining to design formulation.

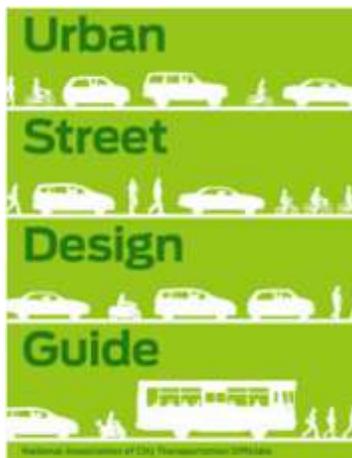
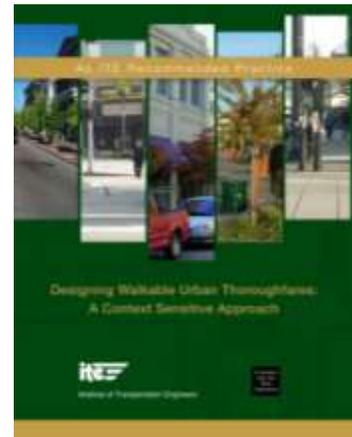




*Manual on Uniform Traffic Design Control Devices  
United States Department of Transportation Federal Highway  
Administration, 2009*

[The Manual on Uniform Traffic Control Devices](#), or MUTCD, defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic.

*Designing Walkable Urban Thoroughfares: A Context Sensitive Approach, Institute of Transportation Engineers (ITE), 2011*  
[Designing Walkable Urban Thoroughfares: A Context Sensitive Approach](#) is a resource that provides guidance for practitioners to design major urban streets to support walkable and bikeable communities, compact development, and mixed land uses. The report includes chapters on incorporating context sensitive solutions into transportation planning and project development, specific design criteria, and case studies where these approaches have been successfully applied.



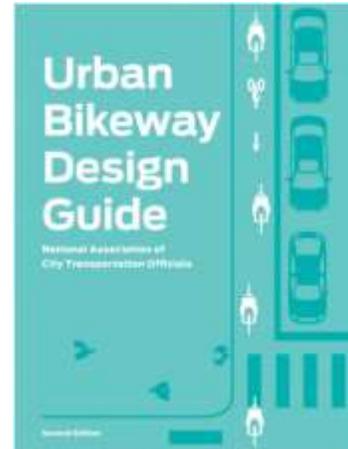
*Urban Street Design Guide  
National Association of City Transportation Officials (NACTO), 2013*

The [NACTO Urban Street Design Guide](#) shows how streets of every size can be reimagined and reoriented to prioritize safe driving and transit, biking, walking, and public activity. The core principle that urban streets are public places and have a larger role to play in communities than solely being conduits for traffic is emphasized in the Design Guide. The Design Guide contains blueprints of street design from multiple perspectives, includes national studies from around the country, and provides guidance on how to implement best practices. Direction for municipalities seeking to improve street design to create more inclusive, multi-modal environments is also outlined in the Design Guide.

Urban Bikeway Design Guide

National Association of City Transportation Officials (NACTO), 2014

The purpose of the [NACTO Urban Bikeway Design Guide](#) is to provide cities with state-of-the-practice solutions that can help create complete streets that are safe and enjoyable for bicyclists. Three levels of guidance (required, recommended, and optional) are provided for each treatment outlined in the Design Guide.

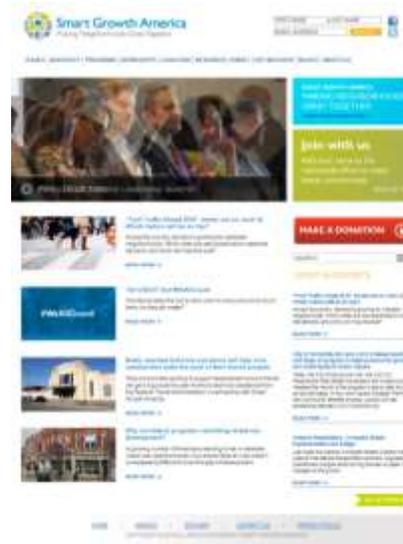


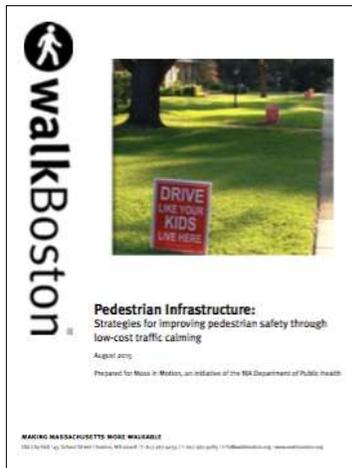
Separated Bicycle Lane Planning and Design Guide, MassDOT, 2015

In 2015, MassDOT released a [Separated Bike Lane Planning and Design Guide](#). The Design Guide is a resource for considering, evaluating and designing separated bike lanes as part of a Complete Streets approach for providing safe and comfortable accommodations for all roadway users. The Design Guide provides a framework for determining when separated bike lanes are appropriate and feasible, presents design guidance for separation strategies, bike lane configuration, as well as considerations for transit stops, loading zones, utilities, drainage, parking and landscaping.

Smart Growth America/National Complete Streets Coalition Website

The [Smart Growth America/National Complete Streets Coalition](#)'s website is a resource for municipalities looking to implement Complete Streets policies and programs. Specifically, the [Complete Streets A-Z](#) and [Fundamentals](#) pages contain comprehensive information.





*Pedestrian Infrastructure: Strategies for Improving Pedestrian Safety through Low-Cost Traffic Calming, WalkBoston, 2015*

[Low-Cost Traffic Calming](#) utilizes data drawn from local projects to inform Massachusetts communities interested in implementing small, incremental infrastructure improvements intended to calm traffic and enhance safety on municipal streets and state roads. The report is a compilation of information describing recent projects, with examples including stand-alone installations of traffic calming features and corridor-level retrofit projects. All suggested strategies address at least one of four different goals associated with pedestrian infrastructure improvements—safety, speed reduction, placemaking, and walking encouragement.

[Boston Complete Streets, 2013](#)

Considered a national leading example, Boston Complete Streets provide a road map for retrofitting Boston's streets and sidewalks and include new street types, guidance on multimodal intersection design, the integration of transit and bicycling and sustainable and smart design solutions.



### [Streetmix.net](http://Streetmix.net)

Designed by Code for America, Streetmix is an educational tool that enables users to better understand how various aspects of roadway design can impact a community. The program enables users to design, remix, and share street designs for multiple modes. For example, users can add bike lanes, widen sidewalks or traffic lanes and include transit elements such as buses. Streetmix.net enables users to adjust the width of lanes and buildings to various heights, in addition to adding intersecting roads. Street features such as wayfinding signs, transit shelters, and landscaping can also be incorporated.

### Example of a Streetmix Street Design



Source: [Streetmix.net](http://Streetmix.net)

### The Green Highways Partnership

The Green Highways Partnership (GHP) is dedicated to transforming the relationship between the environment and transportation infrastructure. The GHP serves as a voluntary public-private collaborative that advances environmental stewardship in transportation planning, design, construction, operations and maintenance while balancing economic and social objectives. The GHP was initiated by the US Environmental Protection Agency (EPA) and the Federal Highway Administration (FHWA) out of a realization that building safe, sound transportation systems and protecting and sustaining a clean and healthy environment were not mutually exclusive, particularly in light of their common denominator, serving the “public good.” A number of publications, case studies, and media resources are located on the GHP website: <http://www.greenhighwayspartnership.org/index.php>

## Recommendations for Regulatory Changes

This section reviews Wellesley's existing land use and zoning documents and develops recommendations for how the Town might implement changes to promote smart growth consistent with the community's goals in this corridor.

The starting point for the review is the Wellesley Comprehensive Plan 2007-2017 Update. This is the fourth Comprehensive Plan the Town has produced. Wellesley is currently preparing to update this Plan. Because of the timing, some of these recommendations may need to be confirmed as continuing community priorities. This was done for the 2007-2017 Plan, with the 1994 Plan providing the starting point to produce the goals and priorities for the current Plan.

The elements that will be considered in this section include recommendations for:

- Identifying smart growth redevelopment nodes along the Route 9 Corridor
- How smart growth redevelopment might be implemented in the identified nodes, to include other elements of the Comprehensive Plan such as housing affordability
- Streetscape and architectural design guidelines that would govern redevelopment of private properties along Route 9, including an illustrative example of elements

### What is “smart growth”?

Smart growth is a relatively new term for what New England has done from the beginning: cluster compatible uses to conserve resources. As the Massachusetts Executive Office of Energy and Environmental Affairs Smart Growth website states:

*Smart growth is development that protects natural resources, enhances quality of life, offers housing choices, reduces energy consumption, and improves municipal finances by considering the location, design and long-term costs of development<sup>28</sup>.*

Smart growth patterns exist in Wellesley: in Linden Street and Wellesley Square. It is not necessary to have a mix of uses (such as residential and retail) in a series of buildings. Smart growth embodies walkable neighborhoods within close proximity to pedestrian-scaled retail. A car is not necessarily required to go to a grocery store or pharmacy. Ironically, the current speeds and conditions of Route 9 frustrate the opportunities for some Wellesley residents to enjoy the existing smart growth nodes.

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<sup>28</sup> [http://www.mass.gov/envir/smart\\_growth\\_toolkit/pages/intro-to-SG.html](http://www.mass.gov/envir/smart_growth_toolkit/pages/intro-to-SG.html)

## IDENTIFY SMART GROWTH NODES

The first task is to identify potential smart growth nodes along Route 9. A node in this report refers to location that is already developed, but that could be a candidate for re-development, and/or re-use. The land may have obsolete buildings, uses that are no longer viable, or be “underdeveloped” relative to newer development. To identify the nodes, MAPC started with the Comprehensive Plan goals and recommendations, and then reviewed existing zoning and land use.

**The Comprehensive Plan 2007 – 2017 Update included these statements relevant to Route 9:**

### ***Land Use Recommendations:***

- “Create a detailed Natick Gateway Plan, including gateway improvements, mixed use development overlay district; affordable housing, open space connections, streetscape and pedestrian environment, underground parking.”
- This area was also identified for town house or multi-family housing potential.
- “Complete the **Cedar Street Commercial Area Plan**, promote redevelopment with higher value buildings.”
- “Create mixed use development frameworks for commercial district sites with potential for housing and mixed use development in order to understand the options for appealing design alternatives.”

### ***2005 Land Use Goals and Objectives***

- Improve the appearance of town gateways that need enhancement
- Promote a mixture of land uses, including diverse types of residences in commercial areas

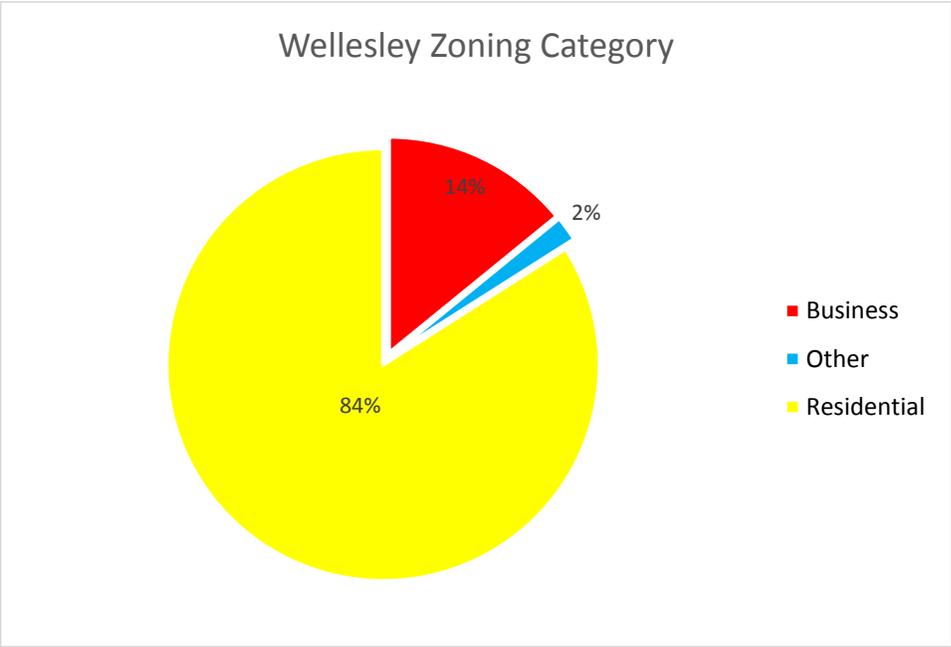
### ***10 Key Comprehensive Plan recommendations that can shape Wellesley’s future:***

- At the Natick line: “Encourage the creation of townhouses, condos, and multi-family housing types in commercial areas in order to create a mixed-use, mixed-income environment for residents who will support local businesses”.
- At the Newton line: “Study the potential for allowing additional development capacity in existing office parks in order to increase non-residential tax revenue if adverse effects on surrounding neighborhoods can be avoided.”

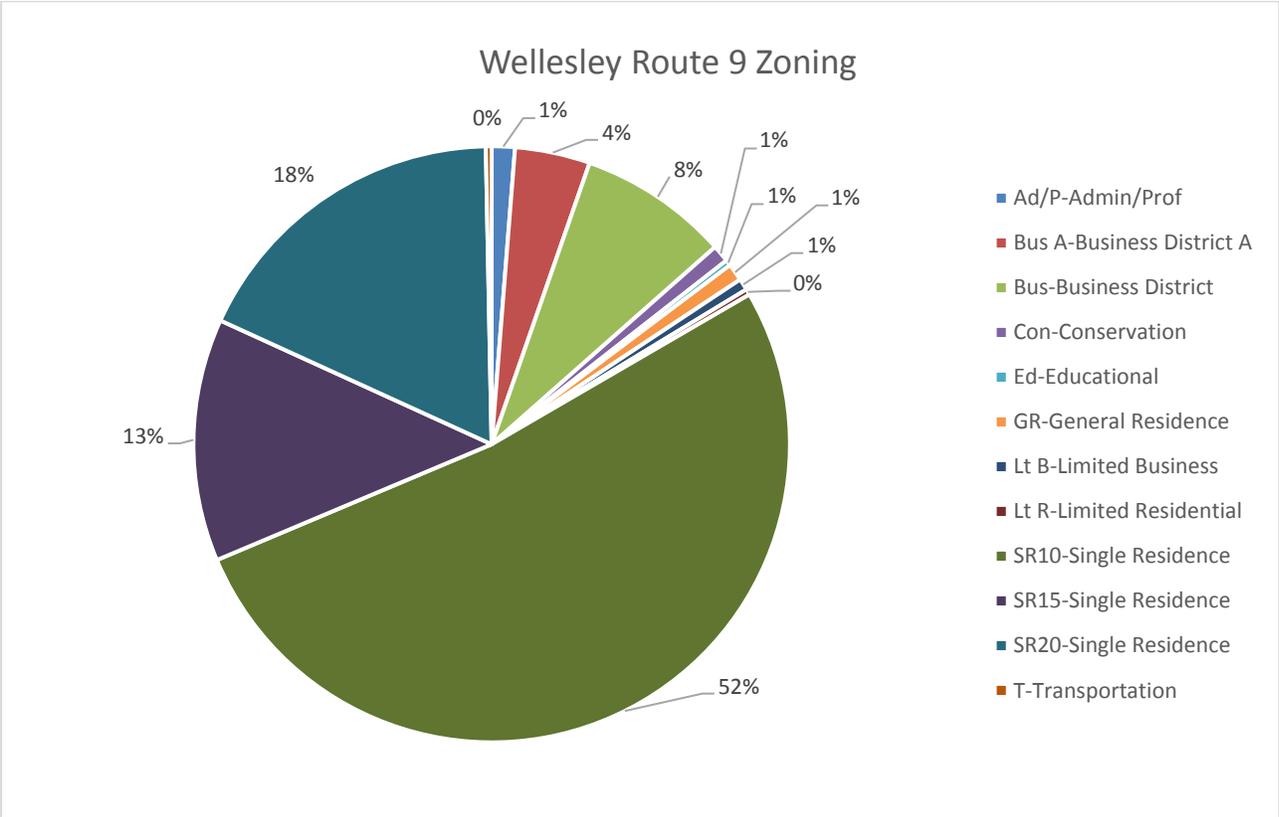
### **Zoning and Land Use Analysis**

The corridor includes 318 parcels ranging in size from the Wellesley Town Forest (owned by the Water Department) at 272 Worcester Street (6.8 acres) to a Town-owned parcel on Cliff Road at 462 sq. ft.

As shown in the pie charts on the next page, the area is zoned and predominantly used for residences (84% of the parcels). The Route 9 Study Area is bookended by commercial development at the eastern boundary with the City of Newton and the western boundary with Town of Natick. Forty-five parcels are commercially zoned, from the Administrative and Professional uses in the vicinity of Routes 9/1-95 Interchange at the eastern gateway, and the Business and Business A Districts in the vicinity of Cedar Street and at the western gateway near Overbrook Street. There are three large town-owned parcels zoned for Conservation in the Study Area, the Massachusetts Bay Community College property zoned for Education; a Massachusetts Bay Transportation parcel zoned for Transportation, and the vast majority zoned for Residential Use (269 parcels). The zoning matches the actual land use.



A more detailed analysis is shown below. The parcels are grouped by the specific zoning district they are in.



As noted in the Comprehensive Plan, owners of commercial properties need to redevelop more often in order to stay competitive and attract customers. Once the commercial/residential break-down was confirmed, MAPC then mapped non-residentially-zoned parcels greater than 100,000 sf.

The 100,000 sf limit was selected because these parcels are large enough to be good candidates for development of a scale that could accommodate a mix of uses. MAPC then mapped these parcels along Route 9 of 100,000 sf or larger that are zoned for commercial uses, including Administrative/Professional; Business, Limited Business and Business A. These are shown in red on the accompanying map.

### Non-Commercially-zoned parcels

MAPC also identified two other parcels over 100,000 sf of land: the National Guard Armory and Bay State College. We understand that the Armory is in active use and unlikely to become available in the near future. However, the Comprehensive Plan identifies Mass Bay Community College as a location that should be re-zoned to include a mandatory cluster zoning overlay. In the event part of the land is sold, the zoning would require buildings (presumably residential) to be clustered in order to preserve open space. The land is currently zoned as Education.



### Analysis

The development at the interchange with Route I-95 is developed with newer and substantial office buildings. They are unlikely to be re-developed in the near term.

The best opportunities for smart growth development on Route 9 are in the Cedar Street area and at the boundary with the Town of Natick. This confirms the analysis from the last Comprehensive Plan.

## FACILITATING SMART GROWTH

The second element of this section recommends ways in which to implement smart growth in the identified nodes. Consistent with the Comprehensive Plan, the western gateway is one node. The Cedar Street area is another.

### Zoning

Zoning are the laws that regulate land use. Because they are adopted locally, there is great flexibility in how a community zones the land within its boundaries. This section evaluates potential changes to the Wellesley Zoning Bylaw in order to facilitate developing smart growth nodes at these two locations.

### Define Mixed-Use

Currently, there is no definition of mixed-use in the Zoning Bylaw.

One definition MAPC suggests is:

### Mixed Use

A combination of uses\*, on the same lot, arranged vertically in multiple stories of a structure or horizontally adjacent to one another in one or more buildings.

The mix of uses shall be balanced and compatible and shall contribute to a vibrant pedestrian atmosphere, including a combination of ground floor street front uses such as retail, and restaurants.

Ground floors of buildings fronting streets or public access ways shall be reserved for non-residential uses, except as specified below:

Dwelling units shall be allowed on ground floors of buildings if:

- a) The building is set behind another building that has commercial uses on the ground floor.  
OR
- b) The residential portion of the ground floor of a building is set behind street-front non-residential uses within the same building.

\* Wellesley, could list uses it wishes to include in a mixed-use development.

### Create An Overlay or Develop a New Zoning District

Wellesley has a lot of specificity in its zoning, including Educational and Conservation Districts. The Town may not wish to develop another specific zone. An overlay could be a preferred solution. An optional overlay would be at the property owner's choice. An optional overlay decreases the number of uses that would become lawful pre-existing non-conforming uses, but it may not create the incentive the community wants to spur the redevelopment of the identified areas.

As noted previously in the report, and in the Comprehensive Plan, the joint Framingham/Natick overlay for Route 9 is one example to review.

### **Are there existing Districts that could be modified to meet the goal?**

Evaluating the zoning for existing districts that might form the foundation for the overlay is a sound approach because Town officials and local developers are familiar with the Zoning Bylaw.

There are two potential mechanisms: The Planned Development District (PDD) and the Residential Incentive Overlay (RIO). The PDD permits a mix of uses, but requires a minimum of 10 acres. This could be adjusted to 100,000 sf to capture parcels in the identified nodes. The RIO is an overlay that is tailored for residential re-use, but it has a 2 acre minimum. Additional uses could be added, or another overlay modeled after the RIO could be developed.

### **Considerations**

If Wellesley decides to pursue re-zoning these nodes, the following issues need to be addressed:

1. Should we create an overlay or a new district for the nodes?
2. Can we modify an existing technique? RIO? PDD?
3. How do we define mixed use? What uses should be included?
4. Should use percentages (such as in PDD) be required, or should we let the market determine the mix?
5. Are there parcels within these nodes that the Town could envision as redeveloped solely for multi-family housing? Should a small number of housing units be allowed as of right?
6. Should we make sure we can qualify for 40R Housing density?
7. For the nodes, ensure that Inclusionary Zoning provisions apply, and consider increasing the required number.
8. Should we allow some townhouse development, particularly at the rear of the parcel, with retail in a separate building in the front of the lot? If so, should the definition be amended for more flexibility? Should we allow ground floor parking in the townhouses, particularly off of a larger lot where an access road separate from Route 9 exists, or could be constructed?
9. Should the height limit be increased to 45 feet to accommodate underground parking?
10. How should these projects be permitted? Special Permit by the Planning Board or Zoning Board of Appeal?
11. Could we include shared parking provisions and parking reduction for car sharing (Zipcar)?

### **Project Review**

Wellesley requires several project review processes: Project Approval for all except one and two family dwellings (there is now a Large House Review). Within Project Approval there is Design Review and Site Plan Review as well as requirements for Projects of Significant Impact. The Town should consider revising and re-writing the process for clarity. A combined Site Plan and Design Review could simplify the review and address all site and design issues comprehensively. Also, include the Drainage Review with Site Plan Review

## STREETSCAPE AND ARCHITECTURAL GUIDELINES

It has been MAPC's experience that most communities desire mixed use developments, at least in areas served by transit and/or in traditional town centers. It really is a "return to our past." Once a community decides to create a mixed use bylaw, and settles on uses and dimensions, the real concern becomes "What will it look like?" There is almost a universal desire to have new mixed use developments respect the best of what the community offers architecturally. Wellesley is no exception, but the Town goes further to emphasize design as a key development element, both in its Comprehensive Plan and in its zoning.

MAPC evaluated the existing Wellesley Design Guidelines, consistent with the Comprehensive Plan goal of creating design guidelines tailored to specific neighborhood areas.

## REVIEW OF CURRENT DESIGN GUIDELINES HANDBOOK, TOWN OF WELLESLEY, NOVEMBER 9, 1989

### Community Character

In the review of community character, the current Design Guidelines identify four commercial areas which are part of the Route 9 Corridor. Two of these commercial areas have been identified as smart growth nodes.

- **Worcester Street at the Natick Town Line** is a small commercial area at the Natick town line on Route 9 characterized by buildings and signage oriented to vehicular traffic. Buildings are set back from the street with parking lots located in front, to the side, and in the rear. Larger signage is allowed for businesses fronting Route 9 because the Town recognizes that this differs in orientation from the others discussed. Facades exhibit a variety of materials and styles, with most buildings constructed during the 1950's and 1960's. There is limited pedestrian traffic and the businesses have provided minimal on-site landscaping. This business area merges with a larger one with a similar character in Natick, forming a long strip of business activity on Route 9.
- **Worcester Street at Cedar Street** is a mixed commercial center at the intersection of Route 9 and Cedar Street that contains a variety of uses including medical offices, automobile dealerships, and general office uses in a mix of building styles of various ages that appears to lack an overall definitive character. Most are oriented to Route 9 traffic and although surrounded by residential uses, do not serve neighborhood shopping needs. The area is adjacent to the Rosemary Brook Town Forest.

### Character Summary

- Town dominated by residential character.
- Village scale of older commercial areas is compatible with residential uses.
- Encourage use of existing landforms and landscaping to enrich open spaces and screen and enhance parking lots and buildings
- Creatively blend proposed buildings into surroundings.
- Proposed signage conforms to the scale and character of the building and the Town.
- Intent is not to prescribe styles of architecture or signage.

## **Design Criteria Comments**

In terms of the categories and organization of the current Design Guidelines, the Guidelines could be refocused to address the following for Route 9 nodes:

### ***Current Design Criteria***

#### **Preservation and Enhancement of Landscape**

- Expand guidelines for expectations of pedestrian connections and crossings – within and from all parking areas to building entries, between adjacent properties, to Route 9 frontage where sidewalks exist.
- Expand guidelines for integration of bicycle amenities.
- Most successful commercial property design in the nodes today can be described as large pockets of parking set within an overall landscape punctuated by the buildings – an example of this approach is the Sun Life Financial property. Less successful site designs are paved indiscriminately with no definition of parking area, building entry, service area, landscape, plazas or other open space or amenities.

#### **Relation of Buildings to Environment**

- Current guidelines are focused on a sense of scale that relates to the surrounding neighborhood, this is not likely appropriate given the likely scale of commercial redevelopment on Route 9 – creating visual buffers through robust landscaping may be more appropriate than limiting scale to that of surrounding single family residential.
- Expand guidance to reinforce relationships between adjacent parcels, buildings and parking lots. Often, patterns on adjacent parcels have no relationship to one another and are even fenced off from one another. Create relationships between adjacent uses and reinforce the ability to walk from one parcel to another, without having to reenter Route 9 in a car.

#### **Open Space**

- Expand guidance relative to the provision of small parks or open spaces – where they should be positioned, relationship to buildings, parking, pedestrian connections, Route 9 frontage.
- Discussion potential function of open spaces – potential amenities, bicycle storage, lighting, public art, etc.

#### **Signs and Advertising Devices**

- Sign visibility and building visibility from Route 9 is one of the major reasons why landscaping is so limited at Route 9 frontages in commercial nodes – signage guidelines could create a balance between signage in the frontage that is integrated with landscaping and tree-lined buffers that allow for business visibility, but continue a more consistent tree cover as found in adjacent residential neighborhoods.
- Directory signage for multi-tenant properties or shared signs between adjacent properties.
- Define different approaches for Route 9 signage, building signage oriented to parking areas or pedestrians and on-site wayfinding and directional signage.

## ***New Design Criteria***

### **Site Frontage**

- The relationship of buildings and sites to Route 9 – and the incremental adaptation of Route 9 frontage – do not orient buildings to Route 9 frontage, create landscape buffer, bring pedestrian connectivity and walkability into the depth of a site, connecting parking areas and building entries
- Current guidelines do not define design expectations for curb cuts and vehicular access into the site from Route 9 or adjoining connections to adjacent parcels apart from Route 9.
- The residential portions of Route 9 are defined by old growth trees overhanging both sides of the highway with homes hardly visible from Route 9, setback and accessed via side streets off of Route 9; Commercial zones are often paved from property line to property line with hardly any tree frontage.

### **Site Design**

- Current guidelines do not define site design expectations and the urban design relationships between street, building, active frontage, open space, parking and landscape.

### **Maximizing Use/Circulation**

- The adaptation of sites that have already been developed to improve visual appeal and pedestrian environment.
- Current guidelines do not define design expectations for structured parking.
- Current guidelines do not define design expectations for multi-modal circulation internal to a site or across abutting sites.
- Current guidelines do not define expectations for shared parking.

### **Fencing**

Currently, many fences along the Route 9 corridor are falling down and are made of disparate materials. Design Guidelines should call for consistently designed residential fences that address height, style, materials, and maintenance. Wellesley should also consider the requirement of a permit prior to the installation or repair of a fence or wall.

The City of Pomona, California has developed a handout that addresses fences and walls within residential zones. The handout, included as *Appendix F*, outlines fence and wall permit requirements, prohibited materials, height requirements, design standards, as well as maintenance and repair.

## **EXAMPLE OF NODE REDEVELOPMENT**

As described in the community character section of the Design Guidelines, the predominant character of Wellesley is residential. Along the Route 9 corridor, this majority land use is evident and is associated with a relatively consistent and canopy of trees and old growth trees that line both sides of Route 9. The aerial photograph below shows this type of pattern. It is a very pleasant frontage along Route 9. The characteristic trees of the residential portion of the Route 9 corridor are starkly missing from the commercial nodes and the transition into the nodes is marked by this absence of greenery. One of the commercial nodes at the town line with Natick is shown below and highlights this contrast.

An approach that could impact the overall look and feel of the Route 9 corridor in Wellesley would be to even this stark contrast, by adding more landscape, specifically trees, to the commercial nodes. While certainly this addition needs to be balanced with the often contrasting needs of business visibility and vehicular circulation, the frontage of the commercial nodes could be dramatically improved through a reconsideration of the approach to site access, signage and landscaping as highlighted in the comments about the Design Guidelines below.

This type of approach to Route 9 frontage for non-residential property could be piloted at the new Recreation Center. The design could include a modest sign at Route 9, near the site entry that is integrated with a robust landscape at the property frontage that includes many trees. The site plan would then be more internally oriented to provide convenient parking, pedestrian access and a building orientation that defines a building entry plaza and other small open spaces with amenities.

A Google Earth snapshot of Route 9 in Wellesley in a predominantly residential portion of the corridor:



A Google Earth snapshot of Route 9 in Wellesley of a commercial node and the stark contrast of less trees and more paving and parking at the frontage of Route 9:



MAPC also created the following to illustrate redevelopment at the Cedar Street node. The first picture is existing conditions:



Next are a series of graphics illustrating how the above site could be successfully redeveloped using the design guidelines previously discussed. The first graphic combines all the techniques; it is followed by illustrations showing the individual strategies.

Eight techniques or strategies are illustrated:



