ROUTE 81 CORRIDOR STUDY
FINAL REPORT

February 2019

(with CTDOT Appendix from 12/31/2019)

TOWN OF CLINTON

RiverCOG
Lower Connecticut River Valley Council of Governments

FITZGERALD & HALLIDAY, INC.
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1.0 Introduction

1.1 Purpose of This Study

The purpose of the Route 81 Corridor Study is to proactively plan for current and long-range intermodal travel, economic development, and quality-of-life along Route 81 in Clinton, Connecticut. Based on public and stakeholder input, field data, existing plans, and design options that are acceptable to stakeholders, this study serves as a guide for future design and construction of improvements or projects within the corridor. The study also identifies opportunities for multimodal transportation along the corridor.

Several projects that are currently underway will impact the operation and character of Route 81 and will have the potential to adversely or positively impact the character of Clinton, particularly from a traffic, circulation, access management, and economic development standpoint. Examples include the potential redevelopment of the former Morgan School campus, the redevelopment of the former Unilever industrial facility, and the continued growth of Clinton Crossing as a retail entity. Each of these has significant potential to impact traffic operations and the character of Clinton.

This study presents a coordinated land use and transportation system plan for the Route 81 within the study area. Toward this end, the emphasis of the study will be on enhancing safety, maintaining traffic operations, and providing multimodal options along the Route 81 corridor. Priorities for the study will include: establishing a "complete street" within the study corridor and fostering sustainable "smart growth" economic development.

The study:

- Establishes a vision and goals and objectives for the corridor – both locally and regionally,
- Evaluates current transportation and land use conditions as well as future conditions and investigates opportunities to make improvements,
- Provides recommendations and priorities for transportation and land use that are aimed at achieving the corridor vision. These are used to create and test alternatives scenarios and establish a preferred scenario, and
- Provides a corridor improvement and implementation plan, including recommended improvements, cost estimates, time frame, potential funding sources, and engaged parties.

The study was funded by grants from the U.S. Department of Transportation, Connecticut Department of Transportation, and the Town of Clinton.

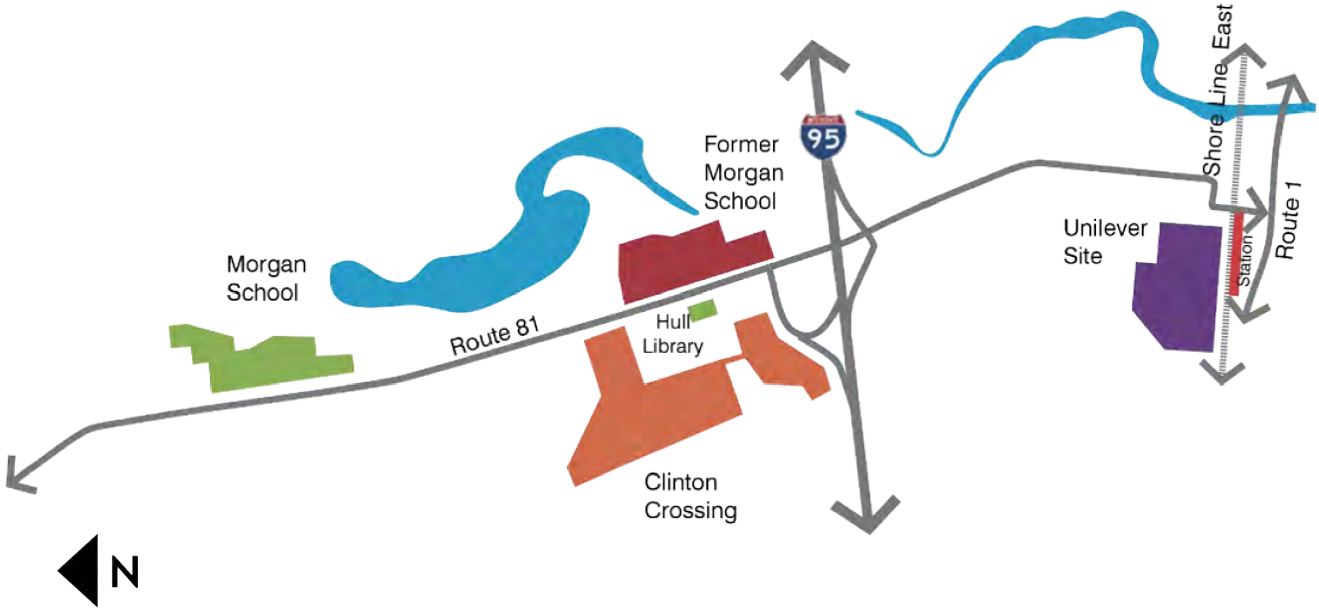


Figure 1.1: Study Area

1.2 Study area

The study area spans approximately two miles along Route 81 as shown in Figure 1.1 and connects Clinton Center to Interstate 95 (I-95) and points north into Killingworth. Route 81 (Killingworth & Haddam Turnpike) is a historical north/south link that serves local and regional mobility needs. Historically, this link connected farms and villages to the downtown; today the corridor provides a gateway into Clinton from exit 63 of I-95 and provides connections to Killingworth and Route 9. Just north of downtown Clinton, Route 81 makes an abrupt turn to traverse under the Amtrak owned Northeast Corridor Railroad bridge. This area is adjacent to the Clinton Shoreline East railroad station and the Unilever property.

1.3 Planning Context

The Lower Connecticut River Valley Council of Governments (RiverCOG) initiated this study to take both a local and regional look at the future of the corridor with respect to land use and transportation. The Town of Clinton has completed significant planning efforts that provide input and context into the development of this corridor plan. The Connecticut Department of Transportation (CTDOT) has also designed improvements and has commenced the construction process for improvements to the Clinton train station. A series of projects, studies, initiatives, and plans have been conducted over the past several years or are currently underway:

- Active development plans for the former Morgan School and Unilever sites
- Town of Clinton Plan of Conservation and Development – November 2015
- Boston Post Road Corridor Plan – November 2015
- Action Plan for the Historic Unilever Property and Area – September 2014
- Long-Range Facilities Assessment Study for Clinton Public Schools – October 2014
- Clinton Natural Hazards Mitigation Plan – 2013
- Commuter Rail Station Upgrades, 2018 construction bid documents/2019 construction start
- Safe Routes to School Masterplan; July 2011
- The Bike and Pedestrian Alliance of Clinton (BPAC) – Proposal for safer accommodation of bicyclists on state routes in Clinton

View north on High Street

2.0 Overview of the Corridor

The Study area begins at the intersection of U.S. Route 1, where Route 81 is named Hull Street. After an eastward turn, the street name changes to Central Avenue. The route then turns to continue north as High Street. North of Glenwood Road, Route 81 is named as Killingworth Turnpike.

Within this area is the Clinton Crossing Premium Outlet Mall. The mall is located on Route 81, just north of the Exit 63 interchange of I-95. It is located across from the vacant former Morgan High School; Morgan School is now located at the northern limit of the study area. Like other corridors in the town and region, Route 81 is experiencing development pressures associated with an area that has good highway access.

Based on the varied nature of the Route 81 Corridor, for the purposes of this study, the roadway was delineated into three unique segments:

- The northern segment of the corridor has a narrow right of way and is primarily residential. This area will be referred to as the "Gateway Residential Zone". This section of the corridor features mostly single-family homes, but it does have a small pocket of commercial uses at the Lantern Square Plaza and it is also the home of the newly constructed Morgan School.
- The middle segment of the corridor is home to the Clinton Crossing Premium Outlet Mall, Petco Plaza, the Henry Carter Hull Library, and vacant former Morgan School Property, will be referred to as the "Commercial Corridor". This section is zoned as business. This section of corridor has the greatest number of intersections and is where the Interstate 95 interchange is located.
- The southernmost segment of the corridor intersects with Route 1. This segment is the gateway into downtown Clinton and as such, will be referred to as the "Village Residential" segment due to its residential makeup and downtown character (see Figure 2.1).

Figure 2.1: Study Area Character

2.1 Southern Segment – Village Residential

The Village Residential segment of Route 81, between the intersection with Route 1 and North High Street is a narrow, tree lined roadway that has a continuous sidewalk along the east side of the roadway. This area of the corridor is mainly residential and connects the neighborhood to Clinton's downtown. Sidewalks in this segment of the study area are in fair shape, but show signs of cracking, heaving and vegetation encroachment. Sidewalks typically range in width from four to six feet but most segments are four feet wide. There is a grass buffer between the sidewalk and the road in this segment of the corridor. The buffer provides pedestrians a small degree of separation from passing vehicles. Additionally, there are many street trees within the grass buffer zone that also offer relief from the sun and aesthetic benefits. Utility poles with cobra head lighting are located on the west side of the roadway (sidewalks are on the east side) in this segment of the study area. Lighting is directed to the roadway not sidewalk areas.

There are few crosswalks within this section of the corridor. They are limited to the intersection of Hull Street and Central Avenue and the intersection of High Street with North High Street, where the I-95 ramps of Exit 63 are located. The crosswalk at the intersection of Hull Street and Central Avenue is long, lacks a refuge island, and has short sight-lines owing to the road's curvature. Drivers have limited sight of crossing pedestrians at this location.

The Unilever site is located at the southern end of this segment of Route 81. The property has been vacant since 2012 and has been proposed for redevelopment. The site is adjacent to the Clinton Train Station, which is served by the Shoreline East commuter rail service. The train station is a critical transportation link in the study area. Its location in proximity to the Unilever site is likely to be influential to development of the site.

There are two Amtrak bridges west of Clinton Station in the project area. One bridge passes over Hull Street (Route 81) and the other is used by pedestrians and provides a direct connection between High Street and Post Office Square. The vertical and horizontal clearance at this location is insufficient for vehicular travel, hence the "dog leg" curve of Route 81 as it shifts from High Street to Central Avenue and Hull Streets.

View north on High Street

View south on High Street, where roadway turns sharply to the west

View north on Hull Street, showing rail overpass

Figure 2.2: Southern Segment

2.2 Middle Segment-Commercial Corridor

The segment of the corridor between Walnut Hill Road and High Street is home to a wide variety of retail businesses, shopping plazas, and the Clinton Crossing Outlets. Additionally, the Henry Carter Hull Library and the vacant former Morgan School are located in this area. The school property has been targeted for mixed-use redevelopment, which could include a hotel, retail, and housing. This type of development would be a significant traffic generator, but it could provide opportunities to improve the pedestrian environment in this section of the study area.

This segment of the corridor has the highest traffic volumes, averaging between 10,000 to 16,000 vehicles per day. The roadway is nearly seventy-feet wide in this section, with multiple traffic lanes and turn lanes at signalized intersections. Sidewalks present in this segment, yet due to limited shoulders and landscape buffers, pedestrians walk in close proximity to traffic. Crosswalks are located on both sides of the street between Glenwood Road and just north of the Clinton Crossing driveway. North of the outlet driveway, the west sidewalk ends, and the east sidewalk continues to immediately north of Walnut Hill Road north.

Crosswalks are located at all signalized intersections and include pedestrian crossing signals. There are ramps at all crosswalks, but they lack tactile warning strips that are required by the Americans with Disabilities Act (ADA). There are long distances between intersections, requiring pedestrians to walk long distances to the nearest intersection to cross Route 81.

View of one-way exit at Clinton Crossing Outlets South

View of Petco Plaza shopping center

View of vacant former Morgan School

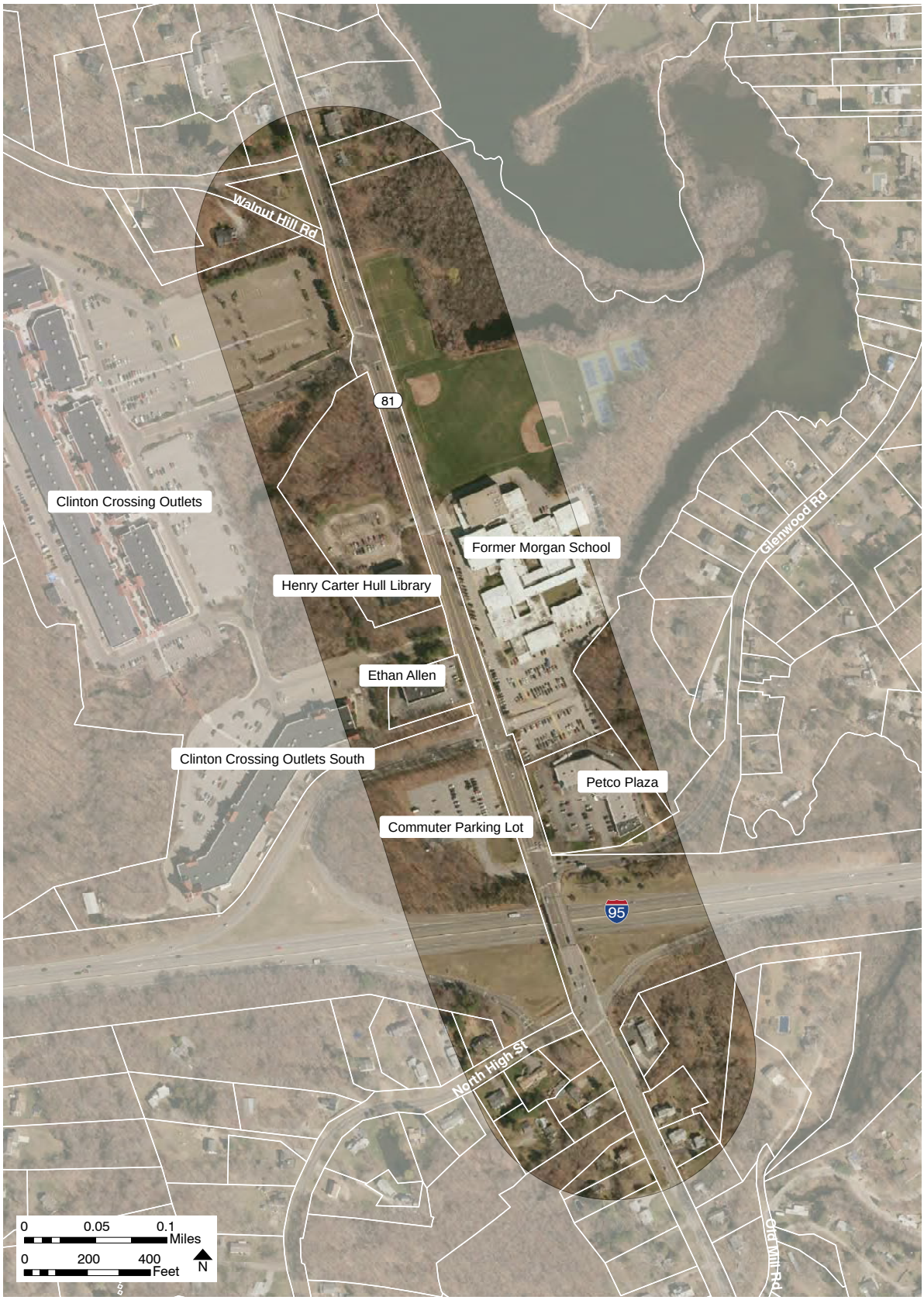


Figure 2.3: Middle Segment

2.3 North Segment- Gateway Residential

North of Walnut Hill Road, the roadway is relatively narrow with one lane of traffic in each direction. The roadway, less than thirty feet wide, is largely enveloped by a tree canopy and there are no sidewalks. Lighting is limited to cobra head lighting attached to utility poles. The newly constructed Morgan School is located in this segment of the study area. Because this area lacks sidewalks, students who choose to walk to the Morgan School, currently walk along the roadway shoulder (a new sidewalk to the school will be completed in 2019). Aside from the school, and the Lantern Square Plaza, the area is primarily residential.

High traffic speeds in this area and narrow roadway shoulders make walking and bicycling in this segment of the corridor unfavorable. Traffic volumes in this area average approximately 8,000 vehicles per day.

View south at intersection with Rocky Ledge Drive South

View north near Woodland Drive

Aerial view of newly built Morgan School

View north towards new Morgan School campus

Figure 2.3: Northern Segment

3.0 Transportation Conditions

3.1 Introduction to the Transportation System

Route 81 is a unique corridor that serves many functions and users. It is geographically situated between Route 1, the Northeast Corridor Railroad, and downtown Clinton to the south and Route 80 and Killingworth to the north. The Clinton Crossing Premium Outlet Mall is in the center of the study area. The outlets are a regional and state destination for shopping. As such, Route 81 is heavily relied on for access to shopping activity. Additionally, the Morgan School is located within the study area, north of the outlet malls.

Route 81 serves many purposes including:

- Regional, state, and out of state trips to the outlet mall shopping destination
- Local and regional truck traffic
- Local residential access
- Employment commuting
- Local business access
- Access to Morgan School
- Access to Killingworth, Haddam, and Middletown

The profile of users varies along the corridor as does the traffic demand. This is evident by nearly 16,000 daily trips along Route 81 near the I-95 Exit 63 ramps and approximately 8,000 daily trips north of the outlet mall, in the residential area. The Route 81 corridor is a northern route that connects Route 1 and other points south, to northern locations and eventually Route 9. As both a local and regional corridor, Route 81 must accommodate and continue to plan for a wide array of users with varying trip purposes, including both local residential and regional shopping trips. At the southern extent of Route 81 is the former Unilever property, while the former Morgan School property is located in the center of the corridor. These two large properties are slated for redevelopment which could potentially impact traffic operations in the study area. Additionally, due to its proximity to downtown Clinton, Route 81 should be evaluated in a way that preserves the integrity of the roadway as both a regional transportation asset and a gateway into the town center.

3.2 Regional Transportation Network

Route 81 is a state highway which begins at the intersection with US Route 1 in downtown Clinton and extends north, passing through Killingworth and Haddam, with a terminus at its intersection with Route 154, in the village of Higganum. Known as Killingworth Road in this location, Route 81 has an interchange with Route 9, which is a four-lane freeway that connects Interstate 95 to the south and Interstates 91 and 84 to the north.

Clinton's train station is adjacent to Route 81 and provides commuter rail service to New Haven, Old Saybrook, and New London with connections to New York City to the south, and to Providence and Boston to the north. Local bus service, serving destinations throughout neighboring towns is also provided on Route 81 with stops located near the train station and outlet mall.

Route 81 is classified as a minor arterial and in the study area; it is a two-or four lane roadway that serves north-south traffic between towns within the region. In this capacity, according to its functional classification as a minor arterial, Route 81 is planned as a corridor with the highest level of service at the greatest speed for the longest uninterrupted distance, with some degree of access control. Figure 3.1 illustrates Route 81's relationship to the surrounding transportation network.

Figure 3.1: Transportation Network

3.3 Traffic Conditions

Existing Traffic

Available traffic counts along Route 81 were assembled from CTDOT's automatic traffic recorder (ATR) database. This database system contains 24-hour traffic counts (Average Daily Traffic, or ADT's), at various locations throughout the state. Because counts are collected throughout the state at different time intervals, some available count data is several years old. The latest counts available (at the time of this study) are 2013 ADT for the Town of Clinton. See Figure Table 3.1.

Traffic volumes throughout the Route 81 study area range from as low as 7,500 vehicles per day, south of High Street to as high as 15,900 north of Glenwood Road, between the I-95 on and off ramps. This range is common in roadways that serve a variety of functions, such as Route 81. This serves as both a local residential street, and a major thoroughfare in the distinctly different segments of the corridor.

Location On U.S. Route 81	CTDOT ADT (Vehicles per Day)			
	2004	2007	2010	2013
Hall Street North of US Route 1	8,500	7,800	7,300	7,900
High Street South of I-95 NB On Ramp	-	8,400	8,400	7,500
High Street North of Glenwood Road	16,200	15,200	15,400	15,900
High Street North of I-95 Ramps	13,900	13,500	14,000	13,100
Killingworth Turnpike North of Clinton Crossing	10,000	10,200	10,100	10,200
Killingworth Turnpike North of Walnut Hill Road	7,600	7,800	8,600	7,900
Killingworth Turnpike North of Egypt Lane	6,900	7,600	8,500	8,400
Killingworth South of Town Line	5,700	6,500	7,600	7,300

Table 3.1: **Historic CTDOT ADT Traffic Volumes**

View north at former Morgan School.

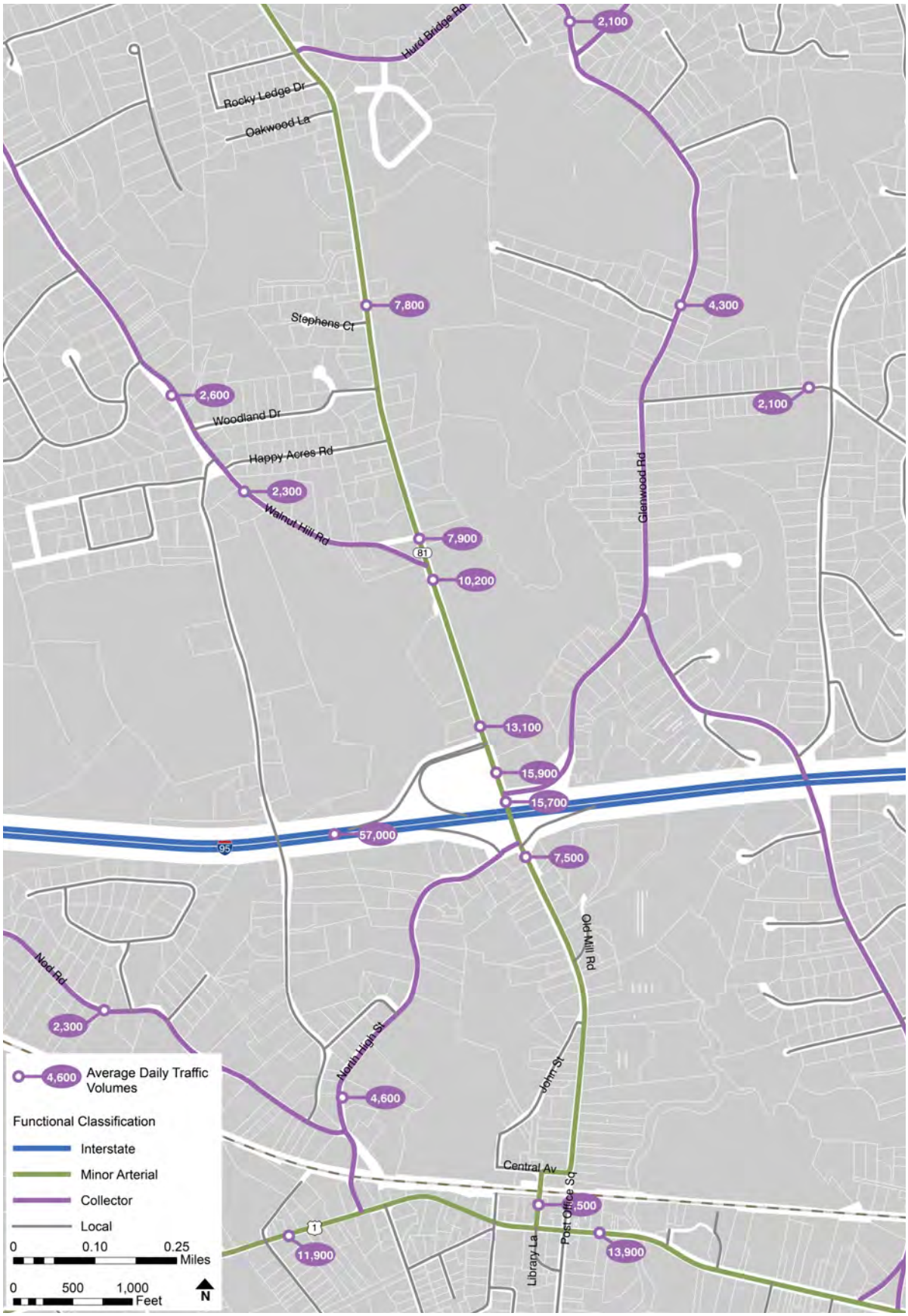


Figure 3.2: **2013 CTDOT Average Daily Traffic (ADT) Volumes**

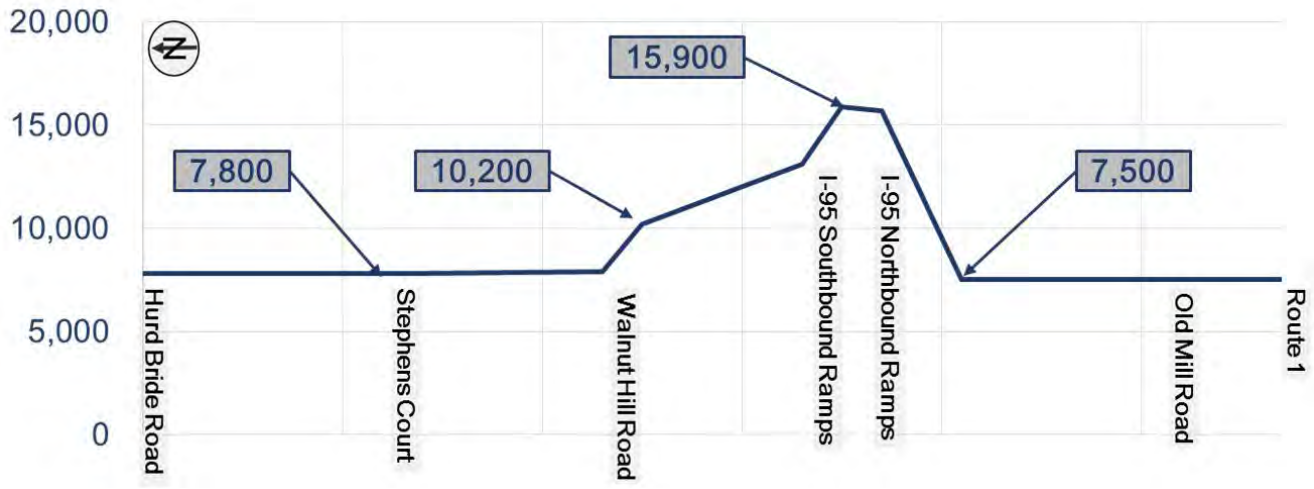


Figure 3.3: **CTDOT Automatic Traffic Recorder (ATR) Locations**

Historically, traffic volumes have been the highest near the I-95 ramps. Recent traffic counts conducted by the study team in 2018 confirm this trend. See Figure 3.3. Daily traffic levels range from over 7,500 vehicles per day at the north end of the corridor to 15,900 vehicles per day near the I-95 on/off ramps. The high volumes near the ramps demonstrate the importance of the I-95 interchange for traffic flow on Route 81. Traffic volumes are significantly lower in the northern limits of the project area and just beyond at town line with Killingworth. Overall there is minimal traffic growth, which is confirmed by a continuous traffic counter located approximately two miles north of I-95.

The continuous count station north of I-95 also provides insight into seasonal variations due to recreational and tourist activity, particularly during the summer months. The monthly data from CTDOT's permanent count sites for 2015 is identified in Figure 3.5, illustrating the variations in demand over the course of one year. Traffic volumes are significantly higher in May through August than in the remainder of the year.

Peak Hour Volumes

In addition to using CTDOT's automatic traffic recorder (ATR) 2013 counts, the Study Team also collected turning movement counts at signalized intersections along Route 81 in order to assess traffic operations in the peak period. The turning movement count data was collected in June of 2018 for the weekday counts. AM peak hour fell between 7:15 and 8:15, while PM peak hour fell between 4:00 and 5:00. The weekday morning and afternoon peak hour turning movement counts are presented in Figure 3.6.

The heaviest turning movements for the AM peak hour were northbound left-hand turns onto I-95 southbound (296 lefts), right hand turns from Glenwood Road in the northbound direction (251 rights), southbound left hand turns onto I-95 northbound (196 lefts) southbound right hand turns onto I-95 southbound (194 rights), and eastbound left-hand turns on Route 1 (184 lefts). Thru traffic is around 500 cars until the interchange with I-95, where thru traffic drops significantly. This means that many trips are thru trips (people commuting to work, etc) during the AM peak hour.

The heaviest turning movements for the PM peak hour were northbound left hand turns into Clinton Crossing (265 lefts), southbound right hand turns onto North High Street (229 rights), southbound left hand turns onto I-95 northbound (225 lefts), and southbound right hand turns onto I-95 southbound (225 rights). Thru traffic varies throughout the corridor, it ranges from 740 cars at the Library to 286 cars in the northbound direction at the intersection with North High Street and I-95 northbound.

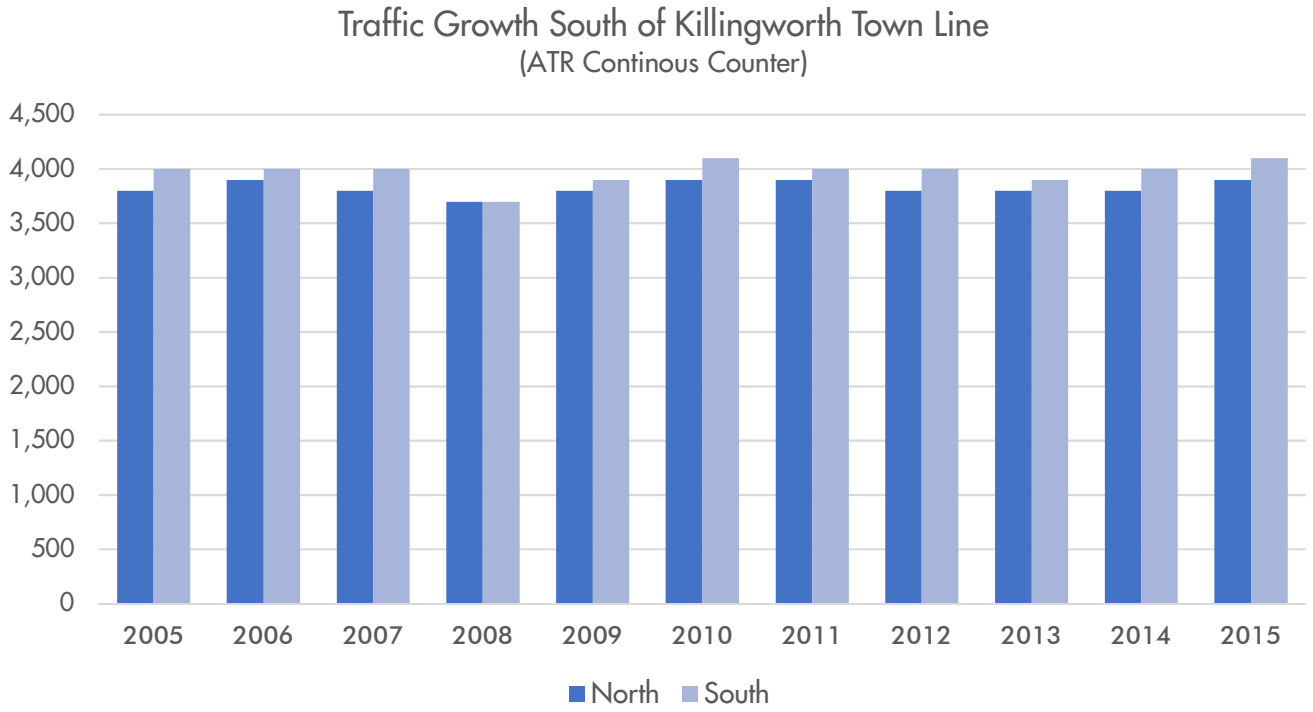


Figure 3.4: **CTDOT Automatic Traffic Recorder (ATR) Continuous Counter Volumes by Direction**

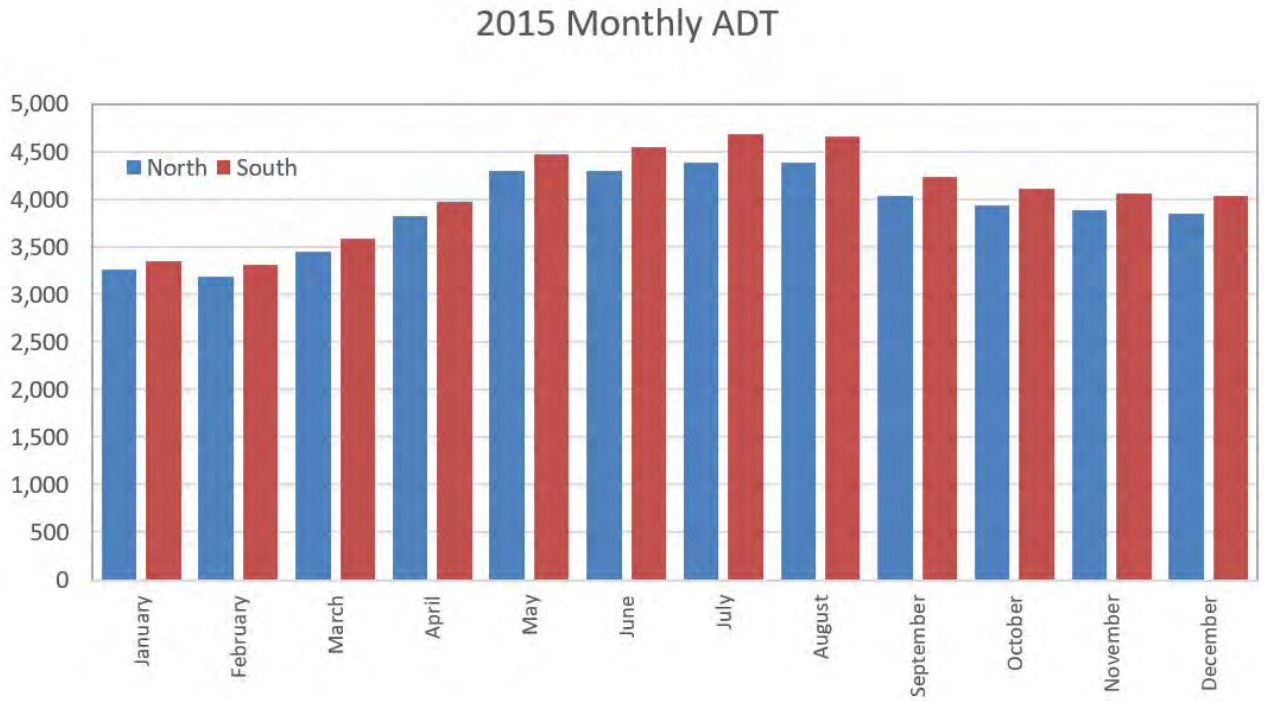
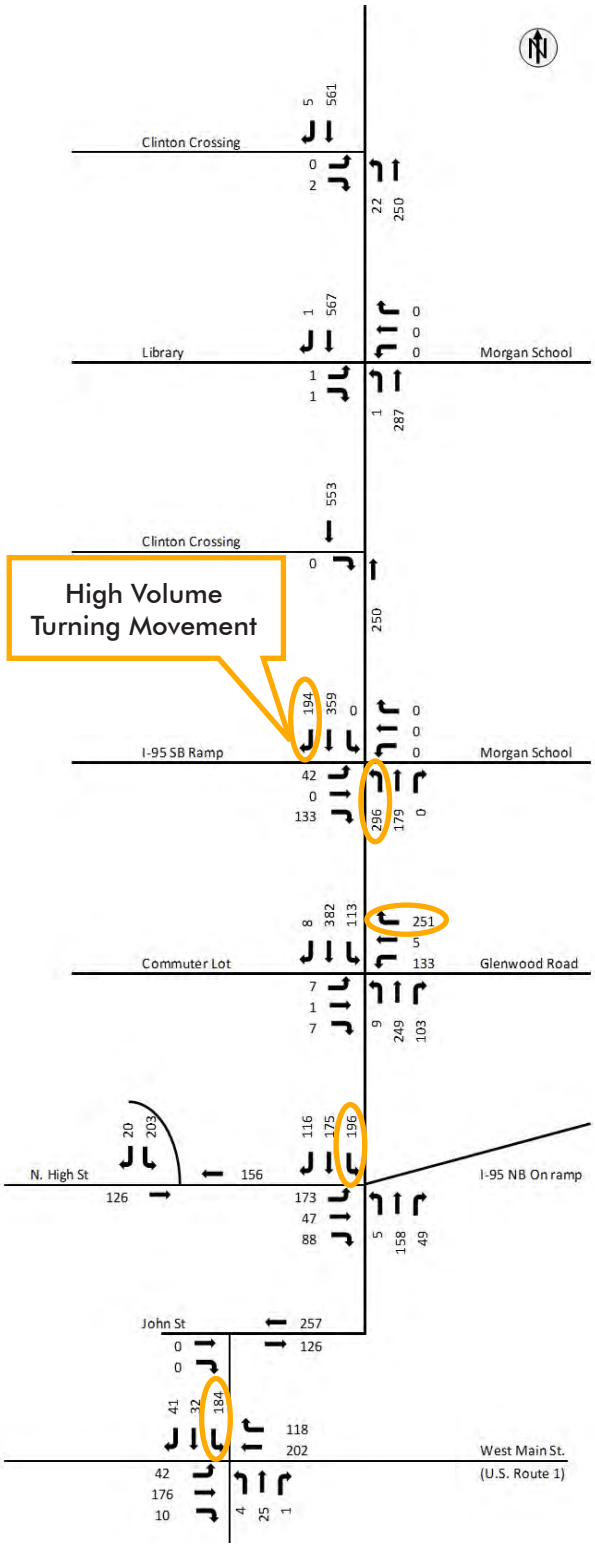
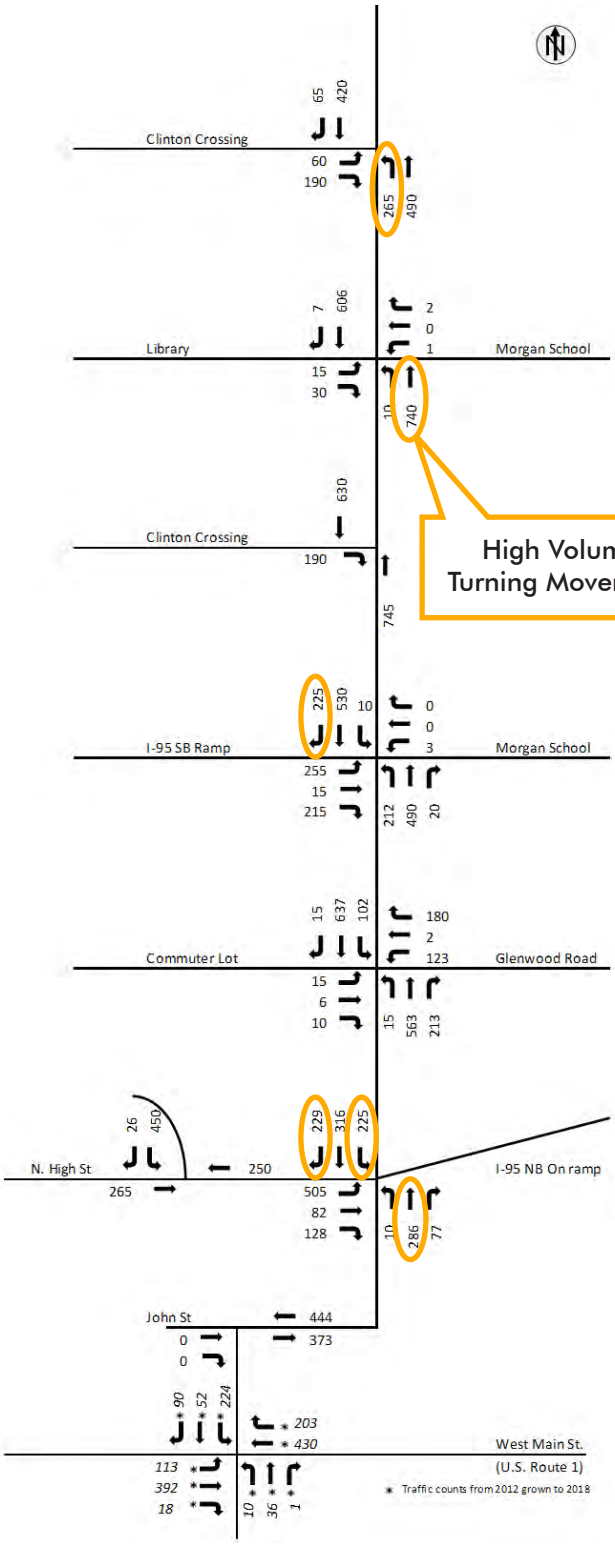


Figure 3.5: **2015 CTDOT Automatic Traffic Recorder (ATR) Monthly Variation by Direction**



Weekday AM Peak Hour
(7:15 - 8:15)



Weekday PM Peak Hour
(4:00 - 5:00)

Figure 3.6: 2015 CTDOT Automatic Traffic Recorder (ATR) Monthly Variation by Direction

Travel Speeds

The speed limit along Route 81 varies throughout the corridor. Office of the State Traffic Administration records indicate that there is no approved speed limit in the vicinity of Route 1; the sharp curves contribute to low speeds near the intersection with Route 1. Between Central Ave and John Street, the northbound speed limit is 40 mph and the southbound limit is 30 mph. North of John Street, the speed limit is generally 40 mph in both directions, with the exception of a 30 mph speed limit when flashing in the immediate vicinity of the new Morgan School. North of Oakwood Lane, the speed limit increases to 45 mph. Speed data collected by CTDOT confirms that the speed limit is generally obeyed, with average speeds from 37-43 mph and 85th percentile speeds from 40-46 mph. The Clinton Police Department confirmed these speed characteristics.

Traffic Operations

Within the Study area, Route 81 has seven signalized intersections and fifteen unsignalized intersections. Traffic on Route 81 has the right-of-way at all unsignalized intersections. All seven signalized intersections along the corridor are operated and maintained by CTDOT. Figure 3.7 illustrates signalized intersections within the corridor. Traffic flow at signalized intersections is controlled by the signal timing and phasing as well as the overall cycle length (the amount of time given to complete all traffic movements). The signals between Clinton Crossing Outlets and North High Street (six signals) are set using time-based coordination with the master signal located at Route 81 and the I-95 NB on-ramp. Fixed offsets are used to coordinate the traffic along Route 81 with a fixed cycle length of 85 seconds between 3:00 and 7:00 PM on weekdays, and 75 seconds during other times. At the south end of the Study area, the signal at Route 81 and U.S Route 1 runs under the same controller as the adjacent intersection to the east. The majority of these signals run semi-actuated, with vehicle detection only on the side street and in turn lanes.

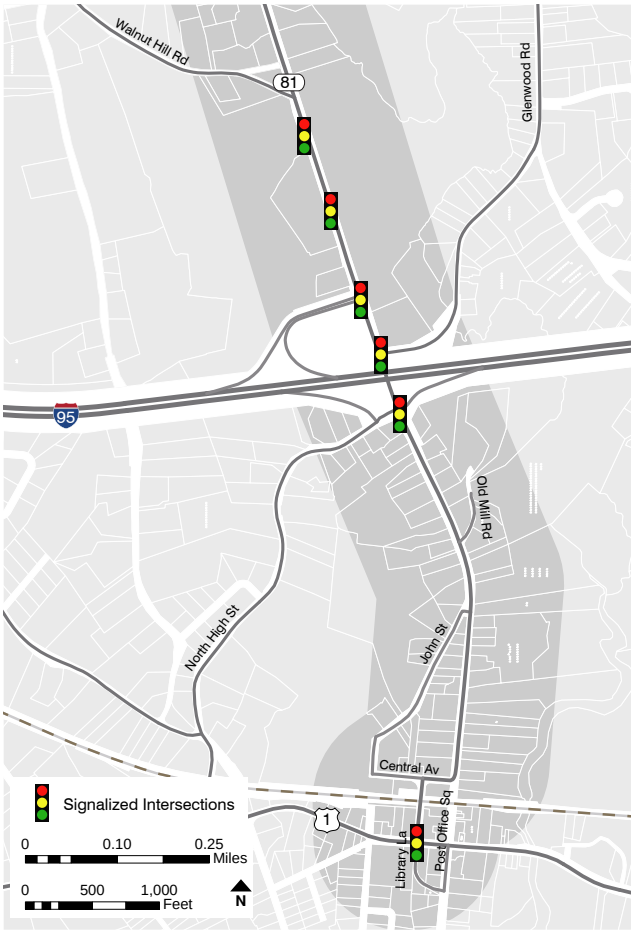


Figure 3.7: **Signalized Intersections**

The existing conditions assessment included an evaluation of congestion and delay at the seven signalized intersections during the weekday AM peak hour and the weekday PM peak hour. Level of Service (LOS) was determined for each intersection based on the average delay (in seconds per vehicle, sec/veh) that motorists experience traveling through an intersection. LOS for an intersection is a qualitative measure of traffic operations that reflects the delay experienced by vehicles at the intersection. LOS values range from A to F. LOS A represents the best operational conditions with little delay. LOS F represents generally congested conditions with long delays and traffic queues. See Table 3.1. A capacity analysis was developed using the Synchro traffic analysis software, the peak hour turning movement volumes, and the traffic signal timing plans obtained as part of this existing conditions analysis.

Route 81 Study Intersection	Weekday AM		Weekday PM	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Route 81 at Clinton Crossing (Norther Access/Egress)	A	2.9	C	24.3
Route 81 at Library Access Point	A	2.1	A	6.6
Route 81 at I-95 Southbound Ramps	A	6.5	C	20.2
Route 81 at Commuter Lot / Glenwood Road	B	18.1	B	18.8
Route 81 at N. High Street / I-95 Northbound On Ramp	A	9.2	B	17.2
Route 81 at N. High Street / I-95 Northbound On Ramp	B	14.9	B	19.6
Route 81 / Hull St at West Main St / U.S Route 1	B	17.7	C	32.9

Table 3.1: **AM and PM Level of Service by Intersection**

Figure 3.8: **AM Peak Level of Service (LOS) at Signalized Intersections**

Figure 3.9: **PM Peak Level of Service (LOS) at Signalized Intersections**

Six levels of service are defined with letter designations from A to F, with LOS A representing a minimal amount of delay and LOS F representing significant delay. Traffic signals in rural and suburban areas are generally designed to operate at LOS C or better, and traffic signals in urban areas are generally designed for LOS D. LOS is a quantitative, objective metric, and the perception of drivers may vary, as discussed below. All traffic signals within the Study area operate at a LOS C or greater during the studied peak periods.

There are instances where a specific intersection approach or movement exceeds LOS C, even if the total intersection does not. According to the Synchro model, drivers may experience more extended delays (LOS D) at the following locations in the AM and PM peak hour (see Figures 3.8 and 3.9):

- Glenwood Road right turn approach (AM and PM)
- I-95 SB off-ramp left turn approach (AM and PM)
- Glenwood Road thru and left turn approach (PM)
- I-95 NB off-ramp left turn approach (PM)
- U.S. Route 1 Southbound (PM)
- Hull Street left turn approach (PM)

While most of the delay incurred at signalized intersections is directly caused by the traffic signal operation, total delays experienced by drivers at these locations are a result of a combination of factors. These factors may include:

- Closely spaced signals – Traffic signals operate best when spaced no closer than ¼ mile (1,320') apart. The traffic signals on Route 81 are more than twice as close.
- Irregular signal spacing – Traffic signal coordination works best when signalized intersections are evenly spaced; irregularly spaced signals, like those on Route 81, are difficult to coordinate in both directions at once.
- Insufficient or lack of turn lanes – When turn lanes are absent or too short, stopped vehicles waiting to turn block through vehicles. Route 81 lacks turn lanes at several intersections.
- Turning vehicles into driveways and unsignalized local roads – The Study area has numerous driveways and local roads that are not signalized. Vehicles on Route 81 are occasionally forced to stop or slow down for turning traffic.
- Broken vehicle detectors – When vehicle detectors are not functioning correctly, queues may fail to clear in one cycle and unnecessary phases may be called.
- School and transit bus stops – Traffic must slow down or stop because of bus stops. In the case of school buses, traffic must stop in both directions. There are several bus stops along Route 81.
- Pedestrians – When pedestrians cross the road, this generally results in delay for vehicles. The traffic signals along Route 81 have an exclusive pedestrian phase, but the cycle length is too short to accommodate frequent pedestrian crossings. A pedestrian phase may cause the signal to drop out of coordination for several minutes. As a result, an increase in pedestrian traffic has the potential to significantly impact vehicular operations.

Improvements to traffic signal timing and using traffic signal coordination are two of the most important strategies for reducing delay, travel time, and queue length. These measures avoid the need to expand the existing infrastructure or build new infrastructure to cope with increased traffic. However, detailed study and accurate forecasting of future traffic scenarios are essential for the longevity of the designed signal plan, more so in case of coordinated signals.

3.4 Commuting Patterns

According to the 2015 U.S. Census Bureau Longitudinal Employer Household Dynamics Survey, commuting patterns into and away from Clinton show that 2,874 workers commute into Town while another 6,166 commuters leave Clinton to travel to work. Additionally, approximately 951 residents both live and work in Clinton (see Figure 3.11). Existing workers who commute to Clinton (or travel further east) represent the group with high potential for considering a move to Clinton. Clinton may be similarly attractive to workers commuting to New Haven from towns east of Clinton.

Just over 50% of Clinton's workforce lives more than ten miles away (approximately 2,000 people) and 24% (approximately 900 people) live 25 miles or more from the town. The majority of workers commute from the west (see Figure 3.10). Given the distance involved in commuting to Clinton, the provision of housing that is in line with market demands could be attractive to these commuters.

The closure of operations at the Unilever factory is reflected in a change in commuting patterns between 2002 and 2015. In 2002, c approximately 1,564 workers commuted into the study area, while another 321 workers left the study area for work. Approximately 30 workers both lived and worked within the study area, see Figure 3.12. In 2015, after the Unilever factory closed, approximately 687 workers commuted into the study area, 246 commuted away from the study area, and only seven people both lived and worked within the study area, see Figure 3.13.

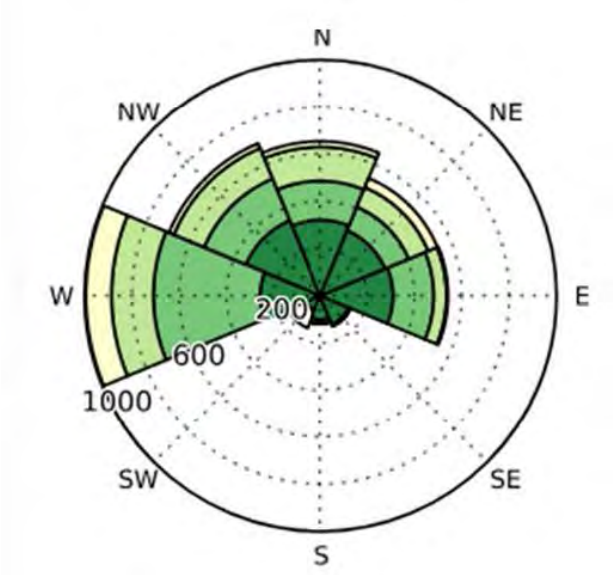


Figure 3.10: **Clinton Workers by Distance and Direction; Source: U.S. Census Bureau, Longitudinal Employer Household Dynamics Survey (LEHDS), LEHD Origin-Destination Employment Statistics (2015)**

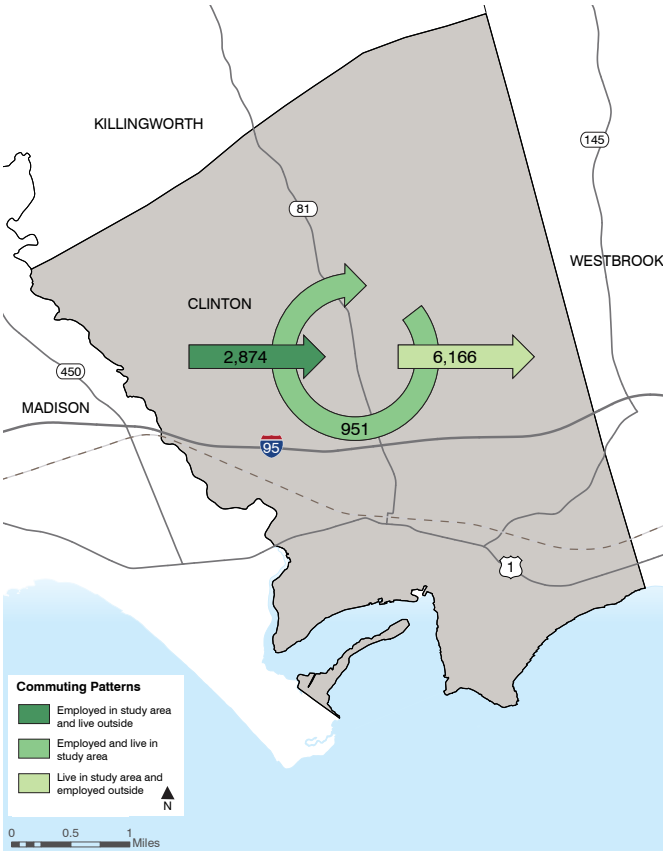


Figure 3.11: **2015 Town Wide Commuting Patterns; Source: U.S. Census Bureau, Longitudinal Employer Household Dynamics Survey (LEHDS), LEHD Origin-Destination Employment Statistics (2015)**

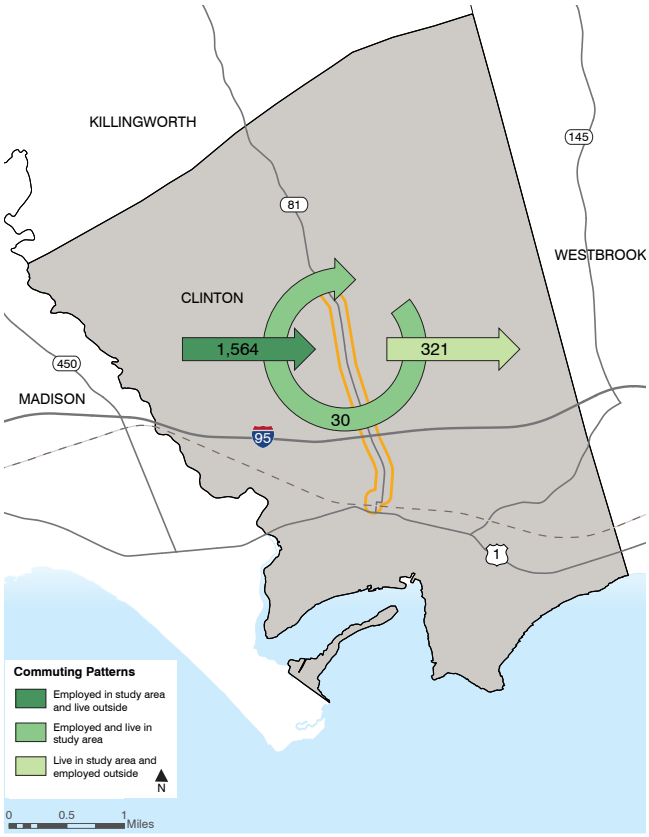


Figure 3.12: **2002 Study Area Commuting Patterns; Source: U.S. Census Bureau, Longitudinal Employer Household Dynamics Survey (LEHDS), LEHD Origin-Destination Employment Statistics (2002)**

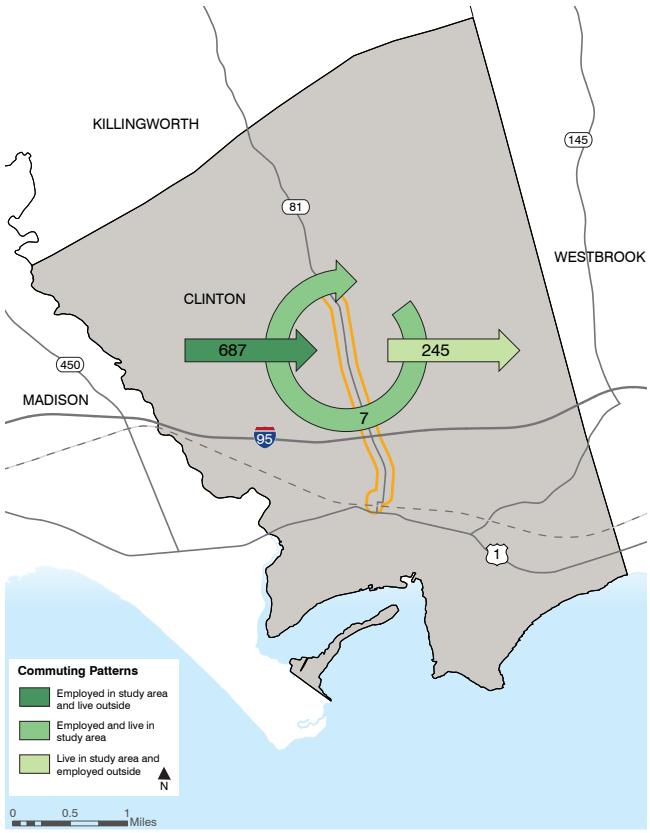


Figure 3.13: **2015 Study Area Commuting Patterns; U.S. Census Bureau, Longitudinal Employer Household Dynamics Survey (LEHDS), LEHD Origin-Destination Employment Statistics (2015)**

3.5 Roadway Geometry

Route 81 is primarily a two lane road for the majority of it's length. Between North High Street and Walnut Hill Road, Route 81 has additional through and turn lanes. Traffic lanes vary in width between eleven and twelve feet. Sidewalks are between four and five feet wide. Figure 3.13 illustrates several roadway elevations of the Route 81 corridor.

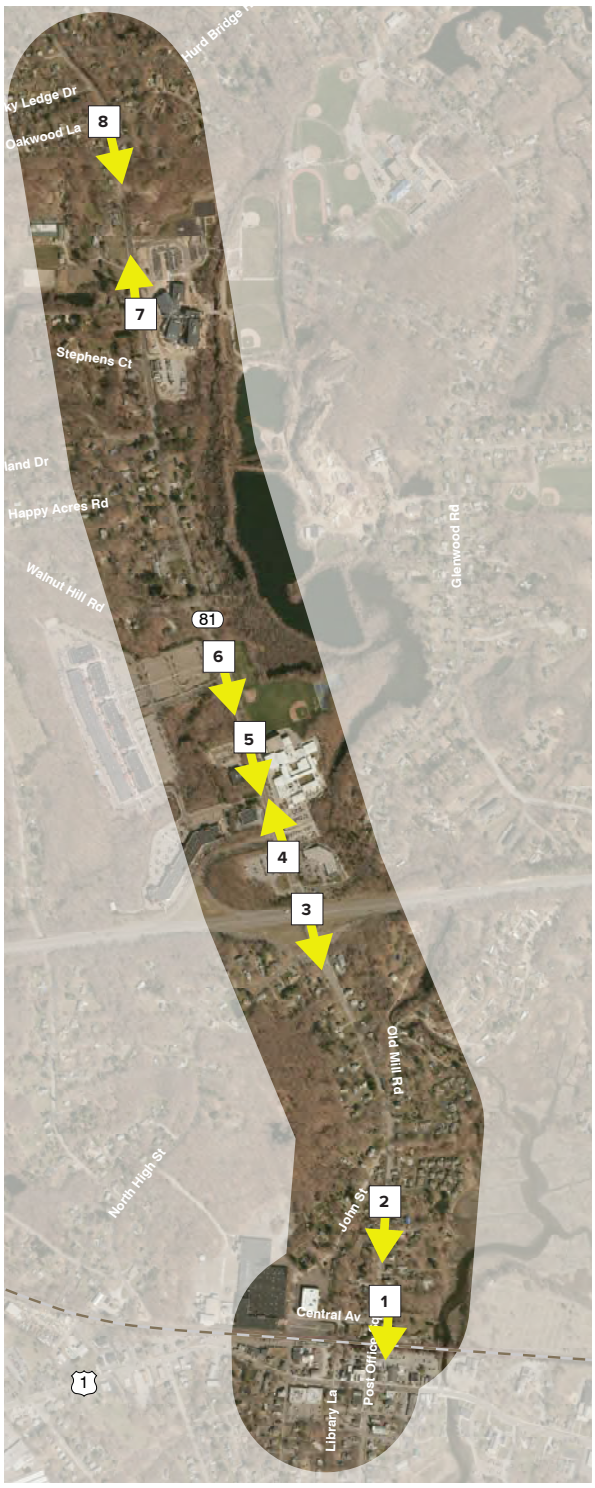


Figure 3.13: **Route 81 Roadway Elevations**

Figure 3.13: **Study Area Roadway Cross Sections**

Traffic Lanes

Route 81 is a minor arterial roadway that begins as two lanes (one lane per direction) in Clinton and transitions between three and four lanes in the middle segment, near the Clinton Crossing Outlet Mall and the I-95 interchange. The corridor returns to two-lanes north of the entrance to Clinton Crossing. Route 81 serves many functions and users, depending on the context of the environment along the corridor. The existing lane widths vary throughout the Study area, and are generally 11 or 12 feet wide, with turn lanes narrower than through lanes.

Speed

The posted speed within the study area varies between 25 mph in front of Morgan School and 40 mph south of Woodland Drive. The advisory speed for the southern portion of Route 81, where it makes a dog-leg jog to traverse under the railroad trestle, is 15 mph.

Roadway Shoulder Width

Road shoulders serve many purposes including emergency vehicle access, breakdown space, and operating space for bicyclists and pedestrians where facilities for those users are lacking. According to the CTDOT Design Manual, arterials are typically designed with 4 to 8-foot shoulders. The northern and southern ends of Route 81 have inconsistent and undersized shoulder widths of less than 4 feet, which cannot effectively accommodate a vehicle and challenges bicycle and pedestrian travel in the corridor. The middle section of the corridor has shoulder widths that are more consistent with CTDOT's design standards.

There are narrow shoulders throughout most of the Route 81 corridor.

Horizontal and Vertical Curves

The horizontal alignment of Route 81 generally consists of tangents and gentle curves with large radii. However, at the southern end of the Study area, Route 81 has two sharp 90-degree curves. There is no significant vertical curvature aside from a gentle crest curve over I-95 and a steep sag curve beneath the railroad tracks.

Applicable Design Standards

According to the CTDOT Highway Design Manual 2003 Edition (HDM) the following conditions apply:

- Minor Arterial roadway functional classification
- Intermediate environment

The most prevalent posted speed limit in the Study area is 40 mph. The design standards for Route 81 are shown in Table 3.2. The values shown indicate either the appropriate range or minimum value. Minor arterial roadways balance access to adjacent commercial and residential uses with mobility of travelers connecting to highway access points and local roads.

Design Element	Design Standard (40 mph)
Lane Width	10′ - 12′
Shoulder Width	2′ - 8′
Sidewalk Width	4′ - 5′
Bicycle Lane Width	5′
Stopping Sight Distance	690′

Table 3.2: **Roadway Design Standards**

Design Standards as prescribed in the CTDOT Highway Design Manual 2003 Edition (HDM)

View south at Park & Ride Lot

3.6 Traffic Control

Traffic Control Devices

Traffic signals control the flow of traffic on Route 81 and the streets and Exit 63 ramps that intersect it. Side streets are controlled by a traffic signal, yield or stop sign. There is a cluster of six signalized intersections along the corridor and CTDOT operates and maintains these signals (see Figure 3.14).

- Intersection 1: Clinton Crossing Outlets at Route 81:
  Route 81 southbound has one thru lane and one right turn lane; northbound, it has two through lanes. There are marked crosswalks on the north and west approaches and sidewalks on both sides of the road.
- Intersection 2: Henry Carter Hull Library and Former Morgan School Driveway at Route 81
  Route 81 southbound has one thru lane; northbound, it has two through lanes. A marked crosswalk is located at the intersection's south approach, and sidewalks line both sides of the road.
- Intersection 3: I-95 Southbound Ramps and Former Morgan School Driveway at Route 81
  Route 81 southbound has one right turn lane, one through lane, and one left turn lane. Route 81 northbound has two through lanes and one left turn lane. Marked crosswalks are provided on the west and south approaches, and sidewalks line both sides of the road.
- Intersection 4: Glenwood Road and Park & Ride Lot at Route 81
  Route 81 southbound has one through lane and one left turn lane. In the northbound direction, there are two through lanes. There are marked crosswalks on the intersection's north and east approaches. The southbound sidewalk terminates at this intersection, while the northbound sidewalk continues through it.
- Intersection 5 & 6: I-95 Northbound Ramps and North High Street at Route 81
  This is actually two closely spaced intersections controlled by a single signal controller. A short segment of North High Street between the northbound off-ramp and Route 81 has three eastbound lanes in order to accommodate queues. Route 81 itself has a southbound through lane and left turn lane, and two northbound through lanes. The south intersection approach has a painted island less than 50' long. There are crosswalks on the south and east intersection approaches, and a sidewalk on the east side.

Figure 3.14: **Cluster of Six Signalized Intersections**

3.7 Access Management Conditions

Route 81 has 95 driveways in total; approximately 48 driveways per mile along the two-mile corridor resulting in an average of 110 feet between driveways. There are pockets along the Route 81 corridor where driveway density is greater than 48 per mile and segments where driveway density is less. Driveways range from narrow single vehicle residential driveways to wide, commercial entrances and exits. Figure 3.15 identifies areas along the Route 81 corridor where commercial driveways are located. The greatest concentration is in the middle segment of the corridor, near the Clinton Crossing Outlet Mall.

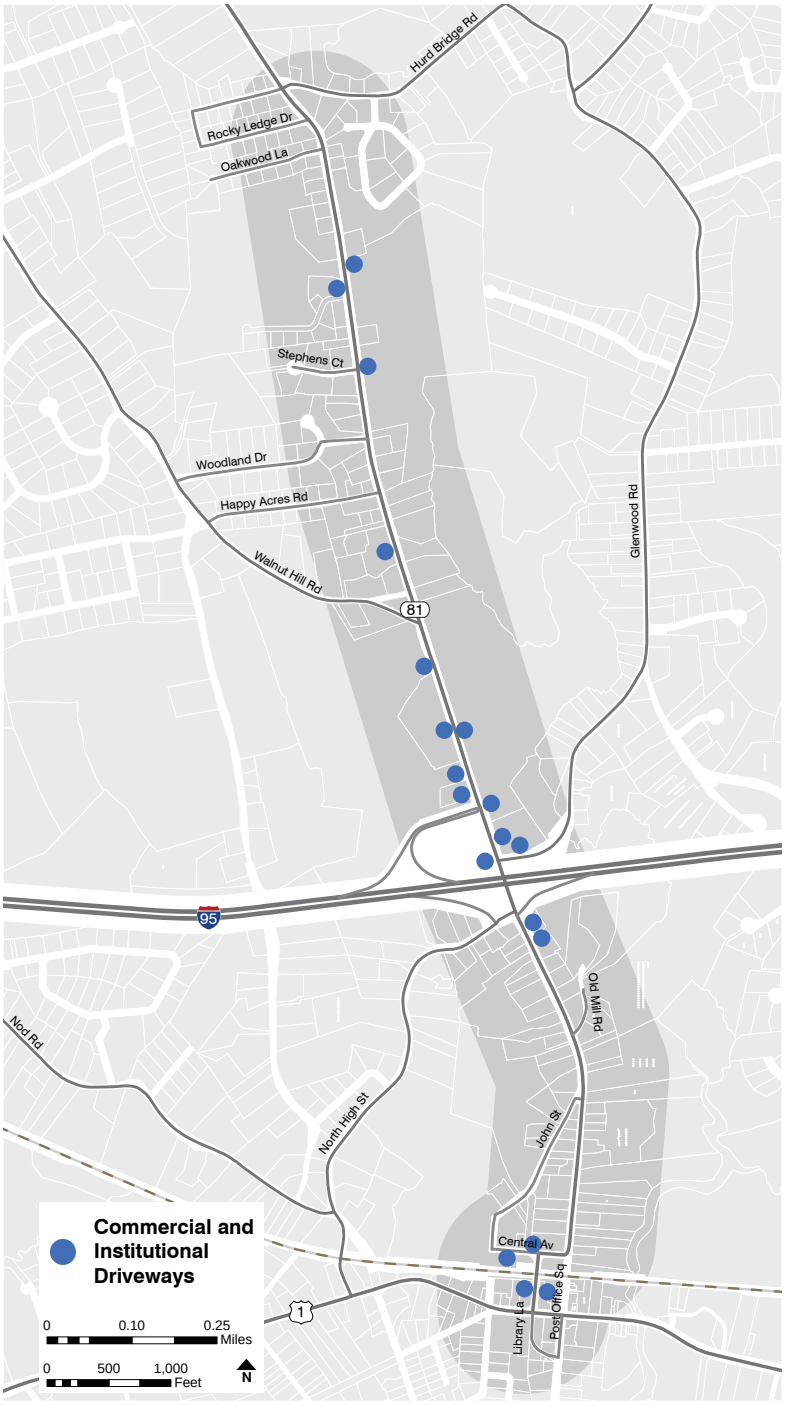


Figure 3.15: **Commercial and Institutional Driveways in the Study Area**

Heavily used commercial and commuter parking lot driveways located along Route 81, in close proximity to the Interstate 95 interchanges.

3.8 Crash Analysis

Crash data was obtained from the Connecticut Crash Data Repository (CTCDR) for years 2013 through 2017. The CTCDR is a web-based tool and is comprised of crash data from two separate sources; The Department of Public Safety (DPS) and CTDOT. Because comparing crash data by individual years may distort analysis results, five years of data was analyzed to account for anomalies caused by outside influence such as construction projects.

General Crash Statistics

The crash data obtained from the CTCDR revealed that 172 crashes occurred within the study area over the five-year period from 2013 to 2017. Crash severity statistics are presented below:

- 1 Fatality
- 1 Serious injury
- 14 Minor injury
- 8 Possible injury
- 148 No injury, property damage only

The I-95 interchange is the location with the highest crash volume activity Town-wide and within the study area (see Figure 3.16). These crashes are mostly rear-end, property damage only type collisions that are typically seen in areas with many or frequent signalized intersections. The northbound interchange, where the I-95 exit terminates onto North High Street and the northbound on-ramp to I-95 has the greatest number of crashes. There are other pockets of high crash activity including the intersection with Route 1 at the southern end of the corridor, near the Petco Plaza and CTDOT Commuter Parking Lot driveways. A cluster of crashes is located at the northern end of the study area, at Hurd Bridge Road and Rocky Ledge Drive. There is a sharp bend in the roadway at this location which limits visibility. Additionally, Hurd Bridge Road is a heavily traveled collector roadway which connects into a roadway network that leads to Route 1 at the southern end and north into Killingworth at the northern end. As such, this makes the intersection with Route 81 and Hurd Bridge Road a particularly busy location. See Figure 3.17 for crashes specific to the corridor.

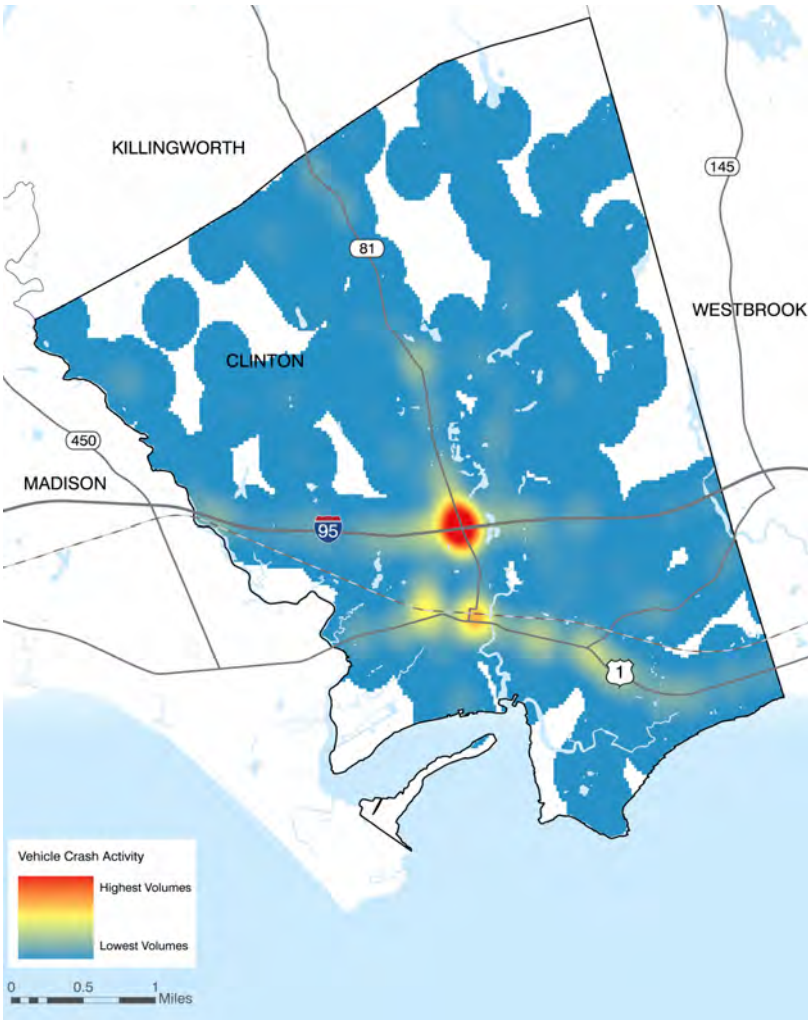


Figure 3.16: **Town Wide Crash Analysis**

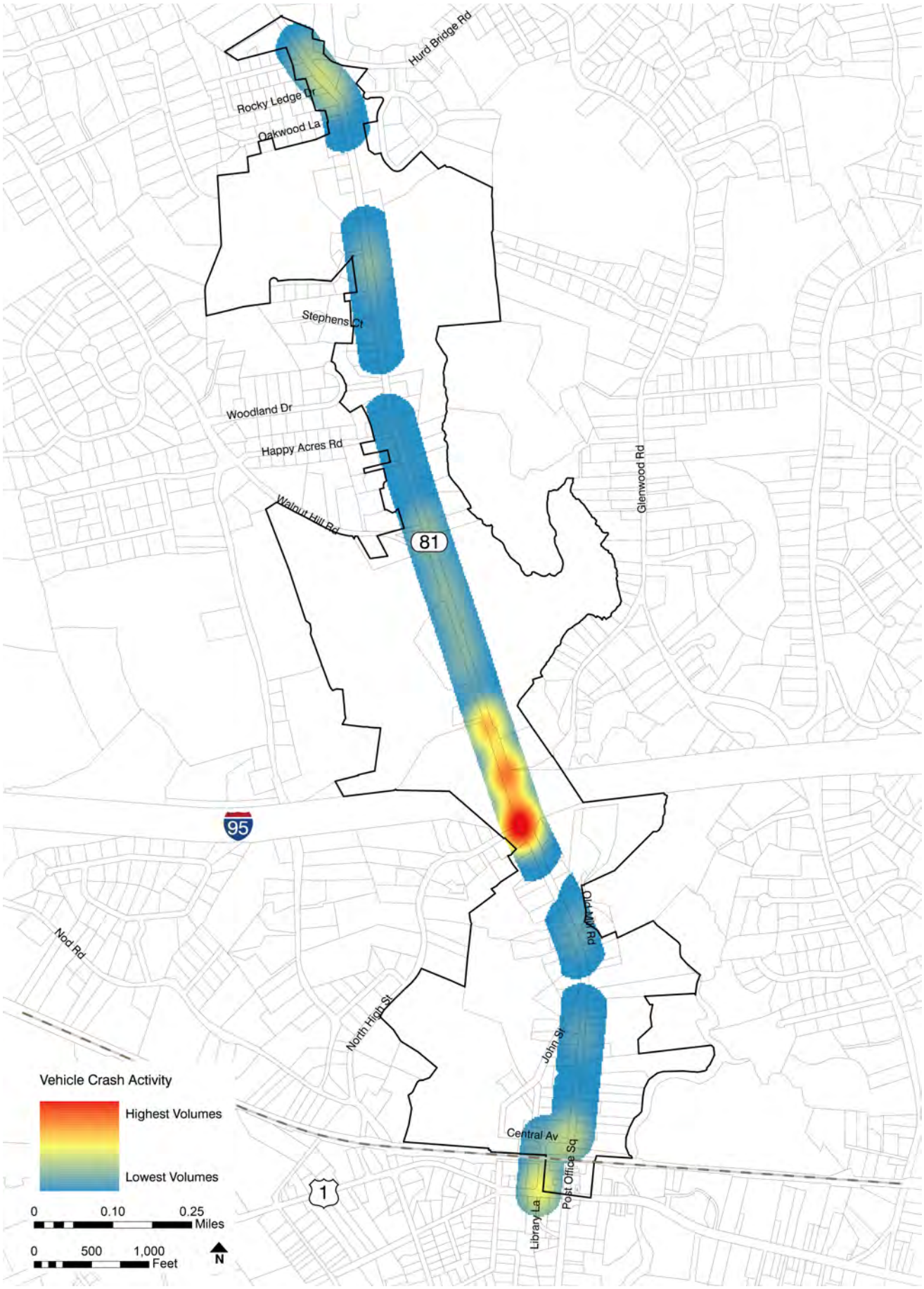


Figure 3.17: **Study Area Crash Analysis**

3.9 Bicycle and Pedestrian Environment

Route 81 is an auto-dominant roadway. There are no designated bicycle facilities along the corridor and pedestrian facilities are limited. See Figure 3.18 for opportunities and constraints associated with the bicycle and pedestrian environment.

Bicycle Facilities

There are no dedicated bicycle facilities within the study area. The roadway environment is not conducive to bicycling due to inconsistent shoulder width, numerous intersecting roadways and busy driveways, and higher speed, high volume traffic. There are also blind curves in the northern end of the study area, near Rocky Ledge Drive, which make it difficult for drivers to see bicyclists or pedestrians.

Despite the lack of bicycle facilities, there are destinations within the study area that would benefit from connections via a bicycle network. These destinations include; Morgan School, at the northern end of the Study area, the Henry Carter Hull Library, Clinton Crossing Outlet Mall, and downtown Clinton, at the southern extent of the study area.

Pedestrian Facilities

Despite the presence of sidewalks in some locations along Route 81, the pedestrian realm is lacking in many locations throughout the corridor. Sidewalks are present along the eastern side of Route 81, between its intersection with Route 1, north until Walnut Hill Road. At the time of this study, a sidewalk extension on the east side of Route 81, between Walnut Hill Road and the new Morgan School complex was under construction. Construction on this project is expected to be completed in 2019.

Sidewalks in the corridor are narrow, and as such, make it difficult for two people to walk side by side. Sidewalks, averaging around 4 feet, are buffered by a landscape buffer along High Street, but the buffer terminates just before the I-95 interchange. Vegetation encroachment and uneven sidewalks result in a poor pedestrian experience. There is no pedestrian realm lighting within the corridor.

Crosswalks

Crosswalks within the study area are shown in Figure 3.18. They are all located at signalized intersections with the exception of one unsignalized crossing, located just north of the railroad crossing on Hull Street. This crosswalk has a long crossing distance and is located at a turn of Route 81, where Central Avenue turns into Hull Street. As such, it is difficult for drivers to see crossing pedestrians. The other crosswalks in the study area are exclusive pedestrian phase crossings, which stop traffic in all directions at the intersection. The walk signal is triggered by a push button with a corresponding pedestrian signal light.

Although there are pedestrian amenities in the Route 81 Corridor, these amenities are lacking, often have long crossing distances at crosswalks, and do not provide a comfortable pedestrian experience.

Unsignalized crosswalk on Hull Street, with sharp corner and limited visibility.

Figure 3.18: **Study Area Sidewalk and Crosswalk Network**

Regional Bicycle and Pedestrian Facilities

The Clinton Bicycle and Pedestrian Alliance (BPAC) has championed the development of a greenway trail that would run east of the Route 81 study area (see Figure 3.19). This trail, while still in planning, would create an off-road network for both cyclists and pedestrians. There is also a cross-Clinton route planned across the northern section of the town, and a southern route planned for the greenway trail, both of which would provide a more complete network throughout Clinton. Furthermore, the former Morgan School property has an existing trail network that abuts the Indian River and has the potential to be connected to the greenway trail, provided that future development is required to maintain public access to the trail system at the eastern edge of the Morgan School property. Opportunities exist to connect into regional trail networks such as the Shoreline Greenway Trail which will connect communities in a 25-mile corridor from New Haven to Madison, improving bicycle and pedestrian accessibility between and within those towns. The Madison segment of this trail, closest to the town border with Clinton, has already been constructed.

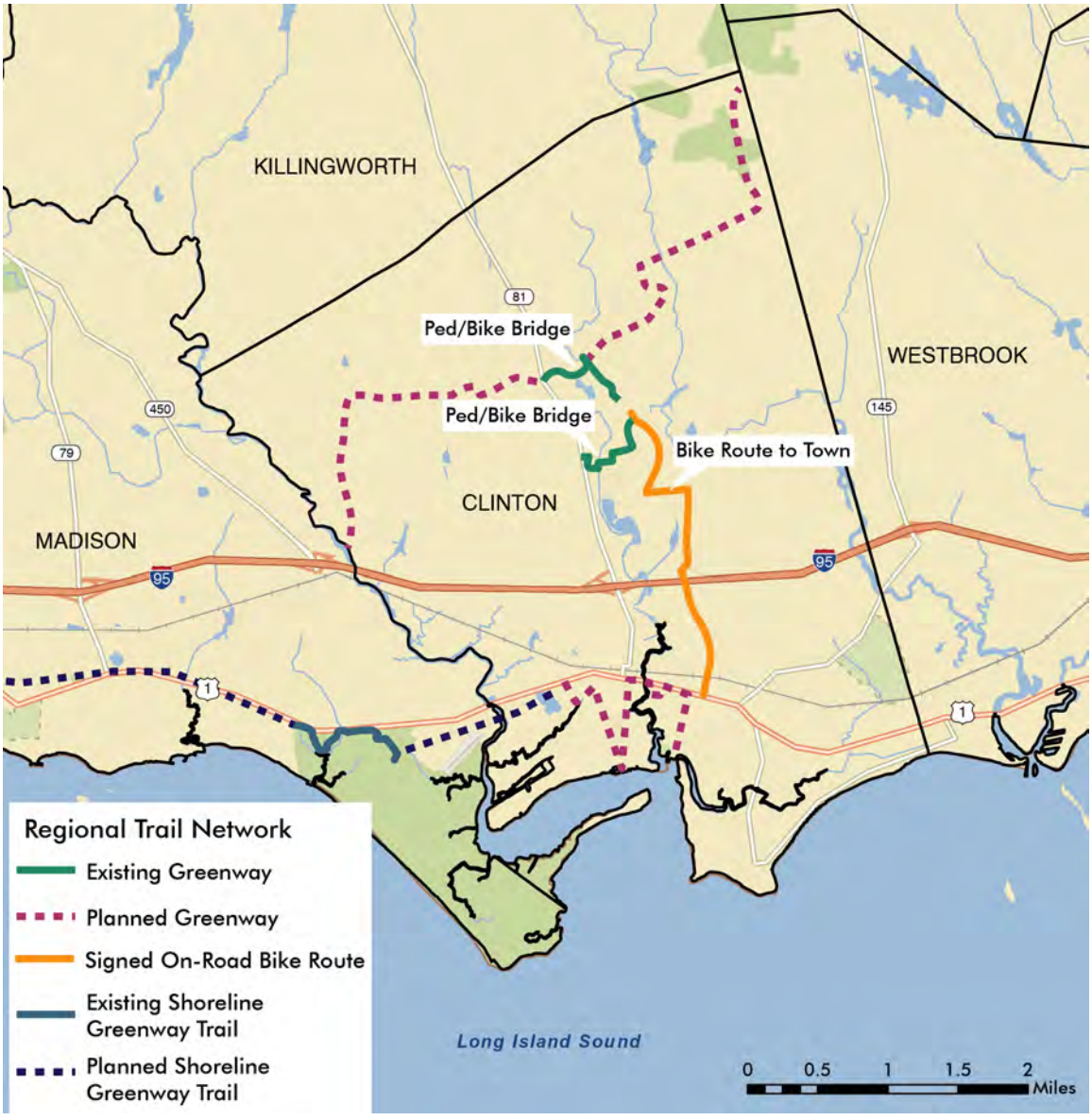


Figure 3.19: **Regional Trail Network**

3.10 Public Transportation System

Public transportation services within the study area are provided by the 9 Town Transit and the Shoreline East Commuter Railroad (see Figure 3.20). These transit services provide both local and regional travel.

9 Town Transit System

9 Town Transit provides public transportation to the towns of Clinton, Chester, Deep River, East Haddam, Essex, Haddam, Killingworth, Lyme, Madison, Middletown, New London, Old Lyme, Old Saybrook, and Westbrook. 9 Town Transit serves its transit users through two main services; four flexible bus routes and a demand response service, known as Dial-A-Ride.

9 Town Transit's Route 1 provides service between Madison and Old Saybrook, along Route 1 and also provides stops at Clinton Crossing Outlet Mall, Petco Plaza and the park and ride lot, and Post Office Square, which is near the Clinton Train Station. A new route was started in the fall of 2018 that connects Madison with Middletown via Route 81, serving the entire length of the study area. This route offers stops in Downtown Madison, Clinton Crossing Outlet Mall, Killingworth Village, Middlesex Hospital, Middlesex Courthouse and downtown Middletown. Free transfers are available between various routes as well as CT Transit S-Route. All 9 Town Transit buses are equipped with bicycle racks.

Service frequency for Bus Route 1 is generally hourly on weekdays between 8:15 am and 7:15 pm in the eastbound direction and between 8:30 am and 6:30 pm in the westbound direction. Weekend service is limited to Saturdays, and runs between 8:25 am to 5:15 pm in the eastbound direction and 8:40 am to 4:30 pm in the westbound direction (see Table 3.3).

There are no bus shelters or benches within the Study area, but there is a bench located at the Post Office Square bus stop, which is the stop for Clinton Train Station.

A passenger waiting for the 9 Town Transit Route 1 bus in Downtown Clinton at Post Office Square

Clinton Crossing Mall Stop Saturdays	
Westbound	Eastbound
None	8:25 AM
8:40 AM	9:25 AM
10:40 AM	11:25 AM
11:40 AM	12:25 PM
1:40 PM	2:25 PM
3:30 PM	4:15 PM
4:30 PM	5:15 PM

Clinton Crossing Mall Stop Weekdays	
Westbound	Eastbound
None	None
None	8:15 AM
8:30 AM	9:15 AM
9:30 AM	10:15 AM
10:30 AM	11:15 AM
11:30 AM	12:15 PM
12:30 PM	1:15 PM
2:30 PM	3:15 PM
3:30 PM	4:15 PM
5:30 PM	6:15 PM
6:30 PM	7:15 PM

Table 3.3: **9 Town Transit Schedule**

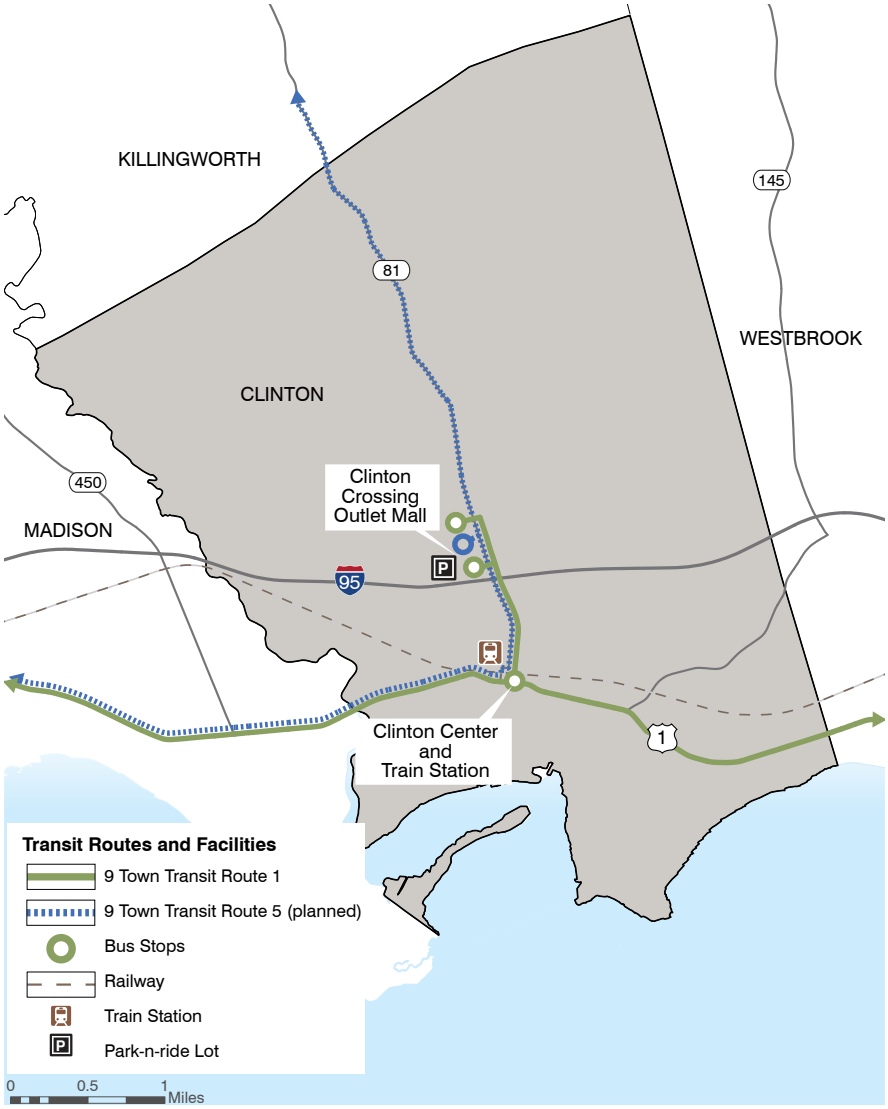


Figure 3.20: **Public Transportation Network**

Commuter Rail – Shoreline East Service

Shoreline East Service (SLE) provides commuter rail service along the Northeast Corridor in Southeastern CT seven days a week. Additionally, SLE offers limited service to Bridgeport and Stamford, and provides connections to NYC via Metro-North Railroad's New Haven Line. Service runs generally every half hour during weekday peak commuting hours and every hour and a half during off peak hours. Weekend service runs generally every hour and a half in the westbound direction between 6:50 AM and 10:36 PM and generally every hour and a half in the eastbound direction between 5:18 AM and 11:16 PM.

CTDOT is upgrading all the Shoreline East Stations and Clinton is the final station to be rebuilt. The new station will have two platforms (one on each side of the tracks), which will allow all trains to stop in Clinton and increase service. Currently not all trains stop in Clinton due to the lack of a platform on the south side. This increase in service is expected to increase ridership and parking demand as currently some residents drive to Madison or Westbrook to take advantage of more frequent train options. Station upgrades will include four ADA accessible elevators on each side of the train tracks and an increase of about 25 parking spaces compared to the existing parking lot. Construction is expected to begin in Spring 2019 and will take two construction seasons.

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4.0 Land Use and Zoning

4.1 Existing Land Use

Land use in the study area ranges from single family residential to institutional and commercial uses within a relatively short span of the roadway. Figure 4.1 displays the mix of land uses present along the corridor.

Gateway Residential Zone

This section of the corridor features mostly single-family homes, but has a small pocket of commercial uses and is home of the newly constructed Morgan School. This segment has a narrow right of way and is the narrowest segment of Route 81.

Commercial Corridor

This segment is home to the Clinton Crossing Premium Outlet Mall, Petco Plaza, the Henry Carter Hull Library, and vacant former Morgan School property. This are is zoned as business, with the former Morgan School property falling within the interchange development zone. It also has the greatest number of intersections and is where the I-95 north and south bound on/off ramps are located.

Village Residential

The southernmost section of the corridor intersects with Route 1 at its terminus. This segment is the gateway into Downtown Clinton and is primarily residential. Homes in this segment are primarily older, single family homes, but there has been conversion to multi-family units with many of the larger residences. Additionally, housing for local schools and institutions, such as the Vista Vocational School is located along this segment. There is also a mobile home park located on Mill Road, which intersects Route 81. This location is a busy school bus stop location. Condominium developments are located on Sterling Drive and Silverbrook Lane, both of which intersect with Route 81.

Utilities

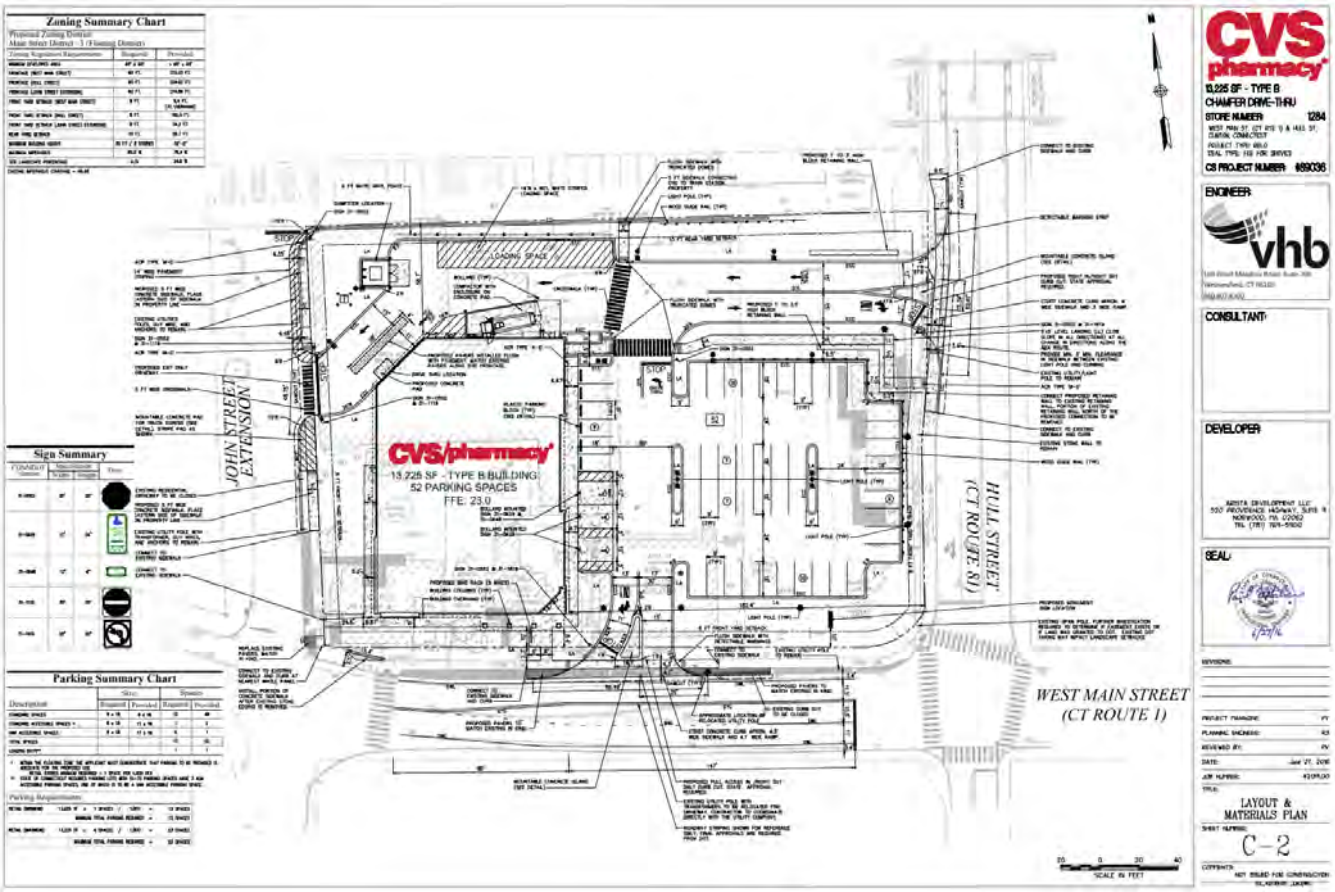
There is no public sewer system in the Route 81 corridor Study area. Clinton has explored options for a sewer system, but to date, no consensus was achieved. The corridor is served by city water, which is supplied by the Connecticut Water Company. Service extends north from Downtown Clinton, and ends at approximately Walnut Hill Road. There is also a water line directly east of Route 81, that services the new Morgan School. This line runs from Stephens Court, across to Oak Ridge Drive, across school property. Since 1997, the Town has been under a Consent Order from the Department of Energy and Environmental Protection (CTDEEP) that requires the Town to develop a plan to address groundwater pollution from private septic systems. Streets adjacent to Route 81, such as Rocky Ledge Drive, Oakwood Lane, Margo Lane, Woodland Drive, and Happy Acres Road, have experienced contamination of drinking water wells. A potential solution would be for homes in those locations is to abandon their private wells and connect to public city water. Planning for this project is underway; an extension of the Connecticut Water line to these streets is expected. The Town of Clinton received a Responsible Growth and Transit Oriented Development grant from the State to design and engineer a wastewater disposal system at the former Unilever site.

Natural gas, provided by Southern Connecticut Gas, is available in the Commercial Corridor. Service is provided to properties located between the Petco Plaza and the Morgan School. Service is also available at the Unilever property. Electricity on Route 81 is provided via Eversource through utility poles.

Active Development

At the time of this study, the only current active development within the study area was the relocation and expansion of the CVS Pharmacy. CVS's previous location was on East Main Street, also in Downtown Clinton. The new CVS will include surface parking, a drive-thru window, and entrances/exits on Hull Street (Route 81), south of the railroad overpass, and on West Main Street.

Construction upgrades to the Clinton Train Station are expected to begin in 2019. Future development is expected to occur at both the former Morgan School site and the Unilever property, as both properties are for sale. At the time of this study, redevelopment plans have not been approved or made public.



CVS site plans at the corner of Hull Street and West Main Street.

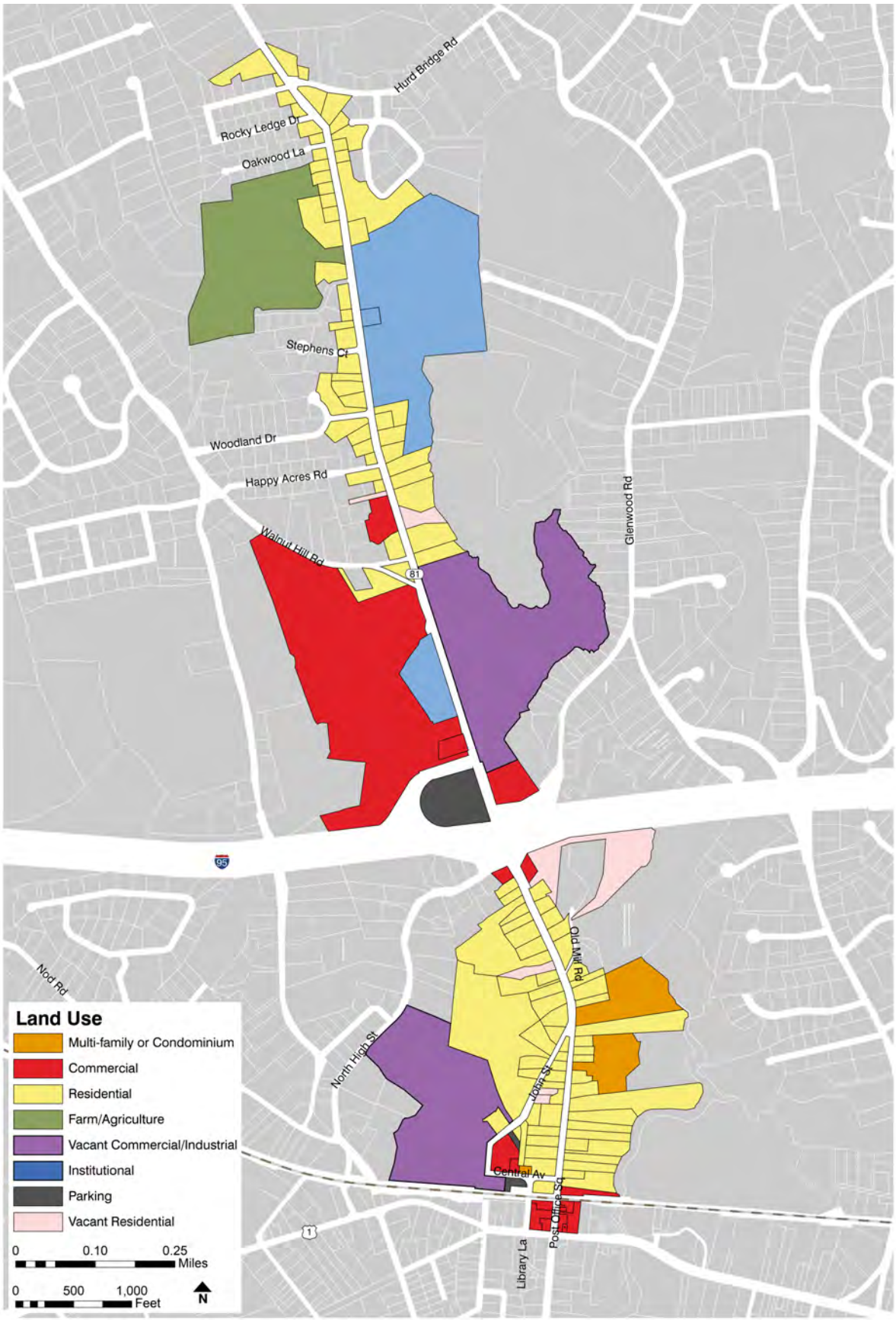


Figure 4.1: **Study Area Land Use**

4.2 Zoning

The Town of Clinton has been updating its zoning regulations, with a focus on districts in key development areas such as Route 81. The most recent zoning map for the Town was updated in 2015 and includes an Interchange Development Zone (IDZ) at the former Morgan School property. With the uncertainty of future development at both the Unilever property and the former Morgan School property, the Town established zoning regulations that both promote future development, while also serving the needs of the community.

The southern portion of the Route 81 Study area is zoned for varied business uses including; B-2, B-3, and B-4. The Unilever property in this area is zoned as an industrial district. The segment of the corridor north of Central Avenue and up to I-95 is zoned for a variety of residential uses including, R-10, R-20, and R-60. North of I-95, the corridor is zoned for a mix of business uses including B-1, B-3, and IDZ. North of Walnut Hill, the corridor returns to residential zoning, with both R-20 and R-40 residential zones. See Figure 4.2. The notable features of each zoning district are as follows:

Zone	Use	Minimum Lot Size	Frontage	Front Setback
B-1	Large scale shopping centers	4.5 Acre	300′	50′
B-2	Office, smaller scale retail	1/4 Acre	60′	25′
B-3	Office, smaller scale retail	1/4 Acre	60′	25′
B-4	Office, large scale shopping centers	1/2 Acre	80′	25′
I-1	Industrial	1/2 Acre	80′	25′
IDZ	Variety of commercial	4.5 Acre	300′	50′
R-10	Single family residential and home office	1/4 Acre	70′	25′
R-20	Single family residential and home office	1/2 Acre	110′	30′
R-40	Single family residential and home office	.9 Acre	150′	40′
R-60	Single family residential and home office	1.4 Acre	150′	50′

Table 4.1: **Study Area Zoning**

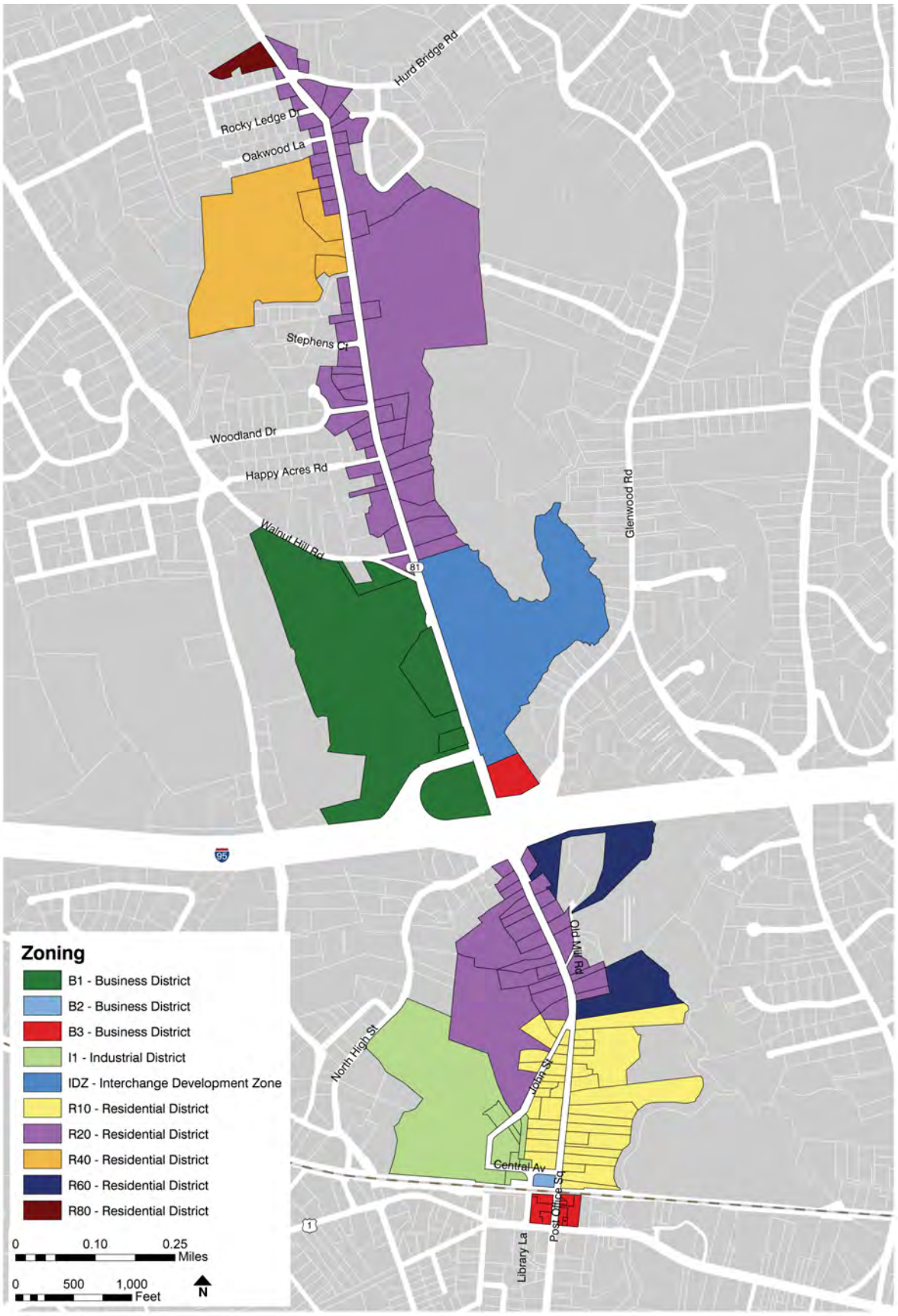


Figure 4.2: **Study Area Zoning**

4.3 Environmental Resources and Constraints

The Route 81 Corridor is home to many wetlands and floodplains, particularly along the eastern edge of the study area, where the Indian River lies. The former Morgan School property has a large area of wetlands as well as steep slopes along the Indian River. Additionally, the middle segment of the corridor, in proximity to the Hull Library and former Morgan School, are within the Aquifer Protection Area. Any future development within the aquifer protection area must adhere to regulations set forth within the Connecticut Department of Energy and Environmental Protection's (CTDEEP) Aquifer Protection Area Municipal Manual (see Figure 4.3).

Although these environmental conditions are potentially a constraint to future development, they are ecological and open space assets to the Town.

The study area was screened for the following natural and cultural resources and physical environment features:

- Surface Water Resources
- Ground Water Resources
- Floodplains
- Wetlands
- Threatened and Endangered Species and Critical Habitats
- Historic Register Properties
- Sensitive Noise Receivers

In addition to reviewing aerial images of the study area, current Geographic Informations Systems (GIS) data from the CTDEEP, RiverCOG, and the Town of Clinton were obtained and reviewed during the screening process.

Surface Water Resources

Surface water resources within the study area include the Indian River, Indian Lake and various ponds and streams associated with the River. The study area rests within the Indian River Watershed. Water quality of the Indian River is listed as "SA". Class SA waters are saline waters that have designated uses are habitat for marine fish, other aquatic life and wildlife; shellfish harvesting for direct human consumption; recreation; industrial water supply; and navigation.

Wetlands

According to the U.S. Army Corps of Engineers (ACOE) 1987 Wetlands Delineation Manual, federal wetlands can be generally defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. The State of Connecticut defines wetlands as land, including submerged land, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the Natural Resources Conservation Services (NRCS).

Based on a review of CTDEEP GIS Mapping, poorly drained and very poorly drained soils are located throughout the study area. Additionally, alluvial and floodplain soils are located within the study area. These areas indicate potential for the presence of wetlands, but do not represent delineated wetland areas.

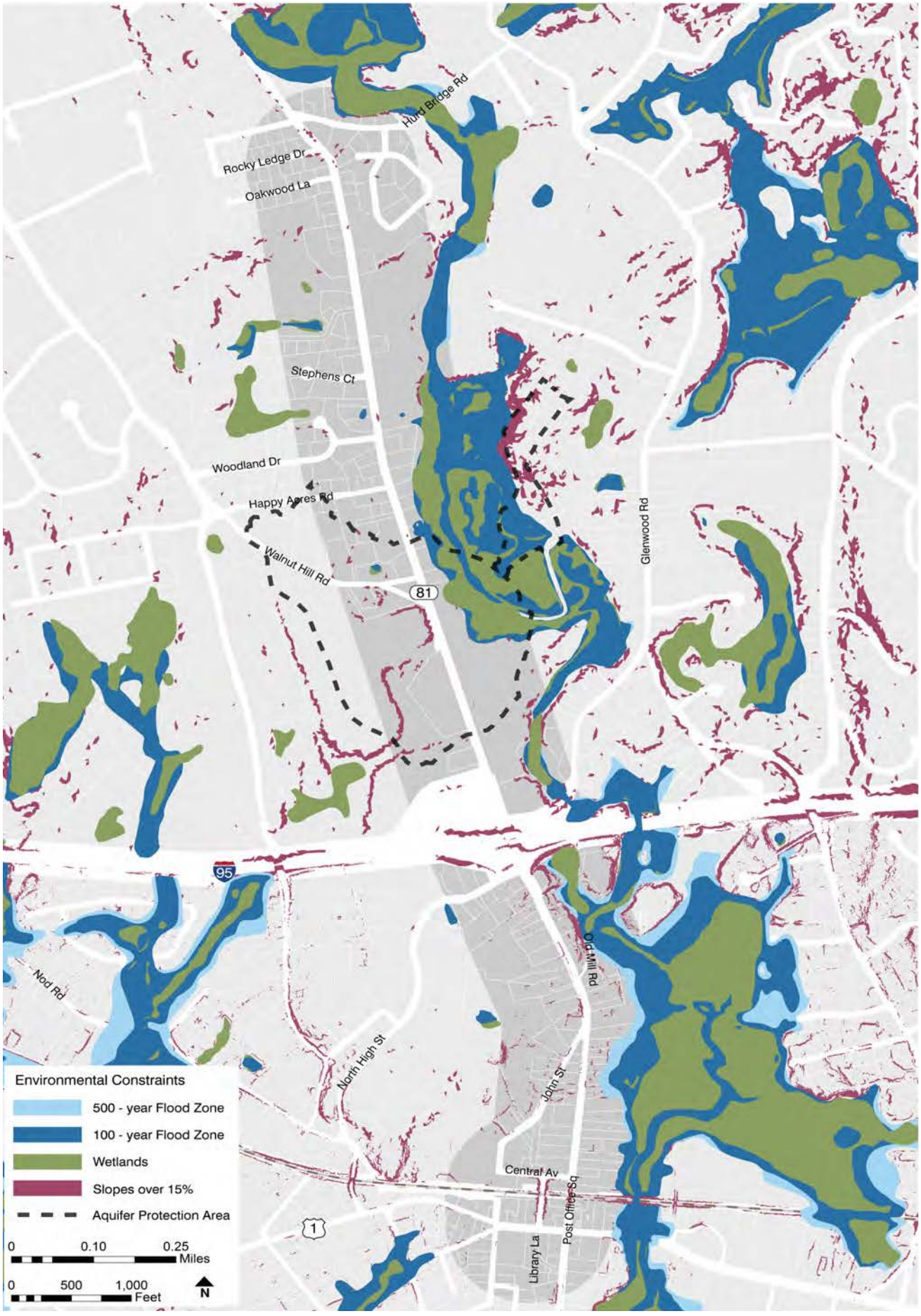


Figure 4.3: **Environmental Constraints**

Floodplains

Floodplains are low-lying areas adjacent to rivers or streams that are inundated periodically by floodwaters. A 100-year floodplain is an area that has a one percent chance of being inundated by floodwaters in a given year, whereas a 500-year floodplain is an area that has a one-five hundredth chance (0.2%) of being inundated by floodwaters in a given year. Floodways are located within floodplains and consist of the river or stream channel plus any portion of the 100-year floodplain which carries stream flows during flood events. Floodplains and floodways are important for storing floodwaters so that adjacent properties and downstream areas are not damaged during flood events. There are 100-year floodplains and 500-year floodplains within the study area, primarily associated with the Indian River.

Threatened and Endangered Species and Critical Habitats

Rare, threatened and endangered species are protected by federal and state legislation. Information on species designated (listed) as threatened and endangered at the state and federal levels is compiled and made available through the CTDEEP's Natural Diversity Data Base (NDDB).

The CTDEEP NDDB data set (December 2017, most recent available) was consulted to determine if there were any records in the study area. Due to the sensitivity of the information, NDDB mapping only depicts approximate locations of protected species, their habitats, and/or significant natural communities. The data set revealed areas of designated species in the areas around the Indian River and other locations in the southern extent of the study area. See Figure 4.4.

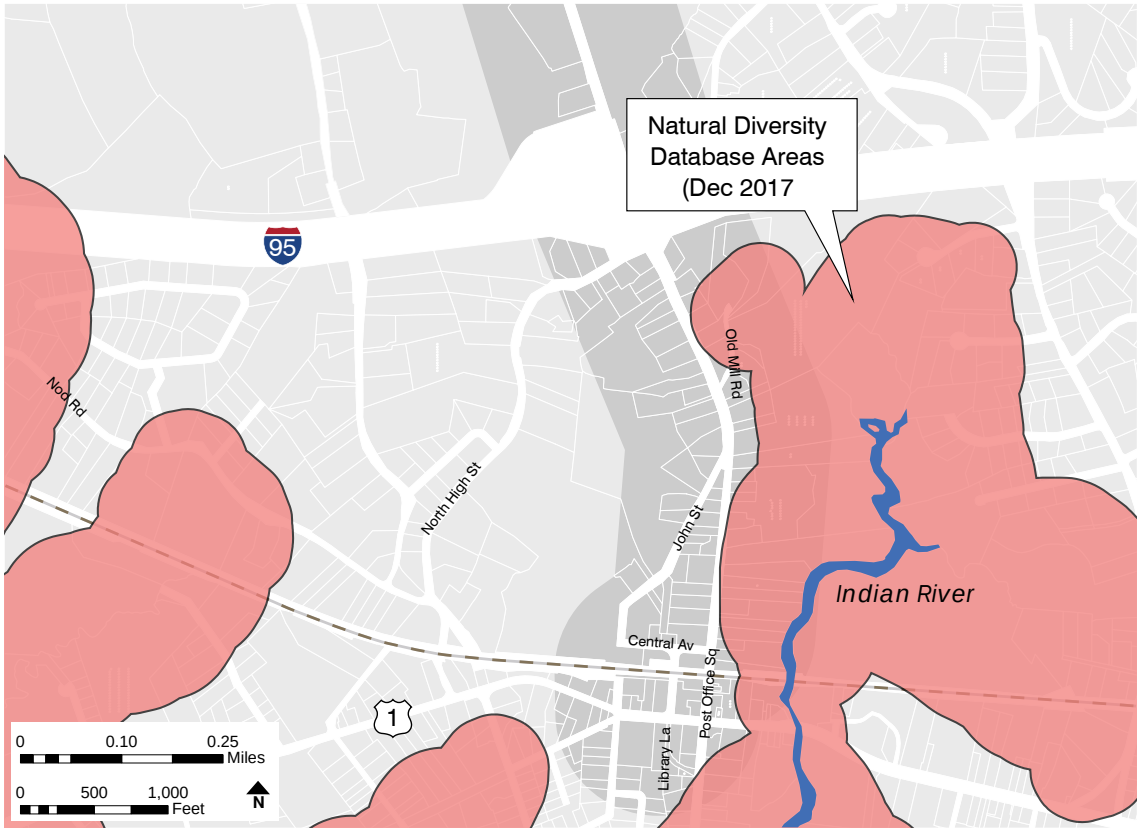


Figure 4.4: **Natural Diversity Areas**

Historic Resources

There are no National or State Register of Historic Places or Districts within the study area. Southeast of the study area lies the Liberty Green Historic District. This district, created in 1979 is within the Clinton Village Historic District and is on the National Register of Historic Places. In addition; twenty-eight individual properties are listed on the State Register of Historic Places. (CT Trust for Historic Preservation)

Downtown Clinton is historic and is designated as a Village Zone. This designation seeks to preserve the character of properties along East Main Street, east of the Indian River and west to Route 145 and Beach Park Road. The purpose of this zone is to maintain "the character and scale of a small New England village". Planning is currently in place to convert the Village Zone to a Village District, which would enable enforceable design regulations. Village Districts are intended to protect the character, landscape, and historic structures within their boundaries and may regulate "new construction, substantial reconstruction and rehabilitation" and "shall consider the design, relationship and compatibility of structures, plantings, signs, roadways, street hardware or other objects in public view". (CGS §8-2j(b))

High Street is primarily residential with many historic homes. A 2014 Vibrant Communities study recommended designating the area as a Village District and a National Register for Historic Preservation District. This would enable property owners to seek Historic Tax Credits. The Vibrant Communities study also recommended designating the area around the Unilever property as a Village District and recommended preserving the art deco facade of the building. The creation of a Village District could adversely impact redevelopment of the Unilever site as encouraging redevelopment is not the intent of a Village District as defined in Connecticut General Statutes §8-2j.

Sensitive Noise Receivers

The Federal Highway Administration's Noise Abatement Criteria (NAC) documented in 23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise is based on Land Use Activity Categories. Land uses considers most sensitive to highway/roadway noise are designated as either Land Use Activity Category A or B. Land Use Activity Category A includes lands on which serenity and quiet are of extraordinary significance and serve and important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Such uses include outdoor amphitheaters, outdoor concert pavilions, and National Historic Landmarks with significant outdoor use. There are no Category A Land Use Activities within the study area.

Land Use Activity Category B includes picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals. The study area possesses many properties that qualify as Category B sensitive noise receivers such as the Morgan School and the Henry Carter Hull Library.

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5.0 Economic Conditions

Unilever Factory building

There are two large-scale development opportunity sites located along the Route 81 Corridor, this includes the 38-acre former Morgan School property, which is owned by the Town, and the 26-acre Unilever property, which is privately owned. Both properties are within close proximity to I-95, Route 1, and Downtown Clinton and represent an opportunity for enhanced economic vitality for the corridor and the Town (see Figure 5.1).

The former Morgan School property falls within the newly created Interchange Development Zone (IDZ), which was created to permit and encourage variety, flexibility, and commercial viability. This zone is meant to allow development appropriate to the area and its surroundings that provides enhancements to infrastructure and integrates with and protects nearby neighborhoods. The IDZ is aimed at fostering high-quality mixed-use development with attention to the design and style of buildings and surrounding amenities and landscaping. The Unilever property is within the Industrial District 1. This property contains a mix of large factory buildings, parking areas, and wooded landscaping. Due to its industrial past, it is assumed that remediation of the property would likely need to occur before any future development commences on the site.

The Town of Clinton lacks public sewer, and as such, any future development on either property would require on-site wastewater treatment.

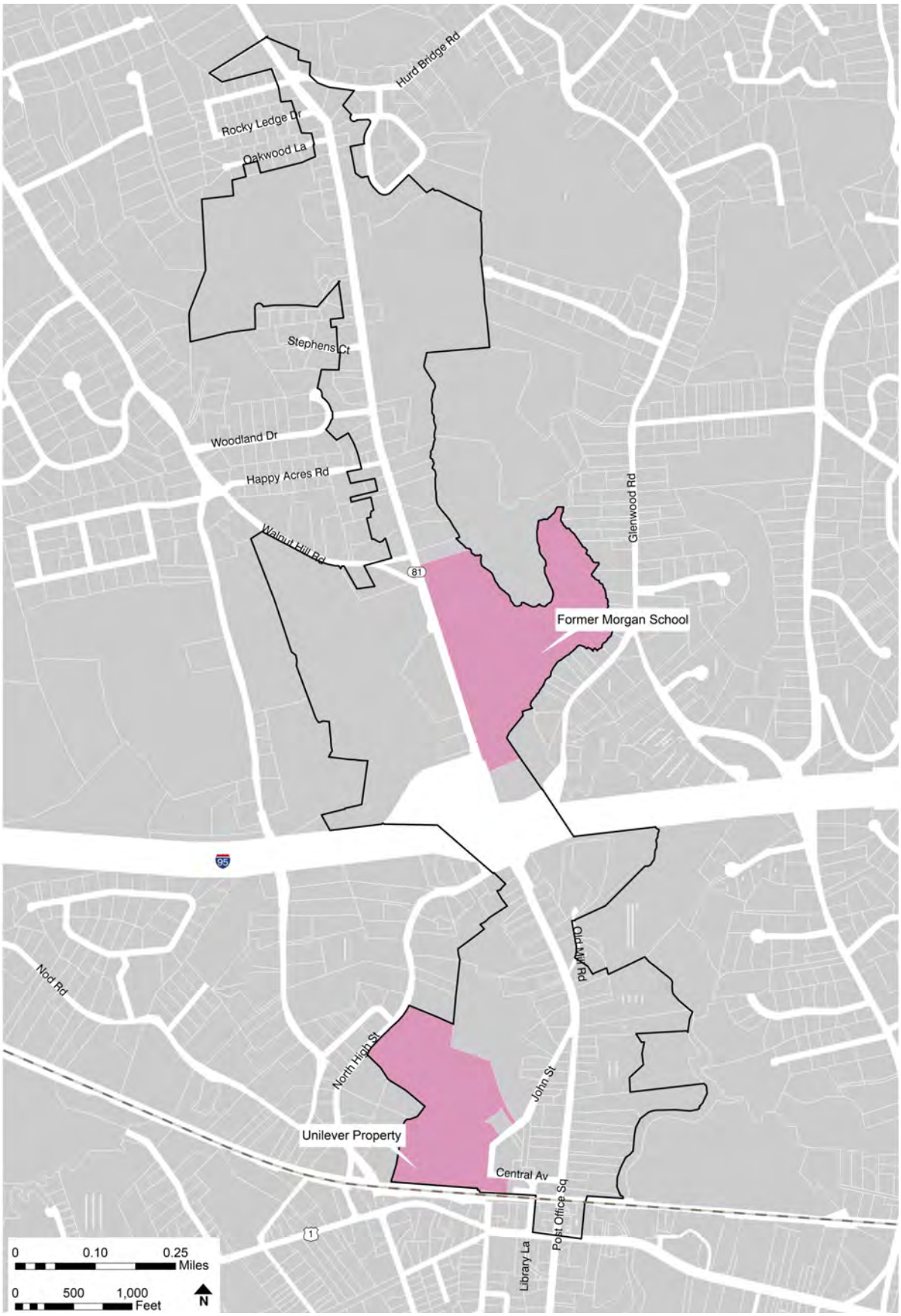

Figure 5.1: **Development Opportunity Sites Within the Study Area**

5.1 Demographic Trends and Housing Demand

Clinton's current population is approximately 13,072. 22% of the population is 19 years old and under, 60% is of working age (20-64 years of age), and 18% is 65 years or older. By 2025 the population is projected to decrease by 11% with losses in all age cohorts except for the population 65 years and older (see Figure 5.2).

Based on the population projections and current household size, it is estimated that Clinton will see a decrease in approximately 580 households. The 65 year and older age cohort is expected to comprise 26% of the total population in 2025. This aging trend continues for 2040 population projections.

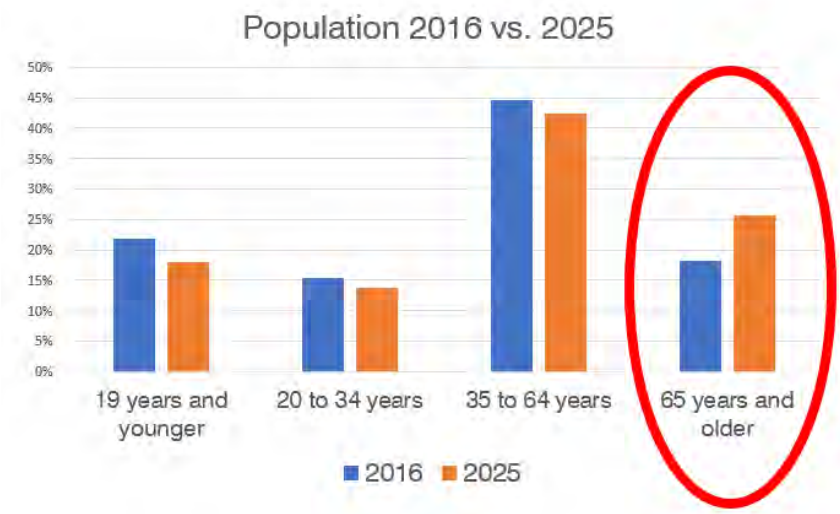

Figure 5.2: **Clinton Population Projections**

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates; CT State Data Center Population Projections for Connecticut

Housing Stock

The structure and age of the town's housing stock speaks to what types of households could find housing based on the current stock and as well as the market potential for different types of housing stock (when looked at in combination with demographic trends).

Clinton's current housing stock is 82% single family with limited types of duplex and multi-family options. Figure 5.3 provides a breakdown of stock by type. Just over 70% of the towns housing stock was built before 1980. Only 7% was built since 2000 or later.

Housing Prices and Availability

As of June 2018, Trulia listed 167 properties on the market in Clinton. Of those, 77% are single family homes. The median sale price for homes is $274,000. Clinton's price per square foot of $199 is comparable to neighboring towns to east and is lower than towns closer in to New Haven. Clinton's rental market has limited availability. An examination of several rental property sites detailed less than 20 listings with an estimated price per bedroom of $880. The price per bedroom is comparable to neighboring towns to east and lower than towns to the west. There is a pocket of slightly higher rents per bedroom close to downtown Clinton.

Prior studies support the potential demand for new rental housing. The 2014 Action Plan for the Unilever Property and Area found the potential for 250 units with 1-2 bedrooms with a maximum rent of $1,800 to be absorbed over 6 years. Additionally, there is a range of rental products coming to the market along the Shoreline East corridor. These properties will offer studio to 2-bedroom units with rents starting at $1,495 (see Table 5.1).

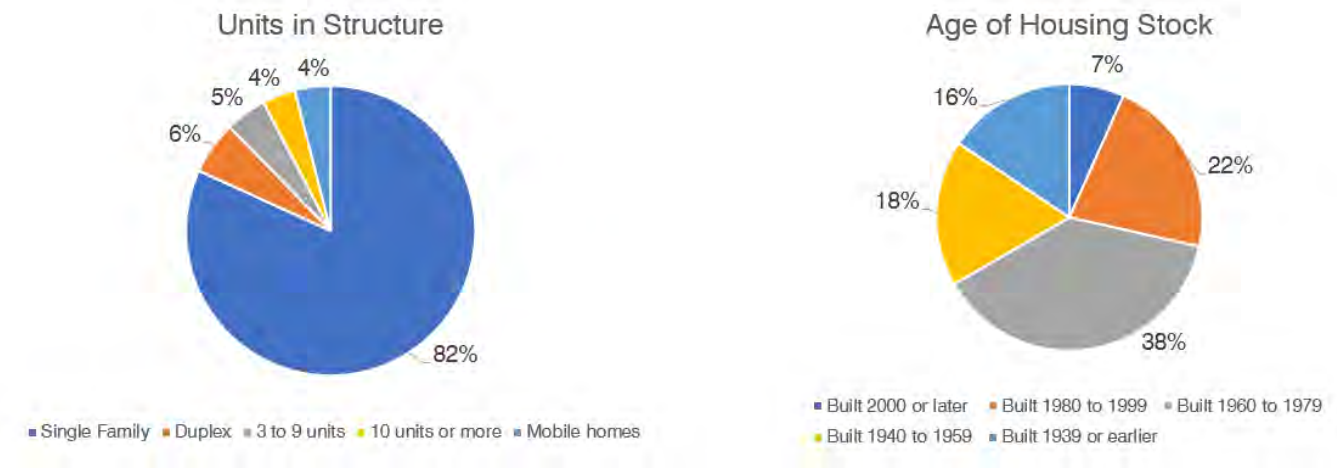

Figure 5.3: **Clinton's Housing Stock**

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Town/ Development	# Units	Bedrooms	Rents	Price Per Square Foot
Old Saybrook - Post and Main	186	1 to 2 bedrooms	$1,600+	$2.10
Branford - Atlantic (planned development)	205	Studio up to 2 bedrooms	$1,500 - $1,800 estimated	

Table 5.1 **Planned or Newly Constructed Rental Units in Nearby Towns**

Drivers of Housing Demand:

- Demographics
- Commuting patterns and job centers
- Housing prices
- Housing availability in region

Housing Market Observations

The following findings are based on the study team's analysis of demographics, commuting patterns, housing stock and availability:

- The increase of the 65+ age cohort in combination with the current housing stock of mostly single-family homes suggest potential demand for housing units that could better support an aging population.
- Commuting patterns suggest somewhere between 2,000-4,700 people could consider moving to make commute easier.
- However, Clinton would see only a percentage of this potential market and there is a pipeline of recent or under construction properties in the region that would be competing for renters.
- The price point of rental units could be an issue for some of the potential market. For instance, an $1,800 monthly rent requires an annual household income of $72,000 (assumes housing accounts for no more than 30% of annual income).

Historic home on High Street

Clinton Crossing

5.2 Retail Demand

The Study area presents two different types of retail opportunities; a regional opportunity driven by the presence of Clinton Crossing and a local opportunity based in the downtown. From the regional perspective, the ability to support additional retail is unclear. Table 5.2 illustrates the retail sales gap for a 10, 20 and 30-minute drive from Clinton Crossing. There may be a reporting error in the retail sales data with potential double counting between "GAFO" (General merchandise, Apparel, Furniture, and Other) retail and other miscellaneous store retailers due to the presence of the outlet mall. GAFO retail includes general merchandise stores, clothing/accessories, furniture/home furnishings, electronics/appliances, sporting goods/hobbies/book/music and offices supplies/stationary stores.

The proximity to the destination retail of Clinton Crossing would be a plus for new retailers. However, GAFO retailers are among the most vulnerable to online sales competition.

The retail sales gap analysis focused on the downtown suggests that there is potential for retail that could add to the existing downtown offerings aimed at a local market. However, the viability of these offerings would rely on the accessibility of the area including parking, walkability, and safety. See Table 5.3.

Commercial Market Observations

- While there is some retail market potential the regional opportunity is vulnerable to competition from online sales and the local market potential depends largely on available amenities and accessibility in the downtown.
- While there has been growth in office dependent sectors the quality of existing office stock and the availability of offices throughout the region will limit this market potential.

Industry	10 Min Drive	20 Min Drive	30 Min Drive
GAFO Retail	$30,109,413	$126,638,374	$123,155,012
Bldg Materials, Garden Equip. & Supply Stores	$10,426,784	($38,447,440)	($74,892,365)
Health & Personal Care Stores	($5,268,362)	$47,477	($66,524,885)
Other Miscellaneous Store Retailers	($122,185,990)	($119,840,204)	($118,237,944)
Food Services & Drinking Places	$1,303,286	$41,510,423	($5,118,898)

Table 5.2 **Retail Sales Gap Analysis - Clinton Crossing Area**

Industry	.25 Miles	.5 Miles	1 Miles
Furniture & Home Furnishings Stores	$161,488	$766,919	$1,362,633
Electronics & Appliance Stores	($824,611)	($503,369)	($1,351,525)
Bldg Materials, Garden Equip. & Supply Stores	($461,127)	$88,845	$133,213
Food & Beverage Stores	$350,917	$2,622,979	$8,227,715
Health & Personal Care Stores	($84,875)	($475,408)	($2,199,692)
Clothing & Clothing Accessories Stores	$297,261	$1,299,987	($42,735,377)
Sporting Goods, Hobby, Book & Music Stores	$144,960	$688,272	$1,468,932
General Merchandise Stores	$601,884	$2,837,531	$7,905,080
Miscellaneous Store Retailers	($237,948)	$261,083	($54,381,724)
Food Services & Drinking Places	($462,877)	($1,222,792)	($2,039,223)

Table 5.3 **Retail Sales Gap Analysis - Downtown Area**

5.3 Office Demand

Office dependent sectors represent a variety of businesses including information, finance and insurance, real estate, professional/scientific/technical services, management of companies and health care and social assistance. According to CT Labor Market Information, Clinton currently has 104 office dependent establishments and 668 jobs. Figures 5.4 and 5.5 illustrate establishment and employment growth between 2011 and 2016. Over the past five years, the number of office dependent establishments grew by 20% in Clinton and 16% in neighboring towns (Madison, Killingworth and Westbrook).

During this same time frame, the number of jobs grew by 58% in Clinton and 9% in neighboring towns. Most of Clinton's employment growth was in professional, scientific and technical services as well as healthcare and social assistance (an increase of 63 and 181 jobs respectively).

Office Dependent Establishments Growth

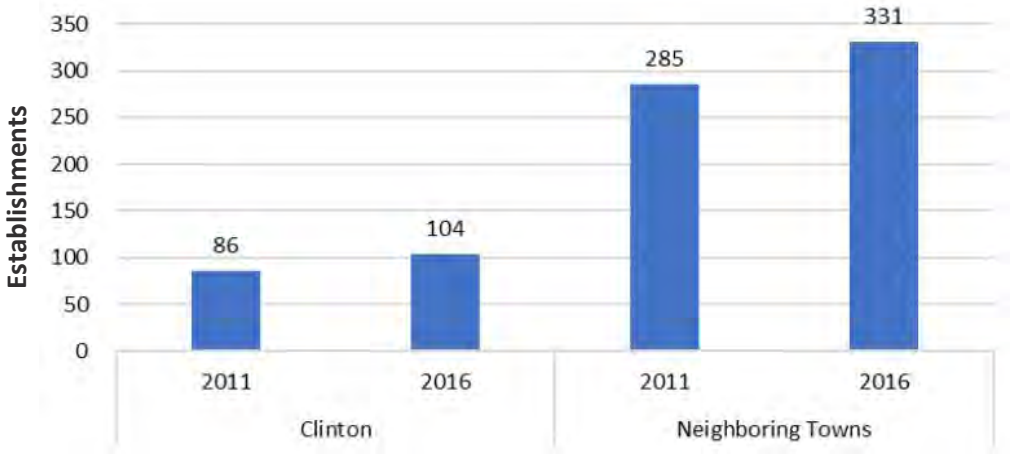

Figure 5.4: **Establishment Growth**

Office Dependent Employment Growth

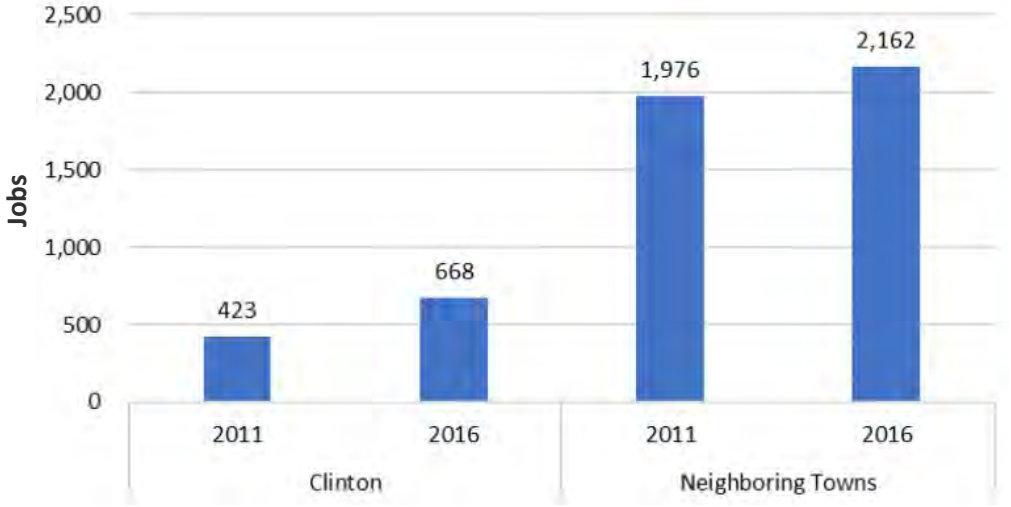

Figure 5.5: **Employment Growth**

Source: CT Labor Market Information, Quarterly Census of Employment and Wages (QCEW)

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6.0 FUTURE CONDITIONS TRAFFIC ANALYSIS

The future conditions assessment evaluates the potential effects of vehicular traffic growth in the study area over the long-term (year 2033) planning horizon. By understanding the potential effects of traffic growth on operations and mobility in the Route 81 study area, local, regional, and state officials and policymakers can make informed decisions about the future needs and priorities of the area relative to improving transportation systems and enacting land use policies that will help mitigate traffic growth over time. This section presents the overall traffic forecasting methodology used for the future conditions assessment and the traffic volumes and associated traffic operations associated with three unique future conditions: a base condition and two different build scenarios.

6.1 TRAFFIC FORECASTING METHODOLOGY

There are two primary components of growth that will contribute to the overall traffic growth in the study corridor. One component is regional growth, which accounts for new traffic demand throughout the regional roadway network that is associated with projected changes in land use and demographics (such as population, employment, households, and other census-based data) in areas beyond the study corridor. A second component of growth is localized growth, which accounts for new traffic demand generated by planned or potential new developments within the immediate study corridor.

Since a regional and statewide traffic forecast model was not available, trip generation estimates were developed by applying Institute of Transportation Engineers (ITE) trip rates published in the Trip Generation Manual, 10th Edition and added to existing conditions traffic volumes.

BASE ASSUMPTIONS

The 2033 Base scenario was based on regional growth and the anticipated development of undeveloped and underutilized land in and around the Route 81 study area. Through coordination meetings with corridor stakeholders, and Town staff; the study team has formulated the following assumptions for the base scenario:

- CVS site: development of a 13,250 sq. ft. pharmacy building with drive-thru window and 52 parking spaces at West Main Street (US Route 1) and Hull Street (Route 81)
- Former Unilever Site: redevelopment of 110,000 sq. ft. structure to support a sporting complex/ recreational community center.

Figure 6.1 illustrates the locations of considered developments in the base condition as well as all access/ egress points to sites. Table 6.1 summarizes the forecasted traffic volumes. Both sites will experience even directional distribution (50% incoming and 50% outgoing trips) during peak periods.

Development		Daily trips	AM Peak	PM Peak	Number of Access / Egress Points (A/E)
Site1	CVS Pharmacy	1,445	120	150	3A / 3E
Site2	Recreational Community Center	3,061	190	255	3A / 3E

Table 6.1: Summary Proposed Developments (Base Condition)

The build scenario is considered to determine how much traffic growth is possible in the corridor and how much the proposed development would impact local roadway systems. The build condition considered various concepts for the redevelopment of the former Morgan High School Site with final analysis of Indian River Landing Development concept that includes:

- Component A – 127,000 sq.ft of retail, multi-tenant retail, restaurants, & grocery store
- Component B – 24 luxury townhomes
- Component C (Optional) – 85 room hotel
- Component D – community amenities

Table 6.2 provides a summary of projected square footage that was used in forecasting traffic. To properly assess traffic, the Component A was furthered detailed with the following assumptions:

- Restaurant with drive thru (6,500 sq.ft)
- Restaurant without drive thru (6,500 sq.ft)
- Quality restaurant (19,050 sq.ft)
- Shopping center (80,250 sq.ft)
- Supermarket (15,000 sq.ft)

Table 6.3 summarizes the forecasted traffic volume ranges using the fitted line (average rate or regression) that best matches the cluster of trip generation values. Regression equation estimation was used when the data sample had at least 20 data points and an R2 value of 0.75 or higher.

Figure 6.1: Base Conditions developments

Project Square Footage	Without Hotel	With Hotel
Retail	127,000	173,000
Residential	60,000	60,000
TOTAL	187,000	233,000

Table 6.2: Indian River Landing Development Square Footage (Build Condition)

Volume/ Period	AM			PM		
	Total	In	Out	Total	In	Out
Retail	1,053-1,320	578-720	475-601	1,244-1,519	644-784	600-735
Residential	8-11	2-3	6-8	10-13	6-8	4-5
SUBTOTAL	1,061-1,331	580-723	481-609	1,254-1,532	650-792	604-740
Hotel	46-54	25-29	21-25	52-54	30-31	22-23
TOTAL	**1,107 - 1,385**	**605 - 752**	**502 - 634**	**1,306 - 1,586**	**680 - 823**	**626 - 763**

Table 6.3: Indian River Landing Development Peak Hour Traffic

Based on the ITE trip rates the proposed 85-room hotel is expected to generate approximately 550-700 daily trips. The 24 luxury townhomes are expected to generate approximately 130 trips on a daily basis including 10 during the morning and afternoon peak hour. The various retail developments are expected to generate a range of daily trips 11,550 to 14,650 with peak ranges provided in Table 6.3.

Based on 2012-2016 US Census American Community Survey for Census Tract commuting data, approximately 5-15 percent of commuting trips can be made by transit, bicycle, walking, or avoided by working from home. Applying this mode split to the residential trips, the site is expected to generate approximately 10 less vehicle trips on a weekday basis.

Also, since the Indian River Landing Development is a mixed-use development, additional reduction factors were used to account for internal, pass-by, and diverted trips, thus the base ITE forecasts were adjusted. The three types of adjustments were:

- Pass-By - Traffic already on the way from an origin to a primary trip destination that will make an intermediate stop at the site being studied without a route diversion. (aka, a gas station or food takeout)
- Diverted - Traffic attracted to the site being studied from adjacent facilities without direct access to the site. A diverted trip example is a through trip on a freeway that diverts to an exit and a development, adding traffic to the local road but removing traffic from the freeway.
- Internal - Traffic associated with mixed-use developments where trips among various land uses can be made on the site being studied without using the major street system. These trips can be made either by walking or by vehicles using internal roadways.

ITE allows for a maximum pass-by rate of 20 percent of site traffic or 10% of passing roadway traffic for major traffic generator applications, whichever is lower. For this project and location, 20% of the site traffic is the lower figure for both the weekday and Saturday periods. For Internal – ITE allows reductions between 5-60% of total traffic, depending on type of mix-use & how well it serves the patrons. In Connecticut 10-25% on average is used.

Figure 6.2 illustrates the locations of proposed development and access/egress points to sites while providing the traffic volume splits. Logically the trips destined south of our development would more likely use the southern access/egress point and trips destined to / originating from north of the proposed development would use the more northern access/ egress point (hence the 5-10% split of total volume).

Figure 6.2: Indian River Landing Development Traffic Distribution

6.2 BASELINE TRAFFIC ANALYSIS

TRAFFIC GROWTH

The background growth rate was added to the existing peak hour traffic volumes in order to estimate the year of development completion (2021) background traffic volumes. The background increase was based on average annual growth rate of 0.25% per year, a figure typically used for studies in Connecticut and checked against average annual growth rate at the continuous counter located approximately 2 miles north of the development and on the corridor.

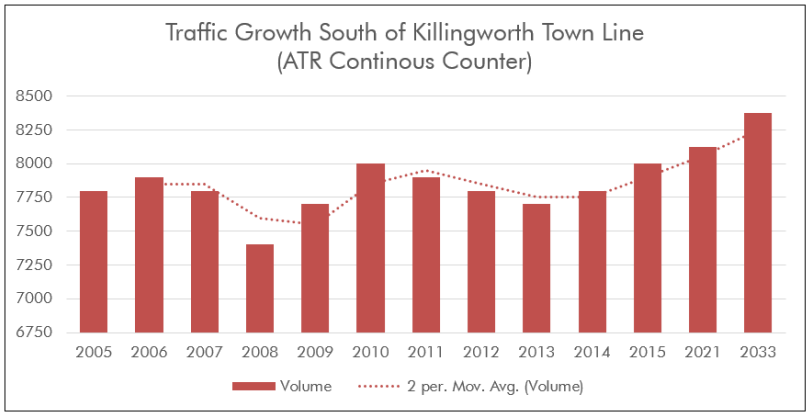


Figure 6.3: Future Base Growth (Volume)

The volumes have been essentially flat in this area. In 2005 the volumes were the same as in 2014 at the Killingworth town Line. Figure 6.3 illustrates potential traffic growth to 8,375 by 2033 under the above mentioned conditions.

TRAFFIC OPERATIONS

The study team evaluated traffic operations in the Route 81 Corridor Study for the "base" condition by determining levels of service (LOS) at corridor intersections. LOS is based on the computed average control delay (in seconds per vehicle, sec/veh) for individual movements at signalized and unsignalized intersections, and for each signalized intersection as a whole. For this study corridor, LOS D or better is considered acceptable for intersections.

The LOS for each intersection was determined by completing capacity analyses using the weekday AM and PM peak hour traffic volumes presented in Figure 6.4 and SYNCHRO software. The analysis assumes that the traffic signal cycles and timings would be optimized over time for the existing signal infrastructure.

The peak hour traffic operations are summarized in Table 6.4.

Note the degradation of traffic conditions at the southern end of the study with existing roadway geometry and signal timings. The U.S-1 intersection along with I-95 ramp intersections experiences additional traffic volumes caused by background and site-specific growth. If no improvements are made to resolve the signal phasing and timing requirements of the closely-spaced signalized intersections along Route 81, these issues will be exacerbated in the future as a consequence of the forecasted traffic growth.

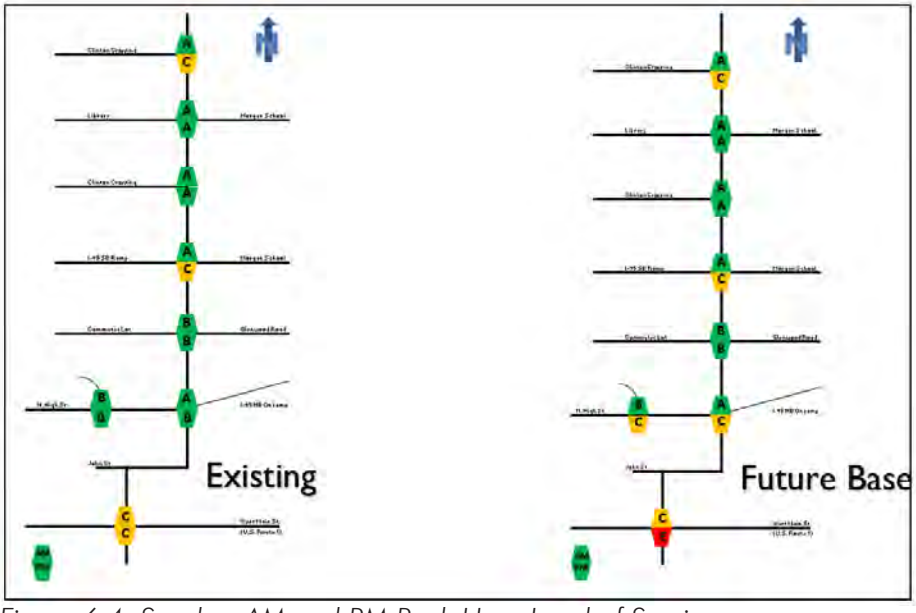


Figure 6.4: Synchro AM and PM Peak Hour Level of Service

Description	Existing AM	Existing PM	Base AM	Base PM
Clinton Crossing (Norther Access/Egress)	A	C	A	C
Library Access Point	A	A	A	A
I-95 Southbound Ramps	A	C	A	C
Commuter Lot / Glenwood Road	B	B	B	B
N. High Street / I-95 Northbound Off Ramp	B	B	B	C
N. High Street / I-95 Northbound On Ramp	A	B	A	C
Hull St at West Main St / U.S Route 1	C	C	C	E

Table 6.4: Peak Hour Traffic Operations LOS – Existing and 2033 Base Conditions

6.3 BUILD TRAFFIC ANALYSIS

As was done for the 2033 base condition, the study team also evaluated traffic operations in the Route 81 corridor for the proposed built-out conditions by determining levels of service (LOS) at corridor intersections. The weekday daily, AM and PM peak hour forecasted traffic volumes were used as the basis of the 2033 Build scenario by incorporating potential development build-out scenarios for Indian River Landing Development. The build-out scenario was based on the overall property development/redevelopment potential described by the developer.

TRAFFIC GROWTH

It is important to note that any increase in development density in Route 81 corridor will occur gradually over time and will be facilitated by private developers. The rate at which development occurs, where it occurs, and to what intensity, is unpredictable and will be a function of many factors including real estate market conditions; changing population and demographics; limitations on utility capacity and infrastructure; regulatory controls (such as zoning regulations); and local and state economic policies (such as tax incentives), among other variables. It is also important to note that the Route 81 development scenario is based upon a development proposal and may not be built out as proposed.

Description	Base		Low Built w/out Hotel		High Built w/ Hotel	
	AM	PM	AM	PM	AM	PM
Clinton Crossing (Northern Access/Egress)	104%	103%	140%	124%	150%	130%
Library Access Point	105%	104%	129%	121%	137%	125%
I-95 Southbound Ramps	110%	104%	194%	168%	217%	183%
Commuter Lot / Glenwood Road	105%	105%	151%	143%	160%	151%
N. High Street / I-95 Northbound Off Ramp	124%	119%	169%	147%	179%	153%
N. High Street / I-95 Northbound On Ramp	110%	109%	168%	148%	183%	157%
Hull St at West Main St / U.S 1	110%	109%	134%	121%	139%	126%

Table 6.5: Peak Hour Traffic Volumes Growth Rates (The existing traffic condition equals 100%)

TRAFFIC OPERATIONS

The study team determined the LOS for each of the seven study intersections to provide a measure of the future traffic operations at these intersections. The LOS for each intersection was determined by completing capacity analyses using the future AM and PM peak hour turning movement volumes forecasted and analyzed using SYNCHRO software. The AM and PM peak hour traffic operations are summarized in Table 6.6 and Figure 6.5. Note, these results reflect existing geometrical and signal conditions.

Description	Base		Low Built w/out Hotel		High Built w/ Hotel	
	AM	PM	AM	PM	AM	PM
Clinton Crossing (Northern Access/Egress)	A	C	A	B	A	B
Library Access Point	A	A	A	A	A	A
I-95 Southbound Ramps	A	C	C	E	D	F
Commuter Lot / Glenwood Road	B	B	C	D	C	E
N. High Street / I-95 Northbound Off Ramp	B	C	C	C	E	D
N. High Street / I-95 Northbound On Ramp	A	C	B	D	B	E
Hull St at West Main St / U.S 1	C	E	C	E	C	F

Table 6.6: Peak Hour Traffic Operations LOS: Base and Build Conditions

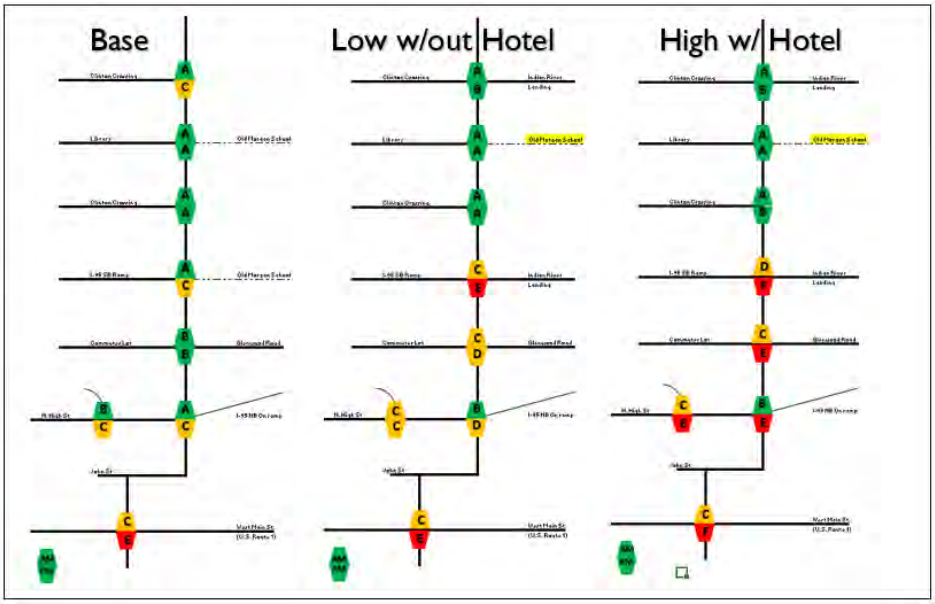


Figure 6.5: Synchro AM and PM Peak Hour Level of Service

6.4 POTENTIAL TRANSPORTATION IMPROVEMENTS CONSIDERED

The transportation improvement recommendations of this study include general improvement strategies for the study area, and location-specific improvement recommendations that together promote the concept of complete streets – or streets that are designed to provide safe access for all users including pedestrians, bicyclists, transit riders, and motorists. Several design considerations were made aimed to improve roadway and driving conditions. Some of these design concept will require additional analysis and / or data collection to assess potential impacts and constraints.

CORRIDOR WIDE

As noted above, the project will have significant impacts at the study area intersections during the weekday peak hours. Several design considerations were made to maintain safe operations in the study area. These are identified on the following pages.

ADDITIONAL SOUTHBOUND THRU-LANE

Based on the Synchro analysis for the future scenarios, 95th percentile queues on Route 81 southbound approaching I-95 are expected to spill back to or past the I-95 ramps in both peak hours under Build conditions. Thus, in several iterations of conceptual planning an additional southbound through lane was considered from the Route 81 intersection with the I-95 on/off ramps / southern access point to the Indian River Landing development to the intersection with North High Street and the I-95 Northbound on-ramp. These tests resulted in potential substantial improvements to delay and queue lengths in the corridor.

ADDITIONAL EXCLUSIVE TURN LANES

An additional southbound thru lane only improved thru movement, however several locations on the corridor experience heavy delays due to high turning volumes. Several locations were identified that would benefit from additional turn lanes. Some of these will be exclusive turn lanes while others would share with the through movement. The proposed locations are:

- Route 81 Northbound Left to I-95 Southbound –2 protected left lanes from one existing.
- I-95 Southbound Left to Route 81 Northbound – change from one exclusive left to include additional turn and through shared.
- Route 81 Northbound Left to N High St – one protected left lane changed from a left and through shared lane
- N High St Eastbound at Route 81 – from one exclusive left and a shared right-turn / through to two exclusive left-turn lanes. The through eastbound movement to I-95 Northbound is proposed as a shared right-turn / through lane.

All concepts were tested using Synchro and required a redesign of the traffic signal phasing to optimize intersection outputs.

ROUNDABOUT CONSIDERATIONS

Modern roundabouts have gained popularity among transportation practitioners and the general public due to their safety performance and operational efficiency. As an intersection control, roundabouts operate efficiently with minimal operating costs under a wide variety of conditions. Based on the United States and international experience, roundabouts are known to reduce delay, total crashes and crash severity for intersections with low to medium traffic volumes. However, several key roundabout selection/installation guidelines must be followed: safety implications, roundabout analysis tools, site selection guidelines, and geometric design considerations. For the analysis Synchro 10 was used with HCS6. Several roundabout types were tested to optimize the geometry and performance of intersections. Below is a quick summary of roundabout feasibility analysis:

- Route 81 @ Walnut Hill Rd – A single-lane roundabout will function adequately. Currently there is a stop sign at Walnut Hill Rd (minor) with free flow on Route 81.
- Route 81 @ Clinton Crossing driveway – Currently a signalized intersection that could be reconstructed as a turbo roundabout (the design provides a spiraling flow of traffic, requiring drivers to choose their direction before entering the roundabout.) This form of roundabout yields acceptable results.
- Route 81 @ library driveway – Turbo roundabout could be installed.
- Route 81 @ I-95 SB ramps – Roundabout would not possible due to high volumes
- Route 81 @ Glenwood Rd – Turbo roundabout could be installed, however its operations are borderline due to high volumes.
- Route 81 @ N High St and I-95 NB on-ramp – Roundabout not practical due to high volume at the NB ramp intersection, particularly the southbound lefts and eastbound lefts.
- I-95 NB off-ramp @ N High St – Only turbo roundabout would work, however its proximity to the intersection with Route 81 would create a problematic queuing situation

- Route 81 (High Street) @ John St – Single-lane roundabout would work acceptably. Currently it is a stop sign at John St (minor) with free flow on Route 81.
- Route 81 (Hull Street) @ Central Ave – A single-lane roundabout at this location is feasible and would serve as a gateway to downtown Clinton for southbound motorists on Route 81. This alternative would require property impacts to provide a Route 81 alignment that situates the roundabout north of the existing intersection to minimize any issues with grades on Route 81 approaching the railroad underpass. This roundabout should be considered as part of any traffic mitigation required for redevelopment of the Unilever site.

PROPOSED DEVELOPMENT

As noted in earlier sections, the Indian River Landing Development will have significant impacts on the study area intersections during the weekday peak hours. Several strategies were tested to mitigate the congestion on Route 81. Some of the proposed solutions included:

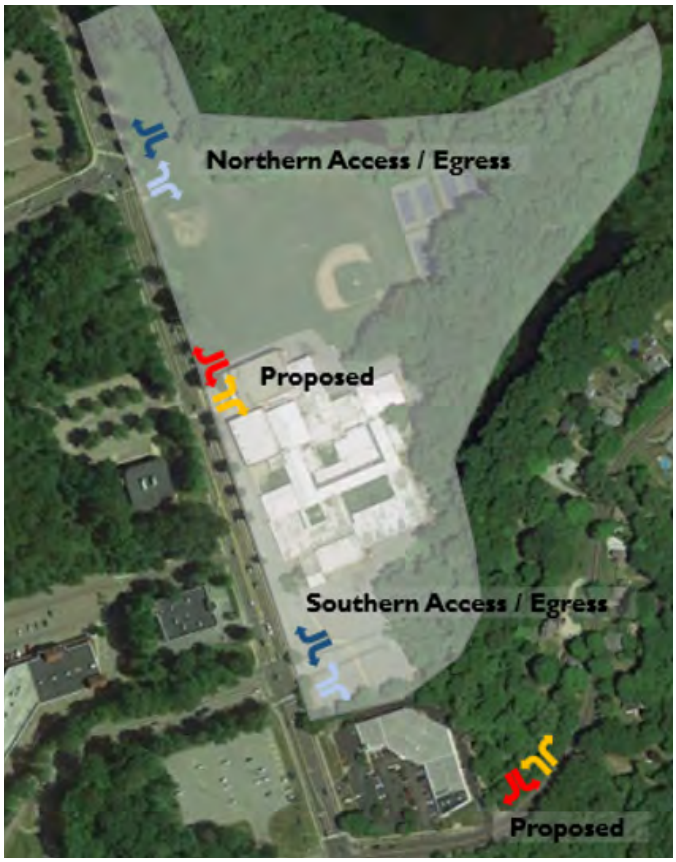


Figure 6.6: Proposed Third Access / Egress Point Locations

THIRD ACCESS/EGRESS POINT

The highest volume in the Route 81corridor is the southern access / egress from the development along with the I-95 SB ramps. The high volumes generated by the development warranted analyzing improvements by providing a third access point. The intent was to lower the volumes utilizing the southern access/ egress point and improving overall level of service for the corridor. Figure 6.6 illustrates the two locations have been identified and tested:

- Route 81 at existing traffic signal with Henry Carter Hull Library
- Glenwood Road east of Petco plaza

In both instances, the traffic improves significantly at the affected intersections on Route 81.

TRAFFIC STUDY IMPACT

One major objective for the study was to correlate land use to the transportation system and how it operates. With changing design concepts of the Indian River Landing development only a preliminary analysis was conducted. Two major scenarios were identified: a worst case where full build out was anticipated and no traffic factor reductions were used and a scenario without a hotel as well as traffic factor reductions to account. Once a design concept for the Indian River Landing development is finalized, a full OSTA-approved Traffic Impact Study will be required.

I-95 RAMPS

Under build conditions, high volumes were observed at the ramp intersections. To alleviate potential queuing back along the I-95 ramps, and spill backs into I-95 mainline and Route 81 various design options were considered for these ramps. This conceptual analysis was intended to allow the study team to assess the feasibility, pros and cons of potential ramp realignment options as well as their potential to improve traffic operations.

I-95 NORTHBOUND RAMPS

Figure 6.7 illustrates design concepts for northbound ramps and Table 6.7 provides a summary of pros and cons of each design.

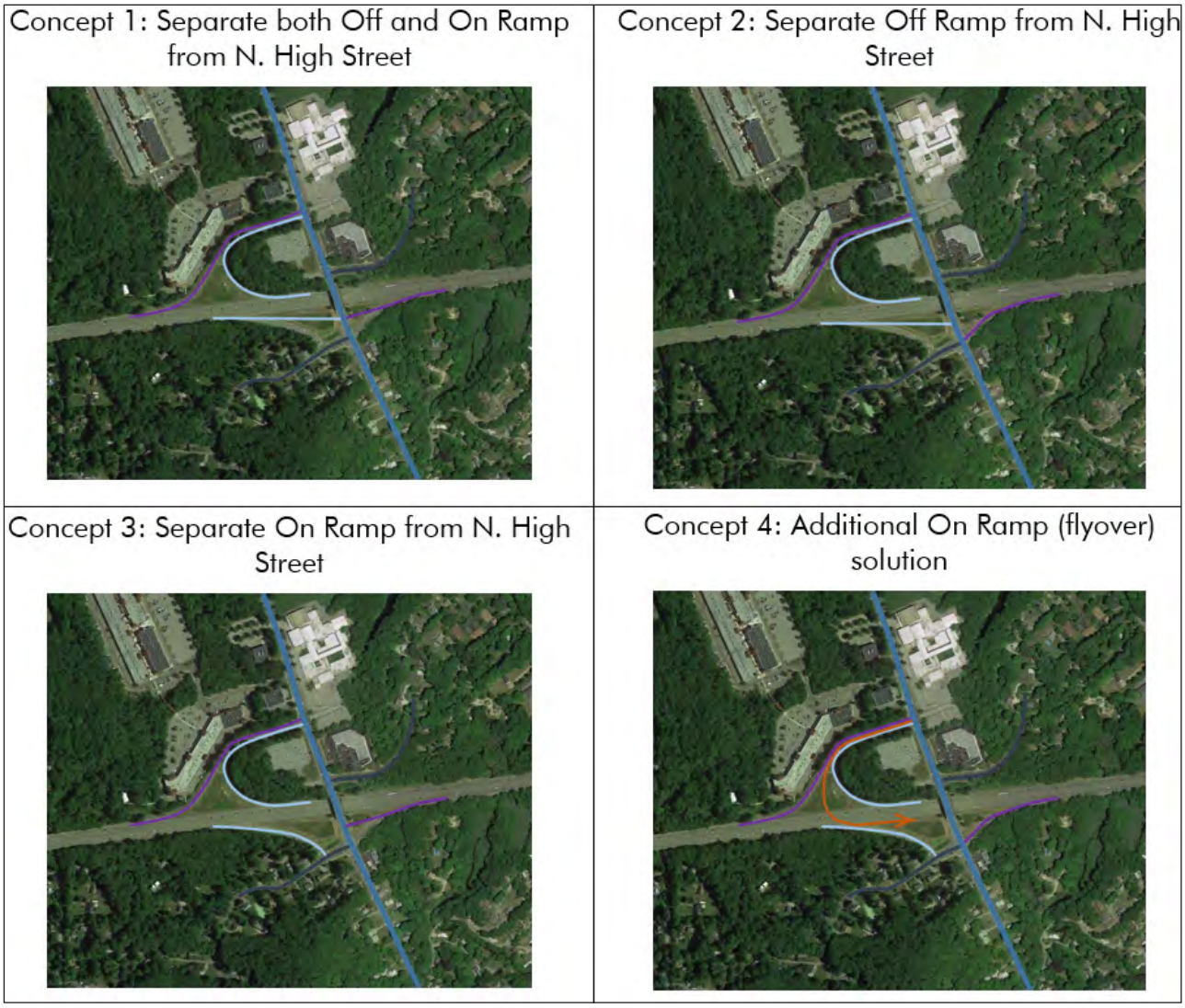


Figure 6.7: Proposed I-95 Northbound Design Concepts

Concept Design	Pros	Cons
Concept 1: Separate both Off and On Ramp from N. High Street	- Glenwood, ramps, N High St should run on same controller.	- Similar to Cromwell (Rt-9/ Rt-372 may experience signal proximity/spacing issues
Concept 2: Separate Off Ramp from N. High Street	- Glenwood, ramps, N High St should run on same controller.	- High left turns (EBL, separated from SBL) (Pro) - Ramp volume spills into I-95
Concept 3: Separate On Ramp from N. High Street	- Glenwood, ramps, N High St should run on same controller.	- SB Volume builds up on viaduct
Concept 4: Additional On Ramp (flyover) solution	- High left turns (SBL) eliminated before bridge by providing a flyover & turning them into right turns - Only one large intersection at Glenwood/ I-95 ramps,	- Very $$$ solution - N High St should run on same controller.

Table 6.7: Proposed I-95 Northbound Design Concepts Pros and Cons

I-95 SOUTHBOUND RAMPS

Figure 6.8 illustrates design concepts for northbound ramps and Table 6.8 provides a summary of pros and cons of each design.

Figure 6.8: Proposed I-95 Southbound Design Concepts

Concept Design	Pros	Cons
Concept 1: Separate Off Ramp for Rt-81 Northbound traffic	- Separate NB and SB off traffic thus improving the Rt-81 performance	- Does not address high SB on volumes & left turn Cost of constructing new ramp
Concept 2: Separate On Ramp for Rt-81 Northbound traffic	- Separate NB and SB on traffic thus improving the Rt-81 performance	- High left turns (EBL, separated from SBL) (Pro) - Ramp volume spills into I-95 Cost of constructing new ramp
Concept 3: Separate both On and Off Ramp for Rt-81 Northbound traffic	- Glenwood and ramps would run on one controller.	- Cost of constructing two new ramp - Traffic impacts to Glenwood St Potentially ramp spacing issue (weave area)

Table 6.8: Proposed I-95 Southbound Design Concepts Pros and Cons

ADDITIONAL CONCEPTS

REALIGNED ROUTE 81 WITH NEW RAIL UNDERPASS

The study team evaluated the feasibility of realigning Route 81 with a new underpass beneath the railroad terminating at the intersection of Route 1 and Commerce Street. Ultimately, this concept is not recommended for further evaluation due to:

- Difficulty in achieving required vertical clearance beneath the railroad without significant property acquisitions as Route 81 would need to be lowered
- Significant expense due to likely need for a stormwater pump station, and need to maintain rail traffic during construction of a new bridge
- Limited right-of-way south of the railroad approaching Main Street would likely require accepting poor traffic operations at the signalized intersection or property acquisitions

LOCAL ROAD THROUGH FORMER UNILEVER SITE

The study team evaluated the feasibility of providing a local road through the Unilever site to relieve traffic on Route 81 and other north-south roadways that extend across the railroad. While there is a lack of information on the potential development at this site to quantify the specific impact this concept would have, the expense of converting the existing narrow driveway to a standard width for a local road to be of sufficient transportation utility will likely require coordination with the property owner/developer and private investment to realize this improvement.

DAN VECE JR WAY (ONE-WAY CONVERSION)

The study team was asked to investigate the potential benefits of converting Dan Vece Jr Way to one-way southbound as means of improving traffic operations at its intersection with Route 81 and US Route 1. Ultimately, this concept would offer minimal traffic benefits to the Route 81 / US Route 1 intersection, as its operations are primarily dictated by the number of left-turns from Route 81 to Main Street. Additional study may be necessary to assess how this conversion might impact the Commerce Street/Post Office Square intersection and how operations might be improved by adjustments to signal operation in this area.

7.0 RECOMMENDED IMPROVEMENTS

The findings from study outreach and review of existing conditions highlighted the potential of the corridor to be a multi-modal, vibrant, mixed use corridor linking the Morgan School, Clinton Crossing and Downtown Clinton. A lack of wayfinding signage, and limited pedestrian and transit amenities are currently a barrier to this vision. While transit is present in the corridor, bus stops lack amenities and the connection between 9 Town Transit buses and the Shore Line East station is poor. The corridor also has traffic congestion and safety issues that are consistent with a corridor with a relatively high traffic volume and several signalized intersections. Key development sites within the corridor such as the former Morgan School site and Unilever Property present opportunities for improving connectivity but redevelopment of these sites will also add traffic to Route 81.

The proposed recommendations respond to the community's vision for the corridor and to the existing and anticipated future conditions along the corridor. Alternative recommendations are provided for areas and intersections that will be significantly impacted by future traffic conditions under a full build-out of the former Morgan School site (Indian River Landing development) and the Unilever site. Recommendations are presented in three classes: intersection improvements, improvements along the corridor, and improvements to properties outside of the right-of-way.

INTERSECTION IMPROVEMENTS

These recommendations focus on transportation improvements to the corridor's intersections. This includes intersection modifications to alleviate congestion, network enhancements such as additional crosswalks to improve pedestrian safety, access management improvements, and curb cut modifications. Improved gateway and wayfinding signage near the interchange with Interstate 95 is also recommended. The overall objective is to improve traffic operations and flow while enhancing safety and better accommodating other modes of travel.

IMPROVEMENTS ALONG THE CORRIDOR

An objective of the Route 81 Corridor Study is to create a more walkable, pedestrian-friendly environment and to enhance safety along the corridor. Recommended improvements to the corridor that support this goal include expansion of the sidewalk network and enhancement of existing pedestrian amenities. Improvements such as new curb ramps are needed to improve ADA compliance along the corridor; new crosswalks and pedestrian refuge islands will make the corridor more convenient for all pedestrians.

Enhancements such as decorative lighting and street trees are recommended as a means of providing a more comfortable pedestrian environment. Wide sidewalks (six feet or greater) are recommended throughout the corridor, those should be coupled with a landscaped buffer between the roadway and the sidewalk where space permits. Gateway and wayfinding signage is also recommended as a means of welcoming people to Clinton and guiding traffic.

Transit infrastructure should be enhanced by providing designated bus stops and waiting areas with shelters where space permits. The 9 Town Transit bus and Shore Line East station connection should also be improved by providing bus stops in proximity of the station.

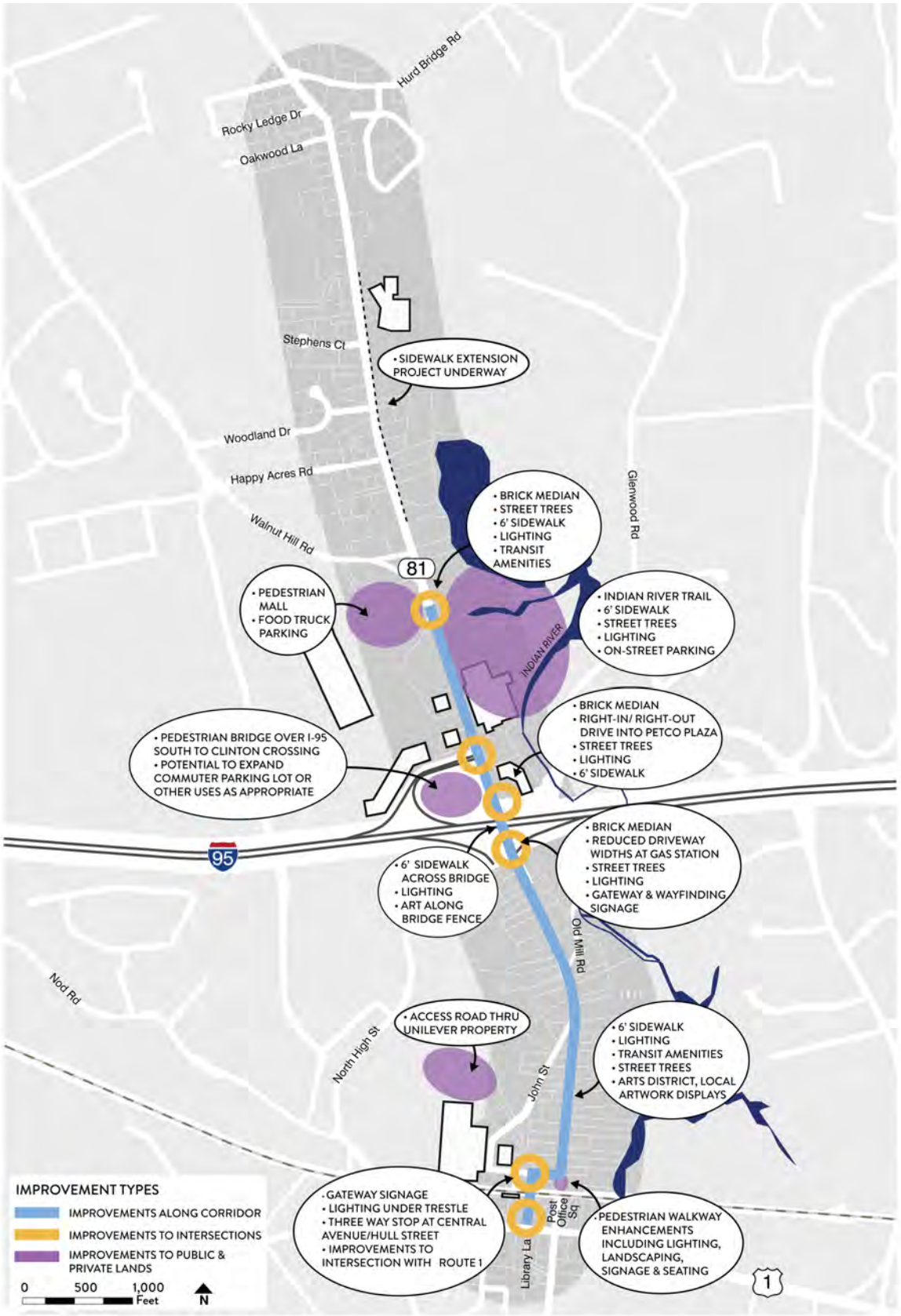
IMPROVEMENTS TO PROPERTIES OUTSIDE OF THE RIGHT-OF-WAY

This study also presents concepts for improvements along the corridor that are outside of the Route 81 right-of-way. These recommendations are focused on improving connections to Route 81, leveraging unique assets in the project area, and improving the mobility network. These recommendations assume the willing participation of property owners and developers; many of these improvements would need to be privately financed and constructed.

By example, these recommendations include the development of a publicly accessible pathway along the Indian River at the former Morgan School site and pedestrian improvements to the Clinton Crossing site that would better connect pedestrians to Route 81.

7.1 LOCATIONS OF RECOMMENDED IMPROVEMENTS

The map below provides a summary of recommended improvements along the corridor.



RECOMMENDATIONS BY LOCATION

The following section provides an overview of recommended improvements to the Route 81 Corridor. These recommendations are based on findings from existing conditions, transportation, and land use analysis factors. Improvements are presented geographically, beginning with the Route 81/Route 1 intersection at the southern extent of the study area. Improvements are presented from south to north along the corridor.

7.2 HULL STREET AT ROUTE 1

CONDITIONS

The intersection of Hull Street (Route 81) and West Main Street (Route 1) experiences routine congestion, although the level of service at the AM peak is B and at the PM peak is C. Delay to southbound Route 81 traffic is occasionally caused be exiting traffic from Dan Vece Jr. Way which can be disruptive to traffic flow as reported by the Clinton Police Department.

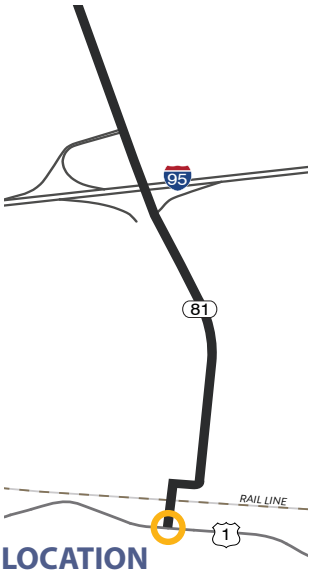
The CVS Pharmacy currently in construction at the northwest corner of the intersection is likely to exacerbate this issue when in operation. Although not considered a major traffic generator, the store will generate trips with access to and egress from Hull Street, Route 1, and John Street Extension. Approximately one third of trips are expected to be via the planned Hull Street driveway.

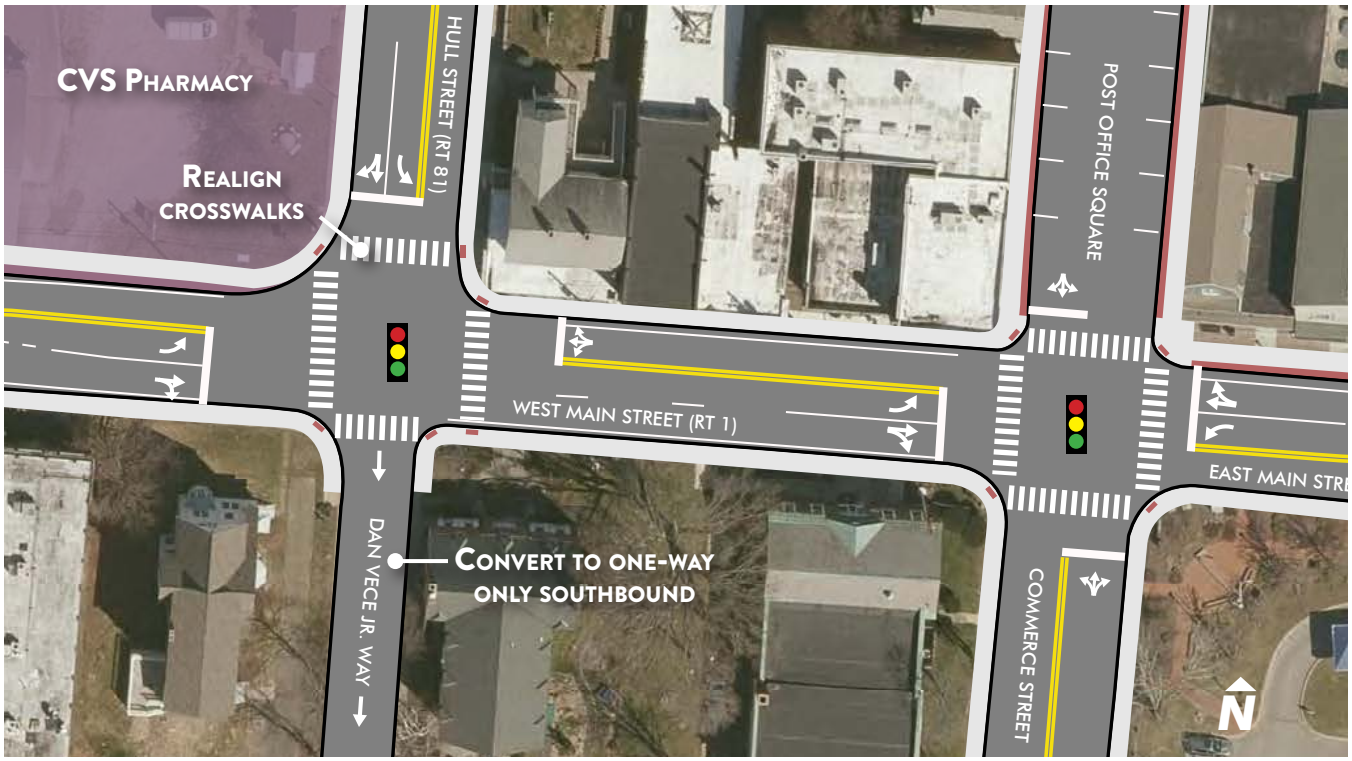
Additionally, crosswalks at the intersection are not aligned perpendicular to the roadways which results in long pedestrian crossing distances.

SUMMARY

- Delays to Route 81 southbound traffic caused by northbound Dan Vece Jr. Way traffic.
- Long pedestrian crossing distances.

LEVEL OF SERVICE (AM/PM): B/C





RECOMMENDATIONS

Dan Vece Jr. Way should be considered for conversion to a one-way southbound street. This would resolve delay to southbound Route 81 traffic caused by exiting traffic from Dan Vece Jr. Way. Traffic modeling of this concept suggests that this change could degrade level of service at the Commerce Street/Post Office Square/ Route 1 traffic, which would accommodate all traffic exiting from Dan Vece Jr. Way. Further analysis of the traffic operations of the Route 1 corridor in this area should be conducted prior to conversion of Dan Vece Jr. Way to a one-way street.

Pedestrian enhancements should be provided regardless of traffic operation enhancements. New curb ramps should be provided on West Main Street at the northeast and southeast corners to provide shorter, perpendicular crosswalks.

BENEFITS

- Improves traffic flow for exiting Route 81 traffic.
- Shorter crossing distances for pedestrians at crosswalks.

CHALLENGES

- Decreased level of service at Commerce Street intersection.

LEVEL OF SERVICE (AM/PM): B/C*

**Conversion of Dan Vece Jr. to a one-way does not demonstrate a significant improvement to level of service and could adversely impact level of service at the Commerce Street intersection. A study of the Commerce Street intersection should be conducted to establish potential for improvement of level of service at both intersections.*

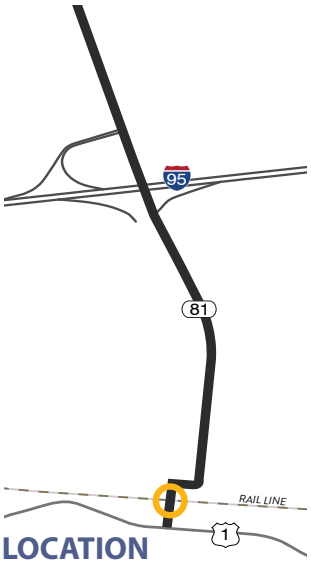
7.3 HULL STREET AT RAIL TRESTLE

CONDITIONS

This location, just north of the intersection with Route 1 and adjacent to Clinton Station, is crossed by the Northeast Corridor Rail Line. There are sidewalks on both sides of the road below the trestle, but a lack of lighting below the rail overpass and overgrown vegetation makes this area unwelcoming to pedestrians. Overall, this area acts as a barrier between Downtown Clinton and the Route 81 corridor.

SUMMARY

- Poor lighting.
- Overgrown vegetation.



RECOMMENDATIONS

Lighting should be substantially improved below the rail trestle to improve overall aesthetics along this segment of Route 81. Trimming and clearing of trees and shrubs is also recommended to remove obstructions to the sidewalk realm.

The rail trestle could be enhanced by painting the structure bright, vibrant colors. This would support the Town's ongoing efforts to establish an "Arts District" in Downtown Clinton. A "Welcome to Clinton" sign could be installed on the trestle as a means of creating a formal gateway to the Downtown.

BENEFITS

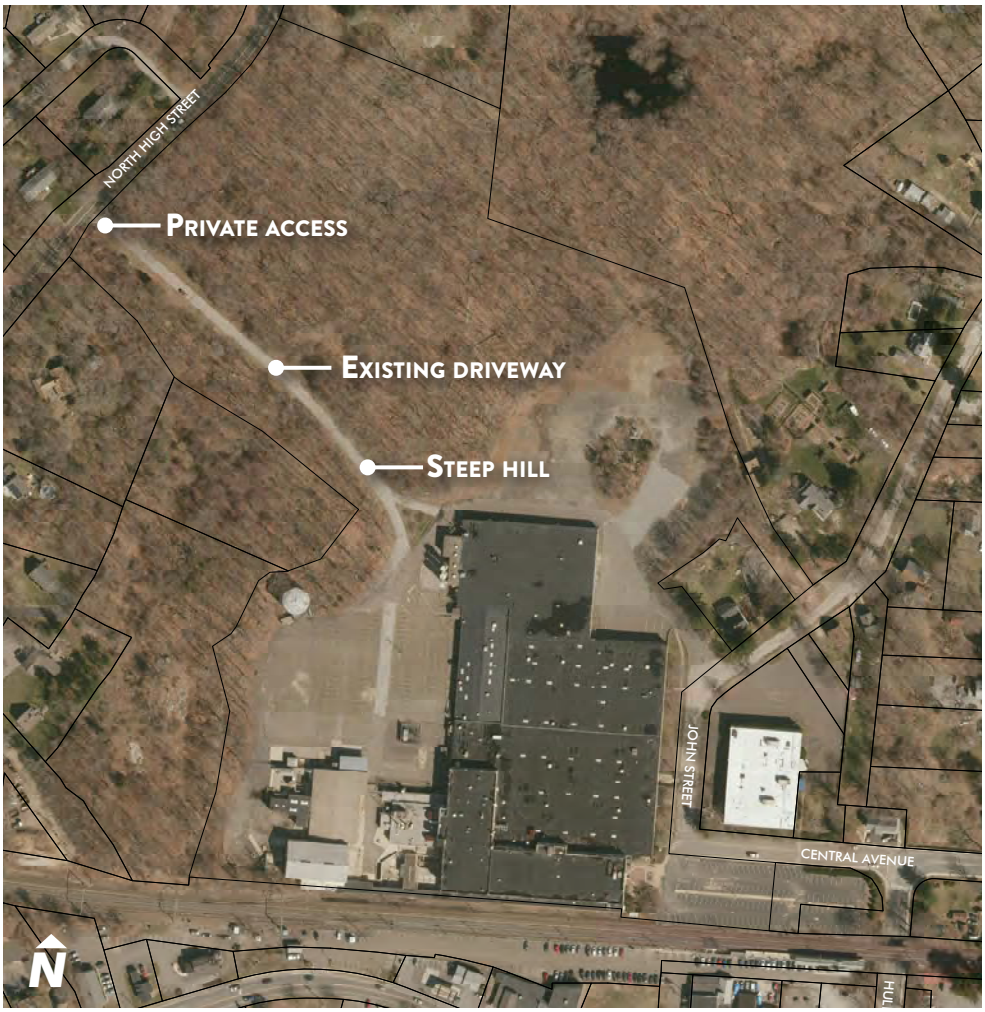
- Improves the pedestrian environment.
- Improves aesthetics of the area.

CHALLENGES

- Would require coordination with Amtrak.

According to the American National Standards Institute (ANSI), underpasses require adequate lighting for security purposes. Facial recognition below bridge structures is a primary concern because of the limited options for retreat from a hostile individual. These spaces are often challenged by luminaire mounting restrictions that could create problems by causing obstructions/hazards to pedestrians as well making glare control from the luminaires more difficult. Underpasses or pedestrian tunnels may also have daytime lighting needs. The recommended illuminance values vary between 5 and 10 footcandles during the day, and 2 and 4 footcandles during the night.*

7.4 UNILEVER SITE



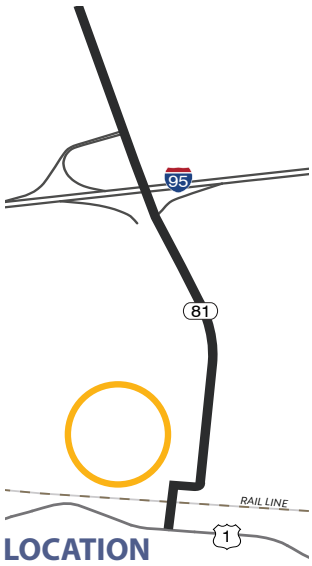
CONDITIONS

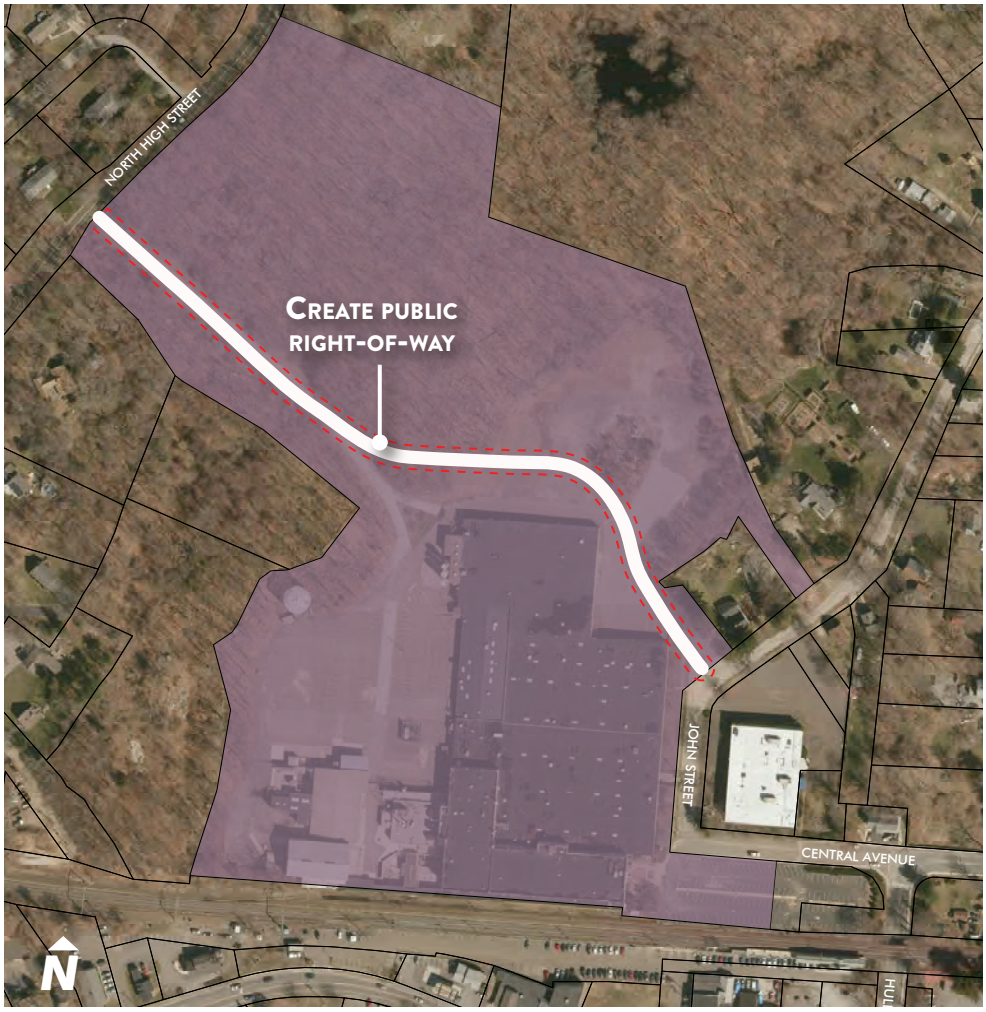
The 26-acre Unilever property parcel is situated between North High Street and John Street with driveways on each of these corridors. The property is being actively pursued for development; the last proposal was for a recreational use. A future reuse of the property for recreation or a comparable intensity of use is expected to generate traffic with a dispersion of trips to both John Street and North High Street. A lack of roadway network in this area requires all other local trips to use Route 1, via low rail crossings at Hull Street and North High Street.

The property presents an opportunity for the development of a right-of-way connecting John Street to North High Street. This concept is supported by the Town.

SUMMARY

- Existing driveway through Unilever property is a private drive, but people use it as a cut-through road to get between North High Street and John Street.





RECOMMENDATIONS

Provide a public right-of-way and roadway through the Unilever property connecting John Street and North High Street. The new roadway would provide an alternative to Route 1 for local trips and could potentially reduce public safety response times in the immediate area. The roadway would also have the benefit of making the Unilever site more accessible to the general public.

BENEFITS

- Would provide additional connectivity in the area.
- Could reduce public safety response times in the immediate area.
- Improves access to the Unilever site.

CHALLENGES

- Would require an agreement with the owner/ developer of Unilever property and potential acquisition of land.
- Existing driveway requires significant grading, drainage, and pavement improvements to support roadway functions.

7.5 HULL STREET AT CENTRAL AVENUE

CONDITIONS

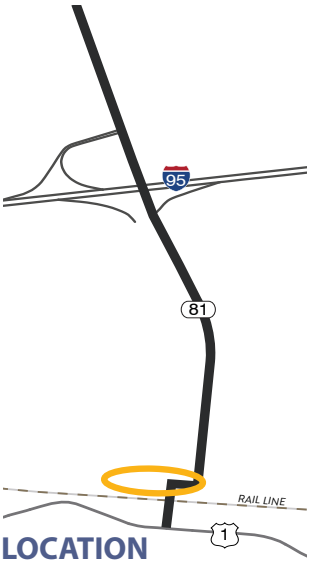
The 9-Town Transit District operates two bus routes that serve Route 81. The existing southbound stop for Downtown Clinton is at Post Office Square. 9-Town Transit is looking to relocate this stop, as it is currently not proximate to the Train Station and it requires a difficult turn at Post Office Square.

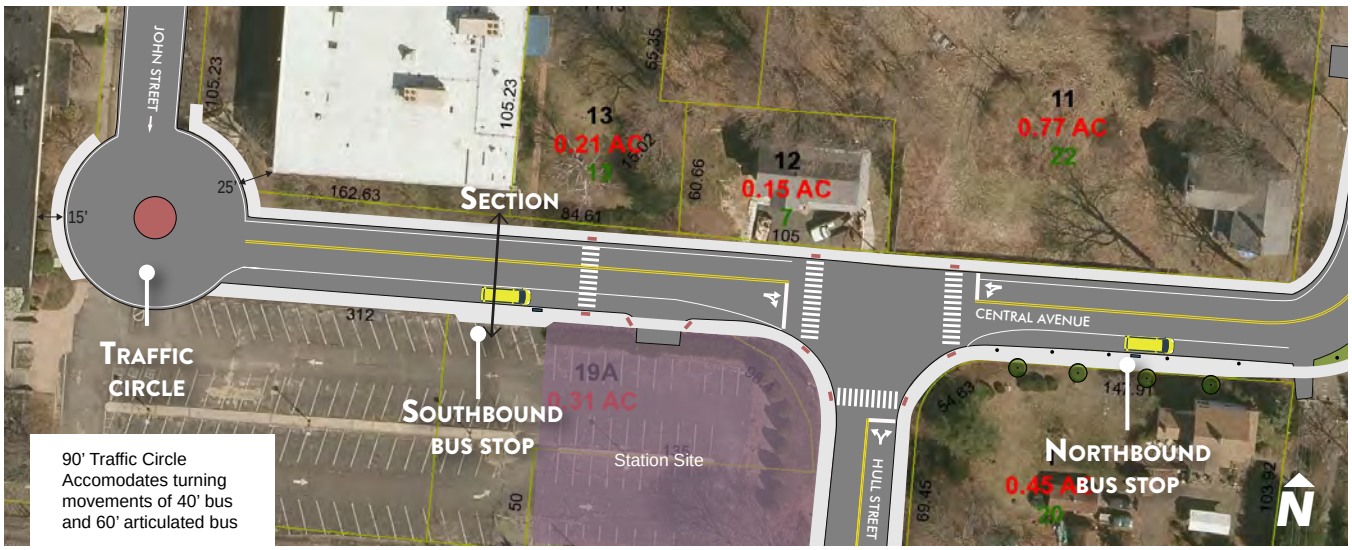
Upgrades are planned for the Clinton Train Station and parking areas adjacent to the station. These upgrades include a redesigned parking area with approximately 21 parking spaces and a kiss-and-ride drop off area. The site design does not provide a bus stop area and the parking lot layout is prohibitive to long-wheelbase vehicles.

Boardings and alightings at the Clinton Train Station are expected to increase with the expanding service planned for the station as is the potential for connections to and from 9 Town Transit routes. Bus stops in proximity of the new station site are preferred by the transit district, although the existing Hull Street and Central Avenue roadways do not readily support curbside bus stops.

SUMMARY

- There is a need for a 9 Town Transit bus stop in proximity to the existing station and planned station entrance
- The planned station site does not provide a bus stop for 9 Town Transit
- Conditions on Hull Street are prohibitive of a bus stop



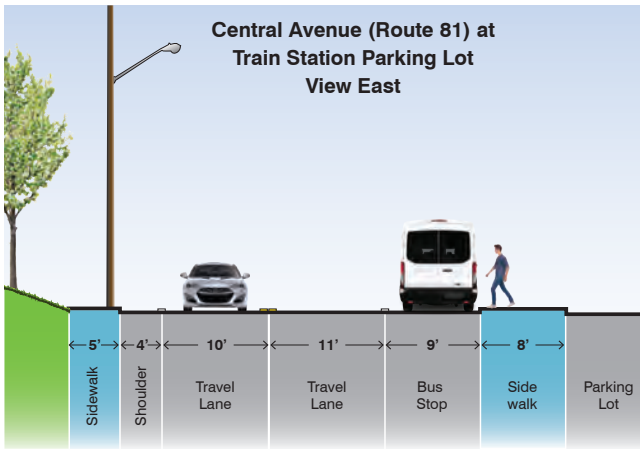


RECOMMENDATIONS

Recommendations for this area include relocating both the northbound and southbound 9-Town Transit stops to the south side of Central Avenue. Sidewalks at the bus stops would be expanded to eight feet, and a nine foot wide bus stop/shoulder would be provided to remove buses from traffic lanes when stopped. Northbound buses would stop on Central Avenue immediately east of Hull Street while southbound buses would stop on Central Avenue west of Hull Street and at the planned station site.

This concept requires the construction of traffic circle at the intersection of John Street and Central Avenue. The circle allows southbound buses to complete the turn-around necessary to stop on the south side of Central Avenue at the station. A 90-foot diameter traffic circle would accommodate 9-Town transit's fleet of 30-foot buses as well as 40-foot buses that are deployed by Shoreline east when rail service is suspended. The construction of a traffic circle requires property acquisition from the Unilever property and will impact parking lot access and spaces on the property.

As an alternative, to minimize property impacts, an 84-foot diameter circle could be constructed which would support the turning of 30-foot buses. This geometry requires larger vehicles such as 40-foot buses to execute a multi-point turn.



SECTION VIEW

BENEFITS

- Efficient bus stop locations and turn around ease.
- Creation of intermodal connection between bus and rail.
- Provides turn-around location for detouring truck traffic

CHALLENGES

- Requires expansion of the right-of-way via a limited property acquisition from the Unilever property

OPTIONS

- An 84 foot traffic circle would minimize property impacts, but would be more restrictive to turning vehicles

7.6 HULL STREET AT CENTRAL AVE AND HIGH STREET

CONDITIONS

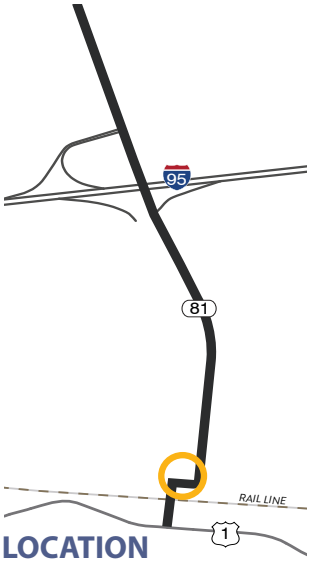
The southern end of the corridor is generally walkable, with sidewalks on the east side of the roadway. At this location, High Street makes a ninety degree turn as it becomes Central Avenue, then it curves sharply again as it transitions to Hull Street. This contributes to a challenging environment for drivers and pedestrians; speeds are perceived as high in this location and visibility is limited.

A pedestrian tunnel is located south of the curve at Central Avenue and High Street. The tunnel connects High Street to Post Office Square. Wayfinding to the tunnel and maintenance of the tunnel and approaching walkway is lacking.

Additional traffic is expected in this area due to future improvements to the Train Station as well the new CVS Pharmacy (currently in construction).

SUMMARY

- Lack of sidewalk on west side of High Street.
- Pedestrian walkway under rail trestle is dark and uninviting.
- Lack of wayfinding between train station, Downtown Clinton and points further north on Route 81.
- Sharp curves and pedestrian crossing at Central Avenue and Hull Street.



RECOMMENDATIONS

Recommendations for this segment of the corridor include the addition of a three-way stop at the intersection of Central Avenue and Hull Street. This would improve pedestrian crossing safety and reduce turning movement conflicts. The three-way stop would be accompanied by crosswalks at all approaches.

The feasibility of establishing a three-way stop at the intersection will be challenged by its impact to traffic flow on Route 81. The three-way stop could be particularly impactful to southbound traffic flow where queues could extend to the roadway curve at High Street causing hazards due to limited sight-lines. These impacts could, however, be outweighed by potential improvements to pedestrian crossing safety and safety improvements related to protected left hand turns into, and egress from, John Street and the planned rail station parking lot.

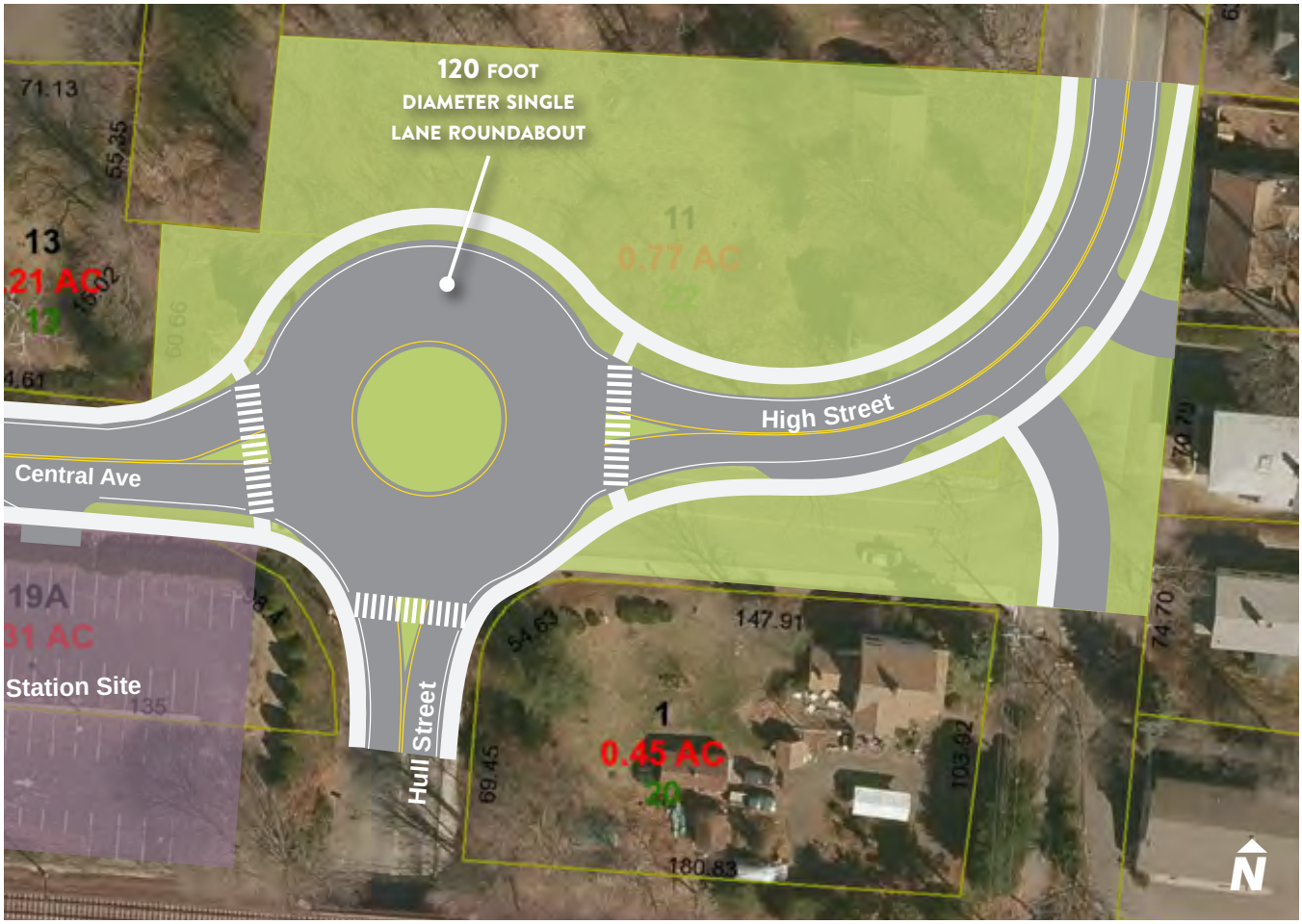
Additional recommended improvements to this area include the provision of a sidewalk on the west side of Route 81 and improvement of the existing sidewalk on the south and east sides of the corridor. Enhancements are also recommended to the pedestrian walkway and tunnel connecting to Post Office Square. This area should be improved by clearing vegetation and providing pedestrian lighting.

BENEFITS

- Improves pedestrian safety and comfort.
- Reduces turning movement conflicts.
- Aesthetic improvements.

CHALLENGES

- Potential negative traffic impacts associated with three-way stop may challenge the feasibility of installing a three-way stop.



ALTERNATIVE RECOMMENDATION

The challenge to installing a three-way stop at the Hull Street/Central Avenue/ High Street intersection may suggest the need for a more robust improvement at that location. The development of a roundabout at this intersection could improve pedestrian crossing safety, reduce turning movement conflicts, provide a pronounced gateway to Downtown Clinton, and provide an opportunity to easily reroute truck traffic detoured by the low rail bridge clearance on Hull Street. This concept would also improve sight-lines and safety at the High Street/Central Avenue intersection.

This concept requires the acquisition of two parcels. It is recommended that this concept only be advanced through the voluntary participation of property owners. Additionally, the property at 22 High Street was built in 1759 and although not listed on the National or local historic registers, if federal funds are used for the improvements, the project would be subject to Section 4(f) of the US Department of Transportation Act. Section 106 of the National Historic Preservation Act requires that federal agencies take into account the effects of their actions on properties listed in, or eligible for listing in, the National Register of Historic Places.

BENEFITS

- Improves pedestrian safety and comfort.
- Reduces turning movement conflicts.
- Aesthetic improvements.

CHALLENGES

- Requires property acquisition
- Impacts historic structures

ALTERNATIVE RECOMMENDATION COUPLED WITH THE JOHN STREET TRAFFIC CIRCLE CONCEPT

The roundabout concept could be coupled with the John Street/Central Street traffic circle concept to provide station area bus stops as described in that concept. Similar to that concept, southbound 9 Town Transit buses would proceed down Central Street and use the traffic circle to redirect eastward on Central Street and stop on the south side of the roadway. Northbound 9 Town Transit buses would stop on the south side of High Street immediately east of the roundabout.

BENEFITS

- Improves pedestrian safety and comfort.
- Reduces turning movement conflicts.
- Aesthetic improvements.
- Designated bus stops in proximity of rail station

CHALLENGES

- Requires property acquisition
- Impacts historic structures

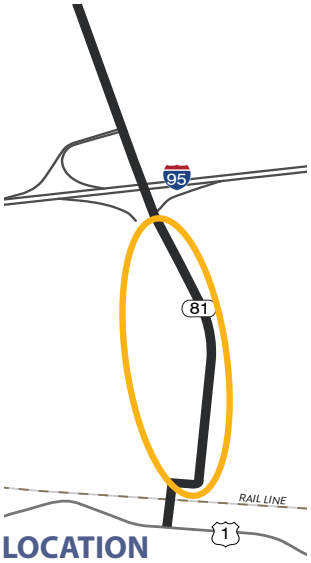
7.7 HIGH STREET

CONDITIONS

This segment of Route 81 is generally walkable, with sidewalks on the east side of High Street, but none on the west side. Sidewalks are buffered from the roadway by a grass strip but are narrow, uneven in many locations, and poorly lit. Vehicle speeds in this location are relatively high for a residential area. Road noise is also excessive due to the wear on the roadway and the coarse aggregate at the surface.

SUMMARY

- Lack of sidewalk on west side of High Street.
- Lack of pedestrian area lighting.
- Narrow, uneven sidewalk on east side of roadway with vegetation encroaching at many locations.



LOCATION

RECOMMENDATIONS

Improvements to this segment of the corridor are focused on enhancing the pedestrian environment. This includes the addition of a sidewalk on the west side of High Street as well as reconstructing the sidewalk on the east side of the roadway. Wider sidewalks, coupled with the addition of pedestrian area lighting and street trees, would enhance the pedestrian environment. These improvements are also likely to provide a traffic calming benefit.

The right-of-way on High Street is adequate to accommodate these improvements as shown without property acquisition with the exception of two properties at 55 and 60 High Street which would require sliver takings for the sidewalk on the west side of the roadway.

While pavement conditions are currently adequate, future resurfacing of High Street should be done with a "low noise" asphalt mix.

BENEFITS

- Provide an enhanced pedestrian environment on High Street that connects to points north and south on the corridor.
- Aesthetic improvements.

CHALLENGES

- Project cost
- Sidewalk maintenance

7.8 HIGH STREET AT NORTH HIGH STREET

CONDITIONS

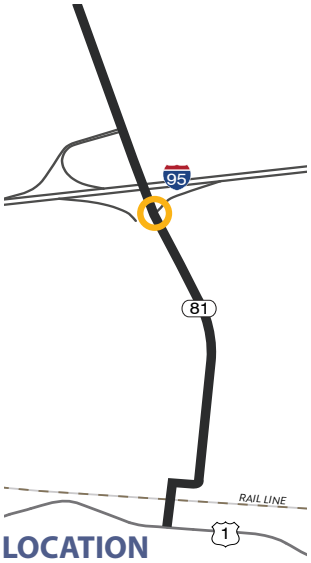
The intersection of High Street, North High Street, and the I-95 North interchange has sidewalks, crosswalks and limited signage, but lacks other amenities for drivers and pedestrians alike. Long crossing distances make for a challenging pedestrian environment. Sidewalks in this location are narrow, mostly between four and five feet. The gas station at the southeast corner has two wide driveways that disrupt the sidewalk network. Additionally, there is no sidewalk on the west side of Route 81 in this location.

CT DOT is planning signal and pedestrian crossing upgrades at the I-95 ramp/North High Street intersection, but improvements are not planned at the Route 81 intersection.

SUMMARY

- Lack of wayfinding and gateway signage.
- Lack of sidewalk on west side of Route 81.
- Long crossing distances for pedestrians.

LEVEL OF SERVICE (AM/PM): A/B*
*High Street/North High Street intersection



RECOMMENDATIONS FOR EXISTING TRAFFIC CONDITIONS

Recommendations for this location include enhanced gateway and wayfinding signage to direct visitors to points both north and south along the corridor. Other improvements include a new sidewalk with a landscaped buffer on the west side of Route 81 and a landscaped median at the southern leg of the intersection. Access management techniques should also be deployed at the gas station where the existing curb cuts should be reduced in width.

All sidewalks should be expanded to at least six feet and street trees and pedestrian area lighting should also be provided.

BENEFITS

- Improved sidewalk connectivity.
- Shorter crosswalks.
- Wayfinding and gateway signage.
- Aesthetic improvements.

CHALLENGES

- Landscaped medians could present an obstruction to emergency vehicles.

OPTIONS

- Flush cobblestone or stamped asphalt medians could be used as an alternative to landscaped medians.

LEVEL OF SERVICE (AM/PM): A/B*

*High Street/North High Street intersection

RECOMMENDATIONS FOR FUTURE TRAFFIC CONDITIONS

A full build-out of the Morgan School and Unilever sites will significantly increase traffic at peak hour travel periods at the High Street/North High Street/I-95 northbound ramps. Minor modifications of the two signalized intersections at this location are required to maintain level-of-service under future traffic conditions.

Traffic modifications include the creation of three northbound queuing lanes on the southern leg of the High Street/North High Street intersection. This would reduce the number of southbound receiving lanes to one lane. Also recommended is the conversion of the eastbound queuing lanes on North High Street to two dedicated two left turn lanes and a combined thru-right lane.

BENEFITS

- Improved level of service under future traffic conditions

LEVEL OF SERVICE (AM/PM): B/D*

*High Street/North High Street intersection

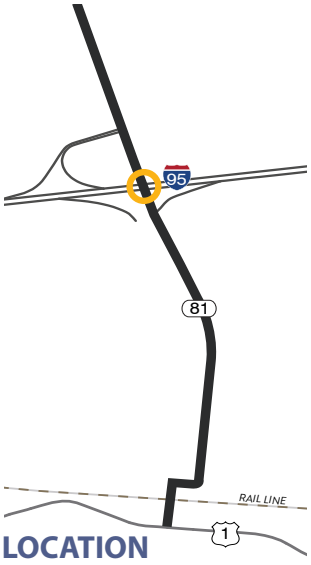
7.9 ROUTE 81 AT THE I-95 OVERPASS

CONDITIONS

The Route 81 bridge over I-95 is an uncomfortable environment for pedestrians. The overpass has a narrow sidewalk, poor lighting, and the existing chain link fence is unattractive. These conditions discourage pedestrian trips between the Clinton Crossing area and Downtown Clinton.

SUMMARY

- Narrow sidewalk.
- Lack of pedestrian area lighting.
- Poor aesthetics.



LOCATION

RECOMMENDATIONS

Improvements in this area include widening the sidewalk and adding pedestrian area lighting. Lighting would be the same throughout Route 81 and would be a unifying element in the corridor. The existing chain link fence should be replaced with a decorative barrier or a new colored vinyl coated chain link fence. These improvements would encourage walking trips between the Clinton Crossing area and Downtown Clinton.

BENEFITS

- Enhanced pedestrian environment.
- Aesthetic improvements.
- Stronger connection between the commercial segment of the corridor and High Street.

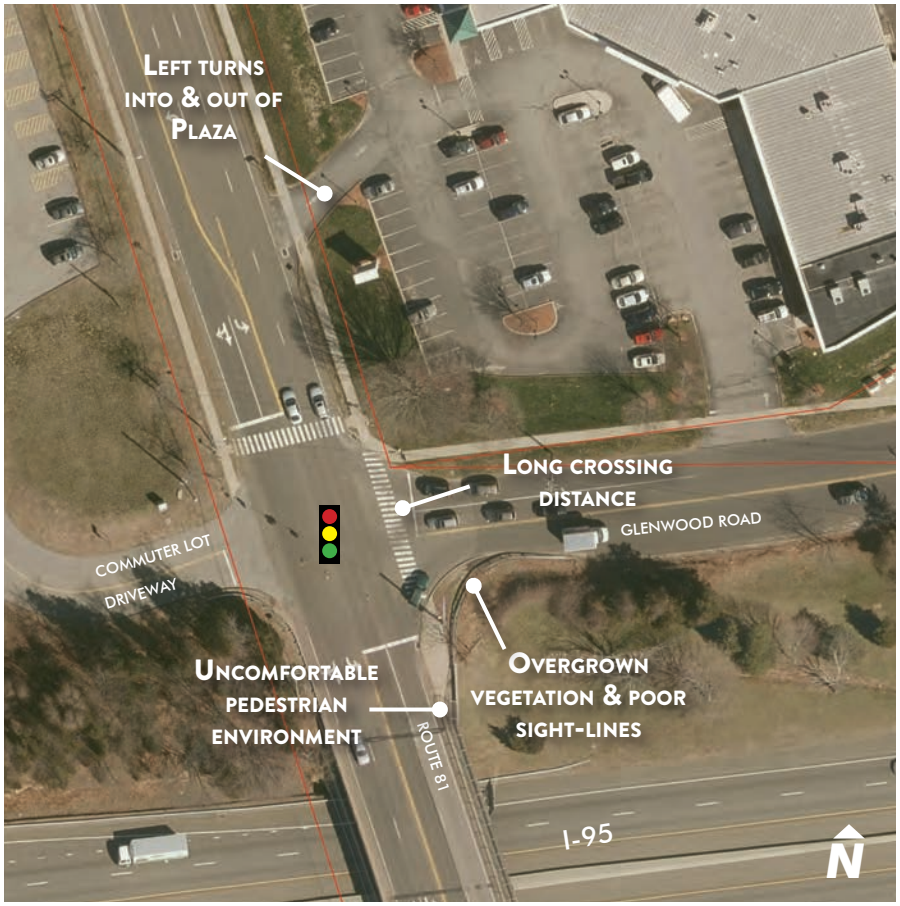
CHALLENGES

- Would require narrowing road lanes on bridge.

OPTIONS

- A colored vinyl coated chain link fence could be provided as a lower cost solution.

7.10 ROUTE 81 AT GLENWOOD ROAD



CONDITIONS

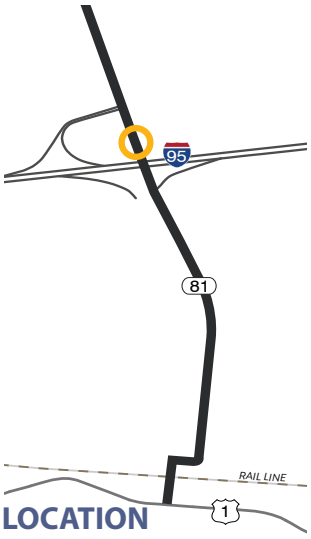
The area near the intersection of Route 81 and Glenwood Road is functional in its current condition, but would benefit from pedestrian enhancements and access management. The shopping plaza driveway north of the intersection results in delays to southbound Route 81 traffic when southbound vehicles turn left into the plaza.

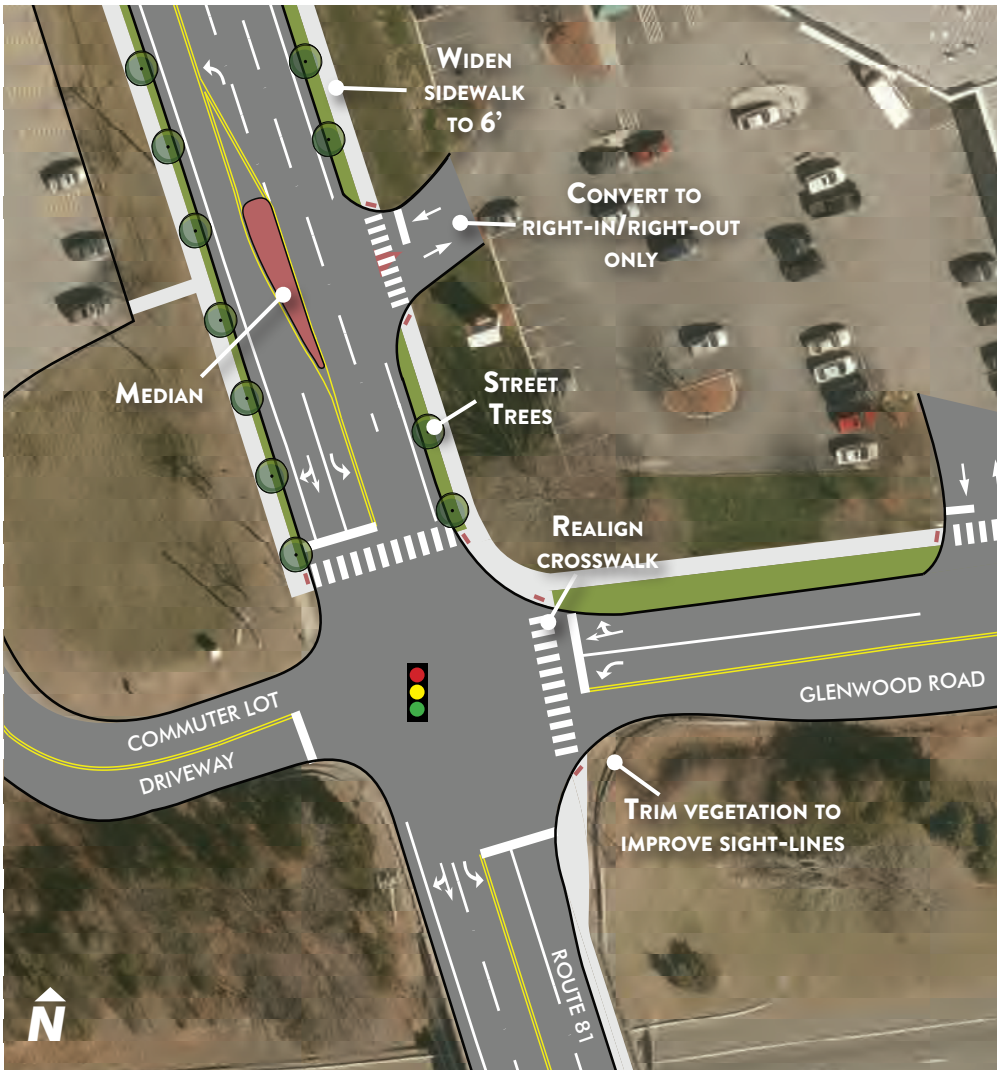
Pedestrian facilities in this area are adequate, but sidewalks are relatively narrow and crossing distances are long. Additionally, sight-lines at the southeast corner of the intersection are poor due to overgrown vegetation.

SUMMARY

- Narrow sidewalks
- Long pedestrian crossing distances
- Left turns into shopping plaza cause delays to southbound Route 81 traffic.

LEVEL OF SERVICE (AM/PM): B/B





RECOMMENDATIONS FOR EXISTING TRAFFIC CONDITIONS

Recommendations for this segment of the corridor include providing wider sidewalks and realigning crosswalks to shorten crossing distances. Sight-lines at the southwest corner of the Glenwood Road intersection should be improved by trimming vegetation at that location.

Access to the shopping plaza at the northeast corner of the intersection should also be limited right-in/right-out traffic at the driveway at Route 81. A median splitter island should be provided within the driveway to reinforce this use. A median should also be provided on Route 81 proximate to the shopping center driveway to prevent left turns.

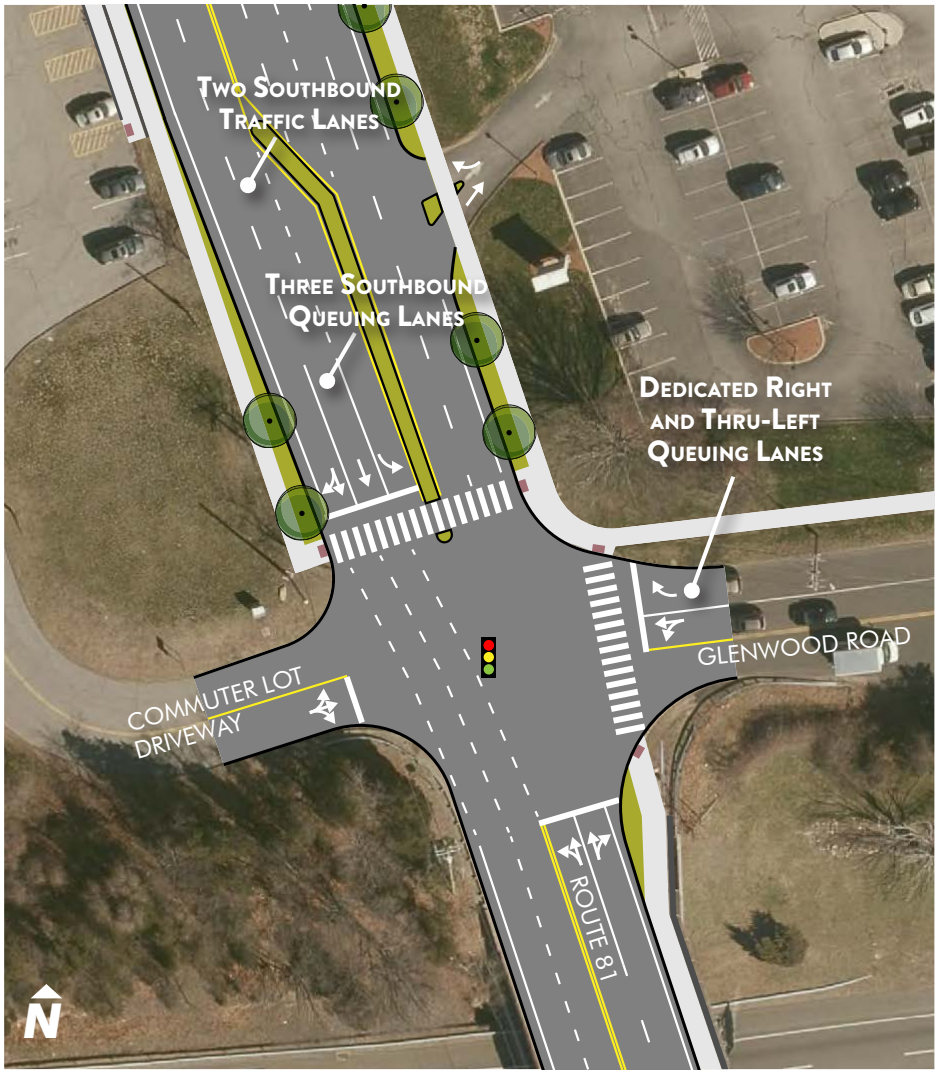
BENEFITS

- Less disruptive access to shopping plaza.
- Shorter pedestrian crossings
- Enhanced pedestrian environment.
- Improved sight-lines at intersection.

CHALLENGES

- Would require coordination with shopping plaza property owner to modify driveway from Route 81.

LEVEL OF SERVICE (AM/PM): B/B



RECOMMENDATIONS FOR FUTURE TRAFFIC CONDITIONS

Capacity enhancements are required on Route 81 between Glenwood Road and the proposed Indian River development in proximity of the Hull Library in order to accommodate future traffic conditions associated with a full build-out of the Indian River site. These improvements are required to maintain level of service at the Glenwood Road intersection.

Capacity enhancements include the following:

- The provision of an additional southbound travel lane on the northern approach to the intersection.
- Conversion of Glenwood Road queuing lanes to a dedicated right and a combined left-thru lane.

BENEFITS

- Maintain level of service under a full build-out of the Indian River Site.

CHALLENGES

- Requires expansion of roadway to the west (property in this location on the west side of the roadway is within the DOT right-of-way)

LEVEL OF SERVICE (AM/PM): B/C

7.11 ROUTE 81 AT COMMUTER PARKING LOT

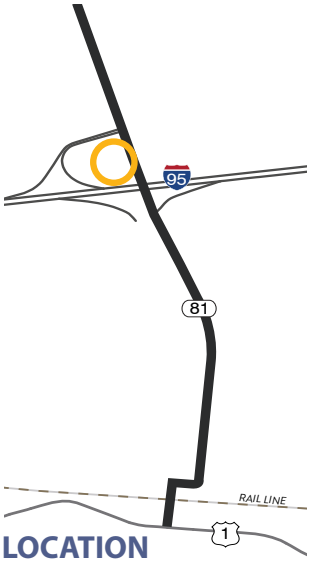
CONDITIONS

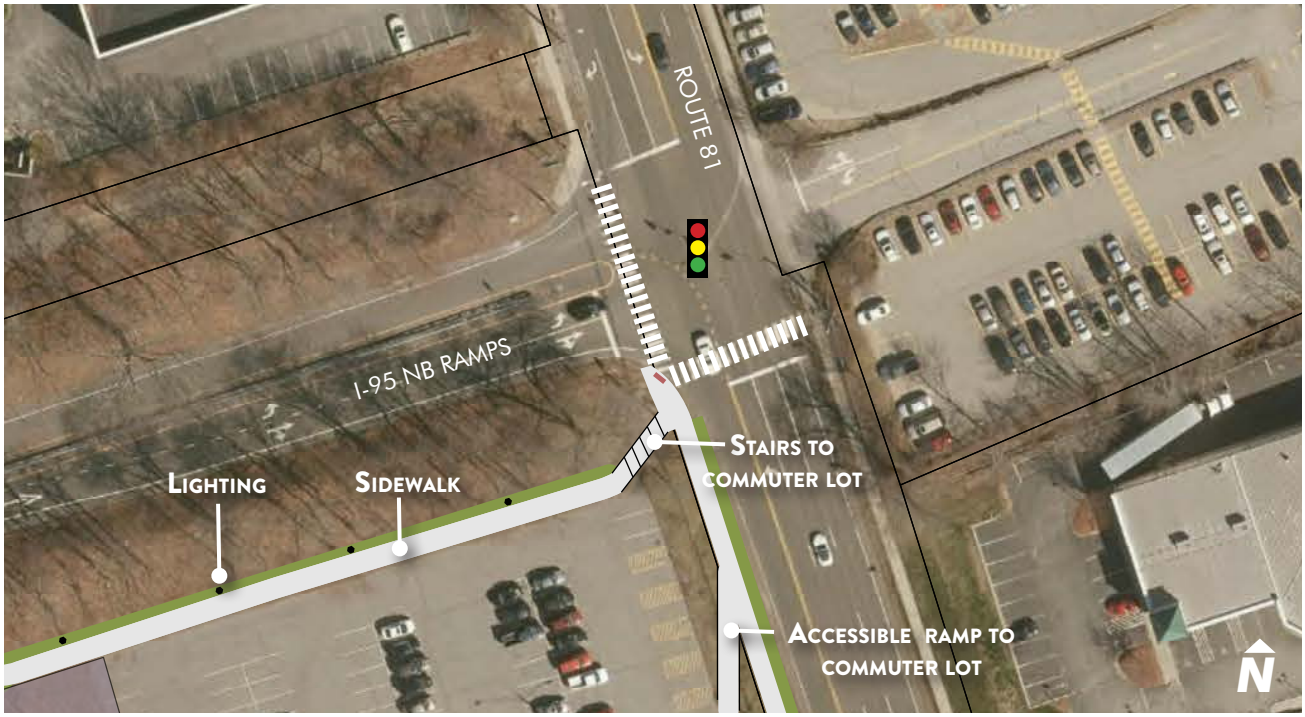
There is a Connecticut DOT commuter parking lot south of the Interstate 95 south interchange. This lot is not heavily utilized and is geographically close to Clinton Crossing South. Despite the proximity, pedestrian access is limited between the parking lot and Route 81 and Clinton Crossing due to a lack of sidewalks between the lot and Route 81.

The outlet mall experiences parking demand pressures during peak shopping days and could benefit from additional parking. High parking demand days for the outlets include weekends and holiday times which are typically not heavy commuter days. The opportunity for shared parking exists between the outlet and the commuter parking lot, but pedestrian connections linking the two areas are limited. Other potential uses for the parking lot site include a solar field or a community sewer/septic system (the parcel is located outside the Aquifer Protection Area).

SUMMARY

- Lack of pedestrian area lighting.
- Long distance for pedestrians who wish to walk between commuter parking lot and Clinton Crossing.





RECOMMENDATIONS

Recommendations to this segment of the corridor are focused on improving the connections to the commuter parking lot. This includes the provision of a staircase and accessible ramp between the Route 81 sidewalk and the commuter lot which is a few feet higher than the roadway. Pedestrian area lighting should also be provided along sidewalks providing access to the commuter lot.

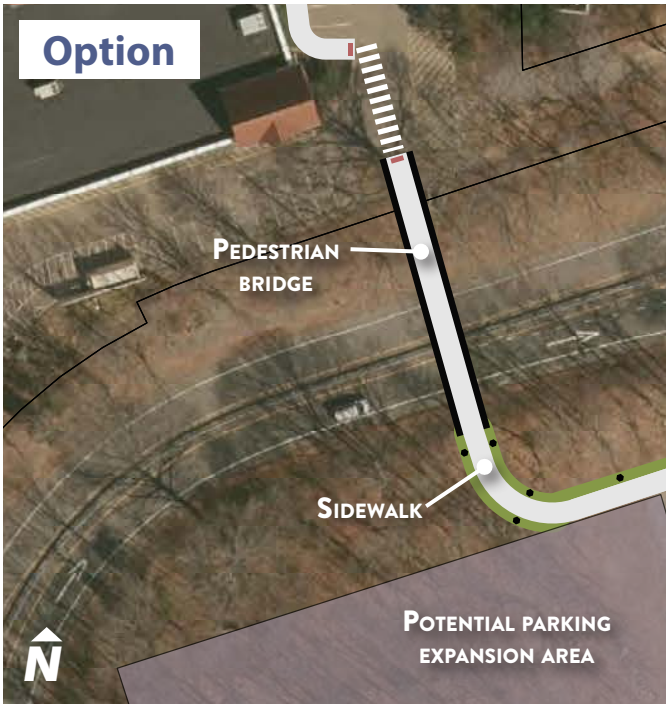
A potential option includes the construction of a pedestrian bridge over the I-95 ramps between the commuter lot and Clinton Crossing. This improvement would allow for the use of the commuter lot as an overflow parking area. Because it would serve a private property, the bridge would require financing by the owners of Clinton Crossing.

BENEFITS

- Provide a needed pedestrian connection between CT DOT commuter parking lot and the existing sidewalk on Route 81.

CHALLENGES

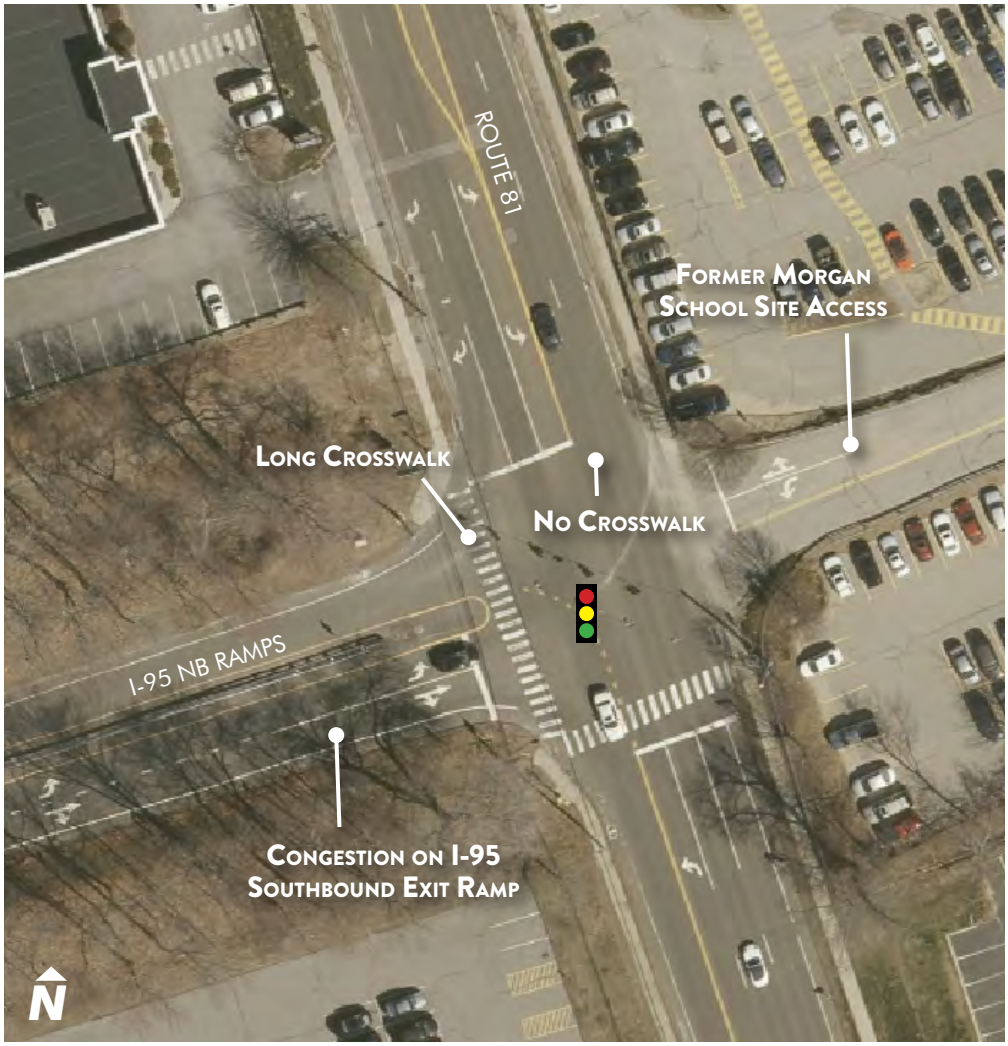
- Grade requires construction of accessible ramps and a staircase between Route 81 and the parking lot.

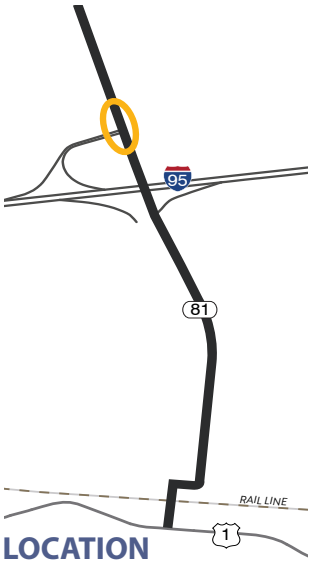


OPTION

- A pedestrian bridge linking the CT DOT commuter parking lot and Clinton Crossing. The bridge could potentially help to alleviate parking demand at the outlets.

7.12 ROUTE 81 AT I-95 SOUTHBOUND INTERCHANGE





CONDITIONS

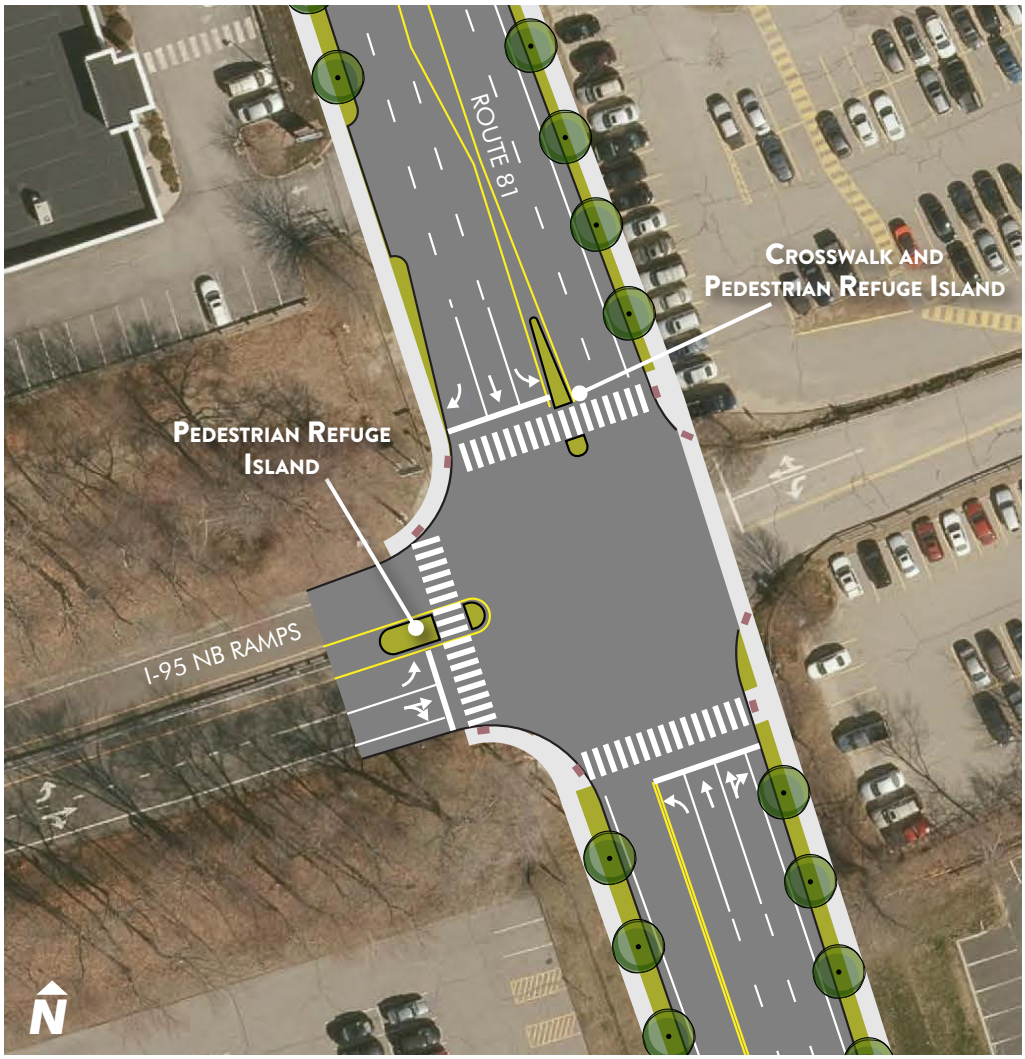
The I-95 Southbound interchange at Route 81 is aligned with the former Morgan School driveway. This intersection is also proposed as the primary site access for the Indian River Landing development site. This is a heavily traveled intersection which experiences occasional travel delay and congestion, particularly on the I-95 southbound exit ramp. A full build-out of the Indian River project will significantly reduce level of service at this location without capacity enhancements to the intersection and approaching roadways.

Existing pedestrian facilities are present at this location, with sidewalks on both sides of Route 81 on the north and southbound approaches. The northern leg of the intersection lacks a crosswalk and crossing distances are long.

SUMMARY

- Planned driveway for Indian River Development at east side of intersection.
- Lack of crosswalk along northern leg.
- Long crossing distance at crosswalks.
- Long queues on I-95 exit ramp
- Proposed Indian River Development will significantly impact level of service.

LEVEL OF SERVICE (AM/PM): A/C



RECOMMENDATIONS FOR EXISTING TRAFFIC CONDITIONS

The primary recommendation for this location is to improve pedestrian crossings. Recommended pedestrian enhancements include:

- Refuge islands
- New crosswalk on the northern leg of the intersection
- Shorter crosswalks moved away from radius apex
- Wider sidewalks

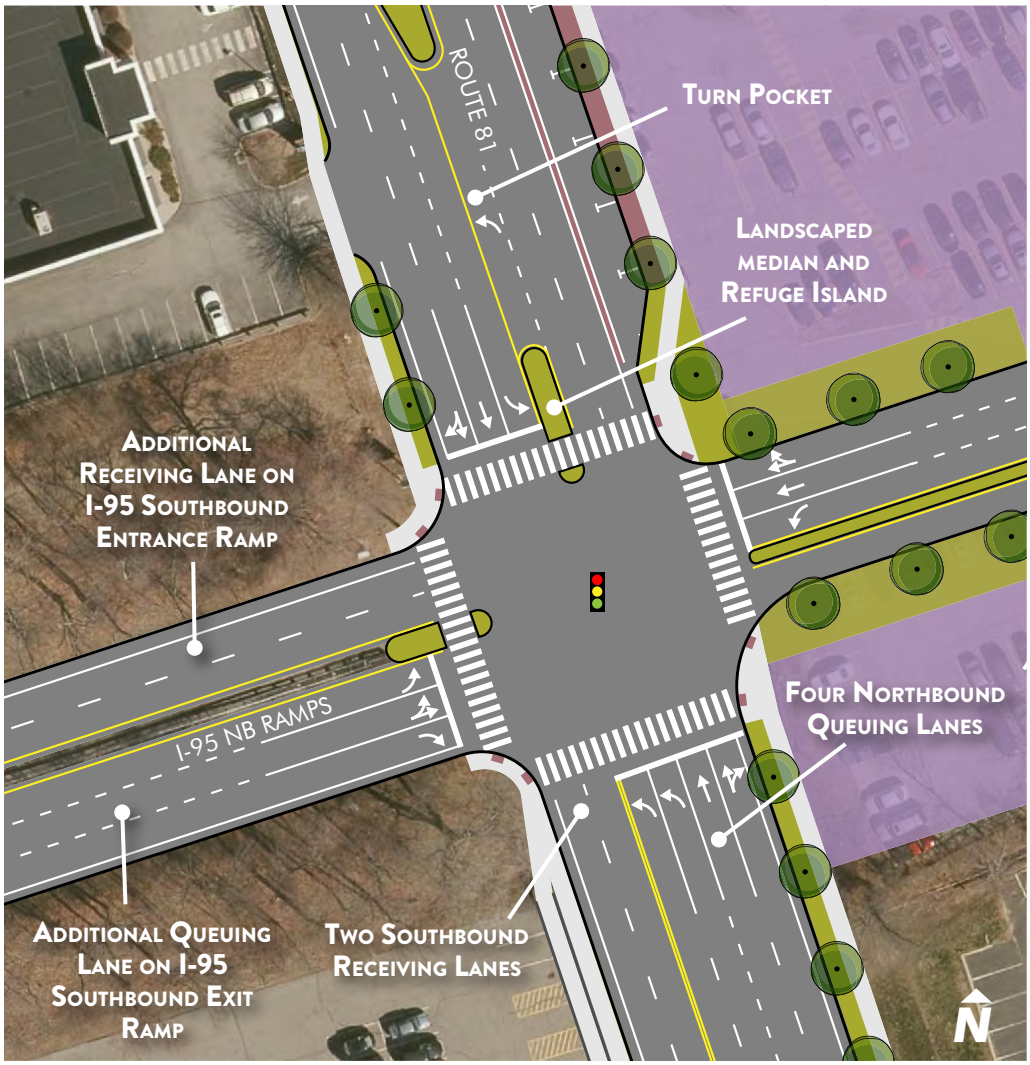
BENEFITS

- Improve pedestrian crossing ease and safety.

CHALLENGES

- Requires expansion of roadway to the west on northern leg to accommodate refuge island.

LEVEL OF SERVICE (AM/PM): A/C



RECOMMENDATIONS FOR FUTURE TRAFFIC CONDITIONS

The primary recommendation for this location is to provide capacity enhancements that will preserve level of service under a full build-out of the proposed Indian River Landing site. Proposed enhancements include the following:

- An additional receiving lane on the I-95 southbound entrance ramp
- An additional queuing lane on the I-95 southbound exit ramp.
- An additional receiving lane on Route 81 south of the intersection.
- An additional queuing lane (four total) on the Route 81 northbound approach.
- Three queuing lanes from the Indian River site.
- A turn pocket for access to the Ethan Allen site.
- Crosswalks at all legs of intersection including pedestrian refuge islands on two of the crossings.

BENEFITS

- Maintains level of service under full build-out scenario
- Resolves existing queuing issues on I-95 southbound exit ramp.
- Crosswalks are enhanced with refuge islands.

CHALLENGES

- Requires expansion of roadway.
- Impacts to Ethan Allen site and site access.

LEVEL OF SERVICE (AM/PM): B/D

7.13 ROUTE 81 AT THE HULL LIBRARY AND FORMER MORGAN SCHOOL

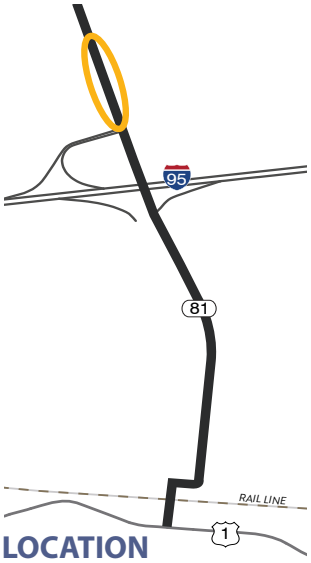
CONDITIONS

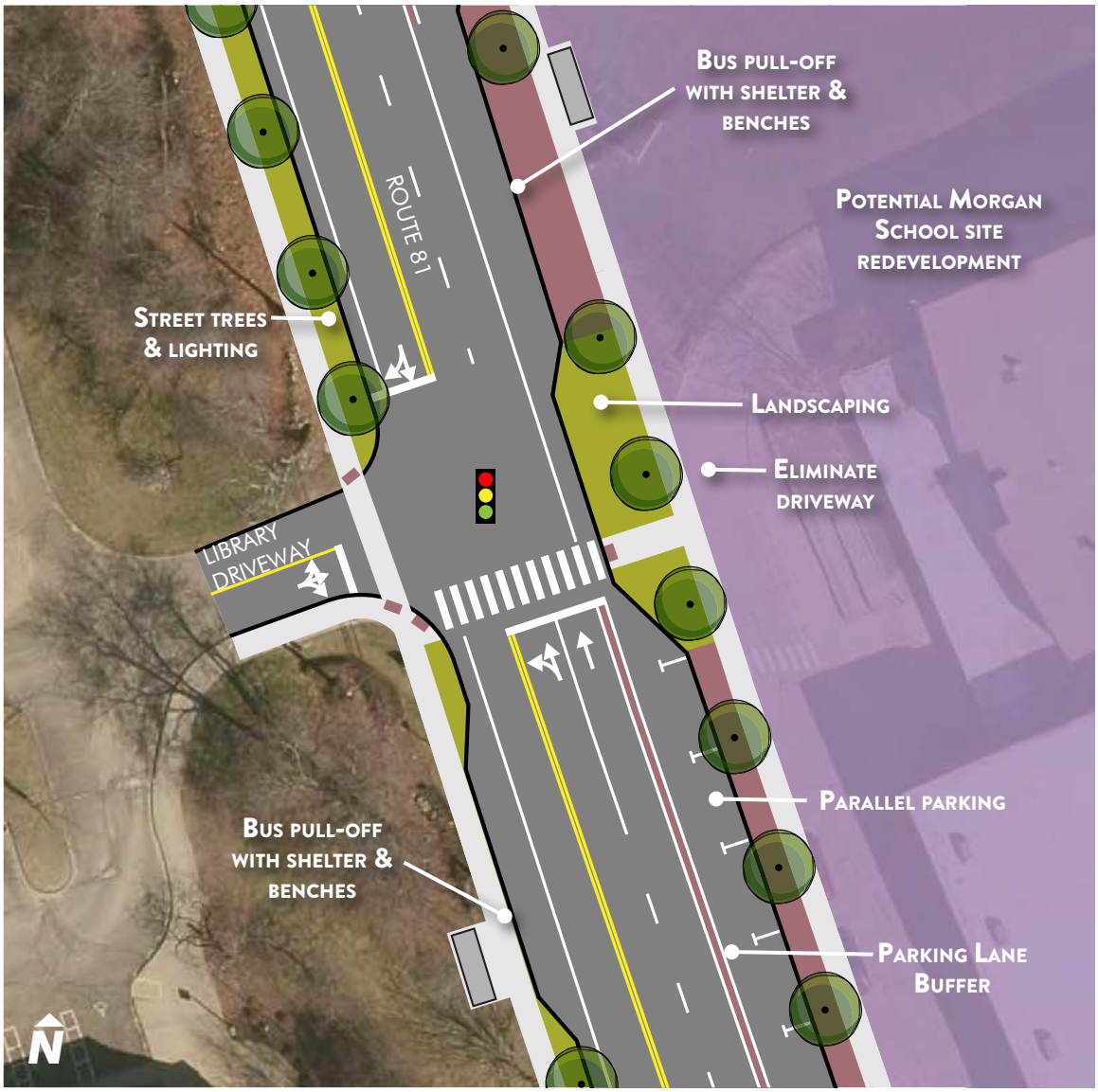
This segment of Route 81 is auto-dominated and does not provide a comfortable pedestrian environment. Although there are sidewalks on both sides of Route 81 at this location, sidewalks are narrow, pedestrian lighting is lacking, and sidewalks are located close to the edge of the roadway, providing little separation from traffic and little room for snow storage. 9 Town Transit buses stop at this location, but there is no designated bus stop. Redevelopment of the former Morgan School site will provide an opportunity to "reinvent" the streetscape in this area.

SUMMARY

- Narrow sidewalks with limited buffer from the road.
- Lack of pedestrian scale street lighting.
- Lack of connection to points north or south along Route 81.

LEVEL OF SERVICE (AM/PM): A/A





RECOMMENDATIONS

The improvements recommended within this concept place emphasis on creating a pedestrian friendly retail environment on Route 81 that compliments the redevelopment of the former Morgan School site.

This concept includes new, wide sidewalks on both sides of the roadway with amenities such as street trees and pedestrian area lighting. The widened sidewalks would complement the proposed development and would create a pleasing and safe pedestrian environment. Street trees, brick paving, and pedestrian area lighting are also recommended in this location. Improvements such as these will have a calming effect on traffic. They also create a unifying connection to recommended improvements on High Street, as wide sidewalks, lighting and street trees would be a common feature in both areas.

Parallel parking is recommended at the east side of the roadway between the I-95 northbound interchange and the Clinton Crossing intersection. This would provide 40 on-street spaces that could serve the new development and create a pedestrian friendly environment.

Far-side bus stops with bus pull-offs and shelters are recommended at the intersection of Route 81 and the entrance to the Henry Carter Hull Library. Bus shelters and benches are recommended due to a relatively high number of boardings at this location.

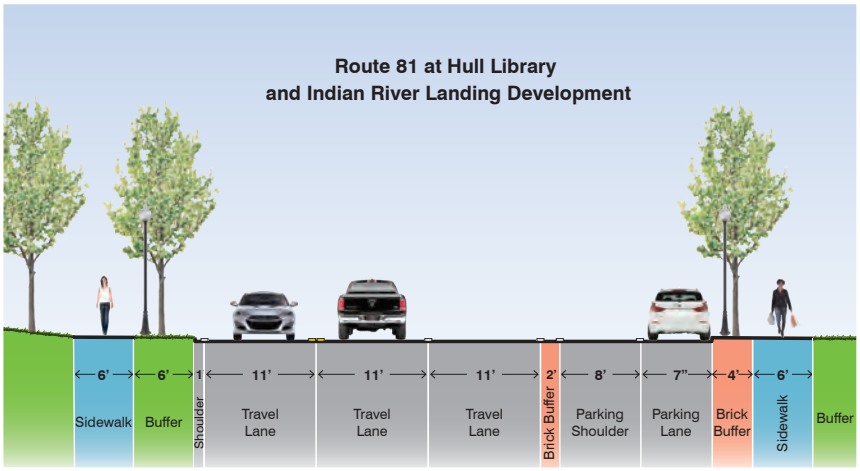
BENEFITS

- 40 on-street parking spaces for retail development.
- Traffic calming associated with on-street parking.
- Enhancements to the pedestrian environment.
- Bus stops and shelters
- Aesthetic improvements.

CHALLENGES

- Would require expansion of the public right-of-way into Indian River Landing development site.

LEVEL OF SERVICE (AM/PM): A/A



ELEVATION VIEW NORTH

7.14 INDIAN RIVER TRAIL

CONDITIONS

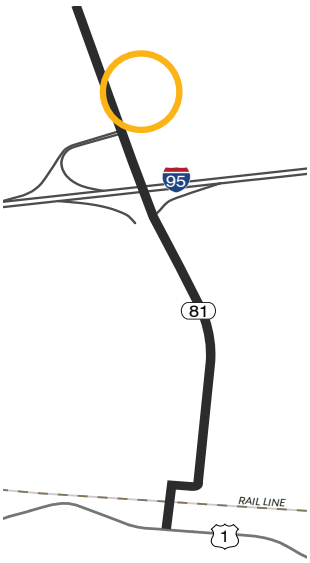
The former Morgan School site includes a trail along the west side of the Indian River. The trail is narrow and is overgrown, but affords pleasant views of the Indian River and access to a river overlook terrace once used for outdoor eduction.

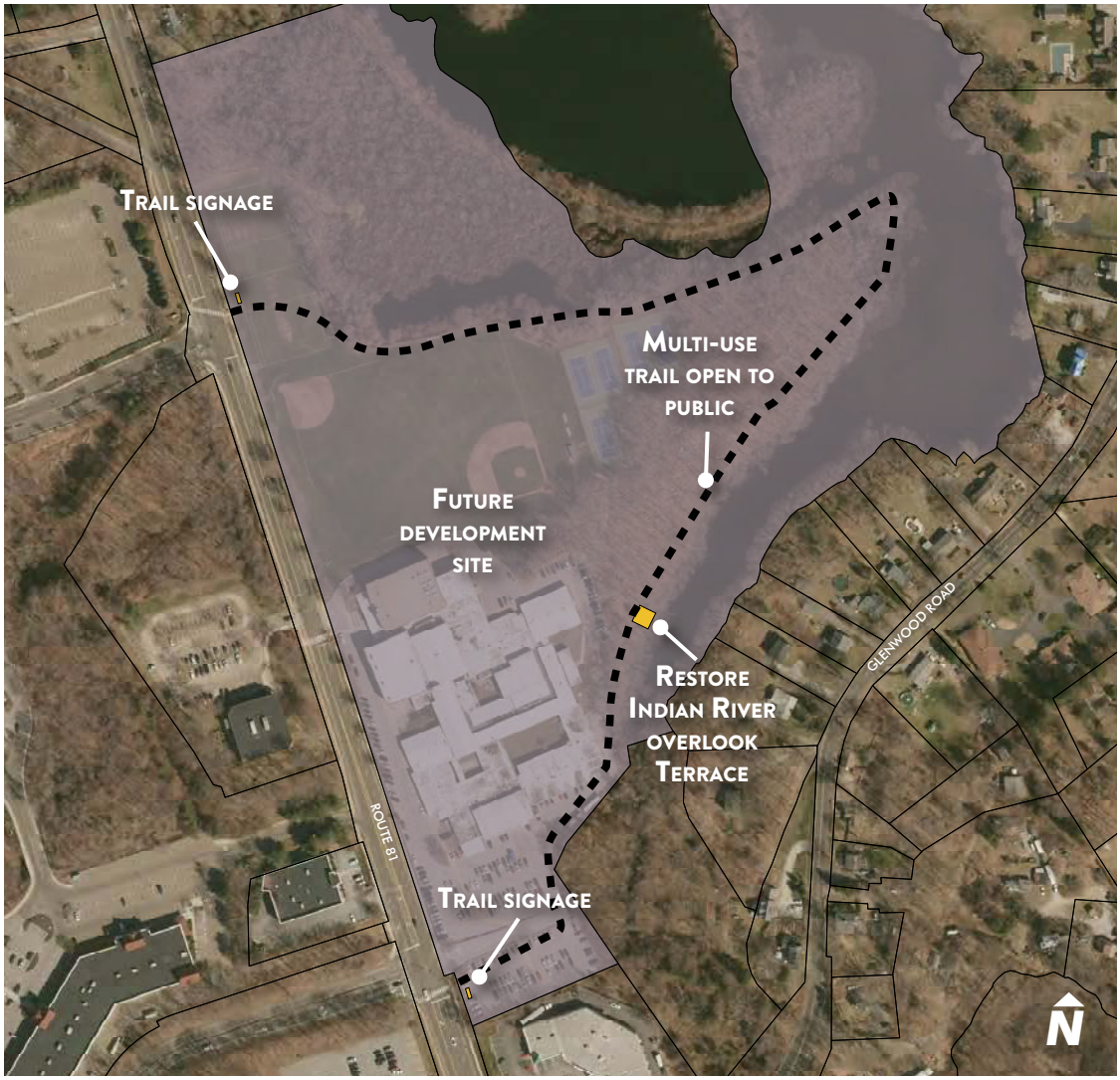
Redevelopment of the Morgan School site will present an opportunity to preserve and improve this trail. The site's developer has expressed interest in this concept.

SUMMARY

- Trail along the Indian River is a unique asset within the project area.

LOCATION





RECOMMENDATIONS

The Town should establish a public access agreement with the owner/developer of the former Morgan School site to ensure that the riverfront trail remains a resource to the community.

The existing trail should be improved and a paved or stone dust accessible pathway should be provided. The overlook terrace should also be improved. Wayfinding signage should be provided at trail heads at Route 81 and internally at access points.

BENEFITS

- Expansion of greenway network in Clinton and multi-modal accommodations.
- Public access to the Indian River.

CHALLENGES

- Require agreement with Indian River Landing developer.

7.15 ROUTE 81 AT CLINTON CROSSING

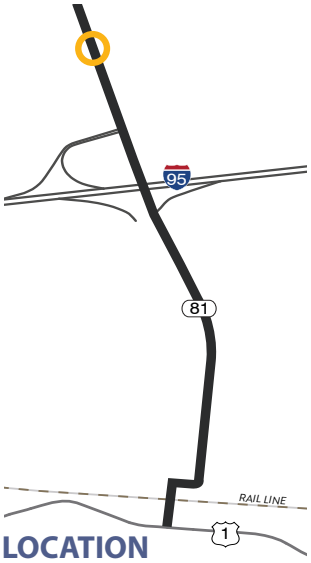
CONDITIONS

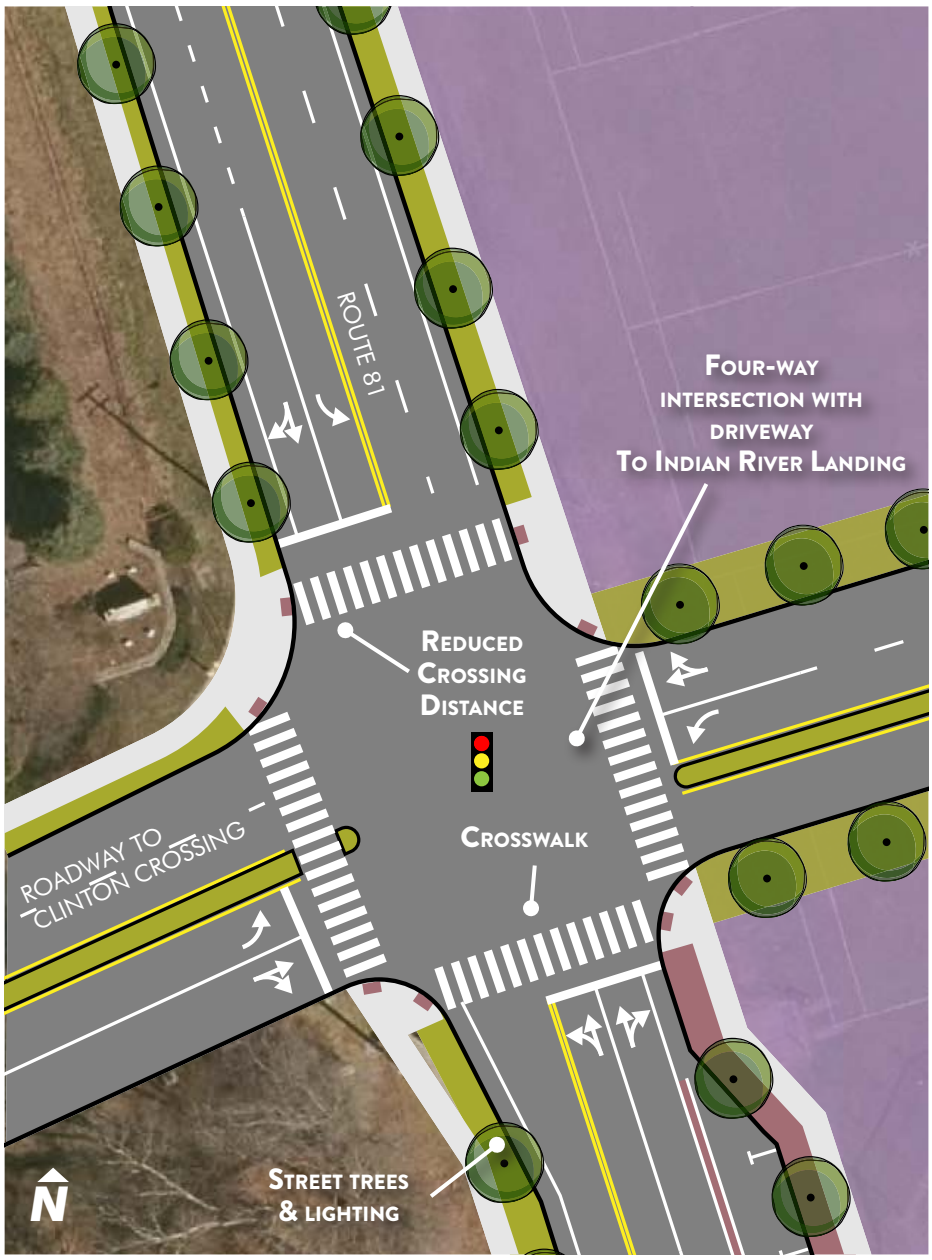
The entrance to the Clinton Crossing outlet is located across from the former Morgan School property where a driveway has been proposed for the Indian River Development at that site. The intersection is signalized and has crosswalks north of the entrance as well as across the driveway, on the west side of the intersection. There is no crosswalk at the southern leg of the intersection and the crosswalk at the northern leg is excessively long due to its skewed crossing.

SUMMARY

- Planned driveway for Indian River Development at east side of intersection.
- Lack of crosswalk along southern leg.
- Long crossing distance at northern leg of intersection.

LEVEL OF SERVICE (AM/PM): A/C





RECOMMENDATIONS FOR FUTURE TRAFFIC CONDITIONS

The primary recommendation for this intersection is to provide enhancements to the pedestrian network by improving roadway crossings. Crossings are recommended at all legs of the intersection. Existing crosswalks should be shortened by providing perpendicular crossings. The median at Clinton Crossing should be extended to provide a pedestrian refuge.

BENEFITS

- Provide additional roadway crossings.
- Reduce pedestrian crossing distances at intersection.
- Enhanced pedestrian environment.

CHALLENGES

- The use of median islands in Route 81 may require roadway widening.

LEVEL OF SERVICE (AM/PM): A/B

7.16 CLINTON CROSSING

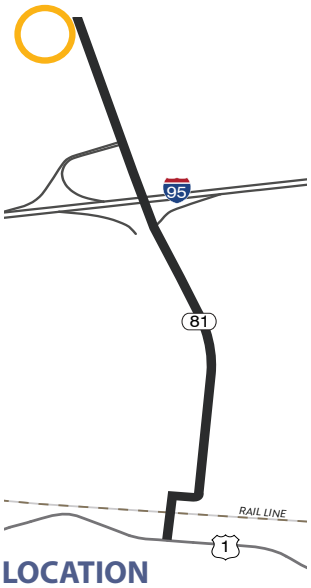
CONDITIONS

Although adjacent to Route 81, the Clinton Crossing outlets are not easily accessible to pedestrians. There is a sidewalk on the north side of the Clinton Crossing driveway, that connects the outlets to Route 81, but the 750 foot distance primarily consists of a narrow walkway close to the edge of driveway traffic.

The site has a wide sidewalk that travels through the parking lot parallel to the driveway. This walkway provides access to the parking lot but does not connect to Route 81.

SUMMARY

- Narrow, uninviting sidewalk connection between Route 81 and outlet mall



LOCATION

RECOMMENDATIONS

Recommendations to this area include making enhancements to the existing parking lot sidewalk to create a pedestrian mall through the parking lot and connecting to the existing sidewalk to Route 81. The pedestrian mall could include landscaping, pedestrian realm lighting, decorative pavements, benches, and designated space for food truck parking. Because these improvements are located on private property, it is assumed that the property owner would provide these enhancements as a means of improving the pedestrian connection between the outlet mall and the planned Indian River Landing development.

BENEFITS

- Enhanced pedestrian environment.
- Aesthetic improvements.
- Improved connection to Route 81 and planned Indian River Landing development.
- Designated space for food trucks.

CHALLENGES

- Improvements are incumbent upon property owner.

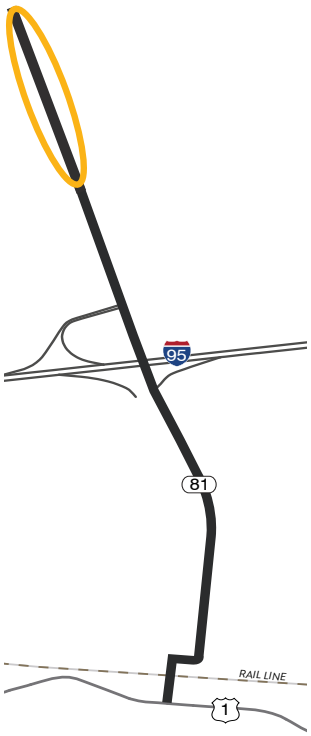
7.17 SHOULDER IMPROVEMENTS

CONDITIONS

Roadway shoulders vary in width and condition through much of the study area. Shoulders are especially narrow north of the Clinton Crossing driveway. The lack of shoulder space presents a challenge to pedestrians where sidewalks are lacking and provides bicyclists little operating space outside of the travel lanes. In addition to the limitations on pedestrian and bicycle mobility, the narrow shoulders provide little space for disabled vehicles and are associated with short sight-lines at horizontal curves in the roadway.

SUMMARY

- Narrow and inconsistent shoulder width, particularly north of the Clinton Crossing driveway.



RECOMMENDATIONS

Roadway shoulders should be widened to a minimum of five (5) feet on Route 81 throughout the study area, and extending north of the study area to the Indian River Recreation Complex. The existing 12 foot wide travel lanes should be reduced to 11 feet and the roadway widened to achieve a minimum roadway width of 32 feet (11 foot travel lanes and 5 foot shoulders). This improvement should be considered for inclusion into the next resurfacing of the roadway.

BENEFITS

- Provides space for pedestrians where sidewalks are not present.
- Provides operating space for bicyclists.
- Provides additional space for disabled vehicles and service vehicles.

CHALLENGES

- Topography is challenging in multiple locations.
- Utility structures may need to be relocated in some locations.

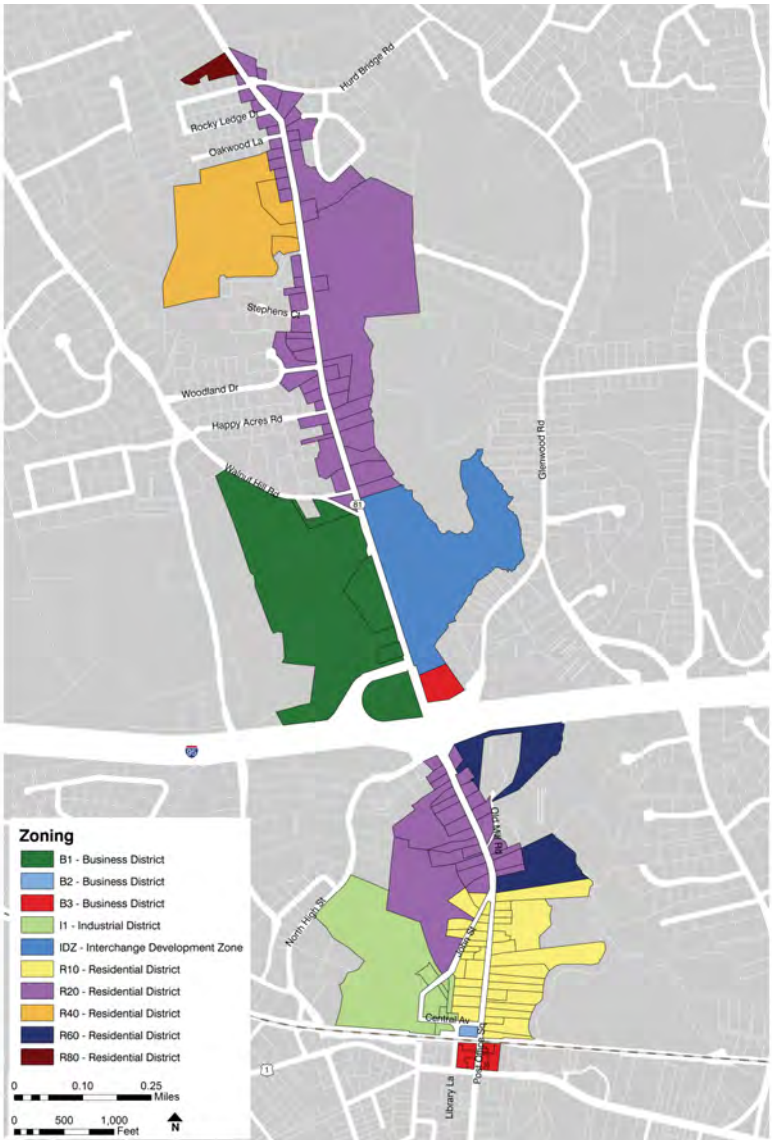
7.18 CORRIDOR ZONING

CONDITIONS

The Route 81 Corridor has a diversity of land uses and multiple zoning districts that allow a range of land uses. The Hull Street segment of the corridor is within the B2 and B3 Business Districts. The I1 industrial district is located west of Hull Street at the Unilever site. Most of High Street is zoned residential and is in the R10 or R20 residential district. The middle segment of the corridor between I-95 and Walnut Hill Road is zoned for business and includes the B1 and B2 business districts. North of Walnut Hill Road, the corridor is zoned residential and includes the R20, R40 and R80 zoning districts.

SUMMARY

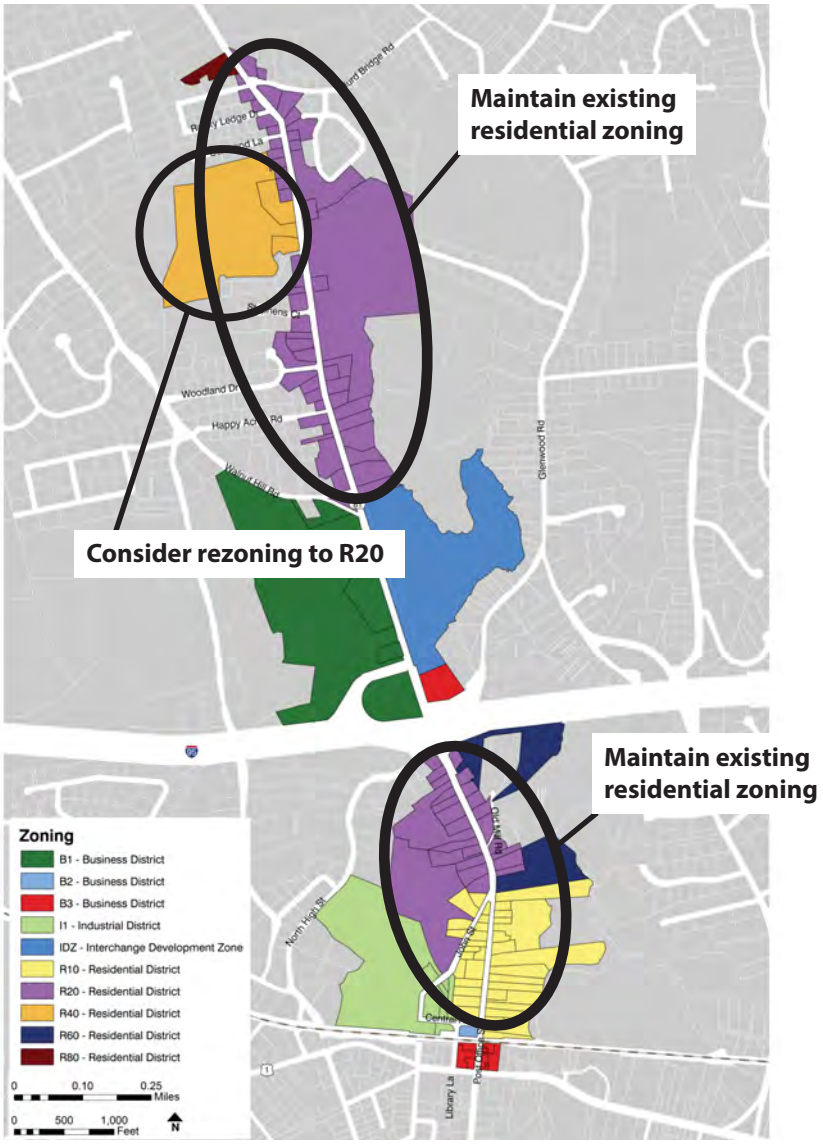
- Zoning varies from residential to business and industrial along the corridor



RECOMMENDATIONS

Proposed and potential developments at the former Morgan School and Unilever sites will have the potential to generate a significant amount of traffic on Route 81 and will significantly impact traffic operations, require substantial traffic capacity enhancements on Route 81 between North High Street and the Clinton Crossing roadway. While this potential build out is consistent with the zoning for this area, the development of more intensive land uses in areas that are currently zoned for residential uses should be avoided so as not to further impact traffic operations on Route 81.

The recommended approach is to maintain the existing residential zoning districts along the corridor at the current density levels. The exception to this is the large parcel and two adjacent parcels between Stephens Court and Oakwood Lane (see figure at right) which are currently zoned R40. The Town should consider redistricting those parcels to R20 to be consistent with surrounding parcels. Residential development of this density generate little traffic compared to commercial land uses.



BENEFITS

- Prevents further local development related traffic growth along the corridor.
- Encouraged development in areas currently zoned for commercial uses.
- Preserves residential properties and character

CHALLENGES

- Development pressures may result in applications for zone changes of residential zoned properties

8.0 DESIGN ELEMENTS

The following pages provide an overview of treatments, furnishings, and improvement types that are recommended for use along the Route 81 Corridor. Incorporating elements such as these into the corridor would enhance the pedestrian environment and improve vehicular travel. They could also aid in the creation of a more uniformed, village character for the corridor.

LIGHTING AND AESTHETICS

PEDESTRIAN REALM LIGHTING

Pedestrian realm lighting enhances the pedestrian environment by increasing safety, security and overall comfort. It illuminates pedestrians at nighttime, making them more visible to passing cars. Pedestrian scale lighting also creates a unifying feature to any streetscape as it can improve aesthetics and create a defining style for an area. Pedestrian scale lighting is recommended throughout the entire corridor where sidewalks are currently present or proposed.

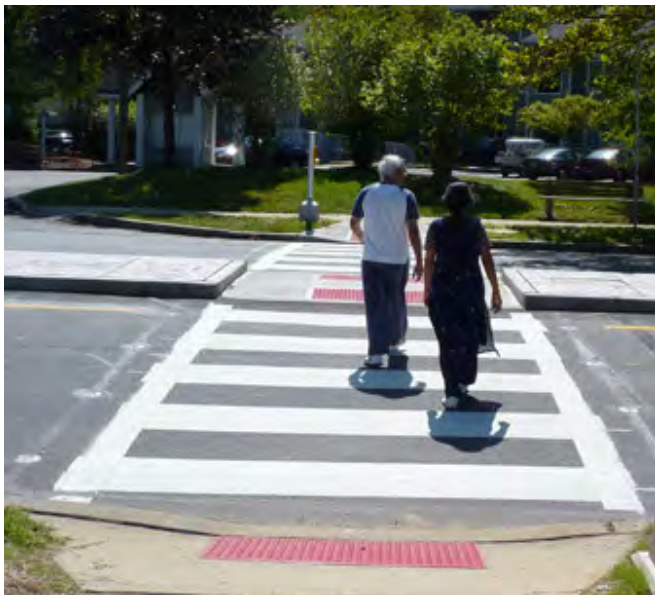
PUBLIC ARTWORK

Public art is an important component of many streetscape improvements. Public art has the ability to unify an area with a theme or identify a neighborhood gateway. At a pedestrian scale, it can provide visual interest for passersby. Clinton is in the process of adopting an Arts District that encompasses the southern end of the corridor. Local art should be utilized whenever possible to further support this designation.

LANDSCAPE BUFFERS AND STREET TREES

Street trees and landscape buffers are recommended along most of the RT 81 corridor where sidewalks are present. Landscape elements can create a unified aesthetic and provide a physical and mental buffer from traffic within the roadway. They also function as a traffic calming element and enhance the pedestrian environment.

PEDESTRIAN SAFETY



ADA COMPLIANT CROSSWALKS AND CURB RAMPS

ADA Compliant crosswalks and curb ramps are recommended at all intersections within the corridor. If designed and constructed to be accessible, a curb ramp provides an accessible route that people with disabilities can use to safely transition from a roadway to a curbed sidewalk and vice versa.

PAVER MEDIANS

Paver medians can provide traffic calming and aesthetic benefits, while also allowing emergency responders to travel freely over them if needed in an emergency. Medians separate opposing travel lanes and can aid in access management by controlling turning movements. Paver medians could be used as an alternative to pedestrian refuge islands should refuge islands be determined to be an obstruction to turning movements or emergency response vehicles.

REFUGE ISLANDS

Refuge islands provide traffic calming and aesthetic benefits. They provide a safe resting location if a pedestrian does not complete a roadway crossing during a pedestrian signal phase. Refuge islands are recommended at the following locations:

- Southern leg of Route 81/North High Street intersection.
- Northern leg of Route 81/Glenwood Road intersection.
- Northern and western legs of the Route 81/I-95 Southbound ramp intersection.
- Western leg of the Route 81/Clinton Crossing intersection.

ACCESS MANAGEMENT

ACCESS MANAGEMENT

Access management is used to reduce turning movement conflicts and improve the quality of the pedestrian environment by minimizing impacts to sidewalks. The most applicable access management tool for Route 81 is to reduce the width of existing driveways and limit left turns to and from driveways.

ON-STREET PARKING

PARALLEL PARKING

On-street parallel parking provides convenient access to retail and restaurant storefronts. On-street parking also has the additional benefit of providing a buffer between pedestrians and traffic. On-street parking has also been demonstrated to provide a traffic calming effect.

ON-STREET PARKING CASE STUDIES

The following examples are drawn from communities in Connecticut that have on-street parking on state routes in proximity of retail areas.

CLINTON

On-street parking is provided along Route 1 in Downtown Clinton. At this location, parking supports the restaurants and businesses within the commercial Downtown.

ROUTE NUMBER:	US ROUTE 1
TRAFFIC VOLUMES:	13,900 ADT
POSTED SPEED LIMIT:	25 MPH

RIDGEFIELD

Connecticut State Route 35 runs through Downtown Ridgefield. The presence of on-street parking, wide sidewalks, street trees, and pedestrian scale lighting helps to calm traffic and help to make the area more pedestrian friendly. Retail, restaurants, and office uses are some of the development types that are thriving in the downtown.

ROUTE NUMBER:	STATE ROUTE 35
TRAFFIC VOLUMES:	12,000 to 17,600 ADT
POSTED SPEED LIMIT:	25 MPH

MANCHESTER

On-street parking, both parallel and pull in, is allowed on State Route 83 in Manchester.

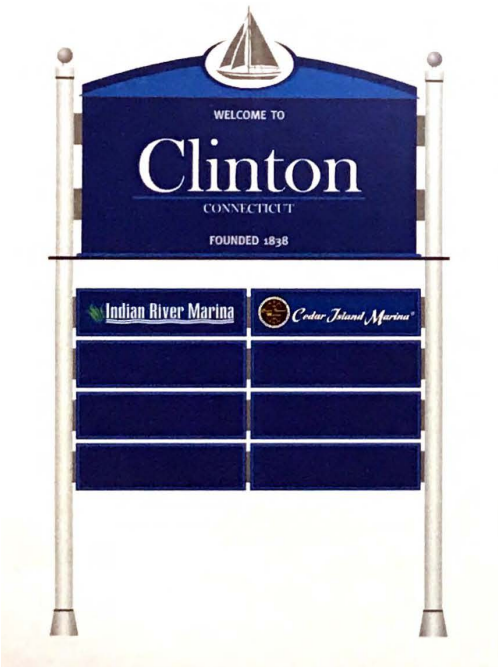
ROUTE NUMBER:	STATE ROUTE 83
TRAFFIC VOLUMES:	14,000 ADT
POSTED SPEED LIMIT:	35 MPH

FAIRFIELD

Route 1 in Fairfield is a two-lane in each direction roadway with on-street parking on both sides of the road. On-street parking serves the businesses along this busy commercial route.

ROUTE NUMBER:	US ROUTE 1
TRAFFIC VOLUMES:	13,800 to 24,300 ADT
POSTED SPEED LIMIT:	25 MPH

GATEWAY AND WAYFINDING SIGNAGE



GATEWAY SIGNAGE

Gateway signage should be utilized in key locations along the corridor to promote Clinton and create a consistent, easily understood and aesthetically pleasing impression of the Town. Gateways into the Town will help promote a sense of place and identity. Locations where gateway signage is appropriate include:

- The intersection of North High Street, the I-91 northbound interchange, and Route 81.
- The intersection of the I-95 southbound interchange, potential Morgan School site access, and Route 81.
- Across the rail trestle crossing Hull Street, at the southbound approach to the intersection with Route 1 and Downtown Clinton .

WAYFINDING SIGNAGE

Wayfinding signage is recommended to enhance accessibility by incorporating clear, well maintained signage that directs people to key destinations and amenities. Wayfinding signage is recommended at:

- The intersection of North High Street, the I-91 northbound interchange, and Route 81.
- The intersection of the I-95 southbound interchange, potential Morgan School site access, and Route 81.
- At the approach to the pedestrian walkway underneath the rail line.
- At the potential development at the former Morgan School site.
- At the Clinton Train Station.
- At the Clinton Crossing exit driveway.

The Town of Clinton is working with the Connecticut Economic Resource Center (CERC), to create Town branding and signage for the area. The images above and left provide a snapshot of a few of the concepts created thus far. These have not been adopted by the Town, but are provided to show an example of the type of signage the Town is interested in creating.

TRANSIT IMPROVEMENTS

BUS SHELTERS

Bus shelters are recommended at heavily used 9 Town Transit stops along the corridor such as at Clinton Crossing and at Clinton's Shore Line East station. Shelters provide passengers with comfortable seating, protection from weather elements and vital information such as schedules. Providing comfortable shelter and seating can improve perception of wait time and rider satisfaction.

BUS PULL-OFFS

Curbside bus pull-offs are recommended for the 9 Town Transit northbound and southbound stops adjacent to Clinton Crossing, at the former Morgan School site, and at Clinton's Shore Line East station. Bus pull-offs help to alleviate congestion issues related to bus service by providing boarding and alighting space outside of traffic lanes.

CIRCULATION IMPROVEMENTS

TRAFFIC CIRCLE

Traffic circles are used as an alternative to stop-controlled intersections as a means of improving intersection safety and providing route redirection for traffic. Traffic circles are only used on low volume roadways.

ROUNDABOUT

Roundabouts are used as an alternative to signalized intersections as a means of improving intersection safety and minimizing traffic queuing.

9.0 Implementation Plan

The following implementation plan provide a framework of recommendations, responsible parties, and funding sources and mechanisms for achieving the improvements proposed within this study. The recommendations provide a vision for what is possible along the Route 81 corridor if investments are made by the Town, State and private property owners and developers. The implementation strategies are focused towards the measures that the Town of Clinton can take to improve infrastructure and modify the regulatory environment so as to encourage improvements along the corridor. Taking actions on the recommendations of this study will require the leadership of Clinton's elected officials, staff, and commissioners.

Implementation Strategies

The recommended course of action is as follows:

1. Pursue a diversity of funding sources to assist in planning and infrastructure enhancements. Grant and funding programs include:

- Transportation Alternatives Program (TA) grants
- Connecticut Responsible Growth and Transit Oriented Development (RGTOD) Program
- Connecticut Department of Transportation Local Transportation Capital Improvement Program (LOTCIP)
- Small Town Economic Assistance Program (STEAP) Grants
- Small Cities Community Development Block Grant Funds (CDBG)

2. Implement pedestrian and transit enhancements in southern segment of the corridor where development is unlikely to require roadway reconstruction:

- Enhance rail underpasses
- Improve sidewalks and crosswalks
- Provide bus stops, waiting areas and shelters in proximity of train station.

3. Provide traffic management and safety enhancements at intersections in proximity of Route 1 and rail station:

- Study traffic operations at Route 1, Dan Vece Jr Way, and Library/Commerce Streets. Explore conversion of Dan Vece Jr to one-way operation
- Explore stop sign warrant for Hull Street/Central Avenue intersection
- Provide traffic circle at John Street/Central Avenue intersection

4. Provide wayfinding and gateway treatments:

- Auto-oriented wayfinding at I-95 NB off-ramp and North High Street and at North High Street and Route 81.
- Gateway signage at Route 81 at North High Street and at rail overpass on Hull Street.

5. Provide pedestrian enhancements between North High Street and Glenwood Road including:

- Crossing enhancements at North High Street intersection
- Sidewalk enhancements on I-95 overpass
- Crossing enhancements at Glenwood Road intersection

6. Provide capacity and pedestrian enhancements commensurate with, and as required to serve, proposed Indian River Development site:

- Additional queuing and turn lanes at intersections
- Additional southbound traffic lane between I-95 SB interchange and Glenwood Road
- On-street parking lane on the east side of Route 81 between I-95 SB interchange and Clinton Crossing driveway.
- Sidewalk and streetscape enhancements between Glenwood Road and Clinton Crossing driveway intersections.
- New crosswalks, curb ramps, pedestrian actuated signals and pedestrian refuge islands at intersections between Glenwood Road and Clinton Crossing driveway intersections.
- Bus stops, waiting areas and shelters in proximity of Hull Library.
- Five-foot wide shoulders between Glenwood Road and Clinton Crossing driveway intersections.

7. Facilitate access improvements on, or through, private properties:

- Develop a public roadway and right-of-way through Unilever site between John Street and North High Street
- Create a publicly accessible trail or easement along the Indian River
- Create a pedestrian mall through Clinton Crossing parking lot

9.1 FUNDING SOURCES & MECHANISMS

The Town of Clinton should pursue multiple sources of funding assistance for enhancements within the Route 81 corridor. Relevant programs administered by the State of Connecticut include, but are not limited to, the following:

Transportation Alternatives Program (TA)

The Transportation Alternatives (TA) program is a Federal Highway Administration program authorized under the most recent Federal transportation funding act, Fixing America's Surface Transportation Act (FAST Act). This program replaces the former MAP-21 Transportation Alternatives Program (TAP).

Projects eligible for TA funding are similar to those eligible under the former TAP, and include those defined as transportation alternatives; including small-scale transportation projects such as bicycle and pedestrian facilities, recreation trails, safe route to schools projects, historic preservation, vegetation management, and environmental mitigation. As with the former TAP program, routine maintenance and operating costs are not eligible for TA funding.

The TA program is intended to help local sponsors fund community based projects that expand travel choices and enhance the transportation experience by improving the cultural, historical and environmental aspects of the transportation infrastructure. The program does not fund traditional roadway projects or provide maintenance for these facilities. Instead, it focuses on providing for pedestrian and bicycle facilities, community improvements, and mitigating negative impacts of the highway system.

The TA program is part of the Federal-aid Highway program, and as such funds are only available on a reimbursement basis with a funding split of 80 percent federal and 20 percent local match. Because it is a reimbursable program the project sponsor must first incur project expenses and then request reimbursement.

To be eligible for TA funding, the design phase of the project must be complete, and construction funds obligated, by the end of federal fiscal year 2020. A project must also have an estimated project cost exceeding $500,000.

Connecticut Office of Policy and Management Responsible Growth & TOD (RGTOD) Grants

Provides up to $2 million in financial support per project for construction projects that expand on previous state investment in transit-oriented development or planning or construction projects that demonstrate responsible growth through their consistency with the State Conservation & Development Plan.

Connecticut Department of Transportation Local Transportation Capital Improvement Program (LOTCIP)

The LOTCIP is intended primarily to address regional transportation priorities through capital improvement projects prioritized and endorsed by the RPO. LOTCIP projects must be located on a roadway classified as an urban collector or higher.

Pavement preservation, pavement rehabilitation, and exclusive sidewalk projects are eligible. Although transportation enhancement/alternative projects are eligible for LOTCIP funding without an explicit cap initially, it is expected that the COGs will limit funding allocation to such projects to a reasonable level.

Projects must have a minimum construction cost of $300,000 to qualify. Planning studies may be eligible for LOTCIP as a funding source, subject to the Department's current Planning Study Process.

Small Town Economic Assistance Program (STEAP) Grants

Note: The Office of Policy and Management is not currently accepting applications for STEAP grants

STEAP funds are issued by the State Bond Commission and can only be used for capital projects. A project is considered to be a capital project if it is new construction, expansion, renovation or replacement for an existing facility or facilities. Project costs can include the cost of land, engineering, architectural planning, and contract services needed to complete the project. The program is managed by the Office of Policy and Management, and grants are administered by various state agencies.

Small Cities Community Development Block Grant Funds (CDBG)

Connecticut's CDBG Program, also known as the Small Cities Program, provides funding and technical support for projects that achieve local community and economic development objectives. The Small Cities Program principally benefits low- and moderate-income persons. This program is only available to Connecticut towns and cities with populations of less than 50,000; Clinton is listed as an eligible community.

Community Development Block Grants help cities and towns implement housing, community, and economic development projects that assist low and moderate-income residents, or that revitalize areas of slum or blight. Eligible CDBG projects relevant to the proposed Route 81 corridor improvements include but are not limited to:

- Acquisition of real property
- Public facilities and improvements
- Disposition of real property
- Public services
- Relocation
- Planning and capacity building
- Program administrative costs
- Technical assistance

National Recreational Trails Program

The Recreational Trails Program is an assistance program of the U.S. Department of Transportation's Federal Highway Administration. The program is administered locally through the Connecticut Department of Energy & Environmental Protection (DEEP). Recreational Trails Program funds are used for projects that include:

- Construction of new trails (motorized and non-motorized).
- Maintenance and restoration of existing recreational trails (motorized and non-motorized).
- Access to trails by persons with disabilities.
- Purchase and lease of trail construction and maintenance equipment.
- Acquisition of land or easements for a trail, or for trail corridors.

9.2 IMPLEMENTATION SUMMARY

Recommended Improvement	Timing	Order of Magnitude Cost Estimate*	Potential External Funding Source	Engaged Parties	Notes
Near Term Improvements/Actions					
Dan Vece Jr Way one-way feasibility study	Near-Term	$10,000		Town of Clinton	
Central Ave/Hull St stop sign warrant	Near-Term	-		Town of Clinton	
Wayfinding and gateway enhancements at Route 81/ North High Street	Near-Term	$20,000		Town of Clinton	
Hull Street rail underpass improvements	Mid-Term	$100,000	RGTOD	Town of Clinton, Amtrak	Lighting, painting, gateway signage
Post Office Square pedestrian rail underpass improvements	Near-Term	$20,000	RGTOD	Town of Clinton, Amtrak	Lighting and landscaping
John St/Central Ave traffic circle and Central Ave bus stop	Near-Term	$50,000	LOTCIP, RGTOD	Town of Clinton, CTDOT	Excludes property acquisition costs
Central Ave/High Street pedestrian enhancements	Mid-Term	$600,000	TA	Town of Clinton, CTDOT	New sidewalks on both side of roadway, pedestrian area lighting
Route 81 bridge at I-95 pedestrian enhancements	Mid-Term	$50,000	LOTCIP	CTDOT	Sidewalk widening, lane restriping, decorative barrier treatment
Commuter lot pedestrian access	Mid-Term	$40,000	LOTCIP	CTDOT	Stairs and accessible ramp
Bus stops and shelters at Hull Library	Near-Term	$60,000	RGTOD, STEAP, CDGB	Town of Clinton, CTDOT	Bus pull-off area, waiting areas, and shelters on both sides of roadway
Roadway shoulder enhancements (Clinton Crossing to Indian River Recreation Complex)	Long-Term	$500,000	LOTCIP	Town of Clinton, CTDOT	Widening and restriping, excludes roadway resurfacing, utility impacts
Development Related Enhancements (Full build out for Future Conditions)					
Unilever site right-of-way	Mid-Term	$300,000		Town of Clinton, Property Owner	Excludes property acquisition costs. Includes drainage, roadway widening, regrading, and resurfacing.
Route 81/North High St intersection modifications	Mid-Term	$50,000	LOTCIP	Town of Clinton, CTDOT	Lane reconfiguration, signal modifications
Route 81/Glenwood Road intersection capacity and pedestrian enhancements	Mid-Term	$200,000	LOTCIP	Town of Clinton, CTDOT	New signals, roadway widening, median island, pedestrian enhancements
Route 81/I-95 SB intersection capacity and pedestrian enhancements	Mid-Term	$1,000,000	LOTCIP	Town of Clinton, CTDOT, IRL Developer	New signals, roadway widening, ramp widening, median island, pedestrian enhancements. Excludes Indian River site access improvements.

Recommended Improvement	Timing	Order of Magnitude Cost Estimate*	Potential External Funding Source	Engaged Parties	Notes
Route 81 parallel parking lane and pedestrian amenities (I-95 SB interchange to Clinton Crossing intersection)	Mid-Term	$800,000	LOTCIP	Town of Clinton, CTDOT, IRL Developer	Parking lane, parking access lane, traffic lane buffer, pedestrian realm enhancements
Clinton Crossing intersection enhancements	Mid-Term	$50,000	LOTCIP	Town of Clinton, CTDOT, IRL Developer	Crosswalk improvements. Excludes Indian River site access improvements
Private Property Enhancements					
Indian River Trail enhancements	Mid-Term	$400,000	RTP Trails Grant	Town of Clinton, IRL Developer	10 foot wide asphalt or stone dust pathway and overlook terrace enhancements
Clinton Crossing pedestrian mall	Mid-Term	$100,000	Private	Town of Clinton, Property Owners	Landscaped sidewalk and pedestrian amenities
Future Enhancements Subject to Property Acquisition					
Hull Street/Central Avenue Roundabout	Long-Term	$600,000	LOTCIP	Town of Clinton, CTDOT, Property Owners	Roadway and pedestrian improvements, drainage and utility modifications. Excludes property acquisition

**Cost estimate is a planning level cost estimate based upon CTDOT unit cost data and published cost data from comparable projects. The estimate does not include or account for property acquisition and unknown potential utility impacts or other contingencies.*

10.0 Appendix

10.1 Public Involvement Summary

10.2 Market Data

10.3 Traffic Data

10.1 Public Involvement Summary

Public Workshop

A public workshop for the Route 81 Corridor Study was conducted at the Morgan School the evening of Monday, June 25th, 2018. Forty-five residents of Clinton attended this workshop to provide their input and ideas regarding the future of the Route 81 Corridor. In support of this workshop, flyers were posted throughout town, there was a notice in the local newspaper as well as in Clinton's Chamber of Commerce Monthly Newsletter, a link about the study and workshop was posted on the Town's Website and Facebook page, there was an announcement in the Clinton Town Patch, and an online survey was launched to engage the public and inform people about the workshop. Over 1,200 people completed the online survey. Additionally, the workshop was advertised at pop-up events prior to the workshop, including the Clinton Memorial Day Parade and the Business Resource Forum.

The workshop began with a presentation that included a brief overview of the study process and existing conditions regarding the corridor. A traffic analysis was presented as well as an overview of the market conditions specific to the area. Results of the online survey were also presented to the group. An interactive survey was completed with the audience using virtual polling software. Participants were asked to rank images of amenities and buildings types that would be desirable/undesirable to them. Images including bicycle and pedestrian amenities were very favorable to the group. Mixed use building types with a variety of business types were also favorable. Single family residential and apartment buildings were less favorable to the group.

After the presentation, break out sessions were conducted with the group. Highlights from the break out sessions are provided on the following pages. (*x2, x3, x4, etc. denotes that a specific comment was brought up more than once during the break out session*)

Visual preference survey portion of the workshop

Route 81 Break Out Session Notes

Strengths:

- Excellent commercial opportunities
- Proximity to I-95, accessibility x4
- Attracts local (Clinton and Killingworth) and regional shoppers
- Proximity to the Train Station, Shore Line East x4
- High School, Library, Clinton Crossing are all assets x4
- Opportunity to expand the tax base
- Opportunity to have a greenway through Clinton
- Possible to connect different facilities through Town
- Most publicly accessible waterfront in the area
- Summer months have a population boom which is good for the Town
- Potential for development
- Three different zones provide a nice variety
- Historic area
- Access to the shoreline x2
- Route 81 doesn't look like Orange or the Berlin Turnpike
- Education- Morgan High School is located here
- Location half way between Boston and New York
- Educated labor force
- Affordable cost of living
- Renewed appetite for development in Town
- Natural gas available

Issues:

- Need a better Senior Center
- Contamination at Unilever Site and Old Morgan High School needs remediation, Clinton should push Unilever to clean up the site x3
- I-95 commuter traffic x2
- Zigzag at lower Route 81 is dangerous
- Lack of sidewalks and poor condition of existing sidewalks is an issue x3
- New Morgan High School needs sidewalks, so students can walk
- Enforcement of pedestrian laws is an issue
- Need better pedestrian scale lighting
- Better wayfinding signage x3
- Traffic concerns (speeding)
- Crime (specific to the outlets)
- No safe bike paths
- Blight issues and aesthetics of the corridor
- Low train trestle is often hit by large trucks x2
- Safety for all users (pedestrian, vehicular, bike) is a concern
- Narrow road
- Zoning is outdated, zoning issues x2
- Access to train station is inadequate
- Timing of traffic lights is off
- CVS traffic and drive thru lane
- Waste water and septic issues are a hindrance to development
- Shore Line East has issues sometimes with service, need better transit availability

Ideas:

- Should have a trolley or jitney that connects the outlets to the school, and downtown Clinton, and then down to the harbor x2
- Bike paths
- Better sidewalks and pedestrian crossings
- Mixed use facility, shopping, hotel x2
- Mixed use, retail and restaurants x2
- The corridor needs more "curb appeal"
- Design with safety in mind – CEPED
- Big box stores like a Trader Joe's or Whole Foods
- Sports complex at the Unilever site
- Private Senior Housing
- Market rate and rental housing
- No car dealerships
- Art space
- Town needs to be willing to work with developers
- Mid-range hotel would be nice
- Something like a Blue Back Square in West Hartford, Downtown Madison, Downtown Essex
- Cultural activities to stimulate the mind
- Common space, Town Green
- Preserve the natural area around the Indian River behind former Morgan School, connect into the Greenway
- Unilever Site- incubator/ vocational training space
- Unilever Site- rental units for younger people

Public Workshop attendees during the break out sessions

Online Survey

An online survey for the study was launched in early June, 2018. This survey was open for approximately six weeks and in that time, it received over 1,200 responses. A sampling of survey results is provided below.

When asked what their home zip code was, over 1,000 people said they were from Clinton. Other common locations include nearby towns such as Killingworth, Madison, and Westbrook. When asked if they live within a five-minute walk of Route 81, about 45% of respondents answered yes, and 50% of respondents said no. Another 5% answered that they were not sure, that they never walked it.

Sixty-six percent of survey respondents live on or near Route 81 and over 9% work at a business on or near Route 81. 29% do not live, work, or own a business on or near Route 81. When asked how long they have lived, worked, or owned a business or commercial property on Route 81, there was a wide range of results. The highest cohort (25%) answered no, I do not live, work, or own a business or commercial property on or near Route 81, 12% answered between 5 – 9 years, 23% answered 10 – 19 years, 15% answered 20 -29 years, 14% answered less than 5 years, and 12% answered 30 or more years. When asked how often you travel on Route 81, the majority (71%) answered that they travel the corridor daily. Another 22% said they travel it a few times a week.

When asked where they were usually going when traveling on Route 81, 70% answered I-95 and nearly 60% said to points further north. 55% of respondents said downtown Clinton and roughly 40% answered Clinton Crossing. 31% said they typically were traveling to the Library and 34% answered that they were traveling to points further south. When asked if you have any concerns about Route 81, 53% answered, no I don't have any concerns. 47% said yes, they had concerns. Responses regarding concerns included lack of sidewalks around the new Morgan School, traffic and speeding, congestion, and many others.

What types of development would you like to see along Route 81?

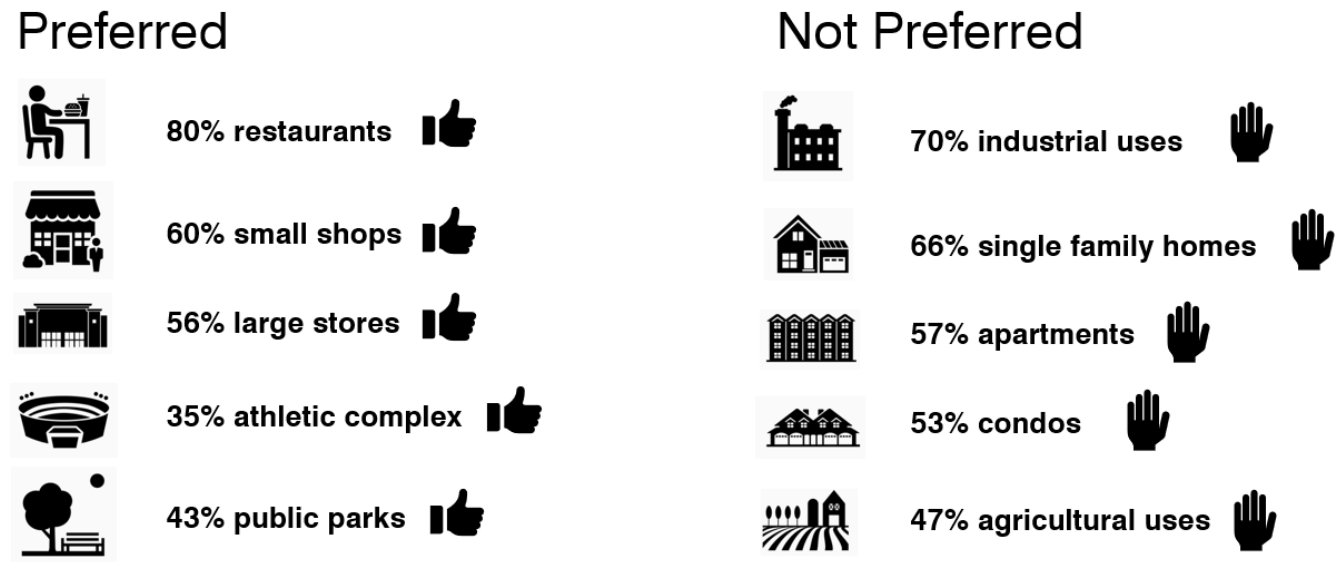


Figure 10.1: Survey Results Snapshot

When asked about their thoughts regarding the Route 81 corridor, 21% of respondents said that Route 81 needs to be completely re-imagined. The majority, (66%) said that Route 81 is ok as is, but needs improvement. Only 13% answered that Route 81 is fine as is, don't change a thing. When asked about their vision for the Route 81 Corridor, 70% of respondents answered that it remains a local/regional destination for shopping. Over 63% said that it becomes a local destination for dining. 42% answered that it is easier to walk or bicycle along and nearly 40% said that it provides better connections to downtown Clinton and the train station. 39% said that it is easier to drive through. When asked about what types of development respondents would like to see along Route 81, preferred uses included; restaurants (80%), small shops (60%), large stores (56%), public parks (43%), and an athletic complex (35%). Uses that were not preferred by survey respondents included; industrial uses (70%), single family homes (66%), apartments (57%), condos (53%), and agricultural uses (47%). See Figure 10.1. When asked about redevelopment specific to the former Morgan School property, popular uses included restaurants (76%), a chain retailer (55%), mixed use development (44%), a grocery store (42%), and local business (39%). Additional comments also commonly specified a hotel as a popular redevelopment choice. See Figure 10.2.

When asked about redevelopment specific to the Unilever property, top choices included an entertainment venue (56%), restaurants (50%), an athletic complex (50%), mixed use development (44%), local businesses (32%), and condos (30%). When asked about priorities for the Route 81 corridor, 50% of respondents said that traffic and pedestrian safety was their top priority and 30% of respondents identified the priority to reduce traffic congestion. Providing facilities for bicyclists and pedestrians was a top priority for 19% of survey respondents and reducing traffic speeds was a top priority for 15% of survey respondents. See Figure 10.3. When asked if they would like to see more bicycle and pedestrian amenities along Route 81, 55% of respondents said yes. 27% answered that they were unsure, or had no preference. Roughly 17% answered no. When asked if they would like a stronger connection between the train station and Route 81, 42% of respondents answered yes and over 45% answered that they were unsure, or had no preference. Only 13% answered no. When asked for their age, results were varied between age cohorts, with the top cohort being the 40-50 age range (27%). 21% of respondents were in the 50-60 age range, and 17% were between 30-40 years old.16% were between 20-30 years old and 13% were between 60-70.

Respondents were also asked to provide any additional comments about Route 81 that they might have. Comments were varied and included many different topics such as safety concerns, congestion related issues, the desire for mixed use development including restaurants, commercial, and hotels. Many comments discussed the need for development that increases the tax revenues of the area. Specific chain retailers that were commonly identified as desirable included Trader Joe's, Whole Foods, and Costco. Some respondents said they would like limited or no future development along Route 81.

Promotional materials were created to both advertise the online survey and public workshop, as well as to inform the community about the corridor study. These materials included; a project postcard, which provided a brief introduction to the study purpose and need as well as an overview map of the project area, a project tri-fold brochure, a flyer advertising the walking tour event, and a press release that was sent to the Clinton Chamber of Commerce, the Clinton Town Patch, and the Harbor News local newspaper.

What type of redevelopment would you like to see at the former Morgan School Property?

What type of redevelopment would you like to see at the Unilever Property?

Figure 10.2: Favorable Development Types

Traffic & Pedestrian Safety - top priority for 50%

Reduce Traffic Congestion - top priority for 29%

Provide Facilities for bicyclists and pedestrians - top priority for 19%

Reduce Traffic Speeds - top priority for 15%

Figure 10.3: Priorities for Route 81

Corridor Walk

A walking tour of the Route 81 Corridor was conducted on the morning of Saturday, June 30th. The team walked the corridor, between Route 1 and Clinton Crossing Outlets. Walking the corridor with engaged residents and stakeholders provided an opportunity to understand the pedestrian experience. Conditions were highlighted such as the narrow sidewalks which make it impossible to walk side by side, the vegetation encroachment happening at many spots, and the loud road noise that is likely due to the coarse aggregate used in paving the roadway. Noting these conditions will enable the team to deliver recommendations to improve the corridor in targeted ways. Clinton residents provided ample local knowledge of the corridor. This included things like busy school bus stop locations and dangerous crosswalks. The team also walked along the former Morgan School property that abuts the Indian River. This wooded walking trail, although slightly overgrown due to lack of use, is an asset to the community. Recommendations will include maintaining public access to the trail network.

Walking tour of the Route 81 corridor

Observations and notes from the walking tour are presented below:

- There are grants available if a developer keeps the façade of the Unilever building, but those may be expired at this time
- Locals often use the cut through that passes through the Unilever property to access North High Street
- Should consider having a turn around for trucks near Unilever and train station
- There is a pedestrian stair planned that will lead up the hill approaching the train station
- Owner occupied would be nice for the homes that are being converted to multi-family
- The road is paved with a coarse aggregate, when it comes time to resurface the road, the Town should ask the CTDOT to use a smoother aggregate to reduce the noise
- Many trucks have hit the train trestle, which causes backups to the train, traffic, etc. CTDOT should put a sign on the highway to warn truck drivers of the low crossing, truck traffic should be directed to exit 62
- Vista and Gilead assisted living housing on High Street
- Mobile home park that is located near the Robin's Nest has many students that get on the bus there
- Clinton is the second highest user of 9 Town Transit (second to Middletown)
- Should try to maintain public access to the pathway along Indian River that is behind the former Morgan School
- Connections to Glenwood School Campus as well should be looked at
- Pedestrian signal light was broken at the intersection crossing with I-95 on/off ramps

Walking trail and scenic vista overlooking Indian River, located on property behind the former Morgan School

Pop Up Events

As part of the public involvement process, FHI designed materials for and staffed three pop-up community events to promote the Route 81 Corridor Study and gather feedback from stakeholders in the Clinton community. The FHI team engaged people at local events, thereby making it more convenient to participate. These events included the Clinton Memorial Day Parade, the Economic Development Business Resource Forum, and the First Friday Night Food Truck Festival at Clinton Crossing. These events were chosen based on their ability to draw large numbers of community stakeholders, variety in type of event, and range of Town location and time of day of event.

Feedback received during the pop-up events was very consistent with what was discussed during the Public Workshop. Most people were concerned with traffic and pedestrian safety, particularly with speeding and lack of pedestrian infrastructure. Regarding potential redevelopment, most people felt that mixed use development was needed, and that something which would increase the tax base in Clinton was favorable. There were concerns related to overdeveloped and increased traffic as well. People were interested in the study, and thought it was an important project for the Town.

Memorial Day Parade Pop-Up Event

10.2 Market Data

Executive Summary

115 High St, Clinton, Connecticut, 06413
Drive Time: 5, 10, 15 minute radii

Prepared by Esri
Latitude: 41.28714
Longitude: -72.52818

	5 minutes	10 minutes	15 minutes
Population			
2000 Population	6,722	27,566	58,205
2010 Population	6,693	28,457	60,143
2018 Population	6,619	28,627	60,835
2023 Population	6,566	28,624	60,977
2000-2010 Annual Rate	-0.04%	0.32%	0.33%
2010-2018 Annual Rate	-0.13%	0.07%	0.14%
2018-2023 Annual Rate	-0.16%	0.00%	0.05%
2018 Male Population	48.7%	48.5%	48.5%
2018 Female Population	51.3%	51.5%	51.5%
2018 Median Age	46.9	49.2	49.7

In the identified area, the current year population is 60,835. In 2010, the Census count in the area was 60,143. The rate of change since 2010 was 0.14% annually. The five-year projection for the population in the area is 60,977 representing a change of 0.05% annually from 2018 to 2023. Currently, the population is 48.5% male and 51.5% female.

Median Age

The median age in this area is 46.9, compared to U.S. median age of 38.3.

Race and Ethnicity			
2018 White Alone	92.8%	93.7%	93.5%
2018 Black Alone	0.8%	0.8%	0.9%
2018 American Indian/Alaska Native Alone	0.2%	0.2%	0.2%
2018 Asian Alone	2.1%	2.2%	2.5%
2018 Pacific Islander Alone	0.0%	0.0%	0.0%
2018 Other Race	2.3%	1.6%	1.3%
2018 Two or More Races	1.6%	1.6%	1.6%
2018 Hispanic Origin (Any Race)	8.0%	5.6%	5.0%

Persons of Hispanic origin represent 5.0% of the population in the identified area compared to 18.3% of the U.S. population. Persons of Hispanic Origin may be of any race. The Diversity Index, which measures the probability that two people from the same area will be from different race/ethnic groups, is 20.9 in the identified area, compared to 64.3 for the U.S. as a whole.

Households			
2000 Households	2,672	10,910	22,714
2010 Households	2,723	11,644	24,156
2018 Total Households	2,676	11,662	24,332
2023 Total Households	2,648	11,634	24,335
2000-2010 Annual Rate	0.19%	0.65%	0.62%
2010-2018 Annual Rate	-0.21%	0.02%	0.09%
2018-2023 Annual Rate	-0.21%	-0.05%	0.00%
2018 Average Household Size	2.46	2.43	2.48

The household count in this area has changed from 24,156 in 2010 to 24,332 in the current year, a change of 0.09% annually. The five-year projection of households is 24,335, a change of 0.00% annually from the current year total. Average household size is currently 2.48, compared to 2.47 in the year 2010. The number of families in the current year is 16,746 in the specified area.

Data Note: Income is expressed in current dollars
Source: U.S. Census Bureau, Census 2010 Summary File 1. Esri forecasts for 2018 and 2023. Esri converted Census 2000 data into 2010 geography.

August 30, 2018

Executive Summary

115 High St, Clinton, Connecticut, 06413
Drive Time: 5, 10, 15 minute radii

Prepared by Esri
Latitude: 41.28714
Longitude: -72.52818

	5 minutes	10 minutes	15 minutes
Median Household Income			
2018 Median Household Income	$69,252	$85,590	$92,728
2023 Median Household Income	$79,366	$96,264	$102,652
2018-2023 Annual Rate	2.76%	2.38%	2.05%
Average Household Income			
2018 Average Household Income	$92,108	$116,078	$125,387
2023 Average Household Income	$109,664	$134,576	$144,172
2018-2023 Annual Rate	3.55%	3.00%	2.83%
Per Capita Income			
2018 Per Capita Income	$37,969	$47,283	$50,293
2023 Per Capita Income	$45,105	$54,670	$57,668
2018-2023 Annual Rate	3.50%	2.95%	2.77%
Households by Income			

Current median household income is $92,728 in the area, compared to $58,100 for all U.S. households. Median household income is projected to be $102,652 in five years, compared to $65,727 for all U.S. households

Current average household income is $125,387 in this area, compared to $83,694 for all U.S. households. Average household income is projected to be $144,172 in five years, compared to $96,109 for all U.S. households

Current per capita income is $50,293 in the area, compared to the U.S. per capita income of $31,950. The per capita income is projected to be $57,668 in five years, compared to $36,530 for all U.S. households

Housing			
2000 Total Housing Units	2,807	12,785	25,949
2000 Owner Occupied Housing Units	2,034	8,767	18,843
2000 Renter Occupied Housing Units	638	2,143	3,871
2000 Vacant Housing Units	135	1,875	3,235
2010 Total Housing Units	2,931	13,872	28,228
2010 Owner Occupied Housing Units	2,113	9,370	20,067
2010 Renter Occupied Housing Units	610	2,274	4,089
2010 Vacant Housing Units	208	2,228	4,072
2018 Total Housing Units	2,949	14,057	28,769
2018 Owner Occupied Housing Units	1,967	9,031	19,517
2018 Renter Occupied Housing Units	709	2,631	4,815
2018 Vacant Housing Units	273	2,395	4,437
2023 Total Housing Units	2,979	14,213	29,155
2023 Owner Occupied Housing Units	1,963	9,058	19,600
2023 Renter Occupied Housing Units	685	2,575	4,735
2023 Vacant Housing Units	331	2,579	4,820

Currently, 67.8% of the 28,769 housing units in the area are owner occupied; 16.7%, renter occupied; and 15.4% are vacant. Currently, in the U.S., 56.0% of the housing units in the area are owner occupied; 32.8% are renter occupied; and 11.2% are vacant. In 2010, there were 28,228 housing units in the area - 71.1% owner occupied, 14.5% renter occupied, and 14.4% vacant. The annual rate of change in housing units since 2010 is 0.85%. Median home value in the area is $387,963, compared to a median home value of $218,492 for the U.S. In five years, median value is projected to change by 2.83% annually to $446,013.

Data Note: Income is expressed in current dollars
Source: U.S. Census Bureau, Census 2010 Summary File 1. Esri forecasts for 2018 and 2023. Esri converted Census 2000 data into 2010 geography.

August 30, 2018

Retail MarketPlace Profile

115 High St, Clinton, Connecticut, 06413
Drive Time: 5 minute radius

Prepared by Esri
Latitude: 41.28714
Longitude: -72.52818

Summary Demographics	
2018 Population	6,619
2018 Households	2,676
2018 Median Disposable Income	$53,362
2018 Per Capita Income	$37,969

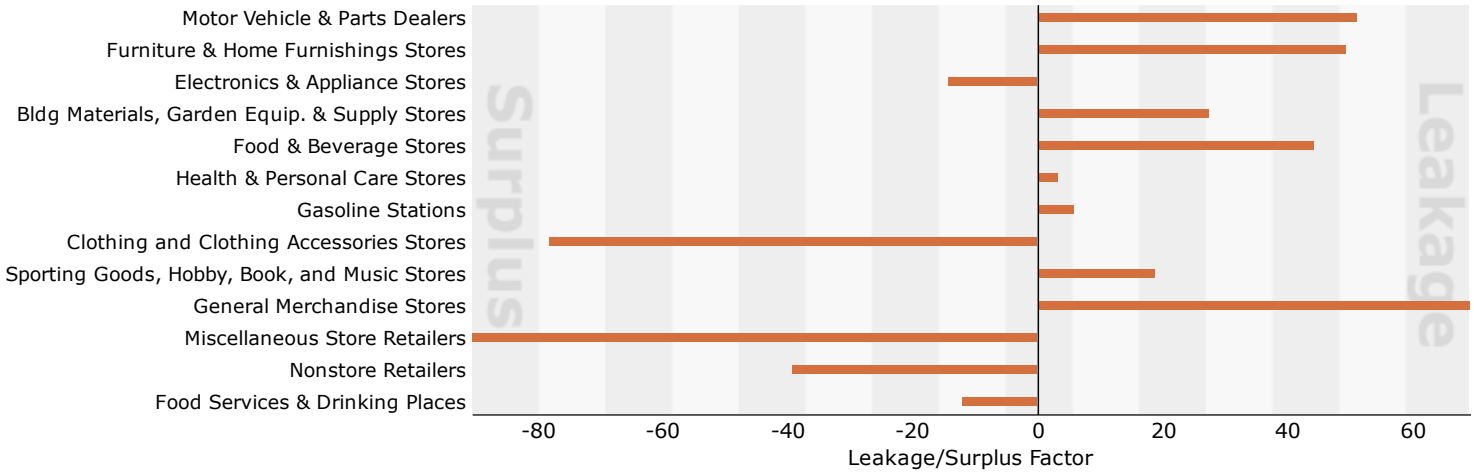
2017 Industry Summary	NAICS	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap	Leakage/Surplus Factor	Number of Businesses
Total Retail Trade and Food & Drink	44-45,722	$108,907,014	$196,163,494	-$87,256,480	-28.6	129
Total Retail Trade	44-45	$98,603,296	$183,050,081	-$84,446,785	-30.0	106
Total Food & Drink	722	$10,303,718	$13,113,413	-$2,809,695	-12.0	23

2017 Industry Group	NAICS	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap	Leakage/Surplus Factor	Number of Businesses
Motor Vehicle & Parts Dealers	441	$20,448,260	$6,581,752	$13,866,508	51.3	6
Automobile Dealers	4411	$16,764,696	$385,168	$16,379,528	95.5	1
Other Motor Vehicle Dealers	4412	$2,159,886	$5,521,160	-$3,361,274	-43.8	4
Auto Parts, Accessories & Tire Stores	4413	$1,523,678	$675,425	$848,253	38.6	1
Furniture & Home Furnishings Stores	442	$3,889,360	$1,315,678	$2,573,682	49.4	4
Furniture Stores	4421	$1,968,686	$997,540	$971,146	32.7	2
Home Furnishings Stores	4422	$1,920,674	$318,138	$1,602,536	71.6	2
Electronics & Appliance Stores	443	$3,664,158	$4,899,758	-$1,235,600	-14.4	5
Bldg Materials, Garden Equip. & Supply Stores	444	$6,533,540	$3,717,590	$2,815,950	27.5	5
Bldg Material & Supplies Dealers	4441	$5,830,825	$3,509,815	$2,321,010	24.8	4
Lawn & Garden Equip & Supply Stores	4442	$702,715	$207,775	$494,940	54.4	1
Food & Beverage Stores	445	$18,467,024	$7,146,426	$11,320,598	44.2	6
Grocery Stores	4451	$15,798,235	$0	$15,798,235	100.0	0
Specialty Food Stores	4452	$747,567	$831,551	-$83,984	-5.3	3
Beer, Wine & Liquor Stores	4453	$1,921,222	$2,763,412	-$842,190	-18.0	3
Health & Personal Care Stores	446,4461	$6,428,869	$6,035,158	$393,711	3.2	7
Gasoline Stations	447,4471	$8,620,759	$7,649,635	$971,124	6.0	3
Clothing & Clothing Accessories Stores	448	$7,341,737	$60,353,827	-$53,012,090	-78.3	30
Clothing Stores	4481	$5,210,808	$39,362,216	-$34,151,408	-76.6	16
Shoe Stores	4482	$809,065	$16,074,798	-$15,265,733	-90.4	9
Jewelry, Luggage & Leather Goods Stores	4483	$1,321,864	$4,916,814	-$3,594,950	-57.6	4
Sporting Goods, Hobby, Book & Music Stores	451	$3,513,951	$2,402,206	$1,111,745	18.8	3
Sporting Goods/Hobby/Musical Instr Stores	4511	$3,113,036	$2,195,636	$917,400	17.3	3
Book, Periodical & Music Stores	4512	$400,915	$206,570	$194,345	32.0	1
General Merchandise Stores	452	$14,292,000	$2,594,550	$11,697,450	69.3	1
Department Stores Excluding Leased Depts.	4521	$9,599,180	$2,086,674	$7,512,506	64.3	1
Other General Merchandise Stores	4529	$4,692,820	$0	$4,692,820	100.0	0
Miscellaneous Store Retailers	453	$3,797,768	$76,662,990	-$72,865,222	-90.6	35
Florists	4531	$317,699	$0	$317,699	100.0	0
Office Supplies, Stationery & Gift Stores	4532	$1,016,762	$356,104	$660,658	48.1	1
Used Merchandise Stores	4533	$368,778	$489,683	-$120,905	-14.1	4
Other Miscellaneous Store Retailers	4539	$2,094,530	$74,437,937	-$72,343,407	-94.5	30
Nonstore Retailers	454	$1,605,870	$3,690,511	-$2,084,641	-39.4	2
Electronic Shopping & Mail-Order Houses	4541	$1,009,860	$3,019,770	-$2,009,910	-49.9	1
Vending Machine Operators	4542	$52,518	$0	$52,518	100.0	0
Direct Selling Establishments	4543	$543,492	$667,209	-$123,717	-10.2	1
Food Services & Drinking Places	722	$10,303,718	$13,113,413	-$2,809,695	-12.0	23
Special Food Services	7223	$292,998	$97,535	$195,463	50.1	1
Drinking Places - Alcoholic Beverages	7224	$161,784	$0	$161,784	100.0	0
Restaurants/Other Eating Places	7225	$9,848,937	$13,000,656	-$3,151,719	-13.8	22

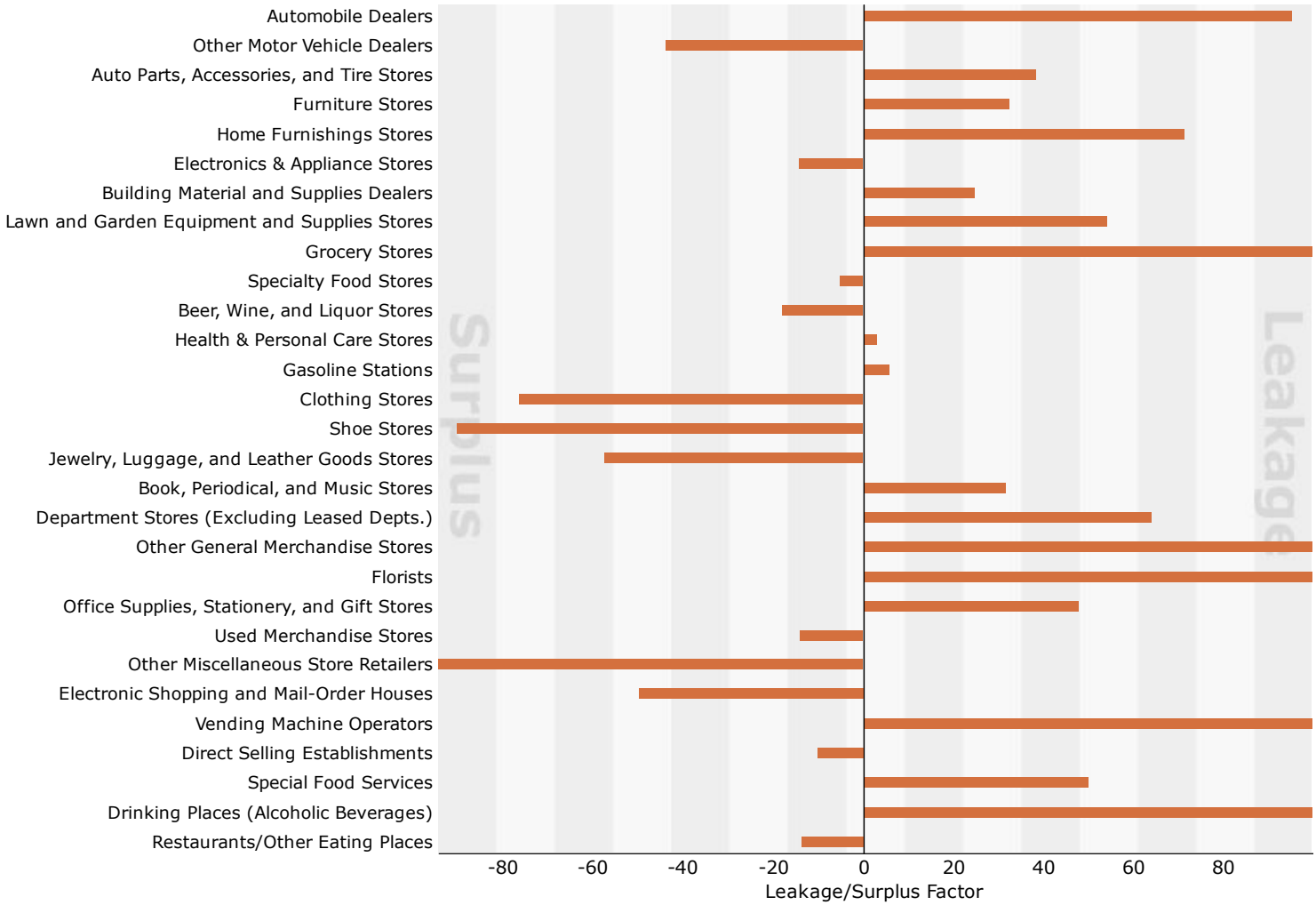
Data Note: Supply (retail sales) estimates sales to consumers by establishments. Sales to businesses are excluded. Demand (retail potential) estimates the expected amount spent by consumers at retail establishments. Supply and demand estimates are in current dollars. The Leakage/Surplus Factor presents a snapshot of retail opportunity. This is a measure of the relationship between supply and demand that ranges from +100 (total leakage) to -100 (total surplus). A positive value represents 'leakage' of retail opportunity outside the trade area. A negative value represents a surplus of retail sales, a market where customers are drawn in from outside the trade area. The Retail Gap represents the difference between Retail Potential and Retail Sales. Esri uses the North American Industry Classification System (NAICS) to classify businesses by their primary type of economic activity. Retail establishments are classified into 27 industry groups in the Retail Trade sector, as well as four industry groups within the Food Services & Drinking Establishments subsector. For more information on the Retail MarketPlace data, please click the link below to view the Methodology Statement.
http://www.esri.com/library/whitepapers/pdfs/esri-data-retail-marketplace.pdf

August 30, 2018

2017 Leakage/Surplus Factor by Industry Subsector



2017 Leakage/Surplus Factor by Industry Group



August 30, 2018

Retail MarketPlace Profile

115 High St, Clinton, Connecticut, 06413
Drive Time: 10 minute radius

Prepared by Esri
Latitude: 41.28714
Longitude: -72.52818

Summary Demographics	
2018 Population	28,627
2018 Households	11,662
2018 Median Disposable Income	$63,278
2018 Per Capita Income	$47,283

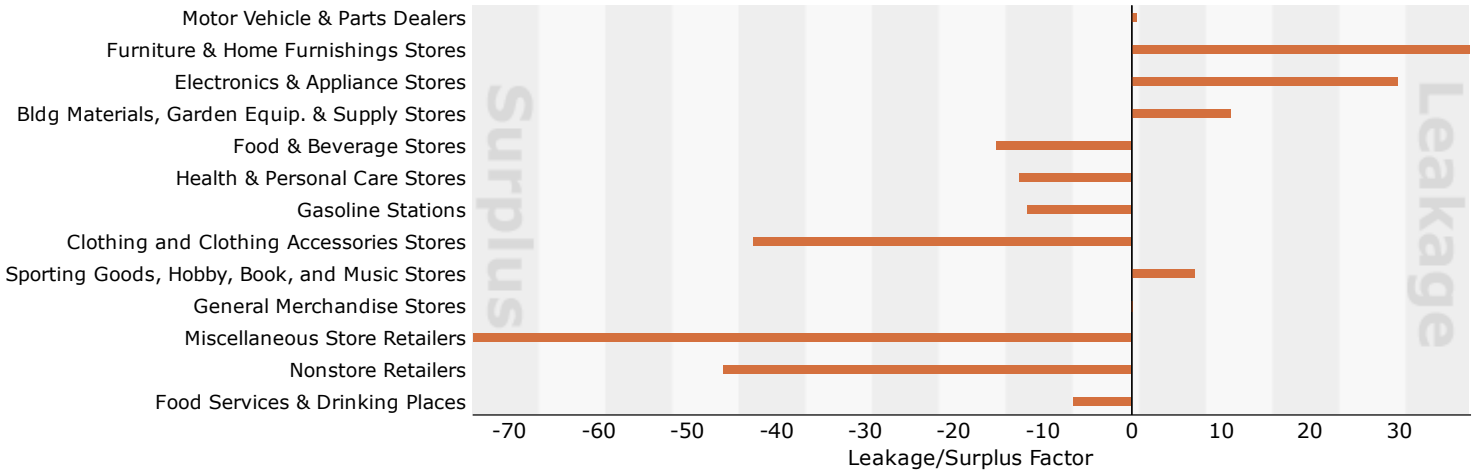
2017 Industry Summary	NAICS	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap	Leakage/Surplus Factor	Number of Businesses
Total Retail Trade and Food & Drink	44-45,722	$604,312,533	$836,704,114	-$232,391,581	-16.1	508
Total Retail Trade	44-45	$546,884,595	$770,999,565	-$224,114,970	-17.0	395
Total Food & Drink	722	$57,427,938	$65,704,549	-$8,276,611	-6.7	114

2017 Industry Group	NAICS	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap	Leakage/Surplus Factor	Number of Businesses
Motor Vehicle & Parts Dealers	441	$113,887,961	$112,224,941	$1,663,020	0.7	40
Automobile Dealers	4411	$93,335,828	$67,584,446	$25,751,382	16.0	10
Other Motor Vehicle Dealers	4412	$12,137,721	$39,623,899	-$27,486,178	-53.1	21
Auto Parts, Accessories & Tire Stores	4413	$8,414,412	$5,016,597	$3,397,815	25.3	8
Furniture & Home Furnishings Stores	442	$21,963,669	$9,835,502	$12,128,167	38.1	16
Furniture Stores	4421	$11,043,051	$5,330,827	$5,712,224	34.9	6
Home Furnishings Stores	4422	$10,920,618	$4,504,675	$6,415,943	41.6	10
Electronics & Appliance Stores	443	$20,444,591	$11,020,051	$9,424,540	30.0	11
Bldg Materials, Garden Equip. & Supply Stores	444	$37,279,781	$29,787,805	$7,491,976	11.2	31
Bldg Material & Supplies Dealers	4441	$33,268,575	$23,925,672	$9,342,903	16.3	23
Lawn & Garden Equip & Supply Stores	4442	$4,011,206	$5,862,132	-$1,850,926	-18.7	8
Food & Beverage Stores	445	$101,297,484	$137,976,816	-$36,679,332	-15.3	34
Grocery Stores	4451	$86,496,040	$119,228,064	-$32,732,024	-15.9	10
Specialty Food Stores	4452	$4,082,405	$3,899,026	$183,379	2.3	9
Beer, Wine & Liquor Stores	4453	$10,719,040	$14,849,726	-$4,130,686	-16.2	15
Health & Personal Care Stores	446,4461	$35,807,348	$46,203,230	-$10,395,882	-12.7	30
Gasoline Stations	447,4471	$46,989,975	$59,696,068	-$12,706,093	-11.9	16
Clothing & Clothing Accessories Stores	448	$40,764,195	$101,393,312	-$60,629,117	-42.6	80
Clothing Stores	4481	$28,858,499	$65,737,954	-$36,879,455	-39.0	46
Shoe Stores	4482	$4,485,849	$26,609,622	-$22,123,773	-71.1	20
Jewelry, Luggage & Leather Goods Stores	4483	$7,419,847	$9,045,735	-$1,625,888	-9.9	14
Sporting Goods, Hobby, Book & Music Stores	451	$19,527,590	$16,946,783	$2,580,807	7.1	22
Sporting Goods/Hobby/Musical Instr Stores	4511	$17,324,799	$13,342,656	$3,982,143	13.0	18
Book, Periodical & Music Stores	4512	$2,202,791	$3,604,127	-$1,401,336	-24.1	4
General Merchandise Stores	452	$78,991,767	$78,905,726	$86,041	0.1	11
Department Stores Excluding Leased Depts.	4521	$53,194,908	$66,184,719	-$12,989,811	-10.9	3
Other General Merchandise Stores	4529	$25,796,859	$12,721,007	$13,075,852	33.9	8
Miscellaneous Store Retailers	453	$21,270,292	$143,588,650	-$122,318,358	-74.2	98
Florists	4531	$1,839,032	$12,856,563	-$11,017,531	-75.0	5
Office Supplies, Stationery & Gift Stores	4532	$5,705,941	$3,778,897	$1,927,044	20.3	7
Used Merchandise Stores	4533	$2,055,545	$5,840,383	-$3,784,838	-47.9	18
Other Miscellaneous Store Retailers	4539	$11,669,775	$121,112,807	-$109,443,032	-82.4	67
Nonstore Retailers	454	$8,659,941	$23,420,681	-$14,760,740	-46.0	8
Electronic Shopping & Mail-Order Houses	4541	$5,596,887	$16,273,673	-$10,676,786	-48.8	4
Vending Machine Operators	4542	$289,558	$134,486	$155,072	36.6	1
Direct Selling Establishments	4543	$2,773,496	$7,012,521	-$4,239,025	-43.3	2
Food Services & Drinking Places	722	$57,427,938	$65,704,549	-$8,276,611	-6.7	114
Special Food Services	7223	$1,621,203	$1,699,462	-$78,259	-2.4	6
Drinking Places - Alcoholic Beverages	7224	$896,368	$1,199,256	-$302,888	-14.5	4
Restaurants/Other Eating Places	7225	$54,910,367	$62,805,831	-$7,895,464	-6.7	103

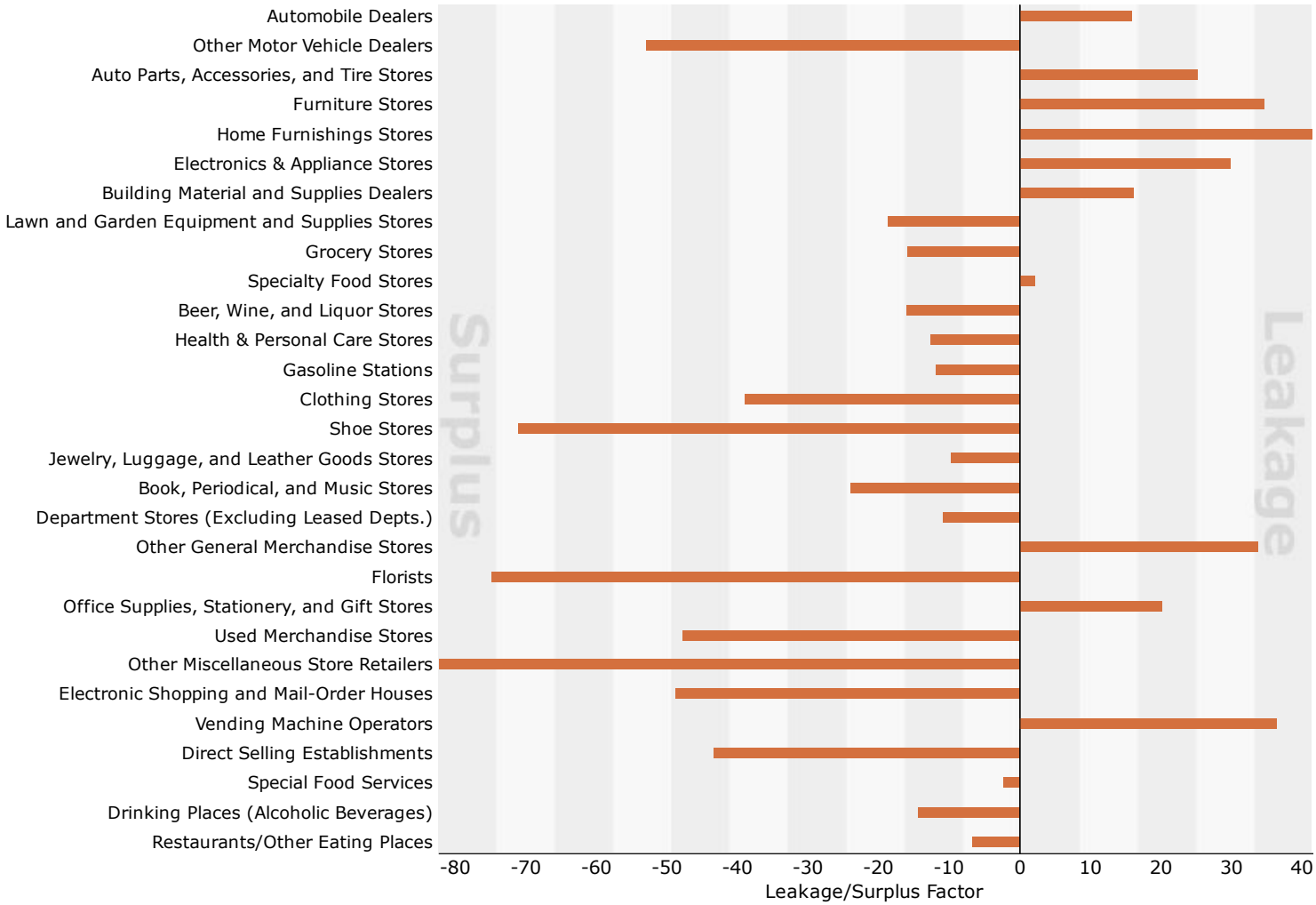
Data Note: Supply (retail sales) estimates sales to consumers by establishments. Sales to businesses are excluded. Demand (retail potential) estimates the expected amount spent by consumers at retail establishments. Supply and demand estimates are in current dollars. The Leakage/Surplus Factor presents a snapshot of retail opportunity. This is a measure of the relationship between supply and demand that ranges from +100 (total leakage) to -100 (total surplus). A positive value represents 'leakage' of retail opportunity outside the trade area. A negative value represents a surplus of retail sales, a market where customers are drawn in from outside the trade area. The Retail Gap represents the difference between Retail Potential and Retail Sales. Esri uses the North American Industry Classification System (NAICS) to classify businesses by their primary type of economic activity. Retail establishments are classified into 27 industry groups in the Retail Trade sector, as well as four industry groups within the Food Services & Drinking Establishments subsector. For more information on the Retail MarketPlace data, please click the link below to view the Methodology Statement.
http://www.esri.com/library/whitepapers/pdfs/esri-data-retail-marketplace.pdf

August 30, 2018

2017 Leakage/Surplus Factor by Industry Subsector



2017 Leakage/Surplus Factor by Industry Group



Retail MarketPlace Profile

115 High St, Clinton, Connecticut, 06413
Drive Time: 15 minute radius

Prepared by Esri
Latitude: 41.28714
Longitude: -72.52818

Summary Demographics	
2018 Population	60,835
2018 Households	24,332
2018 Median Disposable Income	$68,201
2018 Per Capita Income	$50,293

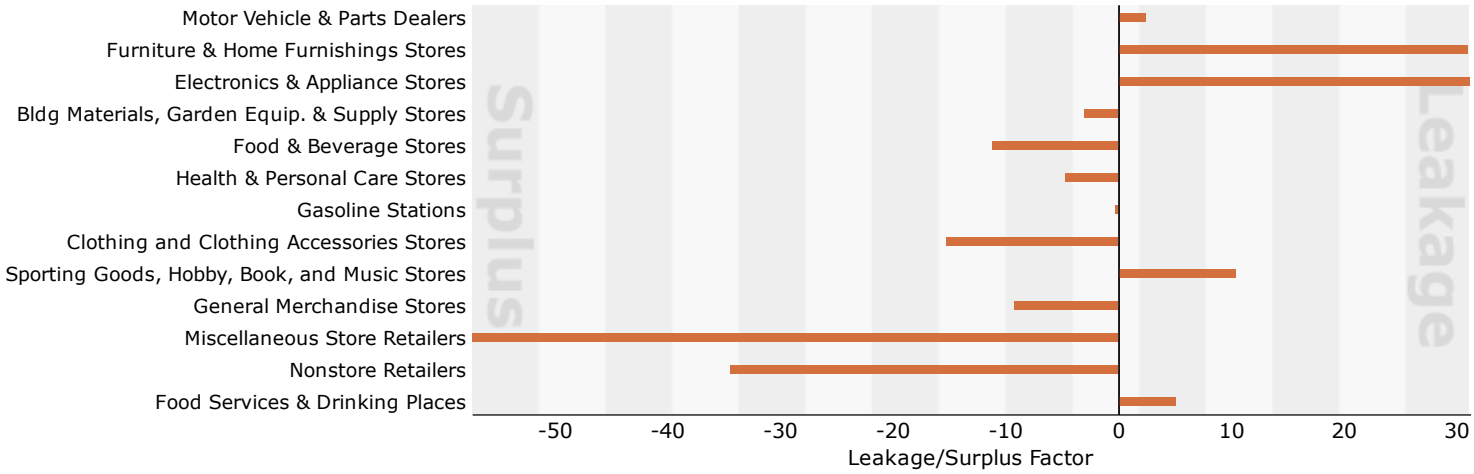
2017 Industry Summary	NAICS	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap	Leakage/Surplus Factor	Number of Businesses
Total Retail Trade and Food & Drink	44-45,722	$1,341,698,125	$1,551,590,389	-$209,892,264	-7.3	934
Total Retail Trade	44-45	$1,212,876,765	$1,435,351,676	-$222,474,911	-8.4	720
Total Food & Drink	722	$128,821,360	$116,238,713	$12,582,647	5.1	213

2017 Industry Group	NAICS	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap	Leakage/Surplus Factor	Number of Businesses
Motor Vehicle & Parts Dealers	441	$251,233,620	$239,005,560	$12,228,060	2.5	70
Automobile Dealers	4411	$205,887,202	$165,700,047	$40,187,155	10.8	23
Other Motor Vehicle Dealers	4412	$26,696,502	$63,985,190	-$37,288,688	-41.1	33
Auto Parts, Accessories & Tire Stores	4413	$18,649,916	$9,320,323	$9,329,593	33.4	15
Furniture & Home Furnishings Stores	442	$49,277,511	$25,962,433	$23,315,078	31.0	36
Furniture Stores	4421	$24,812,134	$11,299,524	$13,512,610	37.4	13
Home Furnishings Stores	4422	$24,465,377	$14,662,908	$9,802,469	25.1	23
Electronics & Appliance Stores	443	$45,646,769	$23,928,510	$21,718,259	31.2	23
Bldg Materials, Garden Equip. & Supply Stores	444	$82,753,517	$88,104,164	-$5,350,647	-3.1	55
Bldg Material & Supplies Dealers	4441	$73,918,446	$66,775,007	$7,143,439	5.1	40
Lawn & Garden Equip & Supply Stores	4442	$8,835,071	$21,329,157	-$12,494,086	-41.4	15
Food & Beverage Stores	445	$224,431,659	$281,712,789	-$57,281,130	-11.3	78
Grocery Stores	4451	$191,332,637	$240,944,691	-$49,612,054	-11.5	26
Specialty Food Stores	4452	$9,034,594	$10,543,301	-$1,508,707	-7.7	23
Beer, Wine & Liquor Stores	4453	$24,064,428	$30,224,797	-$6,160,369	-11.3	29
Health & Personal Care Stores	446,4461	$79,097,943	$87,032,815	-$7,934,872	-4.8	57
Gasoline Stations	447,4471	$103,218,916	$104,099,588	-$880,672	-0.4	28
Clothing & Clothing Accessories Stores	448	$91,666,725	$125,086,878	-$33,420,153	-15.4	121
Clothing Stores	4481	$64,799,339	$79,466,188	-$14,666,849	-10.2	71
Shoe Stores	4482	$10,086,460	$30,493,007	-$20,406,547	-50.3	23
Jewelry, Luggage & Leather Goods Stores	4483	$16,780,926	$15,127,683	$1,653,243	5.2	27
Sporting Goods, Hobby, Book & Music Stores	451	$43,722,978	$35,465,722	$8,257,256	10.4	46
Sporting Goods/Hobby/Musical Instr Stores	4511	$38,789,245	$29,345,566	$9,443,679	13.9	40
Book, Periodical & Music Stores	4512	$4,933,733	$6,120,155	-$1,186,422	-10.7	5
General Merchandise Stores	452	$175,759,239	$212,235,913	-$36,476,674	-9.4	21
Department Stores Excluding Leased Depts.	4521	$118,656,147	$190,269,344	-$71,613,197	-23.2	7
Other General Merchandise Stores	4529	$57,103,092	$21,966,570	$35,136,522	44.4	14
Miscellaneous Store Retailers	453	$47,025,168	$173,507,706	-$126,482,538	-57.4	171
Florists	4531	$4,165,868	$15,798,604	-$11,632,736	-58.3	13
Office Supplies, Stationery & Gift Stores	4532	$12,758,412	$13,958,595	-$1,200,183	-4.5	25
Used Merchandise Stores	4533	$4,596,170	$9,286,271	-$4,690,101	-33.8	38
Other Miscellaneous Store Retailers	4539	$25,504,717	$134,464,236	-$108,959,519	-68.1	94
Nonstore Retailers	454	$19,042,719	$39,209,597	-$20,166,878	-34.6	14
Electronic Shopping & Mail-Order Houses	4541	$12,449,281	$21,172,414	-$8,723,133	-25.9	8
Vending Machine Operators	4542	$644,712	$188,356	$456,356	54.8	2
Direct Selling Establishments	4543	$5,948,726	$17,848,827	-$11,900,101	-50.0	4
Food Services & Drinking Places	722	$128,821,360	$116,238,713	$12,582,647	5.1	213
Special Food Services	7223	$3,635,593	$2,860,358	$775,235	11.9	10
Drinking Places - Alcoholic Beverages	7224	$2,015,083	$1,585,651	$429,432	11.9	6
Restaurants/Other Eating Places	7225	$123,170,685	$111,792,704	$11,377,981	4.8	198

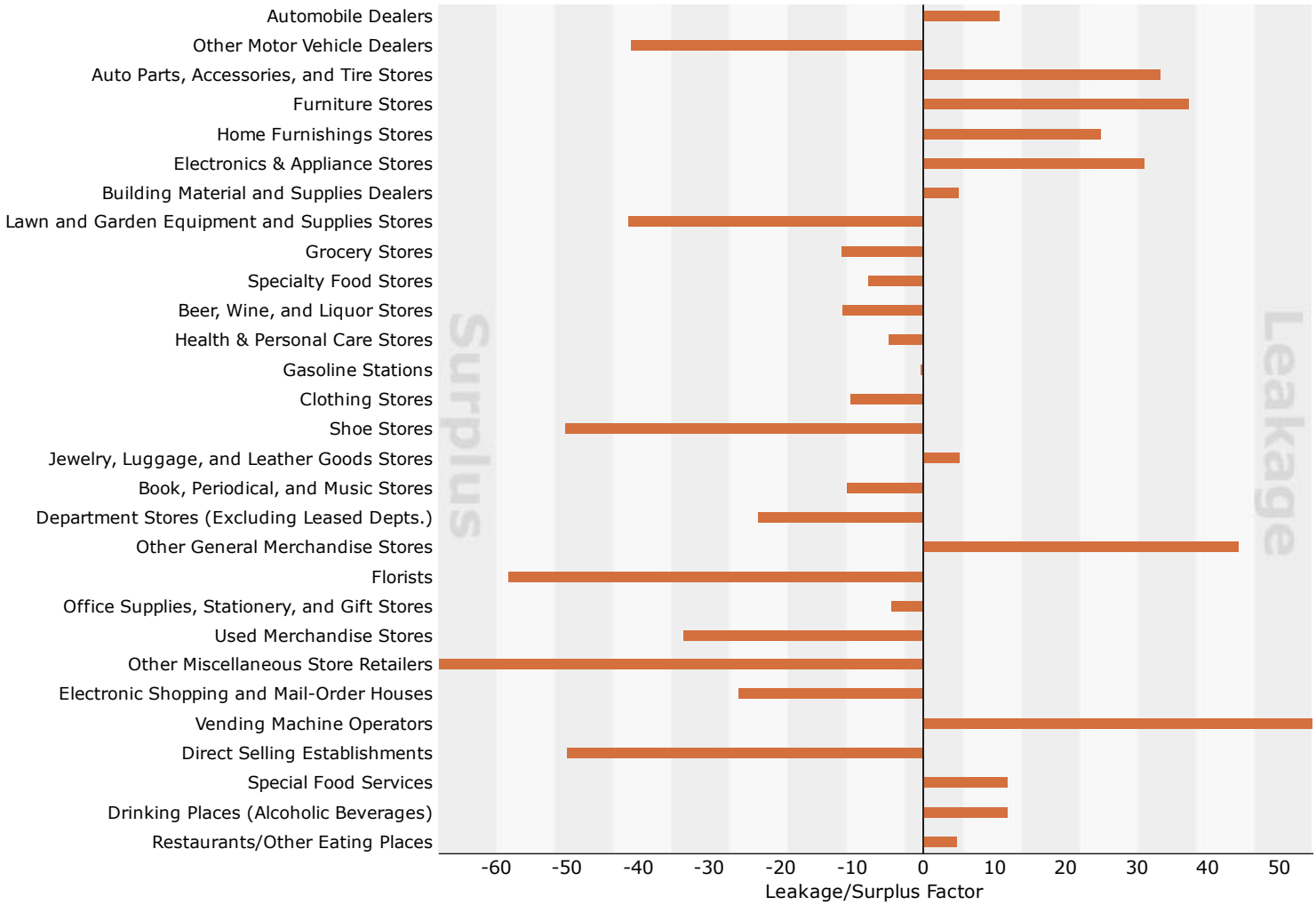
Data Note: Supply (retail sales) estimates sales to consumers by establishments. Sales to businesses are excluded. Demand (retail potential) estimates the expected amount spent by consumers at retail establishments. Supply and demand estimates are in current dollars. The Leakage/Surplus Factor presents a snapshot of retail opportunity. This is a measure of the relationship between supply and demand that ranges from +100 (total leakage) to -100 (total surplus). A positive value represents 'leakage' of retail opportunity outside the trade area. A negative value represents a surplus of retail sales, a market where customers are drawn in from outside the trade area. The Retail Gap represents the difference between Retail Potential and Retail Sales. Esri uses the North American Industry Classification System (NAICS) to classify businesses by their primary type of economic activity. Retail establishments are classified into 27 industry groups in the Retail Trade sector, as well as four industry groups within the Food Services & Drinking Establishments subsector. For more information on the Retail MarketPlace data, please click the link below to view the Methodology Statement.
http://www.esri.com/library/whitepapers/pdfs/esri-data-retail-marketplace.pdf

August 30, 2018

2017 Leakage/Surplus Factor by Industry Subsector



2017 Leakage/Surplus Factor by Industry Group



Tapestry Segmentation Area Profile

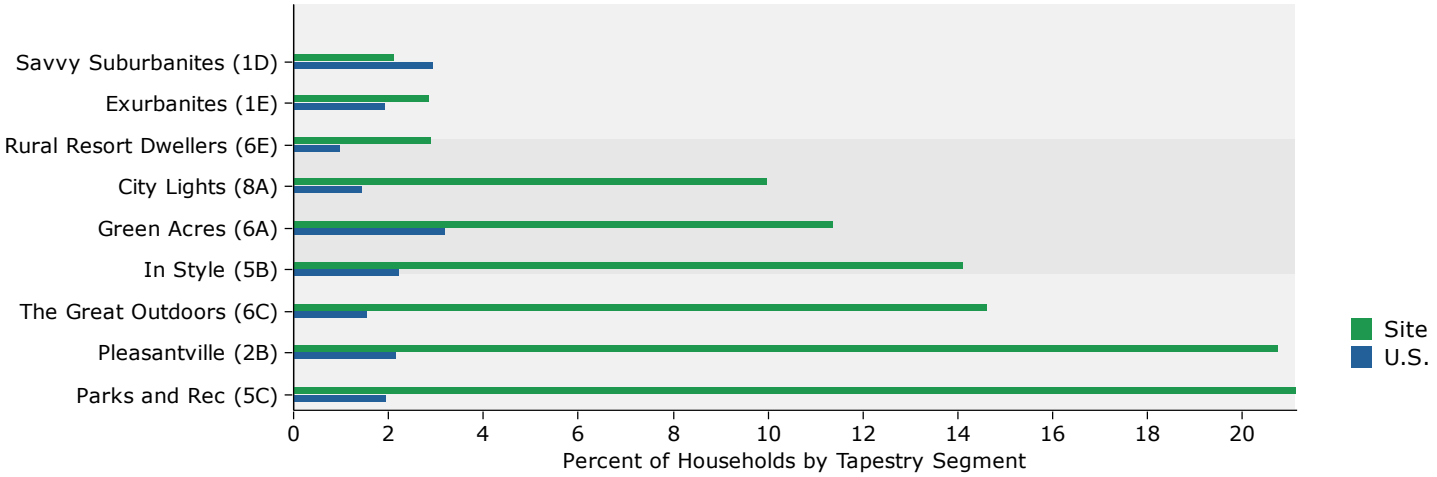
115 High St, Clinton, Connecticut, 06413
Drive Time: 5 minute radius

Prepared by Esri
Latitude: 41.28714
Longitude: -72.52818

Top Twenty Tapestry Segments

		2018 Households		2018 U.S. Households		
			Cumulative		Cumulative	
Rank	Tapestry Segment	Percent	Percent	Percent	Percent	Index
1	Parks and Rec (5C)	21.2%	21.2%	2.0%	2.0%	1069
2	Pleasantville (2B)	20.8%	42.0%	2.2%	4.2%	950
3	The Great Outdoors (6C)	14.6%	56.6%	1.6%	5.8%	943
4	In Style (5B)	14.1%	70.7%	2.2%	8.0%	629
5	Green Acres (6A)	11.4%	82.1%	3.2%	11.2%	356
	Subtotal	**82.1%**		**11.2%**		
6	City Lights (8A)	10.0%	92.1%	1.5%	12.7%	687
7	Rural Resort Dwellers (6E)	2.9%	95.0%	1.0%	13.7%	291
8	Exurbanites (1E)	2.9%	97.9%	1.9%	15.6%	148
9	Savvy Suburbanites (1D)	2.1%	100.0%	3.0%	18.6%	72
	Subtotal	**17.9%**		**7.4%**		
	Total	**100.0%**		**18.5%**		**540**

Top Ten Tapestry Segments Site vs. U.S.



Data Note: This report identifies neighborhood segments in the area, and describes the socioeconomic quality of the immediate neighborhood. The index is a comparison of the percent of households or Total Population 18+ in the area, by Tapestry segment, to the percent of households or Total Population 18+ in the United States, by segment. An index of 100 is the US average.
Source: Esri

August 30, 2018

LifeMode Group: GenXurban

Parks and Rec

5C

Households: 2,449,600

Average Household Size: 2.51

Median Age: 40.9

Median Household Income: $60,000

WHO ARE WE?

These practical suburbanites have achieved the dream of home ownership. They have purchased homes that are within their means. Their homes are older, and town homes and duplexes are not uncommon. Many of these families are two-income married couples approaching retirement age; they are comfortable in their jobs and their homes, budget wisely, but do not plan on retiring anytime soon or moving. Neighborhoods are well established, as are the amenities and programs that supported their now independent children through school and college. The appeal of these kid-friendly neighborhoods is now attracting a new generation of young couples.

OUR NEIGHBORHOOD

- Homes are primarily owner occupied, single-family residences built prior to 1970; town homes and duplexes are scattered through the neighborhoods.
- Both median home value and average rent are close to the national level.
- Households by type mirror the US distribution; married couples, more without children, dominate. Average household size is slightly lower at 2.51, but this market is also a bit older.

SOCIOECONOMIC TRAITS

- More than half of the population is college educated.
- Older residents draw Social Security and retirement income.
- The work force is diverse: professionals in health care, retail trade, and education, or skilled workers in manufacturing and construction.
- This is a financially shrewd market; consumers are careful to research their big-ticket purchases.
- When planning trips, they search for discounted airline fares and hotels and choose to vacation within the US.
- These practical residents tend to use their cell phones for calls and texting only.

TAPESTRY SEGMENTATION
esri.com/tapestry

Note: The Index represents the ratio of the segment rate to the US rate multiplied by 100.
Consumer preferences are estimated from data by GfK MRI.

5C

LifeMode Group: GenXurban

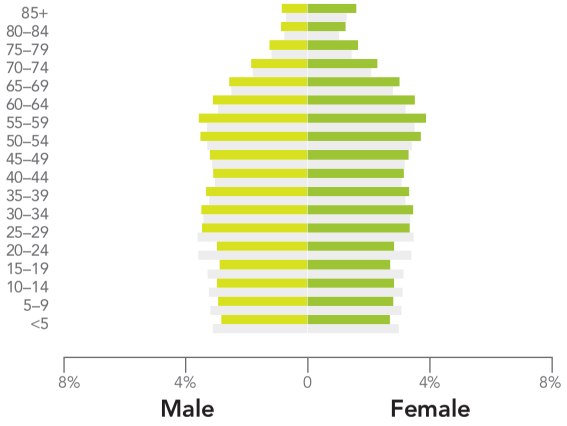
Parks and Rec

TAPESTRY SEGMENTATION
esri.com/tapestry

AGE BY SEX (Esri data)

Median Age: 40.9 US: 38.2

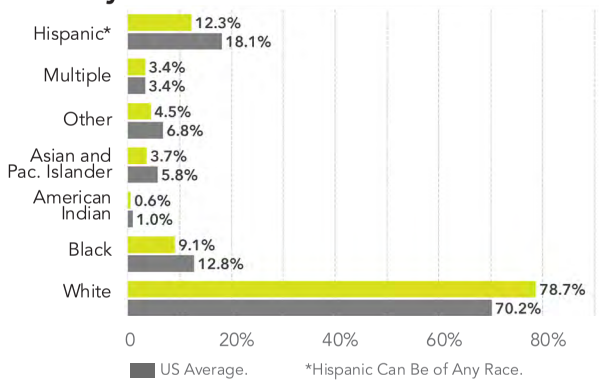
Indicates US



RACE AND ETHNICITY (Esri data)

The Diversity Index summarizes racial and ethnic diversity. The index shows the likelihood that two persons, chosen at random from the same area, belong to different race or ethnic groups. The index ranges from 0 (no diversity) to 100 (complete diversity).

Diversity Index: 50.7 US: 64.0

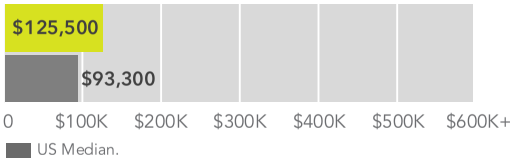


INCOME AND NET WORTH

Net worth measures total household assets (homes, vehicles, investments, etc.) less any debts, secured (e.g., mortgages) or unsecured (credit cards). Household income and net worth are estimated by Esri.

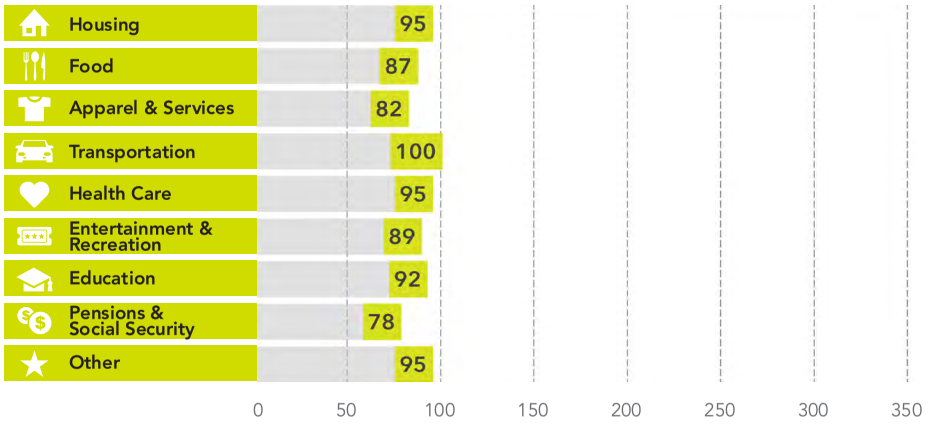
Median Household Income

Median Net Worth



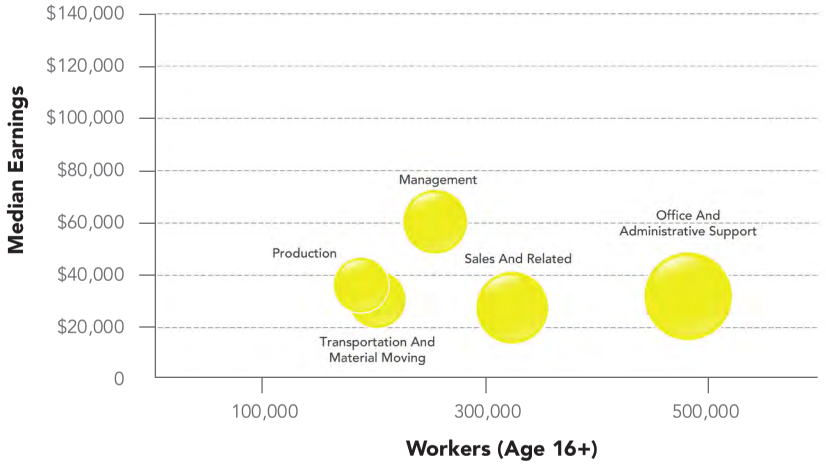
AVERAGE HOUSEHOLD BUDGET INDEX

The index compares the average amount spent in this market's household budgets for housing, food, apparel, etc., to the average amount spent by all US households. An index of 100 is average. An index of 120 shows that average spending by consumers in this market is 20 percent above the national average. Consumer expenditures are estimated by Esri.



OCCUPATION BY EARNINGS

The five occupations with the highest number of workers in the market are displayed by median earnings. Data from the Census Bureau's American Community Survey.



5C

LifeMode Group: GenXurban

Parks and Rec

TAPESTRY SEGMENTATION
esri.com/tapestry

MARKET PROFILE (Consumer preferences are estimated from data by GfK MRI)

- Cost and practicality come first when purchasing a vehicle; *Parks and Rec* residents are more likely to buy SUVs or trucks over compact or subcompact vehicles.
- Budget-conscious consumers stock up on staples at warehouse clubs.
- Pass time at home watching documentaries on Animal Planet, Discovery, or History channels. For an outing, they choose to dine out at family-style restaurants and attend movies. Between trips to the casinos, they gamble on lottery tickets and practice their blackjack and poker skills online.
- Convenience is important in the kitchen; they regularly use frozen or packaged main course meals. Ground coffee is preferred over coffee beans.
- Residents here take advantage of local parks and recreational activities. Their exercise routine is a balance of home-based exercise; a session at their local community gym; or a quick jog, swim, or run.

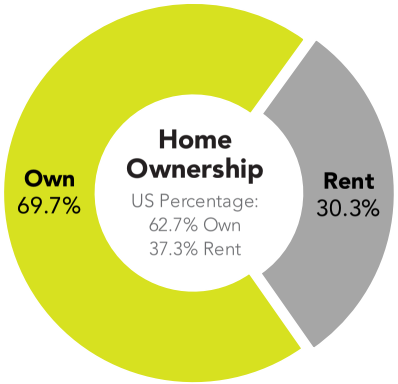
HOUSING

Median home value is displayed for markets that are primarily owner occupied; average rent is shown for renter-occupied markets. Tenure and home value are estimated by Esri. Housing type and average rent are from the Census Bureau's American Community Survey.

Typical Housing:
Single Family

Median Value:
$198,500

US Median: $207,300



POPULATION CHARACTERISTICS

Total population, average annual population change since Census 2010, and average density (population per square mile) are displayed for the market relative to the size and change among all Tapestry markets. Data estimated by Esri.

ESRI INDEXES

Esri developed three indexes to display average household wealth, socioeconomic status, and housing affordability for the market relative to US standards.

LifeMode Group: Upscale Avenues

Pleasantville

2B

Households: 2,718,100

Average Household Size: 2.88

Median Age: 42.6

Median Household Income: $92,900

WHO ARE WE?

Prosperous domesticity best describes the settled denizens of *Pleasantville*. Situated principally in older housing in suburban areas in the Northeast (especially in New York and New Jersey) and secondarily in the West (especially in California), these slightly older couples move less than any other market. Many couples have already transitioned to empty nesters; many are still home to adult children. Families own older, single-family homes and maintain their standard of living with dual incomes. These consumers have higher incomes and home values and much higher net worth (Index 364). Older homes require upkeep; home improvement and remodeling projects are a priority—preferably done by contractors. Residents spend their spare time participating in a variety of sports or watching movies. They shop online and in a variety of stores, from upscale to discount, and use the Internet largely for financial purposes.

TAPESTRY SEGMENTATION
esri.com/tapestry

OUR NEIGHBORHOOD

- Suburban periphery of large metropolitan areas, primarily in Middle Atlantic or Pacific states.
- Most homes owned (and mortgaged) (Index 146).
- Households composed of older married-couple families, more without children under 18, but many with children over 18 years (Index 141).
- Older, single-family homes: two-thirds built before 1970, close to half from 1950 to 1969.
- One of the lowest percentages of vacant housing units at 4.5% (Index 39).
- Suburban households with 3 or more vehicles and a longer travel time to work (Index 132).

SOCIOECONOMIC TRAITS

- Education: 66% college educated, 37% with a bachelor's degree or higher.
- Low unemployment at 4.6%; higher labor force participation rate at 67% (Index 107); higher proportion of HHs with 2 or more workers (Index 118).
- Many professionals in finance, information/technology, education, or management.
- Median household income denotes affluence, with income primarily from salaries, but also from investments (Index 130) or Social Security (Index 106) and retirement income (Index 122).
- Not cost-conscious, these consumers willing to spend more for quality and brands they like.
- Prefer fashion that is classic and timeless as opposed to trendy.
- Use all types of media equally (newspapers, magazines, radio, Internet, TV).

Note: The Index represents the ratio of the segment rate to the US rate multiplied by 100. Consumer preferences are estimated from data by GfK MRI.

2B

LifeMode Group: Upscale Avenues

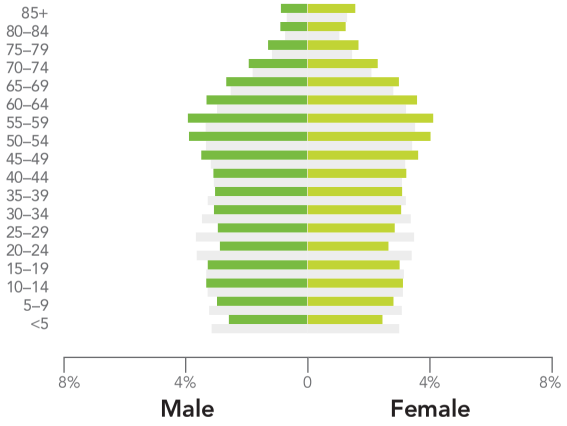
Pleasantville

TAPESTRY SEGMENTATION
esri.com/tapestry

AGE BY SEX (Esri data)

Median Age: 42.6 US: 38.2

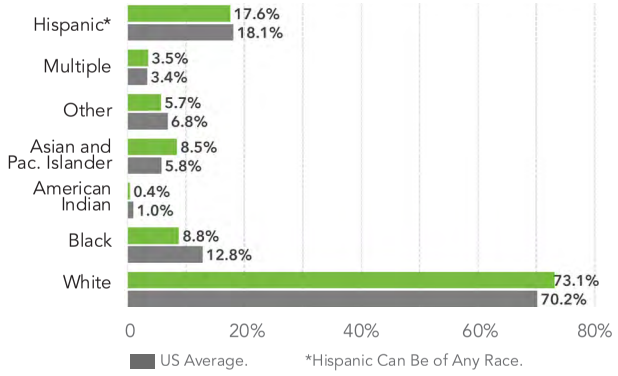
Indicates US



RACE AND ETHNICITY (Esri data)

The Diversity Index summarizes racial and ethnic diversity. The index shows the likelihood that two persons, chosen at random from the same area, belong to different race or ethnic groups. The index ranges from 0 (no diversity) to 100 (complete diversity).

Diversity Index: 61.0 US: 64.0

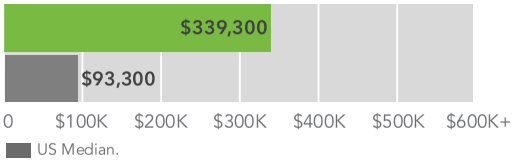


INCOME AND NET WORTH

Net worth measures total household assets (homes, vehicles, investments, etc.) less any debts, secured (e.g., mortgages) or unsecured (credit cards). Household income and net worth are estimated by Esri.

Median Household Income

Median Net Worth



AVERAGE HOUSEHOLD BUDGET INDEX

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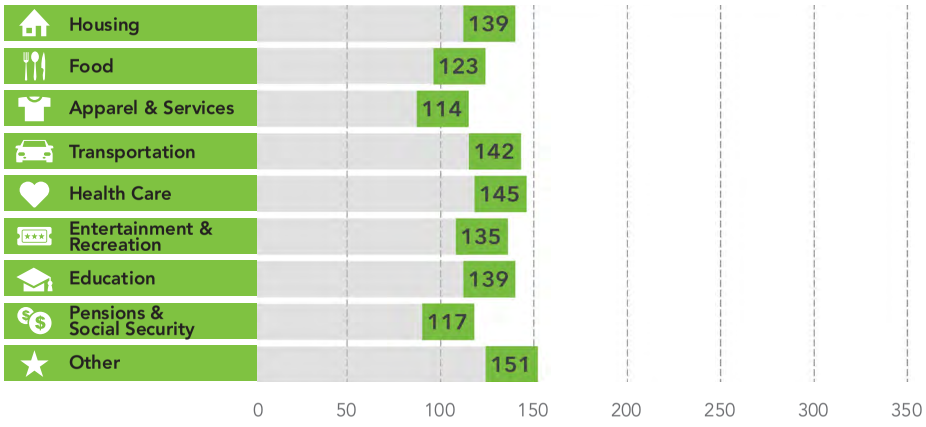

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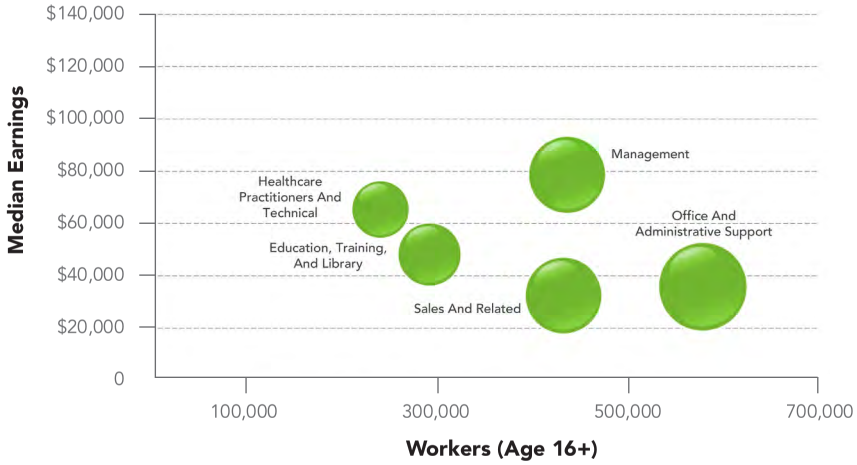


2B

LifeMode Group: Upscale Avenues

Pleasantville

TAPESTRY SEGMENTATION
esri.com/tapestry

MARKET PROFILE (Consumer preferences are estimated from data by GfK MRI)

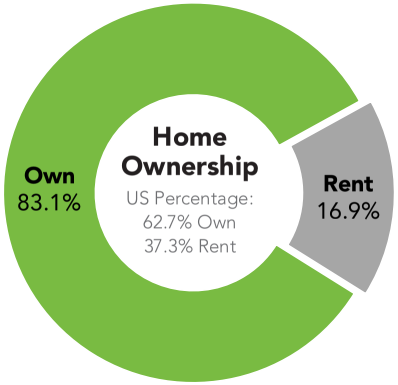
- Prefer imported SUVs, serviced by a gas station or car dealer.
- Invest in conservative securities and contribute to charities.
- Work on home improvement and remodeling projects, but also hire contractors.
- Have bundled services (TV/Internet/phone).
- Access the Internet via fiber optics or cable modem, on a newer computer, to pay bills, make purchases, and track investments.
- Subscribe to premium channels (HBO, Showtime, or Starz) and use video-on-demand to watch TV shows and movies.
- Enjoy outdoor gardening, going to the beach, visiting theme parks, frequenting museums, and attending rock concerts.

HOUSING

Median home value is displayed for markets that are primarily owner occupied; average rent is shown for renter-occupied markets. Tenure and home value are estimated by Esri. Housing type and average rent are from the Census Bureau's American Community Survey.

Typical Housing:
Single Family

Median Value:
$382,000
US Median: $207,300



POPULATION CHARACTERISTICS

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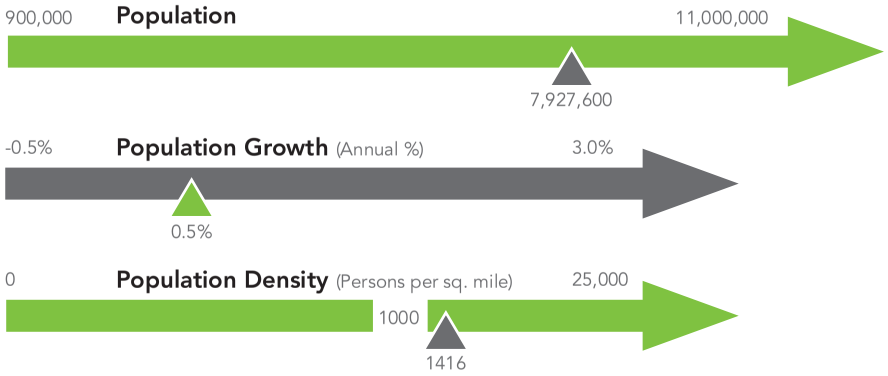


ESRI INDEXES

Esri developed three indexes to display average household wealth, socioeconomic status, and housing affordability for the market relative to US standards.

10.3 Traffic Data

ADT Weekday

During a typical weekday, two pronounced spikes occur during the day, corresponding to the AM and PM peaks, while traffic levels are lower during the midday hours. For the Route 81 corridor, traffic volume increases sharply between 7:00 and 8:00 AM; and traffic remains elevated over the day, with PM peak between 4:00 and 6:00 PM indicating the corridor is used as a commuter route. Figure 1 illustrates the 1.1.1. patterns across five weekdays.

On weekends the pattern is different with the Southbound direction peaking at noon and the Northbound direction peaking at 5:00PM. This reflects a predominantly retail driven behavior typical of weekend traffic in most locations across the United States. Clearly traffic is destined to shopping and town center located south of the continuous counter location; in the evening hours traffic returns using the same route in the evening. (Figure 2)

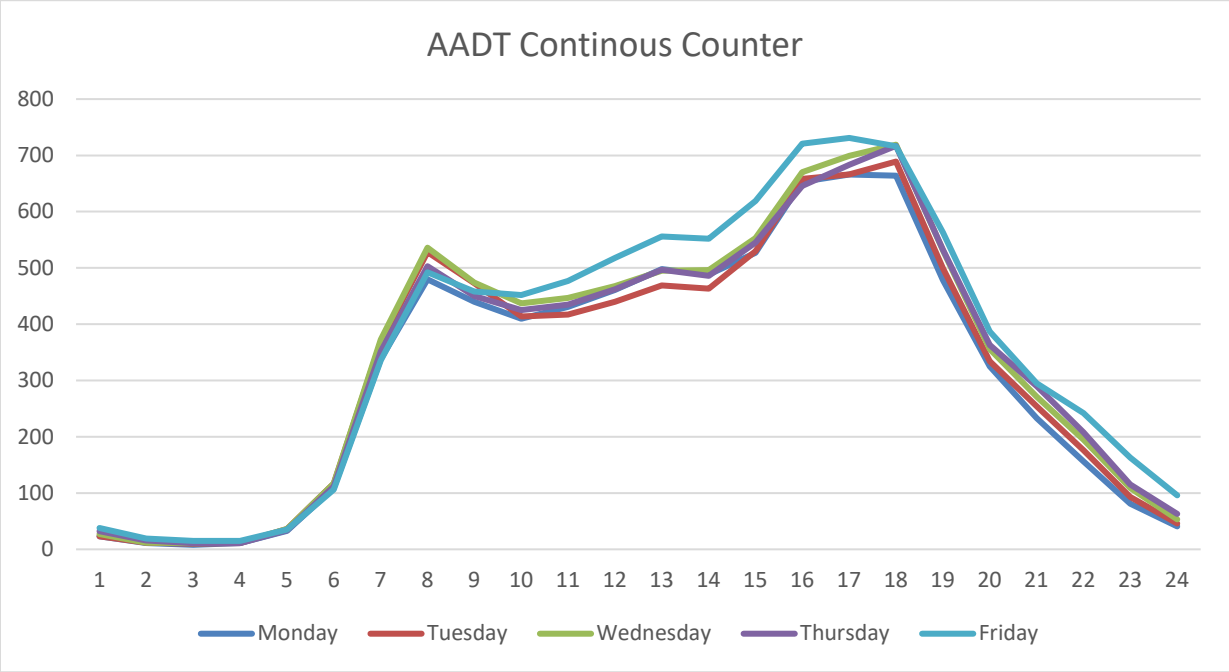


Figure 1: Average Annual Daily Traffic Volume at the Continuous Counter

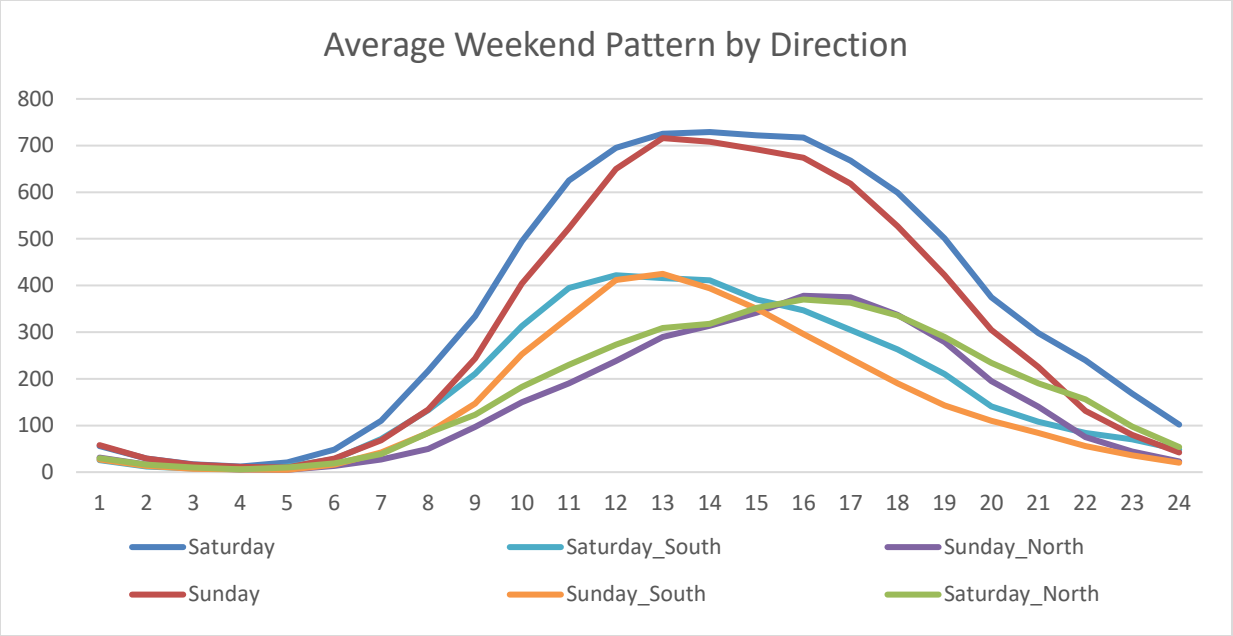


Figure 2: Weekend Traffic Volumes

Since the continuous counter is located approximately 2 miles north from Clinton Crossing Shopping Center, additional 7-day ATRs were collected along Route 81 during summer month of August. The three location were:

- Route 81 between Clinton Crossing Shopping Center Primary Access Driveway and Henry Carter Hull Library Intersection
- Route 81 North of Glenwood Road Intersection
- Route 81 South of I-95 Access/Egress and South of Silverbrook Lane intersection.

The most northern locations continues to illustrate commuter patterns during weekday with distinct AM and PM peaks. Similarly, in the morning the southbound direction is the dominant direction, illustrating vehicles traveling towards I-95 ramps, while northbound highest peak is in the afternoon, illustrating returning commuters. On Sunday, unlike at the continuous counter station, the Sunday traffic is not directional with spate peaking patterns for northbound and southbound. Instead, the traffic steadily builds up and stays high during entire afternoon. Figure 3 illustrates the traffic patterns.

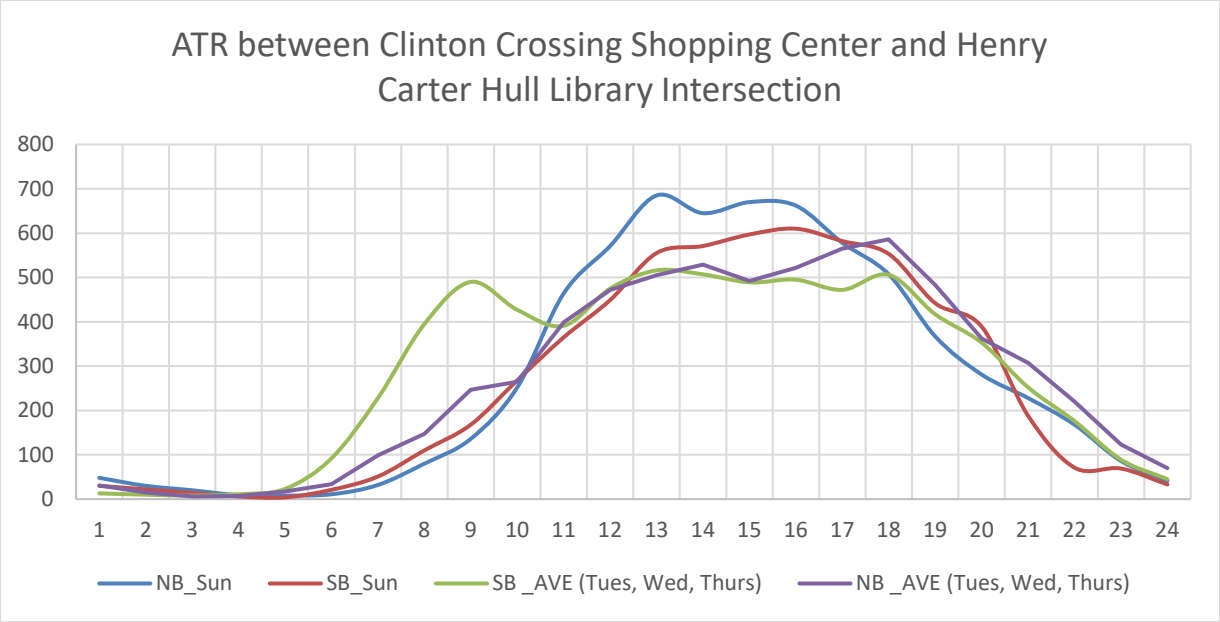


Figure 3: ATR weekday and weekend (Location 1)

At the most southern traffic counter, South of Silverbrook Lane intersection, the traffic volumes are significantly lower than the count North of Henry Carter Hull Library Intersection. The traffic patterns in Northbound direction no longer follow the standard commuter peak pattern and behave like weekend pattern. Only Southbound direction, still has distinct PM peak, however it also has higher than usual Midday peak. (Figure 4)

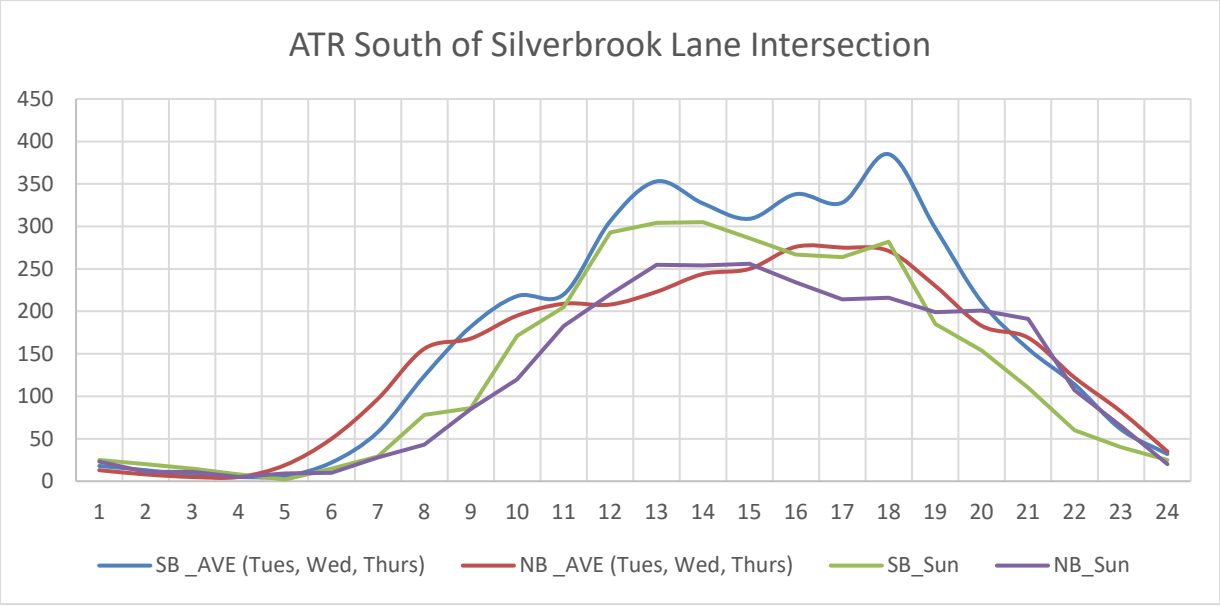


Figure 4: ATR weekday and weekend (Location 3)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	257	0	0	185
Future Volume (vph)	0	0	257	0	0	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected				0.950		
Satd. Flow (prot)	1863	0	0	1770	1611	0
Flt Permitted				0.950		
Satd. Flow (perm)	1863	0	0	1770	1611	0
Link Speed (mph)	30			15	25	
Link Distance (ft)	356			240	468	
Travel Time (s)	8.1			10.9	12.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	279	0	0	201
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	279	201	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.4%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	185	257	6	5	0
Future Volume (vph)	0	185	257	6	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997			
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1857	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1857	0	1770	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1536	1311		823	
Travel Time (s)		26.2	22.3		22.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	201	279	7	5	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	201	286	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.9%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	250	553	0
Future Volume (vph)	0	0	0	250	553	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	0	3539	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	0	3539	1863	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	293			258	422	
Travel Time (s)	6.7			4.4	7.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	272	601	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	272	601	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.4%		ICU Level of Service A	
Analysis Period (min) 15			

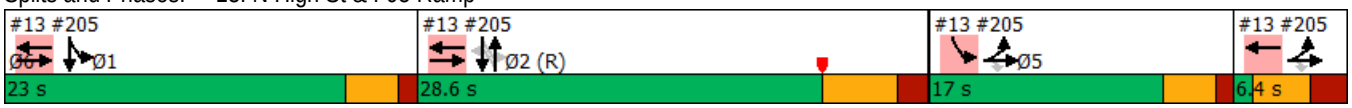
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø1	Ø2	Ø6
Lane Configurations									
Traffic Volume (vph)	0	126	156	0	203	20			
Future Volume (vph)	0	126	156	0	203	20			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Storage Length (ft)	100			0	275	0			
Storage Lanes	1			0	1	0			
Taper Length (ft)	25				25				
Lane Util. Factor	1.00	0.95	1.00	1.00	0.97	0.95			
Frt					0.981				
Flt Protected					0.958				
Satd. Flow (prot)	0	3539	1863	0	3396	0			
Flt Permitted					0.958				
Satd. Flow (perm)	0	3539	1863	0	3396	0			
Right Turn on Red				Yes		Yes			
Satd. Flow (RTOR)					19				
Link Speed (mph)		25	30		30				
Link Distance (ft)		517	211		662				
Travel Time (s)		14.1	4.8		15.0				
Peak Hour Factor	0.25	0.78	0.79	0.79	0.92	0.62			
Adj. Flow (vph)	0	162	197	0	221	32			
Shared Lane Traffic (%)									
Lane Group Flow (vph)	0	162	197	0	253	0			
Enter Blocked Intersection	No	No	No	No	No	No			
Lane Alignment	Left	Left	Left	Right	Left	Right			
Median Width(ft)		0	0		24				
Link Offset(ft)		0	0		0				
Crosswalk Width(ft)		16	16		16				
Two way Left Turn Lane									
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00			
Turning Speed (mph)	15			9	15	9			
Number of Detectors		0	0		1				
Detector Template					Left				
Leading Detector (ft)		0	0		29				
Trailing Detector (ft)		0	0		-5				
Detector 1 Position(ft)		0	0		-5				
Detector 1 Size(ft)		6	6		34				
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex				
Detector 1 Channel									
Detector 1 Extend (s)		0.0	0.0		0.0				
Detector 1 Queue (s)		0.0	0.0		0.0				
Detector 1 Delay (s)		0.0	0.0		0.0				
Turn Type		NA	NA		Prot				
Protected Phases		1 2	1 2 6		5		1	2	6
Permitted Phases									
Detector Phase					5				
Switch Phase									
Minimum Initial (s)					10.0		3.0	15.0	1.0
Minimum Split (s)					14.0		7.0	21.0	6.4
Total Split (s)					17.0		23.0	28.6	6.4

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø1	Ø2	Ø6
Total Split (%)					22.7%		31%	38%	9%
Maximum Green (s)					13.0		19.0	22.6	1.0
Yellow Time (s)					3.0		3.0	4.2	3.3
All-Red Time (s)					1.0		1.0	1.8	2.1
Lost Time Adjust (s)					0.0				
Total Lost Time (s)					4.0				
Lead/Lag					Lead		Lead	Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes	Yes
Vehicle Extension (s)					2.0		1.5	3.0	3.0
Recall Mode					None		None	C-Max	None
Act Effct Green (s)		47.6	56.2		10.8				
Actuated g/C Ratio		0.63	0.75		0.14				
v/c Ratio		0.07	0.14		0.50				
Control Delay		5.4	2.0		30.8				
Queue Delay		0.0	0.5		0.0				
Total Delay		5.4	2.4		30.8				
LOS		A	A		C				
Approach Delay		5.4	2.4		30.8				
Approach LOS		A	A		C				
90th %ile Green (s)					13.0		10.9	30.7	1.0
90th %ile Term Code					Max		Gap	Coord	Max
70th %ile Green (s)					11.0		9.1	32.5	3.0
70th %ile Term Code					Gap		Gap	Coord	Max
50th %ile Green (s)					10.0		8.0	33.6	4.0
50th %ile Term Code					Min		Gap	Coord	Max
30th %ile Green (s)					10.0		6.9	34.7	4.0
30th %ile Term Code					Min		Gap	Coord	Max
10th %ile Green (s)					10.0		5.5	36.1	4.0
10th %ile Term Code					Min		Gap	Coord	Max
Stops (vph)		43	20		184				
Fuel Used(gal)		1	0		4				
CO Emissions (g/hr)		60	30		249				
NOx Emissions (g/hr)		12	6		49				
VOC Emissions (g/hr)		14	7		58				
Dilemma Vehicles (#)		0	0		0				
Queue Length 50th (ft)		13	9		53				
Queue Length 95th (ft)		20	22		84				
Internal Link Dist (ft)		437	131		582				
Turn Bay Length (ft)					275				
Base Capacity (vph)		2246	1395		604				
Starvation Cap Reductn		0	838		0				
Spillback Cap Reductn		0	0		0				
Storage Cap Reductn		0	0		0				
Reduced v/c Ratio		0.07	0.35		0.42				

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow, Master Intersection	

Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 23.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: N High St & I-95 Ramp



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	250	566	0
Future Volume (vph)	0	0	0	250	566	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	520			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	1863	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	1863	0	1863	1863	1863	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	1354			603	1263	
Travel Time (s)	36.9			10.3	21.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	272	615	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	272	615	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.1%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	176	10	0	202	118	4	25	1	184	32	41
Future Volume (vph)	42	176	10	0	202	118	4	25	1	184	32	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	14	12	12	12	12	11	12	12
Storage Length (ft)	100		0	0		0	0		0	100		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.954			0.990			0.919	
Flt Protected	0.950							0.996		0.950		
Satd. Flow (prot)	1770	1959	0	0	1896	0	0	1837	0	1711	1712	0
Flt Permitted	0.368							0.987		0.720		
Satd. Flow (perm)	685	1959	0	0	1896	0	0	1820	0	1296	1712	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			23			3			38	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		934			799			320			468	
Travel Time (s)		25.5			21.8			8.7			12.8	
Peak Hour Factor	0.70	0.88	0.50	0.25	0.78	0.89	0.92	0.52	0.25	0.63	0.66	0.73
Adj. Flow (vph)	60	200	20	0	259	133	4	48	4	292	48	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	220	0	0	392	0	0	56	0	292	104	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	R NA	R NA
Median Width(ft)		12			0			0			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	0.92	1.00	1.00	0.92	1.00	1.00	1.00	1.00	1.04	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2		1	2	
Detector Template	Left	Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	29	100			100		29	100		29	100	
Trailing Detector (ft)	-5	0			0		-5	0		-5	0	
Detector 1 Position(ft)	-5	0			0		-5	0		-5	0	
Detector 1 Size(ft)	34	6			6		34	6		34	6	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	custom	NA			NA		Perm	NA		Perm	NA	
Protected Phases	1	1 2			2 4			5			5	

Lane Group	Ø2	Ø3	Ø4
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	2	3	4

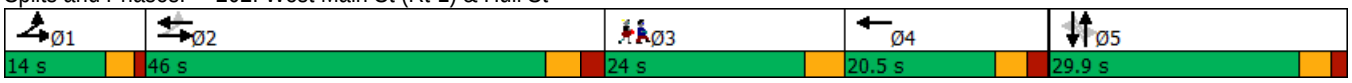
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2						5			5		
Detector Phase	1	2			2		5	5		5	5	
Switch Phase												
Minimum Initial (s)	5.0						7.0	7.0		7.0	7.0	
Minimum Split (s)	9.0						11.9	11.9		11.9	11.9	
Total Split (s)	14.0						29.9	29.9		29.9	29.9	
Total Split (%)	10.4%						22.2%	22.2%		22.2%	22.2%	
Maximum Green (s)	10.0						25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0						3.2	3.2		3.2	3.2	
All-Red Time (s)	1.0						1.7	1.7		1.7	1.7	
Lost Time Adjust (s)	0.0							0.0		0.0	0.0	
Total Lost Time (s)	4.0							4.9		4.9	4.9	
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	1.5						2.0	2.0		2.0	2.0	
Recall Mode	None						None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	25.1	27.3			20.0			25.6		25.6	25.6	
Actuated g/C Ratio	0.40	0.44			0.32			0.41		0.41	0.41	
v/c Ratio	0.16	0.25			0.63			0.07		0.55	0.14	
Control Delay	10.0	10.6			22.1			14.4		21.7	11.1	
Queue Delay	0.0	0.0			0.0			0.0		0.0	0.0	
Total Delay	10.0	10.6			22.1			14.4		21.7	11.1	
LOS	A	B			C			B		C	B	
Approach Delay		10.4			22.1			14.4			18.9	
Approach LOS		B			C			B			B	
90th %ile Green (s)	6.3						25.0	25.0		25.0	25.0	
90th %ile Term Code	Gap						Max	Max		Max	Max	
70th %ile Green (s)	5.7						25.0	25.0		25.0	25.0	
70th %ile Term Code	Gap						Max	Max		Max	Max	
50th %ile Green (s)	5.2						25.0	25.0		25.0	25.0	
50th %ile Term Code	Gap						Max	Max		Max	Max	
30th %ile Green (s)	0.0						25.0	25.0		25.0	25.0	
30th %ile Term Code	Skip						Max	Max		Max	Max	
10th %ile Green (s)	0.0						25.0	25.0		25.0	25.0	
10th %ile Term Code	Skip						Max	Max		Max	Max	
Stops (vph)	21	96			236			18		138	32	
Fuel Used(gal)	0	2			5			0		2	1	
CO Emissions (g/hr)	35	157			316			17		145	40	
NOx Emissions (g/hr)	7	31			62			3		28	8	
VOC Emissions (g/hr)	8	36			73			4		34	9	
Dilemma Vehicles (#)	0	0			0			0		0	0	
Queue Length 50th (ft)	12	47			125			13		88	16	
Queue Length 95th (ft)	21	79			171			22		122	35	
Internal Link Dist (ft)		854			719			240			388	
Turn Bay Length (ft)	100									100		
Base Capacity (vph)	480	1525			1259			752		534	728	

Lane Group	Ø2	Ø3	Ø4
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	7.0	7.0
Minimum Split (s)	21.0	24.0	12.5
Total Split (s)	46.0	24.0	20.5
Total Split (%)	34%	18%	15%
Maximum Green (s)	40.0	20.0	15.0
Yellow Time (s)	3.6	4.0	3.2
All-Red Time (s)	2.4	0.0	2.3
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	2.0
Recall Mode	Min	None	None
Walk Time (s)		7.0	
Flash Dont Walk (s)		13.0	
Pedestrian Calls (#/hr)		0	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
90th %ile Green (s)	28.3	0.0	0.0
90th %ile Term Code	Gap	Skip	Skip
70th %ile Green (s)	22.1	0.0	0.0
70th %ile Term Code	Gap	Skip	Skip
50th %ile Green (s)	19.5	0.0	0.0
50th %ile Term Code	Gap	Skip	Skip
30th %ile Green (s)	16.2	0.0	0.0
30th %ile Term Code	Gap	Skip	Skip
10th %ile Green (s)	15.0	0.0	0.0
10th %ile Term Code	Min	Skip	Skip
Stops (vph)			
Fuel Used(gal)			
CO Emissions (g/hr)			
NOx Emissions (g/hr)			
VOC Emissions (g/hr)			
Dilemma Vehicles (#)			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0			0			0		0	0	
Spillback Cap Reductn	0	0			0			0		0	0	
Storage Cap Reductn	0	0			0			0		0	0	
Reduced v/c Ratio	0.13	0.14			0.31			0.07		0.55	0.14	

Intersection Summary			
Area Type:	Other		
Cycle Length: 134.4			
Actuated Cycle Length: 62			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 17.7		Intersection LOS: B	
Intersection Capacity Utilization 51.3%		ICU Level of Service A	
Analysis Period (min) 15			
90th %ile Actuated Cycle: 74.5			
70th %ile Actuated Cycle: 67.7			
50th %ile Actuated Cycle: 64.6			
30th %ile Actuated Cycle: 52.1			
10th %ile Actuated Cycle: 50.9			

Splits and Phases: 202: West Main St (Rt-1) & Hull St

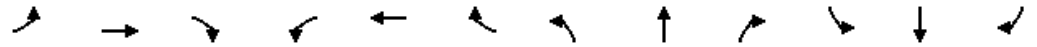


Lane Group	Ø2	Ø3	Ø4
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	47	88	0	0	0	5	158	49	196	175	116
Future Volume (vph)	173	47	88	0	0	0	5	158	49	196	175	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		150	0		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt			0.850					0.960			0.945	
Flt Protected	0.950	0.972						0.998		0.950		
Satd. Flow (prot)	1681	1720	1583	0	0	0	0	3391	0	1770	1760	0
Flt Permitted	0.950	0.972						0.943		0.589		
Satd. Flow (perm)	1681	1720	1583	0	0	0	0	3204	0	1097	1760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102					71			76	
Link Speed (mph)		25			30			40			40	
Link Distance (ft)		211			470			1311			485	
Travel Time (s)		5.8			10.7			22.3			8.3	
Peak Hour Factor	0.82	0.84	0.88	0.88	0.71	0.81	0.62	0.86	0.69	0.88	0.71	0.81
Adj. Flow (vph)	211	56	100	0	0	0	8	184	71	223	246	143
Shared Lane Traffic (%)	37%											
Lane Group Flow (vph)	133	134	100	0	0	0	0	263	0	223	389	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		42			12			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1				1	0		1	0	
Detector Template	Left	Left	Right				Left			Left		
Leading Detector (ft)	29	29	29				29	0		29	0	
Trailing Detector (ft)	-5	-5	-5				-5	0		-5	0	
Detector 1 Position(ft)	-5	-5	-5				-5	0		-5	0	
Detector 1 Size(ft)	34	34	34				34	6		34	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0				0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0				0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0				0.0	0.0		0.0	0.0	
Turn Type	Split	NA	Perm				Perm	NA		D.P+P	NA	
Protected Phases	5 6	5 6						2		1	1 2	
Permitted Phases			5 6				2			2		
Detector Phase	5 6	5 6	5 6							1		
Switch Phase												
Minimum Initial (s)							15.0	15.0		3.0		
Minimum Split (s)							21.0	21.0		7.0		
Total Split (s)							28.6	28.6		23.0		

Lane Group	Ø5	Ø6
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Turn Type		
Protected Phases	5	6
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	10.0	1.0
Minimum Split (s)	14.0	6.4
Total Split (s)	17.0	6.4



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)							38.1%	38.1%		30.7%		
Maximum Green (s)							22.6	22.6		19.0		
Yellow Time (s)							4.2	4.2		3.0		
All-Red Time (s)							1.8	1.8		1.0		
Lost Time Adjust (s)								0.0		0.0		
Total Lost Time (s)								6.0		4.0		
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)							3.0	3.0		1.5		
Recall Mode							C-Max	C-Max		None		
Act Effct Green (s)	19.4	19.4	19.4					33.5		43.6	47.6	
Actuated g/C Ratio	0.26	0.26	0.26					0.45		0.58	0.63	
v/c Ratio	0.31	0.30	0.21					0.18		0.31	0.34	
Control Delay	16.3	16.2	4.3					9.8		7.0	5.8	
Queue Delay	0.8	0.8	0.0					0.0		0.0	0.0	
Total Delay	17.1	17.0	4.3					9.8		7.0	5.8	
LOS	B	B	A					A		A	A	
Approach Delay		13.6						9.8			6.3	
Approach LOS		B						A			A	
90th %ile Green (s)							30.7	30.7		10.9		
90th %ile Term Code							Coord	Coord		Gap		
70th %ile Green (s)							32.5	32.5		9.1		
70th %ile Term Code							Coord	Coord		Gap		
50th %ile Green (s)							33.6	33.6		8.0		
50th %ile Term Code							Coord	Coord		Gap		
30th %ile Green (s)							34.7	34.7		6.9		
30th %ile Term Code							Coord	Coord		Gap		
10th %ile Green (s)							36.1	36.1		5.5		
10th %ile Term Code							Coord	Coord		Gap		
Stops (vph)	48	50	3					89		77	127	
Fuel Used(gal)	1	1	0					3		2	3	
CO Emissions (g/hr)	52	53	17					222		118	178	
NOx Emissions (g/hr)	10	10	3					43		23	35	
VOC Emissions (g/hr)	12	12	4					52		27	41	
Dilemma Vehicles (#)	0	0	0					14		0	25	
Queue Length 50th (ft)	31	31	0					26		45	66	
Queue Length 95th (ft)	50	51	0					48		58	60	
Internal Link Dist (ft)		131			390			1231			405	
Turn Bay Length (ft)												
Base Capacity (vph)	412	421	465					1471		866	1144	
Starvation Cap Reductn	112	119	0					0		0	0	
Spillback Cap Reductn	0	0	0					0		0	0	
Storage Cap Reductn	0	0	0					0		0	0	
Reduced v/c Ratio	0.44	0.44	0.22					0.18		0.26	0.34	

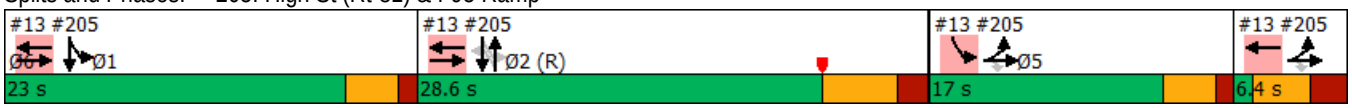
Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow, Master Intersection	

Lane Group	Ø5	Ø6
Total Split (%)	23%	9%
Maximum Green (s)	13.0	1.0
Yellow Time (s)	3.0	3.3
All-Red Time (s)	1.0	2.1
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	2.0	3.0
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	13.0	1.0
90th %ile Term Code	Max	Max
70th %ile Green (s)	11.0	3.0
70th %ile Term Code	Gap	Max
50th %ile Green (s)	10.0	4.0
50th %ile Term Code	Min	Max
30th %ile Green (s)	10.0	4.0
30th %ile Term Code	Min	Max
10th %ile Green (s)	10.0	4.0
10th %ile Term Code	Min	Max
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 48.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 205: High St (Rt-81) & I-95 Ramp



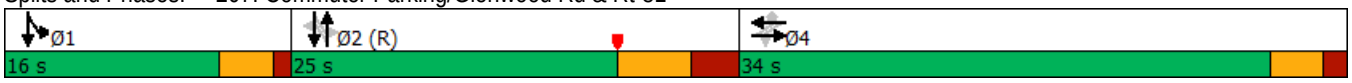
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1	7	133	5	251	9	249	103	113	382	8
Future Volume (vph)	7	1	7	133	5	251	9	249	103	113	382	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		170	0		0	90		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.942				0.850		0.959			0.995	
Flt Protected		0.979			0.956			0.997		0.950		
Satd. Flow (prot)	0	1718	0	0	1781	1583	0	3384	0	1770	1853	0
Flt Permitted		0.890			0.720			0.914		0.495		
Satd. Flow (perm)	0	1562	0	0	1341	1583	0	3102	0	922	1853	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)		12						67			3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		696			797			485			425	
Travel Time (s)		15.8			18.1			11.0			9.7	
Peak Hour Factor	0.58	0.25	0.58	0.83	0.41	0.69	0.38	0.83	0.86	0.68	0.87	0.50
Adj. Flow (vph)	12	4	12	160	12	364	24	300	120	166	439	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	0	0	172	364	0	444	0	166	455	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	0		1	0	
Detector Template	Left	Left		Left	Left	Right	Left			Left		
Leading Detector (ft)	29	29		29	29	29	29	0		29	0	
Trailing Detector (ft)	-5	-5		-5	-5	-5	-5	0		-5	0	
Detector 1 Position(ft)	-5	-5		-5	-5	-5	-5	0		-5	0	
Detector 1 Size(ft)	34	34		34	34	34	34	6		34	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		D.P+P	NA	
Protected Phases		4			4			2		1	1 2	
Permitted Phases	4			4		4	2			2		
Detector Phase	4	4		4	4	4				1		
Switch Phase												
Minimum Initial (s)	9.0	9.0		9.0	9.0	9.0	15.0	15.0		2.5		
Minimum Split (s)	13.4	13.4		13.4	13.4	13.4	21.8	21.8		7.0		
Total Split (s)	34.0	34.0		34.0	34.0	34.0	25.0	25.0		16.0		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	45.3%	45.3%		45.3%	45.3%	45.3%	33.3%	33.3%		21.3%		
Maximum Green (s)	29.6	29.6		29.6	29.6	29.6	18.2	18.2		12.0		
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.1	4.1		3.0		
All-Red Time (s)	1.4	1.4		1.4	1.4	1.4	2.7	2.7		1.0		
Lost Time Adjust (s)		0.0			0.0	0.0		0.0		0.0		
Total Lost Time (s)		4.4			4.4	4.4		6.8		4.0		
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0		1.0		
Recall Mode	None	None		None	None	None	C-Max	C-Max		None		
Act Effct Green (s)		21.9			21.9	21.9		30.9		40.7	44.7	
Actuated g/C Ratio		0.29			0.29	0.29		0.41		0.54	0.60	
v/c Ratio		0.06			0.44	0.79		0.34		0.29	0.41	
Control Delay		11.5			23.8	36.4		19.3		5.8	5.1	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.1	
Total Delay		11.5			23.8	36.4		19.3		5.8	5.2	
LOS		B			C	D		B		A	A	
Approach Delay		11.5			32.3			19.3			5.4	
Approach LOS		B			C			B			A	
90th %ile Green (s)	29.6	29.6		29.6	29.6	29.6	19.5	19.5		10.7		
90th %ile Term Code	Max	Max		Max	Max	Max	Coord	Coord		Gap		
70th %ile Green (s)	25.2	25.2		25.2	25.2	25.2	26.5	26.5		8.1		
70th %ile Term Code	Gap	Gap		Gap	Gap	Gap	Coord	Coord		Gap		
50th %ile Green (s)	22.0	22.0		22.0	22.0	22.0	31.1	31.1		6.7		
50th %ile Term Code	Gap	Gap		Gap	Gap	Gap	Coord	Coord		Gap		
30th %ile Green (s)	18.8	18.8		18.8	18.8	18.8	35.5	35.5		5.5		
30th %ile Term Code	Gap	Gap		Gap	Gap	Gap	Coord	Coord		Gap		
10th %ile Green (s)	13.9	13.9		13.9	13.9	13.9	41.7	41.7		4.2		
10th %ile Term Code	Gap	Gap		Gap	Gap	Gap	Coord	Coord		Gap		
Stops (vph)		7			104	219		250		29	76	
Fuel Used(gal)		0			2	5		4		1	2	
CO Emissions (g/hr)		11			147	324		291		47	148	
NOx Emissions (g/hr)		2			29	63		57		9	29	
VOC Emissions (g/hr)		3			34	75		67		11	34	
Dilemma Vehicles (#)		0			0	0		0		0	0	
Queue Length 50th (ft)		5			64	154		66		16	45	
Queue Length 95th (ft)		3			40	147		126		18	55	
Internal Link Dist (ft)		616			717			405			345	
Turn Bay Length (ft)						170				90		
Base Capacity (vph)		623			529	624		1315		678	1105	
Starvation Cap Reductn		0			0	0		0		0	128	
Spillback Cap Reductn		0			0	0		0		0	0	
Storage Cap Reductn		0			0	0		0		0	0	
Reduced v/c Ratio		0.04			0.33	0.58		0.34		0.24	0.47	

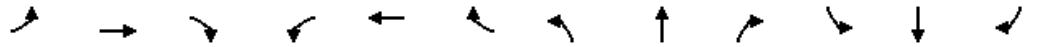
Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 4 (5%), Referenced to phase 2:NBSB, Start of Yellow	

Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 18.1	Intersection LOS: B
Intersection Capacity Utilization 59.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 207: Commuter Parking/Glenwood Rd & Rt-81



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	0	133	0	0	0	296	179	0	1	359	194
Future Volume (vph)	42	0	133	0	0	0	296	179	0	1	359	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	100		0	0		75	250		0	140		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.850										0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1794	0	1863	1863	0	1770	3539	0	1770	1863	1583
Flt Permitted	0.757						0.449			0.567		
Satd. Flow (perm)	1410	1794	0	1863	1863	0	836	3539	0	1056	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		525										255
Link Speed (mph)		15			30			40			40	
Link Distance (ft)		854			693			425			258	
Travel Time (s)		38.8			15.8			7.2			4.4	
Peak Hour Factor	0.65	0.25	0.85	0.25	0.25	0.25	0.94	0.59	0.25	0.25	0.89	0.76
Adj. Flow (vph)	65	0	156	0	0	0	315	303	0	4	403	255
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	156	0	0	0	0	315	303	0	4	403	255
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	0		1	0	0
Detector Template	Left	Right		Left	Right		Left			Left		
Leading Detector (ft)	29	29		29	29		29	0		29	0	0
Trailing Detector (ft)	-5	-5		-5	-5		-5	0		-5	0	0
Detector 1 Position(ft)	-5	-5		-5	-5		-5	0		-5	0	-5
Detector 1 Size(ft)	34	34		34	34		34	6		34	6	34
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Turn Type	Perm	NA		Perm			pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4			4			6			2		2
Detector Phase	4	4		4	4		1			5		
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0	15.0		3.0	15.0	15.0
Minimum Split (s)	10.5	10.5		10.5	10.5		7.0	21.4		7.0	21.4	21.4



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	16.0	16.0		16.0	16.0		19.0	52.0		7.0	40.0	40.0
Total Split (%)	21.3%	21.3%		21.3%	21.3%		25.3%	69.3%		9.3%	53.3%	53.3%
Maximum Green (s)	10.5	10.5		10.5	10.5		15.0	45.6		3.0	33.6	33.6
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	4.2		3.0	4.2	4.2
All-Red Time (s)	2.2	2.2		2.2	2.2		1.0	2.2		1.0	2.2	2.2
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5		4.0	6.4		4.0	6.4	6.4
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	3.0		1.5	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	7.9	7.9					57.6	53.8		49.4	43.1	43.1
Actuated g/C Ratio	0.11	0.11					0.77	0.72		0.66	0.57	0.57
v/c Ratio	0.44	0.24					0.42	0.12		0.01	0.38	0.25
Control Delay	40.1	0.8					3.9	2.5		4.0	10.9	2.3
Queue Delay	0.0	0.0					0.0	0.0		0.0	0.0	0.0
Total Delay	40.1	0.8					3.9	2.5		4.0	10.9	2.3
LOS	D	A					A	A		A	B	A
Approach Delay		12.4						3.2			7.6	
Approach LOS		B						A			A	
90th %ile Green (s)	10.5	10.5		10.5	10.5		11.3	45.6		3.0	37.3	37.3
90th %ile Term Code	Max	Max		Max	Max		Gap	Coord		Max	Coord	Coord
70th %ile Green (s)	9.5	9.5		9.5	9.5		9.2	53.6		0.0	40.4	40.4
70th %ile Term Code	Gap	Gap		Gap	Gap		Gap	Coord		Skip	Coord	Coord
50th %ile Green (s)	8.0	8.0		8.0	8.0		7.8	55.1		0.0	43.3	43.3
50th %ile Term Code	Gap	Gap		Gap	Gap		Gap	Coord		Skip	Coord	Coord
30th %ile Green (s)	6.5	6.5		6.5	6.5		6.7	56.6		0.0	45.9	45.9
30th %ile Term Code	Gap	Gap		Gap	Gap		Gap	Coord		Skip	Coord	Coord
10th %ile Green (s)	5.0	5.0		5.0	5.0		5.5	58.1		0.0	48.6	48.6
10th %ile Term Code	Min	Min		Min	Min		Gap	Coord		Skip	Coord	Coord
Stops (vph)	39	0					89	45		1	208	23
Fuel Used(gal)	1	1					2	1		0	3	1
CO Emissions (g/hr)	54	84					137	73		1	243	46
NOx Emissions (g/hr)	10	16					27	14		0	47	9
VOC Emissions (g/hr)	12	19					32	17		0	56	11
Dilemma Vehicles (#)	0	0					0	7		0	18	0
Queue Length 50th (ft)	29	0					8	3		0	92	0
Queue Length 95th (ft)	45	0					53	25		1	197	20
Internal Link Dist (ft)		774			613			345			178	
Turn Bay Length (ft)	100						250			140		
Base Capacity (vph)	197	702					828	2538		731	1070	1018
Starvation Cap Reductn	0	0					0	0		0	0	0
Spillback Cap Reductn	0	0					0	0		0	0	0
Storage Cap Reductn	0	0					0	0		0	0	0
Reduced v/c Ratio	0.33	0.22					0.38	0.12		0.01	0.38	0.25

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	

Offset: 4 (5%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.44
Intersection Signal Delay: 6.5 Intersection LOS: A
Intersection Capacity Utilization 56.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 216: Rt-81/Killingworth Tpke (Rt-81) & I-95 Ramps

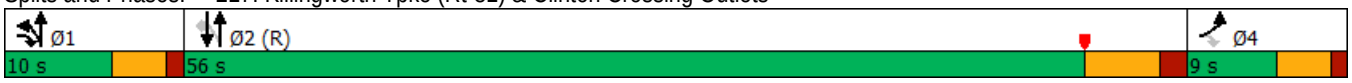
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	2	22	250	561	5
Future Volume (vph)	0	2	22	250	561	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			275
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.996		
Satd. Flow (prot)	1863	1583	0	3525	1863	1583
Flt Permitted				0.898		
Satd. Flow (perm)	1863	1583	0	3178	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		317				12
Link Speed (mph)	25			40	40	
Link Distance (ft)	766			499	603	
Travel Time (s)	20.9			8.5	10.3	
Peak Hour Factor	0.25	0.25	0.61	0.53	0.88	0.42
Adj. Flow (vph)	0	8	36	472	638	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	8	0	508	638	12
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	18			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	0
Detector Template	Left	Right	Left			
Leading Detector (ft)	29	29	29	356	356	0
Trailing Detector (ft)	-5	-5	-5	350	350	0
Detector 1 Position(ft)	-5	-5	-5	350	350	-5
Detector 1 Size(ft)	34	34	34	6	6	34
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	D.P+P	NA	NA	Perm
Protected Phases	4	1	1	1 2	2	
Permitted Phases		4	2			2
Detector Phase	4	4	1	1 2	2	2
Switch Phase						
Minimum Initial (s)	5.0	6.0	6.0		15.0	15.0
Minimum Split (s)	9.0	10.0	10.0		20.7	20.7
Total Split (s)	9.0	10.0	10.0		56.0	56.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (%)	12.0%	13.3%	13.3%		74.7%	74.7%
Maximum Green (s)	5.0	6.0	6.0		50.3	50.3
Yellow Time (s)	3.0	3.0	3.0		4.2	4.2
All-Red Time (s)	1.0	1.0	1.0		1.5	1.5
Lost Time Adjust (s)	0.0	0.0			0.0	0.0
Total Lost Time (s)	4.0	4.0			5.7	5.7
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0		5.0	5.0
Recall Mode	None	None	None		C-Min	C-Min
Act Effct Green (s)		7.8		65.2	57.5	57.5
Actuated g/C Ratio		0.10		0.87	0.77	0.77
v/c Ratio		0.02		0.18	0.45	0.01
Control Delay		0.0		0.6	4.8	1.8
Queue Delay		0.0		0.0	0.0	0.0
Total Delay		0.0		0.6	4.8	1.8
LOS		A		A	A	A
Approach Delay				0.6	4.8	
Approach LOS				A	A	
90th %ile Green (s)	5.0	6.0	6.0		50.3	50.3
90th %ile Term Code	Min	Min	Min		Coord	Coord
70th %ile Green (s)	0.0	6.0	6.0		59.3	59.3
70th %ile Term Code	Skip	Min	Min		Coord	Coord
50th %ile Green (s)	0.0	6.0	6.0		59.3	59.3
50th %ile Term Code	Skip	Min	Min		Coord	Coord
30th %ile Green (s)	0.0	6.0	6.0		59.3	59.3
30th %ile Term Code	Skip	Min	Min		Coord	Coord
10th %ile Green (s)	0.0	6.0	6.0		59.3	59.3
10th %ile Term Code	Skip	Min	Min		Coord	Coord
Stops (vph)		0		21	186	1
Fuel Used(gal)		0		1	5	0
CO Emissions (g/hr)		1		81	327	2
NOx Emissions (g/hr)		0		16	64	0
VOC Emissions (g/hr)		0		19	76	1
Dilemma Vehicles (#)		0		30	37	0
Queue Length 50th (ft)		0		0	65	0
Queue Length 95th (ft)		0		5	189	1
Internal Link Dist (ft)	686			419	523	
Turn Bay Length (ft)						275
Base Capacity (vph)		448		2790	1428	1216
Starvation Cap Reductn		0		0	0	0
Spillback Cap Reductn		0		0	0	0
Storage Cap Reductn		0		0	0	0
Reduced v/c Ratio		0.02		0.18	0.45	0.01

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 51 (68%), Referenced to phase 2:NBSB, Start of Yellow	

Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 2.9	Intersection LOS: A
Intersection Capacity Utilization 42.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 217: Killingworth Tpke (Rt-81) & Clinton Crossing Outlets



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	1	0	0	0	1	287	0	0	567	1
Future Volume (vph)	1	0	1	0	0	0	1	287	0	0	567	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12	12	12	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.932									0.999	
Flt Protected		0.976										
Satd. Flow (prot)	0	1920	0	1863	0	1863	0	3539	0	0	1861	0
Flt Permitted		0.976						0.952				
Satd. Flow (perm)	0	1920	0	1863	0	1863	0	3369	0	0	1861	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		51									1	
Link Speed (mph)		15			15			40			40	
Link Distance (ft)		653			532			422			499	
Travel Time (s)		29.7			24.2			7.2			8.5	
Peak Hour Factor	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.59	0.25	0.25	0.86	0.25
Adj. Flow (vph)	4	0	4	0	0	0	4	486	0	0	659	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	0	0	0	490	0	0	663	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1		1	1	0			0	
Detector Template	Left	Left		Left		Right	Left					
Leading Detector (ft)	29	29		29		29	29	0			0	
Trailing Detector (ft)	-5	-5		-5		-5	-5	0			0	
Detector 1 Position(ft)	-5	-5		-5		-5	-5	0			0	
Detector 1 Size(ft)	34	34		34		34	34	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0			0.0	
Turn Type	Perm	NA		D.Pm		Perm	Perm	NA			NA	
Protected Phases		4						2			2	
Permitted Phases	4			4		4	2					
Detector Phase	4	4		4		4	2	2			2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0		6.0	15.0	15.0			15.0	
Minimum Split (s)	10.9	10.9		10.9		10.9	21.5	21.5			21.5	
Total Split (s)	12.0	12.0		12.0		12.0	63.0	63.0			63.0	
Total Split (%)	16.0%	16.0%		16.0%		16.0%	84.0%	84.0%			84.0%	
Maximum Green (s)	7.1	7.1		7.1		7.1	56.5	56.5			56.5	

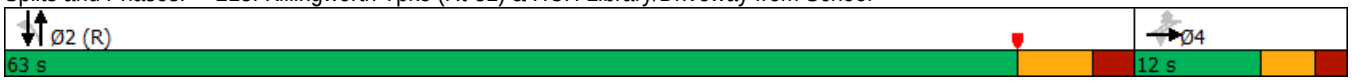
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.0	3.0		3.0		3.0	4.2	4.2			4.2	
All-Red Time (s)	1.9	1.9		1.9		1.9	2.3	2.3			2.3	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0			0.0	
Total Lost Time (s)		4.9		4.9		4.9		6.5			6.5	
Lead/Lag	Lag	Lag		Lag		Lag	Lead	Lead			Lead	
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes			Yes	
Vehicle Extension (s)	2.0	2.0		2.0		2.0	3.0	3.0			3.0	
Recall Mode	None	None		None		None	C-Max	C-Max			C-Max	
Act Effct Green (s)		6.0						71.5			71.5	
Actuated g/C Ratio		0.08						0.95			0.95	
v/c Ratio		0.04						0.15			0.37	
Control Delay		0.5						0.9			3.0	
Queue Delay		0.0						0.0			0.0	
Total Delay		0.5						0.9			3.0	
LOS		A						A			A	
Approach Delay		0.5						0.9			3.0	
Approach LOS		A						A			A	
90th %ile Green (s)	6.0	6.0		6.0		6.0	57.6	57.6			57.6	
90th %ile Term Code	Min	Min		Min		Min	Coord	Coord			Coord	
70th %ile Green (s)	0.0	0.0		0.0		0.0	68.5	68.5			68.5	
70th %ile Term Code	Skip	Skip		Skip		Skip	Coord	Coord			Coord	
50th %ile Green (s)	0.0	0.0		0.0		0.0	68.5	68.5			68.5	
50th %ile Term Code	Skip	Skip		Skip		Skip	Coord	Coord			Coord	
30th %ile Green (s)	0.0	0.0		0.0		0.0	68.5	68.5			68.5	
30th %ile Term Code	Skip	Skip		Skip		Skip	Coord	Coord			Coord	
10th %ile Green (s)	0.0	0.0		0.0		0.0	68.5	68.5			68.5	
10th %ile Term Code	Skip	Skip		Skip		Skip	Coord	Coord			Coord	
Stops (vph)		0						22			101	
Fuel Used(gal)		0						1			3	
CO Emissions (g/hr)		1						77			228	
NOx Emissions (g/hr)		0						15			44	
VOC Emissions (g/hr)		0						18			53	
Dilemma Vehicles (#)		0						8			22	
Queue Length 50th (ft)		0						0			1	
Queue Length 95th (ft)		0						20			230	
Internal Link Dist (ft)		573			452			342			419	
Turn Bay Length (ft)												
Base Capacity (vph)		227						3213			1775	
Starvation Cap Reductn		0						0			124	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.04						0.15			0.40	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 9 (12%), Referenced to phase 2:NBSB, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 2.1	Intersection LOS: A
Intersection Capacity Utilization 44.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 218: Killingworth Tpke (Rt-81) & HCH Library/Driveway from School



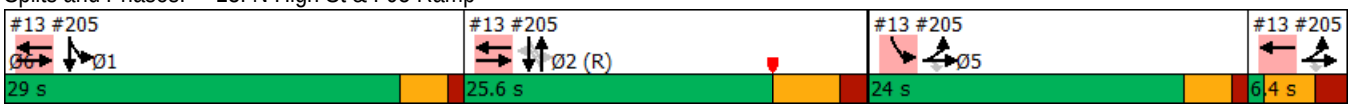
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø1	Ø2	Ø6
Lane Configurations									
Traffic Volume (vph)	0	265	250	0	450	26			
Future Volume (vph)	0	265	250	0	450	26			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Storage Length (ft)	100			0	275	0			
Storage Lanes	1			0	1	0			
Taper Length (ft)	25				25				
Lane Util. Factor	1.00	0.95	1.00	1.00	0.97	0.95			
Frt					0.988				
Flt Protected					0.956				
Satd. Flow (prot)	0	3539	1863	0	3413	0			
Flt Permitted					0.956				
Satd. Flow (perm)	0	3539	1863	0	3413	0			
Right Turn on Red				Yes		Yes			
Satd. Flow (RTOR)					10				
Link Speed (mph)		25	25		30				
Link Distance (ft)		517	211		662				
Travel Time (s)		14.1	5.8		15.0				
Peak Hour Factor	0.25	0.78	0.79	0.79	0.92	0.62			
Adj. Flow (vph)	0	340	316	0	489	42			
Shared Lane Traffic (%)									
Lane Group Flow (vph)	0	340	316	0	531	0			
Enter Blocked Intersection	No	No	No	No	No	No			
Lane Alignment	Left	Left	Left	Right	Left	Right			
Median Width(ft)		0	0		24				
Link Offset(ft)		0	0		0				
Crosswalk Width(ft)		16	16		16				
Two way Left Turn Lane									
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00			
Turning Speed (mph)	15			9	15	9			
Number of Detectors		0	0		1				
Detector Template					Left				
Leading Detector (ft)		0	0		29				
Trailing Detector (ft)		0	0		-5				
Detector 1 Position(ft)		0	0		-5				
Detector 1 Size(ft)		6	6		34				
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex				
Detector 1 Channel									
Detector 1 Extend (s)		0.0	0.0		0.0				
Detector 1 Queue (s)		0.0	0.0		0.0				
Detector 1 Delay (s)		0.0	0.0		0.0				
Turn Type		NA	NA		Prot				
Protected Phases		1 2	1 2 6		5		1	2	6
Permitted Phases									
Detector Phase					5				
Switch Phase									
Minimum Initial (s)					10.0		3.0	15.0	1.0
Minimum Split (s)					14.0		7.0	21.0	6.4
Total Split (s)					24.0		29.0	25.6	6.4

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø1	Ø2	Ø6
Total Split (%)					28.2%		34%	30%	8%
Maximum Green (s)					20.0		25.0	19.6	1.0
Yellow Time (s)					3.0		3.0	4.2	3.3
All-Red Time (s)					1.0		1.0	1.8	2.1
Lost Time Adjust (s)					0.0				
Total Lost Time (s)					4.0				
Lead/Lag					Lead		Lead	Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes	Yes
Vehicle Extension (s)					2.0		1.5	3.0	3.0
Recall Mode					None		None	C-Max	None
Act Effct Green (s)		51.0	58.9		18.1				
Actuated g/C Ratio		0.60	0.69		0.21				
v/c Ratio		0.16	0.24		0.72				
Control Delay		7.8	3.3		36.3				
Queue Delay		0.0	0.6		0.2				
Total Delay		7.8	3.9		36.6				
LOS		A	A		D				
Approach Delay		7.8	3.9		36.6				
Approach LOS		A	A		D				
90th %ile Green (s)					20.0		13.7	30.9	1.0
90th %ile Term Code					Max		Gap	Coord	Max
70th %ile Green (s)					20.0		11.4	33.2	1.0
70th %ile Term Code					Max		Gap	Coord	Max
50th %ile Green (s)					20.0		9.9	34.7	1.0
50th %ile Term Code					Max		Gap	Coord	Max
30th %ile Green (s)					17.9		8.5	36.1	3.1
30th %ile Term Code					Gap		Gap	Coord	Max
10th %ile Green (s)					12.8		6.5	40.2	6.1
10th %ile Term Code					Gap		Gap	Coord	Gap
Stops (vph)		109	34		419				
Fuel Used(gal)		2	1		8				
CO Emissions (g/hr)		140	52		580				
NOx Emissions (g/hr)		27	10		113				
VOC Emissions (g/hr)		33	12		134				
Dilemma Vehicles (#)		0	0		0				
Queue Length 50th (ft)		38	28		129				
Queue Length 95th (ft)		49	29		182				
Internal Link Dist (ft)		437	131		582				
Turn Bay Length (ft)					275				
Base Capacity (vph)		2124	1290		810				
Starvation Cap Reductn		0	622		0				
Spillback Cap Reductn		13	0		32				
Storage Cap Reductn		0	0		0				
Reduced v/c Ratio		0.16	0.47		0.68				

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 85	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow, Master Intersection	

Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 19.6	Intersection LOS: B
Intersection Capacity Utilization 33.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: N High St & I-95 Ramp



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	393	18	0	430	203	10	36	1	224	52	90
Future Volume (vph)	113	393	18	0	430	203	10	36	1	224	52	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	14	12	12	12	12	11	12	12
Storage Length (ft)	100		0	0		0	0		0	100		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.960			0.994			0.909	
Flt Protected	0.950							0.993		0.950		
Satd. Flow (prot)	1770	1965	0	0	1907	0	0	1839	0	1711	1693	0
Flt Permitted	0.100							0.957		0.747		
Satd. Flow (perm)	186	1965	0	0	1907	0	0	1772	0	1345	1693	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			19			2			51	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		934			799			320			468	
Travel Time (s)		25.5			21.8			8.7			12.8	
Peak Hour Factor	0.70	0.88	0.50	0.25	0.78	0.89	0.92	0.52	0.25	0.63	0.66	0.73
Adj. Flow (vph)	161	447	36	0	551	228	11	69	4	356	79	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	483	0	0	779	0	0	84	0	356	202	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	R NA	R NA
Median Width(ft)		12			0			0			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	0.92	1.00	1.00	0.92	1.00	1.00	1.00	1.00	1.04	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	1		1	1	
Detector Template	Left	Thru			Thru		Left	Left		Left	Right	
Leading Detector (ft)	29	100			100		29	29		29	29	
Trailing Detector (ft)	-5	0			0		-5	-5		-5	-5	
Detector 1 Position(ft)	-5	0			0		-5	-5		-5	-5	
Detector 1 Size(ft)	34	6			6		34	34		34	34	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	custom	NA			NA		Perm	NA		Perm	NA	
Protected Phases	1	1 2			2 4			5			5	

Lane Group	Ø2	Ø3	Ø4
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Enter Blocked Intersection			
Lane Alignment			
Median Width(ft)			
Link Offset(ft)			
Crosswalk Width(ft)			
Two way Left Turn Lane			
Headway Factor			
Turning Speed (mph)			
Number of Detectors			
Detector Template			
Leading Detector (ft)			
Trailing Detector (ft)			
Detector 1 Position(ft)			
Detector 1 Size(ft)			
Detector 1 Type			
Detector 1 Channel			
Detector 1 Extend (s)			
Detector 1 Queue (s)			
Detector 1 Delay (s)			
Detector 2 Position(ft)			
Detector 2 Size(ft)			
Detector 2 Type			
Detector 2 Channel			
Detector 2 Extend (s)			
Turn Type			
Protected Phases	2	3	4

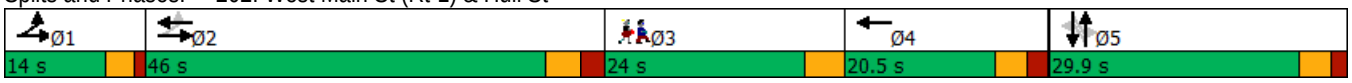
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2						5			5		
Detector Phase	1	2			2		5	5		5	5	
Switch Phase												
Minimum Initial (s)	5.0						7.0	7.0		7.0	7.0	
Minimum Split (s)	9.0						11.9	11.9		11.9	11.9	
Total Split (s)	14.0						29.9	29.9		29.9	29.9	
Total Split (%)	10.4%						22.2%	22.2%		22.2%	22.2%	
Maximum Green (s)	10.0						25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0						3.2	3.2		3.2	3.2	
All-Red Time (s)	1.0						1.7	1.7		1.7	1.7	
Lost Time Adjust (s)	0.0							0.0		0.0	0.0	
Total Lost Time (s)	4.0							4.9		4.9	4.9	
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	1.5						2.0	2.0		2.0	2.0	
Recall Mode	None						None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	51.0	55.0			40.0			25.0		25.0	25.0	
Actuated g/C Ratio	0.57	0.62			0.45			0.28		0.28	0.28	
v/c Ratio	0.61	0.40			0.90			0.17		0.94	0.39	
Control Delay	22.9	9.6			37.4			25.0		67.3	21.9	
Queue Delay	0.0	0.0			0.0			0.0		0.0	0.0	
Total Delay	22.9	9.6			37.4			25.0		67.3	21.9	
LOS	C	A			D			C		E	C	
Approach Delay		13.0			37.4			25.0			50.9	
Approach LOS		B			D			C			D	
90th %ile Green (s)	10.0						25.0	25.0		25.0	25.0	
90th %ile Term Code	Max						Max	Max		Max	Max	
70th %ile Green (s)	10.0						25.0	25.0		25.0	25.0	
70th %ile Term Code	Max						Max	Max		Max	Max	
50th %ile Green (s)	9.2						25.0	25.0		25.0	25.0	
50th %ile Term Code	Gap						Max	Max		Max	Max	
30th %ile Green (s)	8.4						25.0	25.0		25.0	25.0	
30th %ile Term Code	Gap						Max	Max		Max	Max	
10th %ile Green (s)	7.2						25.0	25.0		25.0	25.0	
10th %ile Term Code	Gap						Max	Max		Max	Max	
Stops (vph)	56	192			520			34		188	84	
Fuel Used(gal)	2	5			11			0		5	2	
CO Emissions (g/hr)	115	336			777			35		327	106	
NOx Emissions (g/hr)	22	65			151			7		64	21	
VOC Emissions (g/hr)	27	78			180			8		76	25	
Dilemma Vehicles (#)	0	0			0			0		0	0	
Queue Length 50th (ft)	34	123			383			35		195	67	
Queue Length 95th (ft)	58	177			441			39		192	83	
Internal Link Dist (ft)		854			719			240			388	
Turn Bay Length (ft)	100									100		
Base Capacity (vph)	286	1216			869			500		378	512	

Lane Group	Ø2	Ø3	Ø4
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	15.0	7.0	7.0
Minimum Split (s)	21.0	24.0	12.5
Total Split (s)	46.0	24.0	20.5
Total Split (%)	34%	18%	15%
Maximum Green (s)	40.0	20.0	15.0
Yellow Time (s)	3.6	4.0	3.2
All-Red Time (s)	2.4	0.0	2.3
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	2.0
Recall Mode	Min	None	None
Walk Time (s)		7.0	
Flash Dont Walk (s)		13.0	
Pedestrian Calls (#/hr)		0	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
90th %ile Green (s)	40.0	0.0	0.0
90th %ile Term Code	Max	Skip	Skip
70th %ile Green (s)	40.0	0.0	0.0
70th %ile Term Code	Max	Skip	Skip
50th %ile Green (s)	40.0	0.0	0.0
50th %ile Term Code	Max	Skip	Skip
30th %ile Green (s)	40.0	0.0	0.0
30th %ile Term Code	Max	Skip	Skip
10th %ile Green (s)	40.0	0.0	0.0
10th %ile Term Code	Max	Skip	Skip
Stops (vph)			
Fuel Used(gal)			
CO Emissions (g/hr)			
NOx Emissions (g/hr)			
VOC Emissions (g/hr)			
Dilemma Vehicles (#)			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0			0			0		0	0	
Spillback Cap Reductn	0	0			0			0		0	0	
Storage Cap Reductn	0	0			0			0		0	0	
Reduced v/c Ratio	0.56	0.40			0.90			0.17		0.94	0.39	

Intersection Summary			
Area Type:	Other		
Cycle Length: 134.4			
Actuated Cycle Length: 88.9			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 32.9		Intersection LOS: C	
Intersection Capacity Utilization 72.8%		ICU Level of Service C	
Analysis Period (min) 15			
90th %ile Actuated Cycle: 89.9			
70th %ile Actuated Cycle: 89.9			
50th %ile Actuated Cycle: 89.1			
30th %ile Actuated Cycle: 88.3			
10th %ile Actuated Cycle: 87.1			

Splits and Phases: 202: West Main St (Rt-1) & Hull St

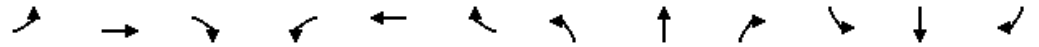


Lane Group	Ø2	Ø3	Ø4
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	505	82	128	0	0	0	10	286	77	225	316	229
Future Volume (vph)	505	82	128	0	0	0	10	286	77	225	316	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		150	0		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt			0.850					0.964			0.942	
Flt Protected	0.950	0.965						0.998		0.950		
Satd. Flow (prot)	1681	1708	1583	0	0	0	0	3405	0	1770	1755	0
Flt Permitted	0.950	0.965						0.921		0.462		
Satd. Flow (perm)	1681	1708	1583	0	0	0	0	3142	0	861	1755	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145					47			67	
Link Speed (mph)		25			30			40			40	
Link Distance (ft)		211			470			1311			485	
Travel Time (s)		5.8			10.7			22.3			8.3	
Peak Hour Factor	0.82	0.84	0.88	0.88	0.71	0.81	0.62	0.86	0.69	0.88	0.71	0.81
Adj. Flow (vph)	616	98	145	0	0	0	16	333	112	256	445	283
Shared Lane Traffic (%)	42%											
Lane Group Flow (vph)	357	357	145	0	0	0	0	461	0	256	728	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		42			12			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1				1	0		1	0	
Detector Template	Left	Left	Right				Left			Left		
Leading Detector (ft)	29	29	29				29	0		29	0	
Trailing Detector (ft)	-5	-5	-5				-5	0		-5	0	
Detector 1 Position(ft)	-5	-5	-5				-5	0		-5	0	
Detector 1 Size(ft)	34	34	34				34	6		34	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0				0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0				0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0				0.0	0.0		0.0	0.0	
Turn Type	Split	NA	Perm				Perm	NA		D.P+P	NA	
Protected Phases	5 6	5 6						2		1	1 2	
Permitted Phases			5 6				2			2		
Detector Phase	5 6	5 6	5 6							1		
Switch Phase												
Minimum Initial (s)							15.0	15.0		3.0		
Minimum Split (s)							21.0	21.0		7.0		
Total Split (s)							25.6	25.6		29.0		

Lane Group	Ø5	Ø6
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Enter Blocked Intersection		
Lane Alignment		
Median Width(ft)		
Link Offset(ft)		
Crosswalk Width(ft)		
Two way Left Turn Lane		
Headway Factor		
Turning Speed (mph)		
Number of Detectors		
Detector Template		
Leading Detector (ft)		
Trailing Detector (ft)		
Detector 1 Position(ft)		
Detector 1 Size(ft)		
Detector 1 Type		
Detector 1 Channel		
Detector 1 Extend (s)		
Detector 1 Queue (s)		
Detector 1 Delay (s)		
Turn Type		
Protected Phases	5	6
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	10.0	1.0
Minimum Split (s)	14.0	6.4
Total Split (s)	24.0	6.4



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)							30.1%	30.1%		34.1%		
Maximum Green (s)							19.6	19.6		25.0		
Yellow Time (s)							4.2	4.2		3.0		
All-Red Time (s)							1.8	1.8		1.0		
Lost Time Adjust (s)								0.0		0.0		
Total Lost Time (s)								6.0		4.0		
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)							3.0	3.0		1.5		
Recall Mode							C-Max	C-Max		None		
Act Effct Green (s)	26.0	26.0	26.0					35.0		47.0	51.0	
Actuated g/C Ratio	0.31	0.31	0.31					0.41		0.55	0.60	
v/c Ratio	0.69	0.68	0.25					0.35		0.44	0.67	
Control Delay	23.7	23.2	3.9					16.9		10.6	12.9	
Queue Delay	2.8	2.8	0.6					0.0		0.0	0.4	
Total Delay	26.5	26.0	4.5					16.9		10.6	13.3	
LOS	C	C	A					B		B	B	
Approach Delay		22.6						16.9			12.6	
Approach LOS		C						B			B	
90th %ile Green (s)							30.9	30.9		13.7		
90th %ile Term Code							Coord	Coord		Gap		
70th %ile Green (s)							33.2	33.2		11.4		
70th %ile Term Code							Coord	Coord		Gap		
50th %ile Green (s)							34.7	34.7		9.9		
50th %ile Term Code							Coord	Coord		Gap		
30th %ile Green (s)							36.1	36.1		8.5		
30th %ile Term Code							Coord	Coord		Gap		
10th %ile Green (s)							40.2	40.2		6.5		
10th %ile Term Code							Coord	Coord		Gap		
Stops (vph)	181	178	10					225		87	272	
Fuel Used(gal)	3	3	0					7		2	6	
CO Emissions (g/hr)	184	182	26					477		145	412	
NOx Emissions (g/hr)	36	35	5					93		28	80	
VOC Emissions (g/hr)	43	42	6					111		34	96	
Dilemma Vehicles (#)	0	0	0					22		0	46	
Queue Length 50th (ft)	94	94	0					77		54	211	
Queue Length 95th (ft)	122	125	m0					117		82	147	
Internal Link Dist (ft)		131			390			1231			405	
Turn Bay Length (ft)												
Base Capacity (vph)	506	514	578					1322		783	1079	
Starvation Cap Reductn	71	77	197					0		0	76	
Spillback Cap Reductn	0	0	0					0		0	0	
Storage Cap Reductn	0	0	0					0		0	0	
Reduced v/c Ratio	0.82	0.82	0.38					0.35		0.33	0.73	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 85	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow, Master Intersection	

Lane Group	Ø5	Ø6
Total Split (%)	28%	8%
Maximum Green (s)	20.0	1.0
Yellow Time (s)	3.0	3.3
All-Red Time (s)	1.0	2.1
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	2.0	3.0
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
90th %ile Green (s)	20.0	1.0
90th %ile Term Code	Max	Max
70th %ile Green (s)	20.0	1.0
70th %ile Term Code	Max	Max
50th %ile Green (s)	20.0	1.0
50th %ile Term Code	Max	Max
30th %ile Green (s)	17.9	3.1
30th %ile Term Code	Gap	Max
10th %ile Green (s)	12.8	6.1
10th %ile Term Code	Gap	Gap
Stops (vph)		
Fuel Used(gal)		
CO Emissions (g/hr)		
NOx Emissions (g/hr)		
VOC Emissions (g/hr)		
Dilemma Vehicles (#)		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

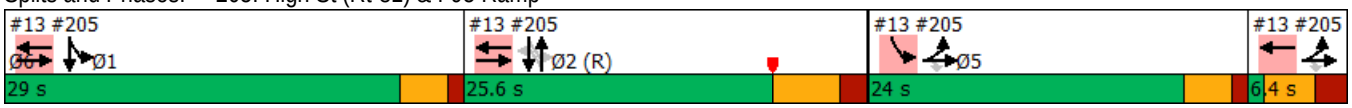
Intersection Summary

Natural Cycle: 50

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 70.9%	ICU Level of Service C
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 205: High St (Rt-81) & I-95 Ramp



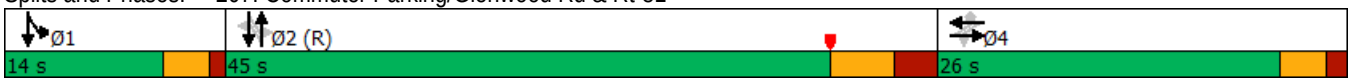
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	6	10	123	2	180	15	563	213	102	637	15
Future Volume (vph)	15	6	10	123	2	180	15	563	213	102	637	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		170	0		0	90		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.966				0.850		0.961			0.994	
Flt Protected		0.981			0.954			0.998		0.950		
Satd. Flow (prot)	0	1765	0	0	1777	1583	0	3394	0	1770	1852	0
Flt Permitted		0.861			0.742			0.894		0.242		
Satd. Flow (perm)	0	1549	0	0	1382	1583	0	3041	0	451	1852	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)		17						73			5	
Link Speed (mph)		15			30			40			40	
Link Distance (ft)		696			797			485			425	
Travel Time (s)		31.6			18.1			8.3			7.2	
Peak Hour Factor	0.58	0.25	0.58	0.83	0.41	0.69	0.38	0.83	0.86	0.68	0.87	0.50
Adj. Flow (vph)	26	24	17	148	5	261	39	678	248	150	732	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	153	261	0	965	0	150	762	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	0		1	0	
Detector Template	Left	Left		Left	Left	Right	Left			Left		
Leading Detector (ft)	29	29		29	29	29	29	0		29	0	
Trailing Detector (ft)	-5	-5		-5	-5	-5	-5	0		-5	0	
Detector 1 Position(ft)	-5	-5		-5	-5	-5	-5	0		-5	0	
Detector 1 Size(ft)	34	34		34	34	34	34	6		34	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		D.P+P	NA	
Protected Phases		4			4			2		1	1 2	
Permitted Phases	4			4		4	2			2		
Detector Phase	4	4		4	4	4				1		
Switch Phase												
Minimum Initial (s)	9.0	9.0		9.0	9.0	9.0	15.0	15.0		2.5		
Minimum Split (s)	13.4	13.4		13.4	13.4	13.4	21.8	21.8		7.0		
Total Split (s)	26.0	26.0		26.0	26.0	26.0	45.0	45.0		14.0		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	30.6%	30.6%		30.6%	30.6%	30.6%	52.9%	52.9%		16.5%		
Maximum Green (s)	21.6	21.6		21.6	21.6	21.6	38.2	38.2		10.0		
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.1	4.1		3.0		
All-Red Time (s)	1.4	1.4		1.4	1.4	1.4	2.7	2.7		1.0		
Lost Time Adjust (s)		0.0			0.0	0.0		0.0		0.0		
Total Lost Time (s)		4.4			4.4	4.4		6.8		4.0		
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0		1.0		
Recall Mode	None	None		None	None	None	C-Max	C-Max		None		
Act Effct Green (s)		17.6			17.6	17.6		46.0		55.0	59.0	
Actuated g/C Ratio		0.21			0.21	0.21		0.54		0.65	0.69	
v/c Ratio		0.20			0.53	0.80		0.57		0.39	0.59	
Control Delay		22.1			36.3	49.5		19.2		6.7	5.9	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.2	
Total Delay		22.1			36.3	49.5		19.2		6.7	6.1	
LOS		C			D	D		B		A	A	
Approach Delay		22.1			44.6			19.2			6.2	
Approach LOS		C			D			B			A	
90th %ile Green (s)	21.6	21.6		21.6	21.6	21.6	39.7	39.7		8.5		
90th %ile Term Code	Max	Max		Max	Max	Max	Coord	Coord		Gap		
70th %ile Green (s)	21.2	21.2		21.2	21.2	21.2	41.4	41.4		7.2		
70th %ile Term Code	Gap	Gap		Gap	Gap	Gap	Coord	Coord		Gap		
50th %ile Green (s)	18.4	18.4		18.4	18.4	18.4	45.4	45.4		6.0		
50th %ile Term Code	Gap	Gap		Gap	Gap	Gap	Coord	Coord		Gap		
30th %ile Green (s)	15.6	15.6		15.6	15.6	15.6	49.1	49.1		5.1		
30th %ile Term Code	Gap	Gap		Gap	Gap	Gap	Coord	Coord		Gap		
10th %ile Green (s)	11.3	11.3		11.3	11.3	11.3	54.4	54.4		4.1		
10th %ile Term Code	Gap	Gap		Gap	Gap	Gap	Coord	Coord		Gap		
Stops (vph)		19			109	166		543		23	144	
Fuel Used(gal)		0			2	4		11		1	4	
CO Emissions (g/hr)		27			161	269		771		46	285	
NOx Emissions (g/hr)		5			31	52		150		9	55	
VOC Emissions (g/hr)		6			37	62		179		11	66	
Dilemma Vehicles (#)		0			0	0		17		0	48	
Queue Length 50th (ft)		22			72	132		198		14	77	
Queue Length 95th (ft)		9			51	147		221		30	169	
Internal Link Dist (ft)		616			717			405			345	
Turn Bay Length (ft)						170				90		
Base Capacity (vph)		406			351	402		1679		463	1286	
Starvation Cap Reductn		0			0	0		0		0	106	
Spillback Cap Reductn		0			0	0		0		0	0	
Storage Cap Reductn		0			0	0		0		0	0	
Reduced v/c Ratio		0.17			0.44	0.65		0.57		0.32	0.65	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 85	
Offset: 1 (1%), Referenced to phase 2:NBSB, Start of Yellow	

Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 18.7	Intersection LOS: B
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 207: Commuter Parking/Glenwood Rd & Rt-81



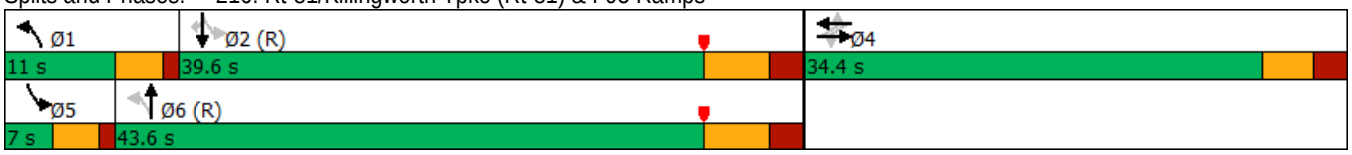
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	255	15	215	2	0	0	212	490	20	10	530	225
Future Volume (vph)	255	15	215	2	0	0	212	490	20	10	530	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	100		0	0		75	250		0	140		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.879						0.987				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1856	0	1770	1863	0	1770	3493	0	1770	1863	1583
Flt Permitted	0.757			0.422			0.194			0.277		
Satd. Flow (perm)	1410	1856	0	786	1863	0	361	3493	0	516	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		224						15				296
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		854			693			425			258	
Travel Time (s)		19.4			15.8			7.2			4.4	
Peak Hour Factor	0.65	0.25	0.85	0.25	0.25	0.25	0.94	0.59	0.25	0.25	0.89	0.76
Adj. Flow (vph)	392	60	253	8	0	0	226	831	80	40	596	296
Shared Lane Traffic (%)												
Lane Group Flow (vph)	392	313	0	8	0	0	226	911	0	40	596	296
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	0		1	0	0
Detector Template	Left	Right		Left	Right		Left			Left		
Leading Detector (ft)	29	29		29	29		29	0		29	0	0
Trailing Detector (ft)	-5	-5		-5	-5		-5	0		-5	0	0
Detector 1 Position(ft)	-5	-5		-5	-5		-5	0		-5	0	-5
Detector 1 Size(ft)	34	34		34	34		34	6		34	6	34
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Turn Type	Perm	NA		Perm			pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4			4			6			2		2
Detector Phase	4	4		4	4		1			5		
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		3.0	15.0		3.0	15.0	15.0
Minimum Split (s)	10.5	10.5		10.5	10.5		7.0	21.4		7.0	21.4	21.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	34.4	34.4		34.4	34.4		11.0	43.6		7.0	39.6	39.6
Total Split (%)	40.5%	40.5%		40.5%	40.5%		12.9%	51.3%		8.2%	46.6%	46.6%
Maximum Green (s)	28.9	28.9		28.9	28.9		7.0	37.2		3.0	33.2	33.2
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	4.2		3.0	4.2	4.2
All-Red Time (s)	2.2	2.2		2.2	2.2		1.0	2.2		1.0	2.2	2.2
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		5.5	5.5		4.0	6.4		4.0	6.4	6.4
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.5	3.0		1.5	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	26.3	26.3		26.3			49.2	42.6		41.4	35.5	35.5
Actuated g/C Ratio	0.31	0.31		0.31			0.58	0.50		0.49	0.42	0.42
v/c Ratio	0.90	0.43		0.03			0.68	0.52		0.13	0.77	0.36
Control Delay	53.1	8.6		19.5			23.5	11.5		8.3	26.4	2.0
Queue Delay	0.0	0.0		0.0			0.0	0.2		0.0	0.0	0.0
Total Delay	53.1	8.6		19.5			23.5	11.6		8.3	26.4	2.0
LOS	D	A		B			C	B		A	C	A
Approach Delay		33.3			19.5			14.0			17.9	
Approach LOS		C			B			B			B	
90th %ile Green (s)	28.9	28.9		28.9	28.9		7.0	37.2		3.0	33.2	33.2
90th %ile Term Code	Max	Max		Max	Max		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	28.9	28.9		28.9	28.9		7.0	37.2		3.0	33.2	33.2
70th %ile Term Code	Max	Max		Max	Max		Max	Coord		Max	Coord	Coord
50th %ile Green (s)	28.8	28.8		28.8	28.8		7.1	37.2		3.1	33.2	33.2
50th %ile Term Code	Gap	Gap		Gap	Gap		Max	Coord		Max	Coord	Coord
30th %ile Green (s)	25.2	25.2		25.2	25.2		8.8	47.9		0.0	35.1	35.1
30th %ile Term Code	Gap	Gap		Gap	Gap		Gap	Coord		Skip	Coord	Coord
10th %ile Green (s)	19.5	19.5		19.5	19.5		6.7	53.6		0.0	42.9	42.9
10th %ile Term Code	Gap	Gap		Gap	Gap		Gap	Coord		Skip	Coord	Coord
Stops (vph)	224	55		2			108	252		5	430	17
Fuel Used(gal)	6	2		0			3	5		0	8	1
CO Emissions (g/hr)	398	156		2			188	359		6	559	46
NOx Emissions (g/hr)	77	30		0			37	70		1	109	9
VOC Emissions (g/hr)	92	36		0			44	83		1	130	11
Dilemma Vehicles (#)	0	0		0			0	14		0	21	0
Queue Length 50th (ft)	189	33		3			46	147		8	276	3
Queue Length 95th (ft)	190	0		4			#136	81		5	#449	5
Internal Link Dist (ft)		774			613			345			178	
Turn Bay Length (ft)	100						250			140		
Base Capacity (vph)	479	778		267			331	1759		303	778	833
Starvation Cap Reductn	0	0		0			0	198		0	0	0
Spillback Cap Reductn	0	0		0			0	0		0	0	0
Storage Cap Reductn	0	0		0			0	0		0	0	0
Reduced v/c Ratio	0.82	0.40		0.03			0.68	0.58		0.13	0.77	0.36

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 85	

Offset: 1 (1%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 20.2 Intersection LOS: C
Intersection Capacity Utilization 73.7% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 216: Rt-81/Killingworth Tpke (Rt-81) & I-95 Ramps



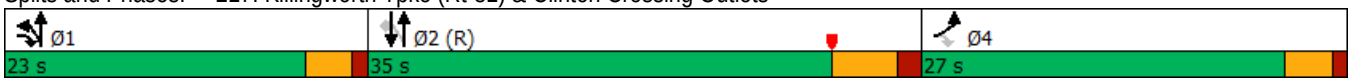
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	60	190	265	490	420	65
Future Volume (vph)	60	190	265	490	420	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			275
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.984		
Satd. Flow (prot)	1770	1583	0	3483	1863	1583
Flt Permitted	0.950			0.560		
Satd. Flow (perm)	1770	1583	0	1982	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		178				155
Link Speed (mph)	25			40	40	
Link Distance (ft)	766			499	603	
Travel Time (s)	20.9			8.5	10.3	
Peak Hour Factor	0.25	0.25	0.61	0.53	0.88	0.42
Adj. Flow (vph)	240	760	434	925	477	155
Shared Lane Traffic (%)						
Lane Group Flow (vph)	240	760	0	1359	477	155
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	18			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	0
Detector Template	Left	Right	Left			
Leading Detector (ft)	29	29	29	356	356	0
Trailing Detector (ft)	-5	-5	-5	350	350	0
Detector 1 Position(ft)	-5	-5	-5	350	350	-5
Detector 1 Size(ft)	34	34	34	6	6	34
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pm+ov	D.P+P	NA	NA	Perm
Protected Phases	4	1	1	1 2	2	
Permitted Phases		4	2			2
Detector Phase	4	4	1	1 2	2	2
Switch Phase						
Minimum Initial (s)	5.0	6.0	6.0		15.0	15.0
Minimum Split (s)	9.0	10.0	10.0		20.7	20.7
Total Split (s)	27.0	23.0	23.0		35.0	35.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (%)	31.8%	27.1%	27.1%		41.2%	41.2%
Maximum Green (s)	23.0	19.0	19.0		29.3	29.3
Yellow Time (s)	3.0	3.0	3.0		4.2	4.2
All-Red Time (s)	1.0	1.0	1.0		1.5	1.5
Lost Time Adjust (s)	0.0	0.0			0.0	0.0
Total Lost Time (s)	4.0	4.0			5.7	5.7
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0		5.0	5.0
Recall Mode	None	None	None		C-Min	C-Min
Act Effct Green (s)	23.0	45.7		50.0	29.6	29.6
Actuated g/C Ratio	0.27	0.54		0.59	0.35	0.35
v/c Ratio	0.50	0.81		0.91	0.74	0.24
Control Delay	30.5	20.8		24.4	32.6	4.5
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	30.5	20.8		24.4	32.6	4.5
LOS	C	C		C	C	A
Approach Delay	23.1			24.4	25.7	
Approach LOS	C			C	C	
90th %ile Green (s)	23.0	19.0	19.0		29.3	29.3
90th %ile Term Code	Max	Max	Max		Coord	Coord
70th %ile Green (s)	23.0	19.0	19.0		29.3	29.3
70th %ile Term Code	Max	Max	Max		Coord	Coord
50th %ile Green (s)	23.0	19.0	19.0		29.3	29.3
50th %ile Term Code	Max	Max	Max		Coord	Coord
30th %ile Green (s)	23.0	19.0	19.0		29.3	29.3
30th %ile Term Code	Max	Max	Max		Coord	Coord
10th %ile Green (s)	23.0	17.6	17.6		30.7	30.7
10th %ile Term Code	Max	Gap	Gap		Coord	Coord
Stops (vph)	50	122		538	358	8
Fuel Used(gal)	1	3		12	8	0
CO Emissions (g/hr)	67	176		811	561	28
NOx Emissions (g/hr)	13	34		158	109	6
VOC Emissions (g/hr)	15	41		188	130	7
Dilemma Vehicles (#)	0	0		48	24	0
Queue Length 50th (ft)	108	242		243	221	0
Queue Length 95th (ft)	42	21		160	325	0
Internal Link Dist (ft)	686			419	523	
Turn Bay Length (ft)						275
Base Capacity (vph)	478	933		1508	648	652
Starvation Cap Reductn	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.50	0.81		0.90	0.74	0.24

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 85	
Offset: 65 (76%), Referenced to phase 2:NBSB, Start of Yellow	

Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 24.3	Intersection LOS: C
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 217: Killingworth Tpke (Rt-81) & Clinton Crossing Outlets



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	30	1	0	2	10	740	0	0	606	7
Future Volume (vph)	15	0	30	1	0	2	10	740	0	0	606	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12	12	12	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.910				0.850					0.995	
Flt Protected		0.984		0.950				0.998				
Satd. Flow (prot)	0	1890	0	1770	0	1583	0	3532	0	0	1853	0
Flt Permitted		0.984		0.449				0.911				
Satd. Flow (perm)	0	1890	0	836	0	1583	0	3224	0	0	1853	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		102				45					6	
Link Speed (mph)		15			15			40			40	
Link Distance (ft)		653			532			422			499	
Travel Time (s)		29.7			24.2			7.2			8.5	
Peak Hour Factor	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.59	0.25	0.25	0.86	0.25
Adj. Flow (vph)	60	0	120	4	0	8	40	1254	0	0	705	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	180	0	4	0	8	0	1294	0	0	733	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1		1	1	0			0	
Detector Template	Left	Left		Left		Right	Left					
Leading Detector (ft)	29	29		29		29	29	0			0	
Trailing Detector (ft)	-5	-5		-5		-5	-5	0			0	
Detector 1 Position(ft)	-5	-5		-5		-5	-5	0			0	
Detector 1 Size(ft)	34	34		34		34	34	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0			0.0	
Turn Type	Perm	NA		D.Pm		Perm	Perm	NA			NA	
Protected Phases		4						2			2	
Permitted Phases	4			4		4	2					
Detector Phase	4	4		4		4	2	2			2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0		6.0	15.0	15.0			15.0	
Minimum Split (s)	10.9	10.9		10.9		10.9	21.5	21.5			21.5	
Total Split (s)	19.0	19.0		19.0		19.0	66.0	66.0			66.0	
Total Split (%)	22.4%	22.4%		22.4%		22.4%	77.6%	77.6%			77.6%	
Maximum Green (s)	14.1	14.1		14.1		14.1	59.5	59.5			59.5	

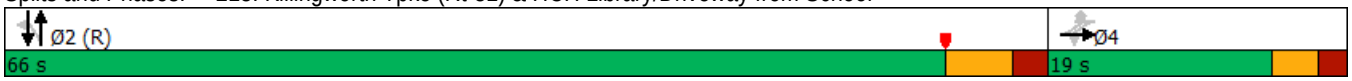
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.0	3.0		3.0		3.0	4.2	4.2			4.2	
All-Red Time (s)	1.9	1.9		1.9		1.9	2.3	2.3			2.3	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0			0.0	
Total Lost Time (s)		4.9		4.9		4.9		6.5			6.5	
Lead/Lag	Lag	Lag		Lag		Lag	Lead	Lead			Lead	
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes			Yes	
Vehicle Extension (s)	2.0	2.0		2.0		2.0	3.0	3.0			3.0	
Recall Mode	None	None		None		None	C-Max	C-Max			C-Max	
Act Effct Green (s)		8.9		8.9		8.9		64.7			64.7	
Actuated g/C Ratio		0.10		0.10		0.10		0.76			0.76	
v/c Ratio		0.62		0.05		0.04		0.53			0.52	
Control Delay		26.3		33.0		0.5		4.0			5.2	
Queue Delay		0.0		0.0		0.0		0.0			0.8	
Total Delay		26.3		33.0		0.5		4.0			6.0	
LOS		C		C		A		A			A	
Approach Delay		26.3			11.3			4.0			6.0	
Approach LOS		C			B			A			A	
90th %ile Green (s)	13.5	13.5		13.5		13.5	60.1	60.1			60.1	
90th %ile Term Code	Gap	Gap		Gap		Gap	Coord	Coord			Coord	
70th %ile Green (s)	10.4	10.4		10.4		10.4	63.2	63.2			63.2	
70th %ile Term Code	Gap	Gap		Gap		Gap	Coord	Coord			Coord	
50th %ile Green (s)	8.3	8.3		8.3		8.3	65.3	65.3			65.3	
50th %ile Term Code	Gap	Gap		Gap		Gap	Coord	Coord			Coord	
30th %ile Green (s)	6.1	6.1		6.1		6.1	67.5	67.5			67.5	
30th %ile Term Code	Gap	Gap		Gap		Gap	Coord	Coord			Coord	
10th %ile Green (s)	6.0	6.0		6.0		6.0	67.6	67.6			67.6	
10th %ile Term Code	Min	Min		Min		Min	Coord	Coord			Coord	
Stops (vph)		20		2		0		228			196	
Fuel Used(gal)		1		0		0		5			5	
CO Emissions (g/hr)		40		1		1		349			325	
NOx Emissions (g/hr)		8		0		0		68			63	
VOC Emissions (g/hr)		9		0		0		81			75	
Dilemma Vehicles (#)		0		0		0		23			40	
Queue Length 50th (ft)		40		2		0		86			99	
Queue Length 95th (ft)		0		3		0		74			194	
Internal Link Dist (ft)		573			452			342			419	
Turn Bay Length (ft)												
Base Capacity (vph)		398		138		300		2455			1412	
Starvation Cap Reductn		0		0		0		0			377	
Spillback Cap Reductn		0		0		0		0			0	
Storage Cap Reductn		0		0		0		0			0	
Reduced v/c Ratio		0.45		0.03		0.03		0.53			0.71	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 85	
Offset: 12 (14%), Referenced to phase 2:NBSB, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 51.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 218: Killingworth Tpke (Rt-81) & HCH Library/Driveway from School



10.4 CTDOT Division of Traffic Engineering Comments 12/31/2020

To: Office of Planning

From: Division of Traffic Engineering

Subject: Route 81 Corridor Study Final Report
Town of Clinton

Date: December 31, 2019

The Division of Traffic Engineering completed a review of the Route 81 Corridor Study Final Report in the town of Clinton and has the following comments/concerns. Please note that the Division understands this study has been underway for some time; however, Traffic Engineering only received the full study report to review on 11/6/2019.

General:

- Traffic Engineering cannot validate and substantiate the proposed lane use changes or the proposed roundabout designs without technical details.
- Proposed widening and lane use changes may require the replacement or upgrading of existing traffic signal equipment.
- Proposed sidewalk ramp work and pedestrian bump-outs may require the replacement or upgrading of existing pedestrian equipment including, but not limited to, new pedestals, new push buttons, and new pedestrian indications to meet the latest ADA requirements.
- Pedestrian refuge islands are not recommended as shown. Further details would need to be provided for justification.
- Some of the planted trees as shown may obstruct the intersectional sight distance along Route 81 and may also obstruct sightlines to pedestrians.
- Capacity analysis (Synchro) was not provided for the proposed lane use changes.
- Was consideration given to converting Walnut Hill Road to a single intersection?
- An encroachment permit will need to be obtained from the Department's District 2 Office of Permits prior to performing any work within the State highway right-of-way.
- Redevelopment of the Unilever site and the former Morgan School site is subject to a detailed OSTA review. Justification for three full access driveways on Route 81 for the Former Morgan School site will be needed during the OSTA review process.
- Other Department of Transportation offices such as Maintenance, Public Transportation, Planning, Highway Management Unit etc. should be contacted for additional comments.

Route 81 at Route 1 and Dan Vece Jr. Way

- Converting Dan Vece Jr. Way to one-way would require detailed analysis at the intersection of Route 1 at Route 81 and Dan Vece Jr. Way and the adjacent intersection of Route 1 at Commerce St. and Post Office Square. (pg. 73)
- CVS Pharmacy relocated the crosswalk across the west leg of Route 1 at the intersection with Route 81 and Dan Vece Jr. Way with a shorter crossing distance under permit. (pg. 73)
- The recommended enhancements to the rail trestle (bridge) over Route 81 is owned by Amtrak. Permission from Amtrak would be required. (pg. 75) In addition, please note the following

guidelines on the CTDOT website: Guidelines for Aesthetic Objects and Treatments within CTDOT ROW.

Route 81 at Central Ave.

- What will be the impact to the State highway system if a public roadway is constructed through the Unilever property connecting John Street and North High Street? (pg. 77)
- Is the proposed all way stop warranted on Route 81 at Central Ave.? Sightlines appear limited to the back of queue on Route 81 southbound due to the sharp curve just ahead of the intersection. (pg. 79)
- What is the report's definition of a traffic circle vs. a roundabout? Recommend revising wording to say roundabout for Central Ave. configuration. (pg. 79)
- Proposed Route 81 northbound 9-Town Transit bus stop location not recommended as shown. Sight distance to the back of a stopped bus is limited and the proposed location increases the number of potential pedestrian conflict points. Recommend having the bus travel down Central Ave. and stop at the same location as the southbound bus stop. (pg. 79)
- A roundabout on Central Ave. that requires the design vehicle make a multi-point turn is not recommended. (pg. 79)
- Recommend not installing the east crosswalk across Route 81 at the intersection with Central Ave. Sight distance to a crossing pedestrian is limited and the proposed location increases the number of potential pedestrian conflict points. It appears two crosswalks at this T-intersection would serve all potential pedestrian movements. (pg. 79)

Route 81 at I-95 Northbound Ramps and North High Street

- The report indicates that the DOT is planning signal upgrades at the I-95 ramp/North High Street intersection, but improvements are not planned at the North High Street/Route 81 intersection. Both intersections operate on the same controller and both intersections are scheduled for a full signal upgrade. (pg. 86)
- Landscaped medians are not recommended as shown because of their potential to restrict sightlines to pedestrians. (pg. 87)
- Proposed lane revisions and raised median islands to the I-95 ramp/North High Street and North High Street/Route 81 intersections requires further technical and geometric analysis. It appears that the proposed through movement from rightmost lane on North High Street does not align with the I-95 Northbound On-Ramp and is not recommended. (pg. 88)
- Reducing shoulder widths or lane widths on the bridge to accommodate a larger sidewalk will require additional analysis. (pg. 90)

Route 81 at Glenwood Road and Commuter Lot

- The report indicated left turns from Route 81 southbound into the shopping plaza near the intersection of Route 81 at Glenwood Road and the Commuter lot are warranted and occurring. However, the aforementioned driveway at the shopping plaza is currently right-in-only.

Recommend geometric improvements to the driveway to physically restrict left turn maneuvers into the plaza. (pg. 91)

- Proposed raised median on Route 81 to restrict lefts into the shopping plaza reduces the left turn storage for northbound and southbound traffic and may cause queues to backup past available storage lengths. (pg. 92)
- Allowing right turns out of the shopping plaza onto Route 81 is not recommended as shown. A right out driveway may encourage exiting vehicles to quickly weave across both lanes of Route 81 in order to access the I-95 southbound on-ramp left turn lane. (pg. 92)
- Sightlines from a Town road along a State highway are the responsibility of the municipality. Likewise, sightlines from a private drive along a State highway are the responsibility of the private property owner. (pg. 92)
- Adding a second southbound through lane at the intersection of Route 81 at Glenwood Road and the Commuter lot would require a full signal upgrade. The configuration as shown would lead to a left turn trap upstream and create an unfavorable through lane shift as you traverse through the intersection. In addition, it is unclear where Route 81 southbound would open to two lanes? (pg. 93)
- Please contact the Department of Transportation's (Department) planning office in regards to shared parking and upgrades at the commuter park and ride lot. (pg. 94-95)

Route 81 at I-95 Southbound Ramps and Former Morgan School Site

- The proposed primary site access and roadway modifications for the Indian River landing development opposite the I-95 southbound ramps needs advanced technical details. This intersection will be reviewed further during the OSTA review process when the development comes in for review. (pg. 98)
- The proposed two-lane on-ramp is not a preferred treatment unless capacity warrants the installation. It appears the merge resulting from the two-lane on-ramp would occur rather abruptly leading to additional vehicle conflict points. (pg. 98)

Route 81 at Library and Former Morgan School Site

- Following the closure of the Morgan School exit driveway, the signal at the entrance to the Town Library may not be warranted (pg. 100). A traffic signal warrant analysis will be required.
    - A proposed development driveway opposite the Library Drive as shown on Figure 6.6, is not shown on the recommendations section 7.13. Please address. (pg. 64 & pg. 100)
- On street parking does not appear to be appropriate along Route 81. In general, on-street parking reduces capacity, impedes traffic flow, produces undesirable traffic operations and increases the crash potential. (pg. 101)
- "Parking Shoulders" are not a typical treatment on State highways. Recommend revising/swapping the provided cross-section, so that the "Parking Shoulder" and parking lane are east of the Brick Buffer, sidewalk, and grass buffer and within the site of the proposed development. (pg. 101)
- Brick Paver Medians or Buffers are not typically allowed on State Roadways. Stamped asphalt may be pursued if the Town is willing to maintain it. (pg. 101 & pg. 113)

- The provided cross-section does not take into account bicyclists. Wider shoulders or bike lanes could be pursued. (pg. 101)

Route 81 Corridor

- Proposed roadway shoulder revision throughout the corridor to 5' wide as recommended on page 109 appears to contradict the recommendation of a 1' shoulder on Route 81 on page 101 and the narrowing of the shoulders on the bridge on page 90. Please address.
- Roadway widening is typically outside the scope of State funded resurfacing projects. The proposed widening throughout the corridor would involve acquiring ROW, utility relocation, drainage improvements, guiderail upgrades etc. (pg. 109)
- Proposed gateway and wayfinding signs located within the State highway ROW must adhere to the Department's Signing Guidelines. (pg. 115)