

TRANSPORTATION & INFRASTRUCTURE

This section details the existing transportation, infrastructure and utilities, and brownfields areas in The Triangle. Existing traffic volume, geographical information system (GIS) data for existing utilities, pedestrian and bicycle facilities and Synchro³⁴ networks for some intersections were obtained from Framingham and Natick as well as private firms that are conducting or have recently conducted analysis in either community. The section also includes information on proposed public improvement projects.

TRANSPORTATION

Three major state numbered roadways run through The Triangle: Route 9, Route 30 and Route 126. Other major local roadways include Speen Street and Old Connecticut Path. The district is served by MetroWest Regional Transit Authority (MWRTA) buses as well as roadway, sidewalk, and limited bicycle facilities.

Route 9 is also known as Worcester Road in Framingham and Worcester Street in Natick and forms the southern boundary of the Study Area. Per the Massachusetts Department of Transportation (MassDOT) published road inventory data, Route 9 is classified as an urban principal arterial. It is oriented in the east-west direction and consists of two to three lanes in each direction. Left and/or right turning lanes are present at some intersections. Sidewalks are present on both sides of the Route 9.

Route 30, also known as Cochituate Road, is also classified as an urban principal arterial. It is oriented in the east-west direction and consists of two to three lanes in each direction. Left and/or right turning lanes are present at some intersections. Sidewalks are present on both sides of Route 30.

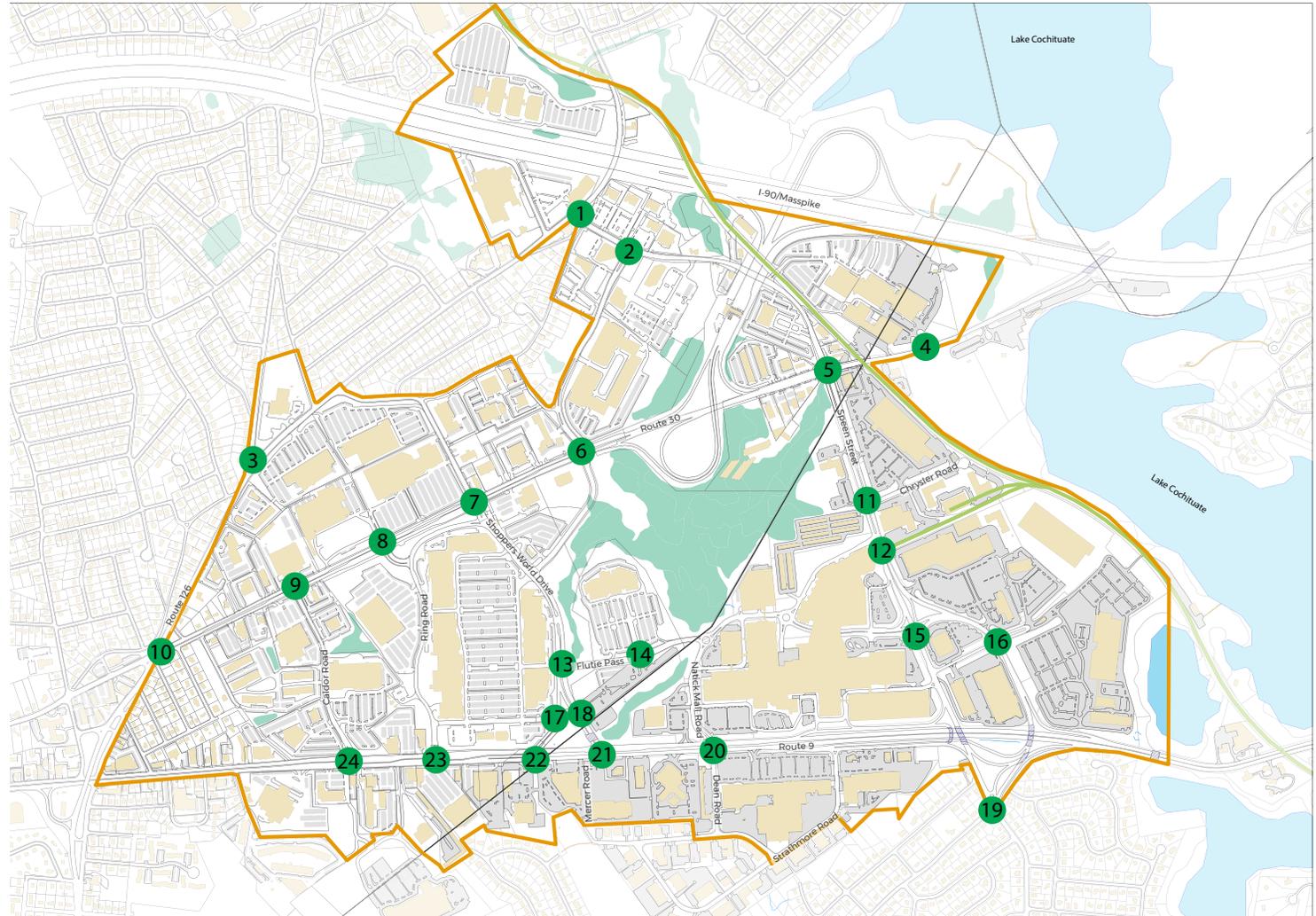
Speen Street forms the eastern boundary of the Study Area and is classified as an urban principal arterial. Speen Street is oriented in the north-south direction and varies between two to three lanes and consists of left and/or right turning lanes at some intersections.

Route 126, also known as Concord Street, is located to the north of the Study Area. It is classified as an urban minor arterial and is oriented in the north-south direction. It consists of one 12'-0" lane in each direction and approximately 6'-0" shoulders on both sides of the road. Turning lanes are present at some intersections. Sidewalks are present on both sides of the roadway.

The lack of connectivity throughout The Triangle, including pedestrian and bicycle facilities as well as east-west roads between Route 9 and Route 30, is a key concern for this Study and was mentioned repeatedly in comments on coUrbanize.

34 *Synchro software conducts traffic analysis to determine Levels of Service*

Old Connecticut Path, classified as an urban minor arterial, is located on the north side of The Triangle. It consists of a single lane in each direction with a minimum width of 12'-0". Sidewalks are located on both sides of the street.



Note: Although Google Maps shows a connection from Mercer Road north to Route 9, that connection does not exist. A plan for making that connection using the existing power line right-of-way would extend Mercer Road to intersection 22.

Figure 3.55: Golden Triangle intersections analyzed.

VEHICULAR TRAFFIC

WSP researched the existing transportation data available, including the existing vehicular traffic volumes and operations within The Triangle.

STUDY AREA INTERSECTIONS

Twenty four signalized intersections were selected for inclusion in the vehicular analysis of The Golden Triangle. The locations are identified below and illustrated in Figure 3.55.

1. Old Connecticut Path @ Speen Street/Office Drive
2. Speen Street @ Leggatt McCall Connector
3. Old Connecticut Path @ Concord Street (Route 126)
4. Cochituate Road @ East TJX Drive
5. Cochituate Road (Route 30) @ Speen Street
6. Cochituate Road (Route 30) @ Burr Street
7. Cochituate Road (Route 30) @ Whitier Street/Shoppers World Drive
8. Cochituate Road @ Shoppers World Way/Ring Road
9. Cochituate Road @ Caldor Road
10. Cochituate Road @ Concord Street/ (Route 126)
11. Speen Street SB @ Storage Driveway/Chrysler Road
12. Speen Street @ Nouvelle Way/Retail Driveway
13. Shoppers World Drive @ Flutie Pass /Shoppers World Driveway
14. Flutie Pass @ AMC Main Driveway/AMC South Parking Lot
15. Speen Street SB @ Speen Street NB/Natick Mall Road
16. Speen Street NB @Superior Drive/Prime Parkway
17. West Couplet @ Ring Road
18. East Couplet @ Ring Road/AMC South Parking Lot
19. Speen Street @ Hartford Street/Route 9 EB ON Ramp
20. Worcester Street (Route 9) at Dean Road/Natick Mall Road;
21. Route 9 @ Shoppers World Drive
22. Route 9 @ West Couplet /Bob's Discount Furniture Driveway
23. Route 9 @ Ring Road/Bed Bath and Beyond Driveway
24. Route 9 @ Caldor Road

EXISTING TRAFFIC VOLUMES

Turning movement counts at the Study Area intersections were obtained from the Natick 2030+ Master Plan and several Traffic Impact and Access Studies (TIASs) conducted for private developers in the area.

Several TIASs were obtained from Framingham and Natick and the consultants that performed the studies. The counts in these studies ranged from the year 2010 to 2016. Turning Movement Counts (TMC) and Automatic Traffic Recorder (ATR) volumes were included from the studies listed below:

- MathWorks Lakeside Campus Parking Garage Traffic Impact and Access Study; Natick, MA; (February, 2013)
- Lifetime Athletic Traffic Impact and Access Study; Framingham, MA; (February 2014)
- Sherwood Plaza South Phased Master Plan Redevelopment Traffic Impact and Access Study; Natick, MA; (April, 2014)
- Retenancing of the JC Penny Building as a Wegman's Grocery Store Traffic Impact & Access Evaluation; Natick, MA; (December, 2015)
- AMC South Parking Lot Redevelopment at Shoppers World; Framingham and Natick, MA; (June, 2016)
- TJX Expansion and Parking Garage Environmental Notification Form; Framingham, MA; (November, 2016)

Daily traffic volume data was only available for limited locations and is summarized in Table 3.23. Automatic Traffic Recorder (ATR) volumes are shown in the table.

Seventy-two-hour ATR counts were conducted at Old Connecticut Path, west of Speen Street in 2013 (Thursday through Saturday). The 2013 ATR counts indicate that on a typical weekday, approximately 8,900 vehicles per day (vpd) travel along Old Connecticut Path, west of Speen Street. Commuter peak hours represent approximately 8 to 10 percent of the daily traffic along Old Connecticut Path. The traffic volumes along Old Connecticut Path, west of Speen Street, are heavier in the eastbound direction in the mornings and heavier in the westbound during the evenings. On Saturdays, Old Connecticut Path west of Speen Street carries 6,200 daily vehicles, including 540 vehicles during the midday peak hour.

ATR counts were conducted for a period of 72 hours along the Route 9 westbound off-ramp to Speen Street, the Route 9 eastbound off-ramp to Speen Street and Speen Street northbound, south of the Route 9 eastbound off-ramp. On a typical weekday, the ADT at the Route 9 westbound off-ramps to Speen Street

TABLE 3.23: EXISTING TRAFFIC VOLUMES				
LOCATION	YEAR	WKDAY ADT (VPD ¹)	AM PEAK HOUR VOLUME (VPH ²)	PM PEAK HOUR VOLUME (VPH ²)
OLD CONNECTICUT PATH, WEST OF SPEEN STREET	2013	8,900	710	930
ROUTE 9 WB OFF-RAMP TO SPEEN STREET	2011	11,860	765	880
ROUTE 9 EB OFF-RAMP TO SPEEN STREET	2011	3,380	215	185
SPEEN STREET NB, SOUTH OF ROUTE 9 EB OFF-RAMP	2011	14,205	1,125	945

was 11,860 with heavier traffic volume during the PM peak. Similarly, the ADT on Route 9 eastbound off-ramp to Speen Street was 3,380 vehicles per day with heavier AM traffic volumes. The Speen Street northbound ADT volumes were approximately 14,200 vehicles per day with a heavier northbound volume in the AM peak.

¹ Average Daily Traffic (ADT) expressed in vehicles per day

² Peak hour traffic volume expressed in vehicles per hour

TMCs at each of the Study Area intersections were obtained from the previous TIAs assembled as part of the Natick 2030+ Master Plan or supplemental counts conducted by Vanasse Hangen Brustlin Inc. (VHB) for Framingham. TMC data ranged from the year 2010 to 2017; TMCs were conducted in different months of the year. To arrive at the 2017 baseline existing volumes, appropriate seasonal adjustments and background growth rates were applied to the counts wherever necessary to create a 2017 existing traffic network.

TMCs obtained from other TIAs contained seasonally adjusted volumes at the intersections. However, raw counts were supplied by VHB at several locations. The nearest MassDOT continuous count station to the Study Area was found to be Station 307 located on the Boston Worcester Turnpike in Westborough. Based on the data obtained from the count station, April volumes are 4 percent higher than an average month. Therefore, no seasonal adjustments were made to volumes collected on Concord Street in April 2011. Similarly, VHB collected TMCs at a few Route 9 intersections in February, 2016. Per count station 307, February volumes were 5 percent lower than an average month. These volumes were increased by 5 percent to match average month traffic volumes. TMCs at the intersection of Route 9 at Concord Street were conducted in March 2017. March volumes were found to be 1 percent lower than an average month and were increased by 1 percent to represent average monthly traffic volumes at the intersection.

The seasonally adjusted volumes were then grown at a rate of one percent per year from the year they were collected to the existing year 2017.

PEAK HOUR OPERATING CONDITIONS

The traffic operations of The Triangle intersections were analyzed using methodologies from the 2010 Highway Capacity Manual (HCM). Level of Service (LOS) and delays were calculated and are summarized below. Synchro 9™ software was used as the analysis tool for determining the LOS at the Study Area intersections. Synchro implements the methods specified in the 2010 HCM to analyze intersection capacity and determine LOS.

LOS is an index that is intended to reflect a traveler’s experience on different types of transportation facilities. LOS ranges from A (free flow, unconstrained travel) to F (severe congestion, long delays) (Table 3.24) and it serves as an indicator of driver discomfort, frustration, fuel consumption and lost time. For operations at intersections, which are the controlling factor for The Triangle’s local roadway system, LOS is based on the HCM-based calculation of “control delay,” which is the average amount of time that a vehicle will spend stopped at a given intersection or intersection approach. LOS control delay values are given in Table 3.24. It is important to note that the LOS criteria described in Table 3.24 is for motorized vehicles only.

Signalized intersection analysis is based upon the capacity of each lane group and the correlating control delay associated with the intersection. Capacity is a measurement of the ability of an intersection design to accommodate all movements within the intersection. Capacity is a function of physical geometry and signalization conditions.

Delay is the measure of the user quality of service and it is based on the relationship between capacity and demand. For unsignalized intersections, delay values apply only to the controlled movements, since the main street movements are not restricted. Synchro 9 software was used as the analysis tool for determining the unsignalized LOS at the Study Area intersections. Synchro implements the methods of the HCM to analyze intersection capacity and determine LOS.

TABLE 3.24: LEVEL OF SERVICE CRITERIA	
LEVEL OF SERVICE	AVERAGE DELAY IN SECONDS AT SIGNALIZED INTERSECTIONS
A	≤ 10 SECONDS
B	>10 AND ≤ 20 SECONDS
C	>20 AND ≤ 35 SECONDS
D	>35 AND ≤ 55 SECONDS
E	>55 AND ≤ 80 SECONDS
F	>80 SECONDS

Source: Highway Capacity Manual, 2010

LOS Measures of Effectiveness (MOEs) results are shown in Figure 3.56 for AM and PM peaks. It should be noted that the operations along Route 9 reflect the soon to be implemented traffic signal timings, phasing and coordination information. During the AM peak, of the 24 Study Area intersections, only the intersection of Cochituate Road (Route 30) at Whitier Street and Shoppers World Drive experienced LOS F conditions and the intersections of Route 30 at Speen Street and Speen Street at Hartford Street/Route 9 operate at LOS E.

Five of the 24 Study Area intersections have an LOS of F and two of the 24 Study Area intersections have an LOS of E during the PM peak. Four of these intersections are located along Route 30 and three on Route 9. Pedestrian (ped) and bicycle volumes recorded during the PM peak at these intersections are shown in parenthesis. As shown, the combined pedestrian and bicycle volumes at most of the locations are less than 20 per hour (likely due to the poor bicycle and pedestrian connectivity noted in coUrbanize), yet for four out of these seven locations (indicated by an *), the intersection includes an exclusive pedestrian phase that the Synchro analysis considers called every cycle which results in worse LOS and likely more lengthy delays than will be observed in the field.

LOS F:

- Cochituate Road (Route 30) @ Speen Street (PM ped & bike volume = 18 pedestrians and/or bicycles/hour)
- Cochituate Road (Route 30) @ Whitier Street/Shoppers World Drive (PM ped. volume = 5/hour)*
- Cochituate Road @ Shoppers World Way/Ring Road (PM ped & bike volume = 4/hour)*
- Worcester Street (Route 9) at Dean Road/Natick Mall Road (PM ped & bike volume = 10/hour)*
- Worcester Street (Route 9) @ Caldor Road (PM ped & bike volume = 49/hour)

LOS E:

- Concord Street (Route 126) @ Cochituate Road (Route 30) (PM ped & bike volume = 14/hour)*
- Route 9 @ Ring Road /Bed Bath and Beyond Driveway (PM ped & bike volume = 24/hour)



Legend

- AM PM LOS
- A-C D-E F
- State Top 200 Crash List
- Golden Triangle Boundary
- Municipal Boundary
- Streets
- Parcel Boundary
- Parking
- Rail Trail
- Water Bodies
- Wetlands

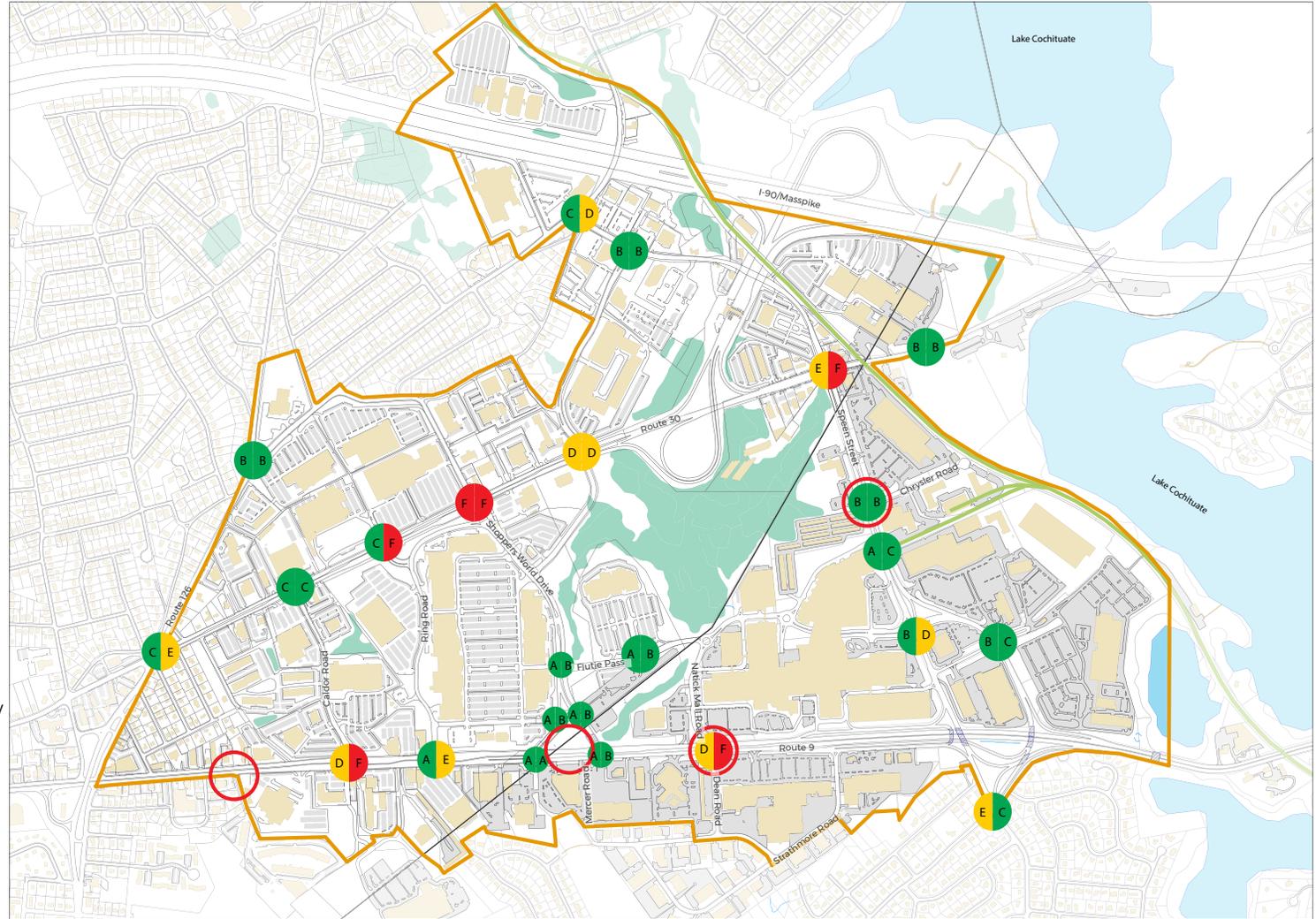


Figure 3.56: AM and PM peak intersection level of service (LOS).

SAFETY ANALYSIS AND HIGH CRASH LOCATIONS

There are four intersections in The Triangle on the MassDOT's statewide top 200 crash location list between 2011 and 2013:

- 81. (tied) Speen Street and Cloverleaf Marketplace Shopping Center (Natick);
- 81. (tied) Worcester Road (Route 9) at Dinsmore Avenue (Framingham);
- 154. Route 9 and Dean Road (Natick); and,
- 178. Route 9 and Shoppers World (Natick/Framingham)

Traffic crash incidence is particularly high at intersections along Route 9 and Speen Street and at locations adjacent to shopping centers and commercial strip development. This reflects high traffic volumes along these corridors. The intersection of Speen Street and Cloverleaf Market Shopping Center is essentially an unsignalized intersection located within a highway interchange with associated high speed traffic. Similarly, it is likely that the high rate of crashes at the unsignalized intersection of Route 9 at Dinsmore Avenue is associated with the heavy volume, high speed nature of Route 9 in that area and the difficulty of vehicles turning onto and off Route 9 onto an unsignalized roadway.

The signalized intersection of Route 9 and Dean Road experiences an LOS of F during the PM peak which indicates congestion at this high volume, multiple lane, multiple approach intersection. Although a more detailed review of the crash data would be required to confirm, it is possible that the crashes are occurring at some of the uncontrolled right turn merge points. As with the other intersection outlined above, unsignalized merges are difficult to maneuver safely with high volume, high speed conflicting traffic. The traffic signal improvement project on Route 9 has likely included modifications to improve safety. Something as simple as providing more adequate clearance times can reduce crash experience.

ROADWAY, INTERSECTION, AND TRAFFIC ISSUES

The following are issues related to roadways, intersections, traffic operations and roadway safety. These issues have been identified through field observations, evaluation of traffic operations, review of previous documents (both private development analyses and publicly-funded studies), input from respective municipal representatives and comments from stakeholders. Several comments related to the roadway and intersections were posted by the public on the online coUrbanize forum. Where appropriate, they are represented in this text and in recommendations in Chapter 6. Although some were more detailed than the scope of this Study, they are available in the coUrbanize addendum to this Report for future reference.

CORRIDOR RELATED ISSUES

- Heavy commuter traffic volumes on Route 9 result in congestion and queuing.
- Access to the MassPike and Route 9 ramps attract heavy traffic from Speen Street, resulting in congestion and queuing despite wide roadways and intersections.
- Difficult access onto and off the MassPike interchange ramps creates weaving conflicts, which are exacerbated by frequent curb cuts and poor access management along Cochituate Road. Stakeholders are concerned that regional access is limited by the traffic in this vicinity.
- Parking management at the Natick Mall, restructured parking for scooters, bikes to increase capacity.
- The lack of wayfinding signage and obstructed views to buildings both cause drivers to make last minute turn decisions.

INTERSECTION RELATED ISSUES

- Ramp access to the MassPike attracts heavy traffic and results in congestion and queuing at Speen Street/Cochituate Road, despite multiple lanes and wide intersection approaches.
- Minimum pedestrian crossing times contribute to deteriorating LOS at Route 9 intersections within the Study Area.
- Location of several retail driveways leading on to Route 9 creates connectivity and safety concerns.
- Lack of coordinated signal timing at several intersections leads to queuing of vehicles at intersections and reduced throughput.

- Left turn waiting times to access major retail developments are high at traffic signals, especially near Sherwood Plaza.

PUBLIC TRANSPORTATION

Public transportation in The Triangle, including both local bus service and connections to the MBTA for regional commuter rail, is provided by the MWRTA. The public transit routes within the Study Area are illustrated in Figure 3.57.

MBTA

The MBTA serves Framingham and Natick via the Framingham/Worcester Commuter Rail Line, running from South Station (Boston) to Union Square (Worcester) via Framingham and Natick. The line stops (from east to west) at South Station, Back Bay, Yawkey Way, Boston Landing, Newtonville, West Newton, Auburndale, Wellesley Farms, Wellesley Hills, Wellesley Square, Natick Center, West Natick, Framingham, Ashland, Southborough, Westborough, Grafton and Worcester. The train stations are located on Waverly Street (Route 135) in Framingham and on West Central Street (Route 135) and North Main Street (Route 27) in Natick. They are accessible to The Triangle via MWRTA bus route number 4N and MWRTA bus route numbers 10 and 11 respectively. Trains run every 30 to 35 minutes during the peak periods.

MWRTA

THE MWRTA was initiated in 2006 by the state legislature to help serve the public transportation needs of the 32-town corridor known as the I-495/MetroWest corridor. There are currently seven MWRTA bus routes – Routes 1, 2, 3, 4N, 9, 10 and 11 - that serve at least some portion of The Triangle (fig. 3.57). These routes in turn provide connections to additional MBTA bus routes and the commuter rail system. The MWRTA headquarters is at the Blandin Hub in downtown Framingham.



Legend

Bus Routes

- Route 1
- Route 2
- Route 3
- Route 4
- Route 9
- Route 10
- Route 11

- Golden Triangle Boundary
- Municipal Boundary
- Streets
- Parcel Boundary
- Parking
- Rail Trail
- Water Bodies
- Wetlands

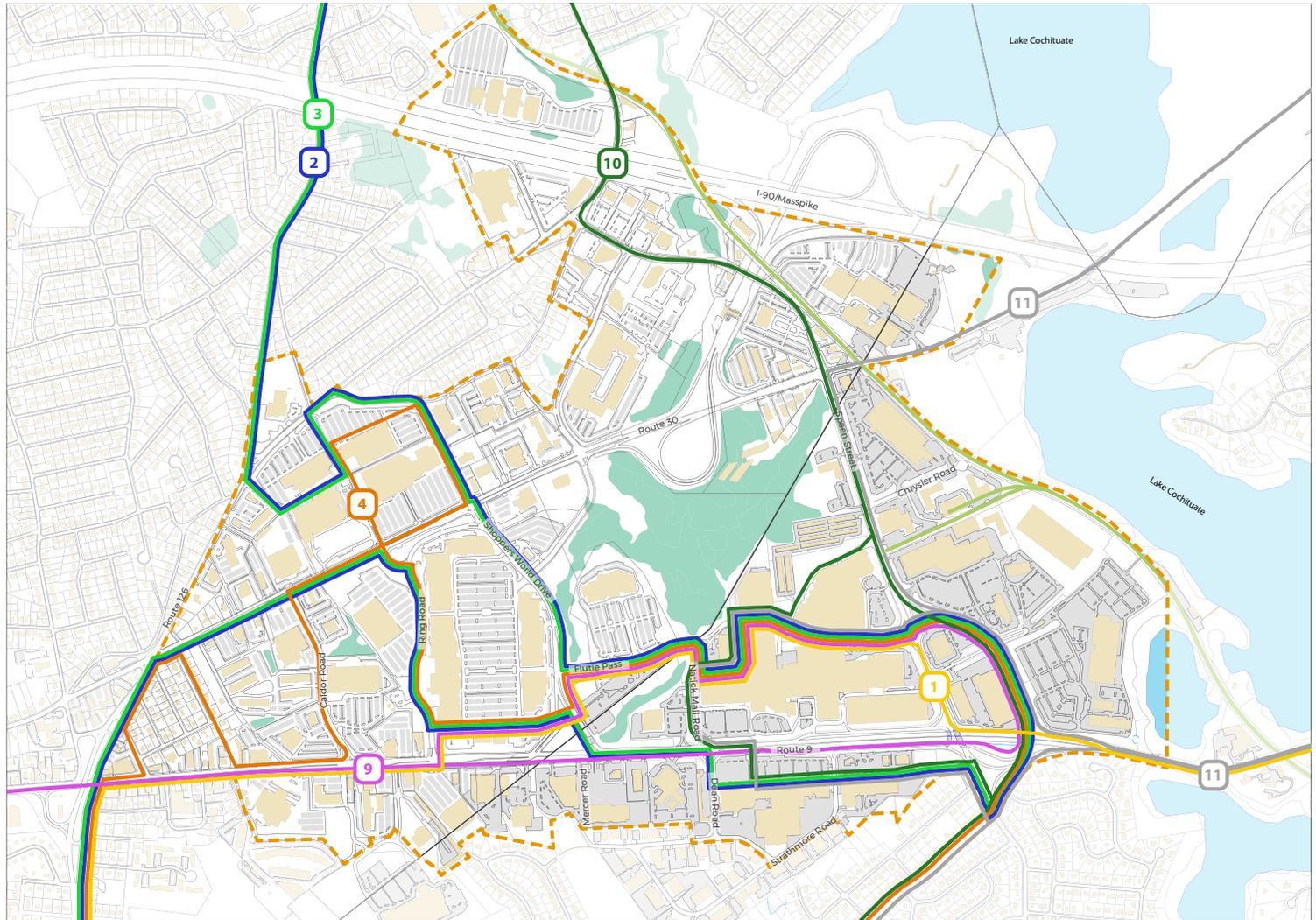


Figure 3.57: Public transportation within The Triangle as of February 2018.

Route 1 services stops between Blandin Hub located in Framingham and the Woodland MBTA Station in Newton with stops within The Triangle at Flutie Pass (in Framingham) and Natick Mall/Macy's (in Natick). Weekday service begins at approximately 5:30 AM (eastbound) or 6:30 AM (westbound) and buses run approximately every half hour. The service runs until approximately 8:20 PM (eastbound) and 8:45 (westbound). Only four round trips go west of Natick Mall/Macy's and weekend service is not available for this route.

Route 2 services stops between Blandin Hub and Pearl Street, both located in Framingham, with stops within The Triangle at Target/Whitier Street, Shoppers World Shelter East, Natick Mall/Macy's, Shoppers World Shelter, Kohl's, Route 30 & Route 126 Concord Street. Weekday service begins at 6:30 AM and ends at 7:55 PM. Buses run approximately every 60 minutes. Buses run approximately every hour between 9:30 AM and 4:30 PM on Saturdays.

Route 3 services stops between Blandin Hub and Danforth Museum, with intermediate stops within The Triangle at Route 30 & Route 126, Concord Street, Walmart, Sherwood Plaza, Natick Mall / Macy's, Shopper's World East, Target / Whitier Street and Stop & Shop. Weekday buses run approximately every 55 minutes between 6:15 AM and 6:55 PM. Weekend service begins at 8:25 AM and buses run approximately every 60 minutes until 3:36 PM.

Route 4N services stops between Blandin Hub and the Banana Lot in Framingham with intermediate stops within the Study Area at MathWorks Lakeside, Natick Mall (Macy's Bus Shelter), Shoppers World Bus Shelter, Kohl's Bus Shelter, Stop & Shop/BJ's Wholesale Club, Walmart and Route 9 West/Beacon Street. Weekday service begins at 6:15 AM and buses run every 40 minutes until 6:55 PM. Saturday service begins at 8:25 AM and buses run every 75 minutes until the end of service at 3:36 PM.

Route 9 services stops between Blandin Hub and Bus Shelter on High Street near Framingham State University in Framingham with intermediate stops at Natick Mall (Macy's bus shelter), Flutie Pass, Shoppers World and Route 9/ Route 30 within the Study Area. Service begins at 5:50 AM and buses run approximately every 20 minutes until 8:09 PM. Weekend service is not available for this route.

Route 10 services stops between Blandin Hub and Sherwood Village (Mill Street) in Natick with intermediate stops within the Study Area at Speen Street at Route 30, TJX, Natick Mall (Macy's Shelter) and Sherwood Plaza. Weekday service begins at 6:30 AM and four buses service this route in the AM and four buses service the route in the PM until the end of service at 7:10 PM. Weekend service is not available for this route.



Figure 3.58: Map of the MetroWest region.



Figure 3.59: The Logan Express facility.

Route 11 services stops between Blandin Hub and Beaver Street at Second Street in Framingham with intermediate stop at Speen Street at Mill/Pond Streets within The Triangle. Route 11 services begin at 6:30 AM and end at 7:15 PM on weekdays. Four buses serve the AM and PM routes. Service begins at 8:10 AM and ends at 4:05 PM on Saturdays. Three buses service Route 11 in the AM and PM during Saturdays.

MWTMA

The MetroWest Transportation Management Association (MWTMA) is a part of the Massachusetts Coalition of Transportation Management Associations (MATMA), also known as MassCommute. The MWTMA is partners with MetroWest Chamber of Commerce, nuride (a ride-sharing/commuting system), Marlborough Chamber of Commerce, 495/MetroWest Partnership, and the MetroWest Regional Transit Authority.

The MWTMA is a member-based non-profit organization that focuses on transportation-related issues in the MetroWest region (Fig. 3.58) and provides sustainable commuting solutions to the large employers located here. The MWTMA is a program of both the MetroWest and Marlborough Regional Chambers of Commerce and focuses on a vital component of the success of the region: transportation.

MWTMA serves the communities of the MetroWest region, including Framingham and Natick and advocates the use of alternate modes of transportation, including carpooling, vanpooling, public transit, and walking/biking. The goal of the MWTMA is to reduce traffic congestion, improve air quality, and increase awareness of sustainable transportation. The MWTMA advocates for sustainable transportation options in the area and collaborates with community leaders to strengthen the economic growth of the area. The result improves the quality of life for people living and working in MetroWest, one of the most dynamic regions in the Commonwealth of Massachusetts.

LOGAN EXPRESS

Logan Express provides bus connections into Logan Airport from its facility located at 11 Burr Street Extension in The Triangle. The facility, constructed in 2015, was built with four floors, but was designed to support two additional parking decks (Fig. 3.59). Buses leave Framingham starting at 3:15 AM and every

half hour from 4:00 AM to 11:00 PM. Trips from Logan start at 6:30 AM and occur every half hour until midnight with an additional trip at 1:15 AM. Weekend service occurs for slightly shorter hours with 60 minute headways.

PETER PAN BUS LINES

Peter Pan Bus Lines runs limited daily service from the MWRTA bus shelter on the southern portion of Ring Road to Boston, Worcester and Springfield.

PUBLIC TRANSPORTATION ISSUES

- Long headways on most routes and minimal or lack of service on weekends.
- As can be seen in Figure 2.54, portions of The Triangle are not well served.
- Lack of safe or convenient pedestrian connections from potential users to bus stops.
- The northern end of the Study Area is only served by MWRTA Route 10 which has no stops north of Route 30. This results in lengthy walks for a significant portion of The Triangle.
- Parcels on the south side of Route 9 have few opportunities for transit resulting in long walks and necessitating crossing Route 9 in many cases.

PEDESTRIAN AND BICYCLE ACCOMMODATIONS

Figure 3.60 shows the existing and planned bicycle accommodations within The Triangle. Figure 3.61 shows the sidewalk coverage in The Triangle. The portion of the Cochituate Rail Trail to the north of Route 30 in Framingham has been constructed.

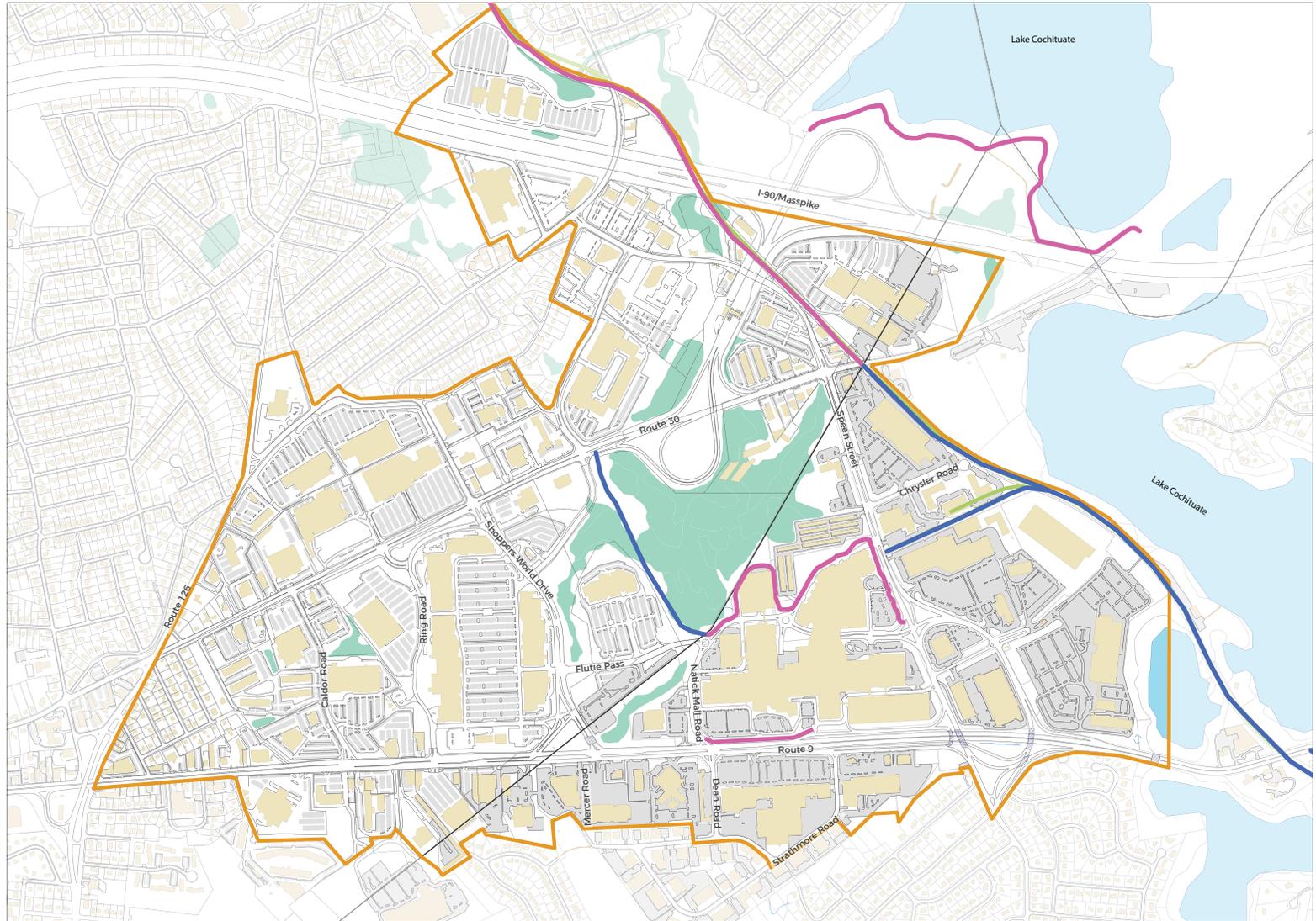


Figure 3.60: Bicycle Accommodations (existing and proposed) within The Triangle.

Source: MassGIS 2013

Data presented may be slightly different from the existing conditions because data was generated in the year 2013.

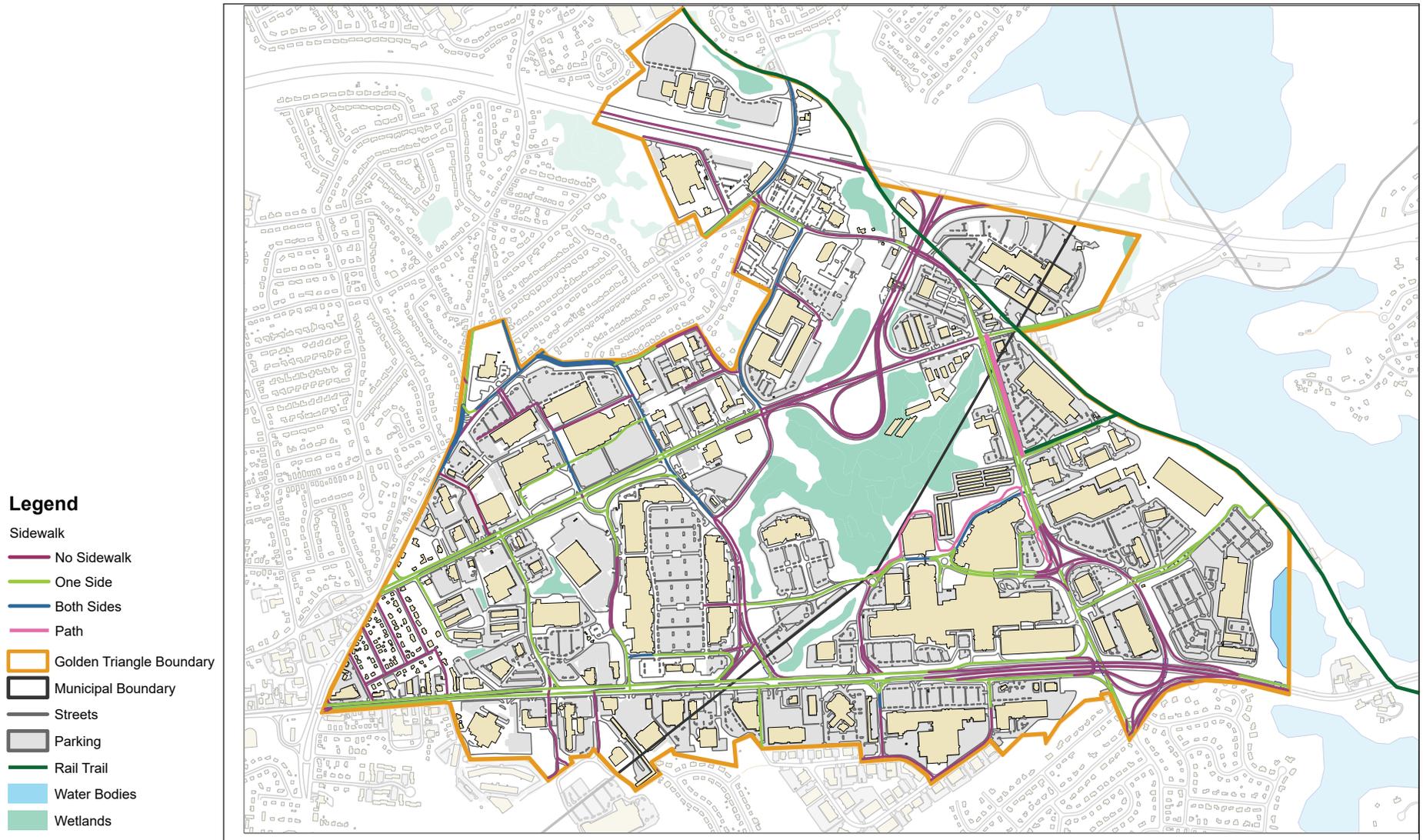


Figure 3.61: Existing Sidewalk Coverage within The Triangle.

Source: MassGIS 2014

Data presented may be slightly different from the existing conditions because data was generated in the year 2014.

PEDESTRIAN AND BICYCLE RELATED ISSUES

- Multiple lanes, wide roadways, and ramp interfaces create an uncomfortable pedestrian and bicycle environment on Speen Street.
- Poor access management and difficulty traveling in the vicinity of the MassPike interchange ramps create a hostile pedestrian and bicycle environment on Route 30.
- Little or no pedestrian facilities are provided in the Study Area north of Route 30 and many developments provide no pedestrian connections into their sites.
- Lack of connections through “big-box” developments (Post office, Lowe’s, Stop & Shop, BJs).
- Crosswalks and sidewalks dead end at various locations along Ring Road in the Shoppers World area.
- Isolated developments are located on Old Connecticut Path north of MassPike with no pedestrian connections or transit connections.
- Bicycle and pedestrian connectivity between retail developments, and to the Framingham commuter rail station, were commonly raised on the coUrbanize webpage.
- Missing roadway regulatory signs, crosswalks, lack of ADA compliant crosswalks at intersections are some of the safety related issues within The Triangle.

PROPOSED PUBLIC CAPITAL INVESTMENT PROJECTS

The following are planned or proposed transportation system projects that would entail investment in the transportation system using public funding. Most of the projects have funding identified, as discussed below and therefore have a high likelihood of implementation. They will significantly improve the Study Area’s transportation network in coming years. These projects also include other infrastructure improvements such as stormwater management.

COCHITUATE RAIL TRAIL (CRT)

The project entails the construction of a shared-use path with overlook areas. The Study Area encompasses a 2.4-mile stretch of the abandoned Saxonville Branch of the former Boston and Albany Railroad (now CSX) and a 0.25-mile connection to Speen Street known as the Wonder Bread Spur (Fig. 3.62). The project follows the existing railroad right-of-way from Cochituate Road (Route 30) in Framingham to the Natick Center MBTA Commuter Rail Station. Pedestrian improvements include construction of a 100-foot single span prefabricated steel bridge over Route 30 that will meet ADA requirements, construction of a single span prefabricated steel truss pedestrian bridge over Route 9 combined with stormwater management design and additional path access locations. No motorized vehicles are allowed on the CRT. The approximate estimated cost for the entire project is \$9,000,000 and the 25 percent design plans are approved.

A pedestrian bridge over Speen Street from the end of the Wonder Bread spur to the Natick Mall has been studied in the past and is currently being studied again.



Figure 3.62: Planned Cochituate Rail Trail in Natick.
 Source: Cochituate Rail Trail Functional Design Report, BETA, 2014

ROUTE 30 ARTERIAL SEGMENT STUDY IN FRAMINGHAM & NATICK LOCATION: ROUTE 30 (COCHITUATE ROAD)

In 2013, Central Transportation Planning Staff (CTPS) completed a corridor study of Route 30 from Ring Road in Framingham to the TJX driveway in Natick (Fig. 3.63). The Study Area is shown in Figure 2.59. The Study purpose was to address significant mobility, congestion and safety issues for pedestrians, bicycles, and motorists in the segment. The study provided alternatives to address the operational and safety issues that would need to be addressed after the completion of the Cochituate Rail Trail (CRT) project in the near future. The following issues were identified:

- Trail crossings should follow pedestrian desire lines
- Bicyclists should not have to walk their bikes to an intersection
- Crossings should avoid busy driveways
- Crossings should avoid site conditions that pose risks for trail users, e.g., crossing busy Route 30 at-grade.

The Study identified three options for closing the gaps in the existing bicycle and pedestrian circulation, including recommendations for signs and markings; traffic signal retiming schemes at four signalized intersections; traffic management options for the Route 30 segment between Speen Street and the MassPike on ramp; and six medium- and long-term concepts for reconfiguring the connection of Speen Street and Route 30 to the MassPike, including adding a second westbound traffic lane to Route 30 from the TJX driveway to the MassPike connector.

The preferred alternative for pedestrian and bicycle accommodations entails construction of new sidewalks and multiuse paths around the outer loop of the MassPike connector south of Route 30 for accessing businesses near the Route 30 and Speen Street intersection, as well as the CRT. The Study also analyzed four crossing options to improve safety for trail users at the Route 30 crossing. The Study concluded that getting CRT users to cross Route 30 at the existing track alignment using grade separation (overpass or underpass) was the preferred alternative. Other improvement recommendations included installing side-



Figure 3.63: Route 30 Arterial Segment Study Area in Framingham and Natick.
 Source: Route 30 Memo, CTPS, 2013

walk buffers, installing countdown timers at signals to help pedestrians make informed decisions about crossing the road, shared bicycle lane markings (“sharrows”) on pavements and fine-tuning traffic signals on Route 30 from Beacon Street to Burr Street and Speen Street. Additional lane geometry modifications to improve safety at various commercial driveways were also suggested.

ROUTE 9 ROADWAY IMPROVEMENTS

Roadway improvements on Route 9 include Framingham-Natick Adaptive Signal Control on Route 9 Transportation Improvement Plan (TIP) project. This project includes installation of adaptive traffic control signal

equipment, vehicle detection, communication equipment and managing software at five traffic signals (3 in Framingham and 2 in Natick). Adaptive traffic control is a traffic management strategy in which traffic signal timing changes, or adapts, based on actual traffic demand. This is accomplished using an adaptive traffic control system consisting of both hardware and software. The budget for this project is approximately \$414,000 and is funded by the congestion mitigation and air quality funds. The project was completed in the summer of 2017.

HIGHWAY SAFETY IMPROVEMENTS IN THE TOWN OF FRAMINGHAM

A stormwater and drainage project to improve storm water infrastructure at the Route 9 and Route 126 interchange is listed on the State TIP webpage. The estimated total contract cost is \$2,875,000 and the project is in the preliminary design phase.

The existing utilities information was obtained from GIS layers provided by both Framingham and Natick. The available data is summarized on the next few pages.

UTILITIES

STORMWATER SYSTEM

Storm drainage in The Triangle is accomplished by catch basins with direct connections to nearby drainage systems.

FRAMINGHAM

The stormwater system on the Framingham side of The Triangle collects to the large wetland area in the middle of The Triangle. The wetland area is a tributary to Lake Cochituate. The major trunk line, approximately 48 inches in diameter, travels down Cochituate Road. Based on preliminary calculations, this 48

inch line has additional capacity of 960 cubic feet per second when analyzed at a 25-year design storm; more than enough capacity to handle any future development.

NATICK

The Natick side of the Project Area is made up of two major truck lines. One approximately 24 inch line travels from Speen Street east down Superior Drive and outfalls to Lake Cochituate. Another large system runs north down Speen Street and outfalls to the large wetland area in the middle of The Triangle. This system also collects drainage area from Chrysler Road, including the Home Depot Property, in an approximately 36 inch pipe. This pipe’s existing capacity could not be determined with no existing invert data available.

WATER SUPPLY SYSTEM

Existing water service to The Triangle is supplied by a water system with a diameter of 12 inches, located along Worcester Road and Cochituate Road. Hydrant flow test data for four locations was received from Framingham; two of the locations are in The Triangle: a line of undetermined size at Worcester Road and Shoppers World and another line of undetermined size at Cochituate Road at Burr Street. These tests show that within the Study Area the system has reasonable fire flow (Table 3.25). Due to these lines having reasonable flow, the 12 inch lines are adequate if they are in good condition. When future development is considered, additional tests should be performed, along with water line cleaning or lining.

TABLE 3.25: WATER SUPPLY TESTING INFORMATION					
TEST LOCATION	TEST DATE	FLOW (GPM)	STATIC PRESSURE (PSI)	RESIDUAL PRESSURE (PSI)	CALCULATED @ 20 PSI RESIDUAL PRESSURE
WORCESTER ROAD AND SHOPPERS WORLD	06/16/2016	1,400	85	80	5,590 GPM
COCHITUATE ROAD AT BURR STREET	06/16/2016	1,420	92	82	5,000 GPM

SEWER SYSTEMS

FRAMINGHAM

The 24 inch polyvinyl chloride (PVC) sewer line that travels out of Framingham along the Cochituate system area includes all of Framingham in The Triangle, as well as Natick from Speen Street west. Using GIS data of the land uses in these areas, the 24 inch sewer system area was split into the land use categories of residential, hotel, retail, office, industrial and institutional. Title 5 estimated flows were then applied to the different land uses to get a combined sewer flow. Based on the calculated Title 5 flows and after applying a peaking factor of two, the existing 24 inch line appears to have adequate capacity for the existing flows. This analysis also shows that the existing 24 inch pipe could have additional capacity to handle more flows. Further analysis with actual flow tests would need to be done to confirm that the existing pipe could accommodate the flows generated with that type of development that is proposed.

NATICK

The sanitary sewer system for the existing development east of Speen Street collects in an approximately 18-inch line from Chrysler Road and Superior Drive to a system that travels south down Speen Street to outside The Triangle to an MWRA sewer line that travels east parallel to the B&A Worcester rail road tracks.

The sanitary sewer system for the existing development east of Speen Street collects in an approximately 18-inch line from Chrysler Road and Superior Drive to a system that travels south down Speen Street to outside The Triangle to a Massachusetts Water Resources Authority (MWRA) sewer line that travels east parallel to the B&A Worcester rail road tracks.

The 18-inch PVC sewer line that travels out of The Triangle down Speen Street to an MWRA sewer line includes all the area in Natick for The Triangle east of Speen Street. Using GIS data of the land uses in these areas, the 18 inch sewer system area was split into the land use categories of residential, hotel, retail, office, industrial and institutional. Title 5 estimated flows were then applied to the different land uses to get a combined sewer flow. Based on the calculated Title 5 flows and after applying a peaking factor of

two the existing 18 inch line appears to have adequate capacity for the existing flows. This analysis also shows that the existing 18 inch pipe could have additional capacity to handle more flows. This system could also contain flows from parcels outside The Triangle; therefore further analysis with actual flow tests would need to be done to confirm that the existing pipe could accommodate the flows generated with that type of development that is proposed.

ELECTRICAL SYSTEMS

Electric and utility pole information is not available from the City of Framingham. Natick provided utility pole data. This data shows there are several poles located along Speen Street, Worcester Road, Superior Drive, and Chrysler Road. There are also several light poles located along Worcester Road, Speen Street, Superior Drive, and Chrysler Road. The utilities pole services in the Natick side of The Triangle are owned by Eversource, but no information is provided as to what is on the poles.

GAS SYSTEMS

No Gas utility data was available for Framingham or Natick.

UTILITY RELATED ISSUES

- Flooding occurs at the northeast corner of the wetlands area and at the intersection of Route 30 at Speen Street. Flooding at the end of the MassPike ramp to Route 30 westbound where it meets and along Route 30 westbound, and at the intersection of Route 9 and Route 126, has also been noted on CoUrbanize.
- Although there are water service connections available in The Triangle, water main information and fire flow tests were not provided for Natick. Data for Framingham indicate adequate flow on that side of The Triangle.

- No GIS sewer information is provided for the Shoppers World area or the “big box” retail area north of Route 30.
- Although limited electrical data was provided, consideration should be given to installing utilities underground rather than on pole moving forward.

BROWNFIELD SITES

Online research revealed that only one area has been identified as a brownfields site. Cochituate Rail Trail – Lots 3b, 14a and 250 in Framingham were identified as brownfield sites in historic brownfield documents. The City of Framingham has been successful in obtaining grants to study and spur development of these sites. It is important to note that brownfield issues are less likely in The Triangle because there is no major industrial history in this area other than the railway lines.

SUMMARY TRANSPORTATION AND INFRASTRUCTURE FINDINGS

This section outlined the existing transportation infrastructure, drainage and utilities within The Triangle and identified the following key issues to be addressed during design and analysis of redevelopment alternatives:

- During the peak hours, a number of locations experienced congestion, most significantly at Route 30 at Speen Street and at the MassPike interchange itself. In order to support future development, improvements should be considered.
- The presence of the MassPike interchange results in a hostile environment for pedestrians and bicyclists. Opportunities to reduce the scale of the traffic infrastructure in this area should be considered.
- Safety analysis indicated four high crash locations within the Study Area. Three out of these four locations were on Route 9 and one was on Speen Street.
- Framingham and Natick and MassDOT have been involved in several traffic signal improvement projects on Route 9 and Route 30 to provide optimal operations given the existing infrastructure.
- Consideration should be given to improving pedestrian and bicycle connectivity within The Triangle, preferably on both sides of the street where it is not currently available. Improving transit, bicycle, and pedestrian connectivity to the commuter rail stations and within The Triangle would encourage the use of alternative transportation modes. Support for these facilities, and incorporating them into future projects, should be considered when development opportunities are presented.
- Where information is available, utilities are adequate to accommodate future growth. All redevelopments will need to comply with local and state regulations to ensure that adequate water supply is available and that capacity exists for the resulting wastewater. When projects are redeveloped in the area of Route 30 and Speen Street, special attention should be given to the stormwater in light of existing flooding occurrences. When possible, underground power, cable and telephone should be considered.