

## **Section 4**

# **Recommendations**

This section presents detailed recommendations for transportation system improvements and enhancements. The recommendations have been identified to address both existing issues and those resulting from the forecasted travel demand and development growth that is expected to occur in the Town of Rocky Hill and the region by the year 2030. The recommendations were identified and developed cooperatively with the Technical Review / Steering Committee, and were refined through a public input process, to address the goals and objectives outlined in the Study Mission Statement.

Generally, the proposed improvements are focused on spot improvements to the transportation system to address future traffic growth, improve safety, increase accessibility, and promote alternative modes of travel. However, in some areas, more extensive improvements are needed to address future transportation needs. Although many of the recommendations address transportation issues related to motor vehicles, a series of enhancement recommendations have been developed to address alternative modes of travel, including pedestrian, transit, cyclist, and recreational usage of the transportation system.

The recommendations are presented on an intersection-by-intersection basis. The development and refinement of the preferred improvements was guided by the Town of Rocky Hill's desire to identify implementable solutions that adequately meet study goals by addressing both the existing deficiencies and potential future operational issues identified and described in the previous sections of this report.

### **4.1 Summary of Recommendations**

Most of the recommended improvements are categorized by Study Area roadway corridor in the following sections (i.e., Cromwell Avenue, West Street, and Brook Street). However, most of the recommendations pertaining to alternative modes of travel are aggregated into study-wide recommendations. Although they are categorized as study-wide, these recommendations can be implemented selectively through spot implementation as funding becomes available or can be incorporated into other transportation projects. Full concept plans and figures for each of the recommendations summarized in the following sections are presented in the Appendix.

### 4.1.1 Cromwell Avenue (Route 3) Recommendations

Based on the character of Cromwell Avenue and its future travel demands, the Cromwell Avenue recommendations generally focus on providing needed capacity, while adhering to the study goals and limiting impacts on existing private development and businesses along the corridor.

#### 4.1.1.1 Closed Loop Traffic Signal System

The State of Connecticut Department of Transportation operates a closed loop traffic control signal system along Cromwell Avenue and West Street. The signal system includes all of the signals along Cromwell Avenue from Inwood Road to New Britain Avenue, and the four signals along West Street at its intersections with Corporate Place, both I-91 interchange 23 ramps, and Capital Boulevard. Maintaining efficient traffic signal system operations should be a priority in advance of implementing physical improvements along the corridors.

#### Recommendations

The operation and configuration of the settings within the closed loop system should be monitored by both Town and State officials to ensure that the system operates in an efficient manner and is responsive to current traffic conditions. As development levels change and traffic volumes increase in the future, the systems settings should be reviewed on an annual basis, and verified or adjusted as necessary. The potential operational improvements that can be achieved through system calibration are summarized in Figure 4-1.

Additionally, the Town of Rocky Hill should consider requiring developers seeking site plan approvals that may impact travel patterns within the signal system envelope to demonstrate either that the current signal system settings are appropriate or provide recommendations for signal system setting changes. This review can also occur at the State level for developments that require Office of the State Traffic Administration review.

#### 4.1.1.2 Inwood Road Intersection Improvements

The existing lane geometry at the intersection of Inwood Road and Cromwell Avenue includes two southbound Cromwell Avenue lanes and a single northbound lane. Lane continuity is an existing geometric deficiency in the southbound travel direction as the existing right travel lane, which functions as a through lane to the north of the intersection becomes a right turn only lane on its approach to Inwood Road. This right turn trap lane causes additional weaving maneuvers for southbound Cromwell Avenue traffic.



In addition to the geometric issue that affects southbound traffic, the northbound lane configuration includes a single approach lane at Inwood Road, with a wide shoulder area to facilitate bypass traffic maneuvers around a vehicle waiting to turn left into Inwood Road. Pedestrian accommodations include an existing sidewalk that runs along the west side of Cromwell Avenue, from approximately the midpoint between Brook Street and Inwood Road to the south before terminating at the south edge of the Inwood Road development. In addition, there are limited segments of sidewalk along the east side of the street that have been constructed through redevelopment of the parcels as required by the Town of Rocky Hill.

#### Recommendations

The recommended intersection improvements eliminate the existing right turn trap lane at the intersection of Inwood Road and Cromwell Avenue. The improvement is achieved by widening Cromwell Avenue along the west side of the road south of the intersection to facilitate the extension of two travel lanes through the intersection, and eliminate the need for through traffic to weave out of the right lane on the southbound approach to the intersection. The Cromwell Avenue cross section can be transitioned back to a single lane in each direction south of the intersection by implementing a typical lane merge transition.

On the intersection's northbound approach, it's recommended that the bypass lane be eliminated and the lane configuration adjusted to provide an exclusive left turn lane into Inwood Road along with a through lane. Additionally, the traffic control signal at this intersection should be modified to include a protected phase for the northbound left turn lane operations.

To address pedestrian access, it is recommended that in-fill sidewalk installation continue to occur along Cromwell Avenue, both through the redevelopment process and through available funding sources for sidewalk infrastructure improvements. The continuity of the sidewalk infrastructure to the north will become more important as development continues along Brook Street, including a recently approved residential complex, potentially providing the ability for new residents to walk to work in the nearby office parks.

The recommendations are illustrated in Figure 4-2.

### Potential Impacts and Constraints

Based on available mapping and property information, the proposed improvements, including the roadway widening and in-fill sidewalk can be installed within the limits of the roadway right of way and property actions will likely not be required. However, based on the final configuration of the intersection lane geometry and overall pavement width, the existing overhead utility facilities that exist along the east side of Cromwell Avenue could potentially be impacted. The design of these improvements should seek to minimize or avoid impacting these facilities, if feasible, as the utility poles carry communication facilities in addition to secondary and primary electric services.

#### 4.1.1.3 Brook Street Intersection Improvements

The existing lane geometry at the intersection of Cromwell Avenue and Brook Street includes two travel lanes in the southbound direction. The interior travel lane functions as a de facto left turn lane during peak periods when traffic conditions along Cromwell Avenue are busy and traffic turning left onto Brook Street is heavy, blocking the through traffic operations. The existing lane configuration forces traffic to weave into the right lane to travel through the intersection when the left lane is blocked by a turning vehicle. This condition is anticipated to deteriorate as development continues along Brook Street.

Additionally, the movement of southbound through traffic to the right lane exacerbates previously identified weaving problems at the Inwood Road intersection located immediately south of this location. As noted under the Inwood Road recommendations, the southbound right lane transitions into a right turn only lane on the approach to Inwood Road, requiring additional weaving operations for through traffic.

Currently, there are no pedestrian facilities at this location, and while the Cromwell Avenue bridge over I-91 to the north of the intersection was constructed with a sidewalk along the east side of the structure, there is no connection to the sidewalk on either side of the bridge.



### Recommendations

The recommended improvements at this intersection seek to mitigate the effects of southbound left turning vehicles on southbound through traffic by widening Cromwell Avenue to provide a short exclusive left turn lane to Brook Street. The southbound exclusive left turn lane will remove turning vehicles from the through traffic stream and improve through movement operations.

The recommendation also includes a new sidewalk along both sides of Cromwell Avenue. The new sidewalk on the west side of the street begins opposite Brook Street and

continues south to connect to existing sidewalk. New sidewalk is also recommended along the east side of Cromwell Avenue to connect to existing facilities to the south and the existing sidewalk on the bridge to the north. One crosswalk is proposed across Cromwell Avenue and one across Brook Street. The recommendations associated with the alternative modes of travel also reference these in-fill sidewalk accommodations for pedestrians.

The existing traffic conditions at the intersection are LOS A and LOS B in the morning and afternoon peak periods, respectively, but they will deteriorate to LOS D in the 2030 afternoon peak period with no modifications. The recommended improvements at this intersection will provide acceptable LOS C conditions under both peak periods.

The recommendations are illustrated in Figure 4-3.

### **Potential Impacts and Constraints**

The recommended improvements, including the roadway widening to facilitate the installation of a southbound left turn lane and the construction of sidewalk along both sides of the corridor, may require small strip property acquisitions to provide additional right of way width to accommodate the additional facilities. The potential acquisitions are minor and do not affect existing parking or development.

The proximity of the intersection to the Cromwell Avenue Bridge over I-91 presents a physical constraint that may limit the length of the recommended exclusive southbound left turn lane. Prior to the initiation of the project, preliminary engineering should be conducted to establish the recommended geometry for the intersection and establish the potential impacts.

A review of existing utilities in the intersection area indicates that only minor impacts to the existing infrastructure will occur as a result of the Cromwell Avenue widening. The primary pole line exists along the east side of Cromwell Avenue. Relocations of guy poles and other utility poles on the west side of Cromwell Avenue will be required to facilitate the widening.

#### 4.1.1.4 West Street (SR 411) & France Street Intersection Improvements

The intersections of West Street and France Street with Cromwell Avenue experience the some of the highest traffic volumes within the study area. Traffic travelling within the Town of Rocky Hill and regional trips, including those travelling to and from the I-91 interchange, use this intersection to reach their destinations.

During the peak hours, traffic volumes travelling south along Cromwell Avenue towards the I-91 interchange are heavy, causing operational issues at the cluster intersection of France Street and West Street. This flow results in a high volume of left turns onto West Street from a single southbound exclusive left turn lane. A review of the existing traffic operations indicates that from an intersection capacity perspective the intersection currently operates at tolerable levels with an LOS D during the existing morning and afternoon peak periods. However, during peak periods, southbound left turn lane queuing routinely extends beyond the adjacent France Street intersection, located just 400 feet to the north, occasionally blocking the intersection. This blocking of the intersection creates long queues on France Street for vehicles attempting to enter Cromwell Avenue traffic flow during the morning peak hour. France Street's single lane approach to Cromwell Avenue also exacerbates the queuing problem as vehicles attempting to turn right onto Cromwell Avenue are routinely blocked by, and queue behind, vehicles waiting to turn left.



However, during peak periods, southbound left turn lane queuing routinely extends beyond the adjacent France Street intersection, located just 400 feet to the north, occasionally blocking the intersection. This blocking of the intersection creates long queues on France Street for vehicles attempting to enter Cromwell Avenue traffic flow during the morning peak hour. France Street's single lane approach to Cromwell Avenue also exacerbates the queuing problem as vehicles attempting to turn right onto Cromwell Avenue are routinely blocked by, and queue behind, vehicles waiting to turn left.

In the future, projected traffic volumes are expected to cause additional operational problems at this location. A review of 2030 operations indicates that the West Street and France Street intersections will operate at a poor LOS E during the morning peak period. The West Street intersection is also anticipated to operate at LOS E during the afternoon peak hour. In addition, operations within the cluster intersection will be significantly affected by queuing. The analysis of traffic operations indicated that, without roadway improvements, the peak southbound queues will extend over 600 feet to the north, blocking vehicles from exiting France Street during the peak hours.

#### Recommendations

In order to address these deficiencies, physical improvements are proposed at both intersections to provide additional capacity and reduce queuing. The primary mitigation requires widening Cromwell Avenue between France Street and West Street to provide an additional exclusive left turn lane on the southbound approach to West Street. The two left turn lanes will almost double the available storage between the two intersections, providing approximately 600 feet of available left turn lane storage. Additionally, to address the queuing and operational issues along France Street, the recommendation includes implementing minor widening along France Street to provide a two lane eastbound approach with an exclusive right turn lane and a through-left lane.

The addition of the right turn lane will facilitate additional right turn on red capacity and allow vehicles to more effectively stack at the intersection.

The implementation of these recommendations results in significant improvements in traffic conditions under the projected 2030 travel demand. A review of the West Street intersection indicates that the intersection will operate at LOS D during both the morning and afternoon peak hours. In addition, the France Street intersection exhibits significant improvements and is anticipated to function at LOS B during both peak hours.

The recommendations described above are illustrated in Figure 4-5.

In an effort to provide an interim solution to help address France Street operational issues, it is recommended that France Street be widened to provide a two lane approach, consisting of a shared left-through lane and an exclusive right turn lane. This will not mitigate the existing Cromwell Avenue queuing issues experienced in the morning peak hour at West Street, but will improve traffic operations for right turns out of France Street during the afternoon peak and other off-peak periods when Cromwell Avenue traffic volumes are lower. The interim plan for France Street is illustrated in Figure 4-4.

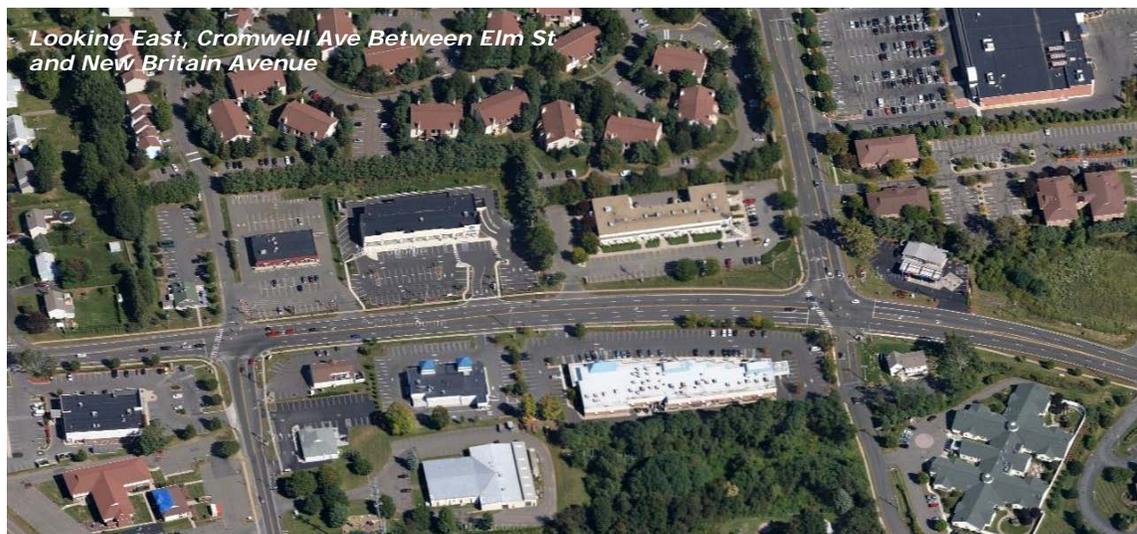
#### **Potential Impacts and Constraints**

The recommended improvements may require the relocation of an existing utility pole line that exists adjacent to the west curb line in the grass strip between the sidewalk and the curb. The proposed widening will eliminate portions of the existing grass strip. The existing utility poles carry communications and electric services.

To minimize impacts, during design it is recommended that consideration be given to reducing the travel lane width to 11 feet in this segment of Cromwell Avenue.

#### 4.1.1.5 Route 160 Overlap Area (Elm Street to New Britain Avenue)

The segment of Cromwell Avenue at the north extent of the study area includes a section of State Route 160 that overlaps Route 3 between the intersections of Elm Street and New Britain Avenue. Route 160 is an east west state highway that begins on the east end at Main Street in Glastonbury and extends west across the Connecticut River via a ferry through the Town of Rocky Hill and continues to the west into Berlin before terminating at the intersection with the Berlin Turnpike (Route 15). Within the study area some of the heaviest volumes are carried on the overlap of the two state routes as regional trips from all directions converge on this segment of the roadway. The anticipated future traffic volumes will result in failing operations at both New Britain Avenue and Elm Street during the afternoon peak hour. Further contributing to the operational deficiencies are the queue lengths that will occur at both the Elm Street intersection and the New Britain Avenue intersection, primarily the southbound left turn onto Elm Street and the northbound left turn onto New Britain Avenue. Extensive queues that potentially block the upstream intersections under 2030 traffic volumes may occur without the implementation of improvements.



Also of concern at the New Britain Avenue/Cromwell Avenue intersection, are the lengthy current and future eastbound queues, especially during the afternoon peak hour. Current queues have been reported to impact numerous driveways along both sides of New Britain Avenue. Rocky Hill Fire Department Station 2 is located approximately 500 feet west of the intersection, and queues have been reported to extend across their driveway raising significant safety and emergency response time concerns.

This segment of Cromwell Avenue is the most built-up section of the corridor with strip retail development along both sides of the street and numerous curb cuts serving the developments. A review of collision data indicated that this section of Cromwell Avenue experiences a higher rate of crashes than expected when compared to statewide data and warrants review and possible mitigation. To address safety concerns the implementation of access management policies is recommended. The result is a recommendation that strives to reduce the number of driveways, and provide inter-parcel connections between adjacent properties, allowing patrons to enter Cromwell Avenue at signalized locations via side streets instead of at unsignalized driveways.

Route 160 in the project area appears on CRCOG’s 2008 Regional Bike Plan as an On Road Bike Route and on the State’s bike map as one of only a handful of bicycle Cross-State Routes. However, along most of this segment, shoulder widths of between 1 and 2 feet are too narrow to adequately accommodate cyclists.

**Recommendations**

Physical improvements are needed to address the operational deficiencies, including mitigating projected delay and congestion, along this segment of Cromwell Avenue. Specifically, the cross section of Cromwell Avenue needs to be widened by one full travel lane between the intersections. This additional lane will serve as left-turn storage for southbound traffic at the Elm Street intersection and northbound traffic at the New Britain Avenue intersection. At Elm Street, the southbound approach will include two through lanes and two left turn lanes. At New Britain Avenue, the northbound approach will provide two left turn lanes and one through lane. Under this improvement scenario, travel lanes should be reduced from 12 feet to 11 feet and minimal shoulders provided in order to minimize the potential effect on adjacent development.



Elm Street also needs to be widened to facilitate the southbound double left turn from Cromwell Avenue onto Elm Street. The improvement provides an additional eastbound travel lane to accept the two southbound left turning lanes. The section of Elm Street between Cromwell Avenue and the Big Y shopping plaza driveway will be increased by one eastbound lane to provide a four lane cross section. The two eastbound lanes should extend through the Big Y center driveway before transitioning back to one eastbound lane across the Big Y plaza frontage. The traffic signal at the Big Y main driveway will be modified to facilitate the revised eastbound lane geometry, which will include an exclusive left into the residential complex and two through lanes, with the right hand through lane facilitating right turns into the Big Y plaza.

Similar to the improvements along Elm Street, New Britain Avenue also requires physical improvements to accommodate the northbound double left turn from Cromwell Avenue. The segment of New Britain Avenue between Cromwell Avenue Haynes Road will be expanded to provide two westbound lanes, connecting to the two lanes at Haynes Road. The widening should be balanced within the



existing roadway right of way, which may require alignment adjustments to mitigate the potential impacts to the parking areas serving the commercial developments along the north side of the street.

In addition to the improvement for westbound traffic, the exclusive right turn lane approaching Cromwell Avenue in the eastbound direction is recommended for lengthening. To better accommodate the right turn traffic volumes, the right turn lane should be extended to the extent possible without impacting adjacent development. These improvements, along with the other recommended intersection capacity improvements will also reduce the problematic New Britain Avenue queuing from the intersection to the west. In addition it is recommended to coordinate with Rocky Hill Fire Department regarding the potential for hardwired fire pre-emption from Station 2 to the nearby signalized intersections.

The Town of Rocky Hill has been installing in-fill sidewalk and as new development has occurred. Sidewalk has been installed such that the pedestrian infrastructure along Elm Street, Cromwell Avenue, and New Britain Avenue is nearly continuous along both sides of each roadway. The remaining section of missing sidewalk along the south side of Elm Street along the gas station frontage and extending to the south along Cromwell Avenue to the medical office building should be installed during development or as funding becomes available. The comprehensive recommendations for the area including Elm Street, Cromwell Avenue, and New Britain Avenue are illustrated in Figure 4-6A and Figure 4-6B.

The recommendations improve pedestrian accommodations and address existing and future motorist traffic issues. Bicycle improvements were also considered for this segment, however due to impacts resulting from their accommodation, a specific recommendation could not be agreed upon. It is recommended that opportunities to provide bicycle accommodations from Elm Street to New Britain Avenue continue to be explored during design of these improvements. A lower impact accommodation may involve the extension of the multi-use trail along either a roadside or off-road alignment from the north end of the new Elm Street Connector Roadway to New Britain Avenue, however no acceptably low-impact alignment was identified during these study efforts.

### **Potential Impacts and Constraints**

The scope of the improvements is extensive and therefore there are several potential impacts that may result from the implementation of the recommended improvements. One concern identified during the public outreach process involved the potential for impacts resulting from widening to accommodate additional travel lanes. Of specific concern were impacts to commercial developments along Cromwell Avenue and Route 160. To address these concerns, the recommendations include the reduction of travel lane widths in these areas from 12 feet to 11 feet. These lane width reductions will reduce required widening by four feet along Route 160 and five feet along Cromwell Avenue, which is critical due to the close proximity of the parking areas to the existing curb line.

The topography alongside Cromwell Avenue exhibits an elevation change along the west side of the roadway, where the existing parking lot for the Cold Spring Plaza is retained by a steep fill slope that meets at the back of sidewalk. Avoiding impacts to the existing parking area by limiting the majority of the widening to the east side of Cromwell Avenue will be critical. The recommended widening along Cromwell Avenue may require acquiring additional right of way from adjacent property owners. During the preliminary engineering phase, design quality survey should be obtained and reviewed relative to

the scope of the recommended improvements to identify the most appropriate alignment of Cromwell Avenue. Efforts should be made to minimize both property taking and physical impacts to adjacent commercial sites and parking. Locations of potential retaining walls can be determined at that time to minimize impacts as appropriate.

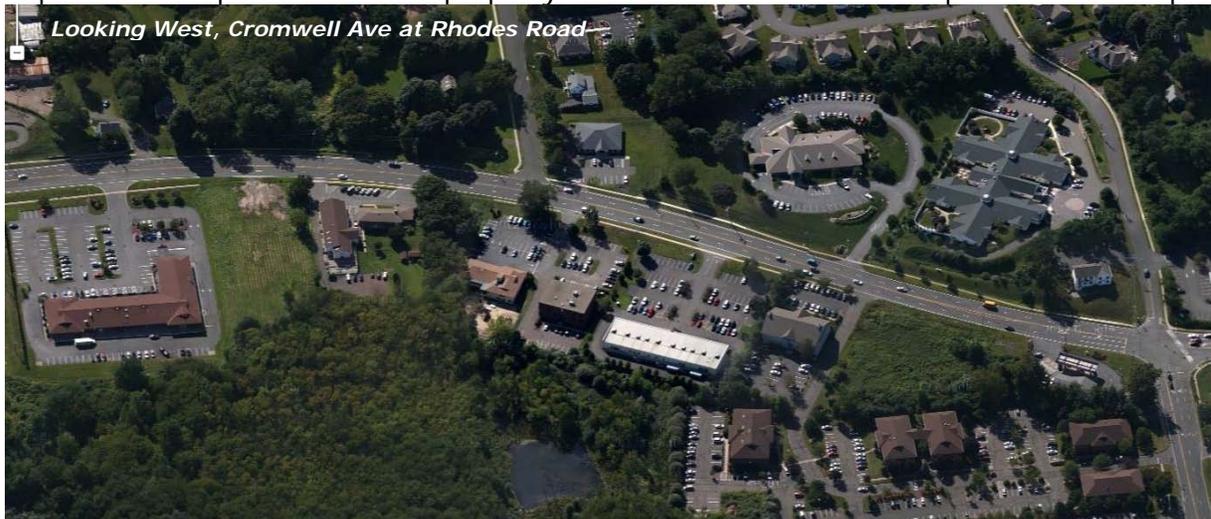
#### 4.1.1.6 Access Management Recommendations

The ability to manage, modify, and control driveway access, and plan for future access along a corridor can provide significant benefits to the operational characteristics of a roadway system. Access Management is the proactive management of vehicular access points to land parcels adjacent to roadways. Good access management encompasses a set of techniques that state and local governments can use to control access to highways, major arterials, and other roadways. Fewer driveways spaced further apart allows for more orderly merging of traffic and presents fewer challenges to drivers. Additionally, back access roadways and vehicular connections between adjacent parcel parking lots allows for trips between parcels and potentially access to side streets without entering the main roadway.

Within the study area, there are two key areas that exhibit a need for implementation of access management principles. The first segment exists along the east side of Cromwell Avenue between Elm Street and Rhodes Road. The second area is along Cromwell Avenue between Elm Street to New Britain Avenue.

### Recommendations

Existing land uses along the east side of Cromwell Avenue between Elm Street and Rhodes Road include small commercial developments including offices, a daycare facility, and medical facility. There are four existing buildings served by three curb cuts opposite and just north of Rhodes Road. The two southerly sites share one driveway and a common parking lot. The two sites located to the north each have one driveway on Cromwell Avenue. It is recommended that the Town work towards the creation of inter-parcel connections between these sites, and realignment of the southernmost driveway access opposite Rhodes Road. The recommendation will accommodate trips between parcels and potentially to Cromwell Avenue via a potential future signalized intersection at Rhodes Road. Implementation of access management measures in this area would require the cooperation of the property owners or town efforts if parcels redevelop.



The second area where implementation of proactive access management would increase safety and provide improved traffic operations for patrons is the area of Cromwell Avenue from Elm Street to New Britain Avenue. Currently there are six existing driveways on this short section of Cromwell Avenue, servicing six commercial establishments. A review of the existing conditions indicated that the Town has taken steps to encourage the application of access management without infringing on the property owners right to access to the public street. One successful application of access management includes the inter-parcel connection between the two strip plazas along the west side of Cromwell Avenue. This connection provides patrons at both sites access to the existing traffic control signal located at the intersection of Elm Street Extension, Elm Street, and Cromwell Avenue. The opportunity to extend the connections between the convenient store and package store to the north of these sites would provide complete access between all of the sites along the west side of Cromwell Avenue. Full inter-parcel connectivity should remain the Town's goal. Full implementation will provide patrons with access to side streets, providing opportunity to make turning movements onto Cromwell Avenue at a signalized location rather than at unsignalized site driveways.



#### **Potential Impacts and Constraints**

The ability to implement access management principles has historically been driven by the local site plan approval process. Proactive involvement by Town staff to help property owners seek inter-parcel connections, combine or consolidate existing driveways, and better align proposed driveways with existing locations has historically been a challenging process. The ability to implement good access management principles along this section of Cromwell Avenue is important to the future traffic conditions and access to the commercial parcels.

## 4.1.2 West Street (SR 411) Recommendations

### 4.1.2.1 I-91 Interchange Area (Corporate Place to Capital Boulevard)

The I-91 interchange area serves as a hub for local and regional traffic within the study area connecting roadways classified as local, arterial, and expressway. Under current conditions, the interchange operates at acceptable Levels of Service during the peak periods. However, as forecast traffic volumes materialize, operating conditions in the interchange area will deteriorate and physical improvements will be required to address the poor operating conditions expected to occur by the year 2030. Without improvements, the intersections of West Street with the I-91 southbound ramps, the I-91 northbound ramps, and Capital Boulevard are expected to operate at a poor LOS E during the morning peak period under 2030 traffic conditions. In the afternoon peak, the intersections with I-91 southbound ramps and the intersection with Capital Boulevard is also anticipated to operate at LOS E.



During the review of existing conditions, crash data indicated that the intersection of West Street and the I-91 southbound ramps experienced a higher number of incidents than expected when compared to statewide data and should be evaluated for safety improvements. The primary movement causing the high incident rate is the left turn movement from westbound West Street onto the southbound ramp.

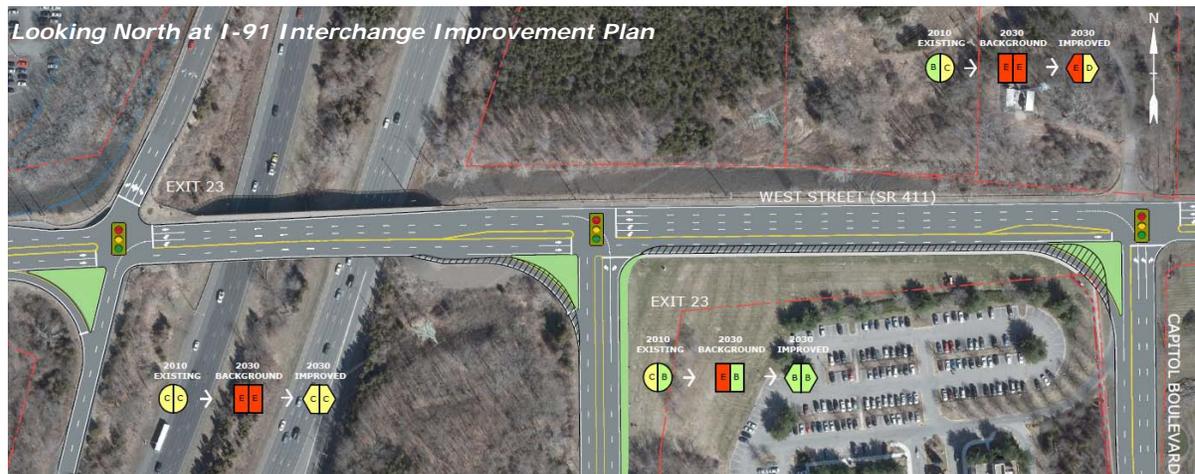
The West Street bridge over I-91 is a relatively new structure, and ConnDOT has indicated that preserving the existing bridge should be a priority for any recommendation. Therefore, the existing bridge was held as a design control for recommended improvements in the interchange area.

### Recommendations

In order to address safety and forecasted operational issues at the interchange, roadway improvements are recommended along West Street, on the southbound I-91 entrance ramp, on the northbound I-91 ramp, and on Capital Boulevard. The improvements also require reconfiguration of the lane use along westbound West Street at the I-91 southbound ramps.

At the intersection of West Street and the I-91 southbound ramps, the poor operations are attributable to heavy left turn volumes. In order to increase the capacity for left turn traffic, the westbound approach lane use is recommended to be modified. Currently, the approach provides a single left turn lane and two through lanes. The recommended arrangement is a single through lane and a double left turn onto the southbound ramp. This recommended double left will require physical improvements on the entrance ramp

to receive the two lanes of traffic. This will require minor widening along the west side of the on-ramp to provide a two lane wide section extending from West Street to beyond the yield merge with the turning roadway carrying traffic from eastbound West Street. The two lanes are transitioned back to a single lane prior to the merge with I-91 southbound such that only one stream of traffic will be entering the freeway. Once implemented, the double left turn onto the ramp will only operate under a protected signal phase. This protected-only operation will help mitigate the existing intersection safety issues.



The improvements recommended for the intersection of West Street and the I-91 northbound ramp are similar to those proposed at West Street's intersection with the I-91 southbound ramps. Again, the recommended plan includes modifying the lane geometry on the westbound approach to provide a double left turn onto the I-91 northbound entrance ramp. The revised lane geometry requires modifications to the existing ramp in the form of physical widening to accommodate receiving traffic from the two left turn lanes, with minor widening and realignment proposed for the turning roadway. Additionally, in order to process the through traffic, two westbound through travel lanes are needed on West Street. Providing a four lane westbound approach at the intersection requires minor West Street widening between Capital Boulevard and the I-91 northbound ramps.

At the intersection of West Street and Capital Boulevard, an increase in the turning radius of the channelized right turn lane into the development is recommended. This modification will increase the capacity of the turning roadway, allowing more efficient processing of vehicles into Capital Boulevard during the critical morning peak hour.

The recommendations for the interchange area are illustrated in Figure 4-7.

### Potential Impacts and Constraints

As noted, one of the critical design controls is the existing West Street Bridge over I-91. The recommended improvements have been devised in a manner that retains the existing structure without major modifications. With any future project phases, it will be critical to either avoid impacts to the structure or confirm the viability of recommendations that impact it in any way.

#### 4.1.2.2 West Street at Main Street (Route 99)

The intersection of Main Street, West Street, and Forest Street currently experiences poor traffic operations during the afternoon peak and is projected to experience failing traffic operations under future 2030 conditions. The cause is partially related to the existing offset West Street and Forest Street alignment that requires these roads operate under inefficient independent signal phases (split phasing). Based on a review of intersection traffic flows, the primary intersection turning movements are between West Street and the northern leg of Main Street, including West Street left turns onto Main Street and southbound Main Street right turns onto West Street. Sidewalks are currently only provided along the northwest corner of the intersection.



#### Recommendations

The recommended improvements at this intersection include physical modifications to both West Street and Forest Street to align the roads opposite each other and form a conventional 4-leg intersection with Main Street. In addition to the realignment, exclusive left turn lanes are proposed to be added on the West Street and northbound Main Street approaches, and an exclusive right turn lane is proposed to be added on the southbound Main Street approach. These recommendations will improve traffic operations in the 2030 morning and afternoon peak periods to acceptable LOS to B and C, respectively. Without improvements the intersection is projected to operate at a tolerable LOS D and a failing LOS F in the 2030 morning and afternoon peak periods.

To improve pedestrian facilities in the area, the installation of sidewalks is recommended on both sides of Main Street and both sides of Forest Street.



Consistent with the Study Bicycle Facilities recommendations (Section 4.1.6.2) a minimum shoulder width of 5 feet is recommended along Main Street through the intersection.

The intersection recommendations appear in Figure 4-8.

**Potential Impacts and Constraints**

The recommended improvements may result in impacts to private property along the north side of Forest Street and south side of West Street in the realignment areas. During the development of the concept plan, attention was given to the proposed roadway realignments in relation to the location of the existing street lines to minimize impacts. However since the property line information is based on available Town GIS data, the identified impacts are approximate and appropriate for study use only. The alignment should be reviewed and adjusted as necessary during design to minimize the rights of way acquisition requirements.

The realignment of West Street to the south will require the relocation of one utility pole with apparent significant utilities. A review of the pole and facilities carried on it indicates that it may function as a junction pole for several utility services, including communications, in addition to secondary and primary electric services. The pole also serves as one of the connection locations for the existing span wire supported traffic control signals. The recommended realignment of West Street will require relocation of this utility pole and may impact adjacent utility poles.

### 4.1.3 Brook Street Recommendations

Brook Street currently serves two distinct land uses with primarily light industrial and commercial uses located west of Henkel Way and residential areas located to the east of Henkel Way. During the Public Outreach process, the Study Team heard several times of the desire to better separate the traffic associated with the vastly different uses. Specifically, the residents along Brook Street do not want tractor-trailer traffic from industrial sites along Brook Street using the residential section of the corridor, consistent with existing signage prohibiting heavy vehicles from this portion of Brook Street. Residents and town staff also noted that travel speeds were high and measures to reduce travel speeds should be reviewed. Finally, the residents that live along Brook Street expressed a need for additional pedestrian and bicycle accommodations. The recommendations proposed along Brook Street seek to enhance the character of Brook Street in the residential areas.

#### 4.1.3.1 Henkel Way Intersection Improvements

The intersection of Henkel Way and Brook Street currently operates with the Henkel Way approach under stop sign control and Brook Street under free flow. Based on the 2030 future traffic operations analysis, the intersection is expected to fail during the afternoon peak hour, coincident with the departing traffic from the Corporate Ridge commercial offices to the north. From a land use perspective, this intersection delineates the transition from the mainly commercial and industrial uses to the west, and a residential neighborhood to the east. The use of the residential section of Brook Street by commercial traffic has been an ongoing issue with the residents, and the Town has taken steps to discourage truck traffic east of the intersection.



*Looking North, Brook Street at Henkel Way*

#### Recommendations

The recommendation primarily involves converting the existing stop sign controlled intersection into a modern roundabout. The roundabout is anticipated to improve operations to a LOS B under future 2030 traffic volumes. Also, the design of the roundabout provides the ability for vehicles to make a U-turn within the circulating roadway. It is recommended that signage encouraging trucks to make a U-turn at the roundabout be placed on the eastbound approach to the intersection, as the Town prefers that heavy vehicles utilize Cromwell Avenue to travel to and from the industrial section of Brook Street.



*Brook St at Henkel Way Roundabout*

The roundabout also provides traffic calming and the opportunity to serve as a gateway to the residential neighborhood. Modern roundabouts are designed for low travel speeds and have demonstrated to effectively reduce vehicular speeds. The center island can be

decoratively landscaped with plantings or other treatments to provide a pleasing gateway between the commercial and residential areas.

The recommendation includes the installation of sidewalk along the edges of the roundabout to connect existing sidewalk infrastructure to the east and west. It is recommended that the roundabout feature pedestrian crosswalks across the Henkel Way approach leg and provide one crosswalk across Brook Street, on the west side of the roundabout intersection.

The Brook Street at Henkel Way recommendations appear in Figure 4-9.

#### **Potential Impacts and Constraints**

The reconfiguration of the intersection into a modern roundabout is anticipated to require minor right of way acquisition from the corners of parcels located immediately to the northeast and northwest of the existing intersection. Additionally, the roundabout should be situated to provide sufficient roadway setback to the house located on the south side of Brook Street across from Henkel Way; based on the approximate study level property line mapping, property acquisition may not be necessary.

A review of the utilities in the area indicate that the utility pole line located along the north side of Brook Street will likely be impacted by the construction of the roundabout and that at least two utility poles will require relocation. Based on a visual review, the existing poles appear to carry several communication facilities in addition to secondary and primary power.

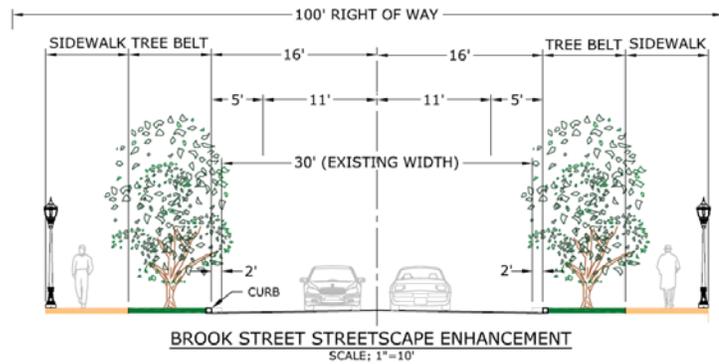
#### **4.1.3.2 Streetscape Enhancements Main Street to Henkel Way**

During the public outreach process, the Study Team heard several times that the roadway in the Brook Street residential area could be enhanced to reflect the neighborhood setting, that travel speeds were high, and that the street lacked the infrastructure to adequately accommodate all modes of travel.



### Recommendations

The plan to improve the residential section of Brook Street includes both roadway and pedestrian improvements to create a street that accommodates multiple transportation modes, encourages lower travel speeds and enhances neighborhood character. The existing Brook Street cross section is approximately 28' wide. The



recommended cross section will widen the road to 32' wide to provide 11' travel lanes and 5' wide shoulders, the minimum width recommended to serve as a bike travel lane. Additionally, in-fill sidewalk installation along both sides of Brook Street is recommended to better accommodate pedestrian traffic along both sides of the street. Finally, the recommended improvements includes the installation of street trees adjacent to the roadway as an aesthetic treatment, a visual barrier along the roadway, and to further enhance the neighborhood setting. At the discretion of the Town, the installation of pedestrian level street lighting is also recommended. Pedestrian street lights are typically 10 to 12 feet above the sidewalk area and are intended to illuminate the pedestrian walkway. A determination regarding the inclusion of pedestrian level lights can be made by the Town during the implementation phase of an overall streetscape enhancement project.

The recommended Brook Street Streetscape improvements appear in Figure 4-10. Although not specifically endorsed as part of the study, consideration should be given during design phases to the viability providing narrower 10 foot wide lanes and designating the 5 foot shoulders as bike lanes.

### Potential Impacts and Constraints

The landscape/enhancement plan has little in the way of potential impacts and constraints for implementation. The existing Brook Street right of way and generous residential setbacks can easily accommodate the recommended improvements. Utility poles exist along the south side of Brook Street and any widening improvements should be implemented in a manner that considers impacts to these facilities.

## 4.1.4 Recommendation for Future Local Roadway

### 4.1.4.1 Elm Street Connector Roadway

One of the goals of the Town is to preserve mobility and provide acceptable traffic operations in the Study area. In addition to opportunities to make improvements to the existing roadway network, additional alternate local roadway corridors were investigated. New roadway links can help better distribute traffic volumes in the study area, provide beneficial missing links in the system, and facilitate opportunities to enhance facilities for alternative modes of travel away from the primary arterials within the study area. The Elm Street Connector recommendation provides a new north-south link between West Street and Elm Street that accommodates multiple travel modes.

#### Recommendations

There are currently only three north-south links between Elm Street and West Street within the study area: Cromwell Avenue, Gilbert Street, and Main Street. The proposed improvement includes the establishment of an additional north-south link in the form of a new Town road, termed the Elm Street Connector, between Elm Street and West Street along the west side of I-91.

Currently, the Corporate Place roadway serves as the site driveway and circulating roadway for an office building complex located on the west side of I-91. Based on information provided by the Town of Rocky Hill, Corporate Place is an existing Town roadway. The recommended improvement proposes to extend Corporate Place to the north to intersect with Elm Street adjacent to the Big Y Plaza and the tennis center, providing a new north-south Town roadway.



Based on discussions with Town Staff, the future corridor for this roadway will most likely be constructed through the redevelopment process of the large industrial site located to the north of the Corporate Place office park. This parcel is well situated for redevelopment in the future and the Town has indicated that there has been interest in redeveloping the site. Under a redevelopment scenario, when a developer is preparing site plans, the development plan should include the establishment of a new Town of Rocky Hill roadway right of way that will facilitate the Elm Street connector. A conceptual layout and typical sections are provided in Figure 4-11. The alignment should be refined during the site planning process, with design and review requirements potentially dictated by Town staff. The future roadway should accommodate, at a minimum, a sidewalk along the east side of the roadway, connecting to the sidewalk on the east side of the existing roadway in Corporate Place. It is recommended that the new roadway also provide accommodations for bicycle traffic, either through the creation of a multi use path or through provision of a minimum 32 feet wide roadway cross section that provides 11 foot travel lanes and 5 foot wide shoulders to accommodate bicycle traffic.

Once the connector is built, it is recommended that the lane use at the signalized Corporate Place approach to West Street be modified to include double left turn lanes

and a shared through and right turn lane. A traffic control signal is recommended at the north end of the connector roadway where it intersects with Elm Street. The recommended northbound lane arrangement includes a two lane approach with an exclusive left and exclusive right lane. In addition, an exclusive right turn lane and a through lane are recommended on Elm Street's eastbound approach to the intersection. The exclusive right turn lane will operate as the eastbound lane drop from the two lane section recommended to the west. The westbound approach should provide a left-through lane with enough room to facilitate a bypass maneuver around a vehicle waiting to make a left turn onto the connector roadway.

The Town or Rocky Hill is currently engaged in a site planning process with a prospective developer seeking to develop the vacant land located directly across West Street from Corporate Place. One proposed site driveway for the mixed use development aligns with the Corporate Place intersection. As one of the elements of the development, a multi-use path has been discussed traversing the site and connecting from West Street at this signalized location to Cromwell Avenue almost a quarter mile to the south. Ideally, a multi-use path along the west side of the development drive to West Street would connect via crosswalk at the signal to a multi-use path along the west side of the Elm Street connector.

#### **Potential Impacts and Constraints**

There is no public land north of Corporate Place for the Elm Street Connector. It is recommended that the Elm Street Connector be a public road, requiring the establishment of a town right of way. This could be accomplished in coordination with the redevelopment of the large industrial parcel. Establishment of the right of way and construction of the recommended facilities could be achieved through a partnership with the developer.

#### 4.1.5 Rhodes Road Area Recommendations

The intersection of Rhodes Road and Cromwell Avenue was the subject of many comments and significant interest from the Town of Rocky Hill and residents that live in Rhodes Landing adult community located on Rhodes Road. The interest stemmed from Town and resident inquires and requests to the Office of the State Traffic Administration (OSTA) and the Connecticut Department of Transportation to have a traffic control signal installed at the currently unsignalized intersection of Rhodes Road and Cromwell Avenue. This signal request had been denied prior to the initiation of this study based on the State's determination that a traffic control signal does not meet the warrants as defined in the Federal Highway Administration publication the *Manual on Uniformed Traffic Control Devices*. The traffic control signal warrants generally utilize recent traffic flows and crash history at an intersection to determine if a signal is needed to provide safe and efficient traffic operations. A review conducted under this Study indicates that a traffic control signal is still not warranted at the intersection of Rhodes Road and Cromwell Avenue.

#### Recommendations

Rhodes Road was planned and designed to provide future access to the undeveloped area located to the west via the end of Rhodes Road. In addition, during the last decade, a small bank development was proposed along Cromwell Avenue adjacent to Rhodes Road. This study considers traffic to a future design year of 2030, and a number of



factors are expected to contribute to significant increases in intersection traffic by that time. Among them are the potential extension of Rhodes Road to the west, the potential for development along Cromwell Avenue and in and around the study area in general, and projected increases in regional traffic. Therefore, with future increases in traffic volumes, the intersection of Rhodes Road may someday meet the minimum traffic signalization warrants. It is recommended that the Town of Rocky Hill continue to pursue the installation of a traffic control signal at this intersection by monitoring intersection traffic volumes and collision counts and review them against traffic signal warrant criteria. Once warrants have been determined to be met, a traffic control signal can be applied for and potentially approved by OSTA and ConnDOT.

Potential alignments for the extension of Rhodes Road to the west are shown in Figure 4-12.

## 4.1.6 Recommendations for Alternative Modes of Travel

### 4.1.6.1 Pedestrian Facilities

#### Sidewalk Recommendations

Recommended improvements to pedestrian facilities are focused on substantially improving sidewalk connectivity within the study area. The corridors prioritized for such improvements include Cromwell Avenue, Elm Street, West Street, and Brook Street (see Figure 4-13). While sidewalks currently exist on these roadways, the network is not contiguous. Approximately 6 miles (32,000 linear feet) of sidewalks are envisioned for installation to complete the sidewalk network within the Study Area. The quantities per corridor are as follows:

- Elm Street: 5,400 lf (linear feet)
- Elm Street Connector: 3,200 lf
- Town Center West: 1,700 lf
- Cromwell Avenue: 3,700 lf
- West Street: 5,900 lf
- Brook Street: 12,100 lf

Sidewalk improvements to Elm Street would require the existing Elm Street bridge structures over I-91 to be widened to accommodate at least one 6 foot wide sidewalk along the bridge's north side (the bridges currently lack sidewalks). The existing structures were constructed in 1965 and the bridges are currently classified as structurally deficient by ConnDOT. The addition of a sidewalk during rehabilitation of the structure would greatly benefit pedestrian connectivity on Elm Street and is recommended to be included in the next bridge improvement program. Based on the current condition of the bridges, improvement is likely needed within the study time horizon.

New sidewalks should be concrete, a minimum width of five feet, and separated from the curb line by a vegetative buffer where feasible, except along bridges.

#### Potential Impacts and Constraints

The potential impacts and constraints of sidewalk construction are primarily related to the physical space required for the sidewalks. Construction easements would likely be necessary as many of the roadsides have substantial grades that would require re-grading of private property to accommodate sidewalk facilities. Additionally, new sidewalks place the burden of maintenance of the sidewalk on the property owner, often resulting in resistance to sidewalk proposals by adjacent property owners.

### Crosswalks

A total of twenty five crosswalks would be needed to connect existing and proposed sidewalks (see figure 4-13). Several side-streets are among the locations where new crosswalks are recommended. The new crosswalks are necessary upon construction of new sidewalks leading up to an intersection. The most critical crosswalks would be those at intersections with Cromwell Avenue. While most proposed crosswalks would be contingent upon the installation of sidewalks, crosswalk improvements would be immediately beneficial at the following locations:



*Typical bar style crosswalk markings.*

- Cromwell Avenue at France Street (no existing crosswalks)
- Cromwell Avenue at West Street (no existing crosswalks)
- Cromwell Avenue at West Side Market (no existing crosswalks – install during development of proposed site at Cromwell Avenue and West Street)
- Cromwell Avenue at Cold Spring Road (no existing crosswalks)
- Cromwell Avenue at Inwood Road

These locations would require the installation of crosswalk pavement markings, ADA accessible curb ramps, and pedestrian actuated buttons and signal heads. New sidewalk would also be required at several of these intersections.

Additionally, crosswalks along Main Street should be upgraded via construction of curb ramps leading to signal buttons and installation of pedestrian signal heads.

### Potential Impacts and Constraints

The introduction of marked and signalized crossings is, for the most part, constrained to locations where sidewalks are present. The potential impact of crosswalk installation is minimal, with pedestrian crossing times at signalized intersection causing a slight delay to traffic and only when signal heads are actuated by pedestrians. Given the current low level of pedestrian activity in the study area, it is not anticipated that additional crosswalks and pedestrian signals at intersections would cause significant delay.

**Multiuse Pathway**

In response to local concerns regarding pedestrian and bicycle connectivity between the Cold Springs Road area and Elm Street, a multi-use pathway is recommended on the east side of Cromwell Avenue between Cold Spring Road and the proposed Town Center West Development (see figure 4-13 and 4-14). This pathway would accommodate both bicyclists and pedestrians, thereby providing an off-street facility for bicyclists on this section of Cromwell Avenue. The multi-use pathway would be a 10 foot (minimum) wide asphalt surface that would connect to a similar multi-use path within the Town Center West development, which would then connect to Elm Street via the new Elm Street Connector. Pedestrian and bicycle accommodations will be provided on the Elm Street Connector either by continuing the multi-use path or providing a combination of sidewalks and 5 foot shoulders.



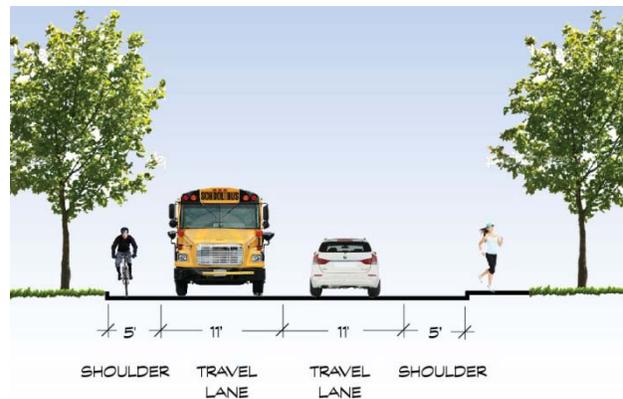
**Potential Impacts and Constraints**

The use of this type of facility is generally limited to areas that have few curb cuts, thereby constraining the use of pathways to rural, industrial, or non-retail commercial areas. A multiuse path has a cross-section that is twice the size of the typical sidewalk and therefore has a greater impact upon properties adjacent to its construction. The proposed locations for the multiuse path are adjacent to or travel through proposed redevelopment areas and the construction related impacts could therefore be minimized in the process of site development/redevelopment. Given the size of these facilities, a maintenance agreement is often necessary between the municipality and adjacent private property owner to ensure adequate seasonal maintenance of the pathway.

**4.1.6.2 Bicycle Facilities**

Bicycles can be best accommodated on four corridors within the study area (see figure 4-14). These corridors include Elm Street, the Elm Street Connector, Main Street, and Brook Street. On each of these routes, bicycles would be accommodated via a 5 foot wide shoulder and bike route signage or along a multi-use pathway.

The proposed roadway improvements of Brook Street and the Elm Street Connector were described in previous sections and allow for the accommodation of bicycles within a 5 foot wide shoulder or along a multiuse pathway.



*Typical roadway section with five foot shoulders*

While Main Street varies in width, most of the roadway within the study area can accommodate bicycles within the existing shoulder. To better accommodate bicyclists along Main Street, it is recommended to conduct roadway widening to provide a minimum 32 foot wide travelway (11 foot lane and 5 foot shoulder widths). In general Main Street's width exceeds 32 feet, however isolated "pinch-point" areas of substandard width do exist and will need widening. One impediment to this widening is the structure which carries Main Street over the Hog Brook approximately 1000 feet north of West Street. The bridge currently has two 12 foot lanes with 2.5 foot wide shoulders within a 29 foot curb-to-curb width. These shoulder widths do not comply with ConnDOT design criteria for an urban minor arterial (4'-8' right shoulders), and the total width of 29 feet over the bridge is significantly less than the 36 foot provided on its approaches. A 2011 bridge inspection report indicates that the bridge was constructed in 1922 and is currently structurally deficient and functionally obsolete. To better accommodate cyclists and match the existing approach widths, it is recommended that a 36 foot wide roadway cross-section (with minimum 6 foot wide shoulders) be provided at this bridge when it is rehabilitated or reconstructed.

Elm Street varies in width between 24 feet and 30 feet and would therefore require widening of 2 feet to 8 feet along the corridor in order to provide a minimum 5 foot wide shoulder alongside 11 foot travel lanes. It is recommended that the roadway be widened from Cromwell Avenue to Main Street to provide 11 foot travel lanes and 5 foot shoulders for a minimum cross section of 32' wide. The structures that carry Elm Street over I-91 southbound and I-91 northbound provide an impediment to this recommendation. Elm Street is currently 30 feet wide (12 foot lanes with 3 foot wide shoulders) which does not meet ConnDOT design criteria for an urban minor arterial (11'-12' lanes and 4'-8' wide shoulders). The 2010 bridge inspection reports indicate that both bridges were constructed in 1965 and that both are currently categorized as structurally deficient. It is recommended that when they are rehabilitated or reconstructed, the bridges be widened to provide for two 11 foot lanes, two 5 foot wide shoulders, and one 6 foot wide sidewalk.

Within the study area, Route 160 appears in CRCOG's 2008 Regional Bike Plan as an On Road Bike Route, and on the State's bike map as one of only a handful of bicycle Cross-State Routes. The recommendation to provide 5 foot wide shoulders along Elm Street addresses the bicycle access issues along much of the route. However, within the study area there is still a need for improved bicycle accommodations along Cromwell Avenue between Elm Street and New Britain Avenue. Bicycle improvements were considered for this segment, however due to resulting impacts consensus was not reached on a specific recommendation. It is recommended that opportunities to provide bicycle accommodations from Elm Street to New Britain Avenue continue to be explored during design of the recommended Cromwell Avenue improvements. A lower impact accommodation may involve the extension of the multi-use trail along either a roadside or off-road alignment from the north end of the new Elm Street Connector Roadway to New Britain Avenue, however no acceptably low-impact alignment was identified during these study efforts.

Although not specifically endorsed as part of the study, during design of roadway widening for recommended 5 foot shoulders, consideration should be given to the viability of designating the shoulders as bike lanes.

### Potential Impacts and Constraints

The introduction of bicycle facilities in the form of 5 foot wide shoulders would have a minimal impact upon existing roadways that are currently 32 feet wide or more. Roadway sections of sufficient width may need to be re-stripped to accommodate a 5 foot wide shoulder. The potential impacts and constraints of accommodating bicycles are primarily related to construction that would be necessary in widening roadways to a minimum width of 32 feet. Construction easements would likely be necessary as many of the roadsides have substantial grades that would require re-grading of private property to accommodate additional roadway width.

#### 4.1.6.3 Transit Facilities

Bus shelters are recommended at two locations within the study area: at the southeast corner of the West Street and Capitol Boulevard intersection and on the south side of Elm Street west of Rose Hill. These shelters would provide a waiting area for CT Transit's Route 47 bus patrons and improve customer service. Proposed shelters should conform to the other bus shelters that have been installed in Town, similar to the one located near Town Hall. Typical Rocky Hill bus shelters have glass surrounds and architectural elements.



*Rocky Hill Bus Shelter*

Additionally, electric service can be run to a shelter or solar panels used to provide electricity to operate lights or other amenities in the bus shelter, such as information displays related to bus service times.

### Potential Impacts and Constraints

The installation of transit shelters is constrained to areas where sufficient right-of-way exists at the roadside to accommodate the shelter and waiting area. A maintenance agreement should be put in place between CT Transit and the municipality to ensure that the shelter and waiting area is kept litter-free, clear of snow in winter months, and in a state of good repair.