Route 5 Corridor Study

Draft Recommendations and Implementation Plan

DATE: SEPTEMBER 20, 2021

PREPARED FOR:

Capitol Region Council of Governments
241 Main Street
Hartford, CT 06106

PREPARED BY:

TranSystems Corporation
530 Preston Avenue
Meriden, CT 0645

With the assistance of:

Fitzgerald & Halliday Inc.
416 Asylum Street
Hartford, CT, 06103

Contents

List of Figures

List of Tables

1 Introduction and Executive Summary

The study team developed a range of alternatives intended to address the study vision, goals and objectives. The alternatives include a mix of transportation improvements, intended to enhance mobility for vehicles, pedestrians, bicyclists and transit users. The vision, goals and objectives of the study are as follows:

The *vision* of the study it to create a multimodal transportation system that supports continued social and economic growth in the Route 5 corridor.

Goals:

- Ensue safe and consistent, vehicular, pedestrian and bicyclist traffic flow and access
- Establish bicyclist, pedestrian and transit options to enhance mobility choices by providing equitable levels of access to affordable and reliable transportation

Objectives:

- Provide turn lanes at all signalized intersections on Route 5
- Provide LOS D or better at all signalized intersections
- Minimize queues between intersections
- Provide transit service to key employment sites and destinations in the corridor
- Provide bicyclist and pedestrian facilities on Route 5 on at least one side of the street

Alternatives were analyzed and formulated into an implementation plan based on their expected time of implementation. These are defined as follows:

Near Term: Improvements that address existing needs, are relatively low cost and low impact (environmental, ROW) and could / should be pursued immediately.

Mid Term: Improvements that address existing future Base scenario needs, are higher cost and could have potential environmental and ROW impacts. These alternatives would either require environmental review (if initiated immediately) or could have outside actions, such as development, that would trigger the need to implement them.

Long Term: Improvements that address future Build scenario needs, are high cost and likely require environmental and ROW impacts. These alternatives have outside actions, such as development, that would trigger the need to implement them.

Table 1, following, lists all of the studied alternatives, potential costs to implement and documents an implementation plan. The following sections discuss the alternatives in detail. Conceptual plans illustrating the alternatives are contained in an appendix.

Table 1: List of Studied Alternatives and Implementation Timeframe

Alternative	Cost in 2021 $	Cost in 2025 $	Cost in 2030 $	Notes
Near Term				
N-1	$1,850,000	$2,130,000	$2,530,000	Could all be implemented immediately
New-1	$2,000,000	$2,300,000	$2,730,000	
Main-1	$750,000	$870,000	$1,030,000	
C-1	$4,800,000	$5,510,000	$6,550,000	
S-1	$7,400,000	$8,500,000	$10,090,000	
Mid Term				
Main-2	$1,250,000	$1,440,000	$1,710,000	Could be implemented immediately
C-2	$9,540,000	$10,950,000	$13,010,000	Should be implemented with development of MMCT casino or other significant development on that site and completion of Base scenario developments
N-2	$5,200,000	$7,090,000	$7,600,000	
Long Term				
N-3	$2,300,000	$3,140,000	$3,360,000	Should be implemented with development of the Build scenario sites
New-5	$1,200,000	$1,380,000	$1,640,000	
S-2	$10,190,000	$11,700,000	$13,010,000	
S-3	$17,300,000	$19,860,000	$23,580,000	
Alternatives in Need of Further, Separate Study				
New-3				Alternatives need to be evaluated in context of operations of mainline I-91
New-4				
Alternative Dismissed				
New-2				Alternative not recommended for further study

2 Alternatives Analysis

This section will explain and document the alternatives developed and analyze their ability to satisfy the vision, goals and objectives.

2.1 Corridor-wide Enhancements

Several recommendations, particularly those affecting pedestrian, bicyclist and transit mobility, were evaluated within the context of the entire project corridor to ensure consistency throughout the corridor. The primary corridor-wide recommendations are to:

- Improve signal infrastructure, specifically modernize detection systems
- Provide bicyclist and pedestrian amenities on at least one side of Route 5 and to serve key destinations
- Provide transit amenities near key destinations and seek to improve transit service

2.1.1 Improve Signal Infrastructure

During the course of the existing conditions analysis the study conducted field work to evaluate whether the traffic signals were operating as expected via traffic modeling software. At several locations, traffic queues and delays appeared to be substantially greater than the modeling software indicated. Upon investigation, the study team identified several broken loop detectors that were fouling the operation of the coordinated signal system.

During the study, using public and private resources, the Town of East Windsor and CTDOT were able to install new video detection throughout the corridor. Field reviews and feedback from the public indicates that these change have had the desired effect of ensuring the traffic signals operate at their full capability for processing traffic efficiently.

2.1.2 Transit Improvement Opportunities

The transit and innovative mobility improvements can be categorized into two sections. The first deals with potential improvements in transit service to East Windsor. The second deals with specific infrastructure, specifically bus stops with shelters that are recommended within the study corridor.

2.1.2.1 Transit and Innovative Mobility Service Alternatives

Four preliminary alternatives have been developed as means to meet the future demand for the transit and mobility needs of the Route 5 corridor. This document includes a summary of the transit demand analysis that was included in the Future Conditions Assessment and four alternatives to add transit or innovative mobility services to the corridor. Innovative mobility services are included for consideration due to the low demand for traditional, fixed route transit.

Extensive Vehicle Queue on Route 5 Southbound at South Water Street prior to Replacement of Detection Systems

Summary of Transit Demand Analysis

The study team evaluated the future transit demand in East Windsor using published population and employment data from the State of Connecticut and the Commonwealth of Massachusetts for the selected design year of 2025. Three different types of demand were assessed: program (demand-response), non-program (local fixed route) and commuter (express). The results are documented in the following tables:

Table 2: Program and Non-Program Transit Demand

Demand Methodology	Annual Demand (trips per year)
Program	13,317
Non-Program	9,951
Total	23,268

The demand analysis, documented in more detail in the Future Conditions Assessment available on the study website, yielded the following conclusions:

- Demand for a new fixed route local bus services is limited.
- One small vehicle could support a demand-response service.
- There is limited demand to support new commuter routes to surrounding employment centers, particularly with the parallel CT*rail* Hartford Line service providing connectivity to Hartford and Springfield.

Table 3: Commuter Transit Demand

Potential Commuter Route Destination	Daily Commutes to / from East Windsor	Miles to Potential Destination	Transit Mode Share	Existing		2025	
				Annual Rides	Daily Rides	Annual Rides	Daily Rides
Hartford	2,235	17	5%	53,000	208	56,710	222
Springfield	425	17	2%	4,600	18	4,775	19
Windsor Locks	428	6	2%	5,400	21	5,778	23

Transit Alternative 1: Increase Current (Express) Transit Service in the Corridor

Prior to August 2021, CT*transit*'s Route 96 ran on Route 5 between Hartford and East Windsor on a few trips during the morning and evening peaks (towards Hartford in the morning; away in the evening). If employment in the corridor increases as expected, there should be an increase in reverse-commute transit service as well.

Instead of operating only a few Route 905 trips to East Windsor, this alternative envisions that a new route be created that follows the "E" trips on Route 905. The proposed routing is shown in Figure 1, right.

Because the anticipated job growth in the corridor would be mainly in warehousing (which has many shifts that are not the standard "9 to 5" shift), the schedule for this route will likely not be run on a standard headway. Rather, the schedule should be tailored around common shift times. For extremely early or late trips, East Windsor should approach the companies individually or the Chamber of Commerce to subsidize these trips.

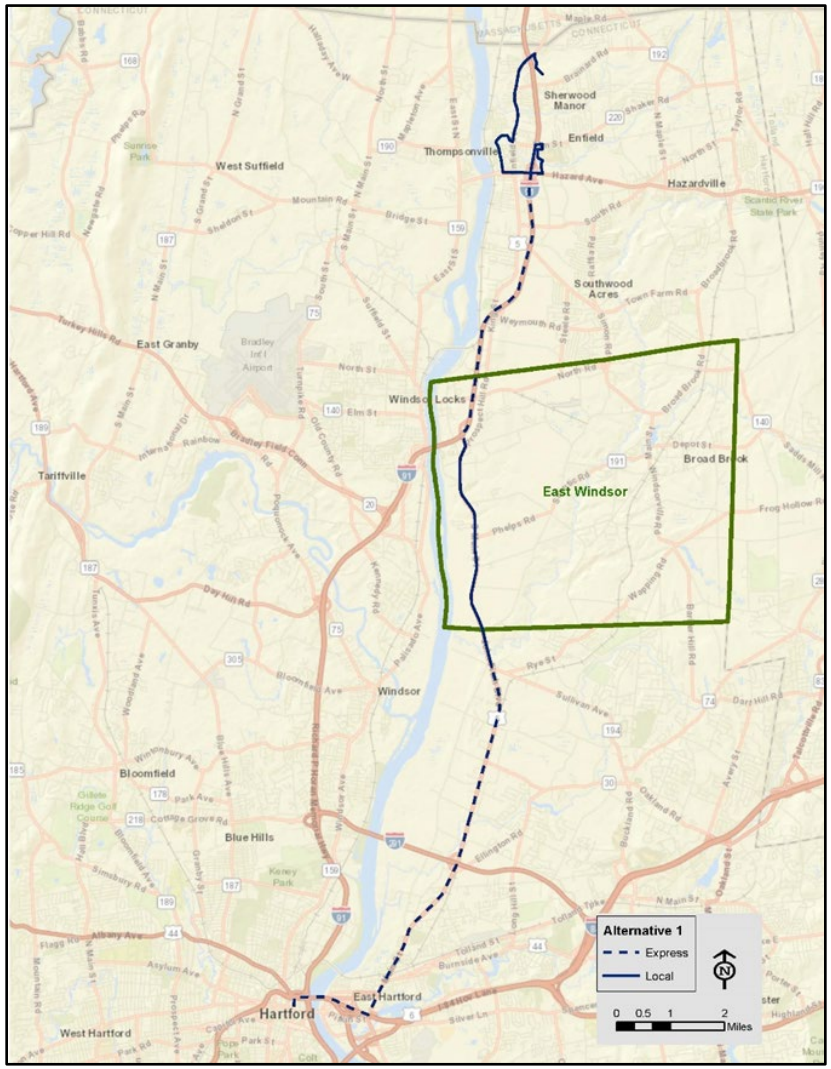
The benefit of pursuing this alternative is that this would allow a relatively quick expansion of transit services to the town. The drawback would be that East Windsor could not directly control its transit service levels or schedules. Assumptions for this alternative include:

- Service would be operated by the existing operator under the CT*transit* express umbrella

There may need to be a subsidy for late night / off peak service to be provided by East Windsor or its partners. This cost assumes that 2 round trips will need to be subsidized at the forecasted cost per hour for CTtransit ($127.09 multiplied annual inflation rate of 1.20% over 5 years equals $134.71).

Initial Capital Cost: None
Annual Operating Cost: $129,600
Estimated Annual Ridership: 56,000

Figure 1: Transit Alternative 1



Transit Alternative 2: New Local Bus Fixed-Route from Windsor Locks Station

CT*transit* is in the process of adding local bus service to the Windsor Locks Train Station, serving Amtrak and Harford Line service. A bus service from the station to Bradley International Airport, approximately 4 mile to the west, has been planned (Route 24) as well as adding two roundtrips from Hartford along Route 5.

The draft schedule for Route 24 shows several trips which have long layovers at Windsor Locks Station. The layovers are greater than 35 minutes, giving the buses sufficient time do a one directional loop in the Warehouse Point district of East Windsor and return to the station. This will allow riders from Hartford to be able to transfer from commuter trains and express buses to local bus service serving East Windsor.

Four trips are proposed—two in the morning and two in the evening peak.

This service could serve as a supplement the East Windsor Only Demand-Response System, described in Alternative 3, to reach even more local destinations.

The benefit of pursuing this alternative is that this would allow a relatively quick expansion of transit services to the town. Drawbacks would be that East Windsor could not directly control its transit service levels or schedules, and that only a small part of the town would be served by transit. Assumptions for this alternative include:

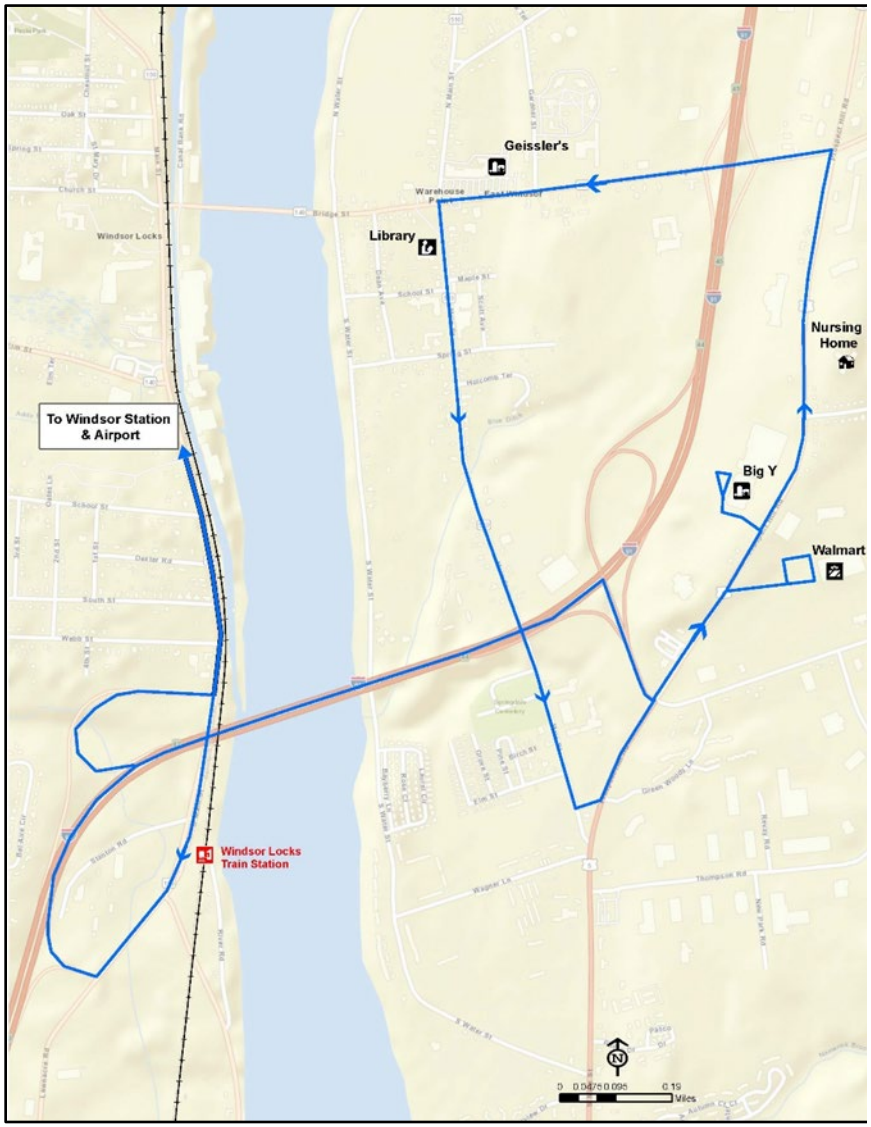
- Service would be operated by CT*transit*
- CTtransit would "protect" these trips when making schedule adjustments in the future
- Big Y and Walmart will allow buses onto their property
- The running time for a round trip between the train station and the East Windsor loop does not exceed 27 minutes
- The estimated running time between Windsor Station and Windsor Locks Station rarely exceeds 37 minutes

This is a near term solution that can be implemented as soon as August 2021; when the station is moved to its new location, there is the possibility of all Route 24 trips being able to loop into East Windsor if the Windsor Locks Park and Ride is moved north as well.

*Table 4: Proposed Route 24 Schedule (Courtesy CT*transit)

Dir	Start	Start Location	Initial Arrival at Endpoint	Arrival at Endpoint After Loop	End Location
NORTH	6:20	WINDSOR RR STN (CENTRAL ST CVS)	6:57	7:24	WINDSOR LOCKS RR STATION
NORTH	7:50	WINDSOR RR STN (CENTRAL ST CVS)	8:27	8:54	WINDSOR LOCKS RR STATION
NORTH	16:11	WINDSOR RR STN (CENTRAL ST CVS)	16:48	17:15	WINDSOR LOCKS RR STATION
NORTH	18:25	WINDSOR RR STN (CENTRAL ST CVS)	19:02	19:29	WINDSOR LOCKS RR STATION

Figure 2: Potential Routing for Transit Alternative 2



Transit Alternative 3: East Windsor Only Demand-Response System

This alternative would have East Windsor run their own demand-response transit system, which would supplement the limited CTtransit service that would remain in operation on Route 5. The system would use one vehicle. The service area would be confined to the East Windsor town limits (with two exceptions). Residents without access to a vehicle, or who are unable to drive because of a disability, would be the most likely users of this alternative.

- 24 hour advance notice will be needed to reserve a trip except at the Windsor Locks train station
- The other out of service area stops would include Enfield Square and Brookside Plaza (there would not be designated times when the vehicle would arrive at these stops; reservations are required)
- Subscription trips would be available
- Door to door service (due to lack of sidewalks in the area)
- The fare should be close to the current Enfield Transit (Magic Carpet Bus) demand response fare (approximately $1 per ride with multi-ride passes offering discounted fares)
- Weekday service from 6:00 AM to 6:00 PM
- Service not available on the following holidays: New Year's Day; Good Friday before Easter; Memorial Day; Independence Day; Labor Day; Thanksgiving; Friday after Thanksgiving; Christmas Day

Definitions / Further Explanation:

Scheduled times: The proposed times at the Windsor Locks commuter rail station where a rider could board an East Windsor transit vehicle without a reservation follow (the minutes shown is the time it would take to make a transfer to/from the train):

Table 5: Transfer Times for Transit Alternative 3

Time	SB Train Transfer Time (Minutes)	NB Train Transfer Time (Minutes)
9:00 AM	14	20
11:30 AM	7	
1:45 PM		10
5:15 PM		15

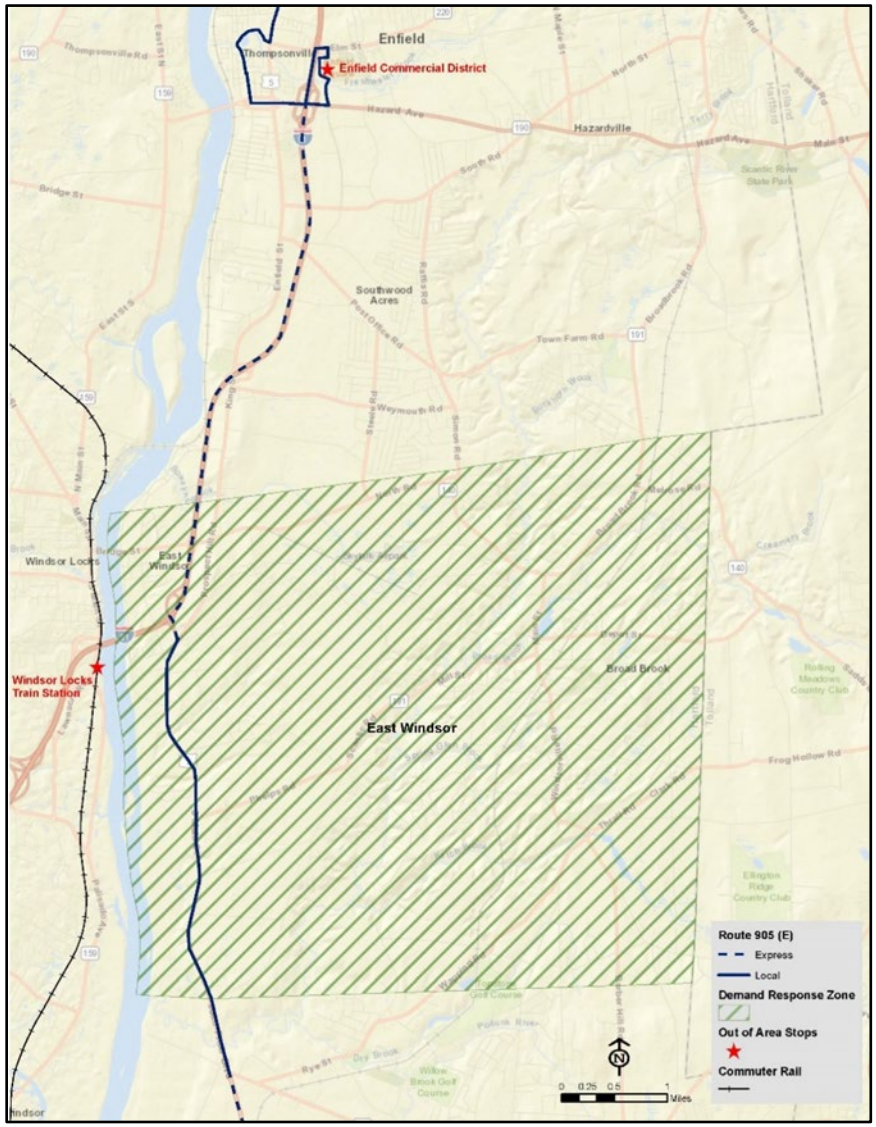
Other trips to the station could be made upon request at other times (subject to availability) and 24 hour advance notice would be required for those trips. In order to encourage riders to go to / from the station at these times, fares on these trips will be less than the standard demand response fare.

Assumptions for this alternative include:

- Initial capital cost for one vehicle (12 passengers, 2 wheelchairs) at the standard local match, assumed to be a Ford Starcaft Allstar shuttle bus
- Operating costs based on average cost per hour from NW and NE CT Transit Districts
- Only program ridership demand would be served

Initial Capital Cost: $13,000
Annual Operating Cost: $126,378
Estimated Annual Ridership: 13,000

Figure 3: Transit Alternative 3



Transit Alternative 4: Subsidized Transportation Network Company (TNC) Service

This alternative would use the private sector (TNCs) to provide transit service to East Windsor town residents. Examples of TNCs include Uber and Lyft. East Windsor would pay the difference between the actual cost of a TNC ride and a flat fare that a rider would pay.

Characteristics of the service include:

- No advance notice will be needed to reserve a trip
- Subscription trips would not be available
- Door to door service (due to lack of sidewalks in the area)
- The fare would be $5; any costs over that would be subsidized by East Windsor
- Out of service area stops would include the Windsor Locks train station and the Enfield commercial area
- Service hours and days to be determined.
- Only **registered riders** from the **ADA eligible population** or those over 65 would be served to keep costs down[1].

Definitions/Further Explanation:

ADA eligible population: Those individuals having a physical or mental impairment that substantially limits one or more of the major life activities of such individual; a record of such an impairment; or being regarded as having such an impairment. These impairments would be[2]:

- Any physiological disorder or condition, cosmetic disfigurement, or anatomical loss affecting one or more of the following body systems: neurological, musculoskeletal, special sense organs, respiratory including speech organs, cardiovascular, reproductive, digestive, genito-urinary, hemic and lymphatic, skin, and endocrine;
- Any mental or psychological disorder, such as mental retardation, organic brain syndrome, emotional or mental illness, and specific learning disabilities;

Registered riders: Only riders from the ADA eligible population or over 65 who are registered would be eligible to use the service. For over 65, a proof of age will be needed; for those with a disability, an application would need to be filled out and reviewed.

TNCs drivers would provide all the rides with their existing business model, with the rider only paying a flat fare for a ride within the town of East Windsor and certain out of town locations. A model for how a transit agency can work with a TNC to provide service is Direct Connect, operated by Pinellas Suncoast Transit (PSTA). Direct Connect replaced a low performing fixed route in a suburban part of the PSTA service area, increasing the ridership in the area previously served by the fixed route. PSTA subsidizes the cost of TNC rides up to $5.00 (with the remainder paid by the rider) within a 15 square mile service area for all riders, regardless of ADA eligibility. Because the potential service area is almost twice as large as Direct Connect's (26 versus 15 square miles), allowing everyone to access the service would be prohibitively expensive. Therefore, this alternative would focus on those with the most mobility needs in the community.

The biggest benefit to East Windsor is that there would be no capital costs; the town's only commitment would be to provide the operating subsidy. Also, the service days and hours would be more flexible than with a transit agency run demand response service—potentially, rides could be taken 24 hours a day, seven days a week.

[1] This means only program ridership demand would be served.

[2] The following definition of ADA eligible comes from the FTA "Transportation Services for Individuals with Disabilities", (49CFR37§3)

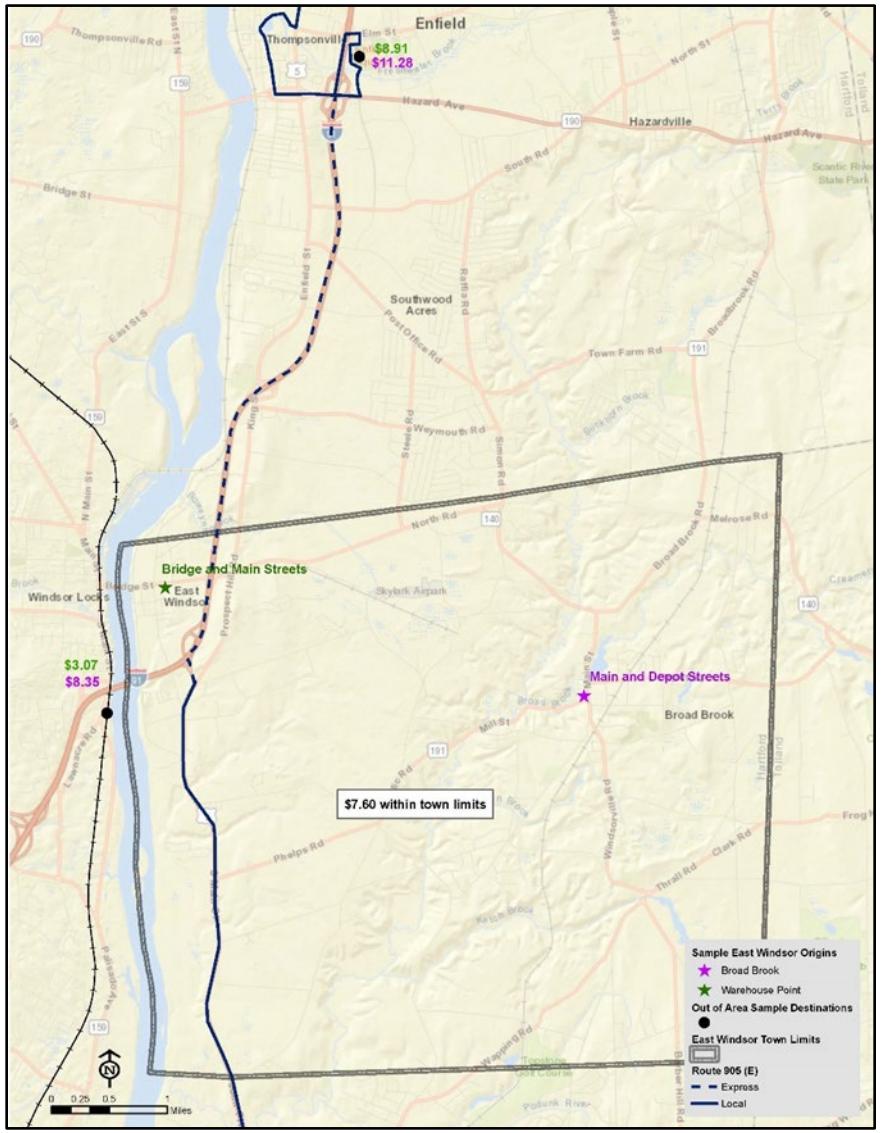
There are some large drawbacks, however. The cost to East Windsor would be higher than operating the transit service described in Alternatives 1 or 3, especially as it may be difficult to meet the equivalent service standard necessary to receive federal operating assistance. An additional issue is that, since most TNCs are considered an exclusive ride service, they are not eligible for FTA operating funds. Another barrier to partnering with TNCs is a lack of transparency from the TNCs. As private companies, TNCs consider their ride information proprietary, making it difficult for transit agencies to evaluate whether these partnerships are effective.

Assumptions for this alternative include:

- Costs shown on Figure 4 are from two sample origins in the population centers of East Windsor quoted for an Uber trip on September 24, 2020.
- The annual operation cost is calculated by the average subsidy ($7.84) multiplied by the total program ridership ($13,000).

Initial Capital Cost: None
Annual Operating Cost: $101,946
Estimated Annual Ridership: 13,000

Figure 4: Transit Alternative 4



2.1.2.2 Transit Infrastructure Improvements

Transit infrastructure improvements are recommended at several locations within the study corridor. Given the local climate and long headways between buses, passenger comfort should be considered at stop locations. For this reason, bus shelters are recommended at several locations along Route 5.

The study team evaluated the surrounding land uses for potential ridership demand and identified suitable locations for stops. In particular, sites with current and expected future employment were identified.

The majority of stop locations would include a solar-powered illuminated shelter, with sidewalk connections to adjacent building uses. Specific detail is provided on a site by site basis in Section 2.3.

Figure 5: Transit Infrastructure Locations

2.2 Bicyclist and Pedestrian Accommodations

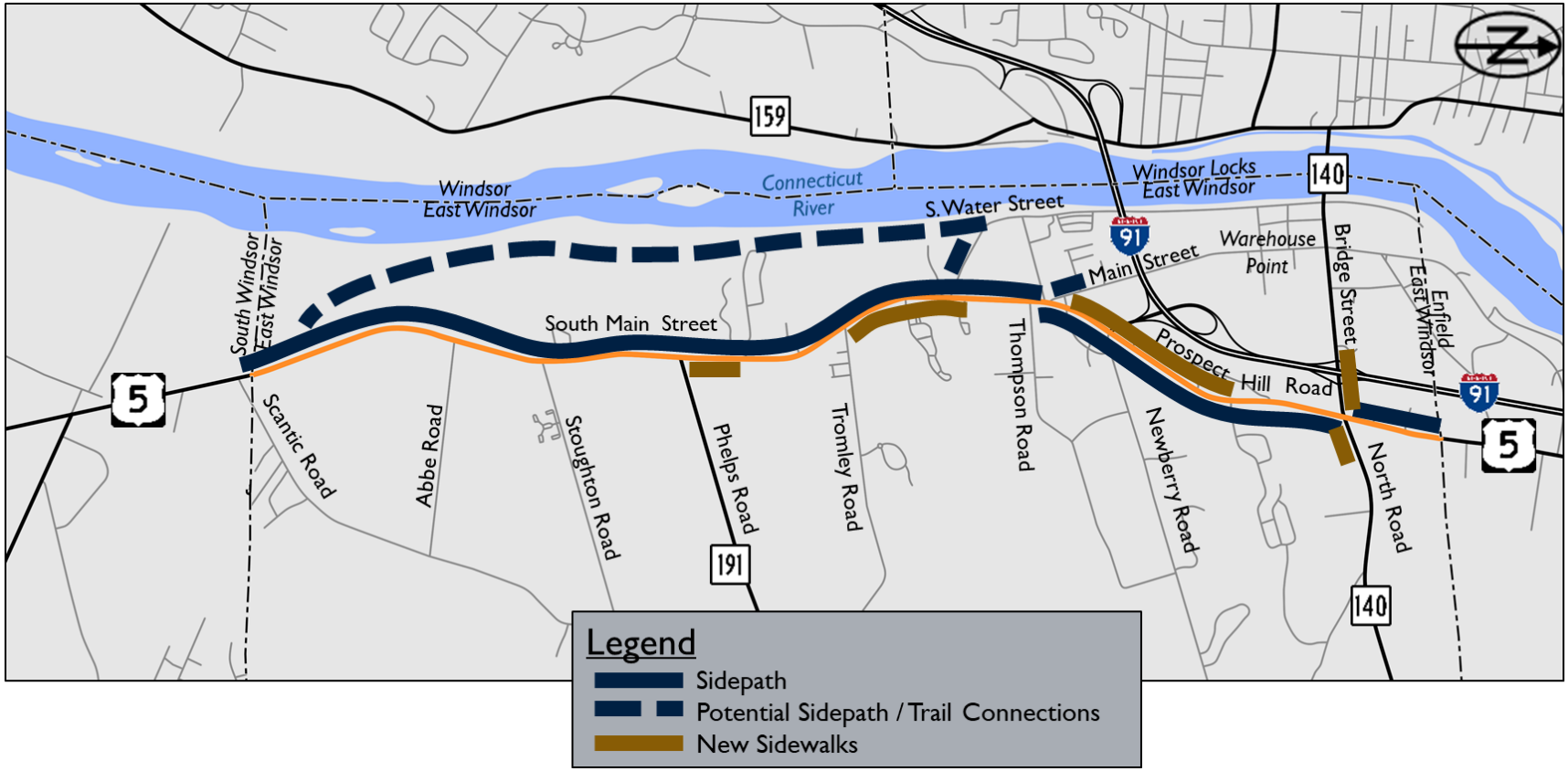
To address the lack of bicyclist and pedestrian facilities throughout the corridor, the study team recommends the implementation of a 10 foot *sidepath* throughout the study corridor. Based upon the traffic volumes and speeds, all but the most experienced cyclists would be uncomfortable using an on-roadway bicycle lane or the roadway shoulder.

> A **sidepath** is a designated path (typically bi-directional), for single use or shared use (i.e. bicyclists and pedestrians allowed) immediately adjacent to and parallel with (but separated from) the roadway. (USDOT)

The sidepath is recommended for the west side of Route 5 for the majority of the corridor. The Town should explore the potential expansion of the trail northerly to Enfield and southerly to South Windsor. Additional sidepath connections are also possible from the Route 5 corridor to Warehouse Point.

In addition to the sidepath, sidewalk connections on the opposite side of the street are recommended to help complete the pedestrian network. These bicyclist and pedestrian recommendations are detailed further in Section 2.3.

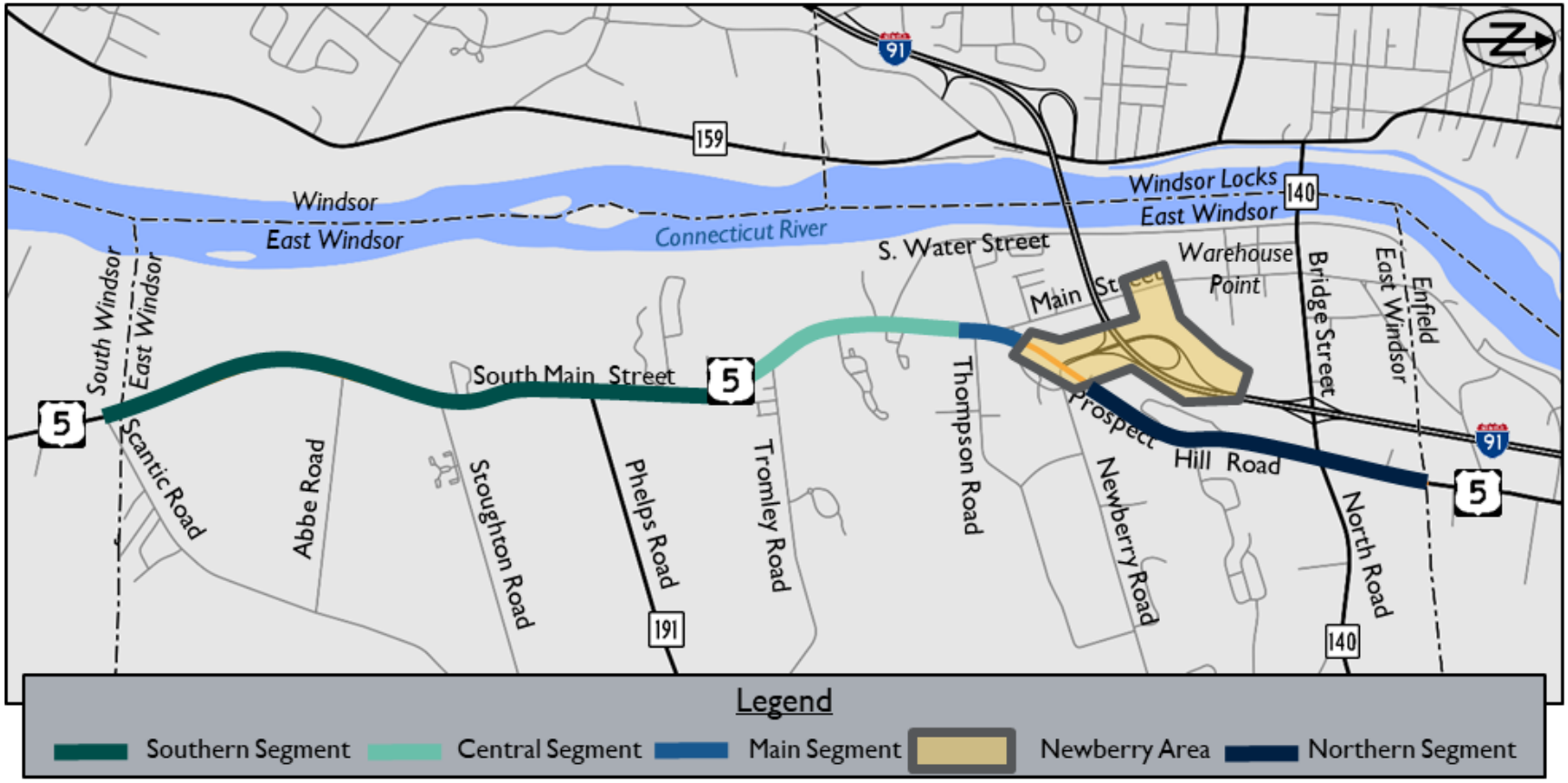
Figure 6: Bicyclist and Pedestrian Recommendations



2.3 Segmental Improvements

The study team subdivided the Route 5 corridor into five segments or areas based on the characteristics of the roadway and the deficiencies identified in the Existing and Future Conditions Assessments. These segments are highlighted in Figure 7, below.

Figure 7: Corridor Subdivision for Alternatives Analysis



2.3.1 Evaluation Categories

The study team identified five evaluation categories to assess the relative performance of the identified alternatives. These categories have been chosen based on the study's vision, goals and objectives, available on the Corridor Vision, Goals and Objectives Statement. The categories are as follows:

- Turn lanes
- Traffic operations
- Queueing
- Transit
- Bike / Ped

The descriptions of the alternatives, beginning with Section 2.3.2, include a description of how and why each alternative addresses the criteria. Each category includes a range of potential results for each alternative. These results range from a filled in upward green arrow as the best possible result, to a hollow upward green arrow, a yellow box indicating a neutral result, to downward facing hollow and solid red arrows. A graphic depiction of the symbols is included in Table 6, right.

Table 6: Evaluation Category Ratings

Rating	Definition
▲	Satisfies the category
△	Partially satisfies the category
■	Neutral
▽	Partially does not satisfy the category
▼	Does not satisfy the category

2.3.2 Northern Segment

The northern segment extends from the study's northern limits at the Enfield town line to the signalized intersection between Route 5 and the commercial driveways serving the Big Y plaza and a commercial development east of Route 5. The northern segment is illustrated in more detail on Figure 8, below. Alternatives developed for the northern segment sought to address the following deficiencies in order to meet the study's vision, goals and objectives:

- Lack of bicyclist and pedestrian facilities along Route 5 and connecting to the Warehouse Point neighborhood
- Lack of transit facilities
- Expected deterioration of traffic operations at the intersection of Route 5 and Route 140, resulting in LOS F during the Base scenario PM peak, LOS E during the Build scenario AM peak and LOS F during the Build scenario PM peak

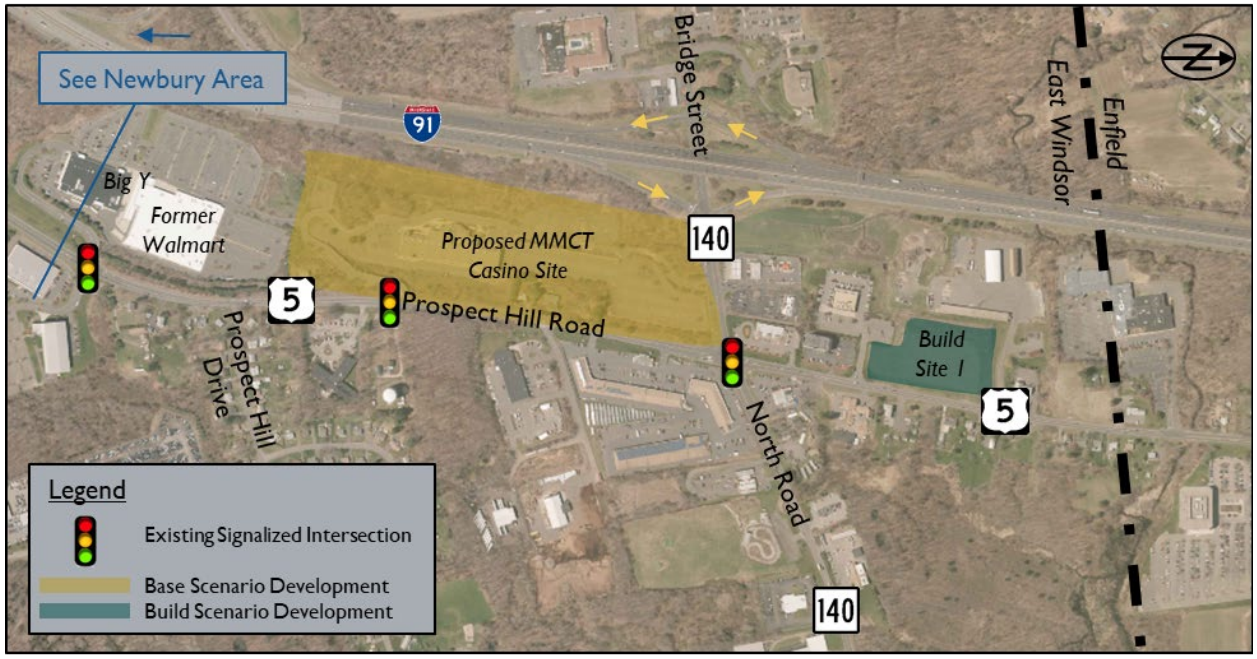
As discussed in Chapter 3, future traffic volumes in this area of the corridor are dependent on significant future development. In particular, the proposed MMCT casino site. While the future of that site is uncertain, there remain a strong desire from the Town to redevelop the site. Based on the uncertainty of the future traffic demand, the study includes an interactive improvement program designed to address existing deficiencies and plan for future growth.

Three alternatives have been developed for the northern section, identified as N-1, N-2 and N-3. They are described in Table 7 below. These alternatives are detailed on the following pages.

Table 7: Northern Segment Alternatives

Alternative	Purpose
N-1	Address existing bicyclist and pedestrian deficiencies by provided a sidepath along Route 5 and pedestrian connections towards Warehouse Point and residential developments on Route 140.
N-2	Address expected traffic operational deterioration at the Route 140 intersection under the Base scenario by providing additional intersection capacity. Provide new signalized intersection at proposed MMCT casino access drive.
N-3	Address expected traffic operational deterioration at the Route 140 intersection under the Base scenario by providing additional intersection capacity.

Figure 8: Northern Segment



2.3.2.1 Northern Alternative 1 (N-1)

Alternative N-1 would address the existing deficiencies along the northern segment by installing a multi-use sidepath along Route 5 and providing key pedestrian connections to destinations along Route 140 to the east and west. N-1 is depicted in Figure 9, below.

Key Features:

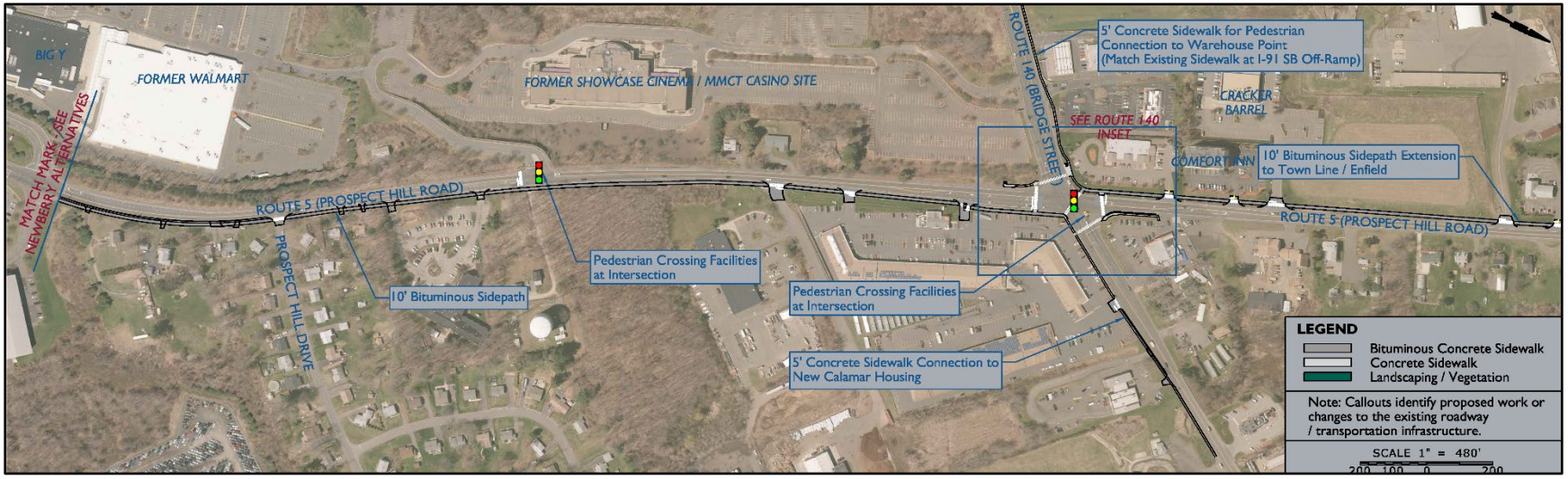
- Multi-use sidepath along west side of Route 5 extending northerly from Route 140 to the Enfield Town Line
- Multi-use sidepath along east side of Route 5 extending southerly from Route 140
- Sidewalk connection from Route 140 westerly towards Warehouse Point and the existing sidewalks west of I-91
- Sidewalk connection from Route 140 easterly along Route 140 to connect with recently constructed housing
- Pedestrian and cyclist crossings at signalized intersections and driveways

Table 8: Evaluation Criteria for Alternative N-1

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	■	Does not address future scenario traffic operational deficiencies
Queuing	▲	No queueing issues along this segment of Route 5
Transit	▲	New bus stops and shelters for development node around Route 140
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

The estimated cost to implement this alternative is $1,850,000. See Chapter 3 for information on how this alternative is recommended as part of the study's implementation plan.

Figure 9: Northern Alternative 1 (N-1)



Traffic Operations (N-1)

Traffic operational analysis was conducted for Alternative N-1 using the Existing, Base and Build traffic forecasts. As intersection capacity improvements are not included as part of this alternative, the resulting traffic operations would be similar to the results presented in the existing and future conditions assessments.

To accommodate expected pedestrian patterns at the Route 140 intersection an exclusive pedestrian phase is recommended and has been modeled as part of the analysis as presented below.

Traffic operations for this alternative are expected to deteriorate under the Base forecast and further under the Build forecast. Should the development scenarios identified in those forecasts advance, additional capacity at the Route 140 intersection would be required.

Table 9: Northern Alternative 1 (N-1) Traffic Operations

Intersection	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay (sec / veh)	Max. V/C Ratio	LOS	Delay (sec / veh)	Max V/C Ratio
Existing (2017) Traffic Volumes						
Route 5 (Prospect Hill Road) at Route 140 (North Road / Bridge Street)	D	44.9	1.09	D	44.9	0.85
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Commercial Driveway	A	2.7	0.19	A	3.7	0.35
Base (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Route 140 (North Road / Bridge Street)	F	114.0	1.70	F	96.7	1.38
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Commercial Driveway	C	23.5	1.14	B	20.0	0.86
Build (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Route 140 (North Road / Bridge Street)	F	143.6	1.83	F	132.5	1.58
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Commercial Driveway	C	26.1	1.14	C	24.4	0.88

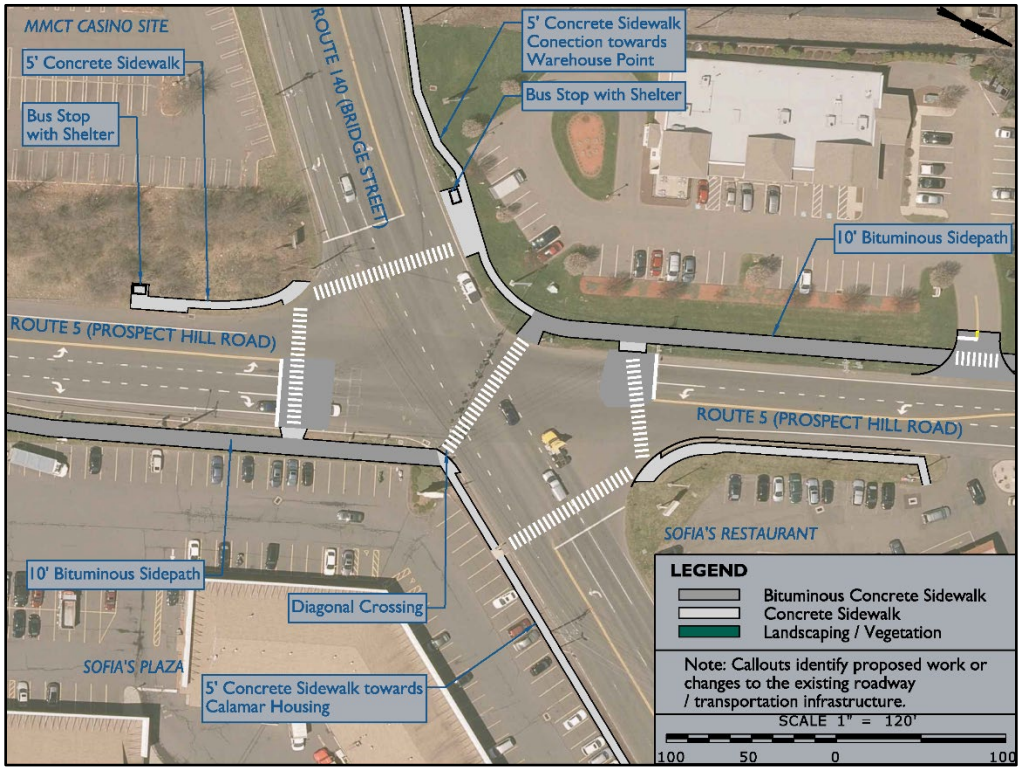
Route 140 Intersection (N-1)

At the Route 140 intersection, this alternative would provide bicyclist, pedestrian and transit facilities to address existing deficiencies. The proposed multi-use sidepath would transition from the east side of Route 5 south of the intersection to the west side north of the intersection. New sidewalks are recommended to connect to local destinations and proposed transit stops.

Due to the skew of the intersection, an exclusive pedestrian phase is recommended to allow for diagonal crossing. This adjustment to the signal operation is accounted for in the previously presented traffic analysis. This would allow sidepath users to cross diagonally rather than cross two legs of the intersection to continue on the sidepath.

Two transit stops are included as part of this alternative. Based on the previously discussed extension of the CT*transit* Route 96, stops are proposed near the Route 140 intersection to serve the surrounding development node. Northbound buses would turn left from Route 5 to Route 140 and stop on shortly after the intersection on the north side of Route 140. There are two lanes on this location of Route 140, allowing vehicles to bypass a stopped bus. Southbound buses would turn right from Route 140 to Route 5 and stop shortly after the intersection. The existing configuration of Route 5 features a wide shoulder that would serve as a *de facto* bus bay.

Figure 10: North Alternative 1 (N-1) Route 140 Inset



2.3.2.2 *Northern Alternative 2 (N-2)*

Alternative N-2 would address the same deficiencies as Northern Alternative 1 (N-1) and also address the traffic operational deficiencies expected to occur under the 2040 Base traffic forecast. Alternative N-2 is depicted in Figure 11, below. This alternative would be considered as part of an iterative approach to maintaining satisfactory traffic operations at the intersection of Route 5 and Route 140. It should be considered if the former Showcase Cinema / MMCT casino site is developed at a similar scale to that shown in the Base development scenario.

Key Features:

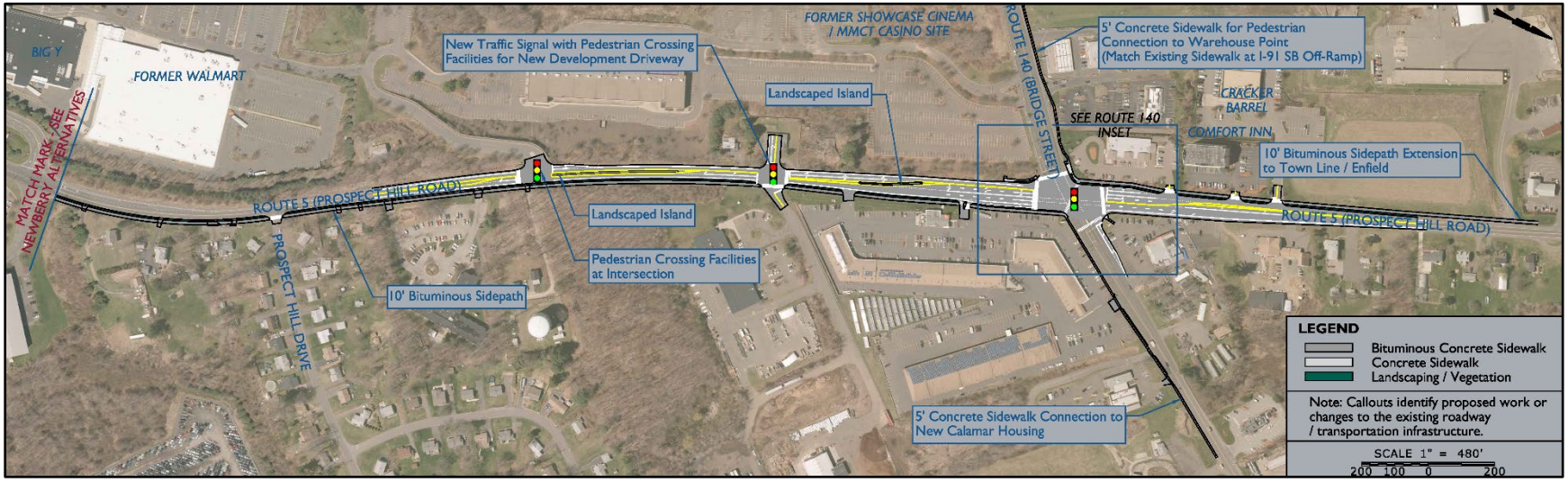
- Second northbound left-turn lane and southbound right-turn lane at Route 140 intersection
- New signalized intersection at the MMCT casino site
- Landscaped islands at two locations
- Bicyclist / pedestrian / transit amenities consistent with Alternative N-1

Table 10: Evaluation Criteria for Alternative N-2

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	△	Does not address future scenario traffic operational deficiencies
Queuing	▲	No queueing issues along this segment of Route 5
Transit	▲	New bus stops and shelters for development node around Route 140
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

The estimated construction cost to implement this alternative is $5,200,000. See Chapter 3 for information on how this alternative is recommended as part of the study's implementation plan.

Figure 11: Northern Alternative 2 (N-2)



Traffic Operations (N-2)

Traffic operational analysis was conducted for Alternative N-2 using the Existing, Base and Build traffic forecasts. The additional capacity provided at the Route 140 intersection enables this alternative to satisfy the study's traffic operational goals under the Base traffic forecast. However, the higher traffic volumes of the Build forecast would still lead to delays at the Route 140 intersection. Improvements to the Route 140 intersection should be seen as iterative and dependent on specific developments moving forward.

For this alternative, the redevelopment of the former Showcase Cinema site / MMCT casino site as a *Major Traffic Generator* would prompt the implementation of this alternative. While the casino project had been initially approved by OSTA, the project has now been suspended due to initiatives to implement online gambling. The study team expects that the Town of East Windsor will continue to seek redevelopment of this site as a major traffic generator.

Major traffic generators are developments of more that 100,000 SF of floor space or 200 or more parking spaces. They are regulated by the Office of the State Traffic Administration (OSTA).

To accommodate expected pedestrian patterns at the Route 140 intersection an exclusive pedestrian phase is recommended and has been modeled as part of the analysis as presented below.

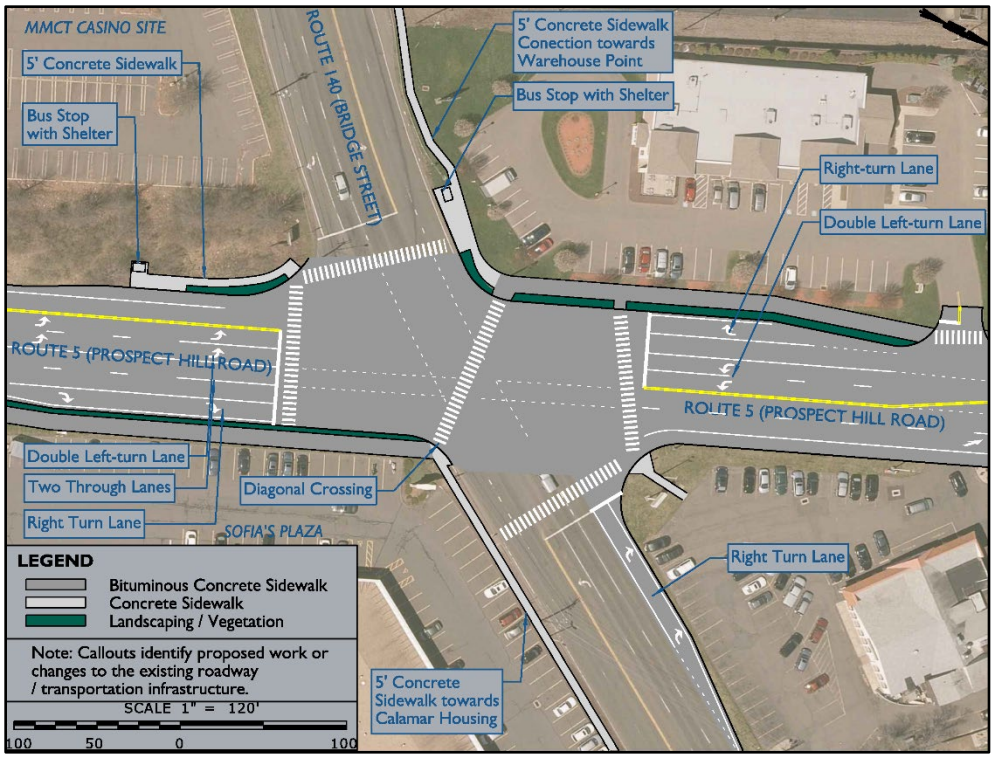
Table 11: Northern Alternative 2 (N-2) Traffic Operations

Intersection	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay (sec / veh)	Max. V/C Ratio	LOS	Delay (sec / veh)	Max V/C Ratio
Existing (2017) Traffic Volumes						
Route 5 (Prospect Hill Road) at Route 140 (North Road / Bridge Street)	D	39.5	0.86	D	37.1	0.79
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Eversource Driveway	A	9.4	0.56	B	10.3	0.69
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Commercial Driveway	A	3.5	0.2	A	6.9	0.45
Base (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Route 140 (North Road / Bridge Street)	D	39.5	0.86	D	37.1	0.79
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Eversource Driveway	A	9.4	0.56	B	10.3	0.69
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Commercial Driveway	A	3.5	0.2	A	6.9	0.45
Build (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Route 140 (North Road / Bridge Street)	D	39.5	0.86	D	37.1	0.79
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Eversource Driveway	A	9.4	0.56	B	10.3	0.69
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Commercial Driveway	A	3.5	0.2	A	6.9	0.45

Route 140 Intersection (N-2)

At the Route 140 intersection, this alternative would provide a new, second, left-turn lane on northbound Route 5 and a new right-turn lane on southbound Route 5, as illustrated in Figure 12, right. It would also maintain the bicyclist, pedestrian and transit amenities featured in Alternative N-1, covered in Section 2.3.2.1.

Figure 12: North Alternative 2 (N-2) Route 140 Inset



2.3.2.3 Northern Alternative 3 (N-3)

Alternative N-3 would address the same deficiencies as Northern Alternative 1 (N-1) and Northern Alternative 2 (N-2) while also addressing the traffic operational deficiencies expected to occur under the 2040 Build traffic forecast. A second northbound through lane would be provided at the Route 140 intersection to satisfy the study's goals for traffic operations. N-3 is depicted in Figure 13, below.

Key Features:

- Second northbound through lane at Route 140 intersection
- Traffic operational improvements and Bicyclist / pedestrian / transit amenities consistent with Alternatives N-1 and N-2

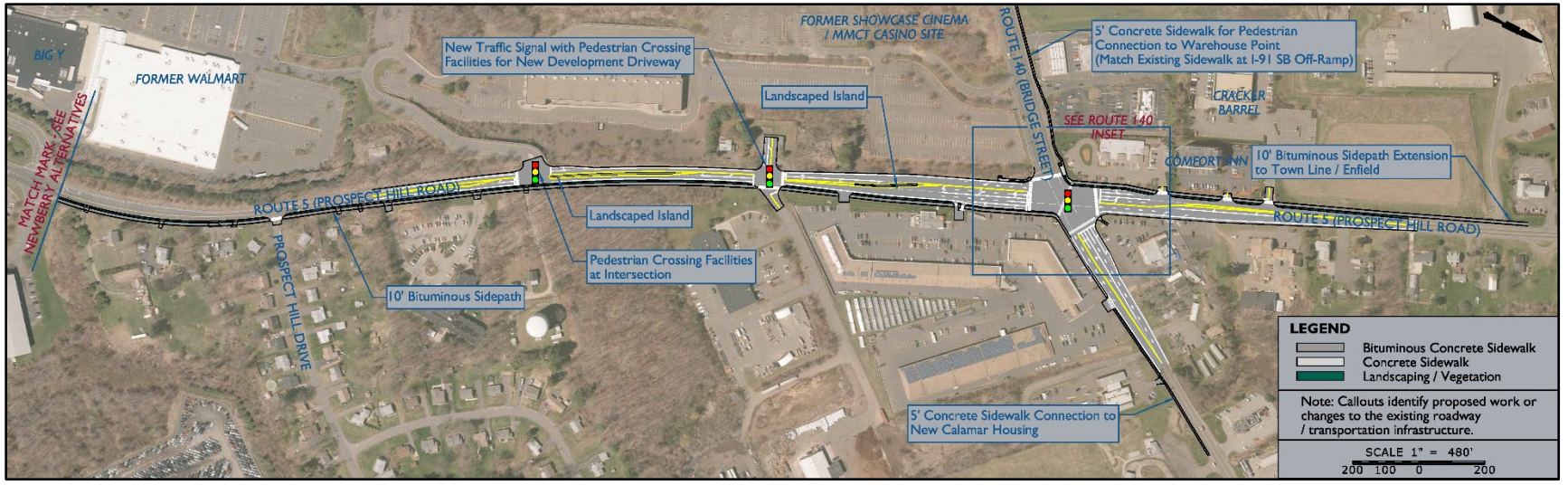
This alternative would be considered as part of an iterative approach to maintaining satisfactory traffic operations at the intersection of Route 5 and Route 140. It should be considered if the former Showcase Cinema / MMCT casino site and the site north of the Cracker Barrel are developed as shown in the Base and Build development scenarios.

Table 12: Evaluation Criteria for Alternative N-3

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	▲	Meets operational goals for all traffic scenarios
Queuing	▲	No queueing issues along this segment of Route 5
Transit	▲	New bus stops and shelters for development node around Route 140
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

The estimated cost to implement this alternative is $2,300,000. See Chapter 3 for information on how this alternative is recommended as part of the study's implementation plan.

Figure 13: Northern Alternative 3 (N-3)



Traffic Operations (N-3)

Traffic operational analysis was conducted for Alternative N-3 using the Existing, Base and Build traffic forecasts. The additional capacity provided at the Route 140 intersection enables this alternative to satisfy the study's traffic operational goals under the Base and Build traffic forecasts.. Improvements to the Route 140 intersection should be seen as iterative and dependent on specific developments moving forward.

For this alternative, the redevelopment of the former Showcase Cinema site / MMCT casino site as a Major Traffic Generator and the addition of a Major Traffic Generator at Build Site 1 would prompt the implementation of this alternative.

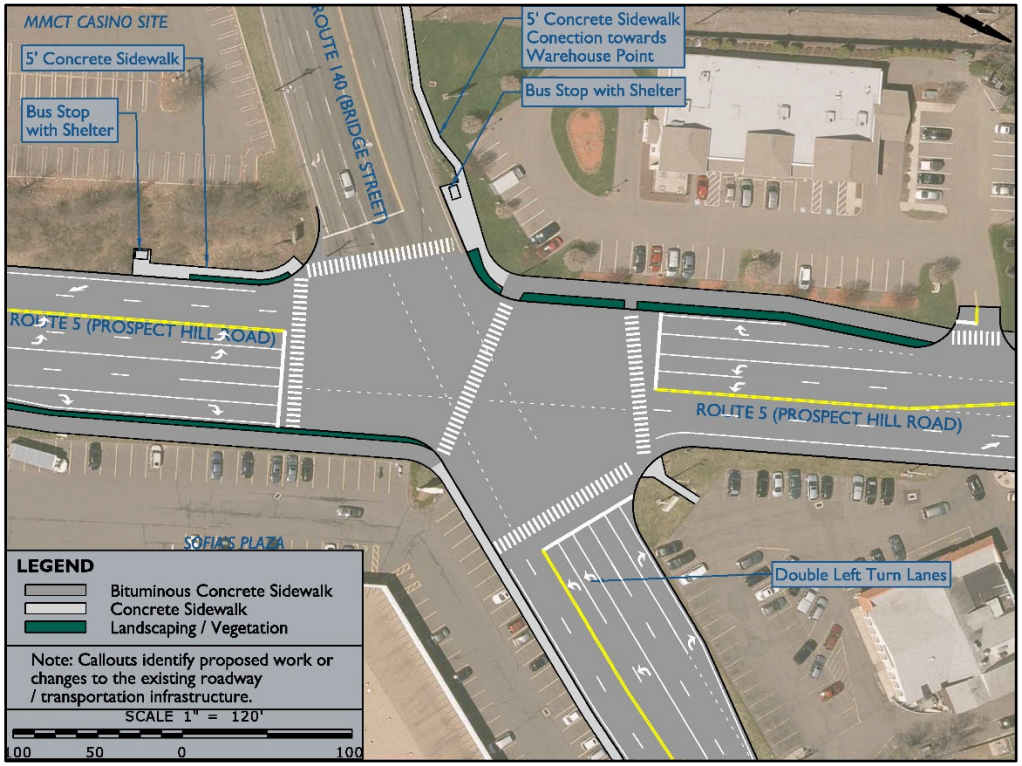
Table 13: Northern Alternative 3 (N-3) Traffic Operations

Intersection	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay (sec / veh)	Max. V/C Ratio	LOS	Delay (sec / veh)	Max V/C Ratio
Existing (2017) Traffic Volumes						
Route 5 (Prospect Hill Road) at Route 140 (North Road / Bridge Street)	D	39.5	0.86	D	37.1	0.79
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Eversource Driveway	A	9.4	0.56	B	10.3	0.69
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Commercial Driveway	A	3.5	0.2	A	6.9	0.45
Base (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Route 140 (North Road / Bridge Street)	D	39.5	0.86	D	37.1	0.79
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Eversource Driveway	A	9.4	0.56	B	10.3	0.69
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Commercial Driveway	A	3.5	0.2	A	6.9	0.45
Build (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Route 140 (North Road / Bridge Street)	D	39.5	0.86	D	37.1	0.79
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Eversource Driveway	A	9.4	0.56	B	10.3	0.69
Route 5 (Prospect Hill Road) at MMCT Casino Driveway / Commercial Driveway	A	3.5	0.2	A	6.9	0.45

Route 140 Intersection (N-3)

At the Route 140 intersection, this alternative would provide an additional northbound through lane on Route 5. This would convert the existing northbound right-turn lane to a through-right. Route 5 north of the intersection would be widened to accommodate the second through lane, as illustrated in Figure 14, right. Shortly after the intersection the second lane would be dropped. It would also maintain the traffic operational improvements and bicyclist, pedestrian and transit amenities featured in Alternative N-1 and Alternative N-2, covered in Section 2.3.2.1 and 2.3.2.2.

Figure 14: North Alternative 3 (N-3) Route 140 Inset



2.3.3 Newberry Road Area

The Newberry Road area consists of Route 5 between Greenwoods Lane and the Big Y / commercial driveway. There are three signalized intersections along Route 5, at the Big Y driveway, Newberry Road and the I-91 Exit 44 On- and Off-ramps and at the Walmart / commercial plaza driveway. One base scenario development is included in this area, the Crossroads Cathedral. A build scenario development is also included, consisting of an expansion of the existing commercial plaza opposite from Walmart. Alternatives developed for the Newberry Road area sought to address the following deficiencies in order to meet the study's vision, goals and objectives:

- Existing traffic operational deficiencies at the intersection with Newberry Road and the I-91 on- and off-ramps, with LOS E during both the AM and PM peak periods
- Queues from the merge between the two I-91 off-ramps that extend back towards the I-91 mainline
- Lack of bicyclist and pedestrian facilities along Route 5
- Lack of transit facilities
- Expected deterioration of traffic operations at the intersection of Route 5 and Route 140, resulting in LOS F during the Base scenario PM peak and LOS F during the Build scenario PM peak

Five alternatives were developed for the Newberry Road area, identified as New-1, New-2, New-3, New-4 and New-5. They are described in, Table 14, following. These alternatives are detailed on the following pages.

Figure 15: Newberry Road

Table 14: Newberry Area Alternatives

Alternative	Purpose
New-1	Reconfigure lane configuration on the I-91 off-ramp approach to the Newberry Road signalized intersection. Address existing bicyclist, pedestrian and transit deficiencies by providing a sidepath along Route 5, with sidewalks providing key connections to developments along with transit stops.
New-2	Install a pre-signal at the point the two I-91 off-ramps merge prior to the signalized intersection with Newberry Road. Based on initial feedback this alternative is not recommended for further evaluation.
New-3	Realign I-91 southbound off-ramp to merge from the right of the northbound off-ramp. Based on initial feedback, this alternative is recommended for further analysis as part of a study of the interchange and adjacent segments of I-91.
New-4	Extend Newberry Road to Main Street with a reconfigured interchange. Based on initial feedback, this alternative is recommended for further analysis as part of a study of the interchange and adjacent segments of I-91.
New-5	Provide capacity improvements at the signalized intersection with Newberry Road to address deteriorating operations in the future base and build scenarios.

2.3.3.1 Newberry Alternative 1 (New-1)

Alternative New-1 would address the existing deficiencies in the Newberry Road area by reconfiguring the I-91 off-ramp approach to the Route 5 / Newberry Road intersection, providing a multi-use sidepath along Route 5, providing key pedestrian connections to destinations along Route 5 and installing two bus shelters.

Key Features:

- Provide second eastbound right turn lane at Newberry Road / I-91 ramps intersection
- Lengthen storage for northbound left turns at Newberry Road / I-91 ramps interaction
- Multi-use sidepath along east side of Route 5
- Sidewalk on the west of Route 5 from the Big Y driveway southerly
- New bus shelters near the Walmart driveway

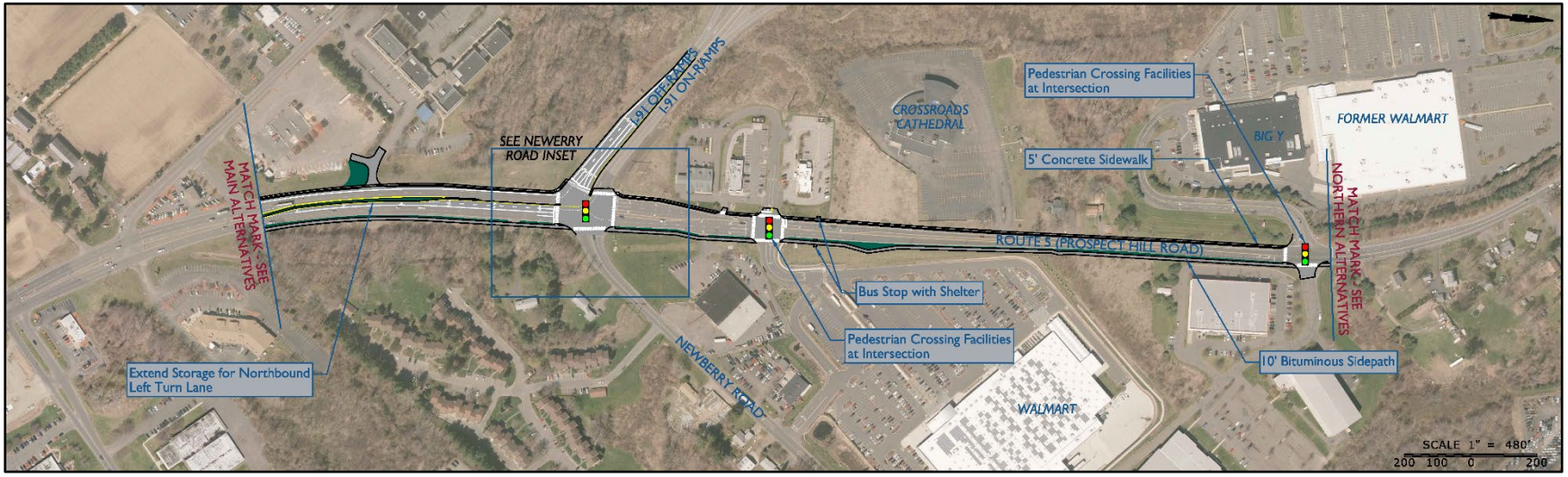
New bus shelters are recommended near the Walmart to enhance the transit experience for shoppers and employees.

Table 15: Evaluation Criteria for Alternative New-1

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	■	Does not address future scenario traffic operational deficiencies
Queuing	■	Does not address queuing for off-ramp merge point back towards the I-91 mainline
Transit	▲	New bus stops and shelters for development around Walmart
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

The estimated cost for this alternative is $2,000,000. See Chapter 3 for information on how this alternative is recommended as part of the study's implementation plan.

Figure 16: Newberry Alternative 1 (New-1)



Traffic Operations (New-1)

Traffic operational analysis was conducted for Alternative New-1 using the Existing, Base and Build traffic forecasts. The addition of the second right turn lane would help improve traffic operations under existing conditions both in terms of delay and queueing. As the eastbound right-turn is the highest volume movement in both the AM and PM peak periods, providing the additional capacity to this movement both reduces queue lengths and overall delay.

Operations at the I-91 ramps / Newberry Road intersection are expected to deteriorate under the Build scenario volumes. In the PM peak users would experience LOS E with a volume to capacity ratio of 1.20 for the northbound left turn movement. Newberry Alternative 5 (New-5) has been developed to address the deficiencies under the Build scenario.

Intersection operations at the other two signalized intersections within this segment are expected to remain acceptable under each of the evaluated scenarios.

Table 16: Newberry Alternative 1 (New-1) Traffic Operations

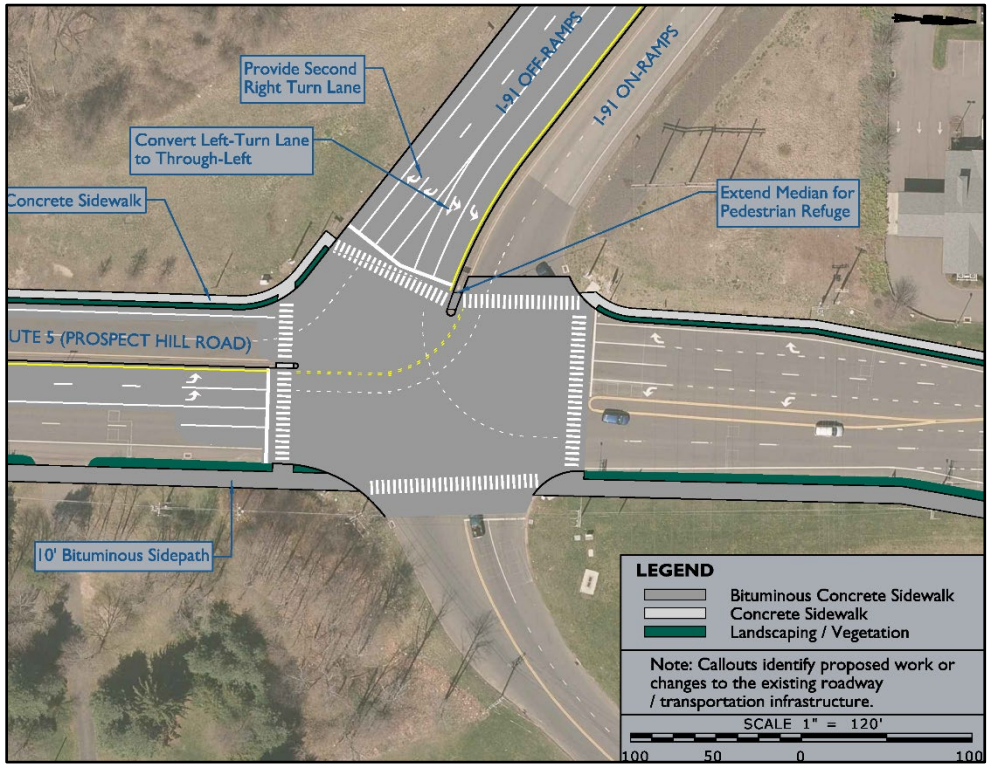
Intersection	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay (sec / veh)	Max. V/C Ratio	LOS	Delay (sec / veh)	Max V/C Ratio
Existing (2017) Traffic Volumes						
Route 5 (Prospect Hill Road) at Big Y / Ethos Energy Driveways	A	4.6	0.21	B	11.1	0.63
Route 5 (Prospect Hill Road) at Walmart / Commercial Driveways	A	7.5	0.42	B	17.5	0.71
Route 5 (Prospect Hill Road) at I-91 Ramps / Newberry Road	D	38.5	1.12	D	40.8	0.92
Base (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Big Y / Ethos Energy Driveways	A	3.4	0.44	B	10.6	0.58
Route 5 (Prospect Hill Road) at Walmart / Commercial Driveways	A	6.4	0.49	B	15.0	0.77
Route 5 (Prospect Hill Road) at I-91 Ramps / Newberry Road	D	36.9	1.08	D	53.1	0.98
Build (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Big Y / Ethos Energy Driveways	B	12.2	0.71	A	3.8	0.50
Route 5 (Prospect Hill Road) at Walmart / Commercial Driveways	B	19.4	0.88	A	7.9	0.52
Route 5 (Prospect Hill Road) at I-91 Ramps / Newberry Road	D	36.2	1.12	E	79.4	1.20

Newberry Road Intersection

At the Newberry Road intersection, this alternative would reconfigure the eastbound approach to provide two right-turn lanes and convert the second existing double left-turn lane to a through-left. In addition bicyclist, and pedestrian facilities would be provided to address existing deficiencies. The proposed multi-use sidepath is recommended on the east side of Route 5 to avoid conflicts with the high volume of eastbound right turning traffic from the I-91 off-ramps.

Sidewalks are recommended on the west side of Route 5 to provide connections between developments on that side of the road. Two of the dividing islands at the intersection are recommended to be extended to help provide pedestrian refuge and reduce the distance pedestrians need to cross at one time.

Figure 17: Newberry Alternative 1 (New-1) Newberry Road Inset



2.3.3.2 Newberry Alternative 2 (New-2)

Alternative New-2 would attempt to address the existing traffic operational deficiencies at the Newberry Road intersection by installing a *presignal* to control the merge between the I-91 off-ramps. Based on preliminary analysis and discussions with the advisory committee it was decided to not further pursue this alternative for the following reasons:

> A **presignal** is a signalized intersection that is placed in advance of an intersection. In this instance it would control the merging of two parallel streams of traffic from the I-91 northbound and southbound off-ramps.

- Despite acceptable delays, it is possible that queuing distance is limited on the northbound off-ramp and queues could extend back to mainline I-91
- Space is limited to provide advance signing of the lane configuration at the presignal, which could lead to additional merging congestion and sideswipe collisions as drivers compete for space in their desired lane
- Queues would extend further down the northbound off-ramp than they currently do under existing conditions, possible leading to increases in the number of rear end collisions, with some potentially at high speed.

Figure 18: Newberry Alternative 2 (New-2)

Table 17: Evaluation Criteria for Newberry Alternative 2 (New-2)

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	■	Operations would deteriorate under future Build scenario volumes
Queuing	▼	Could exacerbate queueing issues on the I-91 northbound off-ramp
Transit	▲	New bus stops and shelters for development around Walmart
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

2.3.3.3 Newberry Alternative 3 (New-3)

Alternative New-3 would address the existing queuing issues between the northbound and southbound off-ramps by realigning the southbound off-ramp so that it merged from the right of the northbound off-ramp. A review of travel patterns illustrated that a higher number and percentage of southbound vehicles turn right at the intersection with Route 5 as opposed to northbound vehicles.

After coordination with CTDOT, it was determined that this alternative should be included in a broader assessment of the operations of I-91 along this segment. Therefore, this alternative is recommended for further evaluation outside this study.

Table 18: Evaluation Criteria for Alternative New-3

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	■	Operations would deteriorate under future Build scenario volumes without capacity improvements at the Newberry Road intersection
Queuing	△	Would improve but not eliminate merging operations between the northbound and southbound off-ramps
Transit	▲	New bus stops and shelters for development around Walmart
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

Figure 19: Newberry Alternative 3 (New-3)

2.3.3.4 Newberry Alternative 4 (New-4)

Alternative New-4 would address the existing queuing issues between the northbound and southbound off-ramps and operational deficiencies at the Route 5 / Newberry Road signalized intersection by reconfiguring the interchange with I-91 into a more traditional interchange. Newberry Road would be extended across I-91 to Main Street and two signalized intersections would be created with the northbound and southbound ramps.

After coordination with CTDOT, it was determined that this alternative should be included in a broader assessment of the operations of I-91 along this segment. Therefore, this alternative is recommended for further evaluation outside this study.

Table 19: Evaluation Criteria for Alternative New-4

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	▲	Operations would exceed metrics for all traffic scenarios
Queuing	△	Would eliminate merging between southbound and northbound off-ramp. Geometry would limit the storage available for the northbound off-ramp
Transit	▲	New bus stops and shelters for development around Walmart
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

Figure 20: Newberry Alternative 4 (New-4)

2.3.3.5 Newberry Alternative 5 (New-5)

Alternative New-5 would address the traffic operational deficiencies expected under the future Build scenario by providing additional capacity at the Newberry Road / I-91 ramps intersection. Bicyclist, pedestrian and transit improvements would be maintained from Alternative New-5.

Key Features:

- Second eastbound through lane with receiving lane on Newberry Road

Improvements consistent with Alternative New1:

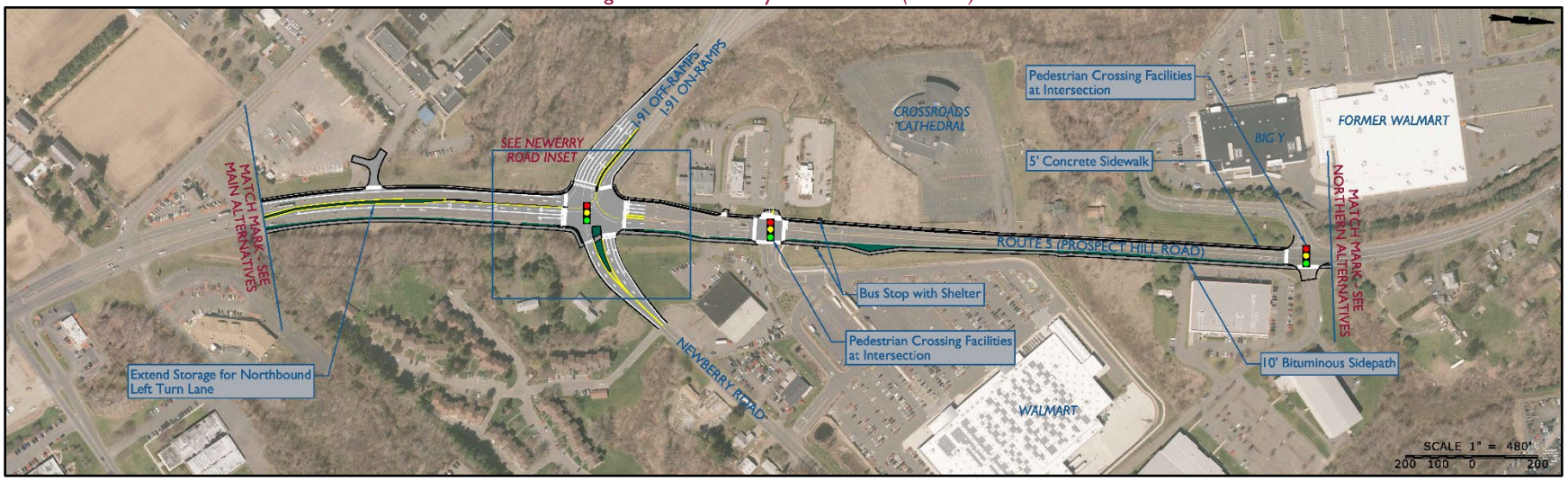
- Lengthen storage for northbound left turns at Newberry Road / I-91 ramps interaction
- Multi-use sidepath along east side of Route 5
- Sidewalk on the west of Route 5 from the Big Y driveway southerly
- New bus shelters near the Walmart driveway

Table 20: Evaluation Criteria for Alternative New-5

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	▲	Operations would exceed metrics for all traffic scenarios
Queuing	■	No change to merge between off-ramps, although additional storage would help minimize queues generated by the traffic signal
Transit	▲	New bus stops and shelters for development around Walmart
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

The estimated cost for this alternatives is $1,200,000. This assumes that improvements initially recommended under Alternative New-1 have previously been constructed. See Chapter 3 for information on how this alternative is recommended as part of the study's implementation plan.

Figure 21: Newberry Alternative 5 (New-5)



Traffic Operations (New-5)

Traffic operational analysis was conducted for Alternative New-5 using the Existing, Base and Build traffic forecasts. The addition of the second eastbound through lane alleviate delay sufficiently to allow intersection to meet the criteria for traffic operations, LOS D or better.

Intersection operations at the other two signalized intersection within the segment are expected to remain acceptable under each of the evaluated scenarios.

Table 21: Newberry Alternative 5 (New-5) Traffic Operations

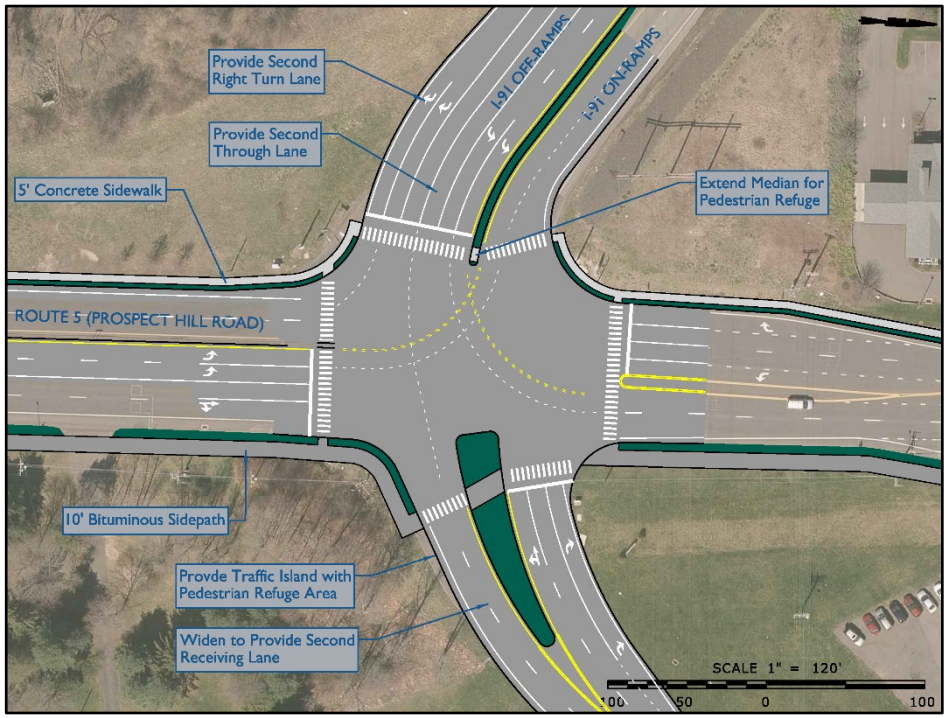
Intersection	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay (sec / veh)	Max. V/C Ratio	LOS	Delay (sec / veh)	Max V/C Ratio
Existing (2017) Traffic Volumes						
Route 5 (Prospect Hill Road) at Big Y / Ethos Energy Driveways	A	4.8	0.23	B	11.0	0.62
Route 5 (Prospect Hill Road) at Walmart / Commercial Driveways	A	7.3	0.38	B	16.8	0.71
Route 5 (Prospect Hill Road) at I-91 Ramps / Newberry Road	C	28.1	0.79	C	29.1	0.79
Base (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Big Y / Ethos Energy Driveways	A	3.8	0.46	A	8.2	0.56
Route 5 (Prospect Hill Road) at Walmart / Commercial Driveways	A	5.4	0.47	B	16.9	0.78
Route 5 (Prospect Hill Road) at I-91 Ramps / Newberry Road	C	29.4	0.85	D	39.3	0.88
Build (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Big Y / Ethos Energy Driveways	A	4.1	0.52	B	11.8	0.71
Route 5 (Prospect Hill Road) at Walmart / Commercial Driveways	A	5.4	0.54	B	19.7	0.88
Route 5 (Prospect Hill Road) at I-91 Ramps / Newberry Road	C	34.1	0.88	D	47.1	0.94

Newberry Road Intersection (New-5)

At the Newberry Road intersection, this alternative would add capacity to the eastbound and westbound approaches. On the west approach, the new capacity would be used as a second eastbound through lane, while also providing a second eastbound left-turn lane.

The east approach would be widened to include a second eastbound receiving lane, and an additional westbound lane, providing a second through lane. A refuge island would be provided to reduce the pedestrian crossing distance. Bicyclist, pedestrian and transit recommendations would be consistent with Alternative New-1.

Figure 22: Newberry Alternative 5 (New-5) Newberry Road Insert



2.3.4 Main / Thompson Segment

The Main / Thompson segment extends from the southern limits of the Newberry area southerly through the intersection with Thompson Road. It includes two signalized intersections, at Main Street and Thompson Road. The Main segment is illustrated on Figure 23, below. Alternatives developed for the Main segment sought to address the following deficiencies in order to meet the study's vision, goals and objectives:

- Lack of bicyclist and pedestrian facilities along Route 5 and connecting north along Main Street towards the Warehouse Point neighborhood
- Intersection skew angle at Main Street, reduced distance between the Thompson Road and Main Street signalized intersection contributes to decreased operational performance.

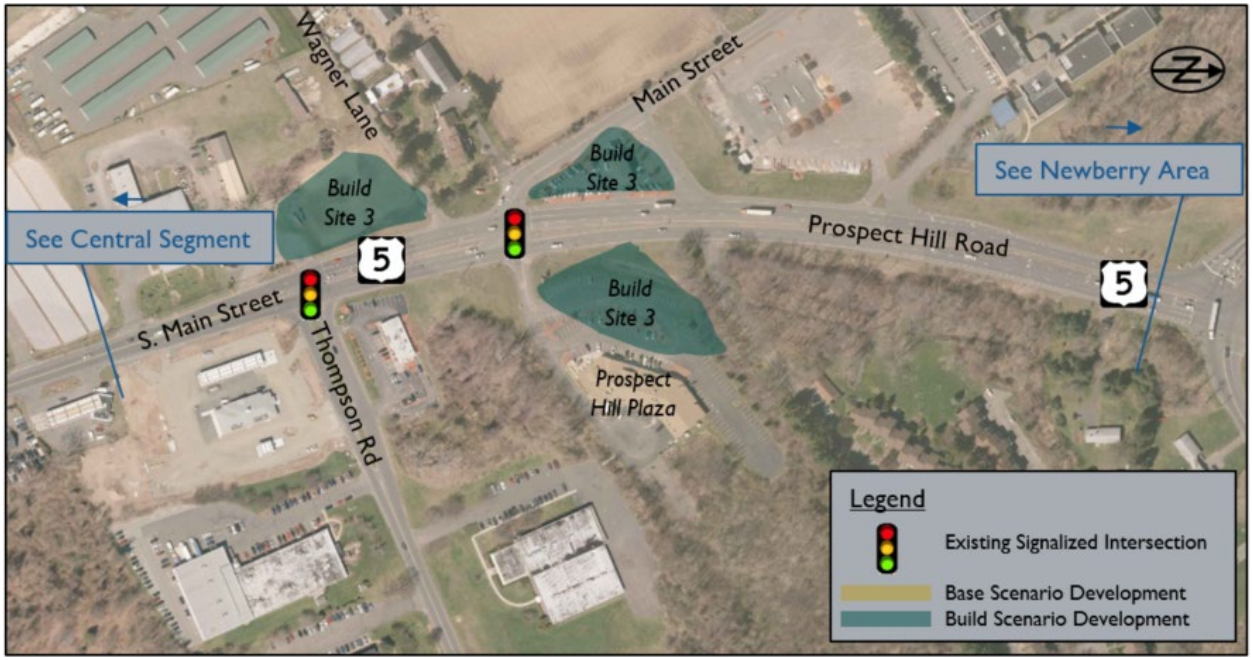
The segment includes Build Site 3, which incorporates infill development at three separate sites around the segment.

Two alternates were developed for the Main / Thompson segment, identified as Main-1 and Main-2. They are described in Table 22. These alternatives are detailed on the following pages.

Table 22: Main / Thompson Segment Alternatives

Alternative	Purpose
Main-1	Address bicyclist and pedestrian deficiencies
Main-2	Realign Main Street to reduce intersection skew, improving traffic operations and safety, incorporate bicyclist and pedestrian improvements recommended in Alterernative Main-1

Figure 23: Main / Thompson Segment



2.3.4.1 Main / Thompson Alternative 1 (Main-1)

Alternative Main-1 would address the existing bicyclist and pedestrian deficiencies in the Main / Thompson segment by providing new sidewalks and sidepaths along with crossing infrastructure at signalized intersections.

Key Features:

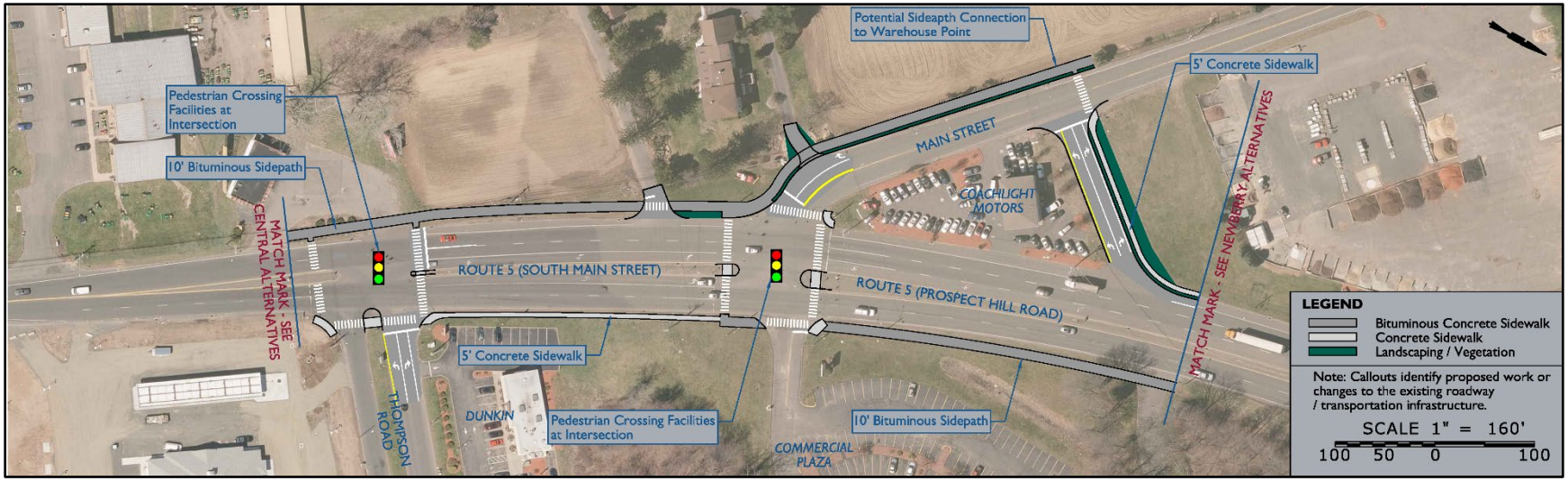
- Provide continuous sidepath, transitioning from east to west side of Route 5 at Main Street
- Sidewalk connection on west side of Route 5 from Main Street extending to the north
- Sidewalk connecting commercial plaza opposite Main Street with Thompson Road
- Reduce width of southbound connection between Route 5 and Main Street
- Provide for potential sidepath connection north to Warehouse Point along Main Street

Table 23: Evaluation Criteria for Alternative Main-1

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	△	Operations would exceed metrics for all traffic scenarios, would not address intersection skew
Queuing	■	No improvement to distance between Main Street and Thompson Road intersection
Transit	■	No bus shelters recommended for this segment
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

The estimated cost for this alternative is $750,000. See Chapter 3 for information on how this alternative is recommended as part of the study's implementation plan.

Figure 24: Main Alternative 1 (Main-1)



Traffic Operations (Main-1)

Traffic operational analysis was conducted for Alternative Main-1 using the Existing, Base and Build traffic forecasts. The intersections within this segment are expected to operate acceptably under all traffic scenarios. Some degradation in LOS and delay is expected to occur, particularly under the Build forecast, but the results indicate the intersections will operate well within the established criteria of LOS D or better.

Table 24: Main Alternative 1 (Main-1) Traffic Operations

Intersection	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay (sec / veh)	Max. V/C Ratio	LOS	Delay (sec / veh)	Max V/C Ratio
Existing (2017) Traffic Volumes						
Route 5 (Prospect Hill Road) at Main Street (SR 710) / Commerical Driveway	B	12.8	0.72	B	12.8	0.74
Route 5 (South Main Street) at Thompson Road	B	10.2	0.72	B	10.2	0.72
Base (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Main Street (SR 710) / Commerical Driveway	B	13.5	0.80	C	21.5	0.84
Route 5 (South Main Street) at Thompson Road	B	16.3	0.80	B	18.1	0.84
Build (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Main Street (SR 710) / Commerical Driveway	C	27.7	0.94	C	23.0	0.88
Route 5 (South Main Street) at Thompson Road	C	20.6	0.94	B	19.1	0.88

2.3.4.2 *Main Alternative 2 (Main-2)*

Alternative Main-2 would address the existing bicyclist and pedestrian and intersection skew deficiencies by realigning Main Street to intersection Route 5 at a perpendicular angle.

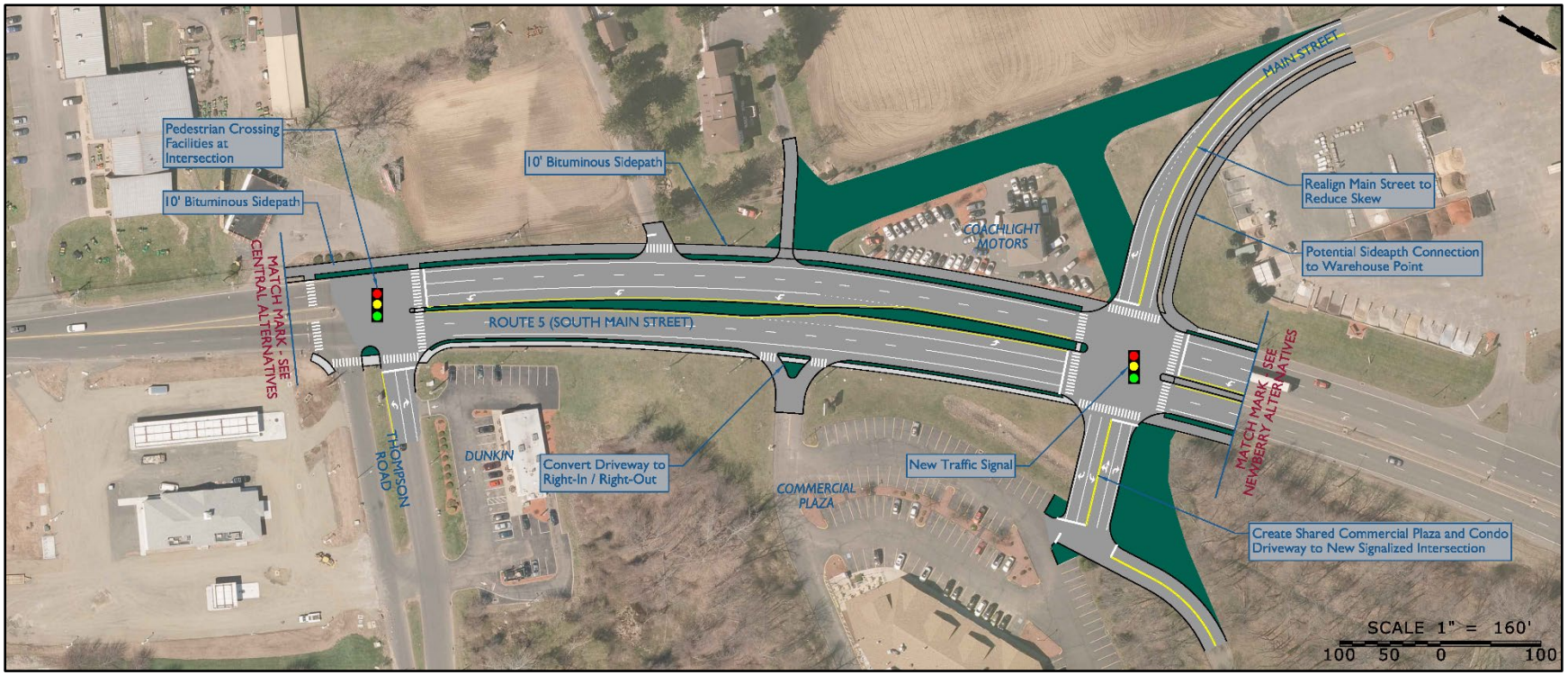
Key Features:

- Realign Main Street to create perpendicular intersection with increased spacing between Main Street and Thompson Road
- Similar bicyclist and pedestrian amenities as Alternative Main-2
- Combined driveway serving commercial plaza and condo complex
- Convert existing commercial driveway to right-in / right-out

Table 25: Evaluation Criteria for Alternative Main-2

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	▲	Operations would exceed metrics for all traffic scenarios and increased storage distance between Main Street and Thompson Road
Queuing	▲	Storage distance increased between Main Street and Thompson Road
Transit	■	No bus shelters recommended for this segment
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

Figure 25: Main Alternative 2 (Main-2)



The estimated cost for this alternative is $2,725,000. See Chapter 3 for information on how this alternative is recommended as part of the study's implementation plan.

Traffic Operations

Traffic operational analysis was conducted for Alternative Main-2 using the Existing, Base and Build traffic forecasts. The intersections within this segment are expected to operate acceptably under all traffic scenarios. Some degradation in LOS and delay is expected to occur, particularly under the Build forecast, but the results indicate the intersections will operate well within the established criteria of LOS D or better.

Table 26: Main Alternative 2 (Main-2)

Intersection	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay (sec / veh)	Max. V/C Ratio	LOS	Delay (sec / veh)	Max V/C Ratio
Existing (2017) Traffic Volumes						
Route 5 (Prospect Hill Road) at Main Street (SR 710) / Commerical Driveway	B	15.2	0.63	B	17.1	0.74
Route 5 (South Main Street) at Thompson Road	B	18.1	0.63	B	11.8	0.74
Base (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Main Street (SR 710) / Commerical Driveway	B	15.8	0.73	B	19.0	0.84
Route 5 (South Main Street) at Thompson Road	B	15.9	0.73	B	19.0	0.84
Build (2040) Traffic Forecast						
Route 5 (Prospect Hill Road) at Main Street (SR 710) / Commerical Driveway	B	19.2	0.84	C	23.5	0.88
Route 5 (South Main Street) at Thompson Road	B	18.3	0.84	B	19.5	0.88

2.3.5 Central Segment

The central segment extends from the Thompson Road intersection southerly to south of Tromley Road. The central segment is illustrated in more detail on Figure 26, below. Alternatives developed for the central segment sought to address the following deficiencies in order to meet the study's vision, goals and objectives:

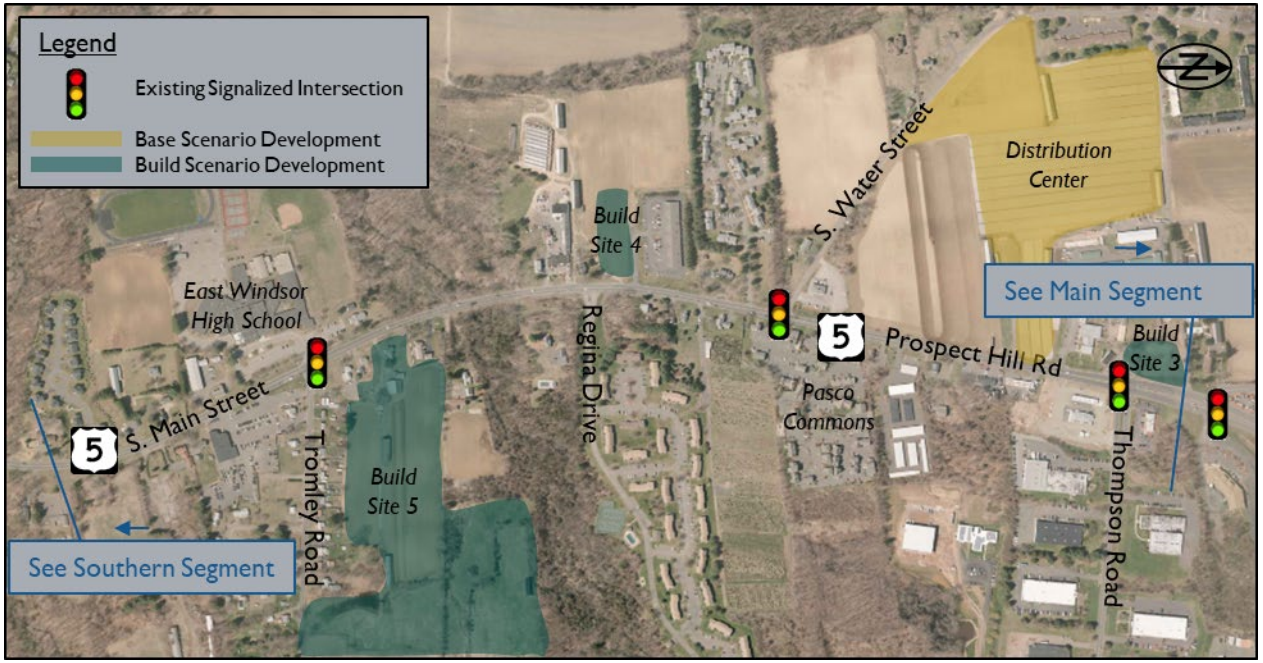
- Poor existing traffic operations at South Water Street, LOS F in both the AM and PM peak periods
- Expected deterioration of traffic operations at Tromley Road under the Build scenario, resulting in LOS F in both the AM and PM peak periods
- Lack of bicyclist, pedestrian and transit amenities

As discussed in future conditions assessment, the future Build scenario traffic volumes in this area of the corridor are dependent on significant future development. The study recommends an interactive improvement program designed to address existing deficiencies and plan for future growth.

Table 27: Central Segment Alternatives

Alternative	Purpose
C-1	Address existing traffic operational deficiencies at South Water Street and lack of bicyclist, pedestrian and transit amenities
C-2	Address deteriorated traffic operations under the future Build scenario

Figure 26: Central Segment



2.3.5.1 Central Alternative 1 (C-1)

Alternative C-1 would address the existing deficiencies and expected deficiencies under the future Base scenario in the central segment by providing additional southbound capacity on Route 5 and providing new sidewalks, sidepaths and transit amenities.

Key Features:

- Extend second southbound through lane beyond South Water Street
- Provide sidepath along west side of Route 5
- Provide sidewalks along the east side of Route 5
- Allow for potential future sidepath connection north to Warehouse Point along South Water Street
- Add transit stop amenities near South Water Street and Tromley Road

Table 28: Evaluation Criteria for Alternative C-1

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	△	Satisfactory operations under Existing volumes and Base scenario, operations would deteriorate under Build scenario
Queuing	■	Queueing distances become lengthy during the Base scenario and deteriorate further under the Build scenario
Transit	▲	Two new sets of bus shelters provided
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

The estimated construction cost to implement this alternative is $4.8 million. See Chapter 3 for information on how this alternative is recommended as part of the study's implementation plan.

Figure 27: Central Alternative 1 (C-1)

Traffic Operations (C-1)

Traffic operational analysis was conducted for Alternative C-1 using the Existing, Base and Build traffic forecasts. The intersections within the segment are expected to acceptably under the existing traffic volumes and the Base scenario, though some delays and queueing will occur at Tromley Road, particularly during the AM peak period.

The implementation of the potential developments outlined in the Build scenario, particularly at Build Site 5, would likely cause traffic operations to deteriorate under this alternative, particularly at Tromley Road. The increases in northbound and southbound through traffic at both South Water Street and Tromley Road indicate a need to provide additional capacity to provide acceptable operations under the Build scenario. For this purpose, Alternative C-2 has been developed.

Table 29: Central Alternative 1 (C-1) Traffic Operations

Intersection	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay (sec / veh)	Max. V/C Ratio	LOS	Delay (sec / veh)	Max V/C Ratio
Existing (2017) Traffic Volumes						
Route 5 (South Main Street) at South Water Street / Pasco Commons Driveway	A	8.6	0.70	A	8.6	0.70
Route 5 (South Main Street) at Tromley Road	B	15.2	0.79	B	15.2	0.79
Base (2040) Traffic Forecast						
Route 5 (South Main Street) at South Water Street / Pasco Commons Driveway	A	7.1	0.67	B	14.0	0.86
Route 5 (South Main Street) at Tromley Road	C	30.6	1.01	D	45.4	1.06
Build (2040) Traffic Forecast						
Route 5 (South Main Street) at South Water Street / Pasco Commons Driveway	A	7.9	0.80	E	66.6	1.24
Route 5 (South Main Street) at Tromley Road	E	58.8	1.14	F	181.6	1.62

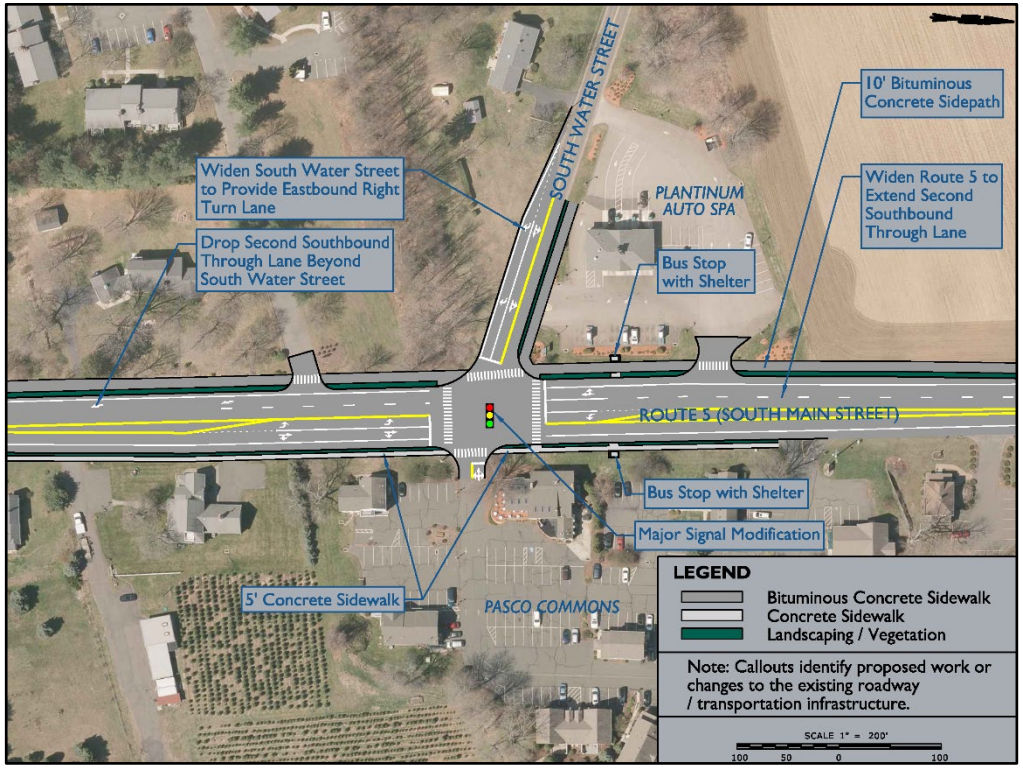
South Water Street Intersection (C-1)

At the South Water Street intersection, this alternative would provide additional capacity to address existing operational deficiencies. Pedestrian, bicyclist and transit amenities would also be provided. The additional capacity would be in the form of the second southbound through lane and an eastbound right-turn lane. The second southbound through lane would be dropped south of the intersection. The extension distance and taper distance would be compliant with CTDOT's *Highway Design Manual*.

The proposed multi-use sidepath would follow the west side of Route 5, with sidewalks provided on the east side to facilitate pedestrian connectivity with Pasco Commons and with residential developments to the south.

Bus shelters are recommended on both sides of Route 5, north of the intersection with South Water Street. For northbound buses, the existing wide shoulder, approximately eight feet wide, would serve as a de facto bus pullout. For southbound buses, a near-side stop is recommended, due to the private road intersection and lane merging activity south of the intersection. A widened shoulder is proposed to reduce the effect of the near-side stop on vehicular operations. These stops would provide access to Pasco Commons, adjacent residential development and the proposed Silverman Group development site.

Figure 28: Central Alternative 1 (C-1) South Water Street Inset



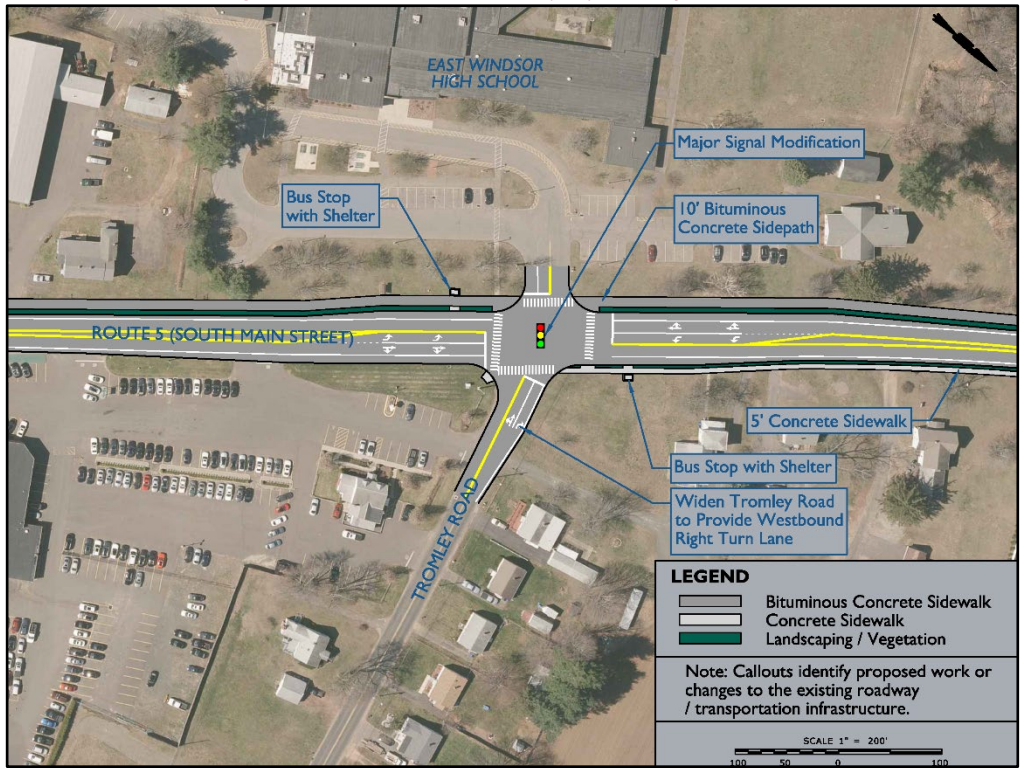
Tromley Road Intersection (C-1)

At the Tromley Road intersection, this alternative would provide additional capacity on the Tromley Road approach to address existing operational deficiencies. The additional capacity would be in the form of a westbound right-turn lane. The existing Route 5 approaches would be widened slightly to provide eight foot wide shoulders, providing the ability for right turning vehicles to bypass through traffic.

The proposed multi-use sidepath would follow the west side of Route 5. It is recommended that the Town consider making parking in the East Windsor High School parking lot available for sidepath users. A sidewalk is recommended on the east side of Route 5 north of the intersection. This sidewalk would provide pedestrian access from the High School to the numerous residential properties along Route 5 and within the residential complex on Regina Drive.

Bus shelters are recommended on both sides of Route 5, as far-side bus stops. In these areas a widened 8 foot shoulder would be provided, see previous discussion regarding right turning traffic, which would reduce the effect of the stops on through vehicle operations. These stops would provide access to the High School (an employment center), other employers, and residents to the north along Regina Drive. They would also serve new development on Build Site 5, located just to the north of the intersection.

Figure 29: Central Alternative 1 (C-1) Tromley Road Inset



2.3.5.2 Central Alternative 2 (C-2)

Alternative C-2 would address the traffic operational deficiencies expected to occur under the Build scenario by providing additional through capacity on Route 5. The sidewalks, sidepaths and transit amenities would remain consistent with Alternative C-1 but would need to be reconstructed to facilitate the roadway widening.

Key Features:

- Widen Route 5 to provide two through lanes in each direction between Thompson Road and Tromley Road
- Provide two-way left turn lane in areas with concentration of commercial and consolidated residential access
- Provide landscaped median in other areas as traffic calming and safety measure
- Relocate or maintain similar bicyclist, pedestrian and transit improvements as Alternative C-1

Table 30: Evaluation Criteria for Alternative C-2

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	▲	Satisfactory operations under all traffic forecast scenarios
Queuing	▲	Provision of two through lanes would reduce queue lengths
Transit	▲	Two new sets of bus shelters provided
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

The estimated construction cost to implement this alternative is $9.5 million. See Chapter 3 for information on how this alternative is recommended as part of the study's implementation plan.

Figure 30: Central Alternative 2 (C-2)

Traffic Operations (C-2)

Traffic operational analysis was conducted for Alternative C-2 using the Existing, Base and Build traffic forecasts. The intersections within the segment are expected to operate acceptably under all scenarios. Under the Build scenario, the development of Build Site 5, north of Tromley Road, is expected to primarily utilize Tromley Road for access from the north and to the south. This would avoid the need for the introduction on left-turning traffic onto Route 5.

As a result, traffic volumes would increase substantially on Tromley Road, particularly the number of vehicles making a westbound left turn during the PM peak hour. The analysis indicates that this would result in an overall intersection LOS C. As development plans for Build Site 5 are advanced, care should be taken to ensure the Tromley Road approach to Route 5 operates acceptably.

Table 31: Central Alternative 2 (C-2) Traffic Operations

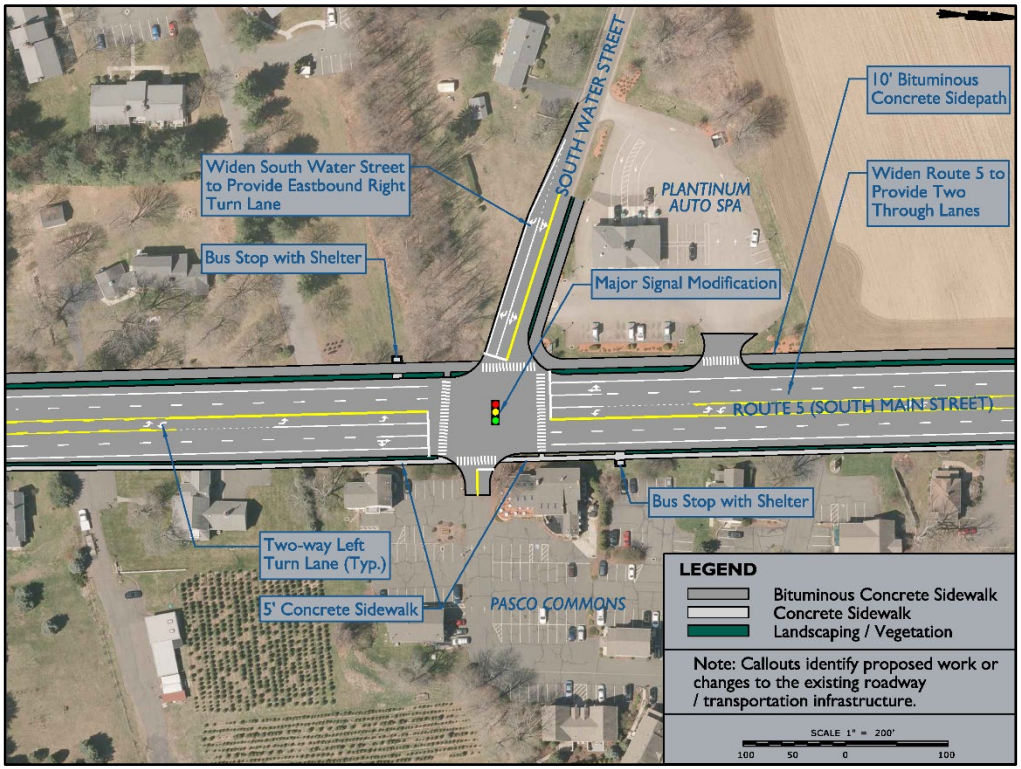
Intersection	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay (sec / veh)	Max. V/C Ratio	LOS	Delay (sec / veh)	Max V/C Ratio
Existing (2017) Traffic Volumes						
Route 5 (South Main Street) at South Water Street / Pasco Commons Driveway	A	5.7	0.61	A	6.0	0.57
Route 5 (South Main Street) at Tromley Road	A	7.2	0.52	A	6.5	0.46
Base (2040) Traffic Forecast						
Route 5 (South Main Street) at South Water Street / Pasco Commons Driveway	A	7.2	0.58	B	16.5	0.79
Route 5 (South Main Street) at Tromley Road	B	11.4	0.72	A	9.5	0.58
Build (2040) Traffic Forecast						
Route 5 (South Main Street) at South Water Street / Pasco Commons Driveway	A	9.5	0.73	B	19.4	0.91
Route 5 (South Main Street) at Tromley Road	B	12.3	0.83	C	21.4	1.14

South Water Street Intersection (C-2)

At the South Water Street intersection, this alternative would provide additional capacity to address expected operational deficiencies under the Build scenario. Pedestrian, bicyclist and transit amenities would be provided, generally consistent with Alternative C-1. The additional capacity would be in the form of additional through lanes for both northbound and southbound Route 5. An eastbound right turn lane is also recommended on South Water Street. Along Route 5 in either direction, a two-way left turn lane would be provided due to the concentration of driveways near this intersection.

The one change from the bicyclist, pedestrian and transit recommendations between Alternative C-1 and C-2 is in the placement of the southbound bus stop. Alternative C-2 would relocate the stop to the far side of the signalized intersection at South Water Street. For both stops near the intersection at South Water Street, eight foot shoulders would be provided on Route 5. In addition to improving the ability for right-turning vehicles to bypass queued vehicles, the wide shoulder would reduce the effect of the bus stops on vehicular operations.

Figure 31: Central Alternative 2 (C-2) South Water Street Inset

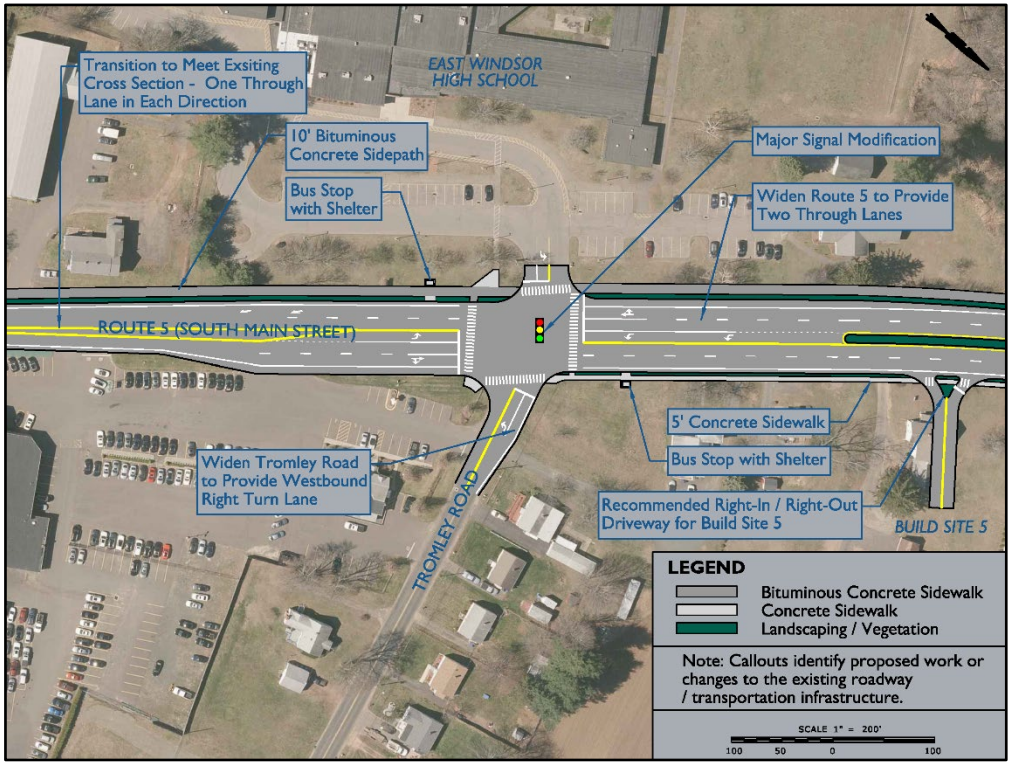


Tromley Road Intersection (C-2)

At the Tromley Road intersection, this alternative would provide additional capacity on Route 5 to address expected deficiencies under the Build scenario. The additional capacity would be in the form of two through lanes in each direction on Route 5. Immediately to the south of the intersection, Route 5 would transition to match its existing cross section, containing one through lane in each direction. Widened, eight foot, shoulders would be provided on both sides of Route 5.

Bicyclist, pedestrian and transit accommodations would be consistent with those provided under Alternative C-2.

Figure 32: Central Alternative 2 (C-2) Tromley Road Inset



2.3.6 Southern Segment

The southern segment extends from north of the Phelps Road (Route 191) intersection southerly to Scantic Road. Scantic Road is the southern boundary of the study area. The southern segment is illustrated in more detail on Figure 33, below. Alternatives developed for the southern segment sought to address the following deficiencies in order to meet the study's vision, goals and objectives:

- Lack of turn lanes at signalized intersection
- Lack of bicyclist and pedestrian amenities
- Increasing delays and queuing under future volumes
- Access management deficiencies in the form of overly-wide driveways and numerous curb cuts
- Elevated crash rates on segments between Stoughton Road and Phelps Road

As discussed in the future conditions assessment, the future Build scenario traffic volumes in this area of the corridor are dependent on significant future development. The study recommends an interactive improvement program designed to address existing deficiencies and plan for future growth.

Table 32: Southern Segment Alternatives

Alternative	Purpose
S-1	Provide turn lanes at signalized intersections, and address other existing deficiencies
S-2	Address deteriorated traffic operations under the future Build scenario, north of Southern Auto Auction
S-3	Address deteriorated traffic operations under the future Build scenario south of Southern Auto Auction

Figure 33: Southern Segment

2.3.6.1 Southern Alternative 1 (S-1)

Alternative S-1 would address the existing deficiencies in the southern segment but adding turn lanes at signalized intersections, reconfiguring Route 5's lane arrangement in the vicinity of Southern Auto Auction and provide a sidepath.

Key Features:

- Provide turn lanes at all signalized intersections
- Reconfigure Route 5 between Stoughton Road and Tromley Road using a **road diet**
- Provide a sidepath along the west side of Route 5

A **road diet** is a reduction in the number of travel lanes, typically including the conversion of an existing four-lane undivided roadway segment to a three-lane segment consisting of two through lanes and a center, two-way left turn lane. (FHWA)

Table 33: Evaluation Criteria for Alternative S-1

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	△	Satisfactory operations under Existing and Base scenarios. Delays would increase under the Build scenario.
Queuing	■	Satisfactory queuing under Existing scenario. Queues would lengthen significantly under the Base and Build scenarios.
Transit	■	Based on the current and proposed land uses, opportunities for bus stops with shelters are limited
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

The estimated construction cost to implement this alternative is $7.4 million. It is anticipated that the road diet conversion could be accomplished via the state's Vendor-in-Place pavement program. See Chapter 3 for information on how this alternative is recommended as part of the study's implementation plan.

Figure 34: Southern Alternative 1 (S-1) (1 of 2)

Figure 35: Southern Alternative 1 (S-1) (2 of 2)

The purpose of the road diet between Phelps Road and Stoughton Road is to address the elevated crash rates in the areas where the existing Route 5 merges from two lanes to one (southbound approaching Stoughton Road and northbound approaching Phelps Road). These two merge lengths do not meet modern design standards, there is not sufficient distance to provide merge lengths between the signalized intersections that meets the standard.

Traffic Operations (S-1)

Traffic operational analysis was conducted for Alternative S-1 using the Existing, Base and Build traffic forecasts. The intersections in the segment are expected to operate acceptably under the existing traffic volumes and the Base scenario. The results are presented in Table 34, following.

The implementation of the potential developments under the Build scenario would cause a deterioration of traffic operations in the form of LOS E at the Southern Auto Auction driveway intersection. Other intersections within the corridor would experience volume to capacity ratios in excess of 1.0. This means that volume would exceed capacity and that queues would continue to extend throughout the peak period. Based on this expected deterioration of operations, Alternatives S-2 and S-3 have been developed

Table 34: Southern Alternative 1 (S-1) Traffic Operations

Intersection	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay (sec / veh)	Max. V/C Ratio	LOS	Delay (sec / veh)	Max V/C Ratio
Existing (2017) Traffic Volumes						
Route 5 (South Main Street) at Phelps Road (Route 191)	A	3.7	0.65	A	7.4	0.67
Route 5 (South Main Street) at Southern Auto Auction (SAA) Driveways)	A	8.7	0.67	A	9.8	0.77
Route 5 (South Main Street) at Stoughton Road	A	7.9	0.61	A	6.9	0.74
Route 5 (South Main Street) at Abbe Road	A	8.3	0.57	A	5.2	0.71
Route 5 (South Main Street) at Scantic Road	A	7.3	0.60	A	4.7	0.44
Base (2040) Traffic Forecast						
Route 5 (South Main Street) at Phelps Road (Route 191)	A	5.5	0.77	A	8.1	0.84
Route 5 (South Main Street) at SAA Driveways	B	18.1	0.89	C	23.1	0.96
Route 5 (South Main Street) at Stoughton Road	A	9.0	0.77	B	15.4	0.94
Route 5 (South Main Street) at Abbe Road	B	11.0	0.71	A	8.1	0.88
Route 5 (South Main Street) at Scantic Road	B	14.1	0.71	A	8.9	0.66
Build (2040) Traffic Forecast						
Route 5 (South Main Street) at Phelps Road (Route 191)	C	24.8	1.07	D	46.7	1.09
Route 5 (South Main Street) at SAA Driveways	E	57.4	1.18	E	65.9	1.17
Route 5 (South Main Street) at Stoughton Road	B	14.1	0.97	D	54.0	1.15
Route 5 (South Main Street) at Abbe Road	B	17.2	0.91	C	29.6	1.06
Route 5 (South Main Street) at Scantic Road	B	15.4	0.79	A	9.8	0.73

Phelps Road (Route 191) Intersection (S-1)

At the Phelps Road intersection, this alternative would widen Route 5 to provide a southbound left turn lane. Phelps Road would be widened to provide an eight foot wide shoulder, allowing right turning vehicles the opportunity to bypass left turning traffic.

The northbound right turn lane would be retained as part of the reconstruction of Route 5. South of the intersection the roadway configuration would transition to the road diet section. This would convert the existing four-lane section to a three-lane section with a two-way left-turn lane.

A landscaped median would be provided south of the intersection, shadowing the southbound left turn lane. The proposed multi-use sidepath would follow the west side of Route 5.

Stoughton Road Intersection (S-1)

At the Stoughton Road intersection, this alternative would widen Route 5 to provide northbound and southbound left turn lanes. South of the intersection, the roadway would transition to its existing two-lane section, one lane in each direction.

Figure 36: Southern Alternative 1 (S-1) Phelps Road Inset

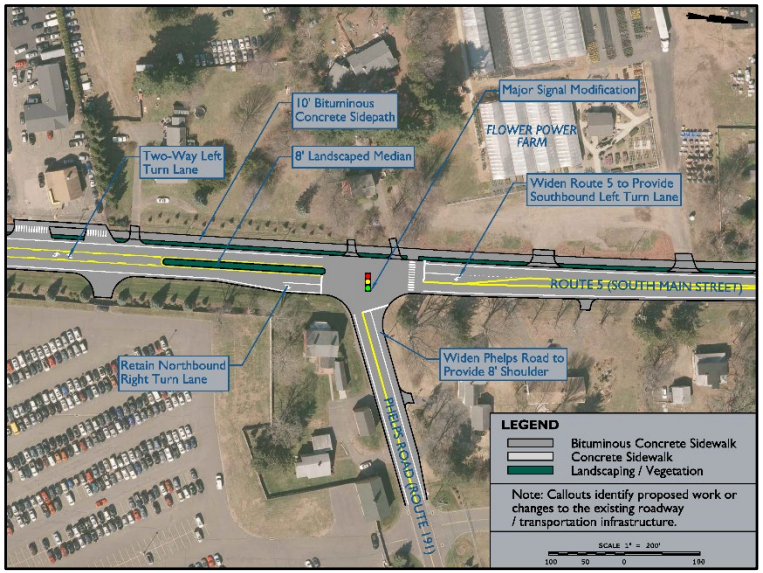
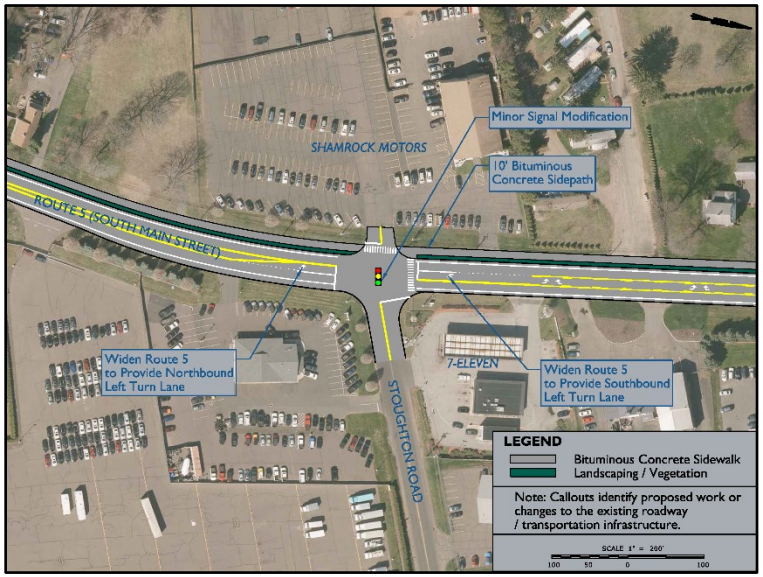


Figure 37: Southern Alternative 1 (S-1) Stoughton Road Inset



Abbe Road Intersection (S-1)

At the Abbe Road intersection, this alternative would widen Route 5 to provide northbound and southbound left turn lanes and a southbound right turn lane. North and south of the intersection, Route 5 would transition to its existing cross section, with one lane in each direction. The proposed multi-use sidepath would follow the west side of Route 5.

Scantic Road Intersection

At the Scantic Road intersection, this alternative would provide a southbound left turn lane to Scantic Road and the land uses on the east side of Route 5. Due to the wide landscaped median south of the intersection, an *offset southbound left turn lane* is recommended.

An **offset let turn lane** provides improved sight distance and helps improve driver's ability to correctly judge gaps in traffic. It separates the left turn lane from the same direction through lanes. (AASHTO)

Figure 38: Southern Alternative 1 (S-1) Abbe Road Inset

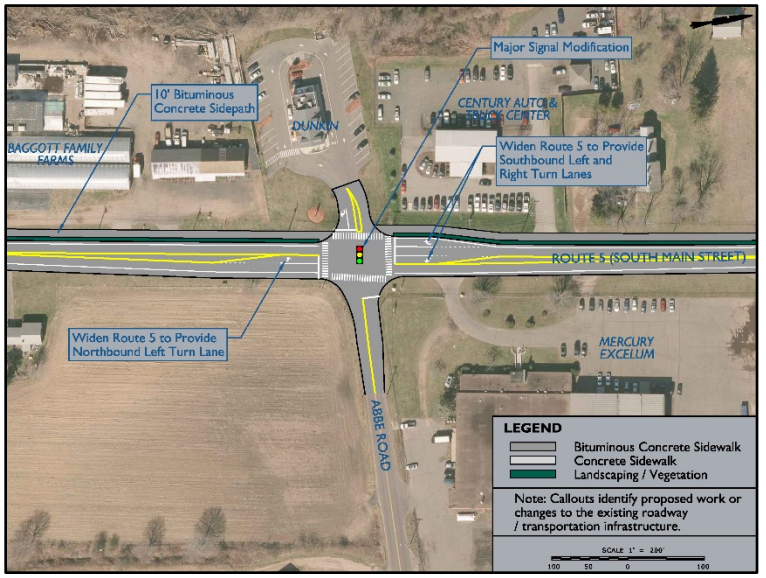
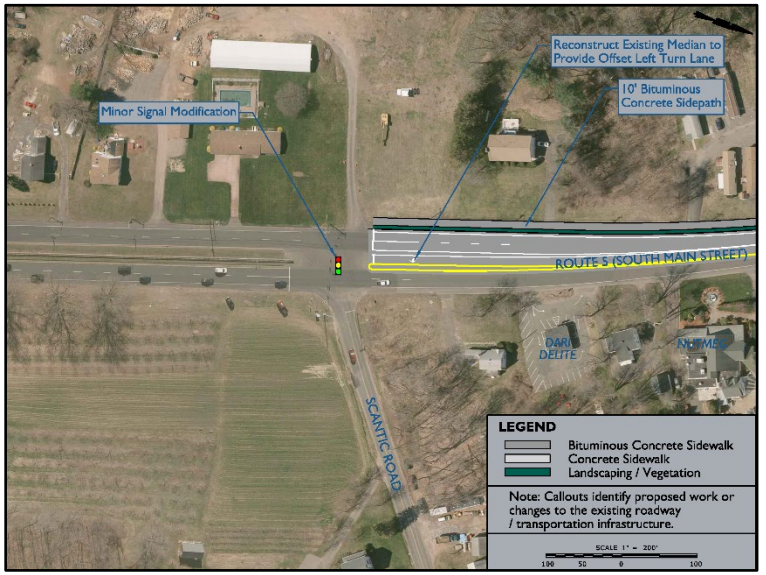


Figure 39: Southern Alternative 1 (S-1) Scantic Road Inset



2.3.6.2 *Southern Alternative 2 (S-2)*

Alternative S-2 would address the expected traffic operational deficiencies under the Base and Build scenarios between Tromley Road and Phelps Road. The sidepath recommended in Alternative S-1 would need to be relocated to facilitate the widened roadway. This alternative would be a continuation of the recommendations in Central Alternative 2 (C-2). The southern boundary of this alternative would have the roadway transition to meet Southern Alternative 1 (S-1).

Key Features:

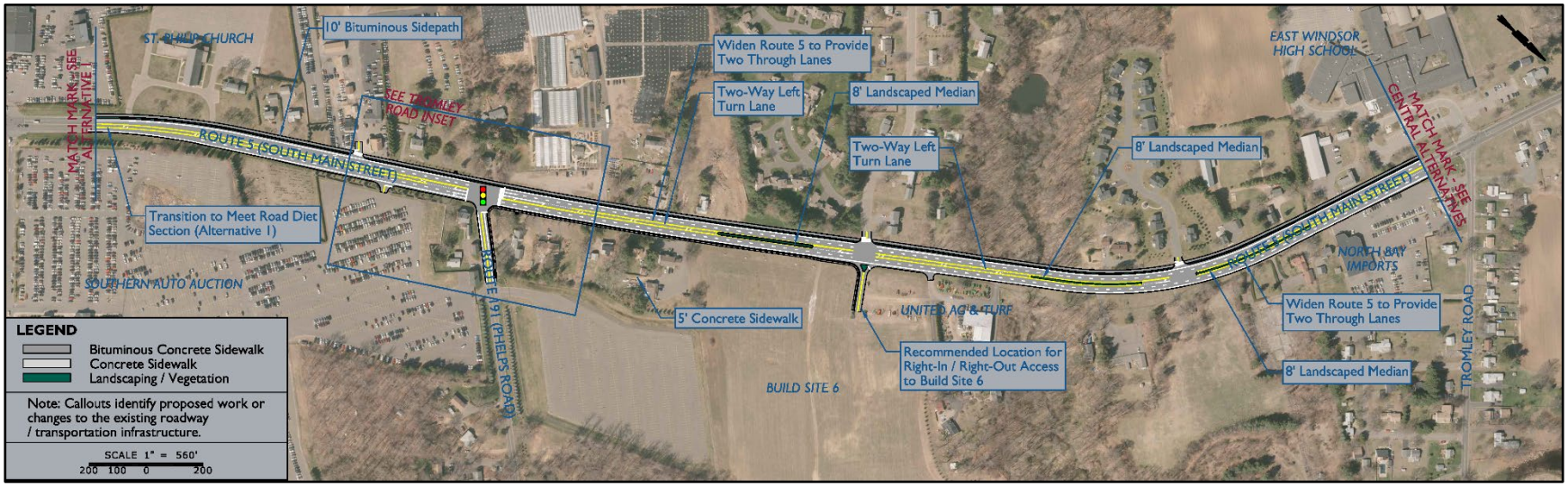
- Widen Route 5 to provide two through lanes in each direction
- Provide two-way left turn lane in areas with concentration of commercial and consolidated residential access
- Provide landscaped median in other areas as traffic calming and safety measure
- Bus stops with shelters near Phelps Road / Build Site 6
- Relocate or maintain similar bicyclist and pedestrian improvements as Alternative S-1

Table 35: Evaluation Criteria for Alternative S-2

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	▲	Satisfactory operations under all scenarios.
Queuing	▲	Satisfactory queuing under all scenarios.
Transit	▲	Transit stop and amenities recommended to serve Phelps Road and Build Site 6
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

The estimated cost to implement this alternative is $10.2 million. See Chapter 3 for information on how this alternative is recommended as part of the study's implementation plan.

Figure 40: Southern Alternative 2 (S-2)



Traffic Operations (S-2)

Traffic operational analysis was conducted for Alternative S-2 using the Existing, Base and Build traffic forecasts. The intersection of Route 5 and Phelps Road, the only signalized intersection within the limits of this alternative, would operate acceptably under all forecasts.

The introduction of this alternative would only be warranted if developments of the scale identified in the Build scenario occur. CTDOT and the Town should monitor future development plans. As any plans become realities, the need to widen this segment of Route 5 should be considered, based on the projected traffic demands.

Table 36: Southern Alternative 2 (S-2) Traffic Operations

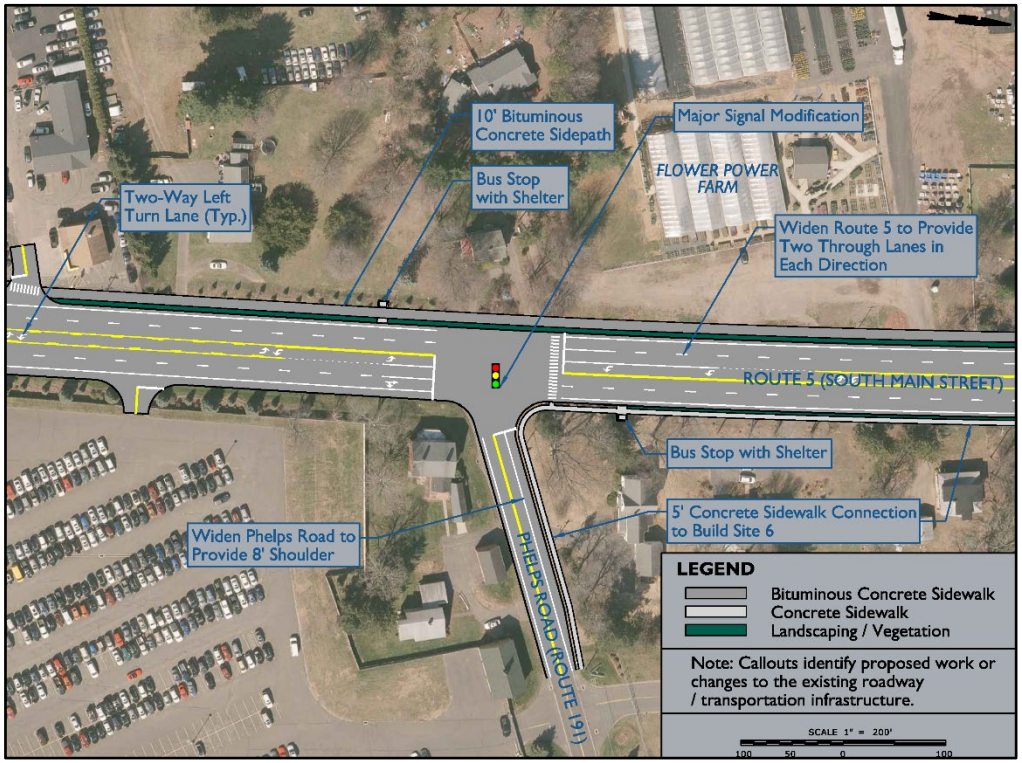
Intersection	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay (sec / veh)	Max. V/C Ratio	LOS	Delay (sec / veh)	Max V/C Ratio
Existing (2017) Traffic Volumes						
Route 5 (South Main Street) at Phelps Road (Route 191)	A	2.4	0.34	A	5.0	0.36
Base (2040) Traffic Forecast						
Route 5 (South Main Street) at Phelps Road (Route 191)	A	4.6	0.42	A	4.8	0.45
Build (2040) Traffic Forecast						
Route 5 (South Main Street) at Phelps Road (Route 191)	A	6.8	0.62	A	7.3	0.59

Phelps Road (Route 191) Intersection (S-2)

At the Phelps Road intersection, this alternative would widen Route 5 to provide two through lanes in each direction. With the improved overall operation of the intersection, the existing northbound right turn lane would be converted to a through-right lane. An eight foot shoulder would be provided on northbound Route 5.

The proposed multi-use sidepath would follow the west side of Route 5. New bus stops with shelters and sidewalks are proposed. The two bus stops would be far-side stops. Sidewalk connections are recommended to be provided to Build Site 6.

Figure 41: Southern Alternative 2 (S-2) Phelps Road Inset



2.3.6.3 Southern Alternative 3 (S-3)

Alternative S-3 would address the expected traffic operational deficiencies under the Base and Build scenarios between Phelps Road and Scantic Road. The sidepath recommended in Alternative S-1 would need to be relocated to facilitate the widened roadway. This alternative would be a continuation of the recommendations in Southern Alternative 2 (S-2).

Key Features:

- Widen Route 5 to provide two through lanes in each direction
- Provide two-way left turn lane in areas with concentration of commercial and consolidated residential access
- Provide landscaped median in other areas as traffic calming and safety measure
- Relocate or maintain similar bicyclist and pedestrian improvements as Alternative S-1

Table 37: Evaluation Criteria for Alternative S-3

Objective	Rating	Notes
Turn lanes	▲	Turn lanes provided at all intersections
Traffic operations	▲	Satisfactory operations under all scenarios.
Queuing	▲	Satisfactory queuing under all scenarios.
Transit	■	Based on the current and proposed land uses, opportunities for bus stops with shelters are limited
Bike / Ped	▲	Addresses existing bicyclist and pedestrian deficiencies

The estimated cost to implement this alternative is $17.3 million. See Chapter 3 for information on how this alternative is recommended as part of the study's implementation plan.

Figure 42: Southern Alternative 3 (S-3) (1 of 2)

Figure 43: Southern Alternative 3 (S-3) (2 of 2)

Traffic Operations (S-3)

Traffic operational analysis was conducted for Alternative S-3 using the Existing, Base and Build traffic forecasts. The intersections within this segment would operate acceptably under all traffic scenarios.

The introduction of this alternative would only be warranted if developments of the scale identified in the Build scenario occur. CTDOT and the Town should monitor future development plans. As any plans become realities, the need to widen this segment of Route 5 should be considered, based on the projected traffic demands.

Table 38: Southern Alternative 3 (S-3) Traffic Operations

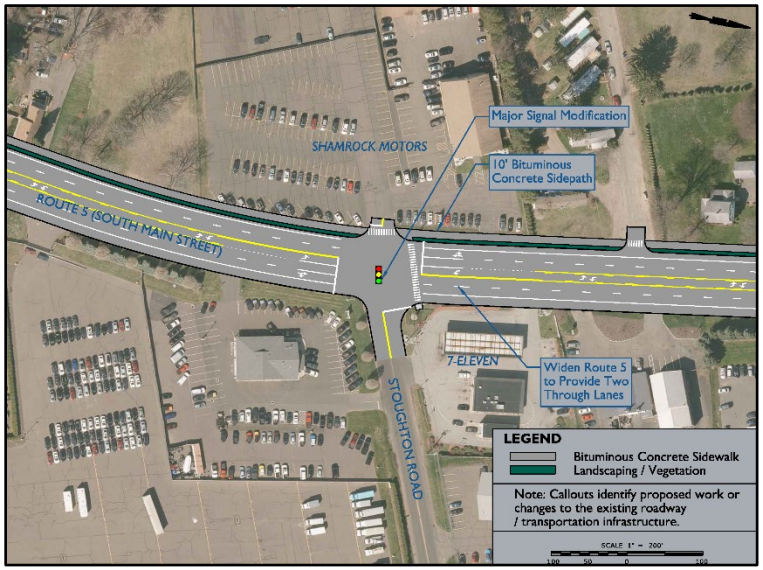
Intersection	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay (sec / veh)	Max. V/C Ratio	LOS	Delay (sec / veh)	Max V/C Ratio
Existing (2017) Traffic Volumes						
Route 5 (South Main Street) at Southern Auto Auction (SAA) Driveways)	A	6.0	0.38	A	4.0	0.41
Route 5 (South Main Street) at Stoughton Road	A	4.2	0.43	A	3.6	0.45
Route 5 (South Main Street) at Abbe Road	A	4.2	0.44	A	1.7	0.38
Route 5 (South Main Street) at Scantic Road	A	9.2	0.57	A	6.8	0.50
Base (2040) Traffic Forecast						
Route 5 (South Main Street) at SAA Driveways	A	5.9	0.50	A	4.3	0.51
Route 5 (South Main Street) at Stoughton Road	A	4.5	0.48	A	5.2	0.51
Route 5 (South Main Street) at Abbe Road	A	5.4	0.58	A	2.5	0.46
Route 5 (South Main Street) at Scantic Road	B	13.8	0.82	A	6.8	0.61
Build (2040) Traffic Forecast						
Route 5 (South Main Street) at SAA Driveways	A	8.3	0.66	A	5.4	0.61
Route 5 (South Main Street) at Stoughton Road	A	5.7	0.53	A	9.6	0.61
Route 5 (South Main Street) at Abbe Road	A	6.2	0.58	A	2.7	0.56
Route 5 (South Main Street) at Scantic Road	B	15.4	0.79	A	6.7	0.65

Stoughton Road Intersection (S-3)

At the Stoughton Road intersection, this alternative would widen Route 5 to provide two lanes in each direction. Both north and south of the intersection, the roadway would feature a two-way left turn lane.

The proposed multi-use sidepath is recommended for the west side of Route 5.

Figure 44: Southern Alternative 3 (S-3) Stoughton Road Inset

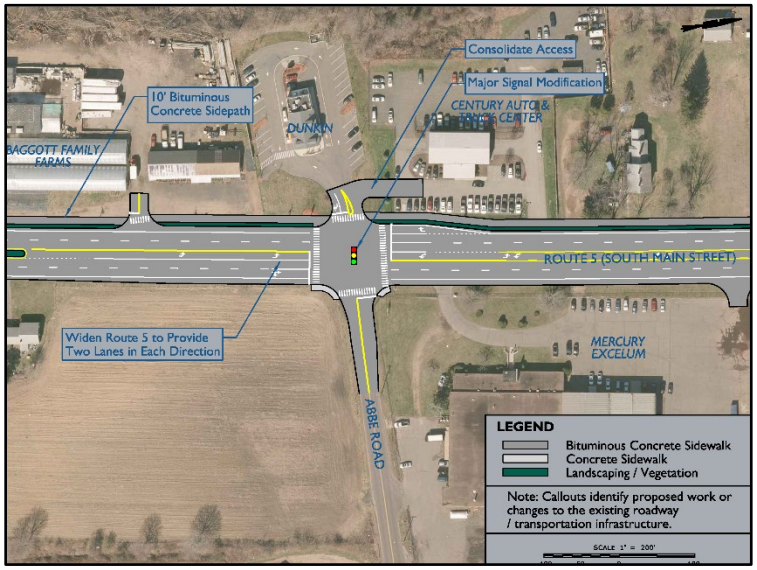


Abbe Road Intersection (S-3)

At the Stoughton Road intersection, this alternative would widen Route 5 to provide two lanes in each direction. North of the intersection, the roadway would feature a two-way left turn lane. South of the intersection, a landscaped median is recommended. Sue to the proximity of the Century Auto & Truck Center driveway to the signalized intersection, consolidation of access with the adjacent Dunkin driveway is recommended.

The proposed multi-use sidepath is recommended on the west side of Route 5.

Figure 45: Southern Alternative 3 (S-3) Abbe Road Inset



Scantic Road Intersection (S-3)

At the Scantic Road intersection, this alternative would provide a southbound left turn lane to Scantic Road and the land uses on the east side of Route 5. Due to the wide landscaped median south of the intersection, an offset southbound left turn lane is recommended. The proposed multi-use sidepath could either terminate or be continued southerly into South Windsor.

Figure 46: Southern Alternative 3 (S-3) Scantic Road Inset)

3 Implementation Plan and Funding Opportunities

This section of the report summarized the recommended implementation plan for the alternatives analyzed in Chapter 2. It also identifies potential funding mechanisms that the Town of East Windsor, CRCOG and CTDOT.

3.1 Implementation Plan

The study team has identified three types of improvement recommendation from the previously identified alternatives:

Near Term: Improvements that address existing needs, are relatively low cost and low impact (environmental, ROW) and could / should be pursued immediately.

Mid Term: Improvements that address existing future Base scenario needs, are higher cost and could have potential environmental and ROW impacts. These alternatives would either require environmental review (if initiated immediately) or could have outside actions, such as development, that would trigger the need to implement them.

Long Term: Improvements that address future Build scenario needs, are high cost and likely require environmental and ROW impacts. These alternatives have outside actions, such as development, that would trigger the need to implement them.

The alternatives presented in Chapter 2 are listed in Table 39, right, and classified by the type of improvement recommendation.

3.2 Cost Estimating

Planning-level cost estimates were prepared for each alternative. Table 39, below, includes these costs for the current year (2021) and escalated to the year 2025 and 2030, using a rate of inflation of 3.5% consistent with CTDOT estimating guidelines. The costs are program costs, and include costs to complete engineering and necessary right-of-way acquisition in addition to construction.

Table 39: Implementation Plan

Alternative	Cost in 2021 $	Cost in 2025 $	Cost in 2030 $	Notes
Near Term				
N-1	$1,850,000	$2,130,000	$2,530,000	Could all be implemented immediately
New-1	$2,000,000	$2,300,000	$2,730,000	
Main-1	$750,000	$870,000	$1,030,000	
C-1	$4,800,000	$5,510,000	$6,550,000	
S-1	$7,400,000	$8,500,000	$10,090,000	
Mid Term				
Main-2	$1,250,000	$1,440,000	$1,710,000	Could be implemented immediately
C-2	$9,540,000	$10,950,000	$13,010,000	Should be implemented with development of MMCT casino or other significant development on that site and completion of Base scenario developments
N-2	$5,200,000	$7,090,000	$7,600,000	
Long Term				
N-3	$2,300,000	$3,140,000	$3,360,000	Should be implemented with development of the Build scenario sites
New-5	$1,200,000	$1,380,000	$1,640,000	
S-2	$10,190,000	$11,700,000	$13,010,000	
S-3	$17,300,000	$19,860,000	$23,580,000	
Alternatives in Need of Further, Separate Study				
New-3				Alternatives need to be evaluated in
New-4				
Alternative Dismissed				
New-2				Alternative not recommended for further study

3.3 Funding Opportunities

There are several different types of both state and federal funding that could be used by the Town, CRCOG and CTDOT. These are documented in Table 40, below. Additionally, as potential developments occur within the corridor, opportunities should be taken to improve the sidewalk, sidepath and transit amenities. The Town may also use the access management appendix in assessing potential changes to or new developments.

Table 40: Potential Funding Programs

Program	State / Federal	Notes
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	Federal	Discretionary grant program managed by FHWA. Primary goal to improve air quality.
Local Transportation Capital Improvement Program (LoTCIP)	State	Discretionary grant program managed by CTDOT.
Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	Federal	Discretionary grant program managed by USDOT, prioritizes economy, safety and the environment
Local Capital Improvement Program (LoCIP)	State	State managed formula-based entitlement funds for municipal projects
Transportation Alternatives Program (TAP)	Federal	FHWA managed program funding non-driver access to transportation
Surface Transportation Program (STP)	Federal	The most flexible Federal-aid highway program
National Highway Performance Program (NHPP)	Federal	Federal program aimed at helping highway facilities meet local performance measures