# U. S. Route 5 Corridor Study
# Existing Conditions Report

**PREPARED FOR:**

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# 1.0 INTRODUCTION

The Capitol Region Council of Governments (CRCOG) and the Town of East Windsor, in cooperation with the Connecticut Department of Transportation (CTDOT), have initiated the U.S. Route 5 Corridor Study (the Study) to evaluate traffic and development issues along Route 5 in the Town of East Windsor. The purpose of the Study is to develop a comprehensive transportation plan for Route 5 that will: (1) address safety, congestion, and mobility of the transit system, pedestrians, and bicyclists; and (2) assess travel demand growth and its impacts on area roadways including traffic associated with development within the Study Area (3) and develop recommendations that address identified issues in the study area, that provide transportation system enhancements and economic growth opportunities.

## 1.1 Study Area

The Study Area includes the corridor along Route 5 in East Windsor from the Enfield town line to the South Winsor town line, a distance of approximately five miles. From the southern limits of the corridor northerly to its intersection with Main Street, Route 5 is known as South Main Street. From Main Street northerly to the Enfield town line, Route 5 is known as Prospect Hill Road. The Study Area limits and street names are shown in **Figure 1**. The Study includes the assessment of intersecting side street approaches, as well as access and egress for adjacent land uses. The Route 5 corridor includes highway exit and entrance ramps for Interstate 91 (I-91), residential streets, and several businesses. There are also many local destinations on or adjacent to Route 5 such as schools, restaurants, farms, retail, and grocery stores. Route 5 is served by infrequent bus service and provides limited amenities to bicyclists and pedestrians.

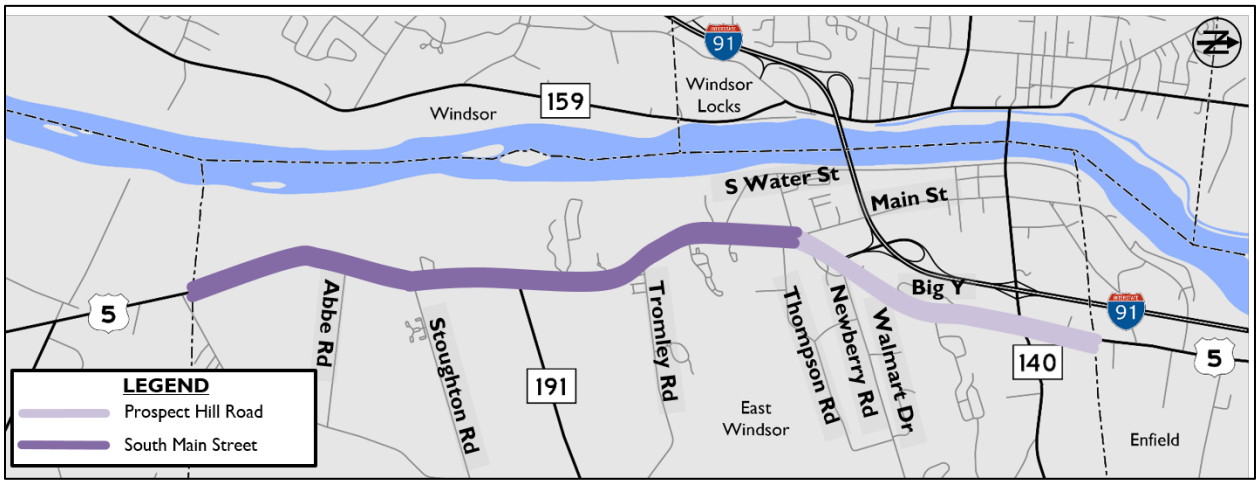



**Figure 1: Route 5 Corridor Study Project Limits and Street Names**

## 1.2 Study Process

The Route 5 Corridor Study is being conducted in a collaborative manner with stakeholder and community involvement, an advisory committee, and technical reviews. The Study takes into consideration other ongoing studies in and around the corridor including the proposed casino owned and operated by MMCT Venture, LLC (a joint venture of the Mashantucket Pequot and Mohegan tribes); Windsor Locks Rail station; and future development plans at sites along Route 5. A summary of the Study Team and the public involvement process is presented in **Figure 2**, page 2.

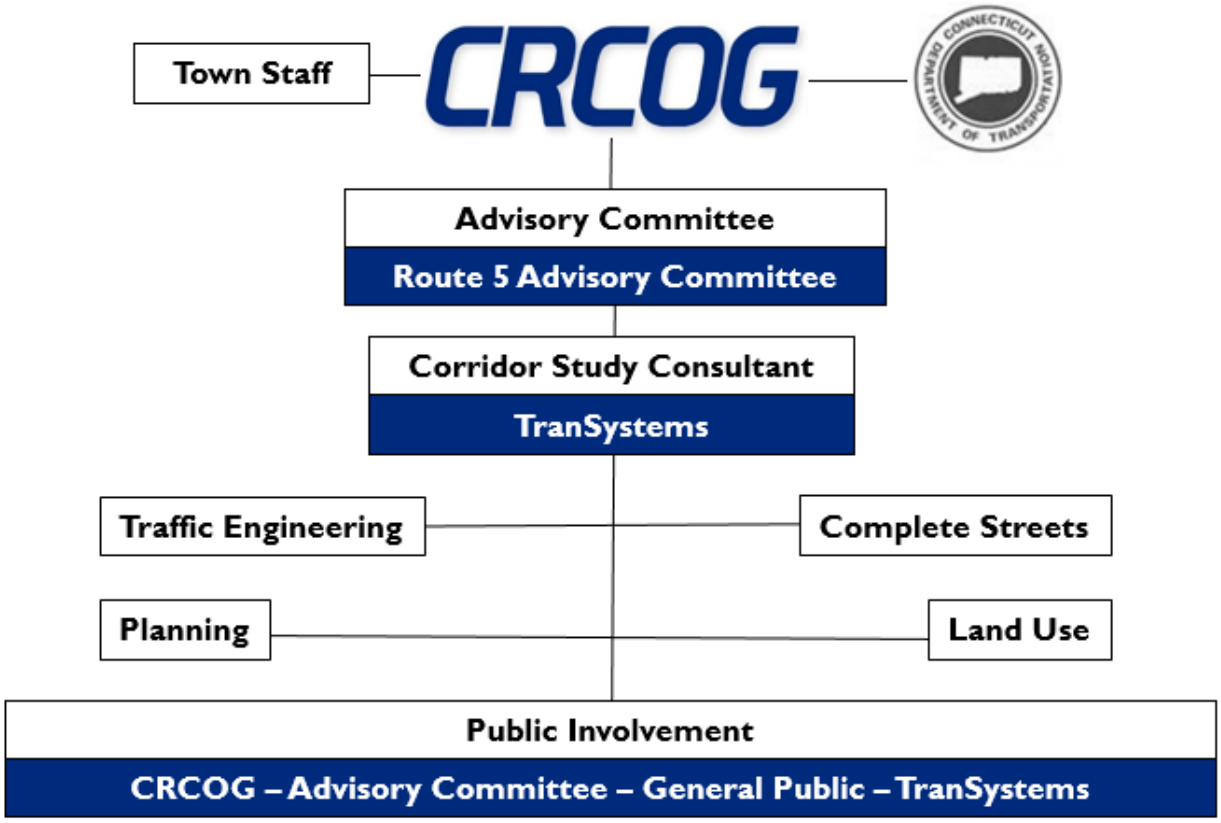



**Figure 2: Study Team and Public Involvement Process**

There are a number of ways that the Route 5 Corridor Study Team collects and distributes information about the Study including:

- Interested parties lists
- Newsletters
- Webpage (http://crcog.org/2018/05/route-5-east-windsor-corridor-study/)
- E-Blasts
- Survey
- Board of Selectmen
- Technical review meetings
- CRCOG Committee meetings
- Stakeholder interviews

As part of the Route 5 Corridor Study, the Existing Conditions Report evaluates current transportation and land use conditions along the corridor. Ultimately, the Study will result in a comprehensive Transportation Improvement and Development Management Plan for Route 5.

# 2.0 EXISTING CONDITIONS ASSESSMENT

This report provides an assessment of the Route 5 Study Area relative to the existing roadway and traffic; land use and development; pedestrian, bicyclist, and vulnerable user; and transit/commuter systems. Stakeholder input was a key component of the data collection process to help complete the existing conditions assessment. The purpose of the existing conditions assessment is to identify deficiencies in order to establish a baseline against which future conditions and improvement recommendations can be evaluated.

## 2.1 Roadway and Traffic

This section identifies and evaluates the issues, deficiencies, and opportunities of the existing roadway system within the Study Area. It is important to note that the roadway system is part of the overall Route 5 transportation system, other elements of which are assessed in the following sections.

### *2.1.1 Roadway Characteristics*

Route 5 is classified as a principal arterial for its approximately 5-mile length in East Windsor. For the majority of its length, Route 5 is two lanes wide, one lane in each direction, with turn lane(s) provided at some intersections. The number of travel lanes and turn lanes on Route 5 within the corridor, as well as the presence of a median, is presented in Figure 3, page 4. Between Thompson Road and the Walmart driveway, north of the I-91 on- and off-ramps, Route 5 has two lanes in each direction with turn lanes. A raised median is provided in this section. Within 600 feet of the Southern Auto Auction main driveway, Route 5 widens to two lanes in each direction without a median.

**Roadway Functional Classification (FHWA)**

**The Federal Highway Administration classifies our Nation's urban and rural roadways by road function. Roadways serve two primary travel needs: access to/egress from specific locations and travel mobility.**

**There are four major roadway functional classifications:**

- **Interstates,**
- **Arterials,**
- **Collectors, and**
- **Local roads.**

**In both rural and urban areas, the principal arterials provide the highest traffic volumes and the greatest trip lengths. Routes on the principal arterial system are divided into Interstates and other principal arterials; these include freeways, multilane highways, and other important roadways that supplement the Interstate System. They connect, as directly as practicable, the Nation's principal urbanized areas, cities, and industrial centers. Land access is limited. Posted speed limits on arterials usually range between 45 and 70 mph.**

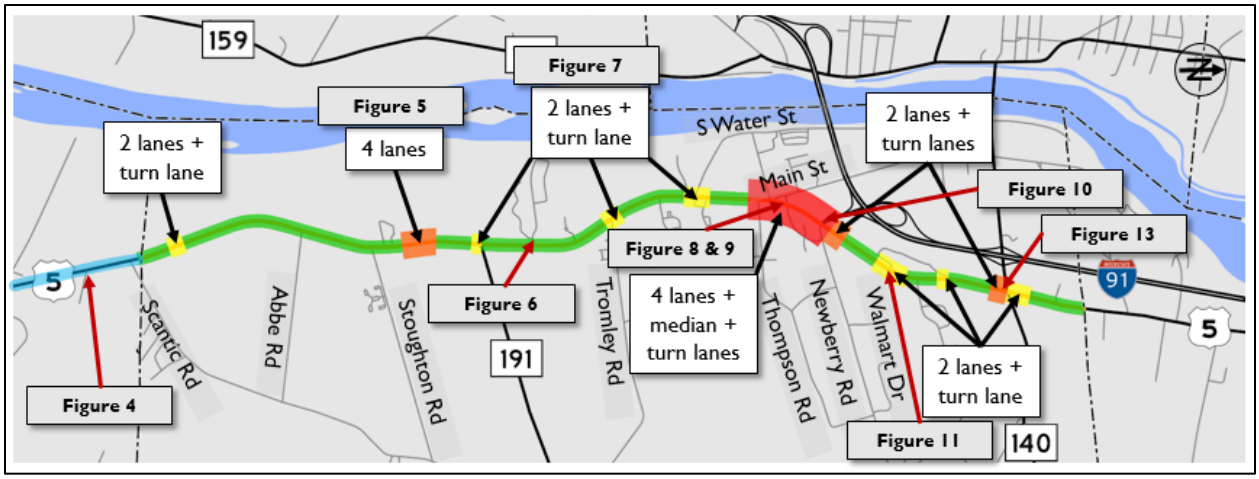



**Figure 3: Total Number of Lanes in the Study Area**

South of East Windsor, Route 5 has two lanes in each direction with a 25–foot-wide median and occasional turn lanes. The roadway continues southerly in this configuration to downtown East Hartford, a distance of approximately seven miles. Traveling north from South Windsor into East Windsor, Route 5 narrows to an undivided roadway with one through lane in each direction, as shown in **Figure 4**.

**Figure 4: Route 5 NB at South Windsor Town Line (Google Street View)**

Other than a short southbound left turn lane at Harken's Market, Route 5 remains one lane in each direction throughout the southernmost 1.3 miles of the Study Area. This high-speed rural segment includes signalized intersections at Abbe Road and Stoughton Road as well as dozens of unsignalized driveways. For more information on these driveways, see Section 2.1.4 - Access Management, page 25.

Route 5 widens to two through lanes in each direction approximately 600 feet south of the traffic signal at Southern Auto Auction's main driveway, as shown in **Figure 5**. This four-lane section continues another 600 feet past the signal. There is no median in this area.

**Figure 5: Route 5 NB at Southern Auto Auction (Google Street View)**

The next signalized intersection to the north is Phelps Road (Route 191). This three-leg intersection has an exclusive right turn lane on Route 5 northbound.

Route 5 continues to the north with one through lane in each direction. On the 0.7-mile segment between Phelps Road (Route 191) and Tromley Road, there are multiple unsignalized intersections at driveways and side streets. One notable intersection is at Winton Road, a residential street serving as the sole access point for dozens of houses and condominiums. No turn lanes are provided. This intersection is shown in **Figure 6**.

**Figure 6: Route 5 NB at Winton Road (Google Street View)**

The character of Route 5 gradually changes north of Phelps Road (Route 191), serving fewer commercial or industrial parcels and more residential buildings. This transitional zone includes several buildings with dual purpose, first floor commercial and second residential.

The next signalized intersection to the north is at Tromley Road and East Windsor High School, shown in **Figure 7**. This is the only traffic signal in the Study Area to have a marked crosswalk. Exclusive left turn lanes are provided in both directions on Route 5.

North of Tromley Road are two significant unsignalized intersections: Regina Drive and Riverview Drive. The intersection with Regina Drive is on the interior of a horizontal curve, limiting sight distance for exiting vehicles. The intersection with Riverview Drive is within 200 feet of the adjacent South Water Street signal. Northbound queues from this traffic signal may extend through the Riverview Drive intersection during peak hours.

**Figure 7: Route 5 NB at Tromley Road and East Windsor High School (Google Street View)**

The signalized intersection at South Water Street includes northbound and southbound exclusive left turn lanes. North of this signal, the road's character becomes more commercial.

A quarter mile to the north South Water Street intersection, the road cross-section rapidly changes. There are several closely spaced gas station driveways south of Thompson Road as Route 5 widens from a two-lane road to a much wider four-lane road with turn lanes and a raised median, shown in **Figure 8**. The complexity of this area has likely contributed to an increased crash rate relative to the surrounding segments. This increase in crashes is discussed in more detail in Section 2.1.3 - Crash History, page 20. The signalized intersection with Thompson Road has two through lanes northbound and southbound, plus a southbound exclusive left turn lane.


**Figure 8: Route 5 NB South of Thompson Road (Google Street View)**

Between the signals at Thompson Road and Main Street, separated by 400 feet, is an unsignalized intersection with Wagner Lane which is only accessible from Route 5 southbound. Northbound traffic must perform a U-turn to get to Wagner Lane. This area is shown in **Figure 9**. The traffic signal at Main Street (unsigned Route 510) runs off the same controller as the signal at Thompson Road due to their proximity. Route 5 has three lanes in each direction here – two through lanes and an exclusive left turn lane.

**Figure 9: Route 5 NB Between Thompson Road and Main Street (Google Street View)**

North of this traffic signal, there is an unsignalized intersection with Greenwoods Lane. Access to and from Route 5 northbound is right-in, right-out, and access from Route 5 southbound is right-in only, serving mainly traffic going from Route 5 southbound to Main Street northbound.

Continuing north, Route 5 gains more lanes as it approaches the I-91 Exit 44 ramps. This is shown in **Figure 10**. Route 5 northbound has two through lanes and two exclusive left turn lanes. Route 5 southbound has two through lanes and exclusive left and right turn lanes. There is no raised median north of the intersection, only occasional painted islands. Crash rates at this intersection are significantly higher than other intersections in the Study Area.

**Figure 10: Route 5 NB Approaching the I-91 Exit 44 Ramps (Google Street View)**

Approximately 500 feet north of the I-91 ramp intersection is another traffic signal serving Walmart on the east side of Route 5 and two restaurants and a bank on the west side. This is another area of transition – Route 5 narrows from two through lanes in each direction to one. At the traffic signal, Route 5 northbound has two through lanes and exclusive left and right turn lanes; the two through lanes merge just north of the intersection. Southbound, Route 5 has one through lane and one exclusive left turn lane. This merge is shown in **Figure 11**.

**Figure 11: Route 5 NB at Walmart (Google Street View)**

North of this signal, the character of Route 5 changes. Traffic signals are more regularly spaced, travel lanes are narrower, the road climbs a hill, and trees line both sides of the road. Adjacent land uses are mixed and there are fewer curb driveways.

The next signal to the north primarily serves Big Y and Ethos Energy. Route 5 has one through lane in each direction plus a northbound exclusive left turn lane and a southbound exclusive right turn lane.

750 feet north of this signal is an unsignalized intersection with Prospect Hill Drive, a residential street serving over 100 houses. This intersection is shown in **Figure 12**. No exclusive turn lanes are provided on Route 5.

**Figure 12: Route 5 NB Approaching Prospect Hill Drive (Google Street View)**

The next signal is an alternative access point to Big Y, and formerly served the Showcase Cinemas. Route 5 has one through lane in each direction plus a northbound exclusive left turn lane. North of this signal, Route 5 begins to head downhill, and the surrounding land uses become predominantly commercial.

The final signalized intersection in the Study Area is at Bridge Street / North Road (Route 140), shown in **Figure 13**. Route 5 widens near this intersection to one through lane in each direction, exclusive left turn lanes in each direction, and a northbound exclusive right turn lane. The intersection itself is skewed with steep grades on its approaches, and it is a complex area due to the surrounding development and numerous driveways. Crash rates here are higher than at most other intersections in the Study Area.

**Figure 13: Route 5 NB at Bridge Street / North Road (Google Street View)**

Between this signal and the Enfield town line, Route 5 has one through lane in each direction and serves a mix of uses. One notable business is Comfort Inn, 500 feet north of Route 140. Route 5 has a northbound exclusive left turn lane for the Comfort Inn driveway. The road continues into Enfield as a two-lane road.

In terms of geometry, the horizontal alignment of Route 5 exhibits gentle curvature within the Study Area. The vertical geometry of Route 5 is generally level south of the I-91 Exit 44 intersection. North of this intersection, Route 5 rises at approximately 5% for one quarter mile, then has a gentler uphill slope of approximately 2% before going downhill at approximately 2% as it approaches Route 140.

#### 2.1.1.1 *Roadway Standards*

This section presents the design standards for Route 5. According to the CTDOT Highway Design Manual (HDM) 2003 Edition (including revisions to February 2013), the following conditions apply:

- Principal arterial roadway functional classification
- Intermediate environment

The posted speed limit in the Study Area is 45 mph, which indicates a 50 mph design speed should be assumed. The design standards for Route 5 are shown in **Table 1**. The values shown indicate either the appropriate range or minimum value. Principal urban arterial roadways balance access to adjacent commercial and residential uses with mobility of travelers connecting to statewide and interstate access points.

**Table 1: Design Standards**

| Design Element | Design Standard |
|---|---|
| Through Lane Width | 11'-12' |
| Shoulder Width | 4'-8' |
| Sidewalk Width | 5' |
| Bicycle Lane Width | 5' |
| Minimum Radius | 665' (e=4%) |
| Stopping Sight Distance | 425' (50mph) |
| Left Turn Intersection Sight Distance (B1 Crossing) | 555' (50mph) |
| Right Turn Intersection Sight Distance (B2 Crossing) | 480' (50mph) |

#### 2.1.1.2 *Geometric Conditions Review*

Using a combination of field observations, field measurements, and aerial photographs, this section provides an assessment of the geometric characteristics of Route 5 to determine where the existing roadways do not meet the current CTDOT design standards. **Table 2**, page 9, summarizes the results of this review.

There is one location, at the intersection of Showcase Cinema and Route 5, where the northbound through lane is less than eleven feet wide. This lane width is noted as a deficiency.

Roadway shoulders within the Study Area range from nonexistent to over six feet. Shoulders are used as bypass lanes for through traffic to get around vehicles waiting to turn left or right; where shoulders are narrow or absent, this is not possible. **Figure 14** highlights locations with deficient shoulder widths.


**Figure 14: Locations of Deficient Shoulder Widths**

**Table 2: Summary of Existing Geometric Deficiencies**

| Existing Feature/Location | Existing Value (Approx.) | Design Standard Value | Comments |
|---|---|---|---|
| ***Through Lane Width*** | | | |
| Between Prospect Hill Drive and Bridge Street (Route 140) | 10'-11' varies | 11'-12' | 10' turning lanes meet standards but through lanes less than 11' are deficient |
| ***Shoulder Width*** | | | |
| Between Stoughton Road and Phelps Road (Route 191) / access to Southern Auto Auction | 2'-6' varies | 4'-8' | Deficient at the approaches to the intersection |
| At Tromley Road Intersection (50'-100'radius) | 2'-4' varies | 4'-8' | Deficient at the approaches to the intersection |
| Between Pasco Drive and Reginal Drive | 2'-5' varies | 4'-8' | Deficient at the approaches to the intersection |
| Between Thompson Road and Newberry Road | 0'-5' varies | 4'-8' | Deficient at the approaches to the intersection |
| Between Thompson Road and Main Street in Northbound direction | 0' | 4'-8' | Deficient, no shoulder present. |
| Between Walmart access and Showcase Cinema access in Northbound direction | 0'-4' varies | 4'-8' | Deficient at the approaches to the intersection |
| ***Sidewalk Width*** | | | |
| Study Area | N/A | 5' min. | There are no sidewalks along Route 5, only on cross streets. Curb ramps at Tromley Road are not ADA-compliant. |
| ***Design Intersection Sight Distance (ISD): Left Turn – B1*** | | | |
| Masons Brook Lane | 520' | 555' | The sight distance is restricted by the road alignment and a large tree in sight view. |
| Regina Drive | 485' | 555' | The sight distance is restricted by vegetation. |
| ***Design Intersection Sight Distance (ISD): Right Turn – B2*** | | | |
| Regina Drive | 300' | 480' | The sight distance is restricted by vegetation. |

Horizontal curvature of a road affects a driver's ability to see far enough to be able to stop safely to avoid a collision. Curves can also contribute to a loss of control of a vehicle if speed limits are not adhered to. The CTDOT Design Manual suggests that a stopping sight distance of 425 feet is required for level surfaces with a posted speed limit of 45 mph (design speed of 50 mph). Some side streets have deficient intersection sight distance due to landscaping or terrain obstructing sight lines. Summary and direction of deficiency is provided in Table 2, page 9.

Steep grades can present safety and operational challenges by restricting sight lines and increasing the distance a vehicle needs to safely stop. During inclement weather, steep grades can also contribute to the loss of traction between a vehicle's tires and the pavement surface. The CTDOT Highway Design Manual suggests that a 7% grade should be considered the maximum for an arterial. Route 5 is located near the

Connecticut River and has stretches that are within wetlands and are relatively flat. North of the I-91 Exit 44 intersection, Route 5 has rolling terrain, yet the slope does not exceed 7%.

Route 5 generally has a rural character and has minimal pedestrian amenities such as sidewalks. There are no sidewalks along Route 5 anywhere in the Study Area. There is only one marked crosswalk, at Tromley Road, connecting a sidewalk at East Windsor High School with a concrete landing on the east side of Route 5. Neither the sidewalk nor the landing is ADA-compliant. At the Walmart driveway, there is a 5' wide sidewalk approaching Route 5 from the east, as well as a concrete landing and curb ramp on the opposite side. There is no marked crosswalk in this location.

### *2.1.2 Traffic Conditions*

The existing traffic conditions assessment includes measures of traffic volumes, travel speeds, and traffic operations. These measures are used to quantify and evaluate trends and identify deficiencies.

#### 2.1.2.1 *Daily Volumes*

On State roadways, CTDOT measures the average daily traffic (ADT) volumes approximately every three years. This data is collected with an automatic traffic recorder (ATR). The most recent counts on Route 5 were in 2016. The historical ADT volumes are presented in **Table 3**, below, and **Figure 15**, page 11. CTDOT also maintains a continuous count station just north of the Walmart driveway. The continuous count station provided for ten years between 2005 and 2015, summarized in **Figure 15**. Historically, the ADT has generally been highest south of the I-91 Exit 44 ramps, with volumes ranging from 14,800 to 20,000. Between the I-91 Exit 44 ramps and Bridge Street / North Road (Route 140), volumes have ranged from 7,900 to 12,800. Traffic volumes have been lowest north of Bridge Street / North Road (Route 140), ranging from 7,700 to 8,000. The location with the highest volume is historically between Main Street and the I-91 Exit 44 ramps. This trend continues with traffic data collected in 2018. The high volumes in this area demonstrate that Route 5 is a major connection for traffic between South Windsor and I-91 to the

**What is Average Daily Traffic (ADT)?**

**ADT is the total two-way traffic volume passing through a defined segment of roadway in a 24-hour period. ADT is measured in vehicles per day (vpd).**

**Table 3: Historical ADT Volumes (2007-2016)**

| | Location On Route 5 | CTDOT ADT (Vehicles per Day | | | |
|---|---|---|---|---|---|
| | | 2016 | 2013 | 2010 | 2007 |
| | North of Bridge Street / North Road (Route 140) | 7,700 | 7,800 | 8,000 | 8,100 |
| Within Study Area Limits | South of Bridge Street / North Road (Route 140) | 9,700 | 9,600 | 10,700 | 11,400 |
| | South of Prospect Hill Drive | - | 7,900 | 8,000 | 8,500 |
| | North of I-91 Exit 44 ramps | 12,800 | 10,700 | 11,800 | 10,600 |
| | North of Main Street | 20,000 | 18,700 | 20,000 | - |
| | North of S. Water Street | 19,900 | 18,600 | 17,100 | 16,300 |
| | North of Phelps Road (Route 191) | 17,400 | 14,800 | 16,100 | 15,700 |
| | South of Phelps Road (Route 191) | 16,400 | 17,300 | 16,400 | 19,600 |
| | South of Stoughton Road | 17,300 | 17,200 | 19,100 | 15,100 |
| | North of Scantic Road | 17,700 | 15,400 | 18,400 | - |
| | North of Sullivan Avenue (Route 194) | 19,100 | 16,400 | 19,600 | 17,500 |

north. North of I-91 Exit 44, this north-south traffic uses I-91 instead, resulting in lower volumes on this section of Route 5.

Traffic growth at the continuous count station has been variable, slowly decreasing between 2005 and 2013. The Walmart just south of the continuous count station was opened in late 2013. Bidirectional traffic volumes at the continuous count station increased from 6,900 in September 2013 to 9,800 in November, 2013.

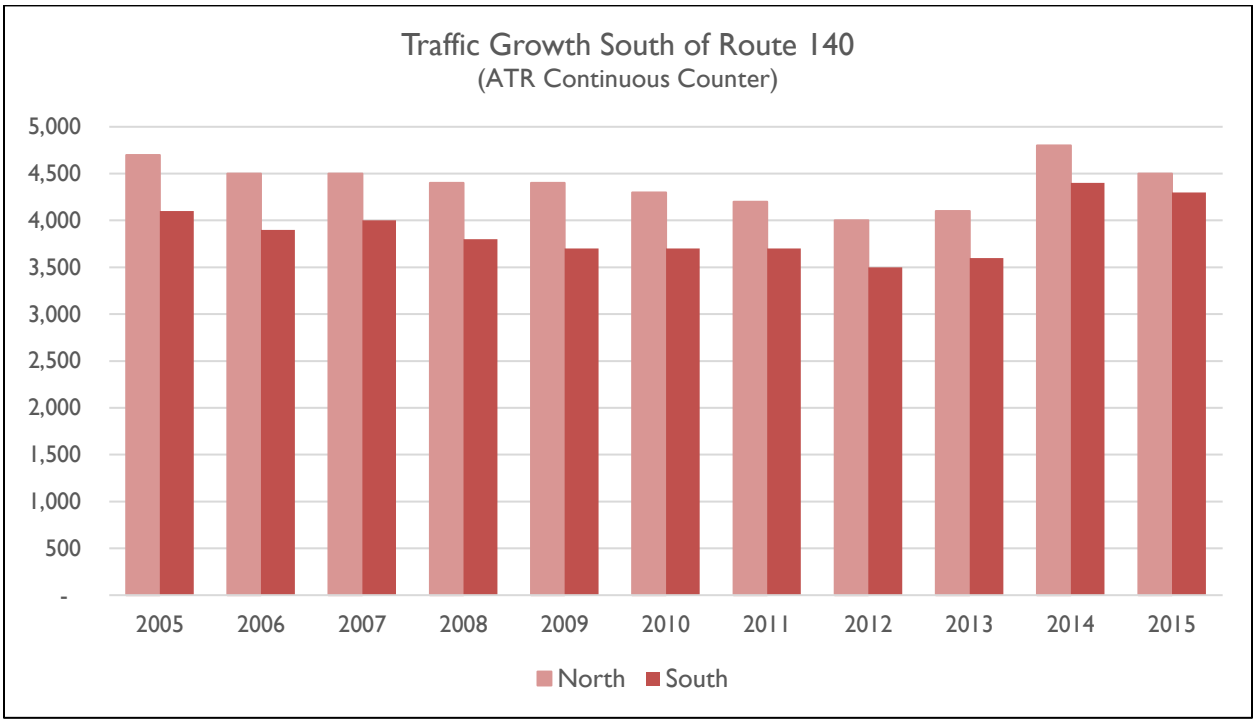



**Figure 15: CTDOT Continuous Count Station Volumes by Direction**

ATR counts collected in 2018 as part of the Study are shown in **Figure 16**, page 12. The directional counts shown were adjusted for day-of-week and month-of-year based on volume trends obtained from the CTDOT continuous count station. North of the I-91 Exit 44 ramps, these 2018 volumes closely match the CTDOT 2013 ATR counts. South of the ramps, the 2018 ATR counts show a clear increase over the 2013 volumes. The fact that southbound volumes are higher than northbound volumes in this area, in conjunction with a closer analysis of hourly trends, field observations, and stakeholder interviews, indicates that southbound traffic uses Route 5 to bypass congestion on I-91 during peak periods.

2018 ATR counts were collected on Tuesday, April 17 through Thursday, April 19 in order to assess the day-to-day variation in traffic patterns throughout the corridor, especially those related to the Southern Auto Auction activity on Wednesdays. Traffic volumes averaged across the four southernmost ATRs are shown in **Figure 17**, page 12. Travel patterns were similar during all three days. On Wednesday, the morning peak exhibited a moderate increase in traffic headed towards Southern Auto Auction, and there was also an increase in traffic leaving Southern Auto Auction throughout the middle of the day. Heavy vehicle counts also increased during these periods. The overall increase in traffic between 5 AM and 4 PM was 8%.

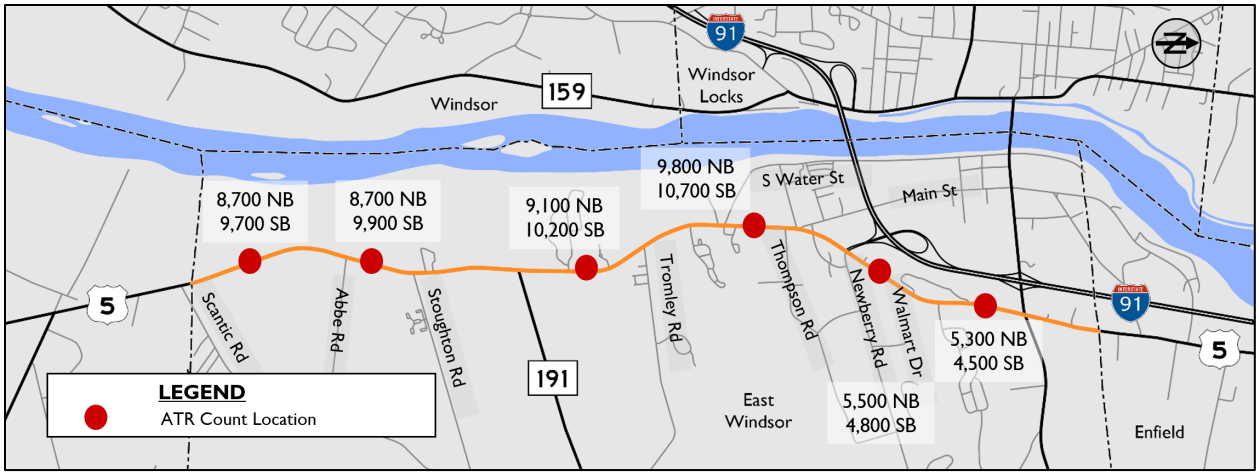



**Figure 16: 2018 Directional Average Daily Traffic**

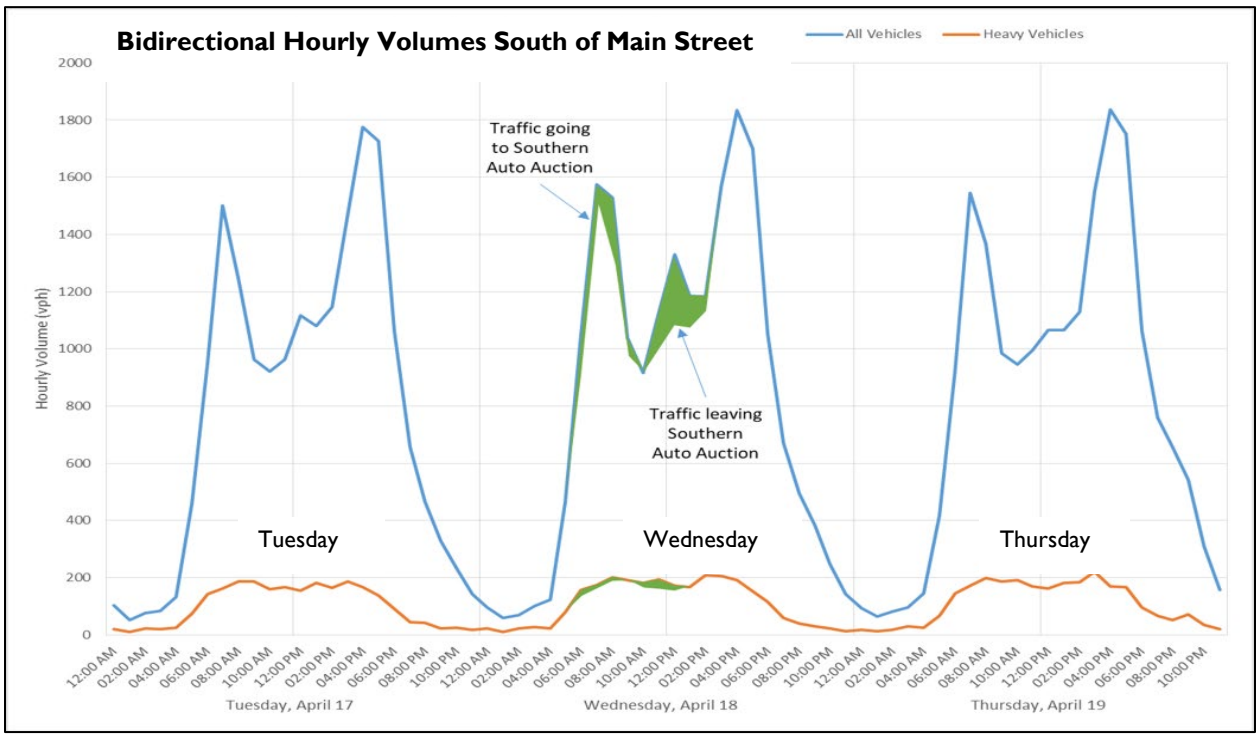



**Figure 17: 2018 Day-of-Week Traffic Volume Trends**

### 2.1.2.2 *Travel Speeds*

The travel speed data presented in this section is from the Federal Highway Administration (FHWA) National Performance Management Research Data Set (NPMRDS). FHWA has made this data set available to States and Metropolitan Planning Organizations (MPOs) as a tool for performance measurement. The NPMRDS data is validated and calibrated quarterly. The NPMRDS average travel speeds are shown in **Figure 18**, page 13. These average travel speeds include delays caused by traffic signals, turning vehicles, bus stops, and pedestrian crossings, thus the recorded speeds are below the posted speed limit of 45mph.


**Figure 18: FHWA NPMRDS Average Travel Speeds along U.S. Route 5**

Between Scantic Road and Stoughton Road, the average travel speeds are approximately 35 mph and are the highest observed within the study area. From Stoughton Road in the northern direction, the average speeds degrade to between 35mph and 30mph until South Water Street; farther north the speed decrease even further to under 30mph.

In addition to FHWA travel speed data, the study team collected average and 85th percentile weekday spot speeds at the 2018 ATR count locations. **Figure 19**, below, and **Figure 20**, page 14, illustrate the speeds during AM, PM and Off-Peak (OP) periods. Throughout the Study Area, the posted speed limit is 45 mph. These data points do not include delay from traffic signals, turning vehicles, bus stops, and pedestrian crossings as the data points were selected between major intersections, clear of such influence.

**What is 85th Percentile Speed?**

**The 85th Percentile Speed is the speed that 85 percent of vehicles do not exceed. Another way of looking at this is that only 15 percent of vehicles go faster than this speed, and 85 percent go at or below this speed.**

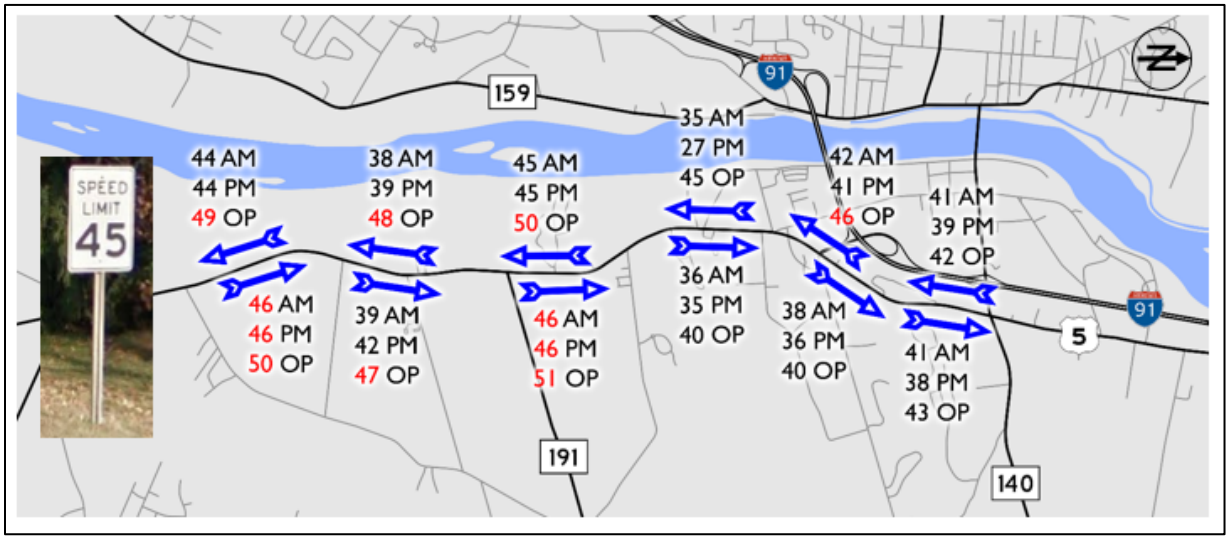



**Figure 19: Average Weekday Segment Speeds (AM, PM, Off-Peak)**

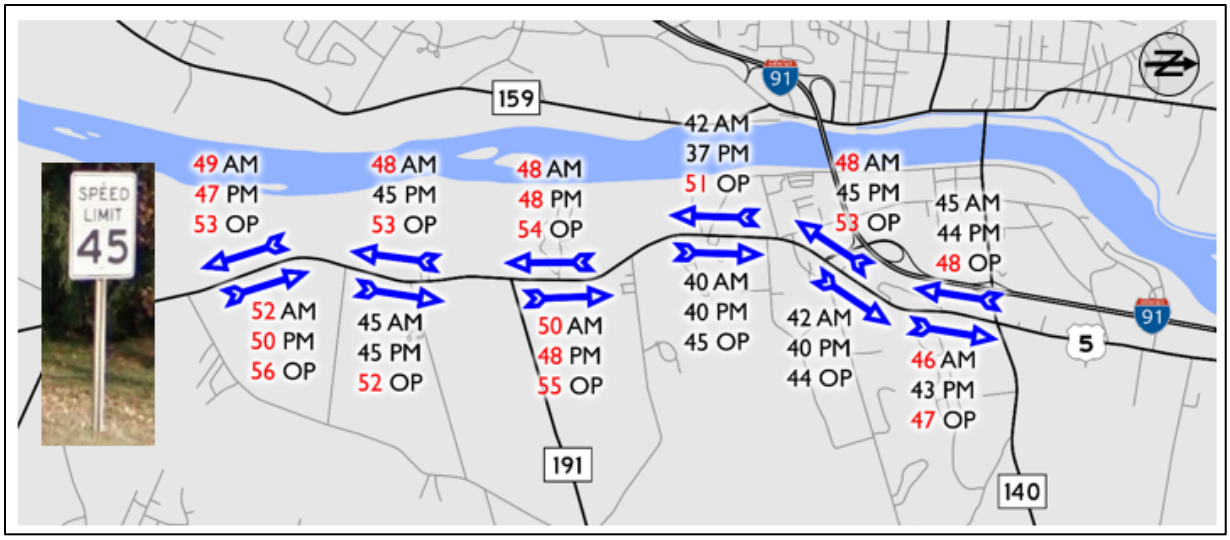



**Figure 20: 85th Percentile Weekday Segment Speeds (AM, PM, Off-Peak)**

The spot speed data between larger segments of roadway without traffic signals shows vehicles traveling at or above the speed limit during off peak, highlighted in red. Similar to the FHWA data, speeds are lower north of Tromley Road throughout the day and in both directions. This delay may be caused by several factors, including high volumes, queues at traffic signals, vehicles turning at unsignalized intersections, heavy vehicles, and bus stops without pullouts.

### 2.1.2.3 *Peak Hour Volumes*

The Study Team collected turning movement counts (TMCs) at signalized intersections along Route 5 in order to assess traffic operations in the peak periods. The TMC data was collected in April 2018 for the weekday counts. The weekday morning peak hour TMCs are presented in **Figure 21**, page 15. The weekday afternoon peak hour turning movement counts are presented in **Figure 22**, page 15.

In the northbound direction, traffic volumes are high throughout the southern portion of the Study Area, typically 800 to 900 vph in both peaks. At the I-91 Exit 44 ramps, the majority of northbound traffic turns left to access the freeway – 73% in the AM peak and 59% in the PM peak. The highest southbound volume on Route 5 was observed between South Water Street and Tromley Road, with southbound volumes of approximately 1,100 vehicles per hour (vph) and 1,200 vph during the AM peak and PM peak, respectively.

North of the I-91 Exit 44 ramps, traffic volumes are significantly lower in both directions. Northbound volumes are generally 200 to 300 vph in the AM peak and 500 to 600 in the PM peak. Southbound volumes vary less, with 250 to 300 vph in the AM peak and 350 to 400 vph in the PM peak.

Some intersections exhibit very different travel patterns in the AM and PM peaks. At commercial driveways (Walmart, Big Y), turning volumes are much higher in the PM peak. This is also apparent at the I-91 Exit 44 intersection, where the PM peak sees more cars turning left off the ramps, many of whom then turn right into Walmart or left into the restaurants. Scantic Road, Tromley Road, and Bridge Street / North Road (Route 140) are heavily directional, with most traffic heading west in the AM peak and east in the PM peak. Southern Auto Auction has high turning volumes only in the AM peak.

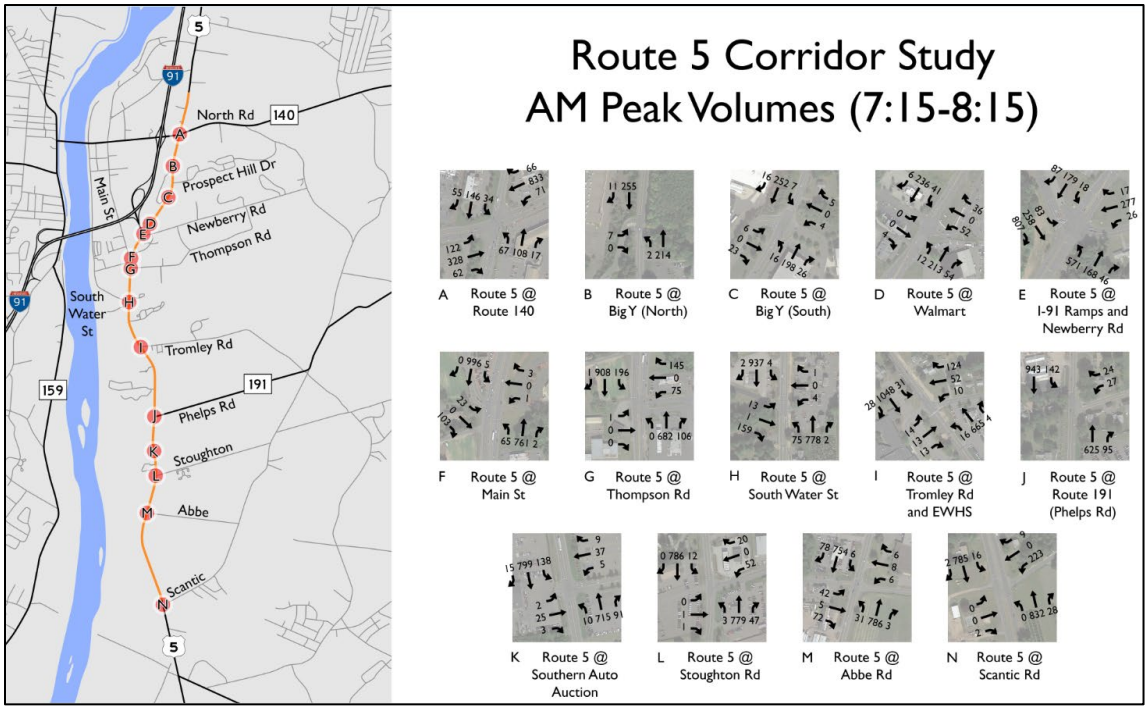



**Figure 21: Weekday AM Peak Hour (7:15-8:15) Turning Movement Counts**

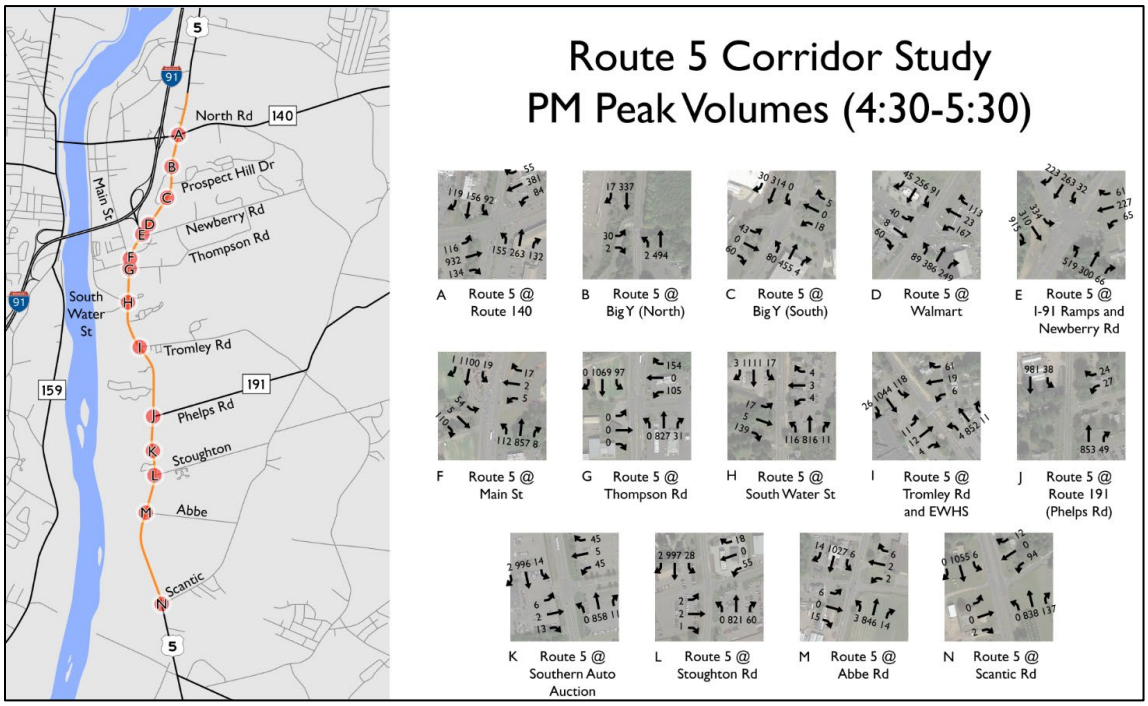



**Figure 22: Weekday PM Peak Hour (4:30-5:30) Turning Movement Counts**

### 2.1.2.4 *Heavy Vehicle Volumes*

ATR data collected by the study team in 2018 shows that heavy vehicles, including trucks and buses, comprise 5% to 16% of the daily traffic volumes on Route 5, as illustrated in **Figure 23**. The highest heavy vehicle percentages are south of the I-91 Exit 44 ramps, where 9% to 16% of vehicles are trucks or buses. This is largely due to the major commercial and industrial uses on this stretch of Route 5 and the adjacent section in South Windsor. Every year, the Connecticut DOT posts vehicle classification reports. Based on 2018 data, other non-interstate principal arterials experience on average 3% to 7% of trucks and buses. **Table 4** provides a sample of site location, comparable AADTs and percentages of heavy vehicles.


**Figure 23: Heavy Vehicle Traffic Percent by Direction**

**Table 4: Sample of Connecticut Non-Interstate Principal Arterial Heavy Vehicle Percentages**

| Town | State Route Number | Site Description | Heavy Vehicle Totals (Count) | Heavy Vehicle Totals (Percent) | Ave. Annual Daily Traffic (AADT) |
|---|---|---|---|---|---|
| Bethany | 69 | South of Route 42 | 949 | 2.6 | 9,100 |
| Farmington | 10 | North of Route 4 | 694 | 6.5 | 6,600 |
| Farmington | 6 | Northeast of SR 552 (Scott Swamp Rd.) | 1,977 | 5.5 | 18,500 |
| New Haven | 152 | Dixwell Ave, South of Gibbs St. | 1,420 | 6.7 | 10,900 |
| Wethersfield | 15 | NE of Pawtucket Ave. | 12,489 | 5.7 | 41,800 |

### 2.1.2.5 *Traffic Operations*

The existing conditions assessment included an evaluation of congestion and delay at the fourteen signalized intersections during the weekday AM peak hour and the weekday PM peak hour. The level of service (LOS) was determined for each intersection based on the average delay (in seconds per vehicle, sec/veh) that motorists experience traveling through an intersection. LOS can be determined for both signalized and non-signalized intersections. A capacity analysis was developed using the Synchro traffic analysis software, the peak hour turning movement volumes, and the traffic signal timing plans obtained as part of this existing conditions analysis.

**What is Level of Service (LOS)?**

**LOS for an intersection is a qualitative measure of traffic operations that reflects the delay experienced by vehicles at the intersection. LOS values range from A to F. LOS A represents the best operational conditions with little delay. LOS F represents generally congested conditions with long delays and traffic queues.**

The intersections in the Study Area operate at a LOS E or better during the studied peak periods. For the Route 5, LOS D or better represents an acceptable degree of congestion; LOS E and F are generally considered to be an unacceptable degree of congestion. LOS D represents approaching unstable flow; speeds slightly decrease as traffic volumes slightly increase. It is a common goal for urban streets during peak hours, as attaining LOS C would require prohibitive cost and societal impact in bypass roads and lane additions. A summary of the LOS results is presented in **Table 5**, page 19, as well as illustrated in **Figure 24** and **Figure 25**, pages 19 and 20.

In addition to LOS, the queue lengths were analyzed for all approaches to the study intersections using Synchro/SimTraffic and observed in the field. As a measure of the efficiency of the signal system, it is important to determine if vehicles queue into adjacent intersections, hindering their operation. Long southbound queues were observed during both peak periods, and northbound queues were also substantial in the PM peak. Queues at Phelps Road (Route 191), South Water Street, Thompson Road, and Main Street were observed to reach adjacent intersections.

**What is Closed-Loop System?**

**A closed-loop system consists of traffic signals that are interconnected thru a master controller thus providing coordinated signal timings.**

Synchronizing the traffic signal cycles of adjacent signals, also known as coordination, can be used to reduce delays and queueing on an arterial roadway. The traffic signals throughout the Study Area are connected to a closed-loop system controlled by the CTDOT Highway Operations Center in Newington. The majority of these signals are coordinated during peak hours using timing plans that are updated every few years to account for changes in traffic.

Overall the sources of delay during AM and PM peaks are:

- **Irregular signal spacing** – Federal Highway Administration recommends that intersection spacing along an arterial roadway should be regular, with constant distances between traffic signals. For rural areas, a minimum spacing of one-half mile is recommended to regulate traffic flow and preserve capacity along arterial routes, with one-mile spacing considered desirable. When the spacing between signals falls below one-quarter mile (1,320 feet), the traffic flow along the route may be disrupted. The ability of the route to carry through traffic will decrease, travel speeds may

decrease, and delays and queues may develop at intersections. It is very difficult to maintain signal coordination when intersection spacing is irregular, as is the case on Route 5.

- **School buses** – Multiple school bus routes use Route 5 within the Study Area. Some of these buses force traffic in both directions to stop completely and yield to students crossing the road to board the bus. In addition to the school bus routes along Route 5, East Windsor High School has school buses dropping off students during the morning peak. As a result of this, the traffic signal at Tromley Road and East Windsor High School is not coordinated during part of the morning peak, resulting in additional delay for through traffic. All signals should be coordinated to AM peak period that starts at 6:30AM and ends at 9:30AM. The traffic signal cycle remains in school schedule impacting AM peak travel."
- **Heavy vehicles** – Route 5 carries a high percentage of trucks and buses, especially south of the I-91 Exit 44 ramps. This is compounded by car carriers going to and from Southern Auto Auction on Wednesdays. These vehicles contribute to congestion because of their size and their acceleration characteristics. Drivers tend to leave larger front and rear gaps around trucks, thus decreasing the roadway capacity and increasing queue length. Slow acceleration at intersections is a challenge for signal coordination and increases the speed differential, breaking up the groups of vehicles that benefit from coordination.
- **Turning vehicles** – Along the Route 5 corridor, vehicles waiting to turn at intersections generally block the through lane. Depending on the shoulder width available, through vehicles may be able to bypass turning vehicles, but they generally slow down when doing so. At some intersections, a left turn lane is provided in lieu of shoulders. This significantly improves through capacity when there are many left turns, though without a shoulder, slowing or stopped right-turning vehicles inhibit the traffic flow. There are many unsignalized intersections along the Study Area, including numerous driveways, contributing to delay.
- **Broken detectors** – Vehicle detectors are a critical component of traffic signal design. Detectors activate and extend signal phases, allowing the signal to adapt its timings to meet traffic demand. When a detector malfunctions, the signal operates on an irregular or pre-set cycle and does not correctly respond to traffic demand, causing delays. Broken detectors are a common complaint among stakeholders, and field observations confirm that some phases are being called without vehicles present.

**Table 5: Level of Service (LOS) Summary for Study Intersections**

| Route 5 Corridor Study Intersection | Weekday AM | | Weekday PM | |
|---|---|---|---|---|
| | LOS | Delay (sec/veh) | LOS | Delay (sec/veh) |
| Bridge Street / North Road (Route 140) | D | 39.5 | D | 37.1 |
| Showcase Cinemas Driveway | A | 2.3 | A | 3.9 |
| Big Y / Ethos Energy Driveway | A | 3.5 | A | 6.9 |
| Walmart Driveway | B | 10.5 | B | 16.8 |
| I-91 Exit 44 ramps | E | 56.4 | E | 73.9 |
| Main Street | B | 10.7 | B | 13.6 |
| Thompson Road | B | 15.4 | B | 11.3 |
| South Water Street | B | 16.5 | C | 24.8 |
| Tromley Road | E | 58.5 | B | 19.8 |
| Phelps Road (Route 191) | B | 11.6 | D | 39.3 |
| Southern Auto Auction | A | 6.8 | A | 7.2 |
| Stoughton Road | A | 6 | B | 12.3 |
| Abbe Road | A | 9.1 | A | 6.2 |
| Scantic Road | B | 10.4 | A | 6.7 |


**Figure 24: AM Peak Level of Service (LOS) for Study Intersections**


**Figure 25: PM Peak Level of Service (LOS) for Study Intersections**

### *2.1.3 Crash History*

Crash data for Route 5 and its intersecting roadways was obtained from the University of Connecticut (UConn) Connecticut Crash Data Repository (CTCDR) for the three year period from January 1, 2015 through December 31, 2017. A total of 205 crashes were recorded in the corridor, 37% of which resulted in injuries. Crash rates were calculated for each intersection and segment.

The following conclusions were drawn from the crash data:

- Crash rates are highest in the north end of the Study Area, but severity is highest in the south.
- There were multiple rear-end crashes between intersections attributed to vehicles following too closely; congestion was cited as contributing factor.
- There were many angle crashes at driveways, especially in the vicinity of Thompson Road and Bridge Street / North Road (Route 140).
- Three accident cluster locations were identified with detail graphics:
    - **Figure 26**, page 21: Segment south of Thompson Road
    - **Figure 27**, page 21: I-91 Exit 44 and Walmart intersections
    - **Figure 28**, page 22: Bridge Street / North Road (Route 140) intersection and adjacent driveways

[Continued on page 22]

**Intersection Crash Rate:**

Crash rate at intersection is calculated as follows:

$$Rate = \frac{1{,}000{,}000 * No.\,Crashes}{365 * \text{Years of Data} * \text{Daily Traffic Volume}}$$

**Road Segment Crash Rate:**

Crash Rate for road segment is calculated as fallows :

$$Rate = \frac{1{,}000{,}000{,}000 * No.\,Crashes}{365 * \text{Years of Data} * \text{Daily Traffic Data} * \text{Length of Segments}}$$

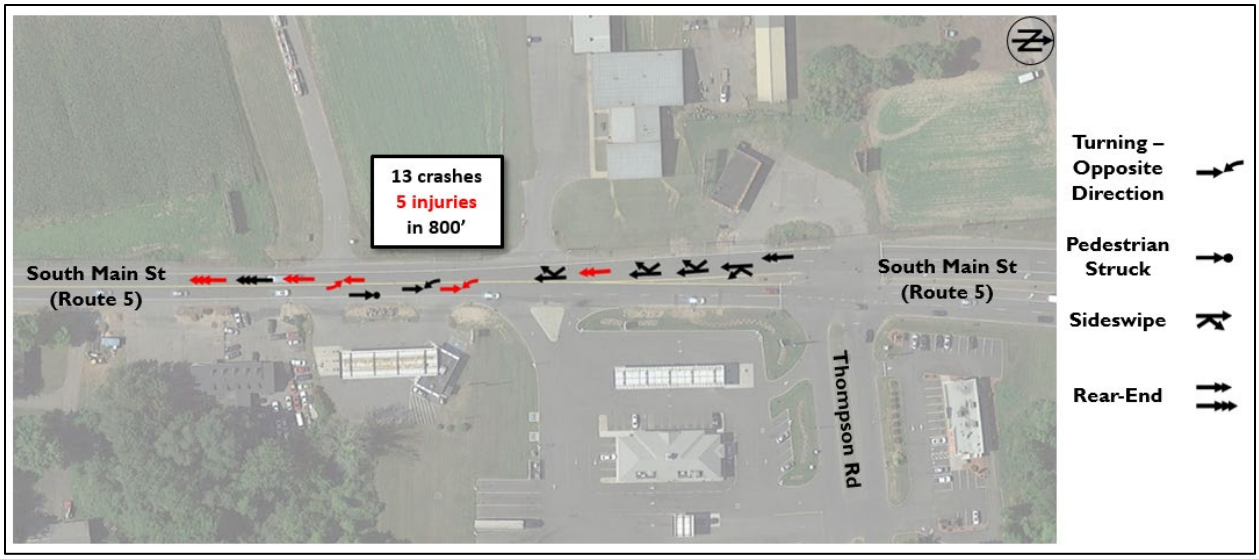



**Figure 26: High Crash Location 1: Segment South of Thompson Road**

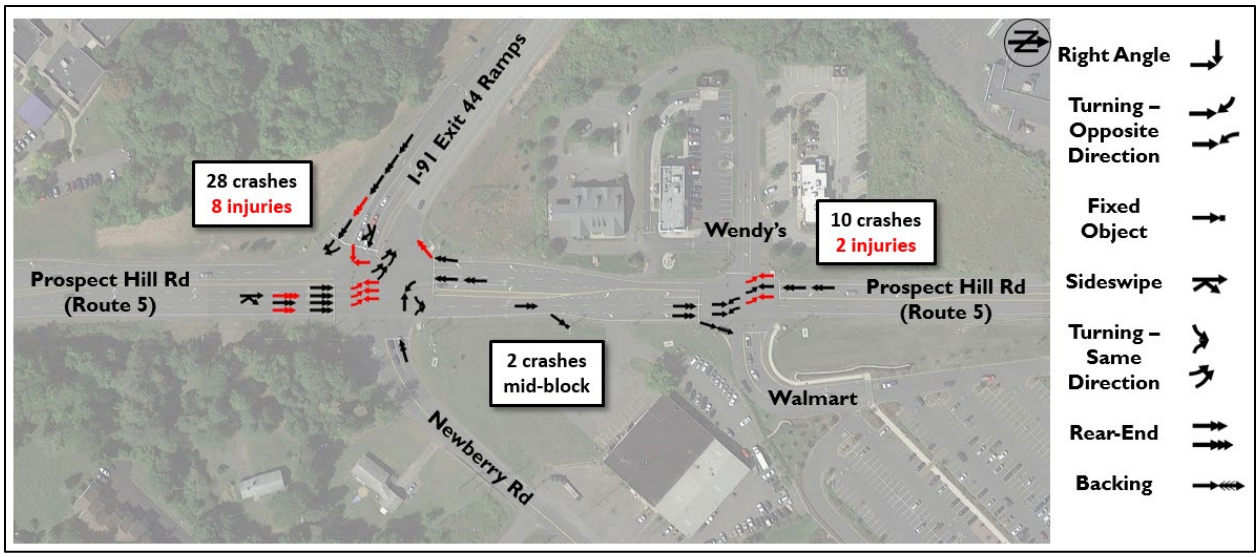



**Figure 27: High Crash Location 2: I-91 Exit 44 and Walmart Intersections**

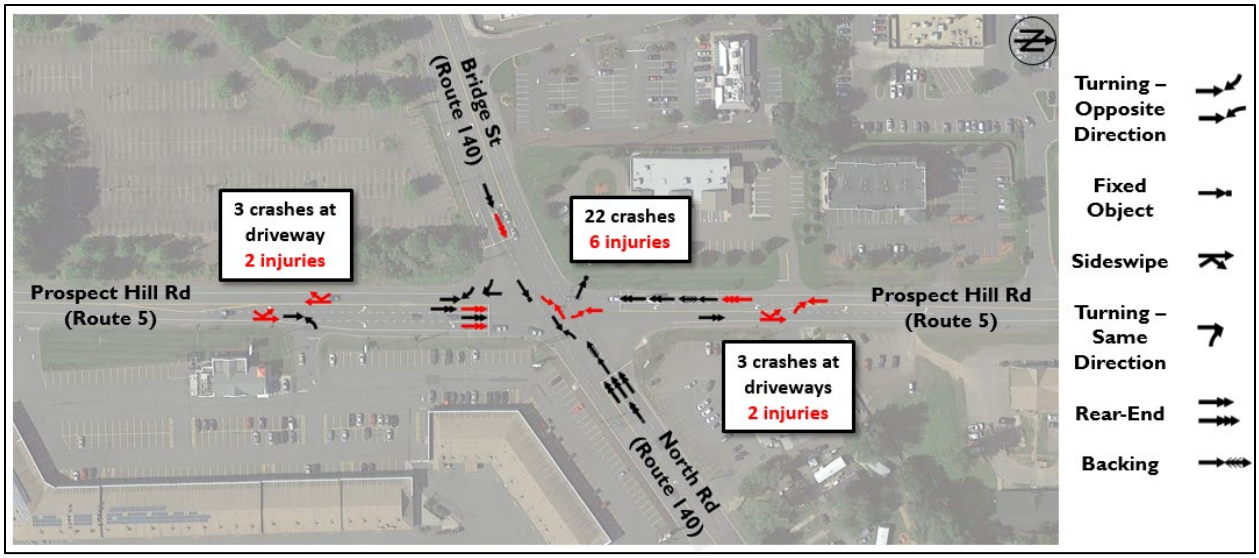



**Figure 28: High Crash Location 3: Bridge Street / North Road (Route 140) intersection and adjacent driveways**

- Nearly half of crashes were rear-ends, a common collision type attributed to vehicles following too closely.
- Approximately 10% of crashes involved sideswipes, attributed to improper passing maneuvers or improper lane change, and generally clustered around merges.
- Approximately 12% of crashes involved angle crashes, attributed to turning vehicles failing to yield the right-of-way, and generally resulting in more severe injuries.
- At the I-91 Exit 44 ramps, left turns are protected-only; however, there were still several angle crashes between left-turning and through vehicles, indicating a potential red-light-running problem.
- Route 5 is listed in the top 10 state routes with highest overall injury rate and severity for crashes.
- There were no fatalities on Route 5 within this three-year period.

**Table 6**, page 23, presents a summary of the crash data for intersections in the Study Area. In the three-year data period (2015-2017), there were 114 crashes at intersections. Half of the study intersections had rear-end collisions as one of the most prevalent collision types. 33% of crashes at intersections resulted in an injury. The amount of traffic using the intersection is represented in million entering vehicles (MEV) per year, and the crash rate is represented in crashes per MEV.

**Table 7**, page 24, presents a summary of the crash data on segments within the Study Area; that is, crashes that were not related to intersections. In the three-year data period (2015-2017), there were 91 crashes between intersections. 42% of crashes between intersections resulted in an injury. The amount of traffic using a segment is represented in hundred million vehicle miles traveled (HMVMT) per year, and the crash rate is represented in crashes per HMVMT. The crash rate corrects for the exposure of the segment (traffic volumes, number of years of data, and length of roadway segment) in order to enable comparison between roadway segments. The crash rate does not account for any other differentiating factors such as geometrics or cross section.

**Table 6: Crash History at Intersections (2015-2017)**

| Intersection Location | Total Crashes in Data Period | Percent Injury | MEV / year | Crash Rate (Crashes per MEV) |
|---|---|---|---|---|
| Scantic Road | 7 | 29% | 7.11 | 0.33 |
| Abbe Road | 5 | 60% | 7.02 | 0.24 |
| Stoughton Road | 6 | 67% | 7.07 | 0.28 |
| Southern Auto Auction | 4 | 50% | 7.47 | 0.18 |
| Phelps Road (Route 191) | 7 | 29% | 7.12 | 0.33 |
| Tromley Road | 7 | 43% | 7.67 | 0.30 |
| South Water Street | 2 | 0% | 7.8 | 0.09 |
| Thompson Road | 5 | 40% | 8.35 | 0.20 |
| Main Street | 8 | 38% | 8.16 | 0.33 |
| I-91 Exit 44 ramps | 28 | 29% | 10.96 | 0.85 |
| Walmart Driveway | 10 | 20% | 4.96 | 0.67 |
| Big Y / Ethos Energy Driveway | 1 | 100% | 3.99 | 0.08 |
| Showcase Cinemas Driveway | 2 | 0% | 3.62 | 0.18 |
| Bridge Street / North Road (Route 140) | 22 | 27% | 9.71 | 0.76 |
| **Subtotal** | **114** | | | |

Note: The CT Data Repository (https://www.ctcrash.uconn.edu/) states that on state non-interstate principal arterials the following accident rates were observed from 2015 through mid-2018:

- less than half a percent of crashes were fatal,
- approximately 26% resulted in an injury, and
- the remaining 74% were property damage only.

These percentages are based on 14,736 reported crash rates over the last 3.5 years. (2015-2018)

**Table 7: Crash History on Segments (2015-2017)**

| Segment Location | Total Crashes in Data Period | Percent Injury | HMVMT / year | Crash Rate (Crashes per HMVMT) | Most Prevalent Collision Type |
|---|---|---|---|---|---|
| Scantic Road to Abbe Road | 10 | 30% | 0.066 | 58 | Front to Front / Sideswipe |
| Abbe Road to Stoughton Road | 4 | 50% | 0.068 | 58 | Front to Rear |
| Stoughton Road to Southern Auto Auction | 8 | 38% | 0.068 | 190 | Front to Rear |
| Southern Auto Auction to Phelps Road (Route 191) | 7 | 71% | 0.068 | 116 | Front to Rear |
| Phelps Road (Route 191) to Tromley Road | 8 | 75% | 0.070 | 58 | Front to Rear |
| Tromley Road to South Water Street | 7 | 43% | 0.070 | 79 | Front to Rear |
| South Water Street to Thompson Road | 19 | 42% | 0.075 | 288 | Front to Rear / Sideswipe |
| Thompson Road to Main Street | 3 | 33% | 0.075 | 239 | Angle |
| Main Street to I-91 Exit 44 ramps | 6 | 0% | 0.075 | 109 | Front to Rear |
| I-91 Exit 44 ramps to Walmart | 2 | 0% | 0.038 | 241 | Front to Rear |
| Walmart to Big Y / Ethos Energy | 2 | 50% | 0.038 | 63 | Other |
| Big Y / Ethos Energy to Showcase Cinemas | 4 | 25% | 0.035 | 141 | Front to Front / Angle |
| Showcase Cinemas to Bridge Street / North Road (Route 140) | 4 | 50% | 0.035 | 135 | Front to Rear |
| Bridge Street / North Road (Route 140) to Enfield town line | 7 | 43% | 0.028 | 219 | Front to Front |
| **Subtotal** | **91** | | | | |

Note: The CT Data Repository (https://www.ctcrash.uconn.edu/) states that on state non-interstate principal arterials the following accident types were observed from 2015 to mid-2018 (3.5 years):

- 45% of crashes were rear-end (also known as "front to rear"),
- 1% were head-on crashes,
- 19% were angle crashes (e.g. T-bone),
- 13% were sideswipes (both same direction and vehicles traveling in different direction),
- 18% were single vehicle crashes, and
- The remaining 3% were categorized as "other".

### *2.1.4 Access Management*

Access Management strategies are used to control access to roadways in order to improve traffic operations, reduce the number of vehicle conflicts, and reduce the number of crashes. These strategies generally include increased spacing between access points, dedicated turn lanes or roundabouts, median treatments, and right-of-way management. Some examples of these strategies are shared drives, one-way drives, two-way left-turn lanes (TWLTL), left-turn prohibitions, and maintenance of sight lines.

**What is Access Management?**

**Access Management is the proactive management of vehicular access points to land parcels adjacent to all manner of roadways. Good access management promotes safe and efficient use of the transportation network. AM encompasses a set of techniques that state and local governments can use to control access to highways, major arterials, and other roadways. (FHWA)**

In the Study Area, there are a number of commercial and residential driveways along the corridor. As new development and redevelopment is planned along the corridor, it is important to consider the management of access points as part of the site plan approval process. This section contains a review of the existing driveways and access management deficiencies. These deficiencies were identified by field visit, stakeholder interviews, a review of crash data, and aerial photos.


***Large Curb Cut & Undefined Driveway***

There are approximately 200 driveways along Route 5 in East Windsor, equaling around 40 driveways per mile. These range from narrow residential driveways to heavily used business access points. In some locations, there are very wide curb cuts with poorly defined boundaries. These dense and poorly delineated driveways are located primarily south of the I-91 Exit 44 ramps, but are frequent throughout the Study Area and present challenges to motorized and non-motorized travel. Route 5 serves a variety of users, including a significant number of heavy vehicles. While access management practices recommend compact driveways, it is clear that certain locations should be designed to accommodate the unique types of vehicles that are primarily expected to access the property, including trucks and large trailers.

#### 2.1.4.1 *Scantic Road to Abbe Road*

This segment of Route 5 begins at the southern edge of the Study Area and continues to the intersection of Abbe Road. The majority of this segment is a two-lane roadway with one lane in each direction. A southbound exclusive left turn lane is provided for Harken's Market. Other driveways do not have protected turn lanes along this segment. The access management deficiencies in this segment relate to driveways adjacent to intersections, wide curb cuts, and the proximity of adjacent commercial driveways.

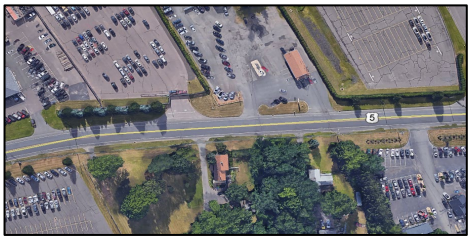

***Adjacent Commercial Driveways and Wide Curb Cut (239 / 248 US-5)***

Generally, driveways should be greater than 150 feet from an intersection. Access points in close proximity of the intersection add to the complexity of an environment for all users, including bicyclists and pedestrians navigating the crossing. This is the case just north of Abbe Road, with a commercial driveway approximately 100 feet from the signal.

***Close Driveway to Signalized Intersection (Abbe Road)***

### 2.1.4.2 *Abbe Road to Stoughton Road*

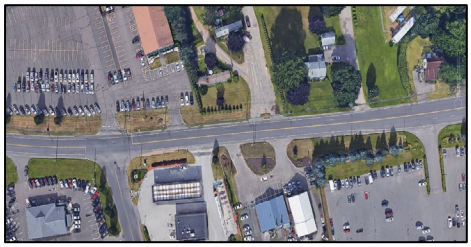
The 0.4-mile segment of Route 5 from Abbe Road to Stoughton Road is one lane wide in each direction. There are no turning lanes, however wide shoulders are provided that can be used to bypass turning vehicles. This area serves a variety of development, from residential farm houses to businesses with wide driveways and extensive parking facilities abutting the corridor.



***Mix of Residential and Commercial Space (192 - 214 S. Main St.)***

### 2.1.4.3 *Stoughton Road to Phelps Road (Route 191)*

North of Stoughton Road, Route 5 widens to two lanes in each direction to provide additional capacity through the signal at Southern Auto Auction. The Southern Auto Auction facilities extend beyond one access point, with multiple parking facilities on both sides of the corridor and additional access via intersecting streets. The employee parking lot is accessed via Phelps Road (Route 191). Within the 0.5-mile segment, on the west side of the corridor, a mobile home park at Fairway Drive provides single unit housing. The access to Fairway Drive is provided via two wide driveways. Across from Fairway Drive are wide curb cuts, including multiple access points to the same commercial establishments. Similarly, St. Philip Church has two access points for parishioner parking with pullouts for optional drop-offs. Next to St. Philip Church, there are two residential houses with driveways 15 feet apart. Next, Nonna's Pizza shares wide access point with A-1 Auto Wholesalers, Windsor Auto Group, and Rick's II Auto Repair establishments. Their driveway is a wide curb cut with two islands to channelize traffic. Route 5 at Phelps Road (Route 191) is signalized and signed as a T-intersection; however, there is a residential driveway present as well, operating independently of the signal. Route 5 has a northbound right turn lane.



***Mix of Residential and Commercial Space / Adjacent Commercial Driveway (154 - 183 S. Main St.)***

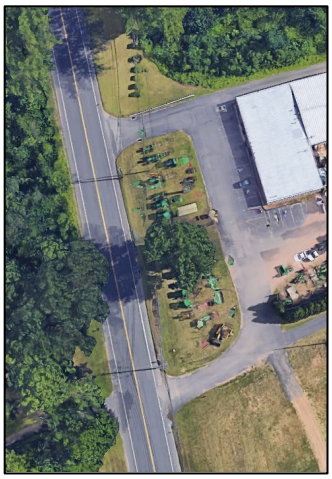
***Adjacent / Shared Commercial Driveways and Wide Curb Cut (140 - 142 S. Main St.)***

The access management deficiencies in this segment pertain to the proximity of adjacent commercial driveways, closely spaced driveways, including at signalized intersections, and redundant driveways. Businesses should not have more driveways than are required to maintain site access and operations.

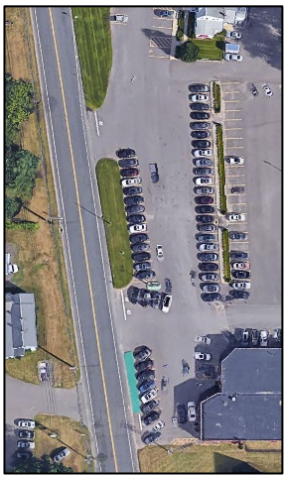
***Residential Driveway across from signalized intersection (134 S. Main St.)***

#### 2.1.4.4 *Phelps Road (Route 191) to Tromley Road*

This segment of Route 5 is 0.7 miles long with left turn lanes at the Tromley Road intersection. Shoulder widths vary from zero to ten feet wide. From an access management perspective, there are limited issues on this segment, aside from redundant two-way driveways.



***Redundant Driveway (107B S. Main St)***



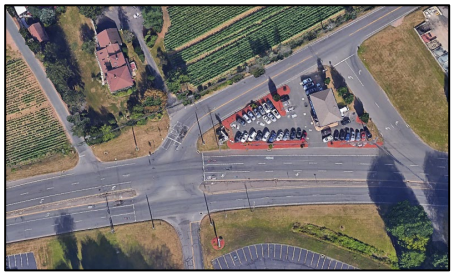
***Redundant Driveway (82 S. Main St)***

#### 2.1.4.5 *Tromley Road to Thompson Road*

The 0.8-mile segment of Route 5 from Tromley Road to Thompson Road has left turn lanes at the intersections with South Water Street and Thompson Road. There are redundant two-way drives and adjacent closely spaced commercial driveways.

#### 2.1.4.6 *Thompson Road to I-91 Exit 44 ramps*

The access point to Wagner Lane is approximately 100 feet away from the intersection of Route 5 and Main St (unsigned Route 510). Having adjacent intersections so close together leads to uncertainty for turning vehicles and inhibits signal coordination.



***Close spacing between access to Wagner Ln and Main St***

#### 2.1.4.7 *North of I-91 Exit 44 ramps*

Access management principles are more closely followed in this area, with greater spacing between access points and fewer redundant driveways. However, there is a greater number of driveways around the intersection of Route 5 and Bridge Street / North Road (Route 140), with driveways less than 250 feet from the traffic signal on all approaches. Residential driveways are closely spaced as well.

#### 2.1.4.8 *North of Bridge Street / North Road (Route 140)*

The access point to Comfort Inn is located approximately 400 feet from Bridge Street / North Road (Route 140). The Cracker Barrel Old Country Store access point is another 100 feet to the north. The Comfort Inn has dedicated left turn lane for vehicles coming from the south, however Cracker Barrel Old Country Store does not. This location could benefit from driveway consolidation.

***High volume left turn access to Cracker Barrel Old Country Store***

Land Use and Environmental Assets

An assessment of the existing land use conditions in the corridor and the development potential sets the framework for evaluating potential future conditions. Future development trends will be informed by the market conditions as well. This is considered in the following section of the existing conditions report, which, along with the future land use scenario, can build corridor-wide themes and identify regional strategies that will help create a more dynamic economic environment supportive of progress towards the land use vision for the community.

Development in the study corridor is diverse. There is a mix of uses and densities throughout which is sometimes quite disparate, yet an overall pattern can be discerned of well-formed centers, clusters of activity, and then dispersed variable land uses sprawled in between. The following observations about land use issues and opportunities can be made:

### *2.1.5 Land Use*

Land use and the transportation system each influence one another in a dynamic way. Where there is sound, safe, and convenient access, development has a greater opportunity to flourish. Where the pattern of land use follows Smart Growth principles, road congestion can be better managed and use of alternate means of travel such as walking, bicycling, and taking transit can be supported and optimized. Along the Study Corridor there are four predominant land use types: agricultural, auto/industrial, commercial, and residential. **Figure 29** illustrates the land type characteristics. In general, the Route 5 corridor transitions from a more rural setting at its southern end to a mix of suburban-scale commercial at its northern end. Automotive uses dominate the section of the Route 5 between Phelps Road and Abbe Road.

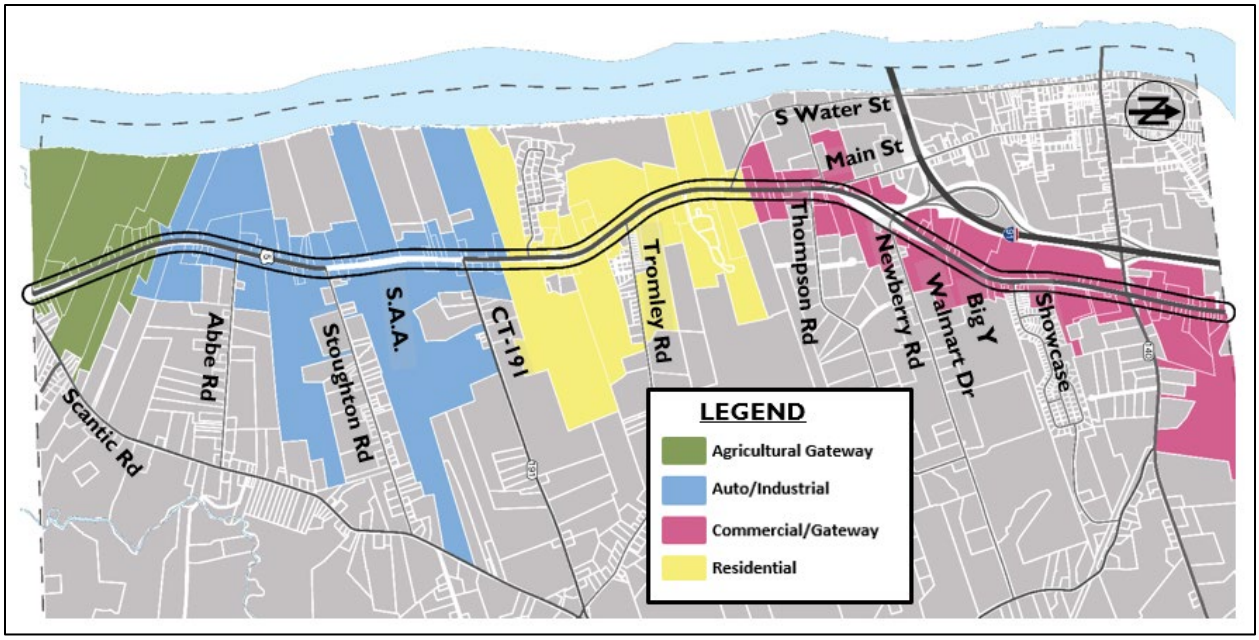



**Figure 29: Land Use Characteristics**

A more granular look at land use categories is shown in **Figure 30**, where vacant commercial land is a standalone category to highlight the potential development opportunities. Agricultural land on the south edge of U.S. Route 5 is also refined into several categories, including residential to the west and vacant commercial to the east of the corridor. Commercial Gateway land use category to the north is intended to encourage business development while managing environmental, traffic, aesthetic, and community character impacts.

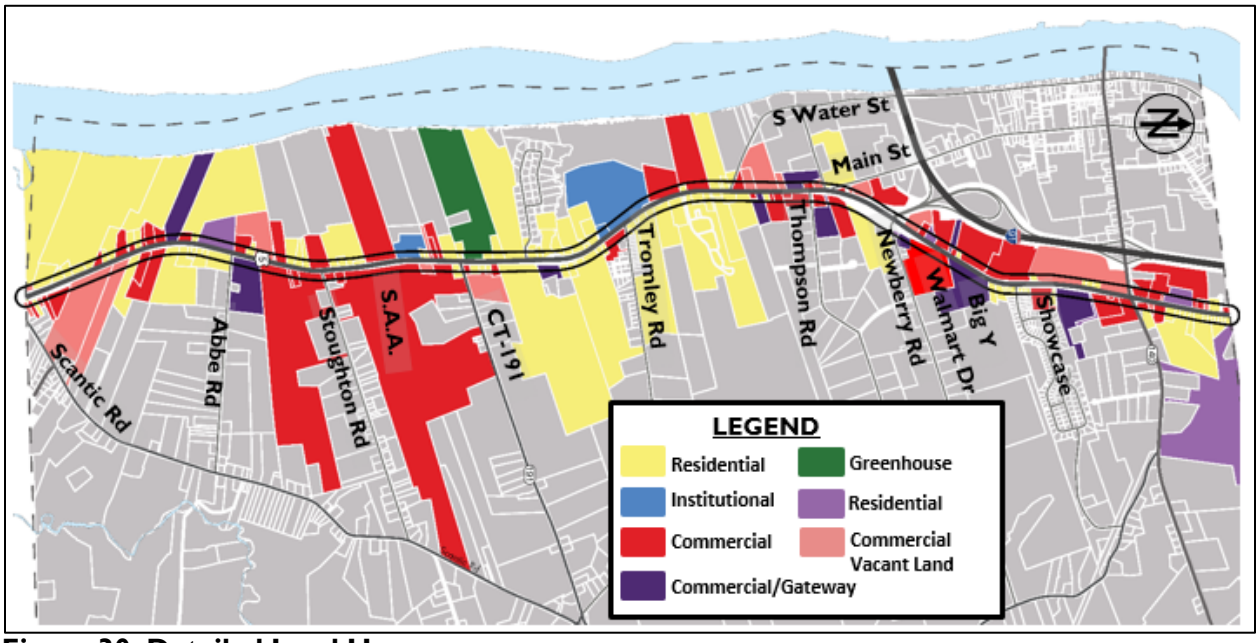



**Figure 30: Detailed Land Use**

### *2.1.6 Zoning*

East Windsor has a distinct set of zoning districts laid out to meet local long-term development objectives. Zoning by primary intended land uses in the Study Area was generalized and is shown in **Figure 31,** page 30. The latest update to the zoning regulations was in the year 2016, when the Multi Family Development District (MFDD) was amended.

The notable features of each existing East Windsor zoning district in the study area are as follows:

*M-1, Manufacturing Zone* – intended to provide areas for manufacturing, warehousing, wholesale, and other forms of commercial and industrial activities. The character of the zone is intended to be commercial in nature while still maintaining the small town community character.

*B-1, Business Zone 1* – intended to establish areas of light commercial activities including neighborhood retail, services, and professional offices. The character of the zone is intended to be small scale commercial activities that serve the surrounding areas and integrate well with the neighboring residential development.

*B-2, Business Zone 2* – intended to provide areas of commercial activity including community retail, business, service, professional offices, and other automotive dependent uses. The character of this zone is intended to be small to large scale commercial developments primarily served by automobile.

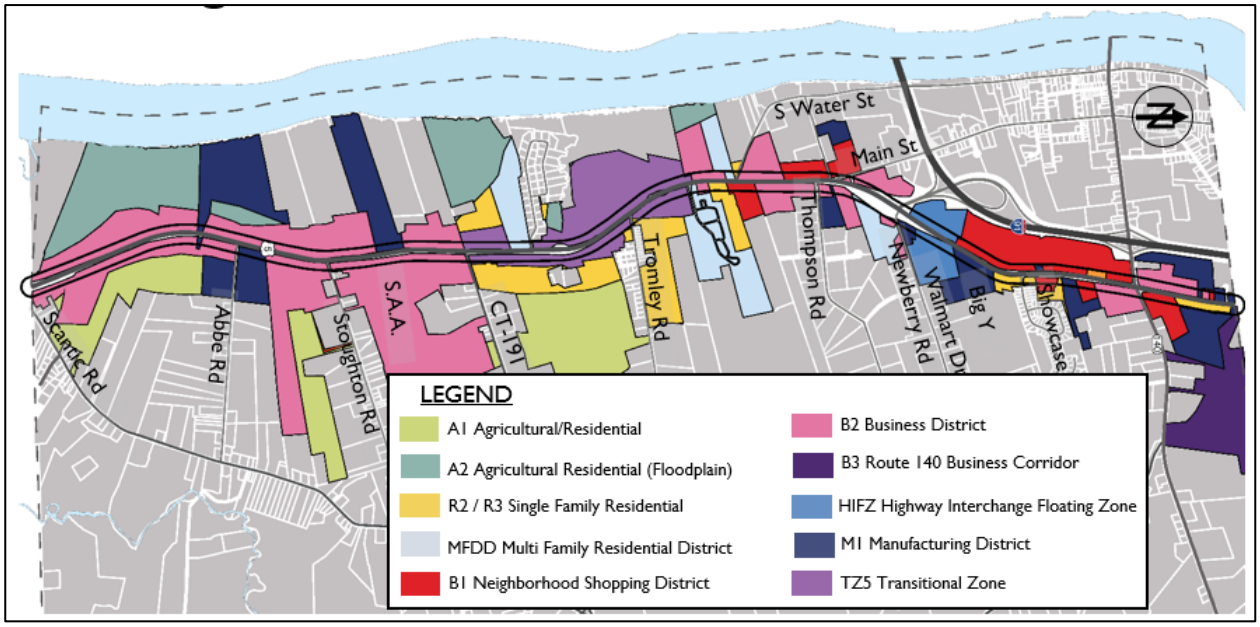



**Figure 31: Corridor Zoning**

*B-3, Business Zone 3, Route 140 Corridor* – intended to provide for business development in order to increase the tax base, provide services and amenities to residents of the town and larger region, and provide jobs. The character of the zone is intended to provide a variety of uses and building types while managing environmental, traffic, and aesthetic/community character impacts. Planned developments with a village character and multiple uses on a parcel are desirable in this district.

*HIFZ, Highway Interchange Floating Zone* – establish a legal framework for land use alternatives that will provide the applicant with a wide variety of development opportunities; to encourage the economic development and fiscal improvement of the community by providing flexible development opportunities and responsiveness to market trends for land having high visibility and access to the major intersections of Route 5 with I-91 at Exit 44, and with Route 140; to empower the Town with a measure of control over the type and quality of development while encouraging mixed Industrial, Commercial, and Business Uses; and to insure that such development is accomplished in an orderly manner with minimal negative impact to neighboring areas and critical natural resources.

*TZ5, Transitional Zone 5* – to allow existing residential areas to transition in an orderly means to a commercial area. The development of this zone should provide minimal impacts on existing residential development within the area.

*Residential - R-2, R-3, A-1, and A2* – where these residential zoning districts are established to provide a harmony with natural features of the land and the needs of East Windsor residents, both present and future. The agricultural zones are also considered residential zones, however, the intent is to promote present and future agricultural uses.

*MFDD, Multi Family Development District* – intended to regulate the development and construction of multi-family housing, including but not limited to apartments, condominiums and cooperatives, whether new or existing structures, and to permit planned residential developments (PRD) for single-family housing with open space conservation in accordance with Section 801.

The parking provisions in the East Windsor zoning regulations include a traditional table with the number of parking spaces required by land use. In addition, the East Windsor Planning and Zoning Commission can waive the minimal required parking spaces based on a parking reduction application.

### *2.1.7 Environmental Conditions*

Environmental conditions are a significant consideration for the Route 5 Corridor due to its proximity to the Connecticut River, floodplains, floodways, and wetlands. The Connecticut River itself flows southward through the State and ultimately empties into Long Island Sound. Within the Study Area, there are several small tributary rivers, brooks, and streams that join the Connecticut River:

- Scantic River – south edge of the study area
- Quarry Brook – north of Stoughton Road
- Stoughton Brook – south of Tromley Road
- Namerick Brook – north of Tromley Road
- Blue Ditch – under the Dexter D. Coffin Bridge
- Boweyns Brook – south of the Enfield town line

**Federal vs. Connecticut's Wetlands Definitions**

**Connecticut's definition of inland wetlands is based on soil characteristics.**
**The Federal Clean Water Act definition for wetlands is based on a three-part criteria:**
**1) soil characteristics**
**2) hydrophytic vegetation**
**3) hydrology.**

**Figure 32** illustrates the approximate boundaries of 100-Year Flood Zone, 500-Year Flood Zone, and wetlands. The 100-Year Flood Zone is the area that has a one percent chance of flooding in any given year. In the southern end of the Study Area, much of the land adjacent to Route 5 is within the 100-Year Flood Zone.

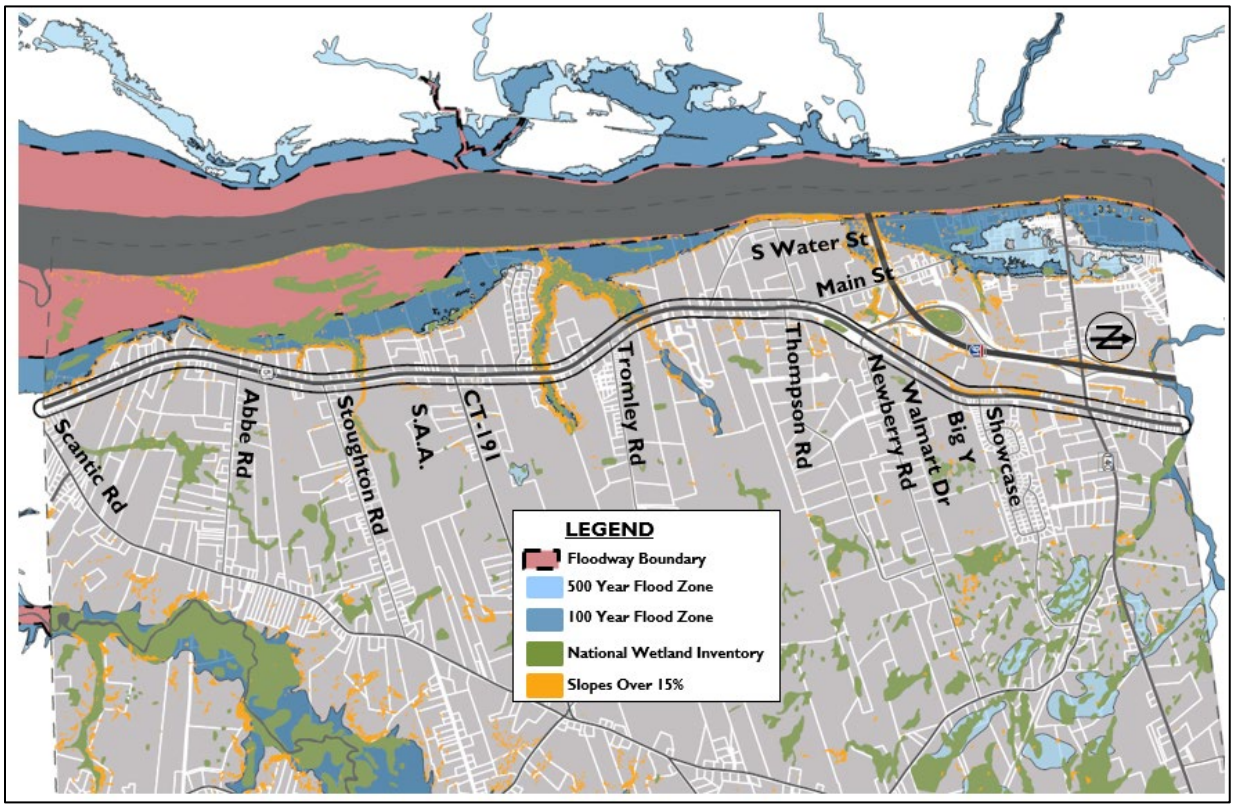



**Figure 32: Environmental Constraints**

**Figure 33** shows Natural Diversity Areas, slopes, and wetlands (Federal and State) within the Study Area. These constraints are present throughout the Study Area, and Route 5 itself runs through both wetlands and Natural Diversity Areas.

More specific environmental evaluations and documentation will be completed in accordance with CEPA and NEPA requirements under subsequent initiatives as study recommendations are advanced to design and implementation.

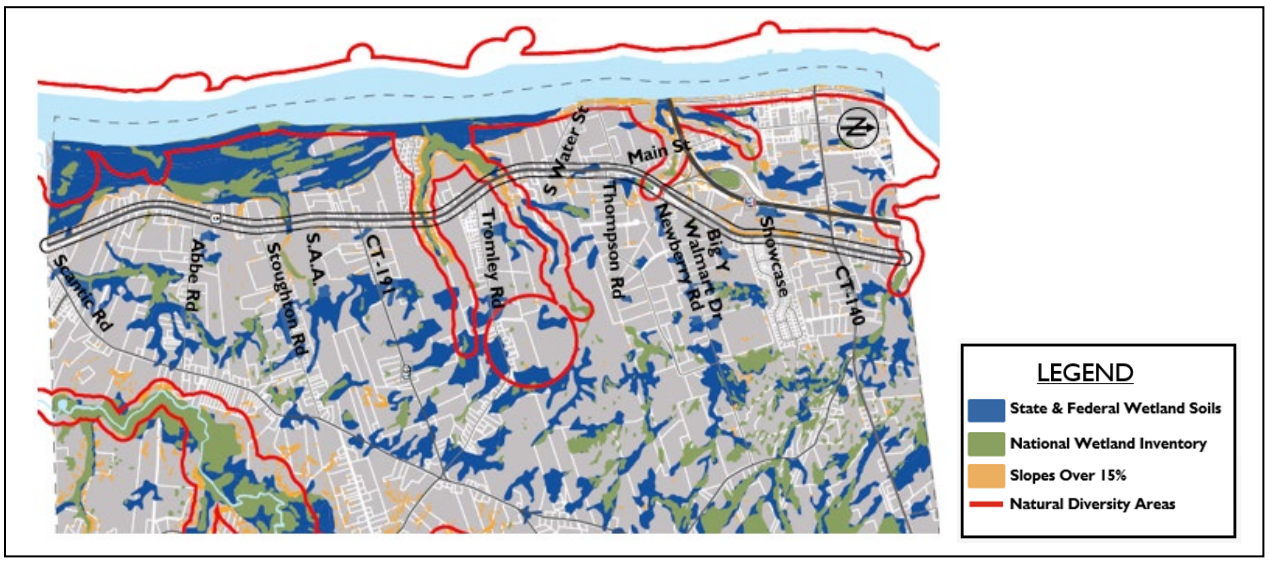



**Figure 33: Natural Diversity Areas, Slopes, and Wetlands**

### *2.1.8 Physical Features / Constraints*

Physical features identified in the study area include Rights-of-Way (ROW) and Utilities.

Based on approximate ROW lines shown in traffic control signal plans, the ROW lines along Route 5 are generally located several feet beyond the edge of road. However, there are some locations where the road is at the edge of the State ROW, for example at the Big Y driveway.

Overhead and underground utilities – such as electric, cable, telephone, water, and sewer lines – are located throughout the Study Area. Because relocation of utilities can be cost-prohibitive to potential improvement projects in the corridor, potential impacts to these utilities are generally minimized or avoided where possible. Additionally, existing public utility infrastructure, particularly water, storm water and sewer capacity, could constrain the intensity of future development that is possible without upgrades.

## 2.2 Multimodal Accommodations

Much of Route 5 in the study area has been designed to prioritize the automobile and the emphasis on a single mode of transportation has largely contributed to the issues regarding safety, congestion, and accessibility along the corridor today. This auto-oriented approach has created an environment along the corridor that generally lacks sufficient facilities for alternative modes of transportation, such as taking a bus, biking, or walking.

While these conditions make Route 5 intimidating and discouraging to bicyclists and pedestrians today, a significant amount of potential does exist. There has been a growing recognition not only across the state,

but across the nation that the key to designing efficient, sustainable, and safe transportation systems is to incorporate multiple modes that are accessible and convenient for all users.

This section of the report includes and assessment of the existing conditions of bicycle, pedestrian, transit, and multi-use facilities within and adjacent to the Study Area.

### *2.2.1 Pedestrian Facilities*

Being rural in nature, the study corridor generally has no sidewalks. Other pedestrian facilities are limited to incomplete sets of pedestrian actuated intersection crossings and a single painted crosswalk across Route 5. The locations of these facilities are noted in **Figure 34**. The crosswalk is located at Tromley Road and East Windsor High School. There are a number of pedestrian push buttons along Route 5 in the Study Area. Many of these push buttons are not accessible to people with disabilities. Only the push button at Tromley Road actuates an exclusive pedestrian phase; the remainder are side-street green.


***Adjacent Sidewalk (Walmart)***

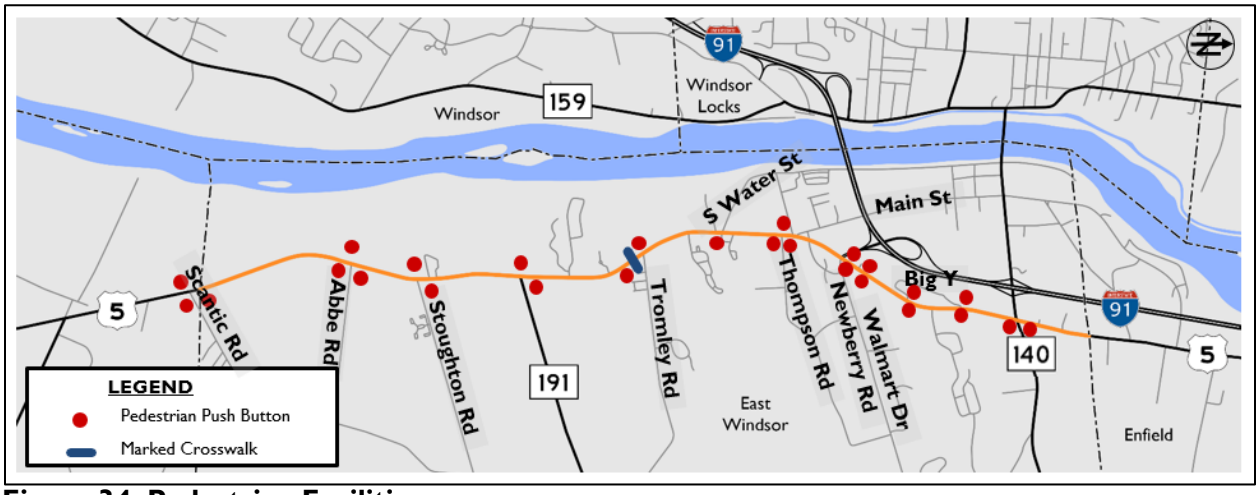
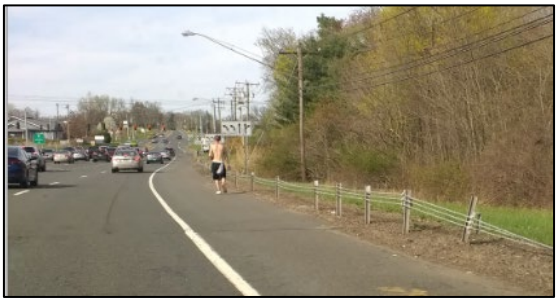



**Figure 34: Pedestrian Facilities**

**Figure 35** shows the number of pedestrians counted at signalized intersections corridor during the AM and PM peak periods. There are signs of pedestrian presence in the corridor such as goat paths on the side of the road. Pedestrians may walk in the shoulder where there is vegetation, a slope, or other barriers along the edge of the road. In general, roadway shoulders of varying width are provided on both sides of the corridor. These shoulders are utilized by motorists for passing turning vehicles, cyclists in lieu of bike lanes, and pedestrians. It should be noted, at some locations the shoulders are absent altogether.

**What is Desire Lane / Goat Path?**

**Desire Lane is informal route that is formed in space by people making their own paths and shortcuts; it is an unofficial and usually the shortest route. Desire Lanes are sometimes also called Goat Paths.**



***Pedestrian Walking in Shoulder Lane (44 South Main Street) Push-to-Walk Button at Newberry Rd Interchange***

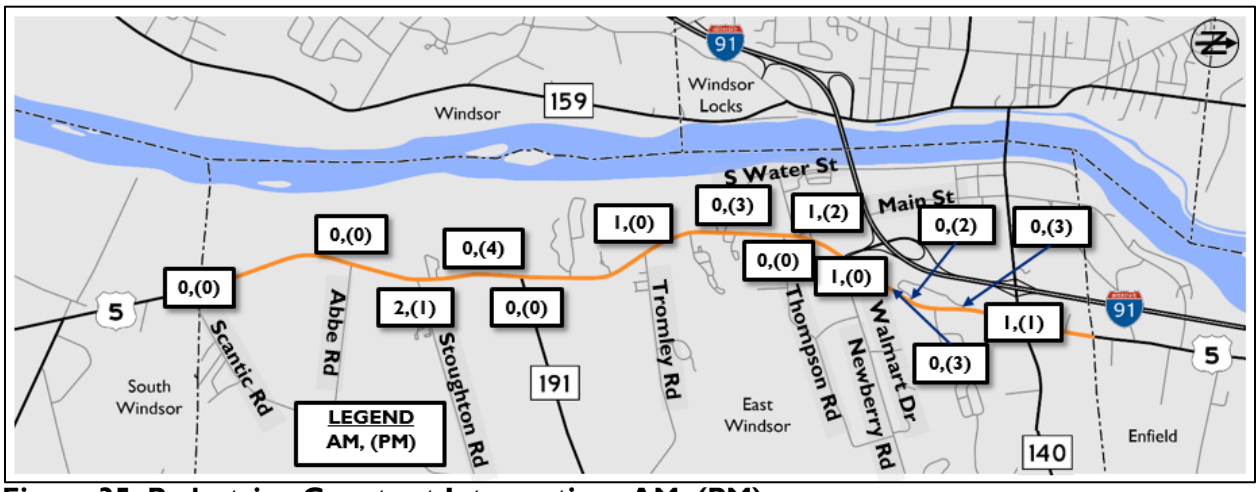



**Figure 35: Pedestrian Counts at Intersections AM, (PM)**

### 2.2.1.1 *ADA measures*

The Americans with Disabilities Act (ADA) requires access to the public right-of-way be provided for people with disabilities and visual impairments. This includes providing accessible sidewalks, street crossings, and pedestrian push buttons at signals. ADA accessibility is a requirement for any project that receives federal funding. Specific ADA accessibility guidelines include:

***Goat Path & No Shoulders (Right Side, 34 South Main Street)***

- Minimum continuous sidewalk widths of 4 feet, with 5 feet of space provided at 200-foot intervals for passing.
- Minimum sidewalk widths maintained without obstruction.
- Curb ramps to transition from sidewalk elevation to street level at crossing locations.
- Detectable warning surfaces on all curb ramps.
- Accessible pedestrian signals that provide non-visual (audible and vibrotactile) queues.
- Accessible pedestrian push buttons.

The single marked crosswalk at Tromley Road does have push buttons, but there are no other amenities typical of a pedestrian corridor, e.g., tactile warning strips, continuous sidewalk on the east side of the corridor, audible or vibrotactile pedestrian signals, and properly designed ramps with curb and gutter considerations. The crossings at this locations may be difficult to navigate for vulnerable users.

***Tromley Road sidewalk condition and ADA non-compliance***

#### 2.2.1.1 *Journey to work*

According to the US Census Bureau Longitudinal Employer-Household Dynamics data, there were 8,583 jobs within the Study Area in 2015 (most recent available data); 279 of these jobs were held by people living within the Study Area and 8,304 jobs were held by people outside of the Study Area. Of residents living within the Study Area, 2,575 residents commute to work outside of the Study Area. These patterns are shown in **Figure 36**.

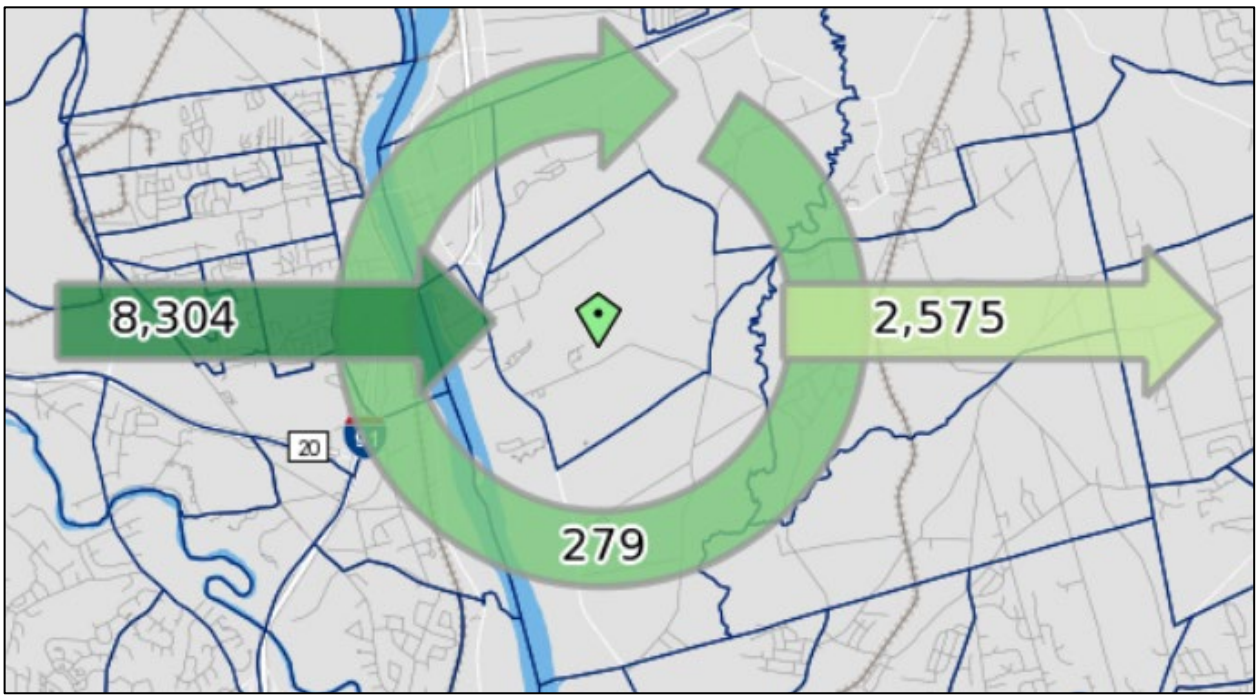



**Figure 36: Study Area Commuting Patterns for Employment in East Windsor**

**Figure 37** illustrates the general direction of employment and distance travelled. 43% of people travel less than 10 miles to work, followed by 38% traveling between 10-25 miles, and remaining 19% traveling more than 25 miles.

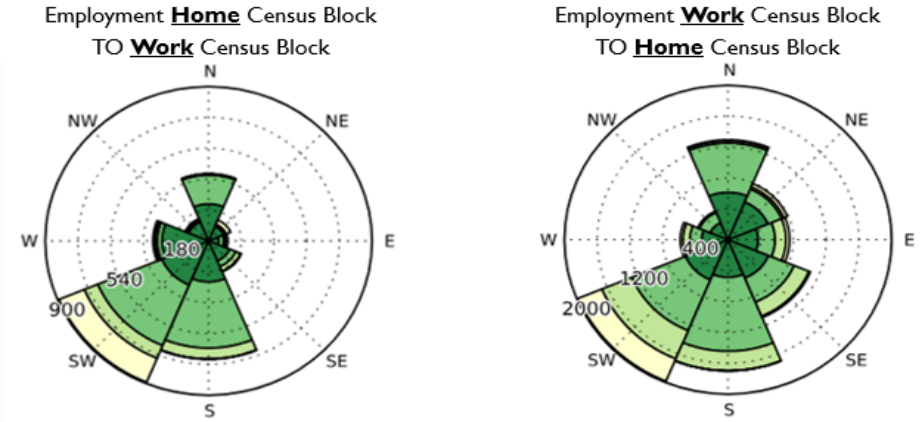



**Figure 37: Study Area Direction of Commuting Patterns to/from Employment**

### 2.2.2 *Bicycle Facilities*

While there are currently no dedicated bike routes, signage, or facilities for bicyclists along Route 5, this mode of transportation has the potential to be well utilized in the study area. Currently, the bicycle environment is less than ideal and characterized by inconsistent shoulders, numerous intersecting roadways and driveways, constant streams of traffic that sometimes travel at high speeds, and a lack of "share the road" signage or other devices that would alert drivers of the potential to encounter a bicyclist.

***Cyclist (252 South Main St)***

Although there is a multi-use trail in proximity to the Study Area, bicycle infrastructure, such as bicycle lanes and bicycle racks, is noticeably lacking on Route 5. Despite this, based on STRAVA bicycle activity data, **Figure 38**, there is low to medium usage between South Water St and Phelps Road (Route 191) as well as along Scantic Road.

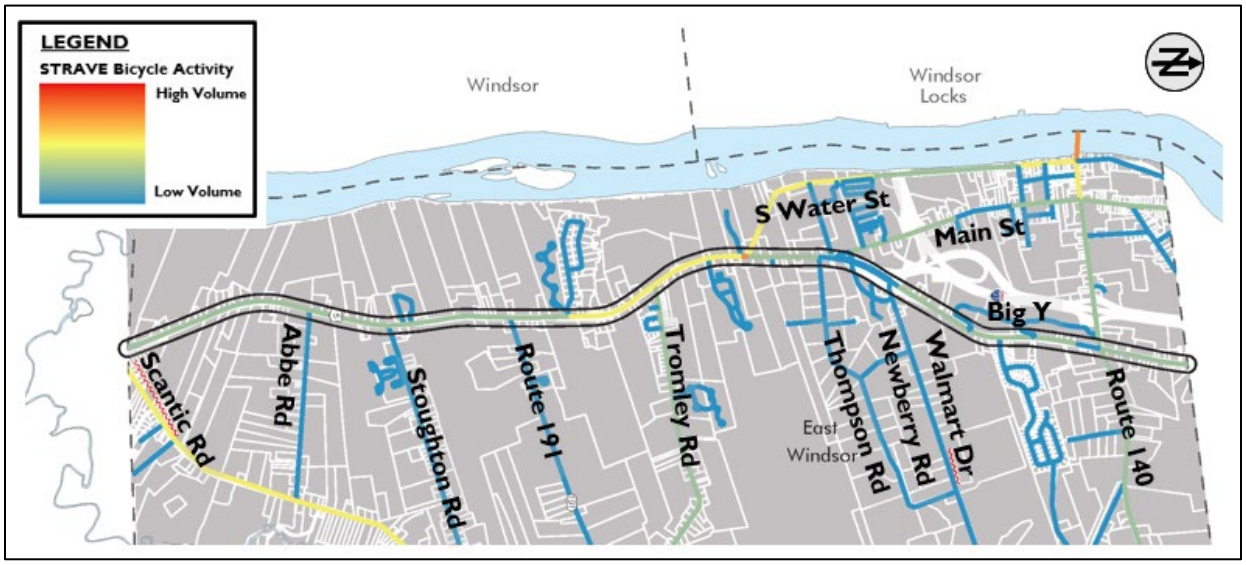



**Figure 38: Strava Bike Usage**

Data collection efforts confirm that there are a few minimal bicycle riders on the corridor during peak periods. Bicycle counts at signalized intersections are shown on **Figure 39**, Page 38. Though the number of bicyclists is low, they travel through multiple intersections, showing that there is demand for medium- and long-distance bicycle travel along Route 5.

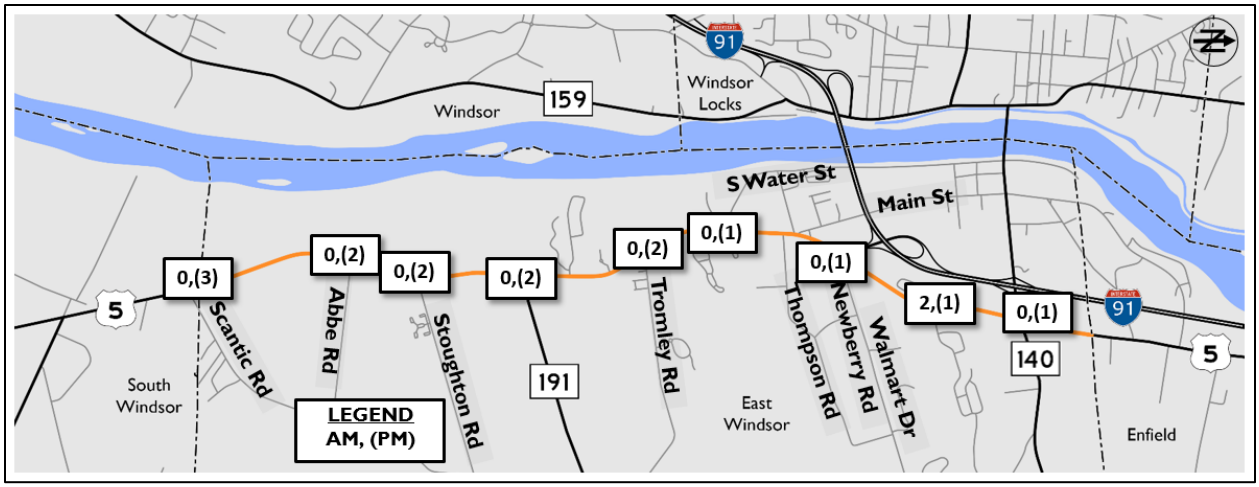
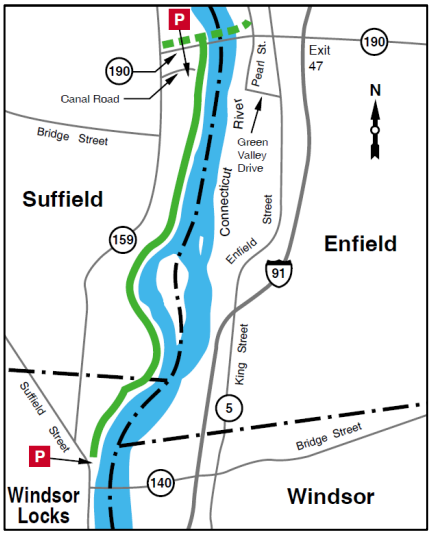



**Figure 39: AM and PM Bicycle Counts**

### *2.2.3 Multi-Use Trails*

The Windsor Locks Canal State Park Trail runs through Windsor Locks and Suffield to the west of the Study Area. The trail begins at Bridge Street (Route 140) in Windsor Locks and proceeds northward along the Connecticut River until its terminus at Canal Road. This trail is approximately 4.5 miles long and its footprint follows the historic towpath of an over-170-years-old waterway. The Connecticut Department of Energy and Environmental Protection (DEEP) had been leasing the land from the Windsor Locks Canal Company for the public use as a state park trail. As of June 2018, the Windsor Locks Canal State Park Trail is temporarily closed in connection with the redevelopment of the Montgomery Mills building. The DEEP and the Windsor Locks Canal Company are finalizing various arrangements, including trail access.




***Windsor Locks Canal State Park Trail Map***

### *2.2.4 Bus Transit Commuter Systems*

#### 2.2.4.1 *Transit Routes*

Connecticut Transit (CT*transit*), a CTDOT-owned bus service, provides bus service to downtown Hartford on weekdays from Enfield and South Windsor. Within the Study Area, only route 905E traverses the corridor, and it does so in the off peak direction. In the AM, the peak travel direction is to Hartford; however, the 905E traverses Route 5 is in the northbound direction towards Enfield, allowing only disembarkments. In the evening, the reverse is true, and the bus only accepts embarkments as it heads down Route 5 towards Hartford. These are the only two CT*transit* buses on Route 5 on weekdays, and there is no bus service on weekends. **Figure 40**, page 39 outlines route 905 and designated stops. On Route 5, bus stops are marked with an official bus stop sign; **Figure 41** on page 39 provides examples.


**Figure 40: 905 Bus Route in Study Area**


**Figure 41: Samples of Bus Stop**

Route 905 ridership averages approximately 960 trips per day on its peak direction route, but only seven to ten riders on its off-peak service down Route 5. While majority of the trips in the off-peak direction are through trips, 2-3 riders embark or disembark at Phelps Street (Route 191) and / or Stoughton Road.

South of the corridor study area, CT*transit* Route 96 provides services between South Windsor, East Hartford, and Hartford. This Route's most northern point is at the intersection of Route 5 and Route 194 in South Windsor, as shown in **Figure 42** on Page 40. CT*transit* Route 94 also serves South Windsor along Route 5. Combining Routes 94 and 96, the average daily ridership in 2014 totaled 1,629 boardings and alightings.

All CT*transit* buses are wheelchair accessible with wheelchair lifts or ramps for access by persons with disabilities. In addition, for compliance with the ADA, the Greater Hartford Transit District provides paratransit transportation services for individuals who, because of their disability, are unable to travel on the fixed route public transit service operated by CT*transit*. The paratransit service is designed to provide those persons with disabilities equal access to public transportation; however, the service is limited to within ¾ (.75) mile radius of the fixed route public transit service. The last stop on Route 96 is 0.7 miles from the East Windsor town line. The 905 is considered a commuter express route, thus it does not qualify for paratransit services.

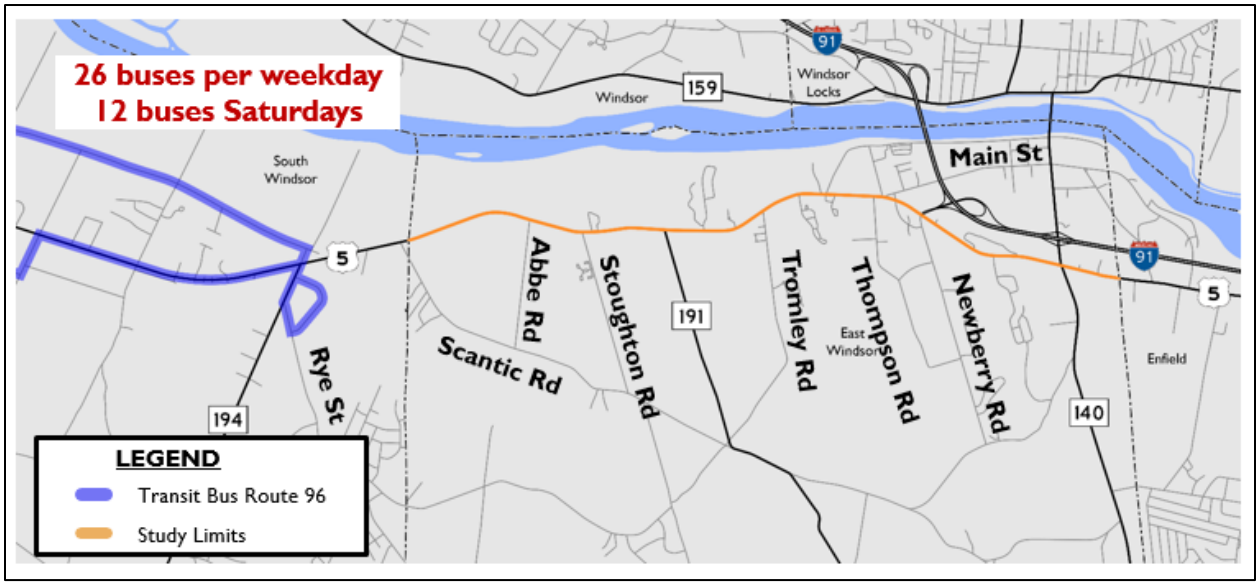



**Figure 42: Bus Route 96 South of the Study Area**

2.2.4.2 *Bus Fares*

Standard CT*transit* fares for (Zone A / Zone 1) are $1.75 for adults, $1.40 for youth, and $0.85 for seniors and persons with disabilities. Ten rides can be purchased for $15.75 and passes are available in the following denominations: 2 hours for $1.75, 1 day for $3.50, 3 day for $8.75, 5 day for $14.00, 7 day for $19.25, and 1 month for $63.00. Express routes (Zone 2) are $3.20 for a one-way fare.

Route 905E is an express route and incurs additional travel zone costs. The cost of a one-way fare within Zone A / Zone B / Zone C is $3.20, a one-way fare between Zone A & B / Zone B & C is also $3.20, and finally, the one-way fare between Zone A & C is $4.10.

CT*transit* tickets can be purchased at ticket vending machines, from the bus drivers, and online. A new method of payment was introduced in 2018 with Go CT Card; it provides the same discounts as the multi-ride and / or monthly pass, but the card and funds on the card will never expire. The algorithm behind Go CT Card will determine best possible discount to be provided to transit rider.

### *2.2.5 Train Services*

On June 16th, 2018, a new CT*rail* Hartford Line service was launched between multiple towns in central Connecticut along the I-91 corridor connecting three major cities: New Haven, Hartford, and Springfield. Windsor Locks is one of the 9 operational stations, with additional four to come on line in the future. Currently, there are 16 weekday trips, including those existing Amtrak trains that honor Harford Line fares and tickets. One-way fares are shown in **Table 8**.

**Table 8: CT*rail* Fare Structure**

| One-Way Fare | New Haven (both stations) | Wallingford | Meriden | Berlin | Hartford | Windsor | Windsor Locks |
|---|---|---|---|---|---|---|---|
| **Wallingford** | $3.50 | | | | | | |
| **Meriden** | $4.75 | $3.00 | | | | | |
| **Berlin** | $6.00 | $3.50 | $3.00 | | | | |
| **Hartford** | $8.00 | $5.50 | $4.50 | $3.25 | | | |
| **Windsor** | $9.25 | $6.75 | $5.75 | $4.50 | $3.00 | | |
| **Windsor Locks** | $10.00 | $7.50 | $6.50 | $5.25 | $3.25 | $3.00 | |
| **Springfield, MA** | $12.75 | $10.25 | $9.25 | $8.00 | $6.00 | $4.75 | $4.00 |

During weekend launch of the service, almost 22,000 riders traveled using the CT*rail* line.

The Windsor Locks station is an Amtrak station and is located approximately one mile south of the historical station house and another 0.8 miles from Route 5 corridor. At the station, there are 30 free parking spaces for commuters until September 3rd, when a nominal fee will be charged. Windsor Locks is the only station without fare vending machines and thus the fare tickets can only be purchased onboard the CT*rail* train. The surcharge for on-board purchases will be waived, but the Amtrak trains will sell tickets at Amtrak prices. Currently, there are no ridership projections.

### *2.2.6 Park & Ride Facilities*

The closest Park & Ride Facility is across the Connecticut River in Windsor Locks, near the I-91 Exit 42 ramps. The access point is via South Main Street (Route 159) immediately south of the I-91 southbound ramps. The parking lot has 342 parking spaces, a bus shelter to serve Route 905, is paved, and has on-street lighting.

## 3.0 NEXT STEPS

As part of the U.S. Route 5 Corridor Study, the Existing Conditions Report is the first step to evaluate traffic and development issues along Route 5 in the town of East Windsor. The next step is to continue to work with stakeholders through the public involvement process to develop an assessment of future 'no-build' scenario to establish a baseline to assess the success of future 'build' conditions. This will lead to the identification and analysis of alternatives. The ultimate purpose of the Study is to develop a comprehensive transportation plan that will: (1) address safety, congestion, and mobility of the transit system, pedestrians, and bicyclists; and (2) assess travel demand growth and its impacts on area roadways including traffic associated with development within the Study Area. The current status of the U.S. Route Corridor Study is presented in **Figure 43**.

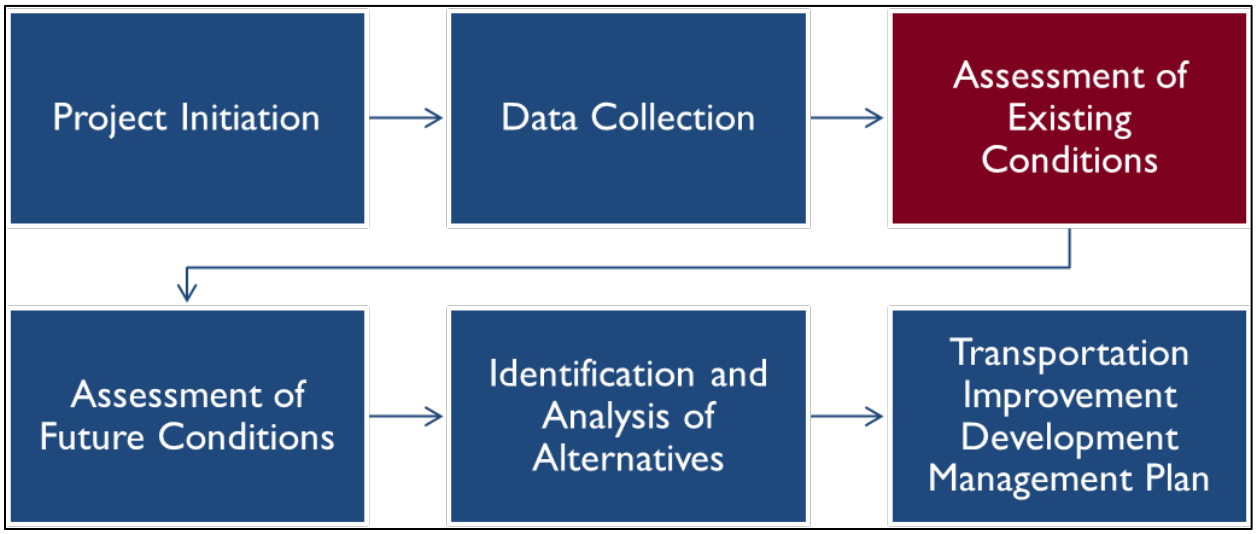



**Figure 43: Outline of U.S. Route 5 Corridor Study Progress**

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