Final Transportation Improvements Plan

Long Ridge | High Ridge

CORRIDORS STUDY

PREPARED FOR
The City of Stamford
Connecticut

Western Connecticut Council of Governments (WCCOG)
Connecticut Department of Transportation (ConnDOT)

PREPARED BY
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IN ASSOCIATION WITH
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Fitzgerald & Halliday, Inc.

June 2015

Acknowledgments

The Long Ridge Road – High Ridge Road Corridors Study has been prepared under the direction of the City of Stamford Traffic Engineering Department and in coordination with the City Land Use Bureau, the Western Connecticut Council of Governments (WCCOG) and the Connecticut Department of Transportation (CTDOT). It is the culmination of two years of investigative and analytical efforts and contributions made by many Stamford residents, business owners, elected officials, municipal officials, advocacy groups, and state agency representatives. The study was guided by a Technical Advisory Group (TAG) led by Mr. Mani Poola, P.E. City Traffic Engineer and included representatives from:

City of Stamford

- Traffic Engineering Department
- Land Use Bureau

Federal and State Transportation Agencies:

- Western Connecticut Council of Governments (WCCOG)
- Connecticut Department of Transportation (CTDOT)
  Bureau of Policy & Planning
  Division of Traffic Engineering
  Project Development Unit
  Office of Strategic Planning and Projects

From the beginning, the High Ridge Road/Long Ridge Road Corridors Study was envisioned as a means of improving safety, mobility and accessibility along the corridors while making them a more enjoyable place to live and work. The LRR-HRR Corridor Study logo that was adopted embraces the multimodal nature of this study. The study recognized the need to reconnect the neighborhoods and communities of the City through integrated and safe transportation systems that provide multiple travel options.

Special thanks to the many contributors who participated in the many public forums, this vision has come to fruition in the form of balanced transportation system recommendations over the near and long-term that benefit all modes of transportation. These balanced recommendations are detailed in this final report.

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Study Process and Framework

This chapter presents the process and framework for the Long Ridge Road and High Ridge Road Corridors Study (LRR-HRR Study). The study goals, scope, study area, and evaluation criteria are presented in this chapter. In addition, an executive summary of study findings, development and execution of the public participation plan is also described in this chapter.

1.1 Study Background

The LRR-HRR Study is an initiative of the City of Stamford, in conjunction with the Western Connecticut Council of Governments (WCCOG) and the Connecticut Department of Transportation (CTDOT), working in close partnership with many Stamford residents, business owners, elected officials, municipal officials, advocacy groups, and state agency representatives.

The City of Stamford has long been aware that the transportation system has a great impact on the quality of life on City residents and visitors. The City's transportation system accommodates residents, businesses, and visitors while also handling regional "through" traffic between communities and cities along the "northeast corridor".

In the spring of 2010, the City of Stamford solicited qualifications statements from qualified and experienced transportation engineering/planning consultants to identify measures for improving traffic operations and safety along the High Ridge Road and Long Ridge Road corridors. The primary objectives of the project were identified as:

- To develop a plan of improvements for the High Ridge Road and Long Ridge Road corridors;

- To enhance traffic operations on the High Ridge Road and Long Ridge Road corridors;
- To improve traffic safety of High Ridge Road and Long Ridge Road corridors for all users;
- To reasonably accommodate all modes of transportation and users in the corridors;
- To support current and future economic development along the High Ridge Road and Long Ridge Road corridors based on input from the City Land Use Bureau;
- To develop a plan to responsibly manage access on both corridors and reduce congestion;
- To actively involve state and local stakeholders in the development of the plan; and
- To develop a High Ridge Road and Long Ridge Road Corridors Operational Improvements Plan, specifically in the vicinity of the Merritt Parkway interchanges on both corridors and for about a mile long section of High Ridge Road south of Merritt Parkway, and Bull's Head area.

In undertaking this study, the findings and recommendations of many previous studies were received and considered, including but not limited to:

- The 2005-2025 Stamford Master Plan
- The Stamford Downtown Streetcar Feasibility Study
- The East Main Street Neighborhood Corridor Plan
- The Stamford Traffic Calming Plan
- The Transportation Master Plan 2010
- Going Forward: The Plan to Maintain & Improve Mobility
- The Merritt Parkway Trail Demonstration project
- Southwestern Region ITS Strategic Plan
- US Route 1 Greenwich/Stamford Operational Improvements Study
- WCCOG Bicycle and Pedestrian Plan
- Complete Streets – Building Momentum in Connecticut

1.2 Study Vision and Goals

This transportation planning study will result in the development of a Comprehensive Multi-Modal Transportation Master Plan for the Long Ridge Road and High Ridge Road corridors which will guide the investment of future funding into the transportation system along the corridors. The Master Plan will take a holistic approach to transportation infrastructure needs and recommend a program of short, medium, and long-term capital improvements suitable for inclusion into the State of Connecticut Transportation Improvement Program (TIP).

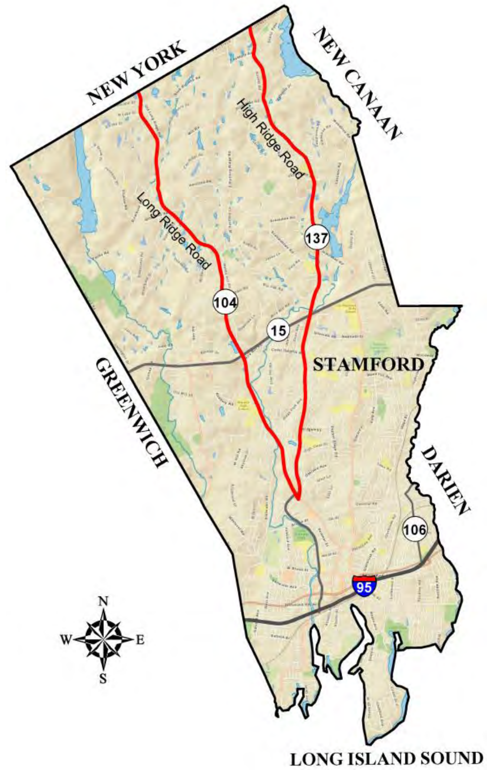
This study is critically important to the future economic viability and quality of life along the corridors. It reaches across all available modes of transportation (bus, bike, pedestrian, auto, etc.) and seeks to make modal connections and improvements consistent with sound land use planning. These efforts are aimed at increasing overall mobility, modal choice, and safety for residents, businesses, employees, and visitors while decreasing traffic congestion and its negative impacts on the environment, economy and quality of life.

To accomplish this vision, the following goals were established for the LRR-HRR Study:

- To analyze existing and potential interrelationships among transportation facilities, services and land-use.
- Based on State planning goals and local comprehensive plans, provide recommendations to accommodate development on along the corridors without creating adverse community or environmental impacts.
- To develop, through an open, public planning process, recommendations to accommodate future travel demands while enhancing environmental quality, multimodal traveler safety and other important quality of life aspects, where possible.
- To determine the current operational characteristics and deficiencies of the transportation system.
- To develop and compare future conditions of the transportation system with and without transportation demand management plans and proposed transportation improvements.
- To recommend multimodal transportation system improvements that enhance efficiency and safety.

- To formulate recommendations that are compatible with and help preserve the capacity of future transportation improvements.
- To build a consensus for proposed transportation improvements and sustainable development through public forums.
- To establish a framework for enhanced public education and for improved communication between governmental agencies that can be built upon during the implementation of study recommendations and other projects in the City.
- To promote the equitable sharing of the transportation system's benefits and to accommodate such considerations as age, income, physical and mental ability and transit dependency.
- To develop a blueprint which will guide the funding and implementation efforts for the LRR-HRR Study’s recommended improvements.

1.3 Study Area



The project study area consists of the entire length of the Long Ridge Road and High Ridge Road corridors (highlighted in red on the right) within the City of Stamford, beginning at their intersection at the "Bull's Head" in the south and extending approximately seven miles to the New York State border in the north.

Figures 1-1S & 1-1N identify the 44 intersections along the corridors that were chosen to be investigated in greater detail. These study intersections were selected for analysis based on a variety of criteria, including traffic congestion, safety, and operational concerns.

Path: J:\41749.00\GIS\Project\Figures\Figure One Study Intersections.mxd

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 1-1 (S)

Study Intersections

Legend

- Signalized Intersection
- Unsignalized Intersection (Stop-Sign Control on Side Streets)
- Project Corridor

Long Ridge Road

1 Long Ridge Road at High Ridge Road/Bedford St/Summer St.
2 Long Ridge Road (Route 104) at Cold Spring Road (Route 137)
3 Long Ridge Road (Route 104) at Drives to Olin Chemicals/ Lord & Taylors
4 Long Ridge Road (Route 104) at Terrace Avenue/260 Long Ridge Rd. Driveway
5 Long Ridge Road (Route 104) at Woodridge Drive South
6 Long Ridge Road (Route 104) at Stillwater Road/Buckingham Drive
7 Long Ridge Road (Route 104) at Drive to Long Ridge Office Park
8 Long Ridge Road (Route 104) at Loughran Avenue/G.E. Energy Financial Services
9 Long Ridge Road (Route 104) at Nestle/Oracle Drives
10 Long Ridge Road (Route 104) at Route 15 NB Off Ramp/Wire Mill Road
11 Long Ridge Road (Route 104) at Route 15 SB Ramps/ Webbs Hill Road
12 Long Ridge Road (Route 104) at Chestnut Hill Road/Butternut Lane
13 Long Ridge Road (Route 104) at Hunting Ridge Road S
14 Long Ridge Road (Route 104) at Wildwood Road
15 Long Ridge Road (Route 104) at River Bank Road
16 Long Ridge Road (Route 104) at Erskine Road
17 Long Ridge Road (Route 104) at Old Long Ridge Road (northern)

High Ridge Road

18 High Ridge Road (Route 137) at Cold Spring Road (Route 137)
19 High Ridge Road (Route 137) at Lord & Taylor Drive/Bulls Head Shopping Center
20 High Ridge Road (Route 137) at Oaklawn Avenue/ Cross Road
21 High Ridge Road (Route 137) at Terrace Avenue/ 225 High Ridge Rd. Driveway
22 High Ridge Road (Route 137) at Unity Road/Brownley Road
23 High Ridge Road (Route 137) at Lakeview Drive/Rippowam High School Drive
24 High Ridge Road (Route 137) at Loveland Road
25 High Ridge Road (Route 137) at Dannel Drive/Mercedes Lane
26 High Ridge Road (Route 137) at Ridge Park Road
27 High Ridge Road (Route 137) at Hartswood Road
28 High Ridge Road (Route 137) at Bradley Place
29 High Ridge Road (Route 137) at Merriman Road
30 High Ridge Road (Route 137) at Vine Road/Private Drive
31 High Ridge Road (Route 137) at Cedar Height Road/Turn of River Road
32 High Ridge Road (Route 137) at Olga Drive/Private Drive
33 High Ridge Road (Route 137) at Square Acres Drive/Shopping Plaza
34 High Ridge Road (Route 137) at Route 15 NB Ramps/Buxton Farms Road
35 High Ridge Road (Route 137) at Route 15 SB Ramps
36 High Ridge Road (Route 137) at Wire Mill Road
37 High Ridge Road (Route 137) at Scofieldtown Road
38 High Ridge Road (Route 137) at Interlaken Road
39 High Ridge Road (Route 137) at Brookdale Road
40 High Ridge Road (Route 137) at North Stamford Road (southern)
41 High Ridge Road (Route 137) at North Stamford Road (northern)
42 High Ridge Road (Route 137) at Sunset Road
43 High Ridge Road (Route 137) at Briar Brae Road
44 High Ridge Road (Route 137) at Mayapple Road

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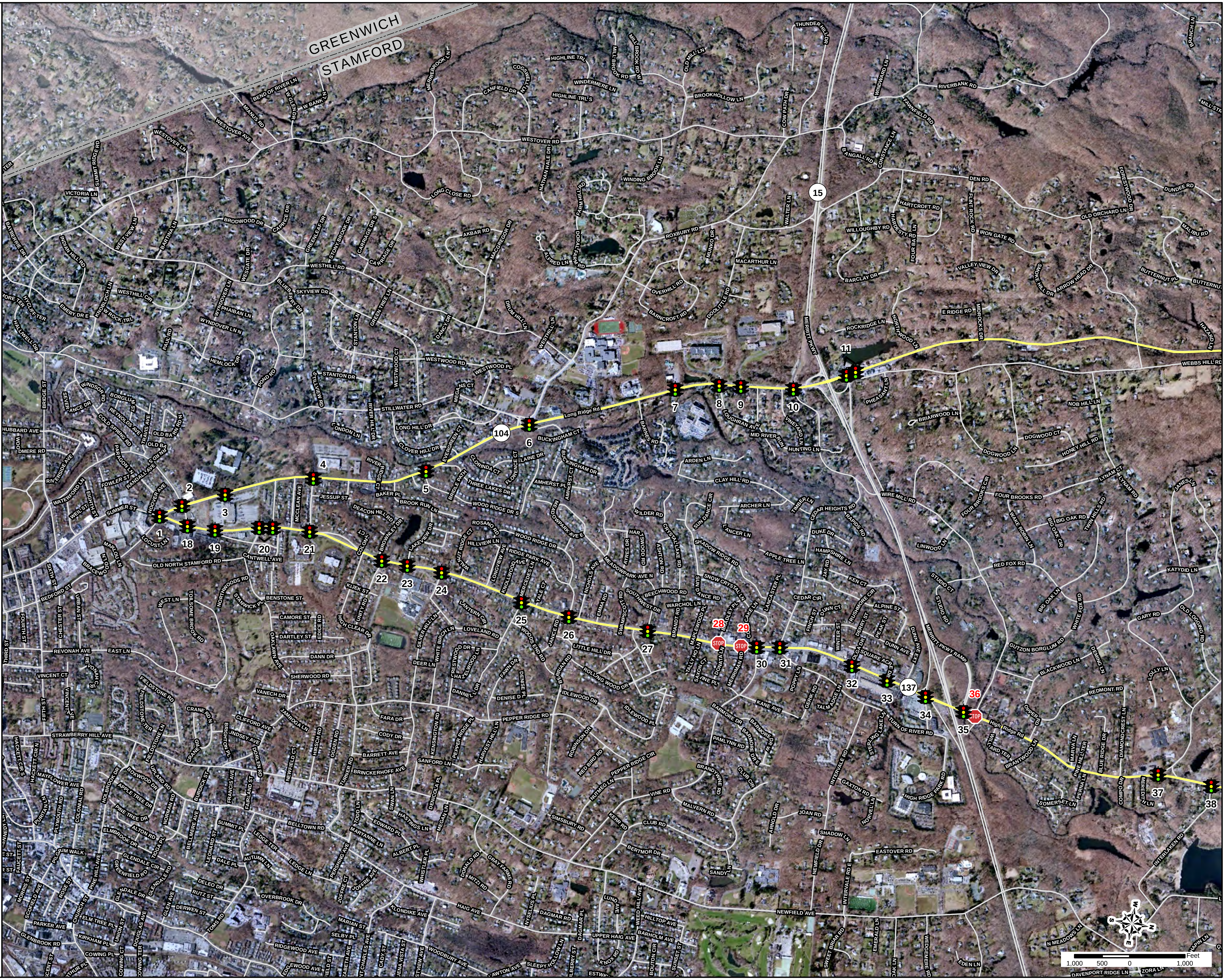
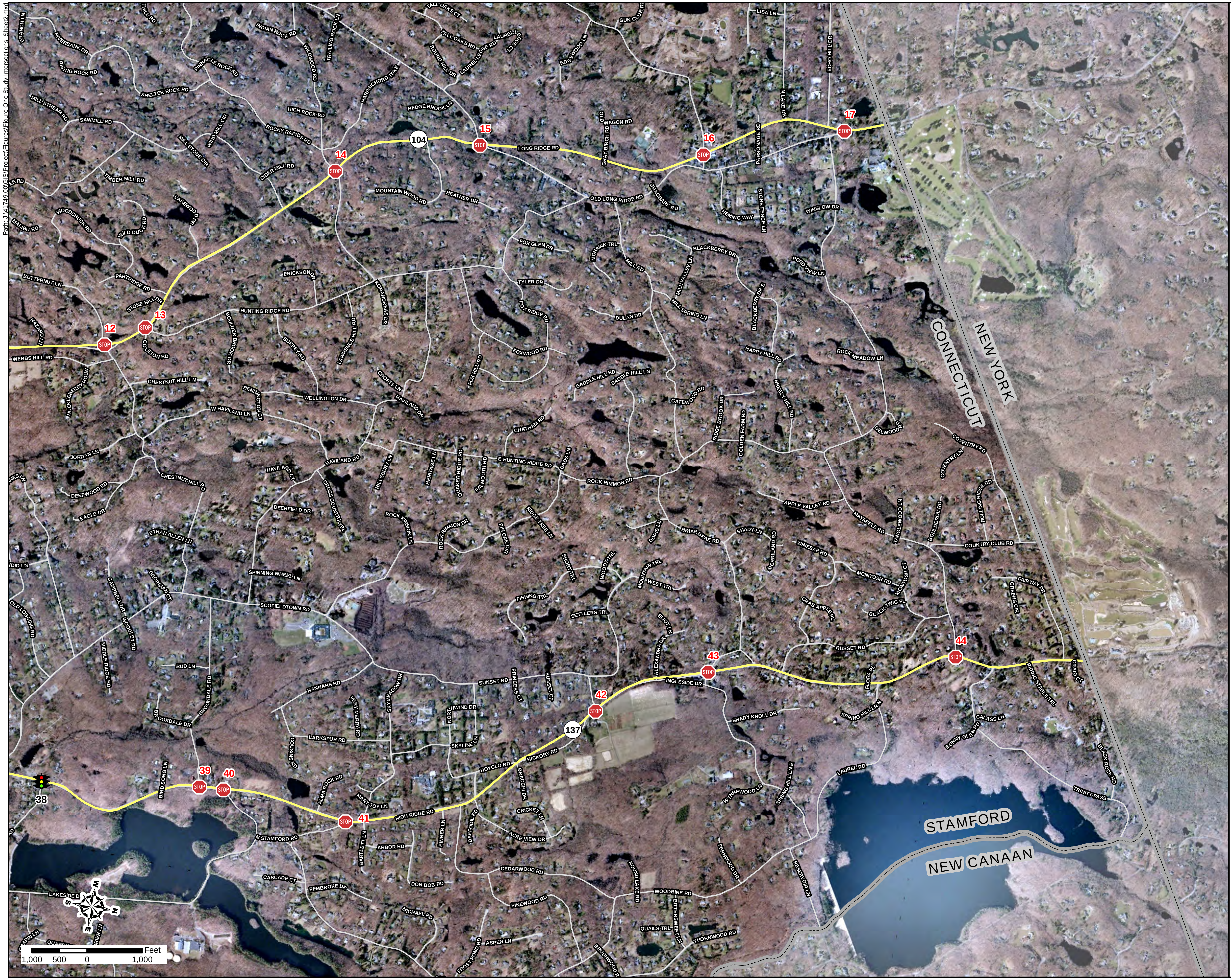
Base Map Source: USGS 2008 High Resolution Orthoimagery for
the Bridgepor t, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)





Long Ridge | High Ridge
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Figure 1-1 (N)

Study Intersections

Legend

- Signalized Intersection
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44	High Ridge Road (Route 137)	at	Mayapple Road

City of Stamford, Connecticut

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

The roadway network in the corridor is largely defined by commuter patterns in the area and the historical drive to accommodate automobile traffic. North of the parkway, both corridors generally serve the City's hinterlands and are a conduit from the suburban communities of Bedford and Pound Ridge to Stamford's vibrant center of commerce downtown. In these sections, the corridors provide one travel lane in each direction with narrow shoulders and few, if any, facilities to adequately accommodate pedestrians, cyclists and transit users.

The study area is bisected by the Merritt Parkway, which is a regional roadway connecting all of the major population centers along the Connecticut shoreline. As such, it too funnels substantial volumes of traffic from these nearby communities to both corridors to get to Stamford's downtown, as well as serving Stamford residents who use the corridors and the Parkway to commute to and from their places of work as well as to leave the City for remote recreation and entertainment activities. In these sections, the corridors provide two travel lanes per direction with shoulders and sidewalks in some places which begin to form the nucleus of an infrastructure to serve pedestrians, cyclists and transit users.

1.4 Study Process

A comprehensive regional transportation planning initiative requires a well-defined structure and process. The LRR-HRR Corridor Study is comprised of seven primary tasks:

1.4.1 Task 1: Study Initiation, Management and Control

Establish the study framework, including the goals, objectives, evaluation/screening criteria, and public participation plan.

1.4.2 Task 2: Public Involvement

Public involvement will take place at three different levels (public, committee, and institutional) throughout the study in order to provide the opportunity for both broad public outreach and more in-depth stakeholder participation.

1.4.3 Task 3: Data Collection and Existing Conditions Analyses

Collect data and evaluate the current transportation system, land use, and socioeconomic conditions in the study area.

1.4.4 Task 4: Future Conditions and Analyses

Forecast future travel conditions in the study area based upon current and projected travel trends as well as anticipated land use and development changes for short-, mid-, and long-term timeframes.

1.4.5 Task 5: Development of Improvement Alternatives

Develop improvement alternatives suitable for future implementation that meet the stated goals and objectives. Improvements may include capital projects, policy changes, or general strategies to improve the overall transportation system or system use.

1.4.6 Task 6: Evaluation of Improvement Alternatives

Evaluate improvement alternatives with the goal of identifying a preferred set of improvements for short-, medium- and long-term timeframes, including integrated land use scenarios.

1.4.7 Task 7: Detailing of Recommended Program and Final Plan

Develop a multimodal Transportation Improvement Plan with a recommended program of short-, medium-, and long-term capital improvements suitable for inclusion into the State of Connecticut TIP**.**

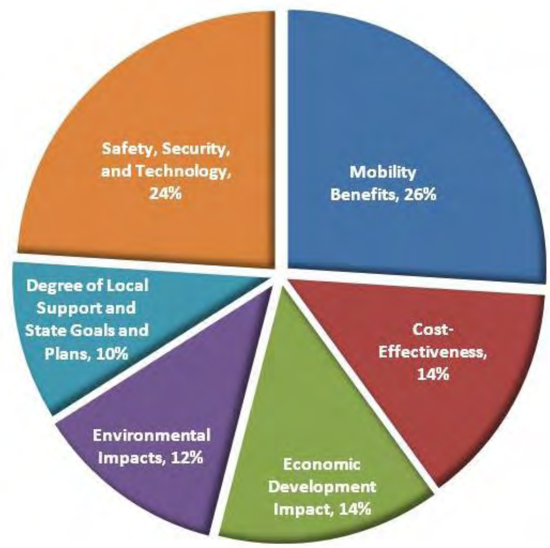
1.5 Summary of Findings

This final report of the Long Ridge Road – High Ridge Road Corridors Study summarizes two years of coordinated planning efforts by many Stamford residents, business owners, elected officials, municipal officials, advocacy groups, and state agency representatives. The study was led by the City of Stamford and guided by a Technical Advisory Group (TAG).

This report includes seven chapters that generally correspond to the major work tasks. Highlights from each chapter are discussed below.

Chapter 1 – Study Process and Framework

The process and framework for the Study is summarized in Chapter 1. The study goals, scope, study area, and weighted evaluation criteria are discussed. The proposed evaluation criteria are consistent with the Connecticut Statewide Planning Program Transportation Improvement Program (TIP) criteria for evaluation of proposed projects, including mobility benefits, cost-effectiveness, economic development impact, environmental impact, degree of support, and safety/security/ technology.



In addition, the development and execution of the public participation plan is detailed. Every outreach meeting throughout the course of the study is noted in Chapter 1.

Chapter 2 – Existing Conditions

Chapter 2 establishes the baseline conditions and helps identify deficiencies and needs while establishing the extents of the sensitive environmental resource areas on the corridors that are to be preserved and enhanced. Sections of this chapter present social and economic demographics, land use, inventories of the transportation infrastructure, system demands and performance, trip patterns, safety reviews, and environmental resources.

Chapter 3 – Future Conditions

The forecasted future 2016, 2026 and 2036 transportation conditions along the corridors are described in Chapter 3. The forecast considers land use and transportation relationships and includes planned and potential land developments that are likely to influence traffic patterns. It is important to establish future conditions in this manner to ensure that any expensive/long-term recommendations to improve the transportation system yield lasting benefits and are not “Band-Aid” fixes.

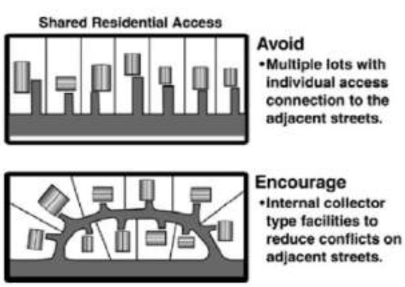
Chapter 4 – Alternatives

Chapter 4 presents a summary of the alternatives and policies that have been identified as having the greatest potential to address transportation system issues, deficiencies, and opportunities. The alternatives include transit (bus and rail), pedestrian/bicycle, and roadway options. These alternatives are evaluated and prioritized using the evaluation criteria from Chapter 1, and recommended alternatives are presented. Based on the detailed investigations and analyses performed for this study it is recommended that the City and State, as appropriate, adopt the following recommended policies and endeavor to implement the recommended transit, pedestrian/bicycle, and roadway improvements summarized below.

Recommended Policies

Policy recommendations include:

- Promote safety as a top priority within all infrastructure projects (including requiring Road Safety Assessments (RSAs) where appropriate) and target educational activities to current and future travelers to improve safety for all transportation modes;
- Continue to develop land use policies/ Zoning Ordinances that are consistent along the corridors and which support transit-oriented development where proven effective;



- Ensure that the Comprehensive Land Use Plans and Zoning Ordinances reflect goals, objectives, and policies that support safety and access management where appropriate and incorporate the LRR-HRR Corridor Study policies;
- Establish/Enhance Travel Demand Management (TDM) program requirements in Zoning Ordinances for new, large projects; for projects over certain thresholds, consider traffic monitoring requirements for exceeding traffic thresholds;
- Develop a bicycle parking/sidewalk Zoning Ordinance that includes bicycle parking and sidewalk requirements into site plan review along the corridors;
- Promote a Complete Streets approach to design and renovation of infrastructure that ensures safety and mobility for all travelers are considered;

- Reduce (Green House Gas) GHG emissions through comprehensive actions that lower Vehicle Miles of Travel (VMT) and allow safe non-motorized travel, reduce vehicle idling time, enable the use of lower GHG fuels, and encourages fuel-efficient vehicles;
- Plan, design, build, and standardize the delivery, preservation, and maintenance solutions necessary to achieve green infrastructure. Comprehensive solutions include materials, elements, systems, activities, and performance connected to the infrastructure;
- Expand the City bicycle network through bicycle suitability studies for local roads and the development of bicycle plans for each corridor to increase the number of suitable roads for bicycles linking key destinations to improve mobility; and
- Establish a strategic transportation committee to oversee the implementation of the recommended actions and policies from this study and discuss important policy issues mentioned in the plan but beyond the scope of the study. Potential members could include representation from the City of Stamford councils, chamber of commerce, tourism, CTDOT, CT Transit or other citizen, social, or civic groups.

Create/Promote Park & Ride Opportunities

- Provide more Park & Ride capacity by the Merritt Parkway, as needed to meet demand; and
- Improve marketing of the Park & Ride program.

Recommended Bicycle Improvements

Bicycle system recommendations include:

- Widen Long Ridge Road and restripe it to create a continuous bicycle route along by providing shoulders of adequate width to accommodate cyclists with a different surface color and wider white edge line (6 to 8 inches) to differentiate it from the vehicular traveled way;
- Widen High Ridge Road north of the Merritt Parkway and restripe it south of the Merritt parkway to create a continuous bicycle route along by providing shoulders of adequate width to accommodate cyclists with a different surface color and wider white edge line (6 to 8 inches) to differentiate it from the vehicular traveled way;
- Make both corridors more accommodating for cyclists by implementing measures to reduce the roadways' operating speeds;
- Implement new bicycle accommodations at various locations and provide connections to new trails (Mill River & Merritt Pkwy) being pursued in the area;
- Improve the connectivity between opposite sides of the roads for cyclists at busy intersections by adding and upgrading crosswalk facilities.
- Develop City-wide routes for cyclists and install signs to inform bicyclists of route changes, confirm route direction, distance, and destinations; and,
- Increase marketing of bicycle routes.

Recommended Pedestrian Improvements

Pedestrian system recommendations include:

- Provide a continuous pedestrian route along both sides of both corridors by extending and upgrading existing sidewalks;
- Improve accessible routes along existing sidewalks for people with disabilities;
- Extend sidewalk connections into the adjacent residential neighborhoods;
- Provide connections to new trails being pursued in the area and provide safe pedestrian crossings of the corridors at those locations;
- Make both corridors more accommodating for pedestrians by implementing measures to reduce the roadways' operating speeds; Implement additional improvements from RSAs to be determined; and

- Improve the connectivity between opposite sides of the roads for pedestrians and transit users by adding and upgrading pedestrian crosswalks.

Shared-Use Path

As an alternate to widening broad roadways north of the Merritt Parkway to provide shoulders which will accommodate cyclists and pedestrians, seek to construct a shared-use path parallel to both corridors to the north of the Merritt Parkway.

Recommended Transit Improvements

Transit recommendations include:

- Provide a continuous ADA accessible pedestrian route from bus stops to local destinations;
- Improve the connectivity between opposite sides of the roads for transit users by adding and upgrading pedestrian crosswalks to include countdown signals and other features;
- Install or upgrade shelters are busier bus stops;
- Convert the northbound right-turn lane on High Ridge Road at Terrace Avenue to a bus pull-off lane;
- Work with major employers and commercial centers along the corridors to evaluate options to strengthen or extend existing bus service; and
- Outfit CT Transit buses with GPS devices and develop an internet application to provide users real-time information regarding bus location and estimated arrival times through the use of their personal computers and smart phones.

Recommended Roadway Improvements

Roadway recommendations include:

Bulls Head

- Convert the double right turn from Bedford Street onto High Ridge Road into a single right-turn lane and use the recovered pavement to create a sidewalk and a shoulder for cyclists;
- At each signalized intersection in the Bulls Head area, reduce the signal cycle lengths to 90 seconds (shorter cycle lengths have shorter red intervals

resulting in shorter delays and queues) and refine signal timings and coordination. Set offset at the Long Ridge Road/High Ridge Road intersection to optimize through flow progression along both streets to accommodate demand.

- Convert the north end of Summer Street to accommodate two-way traffic (but not permitting left-turns to Long Ridge Road) to allow motorists working in the buildings at the north end of Summer Street (including 3001 Summer Street) to exit to the north without proceeding south on Summer Street and doubling back; and,
- Evaluate the potential to provide a connection between Cold Spring Road and both corridors, bypassing the Bulls Head.

Long Ridge Road

- Add left-turn lanes on Long Ridge Road at the driveways to 120/150, 260, 710 Long Ridge Road and at Barnes Road;
- Widen Long Ridge Road sufficiently to provide 5' wide shoulders to accommodate cyclists;
- Reconstruct the northbound Parkway Exit Ramp to provide a double channelized right-turn lane (in the short-term, widen the ramp at Long Ridge Road to provide a 110-foot long through lane on the exit ramp so that through traffic does not block right-turning traffic) and add a dummy, northbound left-turn phase to allow eastbound right-turns to run on the overlap;
- Install a roundabout or traffic signal and a left-turn lane at the intersection of Chestnut Hill Road;
- Tee up the intersection of Hunting Ridge Road with Long Ridge Road;
- Install a traffic signal or channelize the eastbound right-turn lane at the intersection of Wildwood Road; and,

Improvements to the intersection of Long Ridge Road and Stillwater Road are beyond the Scope of this study and are being developed under a separate study.

High Ridge Road

- Provide a curb bump out at Halpin Avenue to slow northbound, right-turning vehicles on High Ridge Road at Halpin;
- Provide separate controllers for the intersections of High Ridge Road with Oaklawn Avenue and Cross Road so that they operate independently, but set the coordination so that green on the High Ridge Road through phases ends at the same time at both signals;

- Restripe High Ridge Road sufficiently to provide minimum 5' wide shoulders to accommodate cyclists;
- Widen High Ridge Road between Vine Road and Cedar Heights Road to accommodate side-by-side left-turn lanes and 5-foot shoulders on either side of the roadway;
- At the High Ridge Road intersections with Cedar Heights Road/Turn of River Road and Vine Road, restripe the Cedar Heights Road and Turn of River Road approaches, upgrade the signal equipment and reconfigure the operation of the signal to simplify the operation and increase the capacity of these intersections;
- Upgrade capacity at both Merritt Parkway ramp intersections with High Ridge Road by installing two roundabouts or by adding a second lane to the southbound ramp jug handle and reconfiguring/widening the intersection of High Ridge Road with the northbound ramp;
- Replace the existing traffic signal at the intersection of Scofieldtown Road and High Ridge Road with a roundabout; and
- Widen High Ridge Road between Sky Meadow Drive and North Stamford Road to provide left-turn lanes, in addition to 5-foot wide shoulders, and tee up the intersection of North Stamford Road.

Traffic Signal Optimization

- Improve coordination of corridor traffic signals, particularly closely spaced intersections near the Parkway and at Bulls Head; and
- Develop a program to maintain traffic signal equipment, collect new traffic volume data, and regularly fine-tune timings.

Safety Improvements

Safety improvements include:

- Providing separate areas of the roadways to accommodate motorists, bicycles and pedestrians;
- Implementing a 3-step process to reduce vehicles speeds along both corridors (install interactive speed signs, evaluate the reduction in speed and make a determination as to whether the roadways' posted speed limits may be reduced);

- Improving sightlines at problem intersections and conducting routine maintenance to ensure that unmanaged vegetation does not grow to obstruct visibility;
- Installing Chevrons on High Ridge Road at the curve north of Interlaken Road;
- Upgrading pedestrian crosswalk facilities to include high-visibility crosswalks and countdown signals;
- Install channelizing islands at either end of Terrace Avenue, Mclean Avenue and Cross Road to calm traffic as it enters these residential streets;
- Close Vineyard Lane, make it one-way westbound or prohibit right turns (perhaps just during peak hours) into Vineyard Lane to stop vehicles turning right from Long Ridge Road and cutting through to Wire Mill Road;
- Install an all-way STOP sign (with Stop Ahead sign) at the intersection of Hunting Lane with Wire Mill Road and interactive speed signs on Wire Mill Road to calm traffic;
- Add left-turn lanes on Long Ridge Road at the driveways to 120/150 and 260 Long Ridge Road;
- Add warning signs and supplementary panels at select locations;
- Install a roundabout or traffic signal and a left-turn lane at the intersection of Long Ridge Road with Chestnut Hill Road;
- Install a traffic signal or channelize the eastbound right-turn lane and improve sightlines at the intersection of Long Ridge Road with Wildwood Road;
- Provide a curb bump out at Halpin Avenue on High Ridge Road to slow northbound, right-turning vehicles on High Ridge Road at Halpin Avenue and install a pedestrian crosswalk across Halpin Avenue;
- Eliminate parking along both corridors south of the Merritt parkway and, most particularly, eliminate parking where motorists are required to back out into the street to leave a parking space;
- Consolidate access to commercial properties, particularly along High Ridge Road.

Aesthetic Improvements

- Adopt and promote consistent landscape, streetscape and signage plans along both corridors;

- Where conditions permit, either through lane reductions or access consolidation, introduce landscaped areas to currently paved areas along the corridor; and

- Install textured crosswalks at each signalized intersection in the Bulls Head area, install textured crosswalks.

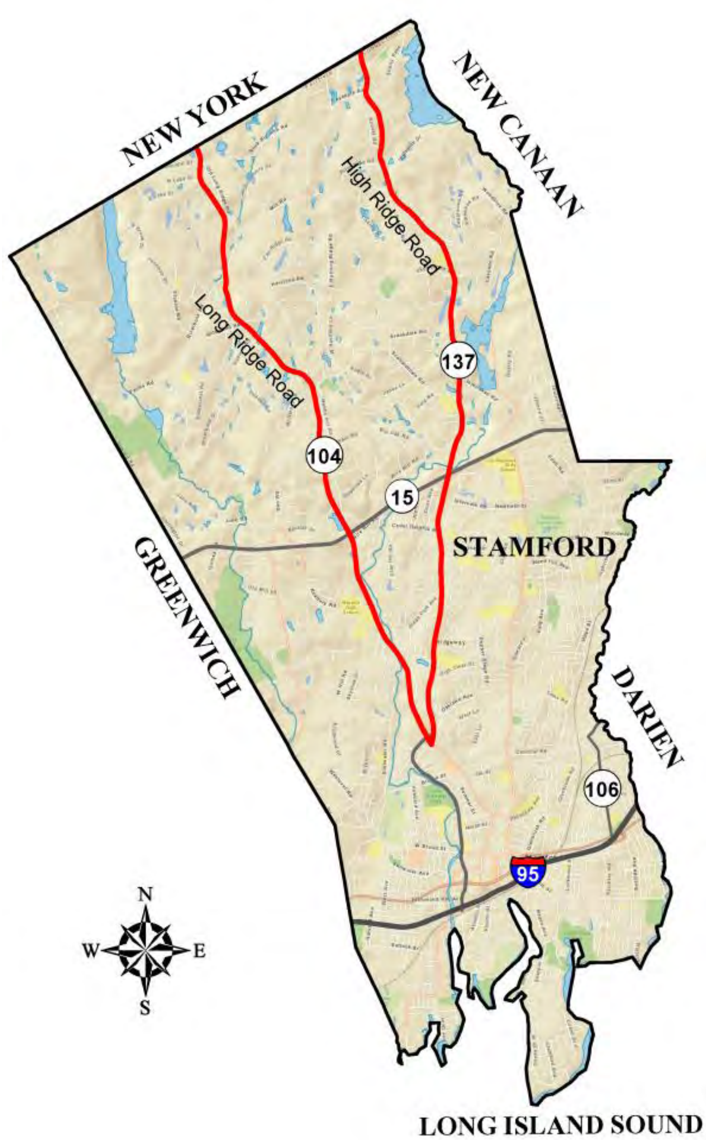
Chapter 5 – Transportation Improvements
Chapter 5 includes further refinements to the options presented in Chapter 4 and establishes "phased and prioritized" recommendations. The resulting Transportation Improvement Plan for the Corridors includes actions that are recommended in the immediate-term (under 1 year), short-term (1 to 5 years), mid-term (6 to 15 years) and long-term (over 16 years).

Chapter 6 – Urban Design Improvements
Chapter 6 presents a series of Toolkits to correspond with the traffic improvements outlined in Chapter 5. This chapter has reviewed, evaluated and outlined the benefits of Complete Street Design and Smart Growth to provide a framework for providing improvements applicable within the corridors. The purpose of the Toolkits is to provide Stamford with guiding criteria, based in current theory, to consider in conjunction with the proposed roadway improvements. Both Complete Street Design and Smart Growth were outlined separately and individual Toolkits developed.

Chapter 7 – Implementation Plan
Chapter 7 presents the Implementation Plan for each recommendation. At the outset of the study, the final report was envisioned to serve as a "vehicle" for project implementation across all modes. The action plan presented in Chapter 6 identifies implementation steps and facilitating organizations for each recommendation. A summary of the Implementation Plan including next steps in the implementation process, the responsibility party, and the actions associated with each of the general timeframes is presented in Table ES-1.

Many of these recommendations hinge on TIP programming and funding, which also means that consensus is needed at the municipal and community level that the recommendation is worthy of TIP programming. As the owner of the Corridors, CTDOT plays a major role in the advancement of these recommendations. CTDOT cannot implement any major infrastructure improvements unless they are approved through the TIP. As an initial step, the City of Stamford would need to take the lead on getting these recommendations included in the TIP.

It is acknowledged that the recommendations presented herein represent a significant investment in potential transportation-related infrastructure. These projects represent an investment in total that likely exceeds available TIP funding as presently programmed. Since most projects listed are not even on the TIP yet, the advancement of the recommendations developed as part of this study will require prioritization in order to address current fiscal constraints as related to transportation improvements. Besides prioritization, identification of potential funding sources and availability to leverage funding could alter priorities.



Long Ridge | High Ridge CORRIDORS STUDY

Table ES-1 Implementation Plan

	RECOMMENDATION	NEXT STEPS	RESPONSIBLE PARTY	IMPLEMENTATION TIMEFRAME: IMMEDIATE-TERM (LESS THAN 1 YEAR)	SHORT-TERM (1-5 YEARS)	MID-TERM (5-10 YEARS)	LONG-TERM (GREATER THAN 10 YEARS)
TRANSIT IMPROVEMENTS	Encourage Transit Oriented Development	Adopt policies to encourage TOD	City of Stamford		Incorporate text in the City Code to encourage development that promotes transit use		
	Maintain or Expand Bus Service	Evaluate options to strengthen or extend existing bus service	CT Transit		Evaluate options to strengthen or extend existing bus service		
	Construct Landing area for Bus shelter and install shelters	Coordinate with CT Transit and identify funding	City of Stamford , CT Transit		Design and construction		
	Strengthen Connection with Transit-generating Centers	Construct sidewalks and crosswalks	City of Stamford/CTDOT		Construct sidewalks and crosswalks for stops		
	Enhance the Transit Experience	Advance development of enhancements, GPS tracking	CT Transit		Construct/implement enhancements		
	Encourage Corridor Employers to Institute Transit Programs for Employees	Meet with major employers to discuss programs	CTDOT, City of Stamford	Institute transit-friendly strategies and programs	Construct improvements at major employers		
	Create Additional Park & Ride Opportunities	Identify potential sites and develop implementation plan	CTDOT, City of Stamford		Site Identification, design, right-of-way actions, construction of additional facilities		
PEDESTRIAN/ BICYCLE IMPROVEMENTS	Shared Use Paths (North of Merritt Parkway)	Pursue Study & Development	CTDOT, City of Stamford			Design, permitting, right-of-way actions	Design, permitting, phased construction
	Modify Corridors (restripe or widen) to provide shoulders of adequate width (5'+) to accommodate cyclists	Restripe roadways/Advance Study & Development	CTDOT, City of Stamford		Restripe roadways of sufficient width to accommodate shoulders suitable for bicycles	Design, permitting, right-of-way actions for widening roadways to accommodate shoulders for cyclists (where no shared path)	Phased construction for roadway widening (where no shared path)
	Implement Measures to Reduce the Roadways' Operating Speeds	Prioritize roadway segments	CTDOT		Install interactive speed signs in conjunction with before and after speed studies		
	Develop City-wide Destination Signing for Bicycles	Prioritize routes for signing	CTDOT, City of Stamford		Develop signing plans and install signs		
	Implement New Bicycle Accommodations & Provide Connections to New Trails	Identify locations where bicycle accommodations should be added	CTDOT, City of Stamford	Identify locations	Add new bicycle facilities	Plan for connections to new trails	
	Improve the connectivity between opposite sides of the busy intersections	Prioritize locations and advance development of bicycle detection enhancements	CTDOT, City of Stamford	Identify locations for immediate action	Install Crosswalk Upgrades		
	General Upgrades of Sidewalks	Prioritize improvements	CTDOT, City of Stamford	Implement early-action items to prioritize locations for upgrade and funding	Design, construction of improvements	Continue to add sidewalks into the residential neighborhoods	
ROADWAY CAPACITY & SAFETY IMPROVEMENTS	Consolidation of Access Improvements	Be alert for opportunities to implement	CTDOT, City of Stamford	Review all applications for properties along the corridor for potential opportunities	Design, permitting, right-of-way actions	Phased construction	Phased construction
	Traffic Signal Optimization	Prioritize locations for optimization	CTDOT, City of Stamford	Fine-tune traffic signal timings	Maintain equipment, collect new counts, fine-tune traffic signal timings		
	Intersection Improvements (minor changes to operation)	Prioritize improvements	CTDOT, City of Stamford	Implement early-action items to identify improvement measures and funding	Design, permitting, construction of short-term improvements	Design, permitting, construction of longer-term improvements	Complete construction of longer-term improvements

Table ES-1 Implementation Plan

	RECOMMENDATION	NEXT STEPS	RESPONSIBLE PARTY	IMPLEMENTATION TIMEFRAME: IMMEDIATE-TERM (LESS THAN 1 YEAR)	SHORT-TERM (1-5 YEARS)	MID-TERM (5-10 YEARS)	LONG-TERM (GREATER THAN 10 YEARS)
	Intersection Reconstruction (significant changes to operation)	Prioritize improvements	CTDOT, City of Stamford	Advance design, permitting	Design, permitting, right-of-way actions	Construction of longer-term improvements	Construction of longer-term improvements
	Localized Safety Improvements	Prioritize improvements	CTDOT, City of Stamford	Implement early-action items from RSAs	Design, permitting, construction of short-term improvements	Design, permitting, construction of longer-term improvements	
	Bulls Head By-pass	Undertake a Design Study	CTDOT, City of Stamford		Project Design & Approval	Construction Design, permitting, right-of-way acquisition	Construction
	Streetscape & Traffic Calming Improvements	Advance design	CTDOT, City of Stamford	Advance design, permitting	Design, permitting, construction of short-term improvements	Design, permitting, construction of longer-term improvements	
Land-Use Planning	Modify Zoning to Encourage Transit, Pedestrian & Bicycle Use	Adopt policies to encourage TOD, walking and cycling	City of Stamford	Develop Zoning Text to encourage TOD, walking and cycling	Incorporate text in City Code to promote transit, walking and cycling		
Land-Use Planning	Modify Comprehensive Plan to Promote Transit/Walking and Cycling	Review Comp Plan for inconsistancies	City of Stamford	Review for inconsistencies	Revise next interation of the Comprehensive Plan to promote transit, walking and cycling		
Land-Use Planning	Promote Safety as a Top Priority	Require all new applications to evaluate safety	City of Stamford	Identify project-related safety improvements	Ensure project-related safety improvements are completed as required by project approval		

1.6 Public Involvement Plan

The Public Involvement Plan provides a framework for undertaking a comprehensive outreach process for the LRR-HRR Corridor Study. It includes an identification of project goals, objectives, and key issues and opportunities that will need to be vetted with the public and Technical Advisory Group (TAG). In addition, the Work Plan establishes a process that will help achieve project consensus and facilitate community visioning through the use of various outreach tools and techniques that will be utilized during the public workshops and TAG meetings.

The outreach tools and techniques identified in the Work Plan will be used to vet the project purpose and need, determine community characteristics, gain consensus on future forecasting results, and evaluate implementation alternatives.

The public involvement plan was established to:

- Seek and sustain widespread involvement of residents, business owners, employees, commuters, local groups and public officials throughout the study process, educating, engaging, and empowering these groups during the study.
- Design a process that maximizes inclusiveness where stakeholders have ample opportunity to express their views.
- Build consensus through an open, transparent, and collaborative process where public participation is facilitated and TAG input is sought at every appropriate opportunity.
- Start with a big picture perspective and gradually build toward precision (i.e. projects/initiatives). The public process should not be consumed with details without having the benefit of understanding the big picture issues along corridors as a whole.
- Use technology to help navigate and streamline the outreach process.

Outreach efforts were accomplished through four activities. They included:

1) Three-day Public Information Workshop/Charrette
2) TAG meetings;
3) Individual Stakeholder Interviews;
4) Additional Stakeholder Focus Group meetings;
5) Public Presentation of Study Findings, and

6) Continuous public engagement through the study website, surveys, and e-newsletters.

1.6.1 Technical Advisory Group (TAG)

The purpose of forming TAG was to validate assumptions, receive guidance on technical matters (what is reasonable and feasible) and to scrutinize recommendations throughout the study. The TAG was also charged with developing study goals, objectives, and a set of evaluation criteria. The TAG membership included:

- Mani S. Poola – City of Stamford, City Traffic Engineer
- Norman Cole – City of Stamford, Land Use Bureau Chief
- David Killeen – City of Stamford, Associate Planner
- David Woods – City of Stamford, Principal Planner
- Susan Prosi – Western Connecticut Council of Governments (WCCOG)
- David Head – CTDOT Policy & Strategic Planning Unit
- Melanie Zimyeski – CTDOT Intermodal Planning Unit
- Thomas Borden – CTDOT Project Development Unit
- Fred Kulakowski – CTDOT Division of Traffic Engineering
- Roxane Fromsen – CTDOT office of Policy & Planning
- Gary Sojka – CTDOT Office of Forecasting

The TAG meetings were held at various study phases:

- June 15, 2011 (Study kick-off meeting)
- July 7, 2011 (Bus tour – windshield survey of corridors)
- April 8, 2013 (Development of alternatives improvements plan)
- October 24, 2013 (Refinement of alternatives)
- January 16, 2014 (Modification and advancement of alternatives for further consideration)

1.6.2 Public Workshops

Several highly publicized workshops occurred at key stages during the study process. Each workshop was organized around a theme that followed the progression of the study scope as follows:

- **Discovery (**June 18, 19 & July 23 2012, afternoon and evening sessions)
  Presentation of the study framework (scope, goals, objectives, schedule) and identification/solicitation of issues, challenges, and priorities to be integrated into the study planning

- **Development of Alternatives** (July 15, 16 & 22, 2013, focus group meetings
  Review and discussion of alternative improvement solutions and policies.

- **Refinement of Alternatives** (December 16, 2013 & January 21, 2014 meetings were postponed to April 2, 2014 due to inclement weather condition)
  Discussion on refinement, evaluation, and screening of preliminary options

- **Final Plan** (September 30, 2014 Public Information Meeting)
  Final presentation of study recommendations and implementation plan

1.6.3 Stakeholder Interviews

In addition to the TAG and Public Workshops, one-on-one interviews with key stakeholders were conducted in an effort to gather additional insight and input into the study. Key stakeholders interviewed included:

- City planners & engineers
- CTDOT
- High Ridge Corporate Park (George Comfort & Sons)
- Nestle
- Oracle
- The Roxbury School

General stakeholder meetings were also held routinely during the course of the study to solicit input on issues, discuss key objectives and improvement plans.

1.6.4 General Public Engagement

During the course of the study, numerous outreach efforts were targeted for the general public. Through the use of the project website, media releases, and e-newsletters, the public was informed about the status of the study as it advances from "big picture" issues to more specific project recommendations and initiatives. General public engagement efforts included:

- Public launch - Outreach efforts included emailing and fliers to interested parties and individuals.

- Project Website - To ensure a clear, open, and transparent process, a study website was established for public access. In addition to providing general information about the study, updates, and notices for upcoming meetings, the website served as a one-stop central repository for meeting notes, agendas, announcements, study reports, and online opinion surveys. Links to the study webpage were provided on the **http://www.vhb.com/LRHRStudy/default.asp** webpage and on the City of Stamford's webpage. Every agenda, press release, email, or announcement that was sent to the public included in the website URL.

- Media releases – Media releases and editorials were prepared for the public workshops and the initial study launch.
- On-line opinion solicitation – The project website included a community outreach option which permitted residents to provide input and comment on every phase of the project, including travel patterns, areas of the transportation system that work well or that need improvement, and ideas for solutions. All input received from the public was received thru the project web link: at http://www.vhb.com/LRHRStudy/contact.asp and considered appropriately.
- E-newsletters – Internet communication to the public was employed as a supplemental outreach method and to give a general study update on progress. All newsletters as well as report documents such as the Draft Existing Conditions Report, Future Conditions Report, Photo-log, etc., were posted at the study website so that they could be reviewed and commented on by the public.

Table 1-1 summarizes the Public Participation Plan execution. A copy of all correspondence, meeting invitation letters and minutes, and public comments is contained in the Appendix titled "Public Involvement Plan Supporting Documents".

Table 1-1 Study Outreach Program

Event	Date	Key Topics
TAG Meeting # 1	6/15/2011	Study kick-off; Review of goals/objectives, schedule;
TAG Meeting # 2	7/17/2011	Windshield survey of study corridors
Stakeholders Meeting # 1	4/26/2012	**Discovery** - Solicitation of input on issues (audience survey), study goals and objectives
Public Workshop # 1, 2, 3	6/18/2012 6/19/2012 7/23/2012	Present the study framework, receive input and identify issues, challenges, and priorities to be integrated into the planning process
TAG Meeting # 3	4/8/2013	Review of Existing Conditions Report and Alternative Improvements
Stakeholders Meeting # 2, 3, 4	7/15/2013 7/16/2013 7/22/2013	**Development of Alternatives** – Review and discuss possible alternative solutions/concepts and solicit input on potential issues and opportunities
TAG Meeting # 4	10/24/2013	Additional review of Alternative Improvements
TAG Meeting # 5	1/16/2014	Review refinement of transportation Improvement Alternatives (TIA) and sketch plans
Stakeholders Meeting # 5	4/2/2014	**Refinement of Alternatives** – Screen options, Phasing/prioritization of recommendations and Implementation matrix
Public Information Meeting	9/30/2014	**Final Plan** - Presented final improvements plan; received additional input; comment period extended to 10/30/2014

1.7 Evaluation Criteria

The criteria used to help evaluate proposed transportation system enhancements are described in this section. The proposed evaluation criteria are consistent with the (WCCOG) TIP criteria for evaluation of proposed projects and have been vetted by the TAG and during the first Public Workshop. They are as follows:

1.7.1 Mobility Benefits

The project reduces delays and back-ups at intersections, improves transportation system reliability, reduces travel times and vehicle-miles traveled, improves modal accessibility by improved access for transit and pedestrian and bicycle transportation.

- Reduced vehicle-miles traveled (VMT) or reduced trip lengths
- Reduced vehicle-hours traveled (VHT) or reduced trip durations
- Reduced delays/back-ups for vehicles at intersections
- Travel time differences
- Improved mobility for bicyclists and pedestrians
- Improved access for transit
- Improved Access for the disabled
- Physical or operational enhancement to bus and parking systems
- Increased average system travel speeds

1.7.2 Cost Effectiveness

This considers the cost/benefit of the project and ability to phase the project over time.

- Order of magnitude costs
- Opportunity for phasing

1.7.3 Economic Development Impact

The project strengthens the City's economy by attracting visitors; enabling sustainable residential development; or encouraging appropriate types of businesses which in turn creates jobs and an expanded tax base.

- Impacts to existing economic bases
- Economic development potential (enhanced access/travel time savings to existing and targeted commercial/corporate development areas)

- Improved access to vacant and underutilized sites
- Enhances opportunities for transit-oriented development

1.7.4 Environmental Impacts

The project considers preservation of the City's natural landscape (wetlands, floodplains, habitat, open spaces, historic areas), sustainability (vehicle emissions reductions), and the human environment (neighborhoods, schools, community facilities) which influence the overall quality of life in the City.

- Greenhouse gas reductions
- Study area intersection delays and improvements to air quality
- Potential for vehicle trip reductions due to mode shifts/reduced reliance on automobiles
- Direct impacts to natural environment (wetland/habitat/open space/historic areas/conservation areas/others)
- Impacts to human environment (residential/business/schools/community facilities benefits and impacts, environmental justice)

1.7.5 Degree of Local Support and State Goals and Plans

The project alternative is aligned with regional goals and municipal plans, goals, and visions so that the public agencies will "champion" the project for implementation.

- Consistency with municipal plans, goals, and visions
- Concurrence and support by City/State officials

1.7.6 Safety, Security, and Technology

The project results in safer conditions for drivers, bicyclists, pedestrians, and transit riders; and/or considers the use of technology for incident or event management.

- Safer conditions for pedestrians
- Safer conditions for bicyclists
- Potential for crash reductions (direct improvement to intersections)
- Potential for crash reductions (indirect benefit from traffic shifts)
- Impacts to emergency response
- Improved driveway/roadway access management (consolidation/elimination of access points on major roadways)

Chapter 4 presents a recommended weighting for each of the evaluation criteria categories to help screen and evaluate recommendations.

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Existing Conditions

This chapter summarizes the tasks associated with the evaluation of the current transportation system, land use, and socioeconomic conditions in the project study area. Discussions in each section is not in any specific order of significance or priority.

2.1 Social and Economic Demographics

This section provides an overview of basic demographic and economic information for the properties within the corridor study area boundaries, which includes lands within one quarter mile of the corridors. Data for this section was obtained both from available US Census Bureau sources as well as estimates and forecasts provided by Environmental Systems Research Institute (ESRI), which is a private mapping and data provider. The business inventory information was summarized from ESRI's Business Analyst reporting.

2.1.1 Demographic Characteristics

Table 2-1 summarizes the population and household trends within the study area corridor from 2000 to 2010. While the city as a whole experienced population growth over the past decade, the study area has been essentially stable, with little change in population or the number of households. Demographic projections from ESRI suggest the study area population will continue to remain stable over the next five years.

Table 2-1 Population and Household Trends

Year	Study Area		Stamford	
	Population	Change	Population	Change
2000	13,699	--	117,083	--
2010	13,716	0%	122,643	4.7%
	Households	Change	Households	Change
2000	5,004	--	45,399	--
2010	5,049	0%	47,357	4.3%

Source: VHB compilation of US Census Bureau 2000 and 2010 Census and ESRI demographic estimates.

The study area population tends to be highly educated, with 30% of the population over 25 having earned a bachelor's degree and 26% having a Master's, Professional, or Doctorate degree. Most of the employed population (approximately 79%) works in white collar jobs (primarily management/business/financial and professional sectors). A comparison of income data for the corridors and the City as a whole, which is provided in Table 2-2, reveals that median household income along the corridors is substantially above the city average.[1]

Table 2-2 Income

Income Characteristics	Study Area	Stamford
Median Household Income	$121,714	$76,134
Per Capita Income	$59,903	$46,298

Source: 2005-2009 American Community Survey and ESFT demographic estimates.

As indicated in Table 2-3, residents in the study area also tend to be somewhat older than the city average, and the study area is aging faster than the city as a whole.

Table 2-3 Median Age

Year	Study Area	Stamford
2000	40.4	36.4
2010	43.1	37.1

Source: 2010 Census and ESRI demographic estimates.

▼

[1] ESRI

2.1.2 Housing Characteristics

As indicated in Table 2-4, housing units within the study area are primarily owner occupied. The city as a whole has a somewhat more balanced mix of rental and ownership units. Based on the Census 2000 figures, the vast majority (87%) of housing units within the study area are in single-family detached residences. An additional 4% are in single-family attached residences, and the remaining 9% are multifamily units. Most housing units are in structures built in the 1960's or earlier, with the median year built for residential structures being 1960.

Table 2-4 Housing Tenure

	Study Area		Stamford	
	Occupied Housing Units	Percent	Occupied Housing Units	Percent
Owner occupied	4,504	89.2%	26,176	55.3%
Renter occupied	545	10.8%	21,181	44.7%
Total	5,049	100.0%	47,357	100.0%

Source: 2010 Census and ESRI demographic estimates

Median home values in the study area are estimated to have increased from $380,000 in 2000 to approximately $635,000 in 2010. This reflects an average 5% annual increase over that period. See Table 2-5 for a comparison of estimated market value and age of housing units within the study area and the city as a whole.

Table 2-5 Housing Characteristics

Housing Characteristics	Study Area	Stamford
Median Home Value	$635,632	$582,300
Median Year Built	1960	1966

Source: 2010 ACS one-year estimate and ESRI demographic estimates

2.1.3 Employment and Business Inventory

2.1.3.1 Regional and Local Economic Environment and General Market Conditions

Stamford is located in the southwestern portion of Fairfield County. Fairfield County is the most populous county in Connecticut and consists of 23 municipalities, including several of the state's largest cities. The county has traditionally been known for activity in the financial services industry and as a location for headquarters for many large companies. The recent recession and continued economic stresses experienced nation-wide have negatively impacted the county economies and commercial real estate markets over the past few years. However, the commercial real estate market, while not robust, appears to be improving from the significantly negative conditions experienced in 2009. As reported in Cushman & Wakefield's most recent quarterly office market report[2], while labor conditions in Fairfield County have deteriorated somewhat since the first half of 2011, overall office vacancy rates have generally stabilized and absorption has reached its highest levels in four years. It is noted, however, that more tenants appear to be looking for smaller spaces, which will exert pressure on vacancy rates.

Stamford is the economic core of Fairfield County, which is reflected in the city having the highest inventory of office space of any municipality in the county. Stamford's commercial real estate market is generally considered to consist of two primary sub-markets: Central Business District (CBD) and Non-CBD. The Long Ridge Road and High Ridge Road corridors are non-CBD locations. According to the Cushman & Wakefield quarterly report, the overall vacancy rate for the Stamford Non-CBD submarket was approximately 26.2%, and the average rent for all classes of office space was approximately $34.13 per square foot. The Stamford CBD and Non-CBD currently have the highest vacancy rates among the seven Fairfield County submarkets as identified by Cushman & Wakefield.

[2] Cushman & Wakefield, MarketBeat – Fairfield County Office Report 3Q11.

2.1.3.2 Corridor Employment and Business Inventory

As illustrated in Section 2.2.1, the corridors host a diverse array of businesses. In all, there are approximately 920 establishments within ¼ mile of the two corridors, employing nearly 10,500 people. The most prevalent types of businesses in terms of the number of establishments are the real estate and restaurants sectors. However, the sectors that support the most employment along the corridor are: real estate, schools, exporters, department stores, and marketing programs and services. The largest individual employers are Stamford Square, Gerald Metals, Inc., Nestle Waters North America and Lord & Taylor. Table 2-6 identifies the top fifteen corridor employers. A complete inventory of existing businesses and employment by SIC code is included in the technical appendix.

Table 2-6 Top 15 Corridor Employers

Employer	Address	Number of Employees
Stamford Square	3001 Summer Street	900
Gerald Metals Inc.	6 High Ridge Park	550
Nestle Waters	900 Long Ridge Road	500
Lord & Taylor	110 High Ridge Road	325
CAP Systems	4 High Ridge Park	300
Synapse Group Inc.	225 High Ridge Road	251
West Hill School	125 Roxbury Road	225
GE Asset Management Inc.	3001 Summer Street	220
KPMG	3001 Summer Street	220
Sheraton – Stamford	2701 Summer Street	200
Genworth Financial	3001 Summer Street	200
Esselte Corp.	5 High Ridge Park	200
GE Commercial Aviation Svc	201 High Ridge Road	200
Frontier Communications Corp	3 High Ridge Park	200
Long Ridge of Stamford	710 Long Ridge Road	160

Source: ESRI

2.1.4 Journey to Work Data

Based on the U.S. Census Bureau, 2011 American Community Survey, 95% of City of Stamford residents over the age of 16 who are employed work outside the home while 5% work in the home. 68% of employed City residents commute alone by car, 11% carpooled, 12% used a train bus or shuttle, 4% walked and 1% cycled, took a taxi or used some other means of transportation. The median commute length was 18 minutes for city residents, however, the average time spent commuting by City residents was 28 minutes.

Although the current census data do not provide a detailed breakdown of where City residents work or where people employed in the City of Stamford live, based on the 2000 Census data, 37% of City residents work in Stamford, with substantially fewer residents working in Stratford (7%), Greenwich (7%), Bridgeport (5%), Manhattan (5%) and Norwalk (4%). Meanwhile, 33% of people who work in Stamford also live in Stamford, with substantially fewer residents living in Norwalk (8%), Bridgeport (4%), Greenwich (4%), and Fairfield (3%).

While the Census data is for the entire City, it is most likely close to representative for the southern portions of the corridors. The northern portions of the corridors are likely to have more driving alone and less transit, walking and bicycling.

2.2 Land Use, Zoning, and Master Plan Overview

The City of Stamford is located in the southwestern portion of Fairfield County. The city is a regional center, the economic core of Fairfield County, and occupies a strategic location in the larger Northeast corridor and regional economy. Long Ridge Road and High Ridge Road are two of the City's major arterials and serve multiple functions: as transportation linkages to the downtown, as home for large corporate tenants, as shopping areas, and as residential neighborhoods. Balancing these roles is an important part of this study. The following sections provide a description of current land use, zoning, economic and demographic conditions along the corridors.

2.2.1 Existing Land Use and Character

Existing and planned land use patterns along the corridors are critically important factors to consider during the investigation of transportation system enhancements. In addition to shaping the transportation system from a supply-demand perspective, potential impacts to sensitive land areas can affect the feasibility of system enhancements that will be studied. Transportation improvements can also influence the growth of residential communities, retail and industrial business, and recreation activities.

The transportation system exists in part to serve and provide access to adjacent land uses, which in turn generate traffic demands that dictate the layout of the transportation system. New roads stimulate development which leads to added traffic demands on the new roads. Similarly, as planners and developers contemplate new developments, demand for additional access and transportation infrastructure typically ensue.

This interconnectivity between transportation and land use has long been documented as a fundamental relationship that must be considered for a comprehensive transportation and land use planning effort. Lack of coordination often has led to an ever-increasing rate of land consumption, a loss of green space, rapidly rising infrastructure costs, as well as an increase in vehicle miles traveled, congestion, and air pollution.

The land use pattern along the corridors generally parallels the existing zoning and includes a diverse mix of residential, open space, commercial, community facility, and office uses. The existing land uses in the study area are depicted on Figures 2-1S and 2-1N.

Long Ridge | High Ridge
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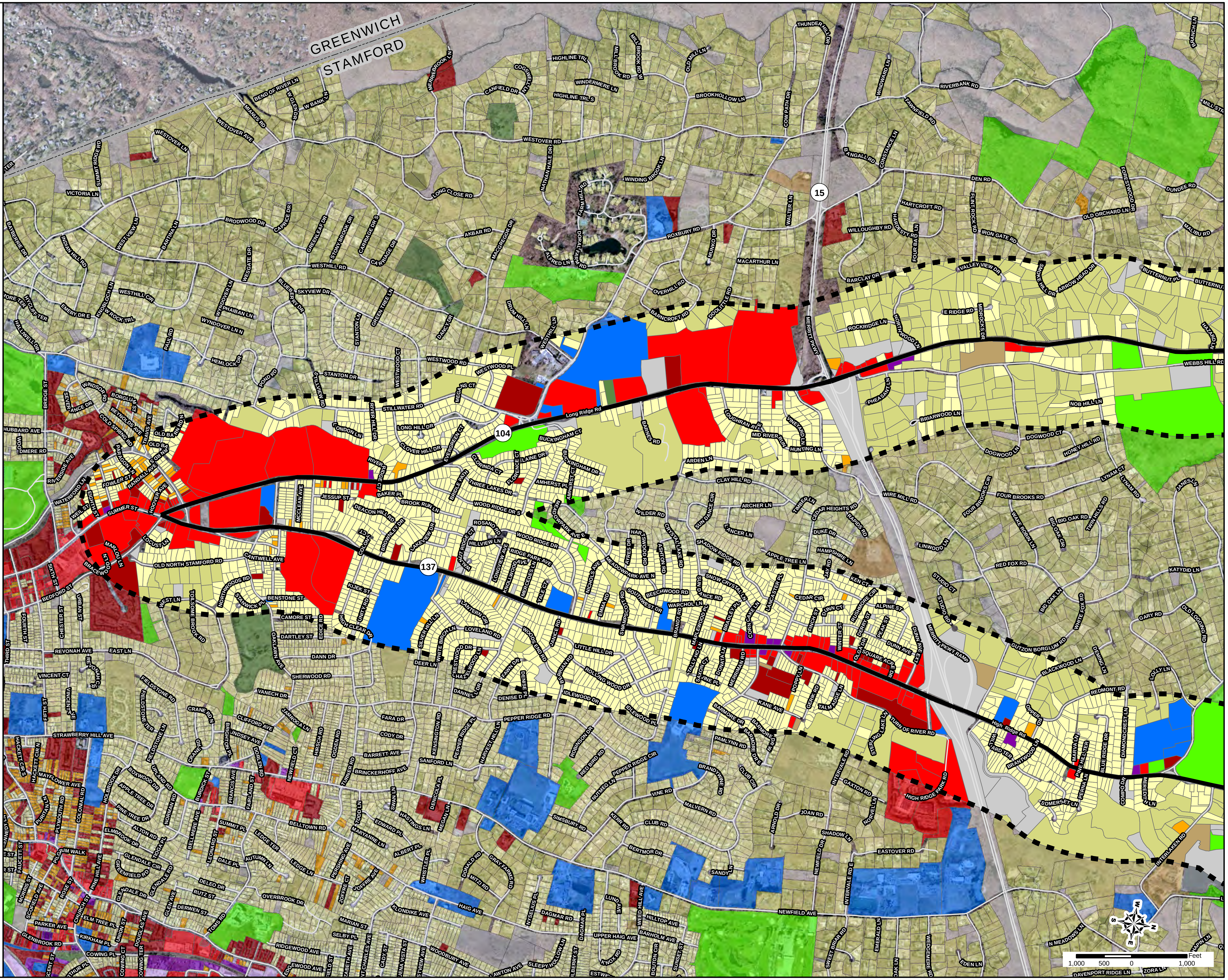
Figure 2-1 (S)

Existing Land Use

Legend

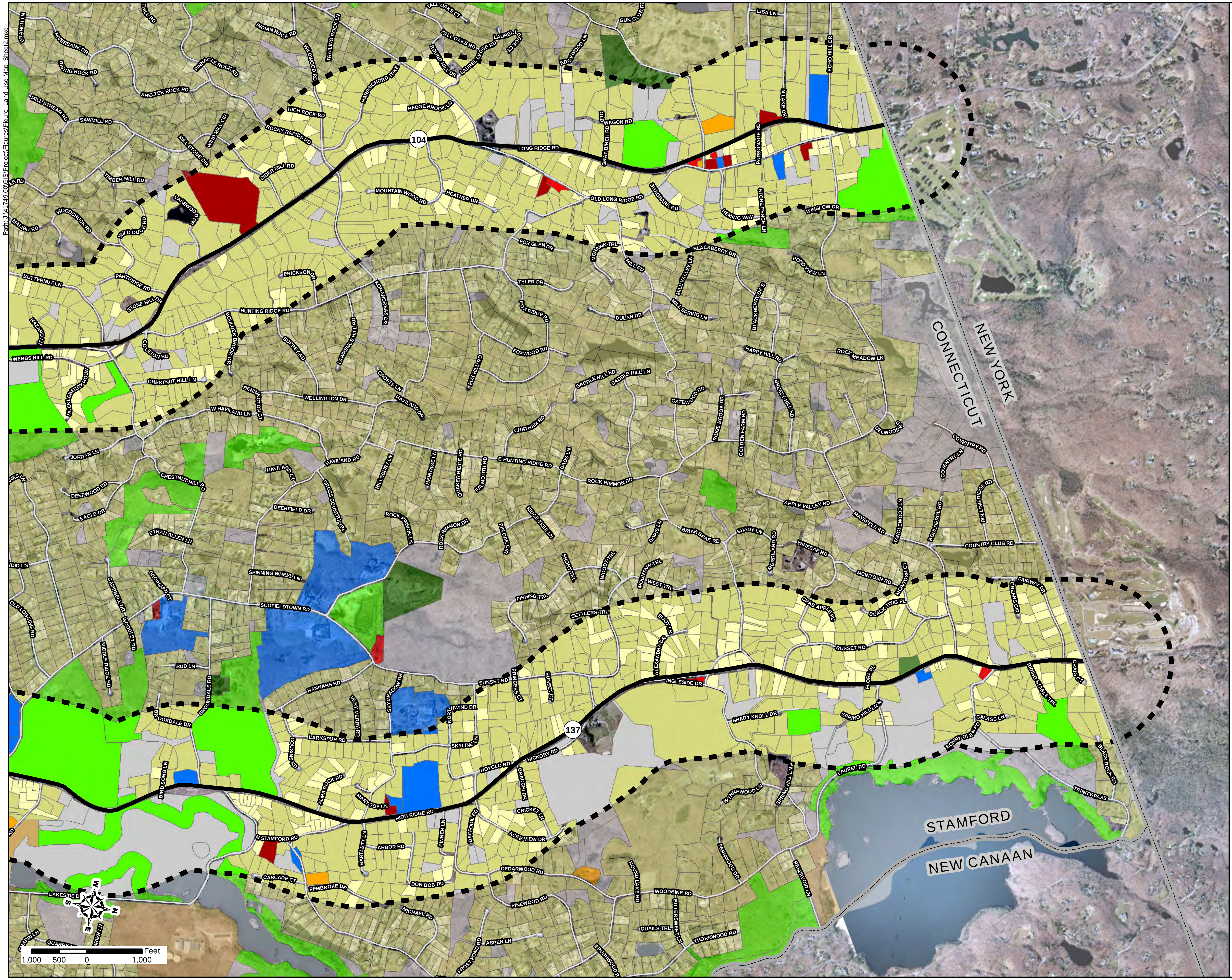
- Study Area Boundary (1,500-foot Radius)
- Single-Family Residential: Low Density
- Single-Family Residential: Medium Density
- Two-Family Residential
- Multi-Family Residenial
- Commercial
- Community Facility
- Industrial
- Light Industrial
- Public Utilities
- Parks, Recreation & Open Space
- Cemeteries
- Vacant Land



City of Stamford, Connecticut

Vanasse Hangen Brustlin, Inc.
Transportation | Land Development | Environmental Services

Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)



Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-1 (N)

Existing Land Use

Legend

- Project Corridor
- Study Area Boundary (1,500-foot Radius)
- Single-Family Residential: Low Density
- Single-Family Residential: Medium Density
- Two-Family Residential
- Multi-Family Residenial
- Commercial
- Community Facility
- Industrial
- Light Industrial
- Public Utilities
- Parks, Recreation & Open Space
- Cemeteries
- Vacant Land

City of Stamford, Connecticut

Vanasse Hangen Brustlin, Inc.
Transportation | Land Development | Environmental Services

Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

Table 2-7 summarizes the approximate land area devoted to the differing land uses within the corridor.

Table 2-7 Land Use Summary

Land Use Type	Acres	Percent of Total
Single-family residential: Low Density	1,421	27%
Single-family residential: Medium Density	3,185	61%
Multifamily Residential	124	2%
Commercial	123	2%
Industrial	12	0%
Community Facility	28	1%
Park or other designated open space	26	1%
Vacant land	210	4%
Cemeteries	6	0%
Other	48	1%
Total	5,183	100%

As shown above, the predominant land use in the approximately 5,200-acre study area is single-family residential (approximately 4,600 acres, or 89% percent of the total land area), followed by vacant land, and commercial or multi-family use. Multi-family and commercial development is concentrated south of the Merritt parkway, while vacant land and open space is largely concentrated north of the Merritt Parkway, although substantial development potential exists on some of the corporate campuses to the west of Long Ridge Road, south of the Merritt Parkway. In all, just under 1 million square feet of unbuilt or unoccupied development potential exists in this area. Based on land area, low-density, single-family development is the most prevalent residential land use. Residential densities generally increase towards the southern end of the corridors. Multifamily use represents a relatively small proportion of the overall corridor. The following narrative further describes the land use pattern within the corridors.

North of Merritt Parkway

The portions of the corridors north of the Merritt Parkway are primarily low-density single-family residential, with densities ranging from one acre/unit to three acres/unit. Tree lined roads, tree canopies, and a rolling topography create an attractive and rural visual experience along the northern Long Ridge Road and High Ridge Road corridors. Homes in the interior of the neighborhoods are generally accessed from winding roads and cul-de-sacs. The character of the northern corridors are also influenced by a number of significant designated open space resources, including country clubs, cemeteries, and preserved lands (e.g., land trust parcels, Centennial State Forest, Stamford Museum/Nature Center), which further the low density and rural/residential feel of the area.

Commercial development in this area is limited to a few small-scale, neighborhood-oriented uses (e.g., restaurant, service station and small retail/office development) and is clustered near the Merritt Parkway. There are some remaining vacant parcels, especially along High Ridge Road, however, the bulk of the northern portions of the corridor have been built-out or preserved as recreation areas, land trust preserves, or parks. Development appears generally to be consistent with the zoning requirements (i.e., there is no significant potential for intensification or increased density on developed lots).

South of Merritt Parkway

The land use pattern is more varied to the south of the Merritt Parkway, and the corridors each take on a more distinctive character. The Long Ridge Road corridor is a suburban thoroughfare that is characterized by larger-scale, attractively landscaped campus developments, open space, and adjacent residential neighborhoods. There are relatively few driveways/curb cuts, with the majority of the residential uses being served by local streets off of Long Ridge Road. Significant large campus tenancies along Long Ridge Road include, among others, GE, Nestle Waters, General Re, Oracle and the Westhill High School. As previously indicated, just under 1 million square feet of unbuilt or unoccupied development potential exists in this area

The portion of the High Ridge Road corridor south of the Merritt Parkway exhibits more of a commercial/retail character than the Long Ridge Road corridor, with “strip” arterial commercial uses between the Merritt Parkway and Bradley Place, and relatively intense shopping and commercial activity occurring in the Bull’s Head area. Commercial uses include a variety of small retailers, eateries, service stations, banks, and personal service providers, as well as large-scale department stores/shopping centers and corporate/office uses. The commercial activity tends to be more exposed to the corridor, with multiple curb cuts and supporting surface parking located in front of the buildings. The conditions of the commercial buildings vary, with some older facilities exhibiting a need for maintenance, while others present fresher façades and/or more landscaping. The architectural character is also mixed and ranges from independent, small-scale businesses with wide variation in store front treatments, to more modern-format national or chain businesses. The variety of store fronts/treatments, parking, and traffic activity contributes to a diverse, and at times cluttered, visual environment. Despite the degree of commercial activity, the southern portion of High Ridge Road is also a residential road along large segments and is lined with a relatively large number of single-family residences that are accessed directly from the corridor.

The single-family neighborhoods surrounding the central portion of the corridors consist mainly of houses on ¼ acre and ½ acre lots. There are also several scattered townhouse/multifamily developments that are generally setback from the corridor. In the southern portion of the corridors near Bull's Head, the residential development becomes more dense, with a mixed pattern of small-lot, single-family homes, two-family homes, and apartments. The residential properties along both corridors generally appear to be built out consistent with their zoning limits. However, some of the larger commercial and campus properties appear to have additional available development potential based on the existing zoning.

2.2.2 Existing Zoning

Development within the City is governed by the Zoning Ordinance, which establishes use and dimensional controls for all property. The corridor study area contains land lying in a considerable number of residential and commercial zoning districts. See Figures 2-2S and 2-2N, Zoning Map. Residential districts within the study area include: the RA-1, R-20, R-10, and R-7.5 One Family Residence Districts; the R-D – Designed Residence District; the R-6 One Family, Two Family Residence District; and the RM-1 – Multiple Family Low Density Design, R-MF Multiple Family Residence Design, and the R-5 Multiple Family, Medium Density Design Districts. Commercial districts include: C-D – Designed Commercial, C-L – Limited Business, C-B – Community Business, and CSC-D – Designed Community Shopping Center. The following section describes the existing zoning along each corridor.

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-2 (S)

Zoning Map

Legend

- Project Corridor
- Study Area Boundary (1,500-foot Radius)
- RA-1 One Family Residence
- RA-2 One Family Residence
- RA-3 One Family Residence
- R-20 One Family Residence
- R-10 One Family Residence
- R-7 1/2 One Family Residence
- R-D Designed Residence
- R-6 One Family Two Family Residence
- RM-1 Multiple Family Low Density Design
- R-5 Multiple Family Medium Density Design
- R-MF Multiple Family Residence Design
- R-H Multiple Family High Density Design
- MR-D Mill River Design
- P-D Planned Development
- C-D Designed Commercial
- IP-D Designed Industrial Park
- MX-D Mix Use Development
- B-D Designed Business
- CSC-D Designed Community Shopping Center
- C-L Limited Business
- C-N Neighborhood Business
- C-B Commuity Business
- C-I Intermediate Commercial
- C-G General Commercial
- CC-S Central City South
- CC-N Central City North
- CW-D Coastal Water Department
- DW-D Designed Waterfront Development
- M-D Designed Industrial
- M-L Light Industial
- HT-D High Technology District
- M-G General Industrial
- TCDD Transportation Center Design District
- SRDN South End Redevelopment District North
- SRDS South End Redevelopment District South
- P Park

City of Stamford, Connecticut

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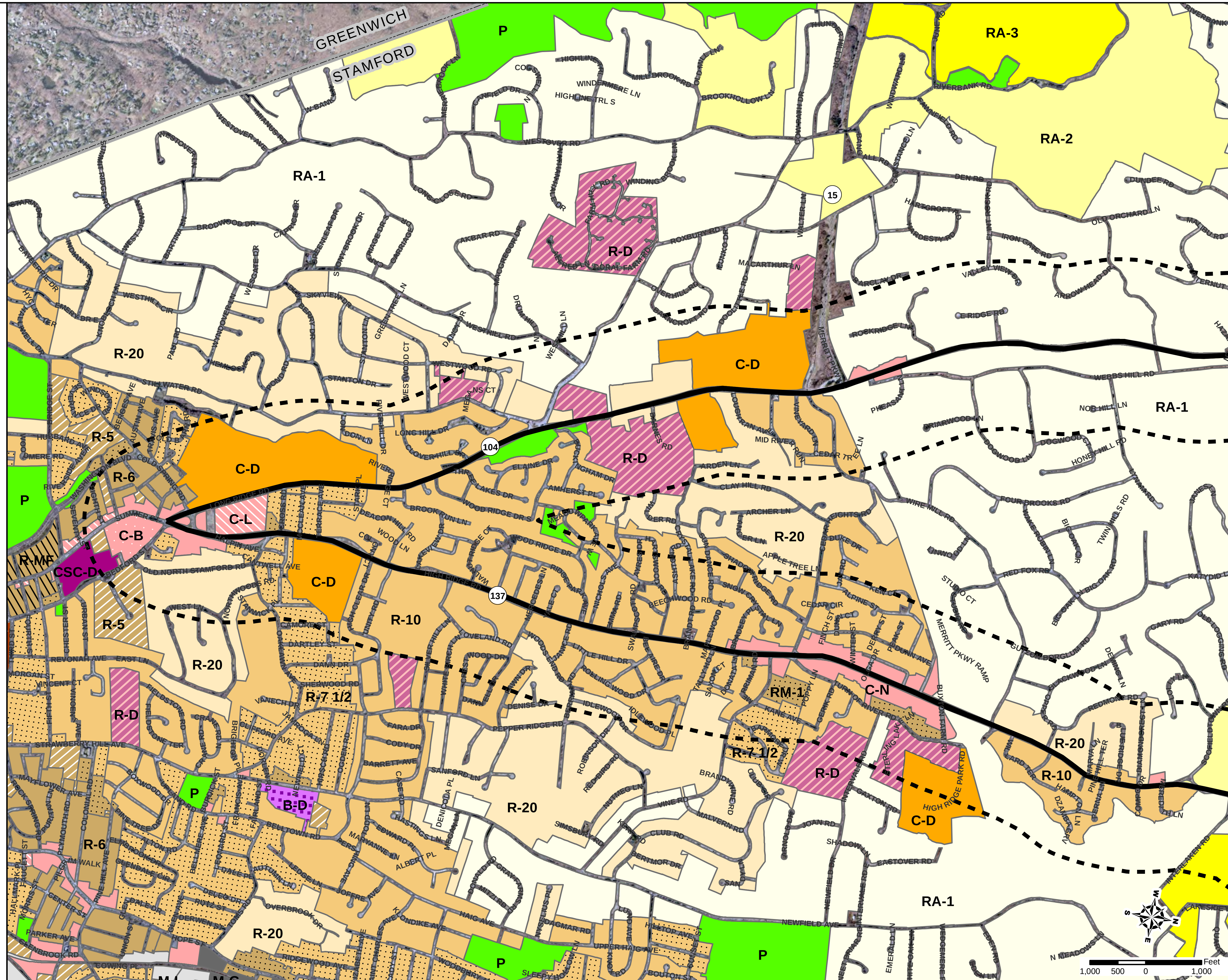
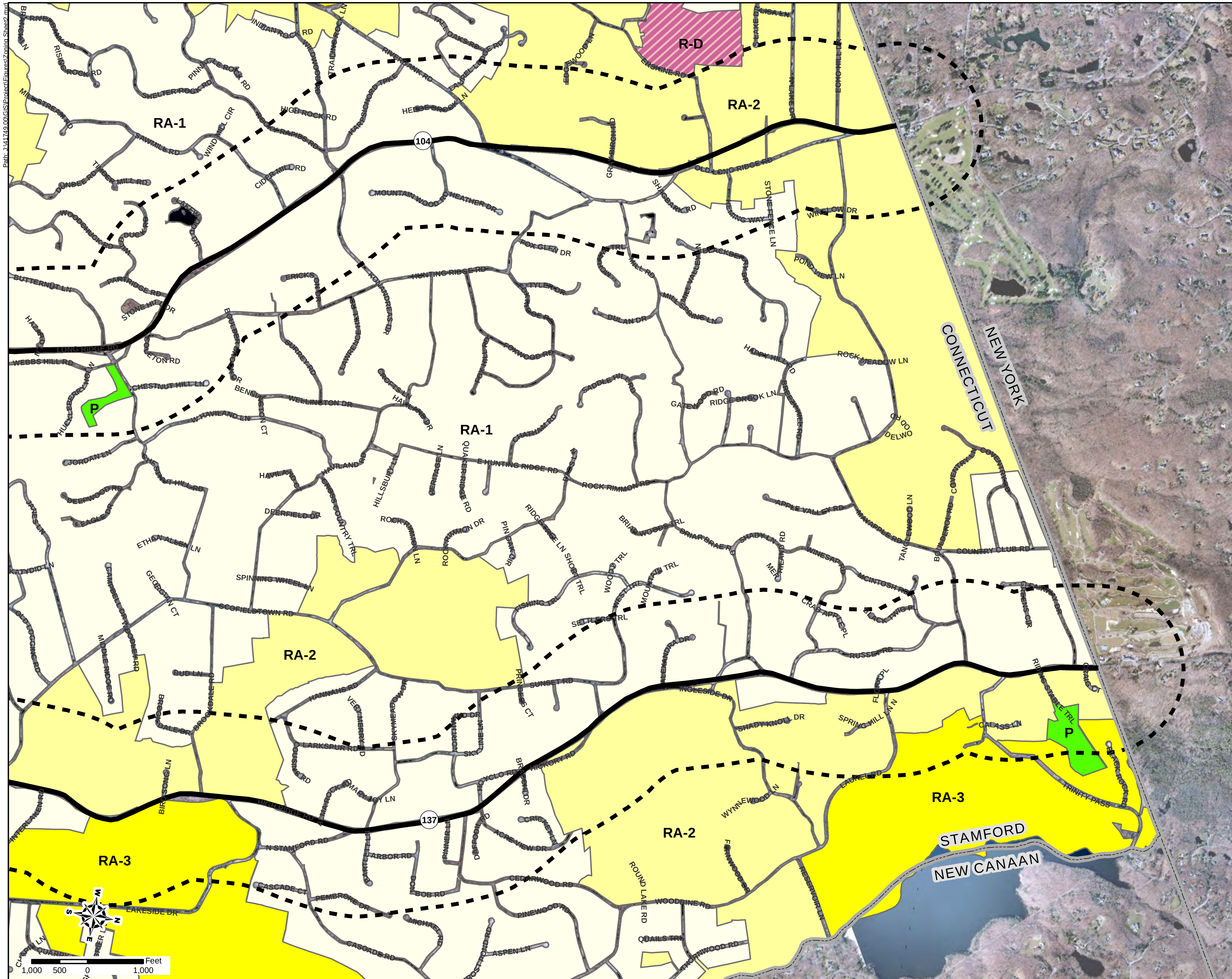
Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)





Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-2 (N)

Zoning Map

Legend

- Project Corridor
- Study Area Boundary (1,500-foot Radius)
- RA-1 One Family Residence
- RA-2 One Family Residence
- RA-3 One Family Residence
- R-20 One Family Residence
- R-10 One Family Residence
- R-7 1/2 One Family Residence
- R-D Designed Residence
- R-6 One Family Two Family Residence
- RM-1 Multiple Family Low Density Design
- R-5 Multiple Family Medium Density Design
- R-MF Multiple Family Residence Design
- R-H Multiple Family High Density Design
- MR-D Mill River Design
- P-D Planned Development
- C-D Designed Commercial
- IP-D Designed Industrial Park
- MX-D Mix Use Development
- B-D Designed Business
- CSC-D Designed Community Shopping Center
- C-N Neighborhood Business
- C-B Commuity Business
- C-L Limited Business
- C-I Intermediate Commercial
- C-G General Commercial
- CC-S Central City South
- CC-N Central City North
- CW-D Coastal Water Department
- DW-D Designed Waterfront Development
- M-D Designed Industrial
- M-L Light Industrial
- HT-D High Technology District
- M-G General Industrial
- TCDD Transportation Center Design District
- SRDN South End Redevelopment District North
- SRDS South End Redevelopment District South
- P Park

City of Stamford, Connecticut

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

2.2.2.1 Long Ridge Road Corridor

North of Merritt Parkway

The Long Ridge Road corridor north of the Merritt Parkway consists primarily of land within the RA-1 – One Family Residence district. There is also an area of RA-2 – One Family Residence district in the northern portion of the corridor near the border with New York State. These are both classified as very low density single family districts, with minimum lot areas of one-acre in the RA-1 district and two-acres in the RA-2. Permitted uses are limited to detached single-family dwellings, public schools, family day care homes, family estates, and public parks and playgrounds. Additional uses, such as camps, cemeteries, churches, clubs, museums, and nursing homes, among others, may be permitted by Special Exception. (Use and dimensional requirements for the residential districts are summarized in the Zoning Ordinance's Appendix A, Land Use Schedule and Appendix B, Schedule of Requirements for Area, Height and Bulk of Buildings, which are included in the technical appendix)

There is a small pocket of C-N - Neighborhood Business zoning located at the Merritt Parkway interchange, next to Holts Ice Pond. The Neighborhood Business district permits a variety of residential and commercial uses, including single-family, two-family, townhouse and apartment residences, and commercial uses such as professional offices, a variety of retail shops, pharmacies, banks, laundries, personal services, and restaurants. The C-N is one of the City's lower-intensity commercial districts; buildings are limited to two-stories and have more stringent bulk requirements so that the district is compatible with surrounding residential districts.

South of Merritt Parkway

The zoning pattern to the south of the Merritt Parkway is more complex, with more intensive commercial districts interspersed with higher-density residential districts. Along most of Long Ridge Road south of the Merritt Parkway, the primary zoning classifications are single-family residential districts (R-10 and R-20) and C-D – Designed Commercial districts mapped onto large corporate campuses. Towards the southern end of the corridor in the Bull's Head area, the residential districts become denser and include multifamily districts. Several types of commercial districts, including C-L – Limited Business, C-N – Neighborhood Business, and C-B – Community Business districts, are found near the intersection of Long Ridge Road and High Ridge Road.

As discussed above, the C-N district is a lower-intensity commercial district intended to serve and be compatible with adjacent residential uses. The maximum floor area ratio (FAR) is limited to 0.3. Buildings are limited to two stories.

The C-B is intended to provide primarily for convenience goods and services to serve adjacent neighborhoods. The same uses as are permitted in the C-N - Neighborhood Business district and additional uses such as community centers, electrical appliance stores, food catering and interior decorating shops are permitted by right. The district is somewhat more intense than the C-N, with a maximum FAR of 0.5 and four-story height limitation.

The C-L Limited Business district allows for a somewhat wider range of commercial uses than the C-B, permitting such additional uses as cafes, department stores, vocational schools and theaters. It also allows for more intensive site activity, with a maximum FAR of 1.0.

The C-D district is concentrated in two large areas, one near the Merritt Parkway and an even larger area near the south end of Long Ridge Road. These areas are mapped onto the large corporate campuses. The C-D district is intended primarily for larger sites (minimum of 15 acres) developed for office or laboratory uses.

There are a number of residential zones along the southern portion of the Long Ridge Corridor, including RA-1, R-20, R-20, R-7.5, R-D, R-6, R-5, RM-1, and R-MF districts. As discussed above, the RA-1 is a very low density single family district. The R-20, R-10, and R-7.5 are moderate density single-family districts. The primary distinction among these districts is the dimensional requirements. The R-7.5 is the most dense single-family district with a required minimum lot area of 7,500 square feet.

The R-D district is a designation that may be applied to larger tracts of land in single-family areas. It is intended to facilitate preservation of open space and natural resources by allowing for the site to be comprehensively planned and developed and individual buildings to be clustered. In addition to the uses permitted in the underlying single-family district prior to its conversion, the R-D allows for attached dwellings in groups of three units or less.

The R-6 district permits single- and two-family detached dwellings on lots with a minimum size of 5,000 square feet and 6,000 square feet, respectively.

The R-5, RM-1 and R-MF are multi-family districts. The RM-1 is the City's lowest density multifamily district, requiring a minimum lot area per dwelling unit of 3,750 square feet. The R-5 is designated for medium density multi-family dwellings, with a minimum lot area per dwelling unit of 2,500 square feet or 3,000 square feet, depending on the size of the parcel. The R-MF is the highest density residential district in the study area, with a minimum lot area per unit of 1,500 square feet on larger parcels and a maximum building height of four stories. For elderly apartment buildings, the minimum lot area may be reduced to 1,000 square feet. For parcels greater than 30,000 square feet, each of these districts is subject to a requirement to provide a portion of below market rate units.

2.2.2.2 High Ridge Road Corridor

North of Merritt Parkway

The High Ridge Road corridor is zoned almost entirely residential north of the Merritt parkway. The northern portion of this area consists primarily of land within the one-acre and two-acre RA-1 and RA-2 districts. There is also an area of RA-3 district surrounding the North Stamford Reservoir, which requires minimum lot sizes of three-acres.

As High Ridge Road approaches the Merritt Parkway, there is a cluster of more dense R-10 and R-20 residential zoning, with minimum lot sizes of 10,000 square feet and 20,000 square feet, respectively. While somewhat denser than the RA districts, these remain primarily detached single-family residence districts. Senior housing and nursing home facilities are additional uses permitted in these districts by Special Exception. The R-10 also permits apartment buildings for the elderly by Special Exception.

South of Merritt Parkway

To the south of the Merritt Parkway, the zoning becomes more varied with commercial districts interspersed with residential zoning. Along most of this stretch, the predominant residential zoning surrounding the corridor is R-10. Closer to the Bull's Head area, there are smaller pockets of more dense R-7.5 and R-6 districts, as well as the multifamily R-5 district. At the southern tip of the study area, additional multifamily R-MF zoning leads toward the downtown. The commercial districts include a relatively long strip of C-N running from the Merritt Parkway to Bradley Place, two C-D parcels mapped on corporate campuses (one by the Merritt Parkway and one at the south end of the corridor), and a mix of C-N, C-L, and C-B districts in the Bull's Head area. There is also one parcel within the CSC-D district. The CSC-D district was created and mapped on existing large shopping centers to foster their rehabilitation and modernization. It requires a minimum 10-acre site with at least 100,000 square feet of active retail floor area and 10 contiguous stores. The only CSC-D in the study area is mapped onto a shopping center located to the south of the Long Ridge Road/High Ridge Road intersection.

2.2.3 Summary of Relevant Policies, Goals or Proposals from 2015-2025 Master Plan

The principal policy document that guides development and land use policy within the project area is the Stamford 2015-20120 Master Plan. The Master Plan consists of a City-wide Policies report, a Neighborhood Plans report, and a City-wide land use plan map. A series of companion reports focusing on economic development, urban design, traffic and transit, affordable housing and community input help support the plan. The Master Plan is intended to provide a comprehensive study for the entire City. The following is the summary of the Master Plan Vision and Major Land Use Trends.

Master Plan Vision

Stamford has experienced substantial changes since the 2002 Master Plan, but the long-term vision for the City's future remains largely intact: to create a livable built, economic, social and political environment. In furtherance of this vision, the highest-intensity development and redevelopment should be focused in the Downtown, recognizing that it serves as both Stamford's economic engine and as the transportation hub for the region. Areas adjacent to the Downtown should accommodate growth at a lesser intensity, while the character of Stamford's neighborhoods will be supported and enhanced, but not significantly altered. No land-use changes are envisioned in North Stamford. The City's vision also incorporates increased mobility for all transportation users, as well as measures to enhance the City's environmental sustainability and resiliency. The vision for Stamford's future that emerged through the planning process is captured in six central themes. These themes inform the chapters of the Master Plan, which tell the story of where the City is today, where it wants to be 10 years from now, when the population is projected to reach nearly 134,000 people, and how it will get there.

Major Land Use Trends

Well over half of Stamford's total land area is comprised of residential neighborhoods, which generally include North Stamford, Newfield, Turn-of-River, Westover, Shippan and portions of Cove and the East Side. These distinct low-density areas represent Stamford's rich history of stable residential communities. Commercial uses in the residential neighborhoods are generally limited to small-scale neighborhood shopping centers serving the local population. Property values in these areas are among the City's highest, and the land area is mainly built out.
Both the 1977 and 2002 Master Plans recommended preservation and enhancement of Stamford's low density residential neighborhoods, and this Master Plan reiterates this goal. Preserving the existing land use character of these areas will be accomplished with a two-pronged growth management strategy:

- Maintain existing single-family zoning and discourage expansion of additional commercial activity in low-density residential areas, and
- Concentrate future commercial, office and mixed-use development in identified growth areas, particularly in areas with strong transit access and

existing infrastructure systems that can accommodate higher-density development.

2.2.3.1 City-wide Policies

In addition to the specific items in the Neighborhood Plans report that are excerpted below, there are several City-wide policies that have applicability to the corridors. For example, one of the City-wide Diversity policies is to *"Carefully control the potential expansion of offices on Long Ridge Road and High Ridge Road."* The document notes that the study corridors are major corporate corridors, with up to 2 million square feet of office space, and with significant additional office development possible under existing zoning. The Master Plan recommends limiting the amount of additional office development along the corridors in order to encourage development in the Downtown and to manage traffic capacity. The Plan also indicates that new commercial development should be conditioned on employing Traffic Demand Management measures and identifies recreational, open space, congregate care, and housing as preferred uses for undeveloped property.

Traffic was identified in the Plan as being the issue of concern raised most often by community residents during the planning process. The Plan includes a number of traffic related strategies that extend beyond roadway geometry and are generally intended to promote *"consolidated access/egress, shared parking, streetscape improvements, and transit-friendly development"* that apply to the study corridors. The document also suggests that the City "*Adopt roadway policies and classifications that put as much emphasis on pedestrian/bicyclist experience and safety as on moving vehicles."* The supporting Plan recommendation notes that the city's roadways should be reclassified to reflect pedestrian and bicycle activity, and that the reclassification should be *"informed by the urban design goals of reinforcing the radial corridors which connect Downtown to the neighborhoods and the importance of High Ridge Road and Long Ridge Roads in linking the surrounding neighborhoods."*

Other related City-wide strategies that are applicable to the study area include:

- Providing continuous sidewalks throughout the city (except in low-density, RA residential zones) and making the walking environment in the vicinity of bus stops more attractive, interesting and accessible.
- Encouraging employers to institute programs such as flex time schedules, staggered works hours, telecommuting, transit-fare discounts, and carpool programs to help reduce peak period traffic.
- Promoting increased housing density within walking distance of existing bus stops and the Downtown.

2.2.3.2 Neighborhood Plans

The Neighborhood Plans Report grouped the City into five neighborhoods. Two of these groupings (North Stamford and Newfield, Turn of River, Westover) include the study area corridors. Relevant policies/objectives/items from the Neighborhood Plans are identified below.

North Stamford (NS)

The North Stamford neighborhood includes the portion of the city north of the Merritt Parkway. It is described in the Master Plan as the city's most affluent neighborhood and consisting almost exclusively of single-family homes on large wooded lots. Most of the recommended strategies for the North Stamford area are generally targeted toward maintaining and preserving the neighborhood's natural environment and scenery.

The following Implementation Strategies/ Policies were identified for North Stamford:

Policy NS1: Preserve and protect neighborhood character and quality-of-life

- NS1.1: Preserve and protect North Stamford as a low-density residential neighborhood by maintaining existing residential zoning districts.
- NS1.2: Discourage expansion of commercial districts in North Stamford. Maintain the neighborhood's two commercial districts at their present size.
- NS1.3: Retain current floor area ratio (FAR) caps for commercial and office development in industrial districts outside of Downtown.
- NS1.4: Identify architectural design standards for the purpose of retaining and enhancing the quality of building design in commercial areas such as Chimney Corners.
- NS1.4: Identify architectural design standards for the purpose of retaining and enhancing the quality of building design in commercial areas such as Chimney Corners.
- NS1.5: Within the road rights-of-way serving the Long Ridge Village Historic District, the City should seek to address streetscape preservation and the burying of utility lines.
- NS1.6: Designate significant roads in North Stamford as Scenic Corridors to assure that the character of the existing streetscape is retained and enhanced. Efforts should focus on retaining natural street trees and historic elements, such as stone walls, located within the right-of-way and minimizing the impacts of engineered roads on these important features.
- NS1.7: Protect the quantity and quality of the drinking water supply through the promotion of Best Management Practices and expansion of the well water testing program.

Policy NS2: Improve mobility and circulation

- NS2.1: Improve existing public bus service along Long Ridge and High Ridge Roads between North
- Stamford and Downtown, including frequency of buses and expansion of bus shelters.
- NS2.2: Support and implement the recommendations set forth in the Long Ridge and High Ridge
- Roads Study, as they apply to North Stamford.
- NS2.3: Where appropriate and feasible, support the implementation of the traffic calming measures
- Recommended in the 2011 Traffic Calming Master Plan.
- NS2.4: Provide for a safe and efficient pedestrian and bicycle network where appropriate.

Policy NS3: Preserve and enhance parks, open space and the natural environment

- NS3.1: Develop and implement land-use and subdivision tools aimed at preserving and protecting open space holdings and environmentally sensitive land by encouraging development to incorporate long-term protection of these sensitive areas; requiring development to be designed in context with these natural resources; and preventing clear-cutting and retaining matures trees to the extent feasible.
- NS3.2: Continue to expand and improve greenways along the Mianus and Rippowam Rivers and along the Poor House Brook, linking the Bartlett Arboretum, the Nature Center and Scofield Park.
- NS3.3: Support and expand Stamford's tree preservation tools, including subdivision and other review procedures and the creation of a tree preservation ordinance.

Newfield/Turn of River/Westover (NTW)

The Newfield/Turn of River/Westover Neighborhood Plan section includes several recommendations that relate directly to the Long Ridge Road and High Ridge Road corridors. The recommendations/policies for these neighborhoods include:

Policy NTW1: Preserve, protect and enhance neighborhood character and quality-of-life

- NTW1.1: Maintain existing residential character of neighborhoods by maintaining existing residential zoning districts.
- NTW1.2: Direct and enhance commercial/office development in existing commercial zones.
- NTW1.3: Retain current floor area ratio (FAR) caps for commercial and office development in industrial districts outside of Downtown.

- NTW1.4: Explore the feasibility of rezoning certain vacant or underutilized commercial/office properties along Long Ridge Road for multifamily residential and mixed-use development.
- NTW1.5: Designate significant roads in Newfield, Turn-of-River and Westover as Scenic Corridors to assure that the character of the existing streetscape is retained and enhanced. Efforts should focus on retaining natural street trees and historic elements, such as stone walls, located within the right of-way and minimizing the impacts of engineered roads on these important features.

Policy NTW2: Improve mobility and circulation

- NTW2.1: Support the recommendations established in the Long Ridge Road and High Ridge Road Corridor Study that aim to transform these key roadways into unique neighborhood-friendly boulevards that are safe, attractive and efficient for all users.
- NTW2.2: Support efforts to reduce traffic congestion along Newfield Avenue and Westover Road by ensuring that Long Ridge and High Ridge Roads – the City's key north-south arterials serving through traffic – operate at optimal levels of service. Newfield Avenue and Westover Road should be maintained as collector roads serving local traffic.
- NTW2.3: Where appropriate and feasible, support the implementation of the traffic calming
- Measures recommended in the 2011 Traffic Calming Master Plan.
- NTW2.4: Improve and expand pedestrian and bicycle connections within and between neighborhoods.

Policy NTW3: Preserve and enhance parks, open space and the natural environment

- NTW3.1: Create greenways along the Mianus and Rippowam Rivers that connect with the Mill River Greenway and other potential greenways including the Merritt Parkway.
- NTW3.2: Preserve and protect open space holdings and environmentally sensitive land.
- NTW3.3: Enhance existing parks and explore the potential for additional public open space holdings for passive and active recreation, including picnic areas, benches, ball fields and recreational facilities.
- NTW3.4: Develop and implement land-use and subdivision tools aimed at preserving and protecting open space holdings and environmentally sensitive land by encouraging development to incorporate long-term protection of these sensitive areas; requiring development to be designed in context with these natural resources; and preventing clear-cutting and retaining matures trees to the extent feasible.

2.2.4 Other Local or Regional Plans

Stamford has taken an active role in planning for its future and several other City-led plans and studies have been prepared over the last decade, including a Traffic Calming Plan, Local Action Plan for Greenhouse Gas Reductions, Transportation Center Master Plan, and Downtown Streetcar Feasibility study. Additional planning efforts in and around Stamford have also been undertaken by the South Western Regional Planning Agency (SWRPA). These include the Merritt Parkway Trail Demonstration Project, a Bicycle and Pedestrian Plan, ITS (Intelligent Transportation Systems) Strategic Plan, and Long Range Transportation Plan. These reports are generally focused on specific transportation-related items and do not identify specific future land use or zoning proposals or recommendations for the property within the corridors study area.

2.3 Existing Roadway Conditions

This section includes an evaluation of the physical roadway conditions in the study area. This information is intended to identify current transportation design issues and was based on multiple field visits and a review of available record plans and reports.

2.3.1 Roadway Geometrics & Classification

Long Ridge Road is a principal arterial roadway that begins at its intersection with High Ridge Road, Summer Street, and Bedford Street in the south and extends in the northerly direction approximately seven miles to the New York State border. The segment of Long Ridge Road between Cold Spring Road and its southern terminus is owned and maintained by the City of Stamford, while the portion of Long Ridge Road between Cold Spring Road and the New York State border is a state owned roadway designated as State Route 104.

Above: View of Long Ridge Road cross section north of Merritt Parkway.

Below: View of Long Ridge Road cross section south of Merritt Parkway.

South of the Merritt Parkway, Long Ridge Road consists of two through lanes in each direction with auxiliary turning lanes at various intersections and commercial driveways. The cross section of Long Ridge Road narrows to a single travel lane in each direction north of the Merritt Parkway. Shoulder widths along the corridor vary from approximately one-foot to five-feet, and on-street parking is not accommodated within the study area. The posted speed limit on Long Ridge Road is 40 miles per hour south of Northwood Lane, 45 miles per hour from Northwood Lane to Erskine Road, and 40 miles per hour from Erskine Road to the New York State border.

High Ridge Road is a principal arterial roadway that begins at its intersection with Long Ridge Road, Summer Street, and Bedford Street in the south and extends in the northerly direction approximately seven miles to the New York State border. The segment of High Ridge Road between Cold Spring Road and its southern terminus is owned and maintained by the City of Stamford, while the portion of High Ridge Road between Cold Spring Road and the New York State border is a state owned roadway designated as State Route 137.

Above: View of High Ridge Road cross section north of Merritt Parkway.

Below: View of High Ridge Road cross section south of Merritt Parkway.

South of the Merritt Parkway, High Ridge Road consists of two through lanes in each direction with auxiliary turning lanes at various intersections and commercial driveways. The cross section of High Ridge Road narrows to a single travel lane in each direction north of the Merritt Parkway. Shoulder widths along the corridor vary from approximately one-foot to five-feet. Street-side perpendicular parking spaces, which access directly into High Ridge Road serve adjacent retail uses in the blocks from Cedar Heights Road to Merriman Road. High Ridge Road does not accommodate on-street parking at any other location in the study area. The posted speed limit on High Ridge Road is 40 miles per hour south of Brookdale Road and 45 miles per hour north of Brookdale Road.

2.3.2 Traffic Control Signal System & ITS Elements

There are 29 signalized intersections along the Long Ridge Road and High Ridge Road corridors, most of which are located south of the Merritt Parkway. These traffic signals operate in a coordinated system, and the signal timing splits at each location are controlled by a master computer. Closed-circuit television (CCTV) surveillance cameras are located at six intersections along the corridors. Fiber optic interconnect cable, which can be used to accommodate the installation of additional CCTV cameras or other Intelligent Transportation System (ITS) elements in the future, runs along both corridors from the Bull's Head to the Merritt Parkway.

2.3.3 Pavement Conditions Assessment

Pavement, curb, and drainage conditions were reviewed in the field on November 3, 2011 in order to identify obsolete or deficient locations on Long Ridge Road and High Ridge Road. The findings from this field investigation are summarized below.

Long Ridge Road can be divided into three sections based on observed pavement conditions. The first section begins at the southern terminus of Long Ridge Road at the intersection with High Ridge Road and continues in a northerly direction to a point approximately 1,000 feet north of the Merritt Parkway underpass. This section has been recently overlaid with hot mix asphalt (HMA). The pavement exhibits some reflective transverse and longitudinal cracking, which should be sealed now to preserve the pavement. This section of Long Ridge Road has bituminous curbing. Intermittent sections of curbing are broken and should be repaired as part of routine maintenance activities.

Typical pavement condition on Long Ridge Road, south of Merritt Parkway

The second section of Long Ridge Road proceeds from the point approximately 1,000 feet north of the Merritt Parkway underpass to the intersection with Mountain Wood Road. This section appears to be an HMA overlay on Portland cement concrete pavement (PCCP). This section exhibits reflective medium severity transverse and longitudinal cracking, which should be crack sealed now to preserve the pavement condition. There are areas that exhibit raveling and potholes, which should be cut and patched at this time. There are isolated areas of missing bituminous curbing along this section that should be replaced to maintain the roadway's drainage pattern. This section should be considered for a mill and overlay in approximately five years.

Typical pavement condition on Long Ridge Road, between Merritt Parkway and Mountain Wood Road

The final section of Long Ridge Road proceeds from the intersection with Mountain Wood Road north to the New York State border. The pavement in this section exhibits some transverse and longitudinal cracking. The bituminous curb is generally in good shape and has sufficient reveal, although there were isolated areas of missing curbing, which should be replaced. Three locations were noted that would benefit from the installation of paved leak offs.

High Ridge Road can be divided into four sections based on observed pavement conditions. The first section begins at the southern terminus of High Ridge Road at the intersection with Long Ridge Road and continues in a northerly direction to the intersection with Dannell Drive. This section exhibits extensive medium severity block cracking. The pavement should be milled and overlaid within five years. This section of High Ridge Road has Portland cement curbing, with limited reveal in many areas. Sections of the curbing may need to be replaced at the same time as the mill and overlay pavement treatment.

Typical pavement condition on High Ridge Road, between Dannell Drive and Merritt Parkway

The second section of High Ridge Road proceeds from the intersection with Dannell Drive to a point approximately 500 feet south of the Merritt Parkway underpass. This section of High Ridge Road has some medium severity block cracking with additional areas exhibiting transverse and longitudinal cracking. The cracking is less severe than the section to the south, and consequently it is a candidate for crack sealing now to preserve the pavement condition. This section also has some areas of limited curb reveal.

The third section of High Ridge Road proceeds from the point approximately 500 feet south of the Merritt Parkway underpass to the northern intersection with North Stamford Road. This section has extensive medium severity transverse and longitudinal cracking. The section appears to be an HMA overlay on PCCP. This section is a candidate for crack sealing at the current time. The curbing changes to bituminous curbing north of the Merritt Parkway. There are isolated areas of missing curbing, which should be repaired.

Typical pavement condition on High Ridge Road, between Merritt Parkway and North Stamford Road. Note the missing bituminous curbing on the right side of the road.

The final section of High Ridge Road proceeds from the northern intersection with North Stamford Road north to the New York State border. This section exhibits less extensive medium severity transverse and longitudinal cracking than the section to the south. This section is also a crack seal candidate. Isolated areas within this section require cutting and patching as part of a routine maintenance activity.

Long Ridge Road and High Ridge Road are served by a closed drainage system south of the Merritt Parkway and a curbed section with leak offs as required north of the Merritt Parkway. No obvious drainage system failures other than the intermittent sections of missing curbing were noted along either corridor in the field review.

2.3.4 Street Lighting

Street lighting is provided along the entire length of the High Ridge Road corridor; however, the street lights are generally located further apart in the more rural areas in the northern portion of the study area.

Street lighting is provided consistently along Long Ridge Road south of Wildwood Road. North of Wildwood Road, street lighting is less frequent and is generally only provided at major intersections and a few other isolated locations.

2.3.5 Structural Evaluation

The corridor study area contains 16 bridge structures. A majority of these bridges carry state and local roads over various waterways, and three of them carry traffic over other state and local roads, including two interchanges with the Merritt Parkway. A majority of the bridges were built in the early to mid-1930s, including six that carry or cross over the Merritt Parkway. A few others were built in the 1940s, 1950s, and 1960s, and two recently in the 1990s and 2000s. Two of the 1930s era bridges have been rehabilitated, one in the 1970s and the other in the 1990s.

The bridges in the study area are of a variety of structure types and materials. Five of the six bridges associated with the Merritt Parkway were built in the late 1930s and are concrete structures: two concrete frames, two concrete culverts, and a concrete deck arch. The sixth bridge associated with the Merritt Parkway was also built in the 1930s and is a steel frame. Of the five remaining bridges built in the 1930s and 1940s, one is a steel stringer/multi beam structure, and the others are of various concrete types: slab, T-beam, culvert, and deck arch. The bridges built in the 1950s and 1990s are all steel stringer/multi beam bridges. The newest bridge, which was built in the 2000s, and the most recently rehabilitated structure are both prestressed concrete. The bridge structures are summarized in Table 2-8.

The deficiencies of the bridge structures within the corridor study can be summarized into two categories: 1) bridges that are deficient due to the poor operating conditions with respect to roadway geometry, traffic flow, and associated safety issues; and/or 2) bridges that are deficient due to poor physical condition.

Table 2-8 Bridge Structure Summary

Structure #	Facility Carried by Structure	Feature Intersected	Mile Post	Year Built	Year Reconstructed	Structure Type
0 0703	Route 15	Route 104	9.47	1936	-	Concrete - Frame
0 0704	Mill Road	Route 15	1.00	1938	-	Concrete - Frame
0 0705	Route 15	Rippowam River	10.12	1936	-	Concrete - Deck Arch
0 0706	Route 15	Route 137	10.66	1937	1994	Steel- Frame
0 1350	Route137 (High Ridge Road)	Rippowam River	4.62	1931	1974	Concrete - T-Beam
0 2141	Route 15	Brook	10.73	1936	-	Concrete - Culvert
0 2142	Route 15	36" Water Main and Drainage	10.76	1936	-	Concrete - Culvert
0 2600	Route 104	East Branch of Mianus River	5.52	1933	-	Concrete - Culvert
0 2665	Route137 (High Ridge Road)	Poor House Brook	5.40	1930	-	Concrete - Slab
0 4067	Cedar Heights Road	Rippowam River	0.58	1933	-	Steel - Stringer/Multi-Beam
0 4068	Interlaken Road	N Stamford Res Outlet	0.56	1941	-	Concrete - Deck Arch
0 4070	Wire Mill Road	Havilland Brook	24.58	1957	-	Steel - Stringer/Multi-Beam
0 4071	River Bank Road	East Branch of Mianus River	0.15	1957	-	Steel - Stringer/Multi-Beam
0 5007	Buckingham Drive	Rippowam River	0.07	1965	2005	Prestressed Concrete - Box or Girder
0 5506	Studio Road	Rippowam River	0.07	2005	-	Prestressed Concrete - Slab
0 5963	Route 104	Rippowam River	0.95	1991	-	Steel - Stringer/Multi-Beam

Source: CTDOT and National Bridge Inspection Standards (NBIS)
Based on inspection reports, plans and data provided by CTDOT as of October 2011

A number of the bridges along the study section have geometric and operational conditions that do not meet present design standards. These deficiencies encompass a range of criteria, including horizontal and vertical clearance over and under intersecting roadways as well as traffic safety related items. Many bridges have traffic safety features that do not meet current AASHTO standards, including bridge railings, transitions, and approach guardrails. A summary of the operational deficiencies found on study area bridge structures is shown on Table 2-9.

Table 2-9 Bridge Operational Conditions Summary

Structure # (location)	Structural Evaluation	Deck Geometry	Under Clearances Vert. and Horz.	Waterway Adequacy	Approach Roadway Alignment	Scour Critical	Traffic Safety Deficiencies
0 0703 (Rt 15 over Rt 104)	5	4	3	N/A	8	N/A	Bridge Railing, Transition Railing, Approach Railing, Approach Ends
0 0704 (Mill Rd over Rt 104)	5	4	2	N/A	6	N/A	Bridge Railing, Transition Railing, Approach Railing, Approach Ends
0 0705 (Rt 15 over Ripp. River)	5	2	N/A	9	8	3	Transition Railing, Approach Ends
0 0706 (Rt 15 over Rt 137)	6	2	3	N/A	8	N/A	Transition Railing, Approach Railing
0 1350 (Rt 137 over Ripp. River)	5	2	N/A	7	8	4	Transition Railing, Approach Railing
0 2141 (Rt 15 over Brook)	6	N	N/A	9	8	8	--
0 2142 (Rt 15 over Water Main)	6	N	N/A	8	8	8	--
0 2600 (Rt 15 over Mianus River)	4	N	N/A	6	8	8	--
0 2665 (Rt 137 over P.H. Brook)	5	9	N/A	6	6	6	Bridge Railing, Transition Railing, Approach Railing
0 4067 (CH Rd over Ripp. River)	4	4	N/A	9	4	8	Bridge Railing, Transition Railing, Approach Railing, Approach Ends
0 4068 (IL Rd over Res outlet)	5	4	N/A	6	8	8	Bridge Railing, Transition Railing, Approach Railing, Approach Ends
0 4070 (WM Rd over Havilland Bk)	4	4	N/A	7	6	5	Bridge Railing, Transition Railing, Approach Railing, Approach Ends

0 4071 (RB Rd over Mianus River)	4	5	N/A	7	6	5	Bridge Railing, Transition Railing, Approach Railing, Approach Ends
0 5007 (Buck Dr over Ripp. River)	7	5	N/A	7	4	N/A	Transition Railing, Approach Railing, Approach Ends
0 5506 (Studio Rd over Ripp. River)	7	5	N/A	6	7	5	Bridge Railing, Transition Railing, Approach Railing, Approach Ends
0 5963 (Rt 104 over Ripp. River)	6	4	N/A	9	8	8	Transition Railing, Approach Railing, Approach Ends

Source: CTDOT and National Bridge Inspection Standards (NBIS)
Based on inspection reports, plans and data provided by CTDOT as of October 2011

Connecticut DOT performs routine inspections of all bridge structures, typically on a biannual basis. Based on the information contained within the latest inspection reports, 12 of the 16 bridges within the study area were found to be in fair to satisfactory condition, with the primary structural components, superstructure, substructure, and deck, receiving a condition ratings varying from a 5 (fair condition) up to 8 (very good condition). A concrete culvert built in the 1930s and the steel – stringer/multi beam built in the 1930s had one of the primary structural components with a condition rating of 4 (poor). The two steel – stringer multi-beam bridges built in the 1950s are in fair to poor condition receiving rating conditions from 3 (serious condition) to 5 (fair condition). A summary of the physical condition of the bridge structures can be found on Table 2-10.

Table 2-10 Bridge Physical Conditions Summary

Structure #	Deck	Super-structure	Sub-structure	Channel & Channel Protection	Culverts	Operating Rating (Tons)	Inventory Rating (Tons)
0 0703 (Rt 15 over Rt 104)	N/A	5	7	N/A	N/A	75	27
0 0704	N/A	5	6	N/A	N/A	58	34
0 0705	N/A	5	6	5	N/A	62	23
0 0706	6	6	6	N/A	N/A	64	35
0 1350	7	5	5	5	N/A	58	34
0 2141	N/A	N/A	N/A	6	6	99	36
0 2142	N/A	N/A	N/A	8	6	99	36
0 2600	N/A	N/A	N/A	7	4	39	29
0 2665	7	5	5	6	N/A	58	36
0 4067	6	4	7	6	N/A	60	32
0 4068	N/A	6	5	6	N/A	58	34
0 4070	3	4	5	7	N/A	37	22
0 4071	5	4	4	6	N/A	43	27
0 5007	8	8	7	6	N/A	49	36

0 5506	8	7	7	6	N/A	81	47
0 5963	7	7	6	6	N/A	90	54

Source: CTDOT and National Bridge Inspection Standards (NBIS)
Based on inspection reports, plans and data provided by CTDOT as of October 2011

Given that a majority of the bridges within the corridor area were built in the 1930s through 1950s, and only three bridges were either new or rehabilitated in the 1990s and 2000s, the older bridges will require rehabilitation or reconstruction work to maintain their structural adequacy to 2030. Addressing only the physical condition of the bridge structures, the following rehabilitative actions would be required:

- Concrete deck replacement
- Elimination/reduction of deck joints
- New membrane waterproofing and roadway pavement
- Cleaning and painting of structural steel
- Rehabilitation or replacement of bridge bearings
- Rehabilitation of concrete substructure elements

In addition, while some of these bridges may have undergone seismic retrofits in the recent past, further investigation and analysis is required to determine if they comply with current AASHTO seismic requirements.

2.4 Existing Traffic Demand

To identify current traffic flow characteristics along the study corridors, historical traffic data collected by CTDOT was reviewed and supplemented by the collection of additional traffic data in September and October 2011. The traffic data reviewed in this study includes daily and peak hour traffic volumes, vehicle speeds and composition, travel times, and pedestrian volumes. The following section summarizes this traffic data collection process and documents the results.

2.4.1 Daily Traffic Volumes

Daily traffic volumes were collected by CTDOT throughout the City of Stamford in 2008 as part of an ongoing statewide traffic counting program. These historical traffic counts were reviewed and supplemented by collecting daily traffic volume data at numerous locations along the study corridors and key side streets in September and October 2011 using automatic traffic recorders (ATR). The ATRs recorded traffic data by direction in 15-minute increments and included vehicle speed and classification data, which is discussed in subsequent sections. The locations of the CTDOT daily traffic counts and the additional ATR counts (total of 73 count stations) conducted for this study are shown on Figures 2-3S and 2-3N.

Based on the traffic count data discussed above, daily traffic volumes are significantly higher on the study corridors south of the Merritt Parkway, with the highest traffic volumes in the study area occurring on High Ridge Road, generally between Vine Road and the Merritt Parkway. Traffic volumes progressively decrease from the Merritt Parkway to the New York State border, with the lowest daily traffic volumes on the study corridors occurring near the New York State border. The existing daily traffic volumes on the study roadways are summarized on Figures 2-4S and 2-4N. The raw traffic count data is included in the technical appendix.

2.4.2 Peak Traffic Volumes

While the daily traffic data provide an overview of the level of traffic demand along the study corridors, a key focus of this study was to evaluate how the study intersections are able to accommodate the traffic demands placed upon them during the peak traffic periods. As such, manual turning movement counts (TMCs) were conducted at the 44 study intersections along the Long Ridge Road and High Ridge Road corridors to collect peak hour traffic data. The TMCs were conducted between the hours of 7:00 AM to 9:00 AM and 4:00 PM to 7:00 PM on various weekdays (non-holiday) in September and October 2011. The traffic counts were conservatively balanced and adjusted based on a review of historical counts in the area in order to establish the existing peak hour traffic volumes for use in evaluating current peak-hour traffic operating conditions.

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-3 (S)

24 - Hour Automatic
Traffic Recorder Count Locations

Legend

- 24-Hour Automatic Traffic Recorder Count
- ConnDOT ATR Count Stations
- Project Corridor

Long Ridge Road

1 Long Ridge Road, north Cross Road
2 Long Ridge Road, north of Stillwater Road
3 Long Ridge Road, south of Den Road
4 Long Ridge Road, south of Chestnut Hill Road
5 Long Ridge Road, north of Chestnut Hill Road
6 Long Ridge Road, north of Hunting Ridge Road
7 Long Ridge Road, south of Wildwood Road
8 Long Ridge Road, south of Riverbank Road
9 Long Ridge Road, north of Riverbank Road
10 Long Ridge Road, south of Erskine Road

High Ridge Road

11 High Ridge Road, north of Cold Spring Road
12 High Ridge Road, south of Rippowam School Drive
13 High Ridge Road, north of Rippowam School Drive
14 High Ridge Road, north of Bel Aire Drive
15 High Ridge Road, north of Interlaken Road
16 High Ridge Road, south of Hickory Road
17 High Ridge Road, north of Sunset Road

Side Streets

18 Cross Road, between Long Ridge Road and High Ridge Road
19 McClean Avenue, between Long Ridge Road and High Ridge Road
20 Terrace Avenue, between Long Ridge Road and High Ridge Road
21 Longview Road, west of High Ridge Road
22 Bradley Place, west of High Ridge Road
23 Merriman Road, east of High Ridge Road
24 Dunn Avenue, west of High Ridge Road
25 Wire Mill Road, west of High Ridge Road
26 Webbs Hill Road, east of Long Ridge Road
27 Wildwood Road, west of Long Ridge Road
28 Wildwood Road, east of Long Ridge Road
29 Erskine Road, west of Long Ridge Road
30 Erskine Road, east of Long Ridge Road
31 North Stamford Road, east of High Ridge Road
32 Sky Meadow Drive, west of High Ridge Road
33 Laurel Road, east of High Ridge Road
34 Stillwater Road, west of Long Ridge Road
35 Roxbury Road, west of Long Ridge Road

City of Stamford, Connecticut

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-3 (N)

24 - Hour Automatic
Traffic Recorder Count Locations

Legend

- 24-Hour Automatic Traffic Recorder Count
- ConnDOT ATR Count Stations
- Project Corridor

Long Ridge Road

1 Long Ridge Road, north Cross Road
2 Long Ridge Road, north of Stillwater Road
3 Long Ridge Road, south of Den Road
4 Long Ridge Road, south of Chestnut Hill Road
5 Long Ridge Road, north of Chestnut Hill Road
6 Long Ridge Road, north of Hunting Ridge Road
7 Long Ridge Road, south of Wildwood Road
8 Long Ridge Road, south of Riverbank Road
9 Long Ridge Road, north of Riverbank Road
10 Long Ridge Road, south of Erskine Road

High Ridge Road

11 High Ridge Road, north of Cold Spring Road
12 High Ridge Road, south of Rippowam School Drive
13 High Ridge Road, north of Rippowam School Drive
14 High Ridge Road, north of Bel Aire Drive
15 High Ridge Road, north of Interlaken Road
16 High Ridge Road, south of Hickory Road
17 High Ridge Road, north of Sunset Road

Side Streets

18 Cross Road, between Long Ridge Road and High Ridge Road
19 McClean Avenue, between Long Ridge Road and High Ridge Road
20 Terrace Avenue, between Long Ridge Road and High Ridge Road
21 Longview Road, west of High Ridge Road
22 Bradley Place, west of High Ridge Road
23 Merriman Road, east of High Ridge Road
24 Dunn Avenue, west of High Ridge Road
25 Wire Mill Road, west of High Ridge Road
26 Webbs Hill Road, east of Long Ridge Road
27 Wildwood Road, west of Long Ridge Road
28 Wildwood Road, east of Long Ridge Road
29 Erskine Road, west of Long Ridge Road
30 Erskine Road, east of Long Ridge Road
31 North Stamford Road, east of High Ridge Road
32 Sky Meadow Drive, west of High Ridge Road
33 Laurel Road, east of High Ridge Road
34 Stillwater Road, west of Long Ridge Road
35 Roxbury Road, west of Long Ridge Road

City of Stamford, Connecticut

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-4 (S)

Average Daily
Traffic Volumes

Legend

Average Daily Traffic Volumes

- 0 - 5,000
- 5,000 - 10,000
- 10,000 - 15,000
- 15,000 - 20,000
- 20,000 - 25,000
- 25,000 - 30,000
- 30,000 - 35,000

City of Stamford, Connecticut

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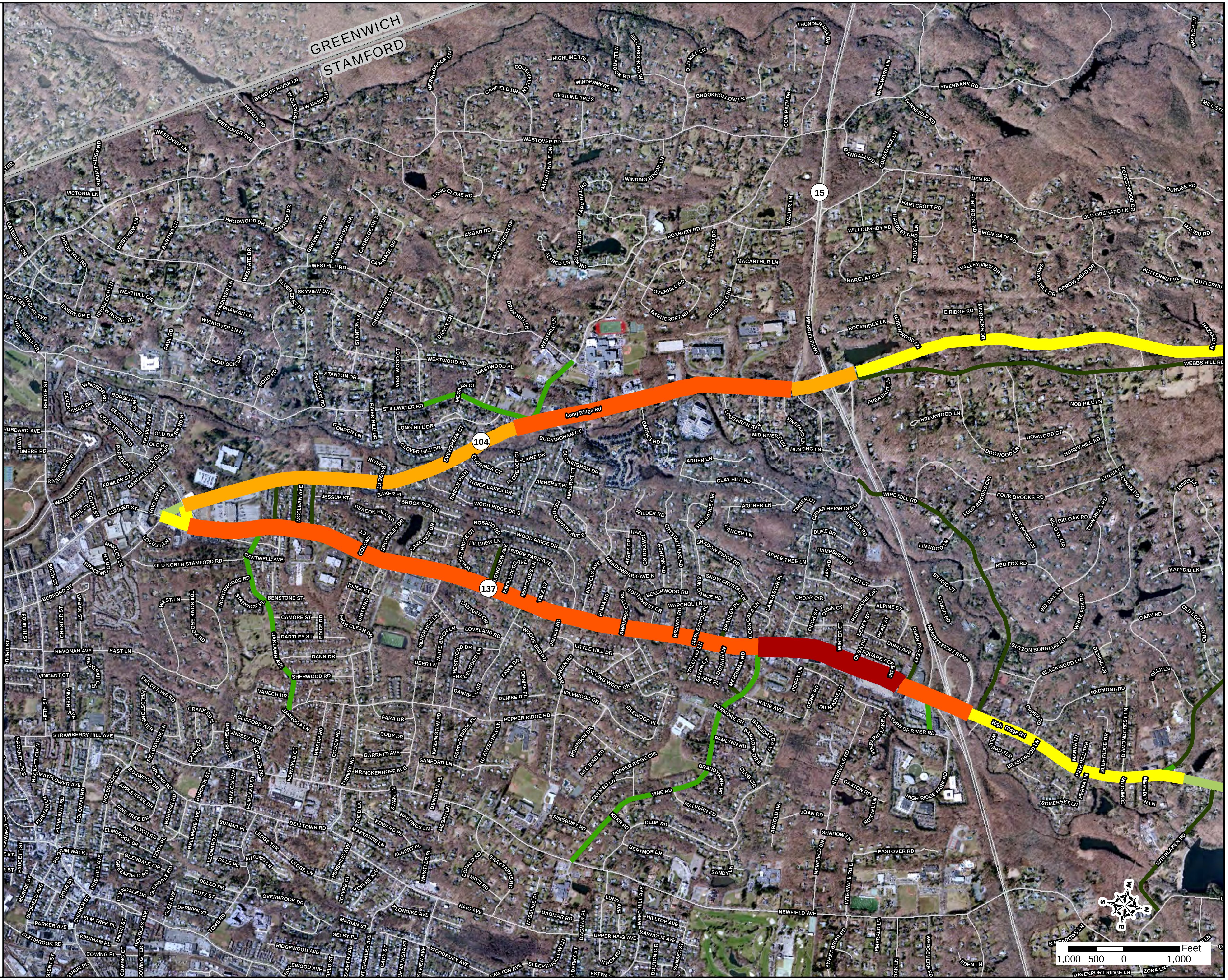
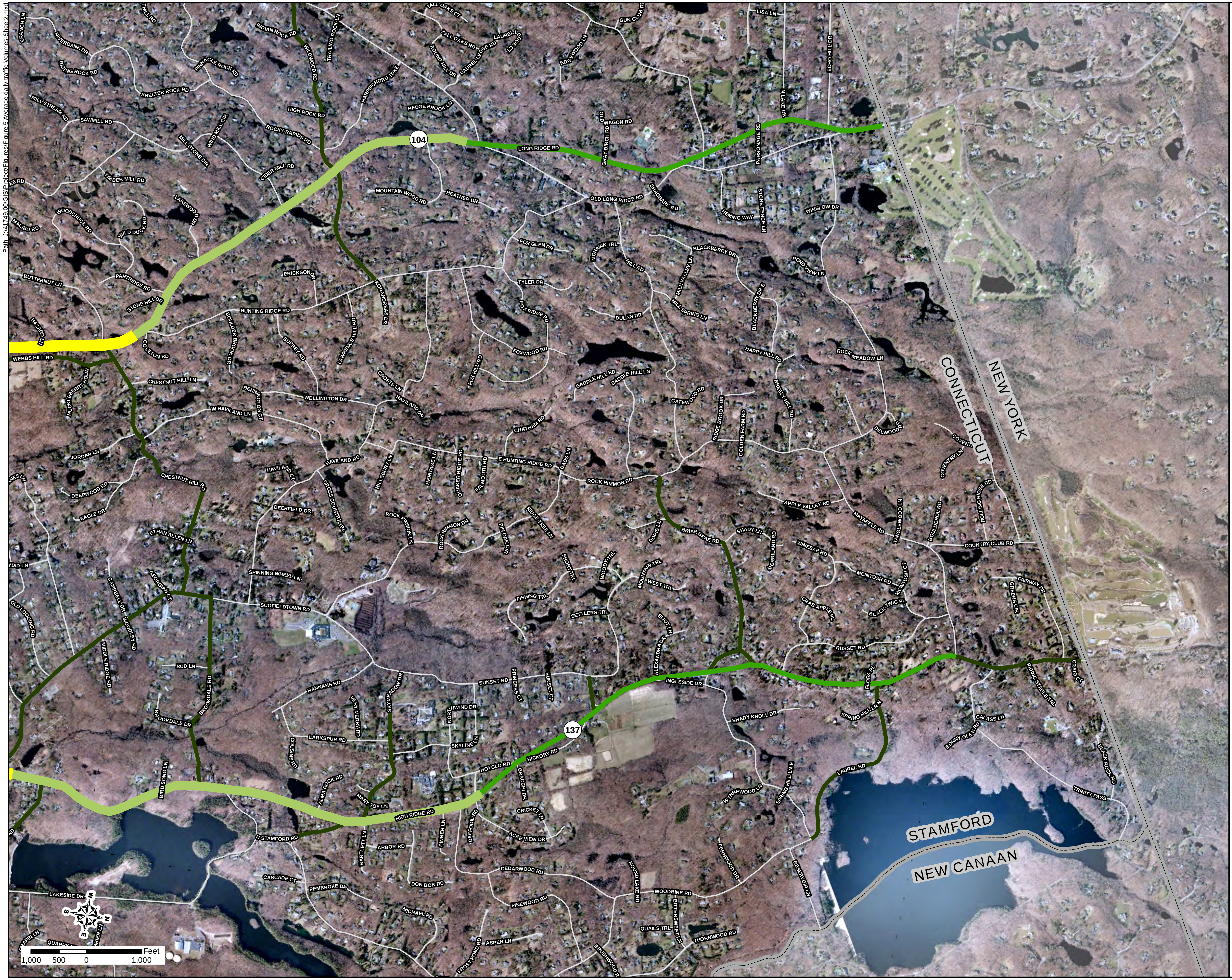
Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)





Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-4 (N)

Average Daily
Traffic Volumes

Legend

Average Daily Traffic Volumes

- 0 - 5,000
- 5,000 - 10,000
- 10,000 - 15,000
- 15,000 - 20,000
- 20,000 - 25,000
- 25,000 - 30,000
- 30,000 - 35,000

City of Stamford, Connecticut

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

2.4.3 Vehicle Classification

Vehicle classification data was collected at multiple locations along the study corridors using automatic traffic recorders (ATR). The detailed classification data was aggregated into three broad vehicle types: cars, light trucks, and heavy trucks. The cars category consists of passenger cars, motorcycles, and two-axle pick-up trucks. The light trucks category consists of buses and single-unit trucks with more than four tires on two axles. The heavy trucks category consists of all trucks with three or more axles.

The vehicle classification data is summarized in Table 2-11 below. As indicated in this table, the total percentage of trucks (light and heavy) in the traffic stream along the study corridors varies between 1.8-percent to 9.3-percent.

Table 2-11 Vehicle Classification

Location	Northbound Vehicle Classification (%)			Southbound Vehicle Classification (%)		
	Cars	Light Trucks	Heavy Trucks	Cars	Light Trucks	Heavy Trucks
Long Ridge Road						
Long Ridge Road, north Cross Road	97.4	1.3	1.3	96.7	1.9	1.4
Long Ridge Road, north of Stillwater Road	97.3	1.1	1.6	97.5	1.1	1.4
Long Ridge Road, south of Den Road	98.1	1.3	0.6	90.7	8.6	0.7
Long Ridge Road, south of Chestnut Hill Road	97.4	2.3	0.3	95.2	4.4	0.4
Long Ridge Road, north of Chestnut Hill Road	93.7	5.8	0.5	97.9	1.6	0.5
Long Ridge Road, north of Hunting Ridge Road	97.5	2.2	0.3	95.0	4.5	0.5
Long Ridge Road, south of Wildwood Road	90.8	8.1	1.1	98.1	1.3	0..6
Long Ridge Road, south of Riverbank Road	98.1	1.5	0.4	94.0	5.5	0.5
Long Ridge Road, north of Riverbank Road	94.9	4.6	0.5	98.2	1.4	0.4
Long Ridge Road, south of Erskine Road	96.8	2.7	0.5	98.1	1.6	0.3
High Ridge Road						
High Ridge Road, north of Cold Spring Road	96.4	2.1	1.5	96.2	2.2	1.6
High Ridge Road, south of Rippowam School Drive	95.9	2.5	1.6	96.7	1.7	1.6
High Ridge Road, north of Rippowam School Drive	95.4	2.7	1.9	96.4	2.2	1.4
High Ridge Road, north of Bel Aire Drive	95.8	2.5	1.7	97.4	1.3	1.3
High Ridge Road, north of Interlaken Road	96.7	2.7	0.6	97.6	2.1	0.3
High Ridge Road, south of Hickory Road	97.1	2.5	0.4	95.9	3.7	0.4
High Ridge Road, north of Sunset Road	96.5	2.8	0.7	96.0	3.3	0.7

Source: 24-hour Automatic Traffic Recorder (ATR) counts conducted by VHB in September and October 2011.

2.4.4 Vehicle Speeds

Vehicle speed data at numerous mid-block locations along Long Ridge Road and High Ridge Road were compiled from speed surveys conducted by CTDOT and supplemented with the automatic traffic recorder (ATR) data collected in September and October 2011. The vehicle speed data are summarized on Table 2-12 in terms of average speed and 85th percentile speed in each direction of travel. The 85th percentile speed is the speed at which 85-percent of vehicles travel at or below and is typically used as the design speed by regulatory agencies to establish speed limits. The data locations on this table are listed in geographical order for each corridor, from south to north. Based on the vehicle speed data, the 85th percentile speeds along the corridors generally vary between the posted speed limit and ten miles per hour above the speed limit. The few locations where the 85th percentile vehicle speeds are more than 10 miles per hour above the posted speed limit are highlighted in the summary table. The mid-block average and operating speeds along the Long Ridge Road corridor averaged 2 to 4 percent higher than those along the High Ridge Road corridor.

Table 2-12 Existing Traffic Speeds

		Northbound		Southbound	
Location	**Posted Speed Limit (mph)**	**Average Speed (mph)**	**85th % Speed (mph)**	**Average Speed (mph)**	**85th % Speed (mph)**
Long Ridge Road, north of Cross Road [1]	40	35	41	36	44
Long Ridge Road, at Stark Place [2]	40	45	**50**	44	48
Long Ridge Road, north of Stillwater Road[1]	40	38	43	37	43
Long Ridge Road, south of Barnes Road [2]	40	47	**51**	48	**53**
Long Ridge Road, at Maltbie Avenue [2]	40	42	45	42	44
Long Ridge Road, south of Den Road [1]	45	37	42	45	54
Long Ridge Road, at Den Road [2]	45	47	50	48	51
Long Ridge Road, south of Chestnut Hill Road [1]	45	38	47	38	48
Long Ridge Road, north of Chestnut Hill Road [1]	45	42	51	35	42
Long Ridge Road, north of Hunting Ridge Road [1]	45	39	46	44	50
Long Ridge Road, at Sawmill Road [2]	45	46	49	47	50
Long Ridge Road, south of Wildwood Road [1]	45	42	51	34	40

Table 2-12 Existing Traffic Speeds (continued)

Location	Posted Speed Limit (mph)	Northbound Average Speed (mph)	Northbound 85th % Speed (mph)	Southbound Average Speed (mph)	Southbound 85th % Speed (mph)
Long Ridge Road, south of Riverbank Road [1]	45	44	52	37	43
Long Ridge Road, north of Riverbank Road [1]	45	46	54	40	45
Long Ridge Road, south of Erskine Road [1]	45	37	42	38	46
Long Ridge Road, north of Parsonage Road [2]	40	45	49	43	47
High Ridge Road, north of Bedford Street [2]	40	43	46	43	45
High Ridge Road, north of Cold Spring Road [1]	40	29	35	29	36
High Ridge Road, south of Rippowam School Dr. [1]	40	36	44	32	41
High Ridge Road, north of Rippowam School Dr. [1]	40	38	46	34	44
High Ridge Road, north of Bel Aire Drive [1]	40	39	46	34	39
High Ridge Road, at Bradley Place [2]	40	41	44	40	43
High Ridge Road, north of Route 15 [2]	40	42	45	43	46
High Ridge Road, north of Diamondcrest Lane [2]	40	42	46	41	44
High Ridge Road, north of Interlaken Road [1]	40	35	41	29	39
High Ridge Road, at North Stamford Road [2]	45	46	49	46	49
High Ridge Road, south of Hickory Road [1]	45	43	48	42	49
High Ridge Road, north of Hoyclo Road [2]	45	45	49	45	49
High Ridge Road, north of Sunset Road [1]	45	41	46	41	47
High Ridge Road, north of Ingleside Drive [2]	45	49	**55**	48	52
High Ridge Road, north of Laurel Road [2]	45	46	49	45	49

1 Based on ATR counts conducted in September and October 2011
2 Based on speed surveys conducted by CTDOT in 2009 and 2011
Shaded areas denote 85th percentile speed 10 or greater miles per hour above speed limit

2.4.5 Intersection Sight Distance Evaluation

Due to the rural nature of both corridors north of the Merritt Parkway, the provision of adequate intersection sight distance (ISD) at unsignalized intersections is an important safety concern. For this reason, the Automatic Traffic Recorders recording vehicle speeds along the corridors were placed at strategic locations upstream of the intersections of most concern. The speed data collected was used to determine the appropriate intersection sight distance, based on design standards identified by the Connecticut Department of Transportation[3]. Field measurements were then conducted to determine whether adequate sight distances are provided and, if not, to identify sightline obstructions. The results of this investigation are summarized in Table 2-13. As indicated in this table, adequate intersection sight distance is not available at multiple locations along the Long Ridge Road and High Ridge Road corridors.

▼

[3] Connecticut Department of Transportation; Highway Design Manual; December 2006

Table 2-13 Intersection Sight Distance Evaluation

	Study Intersection / Approach	Design Speed (mph)[1] Left	Design Speed (mph)[1] Right	Recommended ISD[2] Left	Recommended ISD[2] Right	Available ISD[3] Left	Available ISD[3] Right	Meets Standard Left	Meets Standard Right	Notes
12	Long Ridge Rd at Chestnut Hill/Butternut Ln									
	- EB Butternut Lane	42	47	463'	518'	360'	700'	NO*	Yes	* Sight lines obstructed by vegetation and horizontal curvature of roadway
	- WB Chestnut Hill Rd	47	42	518'	463'	700'	600'	Yes	Yes	
	- WB Chestnut Hill Rd north connector	47	42	518'	463'	>900'	650'	Yes	Yes	
	- WB Chestnut Hill Rd south connector	47	42	518'	463'	650'	775'	Yes	Yes	
13	Long Ridge Road at Hunting Ridge Road S									
	- WB Hunting Ridge Road S (north)	51	50	562'	551'	725'	715'	Yes	Yes	
	- WB Hunting Ridge Road S (south)	51	50	562'	551'	615'	825'	Yes	Yes	
14	Long Ridge Road at Wildwood Road									
	- EB Wildwood Road	40	51	441'	562'	575'	475'	Yes	NO*	* Sight lines obstructed by vegetation and roadway geometry
	- WB Wildwood Road	51	40	562'	441'	500'	500'	NO**	Yes	** Sight lines obstructed by vertical crest in roadway
15	Long Ridge Road at River Bank Road									
	- EB River Bank Road	45	52	496'	573'	450'	900'	NO*	Yes	* Sight lines obstructed by vegetation
16	Long Ridge Road at Erskine Road									
	- EB Erskine Road	46	42	507'	463'	>800'	350'	Yes	NO*	* Sight lines obstructed by vertical crest in roadway
	- WB Erskine Road	42	46	463'	507'	300'	>800'	NO**	Yes	** Sight lines obstructed by vertical crest in roadway
17	Long Ridge Rd at Old Long Ridge Rd (northern)									
	- WB Old Long Ridge Road (northern)	49	47	540'	518'	725'	650'	Yes	Yes	
36	High Ridge Road at Wire Mill Road									
	- EB Wire Mill Road	46	45	507'	496'	450'	>900'	NO*	Yes	* Sight lines obstructed by vegetation
39	High Ridge Road at Brookdale Road									
	- EB Brookdale Road	49	49	540'	540'	440'	715'	NO*	Yes	* Sight lines obstructed by vegetation
40	High Ridge Rd at North Stamford Rd (southern)									
	- WB North Stamford Road (southern)	49	49	540'	540'	440'	775'	NO*	Yes	* Sight lines obstructed by vegetation and vertical curvature of roadway
41	High Ridge Rd at North Stamford Rd (northern)									
	- WB North Stamford Road (northern)	49	49	540'	540'	515'	650'	NO*	Yes	* Sight lines obstructed by vegetation
42	High Ridge Road at Sunset Road									
	- EB Sunset Road	47	46	518'	507'	675'	350'	Yes	NO*	* Sight lines obstructed by vegetation
43	High Ridge Road at Briar Brae Road									
	- EB Briar Brae Road	52	55	573'	606'	450'	>900'	NO*	Yes	* Sight lines obstructed by vegetation
	- WB Briar Brae Road	55	52	606'	573'	>900'	400'	Yes	NO**	** Sight lines obstructed by vegetation
44	High Ridge Road at Mayapple Road									
	- EB Mayapple Road	49	49	540'	540'	800'	610'	Yes	Yes	

1 Design speed for approaching vehicle based on closest available 85th percentile speed data.
2 Recommended Intersection Sight Distance calculated based on design speed of approaching vehicle and design standards identified in the Connecticut Department of Transportation Highway Design Manual.
3 Available Intersection Sight Distance based on field measurements conducted by VHB in December 2011.

2.4.6 Travel Times

Travel time data were collected on Long Ridge Road and High Ridge Road to help assess operating conditions on the study corridors. Travel time observations were made by a driver traveling along the corridors using global positioning system (GPS) equipment to obtain time-space data. Two runs were conducted in both directions along the corridors during each of the morning (7:00 AM to 9:00 AM), midday (11:00 AM to 1:00 PM), and evening (4:00 PM to 6:00 PM) peak periods. The travel time runs were conducted on a typical weekday in October 2011 with no crashes, adverse weather conditions, breakdowns, or other special events that would result in atypical traffic conditions. The driver of the vehicle obeyed all traffic laws and followed the flow of traffic while conducting the runs.

Based on the results of these travel time runs, the traffic flow characteristics on each corridor vary greatly in the segments to the north and south of the Merritt Parkway. Travel is much slower, and delays are longer on the segments of Long Ridge Road and High Ridge Road south of the Merritt Parkway due to congested traffic conditions and a greater frequency of traffic control signals. Traffic generally flows much more freely with fewer delays on Long Ridge Road and High Ridge Road north of the Merritt Parkway.

The time it takes to travel the High Ridge Road corridor is longer in the southbound direction in the morning peak period and in the northbound direction in the evening peak period. On Long Ridge Road, the differences were less clearly defined, although travel times were slightly longer in the morning peak period in both directions.

Even though the High Ridge Road corridor is just 6/10 of a mile longer than the Long Ridge Road corridor, it takes a disproportionately longer time (5 to 7 minutes more) to travel the length of the High Ridge Road corridor during the busiest periods. The average speed over the entire length of the Long Ridge Road corridor (accounting for time stopped at traffic signals and spent in congestion) was approximately 33 miles per hour during the busiest peak period. Peak-period average speeds along the High Ridge Road corridor, by comparison, varied between 24 and 26 miles per hour.

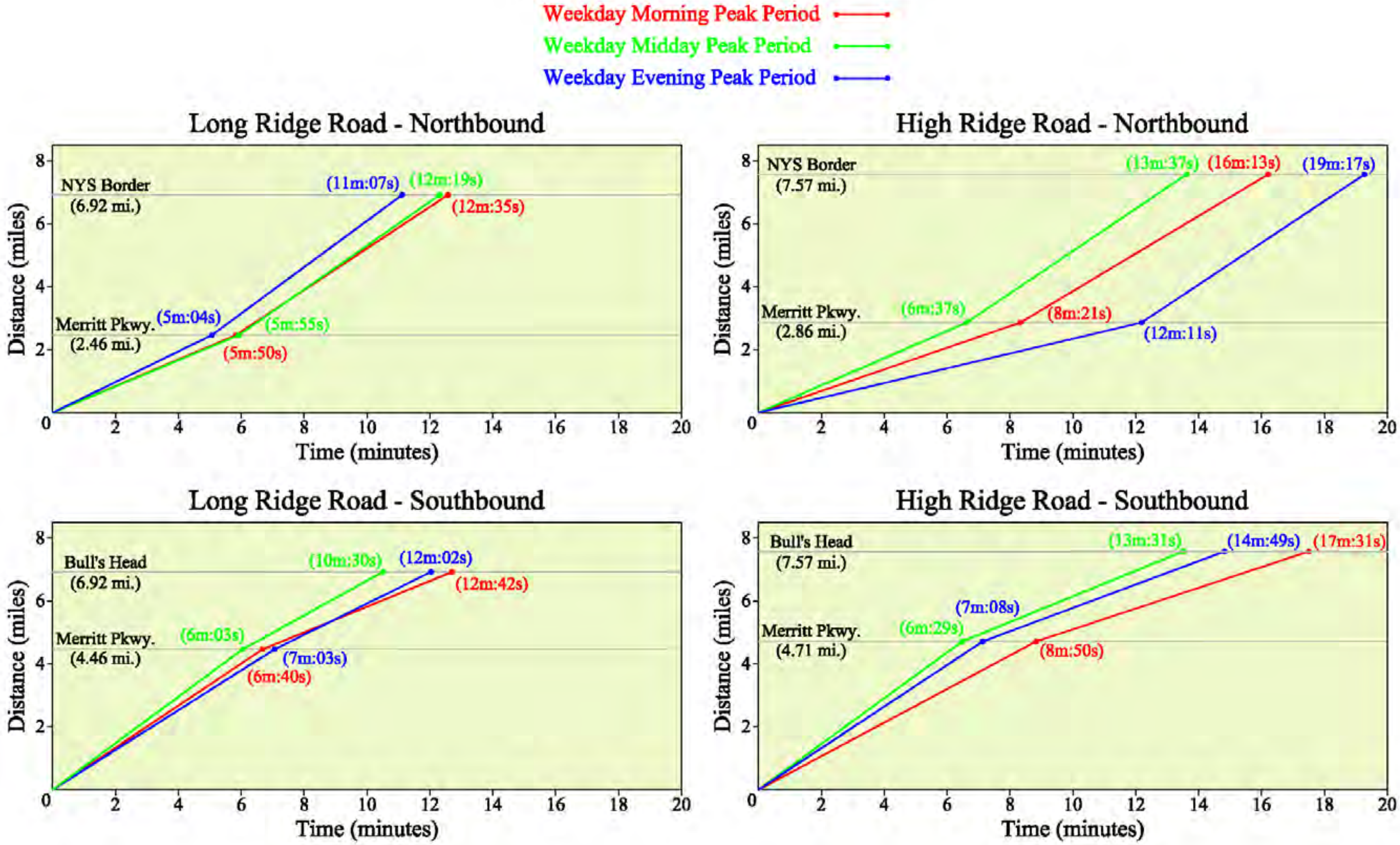
The results of the travel time study are summarized in Table 2-14 and depicted graphically on the following page.

Table 2-14 Travel Times

Corridor	Corridor Distance (Miles)	Average Travel Time (Min : Sec) AM Peak	Midday	PM Peak
Long Ridge Road – Northbound				
From Bull's Head to Merritt Parkway	2.46	5:50	5:55	5:04
From Merritt Parkway to New York State Border	4.46	6:45	6:24	6:03
Total	6.92	12:35	12:19	11:07
Long Ridge Road – Southbound				
From New York State Border to Merritt Parkway	4.46	6:40	6:03	7:03
From Merritt Parkway to Bull's Head	2.46	6:02	4:27	4:59
Total	6.92	12:42	10:30	12:02
High Ridge Road – Northbound				
From Bull's Head to Merritt Parkway	2.86	8:21	6:37	12:11
From Merritt Parkway to New York State Border	4.71	7:52	7:00	7:06
Total	7.57	16:13	13:37	19:17
High Ridge Road – Southbound				
From New York State Border to Merritt Parkway	4.71	8:50	6:29	7:08
From Merritt Parkway to Bull's Head	2.86	8:41	7:02	7:41
Total	7.57	17:31	13:31	14:49

Source: Compiled by VHB based on travel time runs performed in October 2011

Travel Times



2.5 Traffic Operations

Understanding the relationship between the supply and demand on a roadway is a fundamental consideration in evaluating how well a transportation facility accommodates motorists. As such, capacity analyses were conducted based on methods from the 2000 Highway Capacity Manual[4] (HCM) to evaluate how well the study intersections accommodate peak hour traffic demands under existing conditions. The following section summarizes the methods of capacity analyses used in this study and documents the results.

2.5.1 Method of Capacity Analysis

As documented in the HCM, intersection performance is influenced by a number of factors, including: traffic demand; lane configurations; lane widths; turning restrictions; roadway grades; speeds; and signal phasing and timing settings for signalized intersections. The traffic demand at each of the study intersections was based on the peak hour manual turning movement traffic count data discussed in the previous section. The existing physical roadway characteristics were determined by reviewing various record plans and collecting field measurements. For the signalized study intersections, the signal phasing and timing settings were determined by reviewing the current traffic control signal plans and timing sheets provided by the City of Stamford.

Synchro™ software was used to model the study intersections based on the parameters mentioned above. Synchro software is widely used by traffic engineering professionals and is consistent with the procedures in the HCM.

Capacity analyses results are reported using a variety of performance measures, including "Level of Service" (LOS). The level of service designation is an index based on the average control delay experienced by a vehicle traveling through the intersection. Similar to a report card, LOS designations are letter based, ranging from A to F, with LOS A representing the best operating condition (lowest vehicle delays) and LOS F representing the worst operating condition (highest vehicle delays). LOS D or better conditions are typically considered to be acceptable during the peak hours, while LOS E or F conditions are typically considered to be overly congested. In some instances, however, LOS E or F conditions may be deemed tolerable, provided that the lengthy delays do not lead to other, more serious conditions, such as increases in accident frequency. Circumstances where LOS E or F may be considered tolerable are for low volume movements where progression on the main street takes priority over low volume side street movements.

▼

[4] Highway Capacity Manual 2000; Transportation Research Board, National Research Council, Washington, DC (2000).

LOS is assigned differently for signalized and unsignalized intersections. For signalized intersections, the analysis considers the operation of all traffic entering the intersection, and the LOS can be reported for individual turning movements, approaches, or for the intersection as a whole. For unsignalized intersections with stop-control on the side street approaches, the analysis assumes that through and right-turning movements on the main street are unimpeded by side street traffic. As such, LOS is reported only for left-turns from the main street and for all movements from the side street; the overall intersection LOS is not reported. Additionally, the delay values for each range are slightly longer for signalized intersections than unsignalized intersections. This is based on the presumption that the public will be more patient at signalized intersections where they are guaranteed entry into the intersection in a reasonable amount of time.

2.5.2 Capacity Analysis Results

The intersection capacity analyses indicate that suboptimal operating conditions are currently experienced at numerous intersections along the corridors, while the most problematic operating conditions were identified at the intersections by the Merritt Parkway ramps on both corridors, the Bull's Head intersections, the intersection of Long Ridge Road with Stillwater Road, and at the intersection of High Ridge Road with Vine Road. Unsignalized analyses of the intersections of Bradley Place and Merriman Road on High Ridge Road indicate that it is difficult to make left-turns onto either of the corridors south of the Merritt Parkway during the peak hours.

To the North of the Merritt Parkway, the intersection capacity analyses indicate that suboptimal operating conditions are currently experienced at the intersection of Scofieldtown Road with High Ridge Road around the arrival period of the nearby Northeast Elementary School. In addition, the heavy volumes of peak-hour traffic on Long Ridge Road north of the Parkway make it difficult to make left-turns onto Long Ridge Road during the peak hours. Similar, though less severe, conditions are experienced on High Ridge Road north of the Parkway.

The results of the study intersection capacity analyses under existing conditions are summarized on Figures 2-5S and 2-5N. These figures show the overall intersection LOS for signalized intersections and the LOS of the side street approaches for unsignalized intersections. The analyses results for the signalized and unsignalized study intersections are discussed in more detail in the following sections, and the Synchro output reports are included in the technical appendix.

Example of heavy traffic conditions on High Ridge Road at Vine Road.

Example of heavy traffic conditions on Long Ridge Road north of the Merritt Parkway.

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-5 (S)

Intersection Level of Service
Existing Conditions

Long Ridge Road

1 Long Ridge Road at High Ridge Road/Bedford St/Summer St.
2 Long Ridge Road (Route 104) at Cold Spring Road (Route 137)
3 Long Ridge Road (Route 104) at Drives to Olin Chemicals/ Lord & Taylors
4 Long Ridge Road (Route 104) at Terrace Avenue/South Drive to G.E. Credit Corp
5 Long Ridge Road (Route 104) at Woodridge Drive South
6 Long Ridge Road (Route 104) at Stillwater Road/Buckingham Drive
7 Long Ridge Road (Route 104) at Drive to Long Ridge Office Park
8 Long Ridge Road (Route 104) at Loughran Avenue/G.E. Energy Financial Services
9 Long Ridge Road (Route 104) at Nestle/Oracle Drives (formerly Hyperion)
10 Long Ridge Road (Route 104) at Route 15 NB Off Ramp/Wire Mill Road
11 Long Ridge Road (Route 104) at Route 15 SB Ramps/Webbs Hill Road
12 Long Ridge Road (Route 104) at Chestnut Hill Road/Butternut Lane
13 Long Ridge Road (Route 104) at Hunting Ridge Road S
14 Long Ridge Road (Route 104) at Wildwood Road
15 Long Ridge Road (Route 104) at River Bank Road
16 Long Ridge Road (Route 104) at Erskine Road
17 Long Ridge Road (Route 104) at Old Long Ridge Road (northern)

High Ridge Road

18 High Ridge Road (Route 137) at Cold Spring Road (Route 137)
19 High Ridge Road (Route 137) at Lord & Taylor Drive
20 High Ridge Road (Route 137) at Oaklawn Avenue/Cross Road
21 High Ridge Road (Route 137) at Terrace Avenue
22 High Ridge Road (Route 137) at Unity Road/Brownley Road
23 High Ridge Road (Route 137) at Lakeview Drive/Rippowam High School Drive
24 High Ridge Road (Route 137) at Loveland Road
25 High Ridge Road (Route 137) at Dannel Drive/Mercedes Lane
26 High Ridge Road (Route 137) at Ridge Park Road
27 High Ridge Road (Route 137) at Hartswood Road
28 High Ridge Road (Route 137) at Bradley Place
29 High Ridge Road (Route 137) at Merriman Road
30 High Ridge Road (Route 137) at Vine Road/Private Drive
31 High Ridge Road (Route 137) at Cedar Height Road/Turn of River Road
32 High Ridge Road (Route 137) at Olga Drive/Private Drive
33 High Ridge Road (Route 137) at Square Acres Drive/Shopping Plaza
34 High Ridge Road (Route 137) at Route 15 NB Ramps/Buxton Farms Road
35 High Ridge Road (Route 137) at Route 15 SB Ramps
36 High Ridge Road (Route 137) at Wire Mill Road
37 High Ridge Road (Route 137) at Scofieldtown Road
38 High Ridge Road (Route 137) at Interlaken Road
39 High Ridge Road (Route 137) at Brookdale Road
40 High Ridge Road (Route 137) at North Stamford Road (southern)
41 High Ridge Road (Route 137) at North Stamford Road (northern)
42 High Ridge Road (Route 137) at Sunset Road
43 High Ridge Road (Route 137) at Briar Brae Road
44 High Ridge Road (Route 137) at Mayapple Road

City of Stamford, Connecticut

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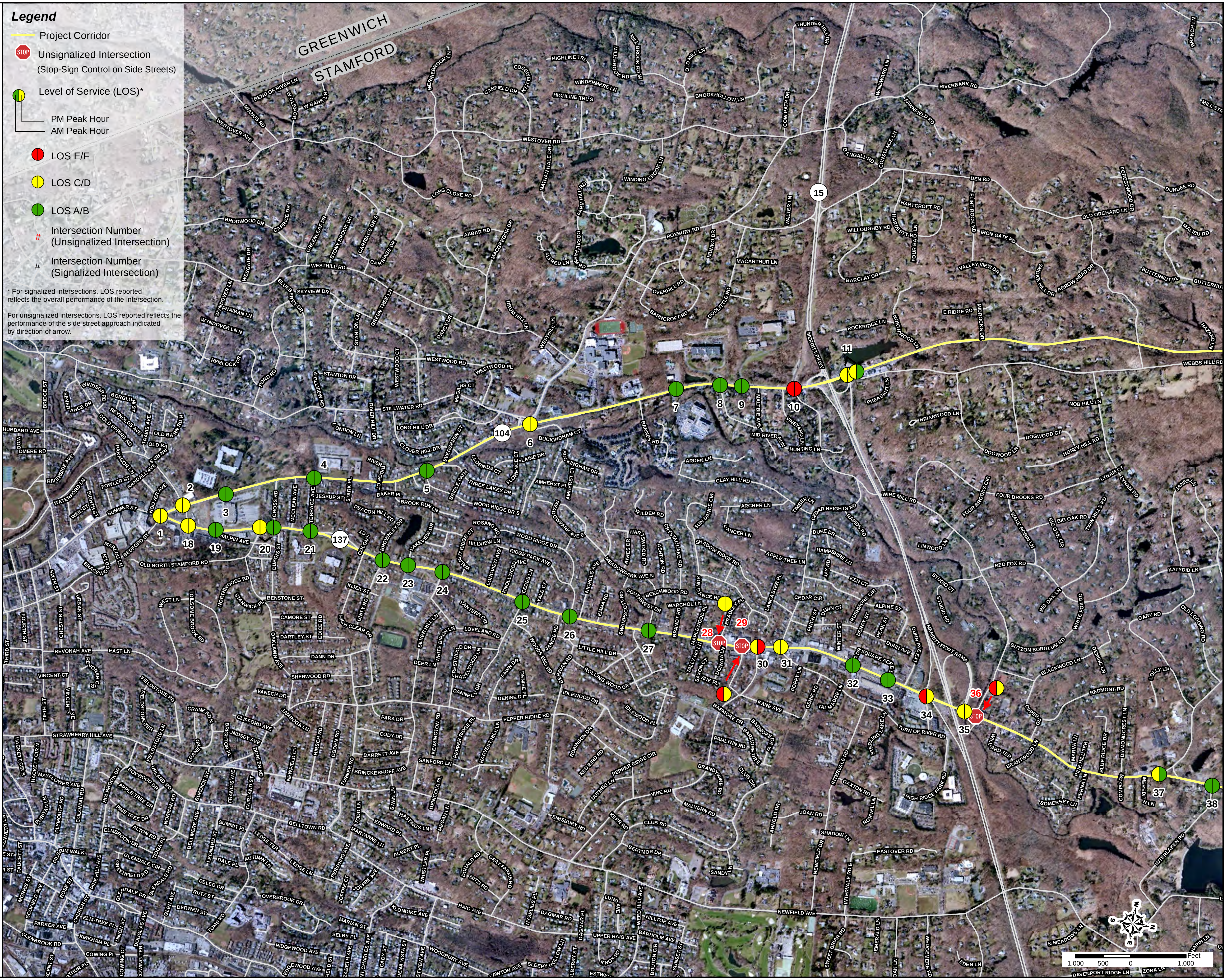
Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)



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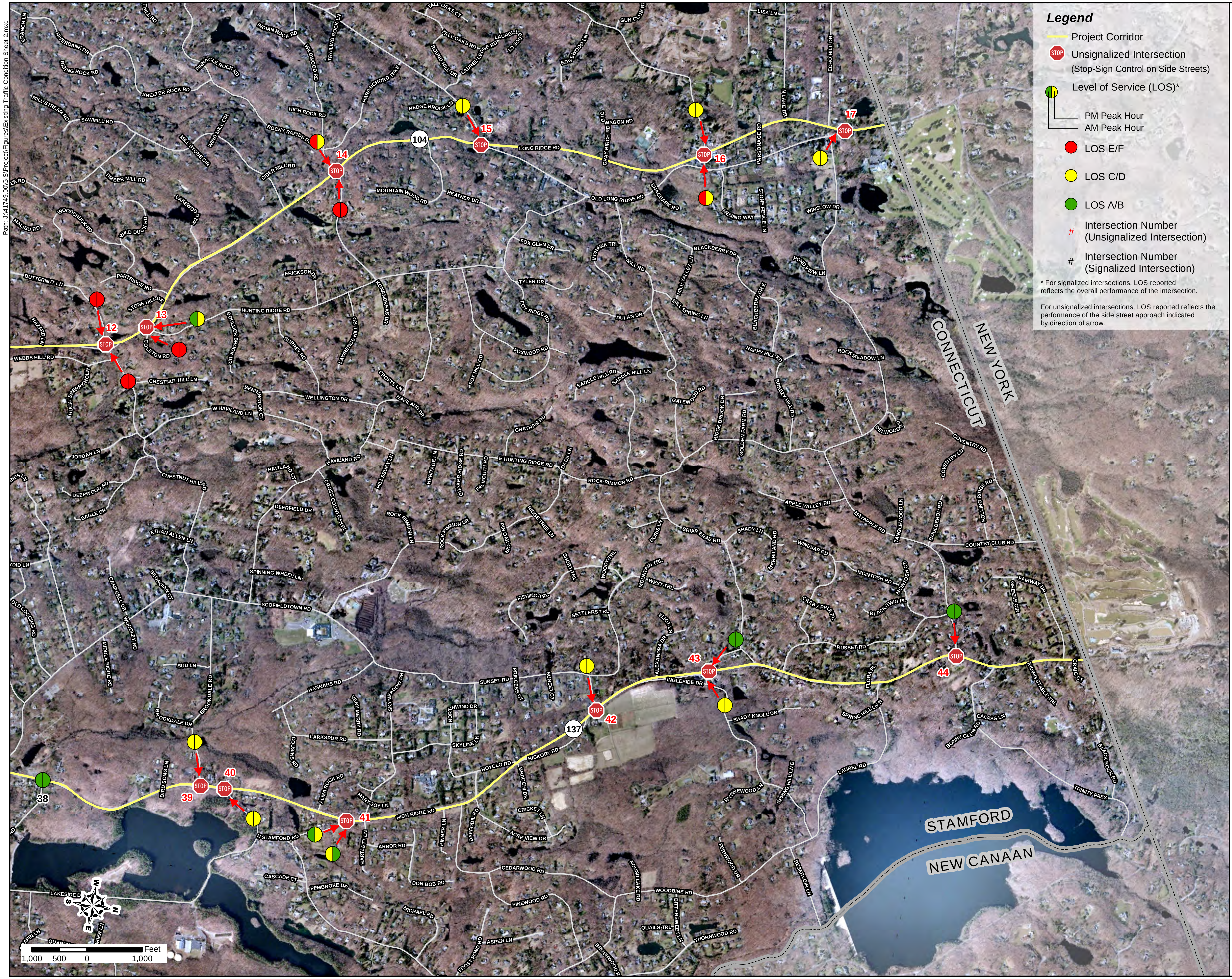

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-5 (N)

Intersection Level of Service
Existing Conditions

	Long Ridge Road		
1	Long Ridge Road	at	High Ridge Road/Bedford St/Summer St.
2	Long Ridge Road (Route 104)	at	Cold Spring Road (Route 137)
3	Long Ridge Road (Route 104)	at	Drives to Olin Chemicals/ Lord & Taylors
4	Long Ridge Road (Route 104)	at	Terrace Avenue/South Drive to G.E. Credit Corp
5	Long Ridge Road (Route 104)	at	Woodridge Drive South
6	Long Ridge Road (Route 104)	at	Stillwater Road/Buckingham Drive
7	Long Ridge Road (Route 104)	at	Drive to Long Ridge Office Park
8	Long Ridge Road (Route 104)	at	Loughran Avenue/G.E. Energy Financial Services
9	Long Ridge Road (Route 104)	at	Nestle/Oracle Drives (formerly Hyperion)
10	Long Ridge Road (Route 104)	at	Route 15 NB Off Ramp/Wire Mill Road
11	Long Ridge Road (Route 104)	at	Route 15 SB Ramps/Webbs Hill Road
12	Long Ridge Road (Route 104)	at	Chestnut Hill Road/Butternut Lane
13	Long Ridge Road (Route 104)	at	Hunting Ridge Road S
14	Long Ridge Road (Route 104)	at	Wildwood Road
15	Long Ridge Road (Route 104)	at	River Bank Road
16	Long Ridge Road (Route 104)	at	Erskine Road
17	Long Ridge Road (Route 104)	at	Old Long Ridge Road (northern)
	High Ridge Road		
18	High Ridge Road (Route 137)	at	Cold Spring Road (Route 137)
19	High Ridge Road (Route 137)	at	Lord & Taylor Drive
20	High Ridge Road (Route 137)	at	Oaklawn Avenue/Cross Road
21	High Ridge Road (Route 137)	at	Terrace Avenue
22	High Ridge Road (Route 137)	at	Unity Road/Brownley Road
23	High Ridge Road (Route 137)	at	Lakeview Drive/Rippowam High School Drive
24	High Ridge Road (Route 137)	at	Loveland Road
25	High Ridge Road (Route 137)	at	Dannel Drive/Mercedes Lane
26	High Ridge Road (Route 137)	at	Ridge Park Road
27	High Ridge Road (Route 137)	at	Hartswood Road
28	High Ridge Road (Route 137)	at	Bradley Place
29	High Ridge Road (Route 137)	at	Merriman Road
30	High Ridge Road (Route 137)	at	Vine Road/Private Drive
31	High Ridge Road (Route 137)	at	Cedar Height Road/Turn of River Road
32	High Ridge Road (Route 137)	at	Olga Drive/Private Drive
33	High Ridge Road (Route 137)	at	Square Acres Drive/Shopping Plaza
34	High Ridge Road (Route 137)	at	Route 15 NB Ramps/Buxton Farms Road
35	High Ridge Road (Route 137)	at	Route 15 SB Ramps
36	High Ridge Road (Route 137)	at	Wire Mill Road
37	High Ridge Road (Route 137)	at	Scofieldtown Road
38	High Ridge Road (Route 137)	at	Interlaken Road
39	High Ridge Road (Route 137)	at	Brookdale Road
40	High Ridge Road (Route 137)	at	North Stamford Road (southern)
41	High Ridge Road (Route 137)	at	North Stamford Road (northern)
42	High Ridge Road (Route 137)	at	Sunset Road
43	High Ridge Road (Route 137)	at	Briar Brae Road
44	High Ridge Road (Route 137)	at	Mayapple Road

City of Stamford, Connecticut

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

2.5.2.1 Signalized Intersections

The results of the signalized intersections capacity analyses indicate that four signalized study intersections currently operate with an overall LOS E or F during the peak periods. These intersections are discussed below.

#6 Long Ridge Road at Stillwater Road/Buckingham Drive

- The overall intersection operates at LOS C during the weekday morning peak period but LOS E during the weekday evening peak period.
- During the morning peak period, vehicle queues in the southbound right-turn lane exceed the available storage and interrupt the flow of southbound through vehicles on Long Ridge Road.
- During the evening peak period, the northbound left-turning movement and the southbound right-turning movements from Long Ridge Road operate at LOS F. Additionally, vehicle queues in the northbound left-turn lane and the southbound right-turn lane exceed the available storage and interrupt the flow of through vehicles on Long Ridge Road.
- Operating conditions at this intersection are further complicated by the proximity of the two unsignalized intersections of Stillwater Road with Roxbury Road, located immediately to the west of the intersection. The entire three-intersection configuration is currently being studied for redesign by Tighe & Bond, and the results of that study will be incorporated into this study.

#10 Long Ridge Road at Route 15 Northbound Off-ramp / Wire Mill Road

- The overall intersection operates at LOS F during the weekday morning and evening peak periods.
- During the morning peak period, the southbound Long Ridge Road approach operates at LOS F. Long vehicle queues in the southbound through lanes block access to the southbound left-turn lane.
- During the evening peak period, the northbound Long Ridge Road approach operates at LOS F.

#30 High Ridge Road at Vine Road/Private Drive

- The overall intersection operates at LOS D during the weekday morning peak period but a LOS F during the weekday evening peak period.
- During the morning peak period, the southbound left-turning movement and the northbound approach on High Ridge Road operate at LOS E. Long vehicle queues in the southbound left-turn lane and the westbound right-turn lane

exceed the capacity of the storage bays, resulting in queue spillback that blocks the adjacent lanes.

- During the evening peak period, the southbound left-turning movement and the northbound approach on High Ridge Road operate at LOS F. Long vehicle queues in the southbound left-turn lane and the westbound right-turn lane exceed the capacity of the storage bays, resulting in queue spillback that blocks the adjacent lanes.

#34 High Ridge Road at Route 15 NB Ramps/Buxton Farms Road

The overall intersection operates at LOS E during the weekday morning peak period and LOS D during the weekday evening peak period.

- During the morning peak period, the eastbound through movement and the southbound left-turning movement operate at LOS E, and the northbound approach operates at LOS F. Long vehicle queues in the Route 15 off-ramp left-turn and through lanes block access to the channelized right-turn lane, and vehicle queues in the westbound Buxton Farms right-turn lane onto Long Ridge Road block access to the adjacent turning lanes. Excessive vehicle queues in the northbound Long Ridge Road through lanes back up to the upstream signalized intersection with Square Acres Drive and the shopping plaza driveway to the south.
- During the evening peak period, the northbound through movement operates at LOS E. Long vehicle queues in the Route 15 off-ramp left-turn and through lanes block access to the right-turn lane, and vehicle queues in the westbound Buxton Farms right-turn lane onto Long Ridge Road block access to the adjacent turning lanes. Excessive vehicle queues in the northbound Long Ridge Road through lanes extend into the signalized intersection with Square Acres Drive and the shopping plaza driveway to the south.

- The remaining signalized study intersections currently operate with overall LOS D or better conditions during the peak periods. However, LOS E or F conditions were identified for individual turning movements, commonly from side street approaches, at many of these intersections. The long delays on the side streets are generally caused by relatively long intersection cycle lengths, which provide greater capacity for the higher volume Long Ridge Road and High Ridge Road approaches. Progression along Long Ridge Road and High Ridge Road should take priority, and therefore, LOS E or F should be considered tolerable for some of the low volume side street movements. The signalized study intersections with individual turning movements experiencing LOS E or F conditions and/or excessive vehicle queuing are identified below.

#1 Long Ridge Road at High Ridge Road / Bedford Street / Summer Street

- During the morning peak period, the Long Ridge Road eastbound left-turn movement onto High Ridge Road and the right-turn movement onto Summer

Street operate at LOS F. Additionally, the High Ridge Road southbound approach operates at LOS E with excessive vehicle queues that back up through the upstream signalized intersection with Cold Spring Road to the north.

#2 Long Ridge Road at Cold Spring Road

- During the morning peak period, vehicle queues on the westbound Cold Spring Road approach back up through the upstream signalized intersection with High Ridge Road to the east. Vehicle queues in the northbound left-turn lane and the southbound right-turn lane exceed the capacity of the storage bays, resulting in queue spillback that blocks the adjacent through lanes.
- During the evening peak period, the northbound through movement on Long Ridge Road operates at LOS E. Additionally, vehicle queues in the northbound left-turn lane slightly exceed the capacity of the storage bay.

#3 Long Ridge Road at Drives to Olin Chemicals / Lord & Taylor

- During the morning peak period, the Olin Chemicals eastbound approach and Lord & Taylor westbound approach currently operate at LOS E; however, these side street approaches have relatively low traffic volumes, and the overall intersection operates at LOS A.

#5 Long Ridge Road at Woodridge Drive South

- During the morning peak period, the westbound Woodridge Drive South approach operates at LOS E; however, this side street approach has relatively low traffic volumes, and the overall intersection operates at LOS A.

#11-A Long Ridge Road at Route 15 SB Ramps

- During the morning peak period, the Long Ridge Road northbound right-turning movement operates at LOS F; the overall intersection operates at LOS C during this period.
- During the evening peak period, the Long Ridge Road northbound right-turning movement operates at LOS E; the overall intersection operates at LOS C during this period.

#18 High Ridge Road at Cold Spring Road (Route 137)

- During the morning peak period, the eastbound Cold Spring Road approach at LOS F with long vehicle queues that back up through the upstream signalized intersection with Long Ridge Road to the west. Additionally, the westbound Home Goods driveway approach operates at LOS E.
- During the evening peak period, vehicle queues in the eastbound Cold Spring Road approach back up through the upstream signalized intersection with Long Ridge Road to the west. Additionally, the westbound Home Goods driveway approach operates at LOS E.

#19 High Ridge Road at Lord & Taylor Drive / Bull's Head Shopping Center

- During the morning peak period, the left-turn exiting movement from the Bull's Head Shopping Center operates at LOS E with vehicle queues that extend into the shopping center parking aisles. Additionally, vehicle queues in the northbound through lanes on High Ridge Road back up into the upstream signalized intersection with Cold Spring Road to the south.
- During the evening peak period, vehicle queues from the Bull's Head Shopping Center driveway back up into the shopping center parking aisles, and vehicle queues in the northbound through lanes on Long Ridge Road back up into the upstream signalized intersection with Cold Spring Road to the south.

#20 High Ridge Road at Oaklawn Avenue/Cross Road

- The intersections of High Ridge Road at Oaklawn Avenue and High Ridge Road at Cross Road are operated by the same traffic signal. This results in a complicated phasing operation that includes a six-second clearance interval between the intersections.
- During the morning peak period, the northbound approach at the intersection with Oaklawn Avenue operates at LOS E.
- During the evening peak period, the northbound approach at the intersection with Oaklawn Avenue operates at LOS E with vehicle queues that back up into the upstream signalized intersection with the Lord & Taylor/Bull's Head Shopping Center drives to the south.

#21 High Ridge Road at Terrace Avenue

- During the morning peak period, the Terrace Avenue eastbound approach operates at LOS E; the overall intersection operates at LOS A during this period.
- During the evening peak period, the westbound left-turning movement from the private drive operates at LOS E; the overall intersection operates at LOS B during this period.

#22 High Ridge Road at Unity Road / Brownley Road

- During the morning and evening peak periods, the eastbound Brownley Road approach and the westbound Unity Road approach operate at LOS E; however, the side street approaches have relatively low traffic volumes, and the overall intersection operates at LOS A during both peak periods.

#23 High Ridge Road at Lakeview Drive / Rippowam High School Drive

- During the morning and evening peak periods, the eastbound Lakeview Drive approach operates at LOS E; the overall intersection operates at LOS A during both peak periods. It is also noted that arrivals and departures at the school occur outside of the peak hours.

#25 High Ridge Road at Dannel Drive/Mercedes Lane

- During the morning peak period, the westbound Dannel Drive approach operates at LOS E; the overall intersection operates at LOS A during this period.

#26 High Ridge Road at Ridge Park Road

- During the morning peak period, the eastbound Ridge Park Road approach operates at LOS E; however, the side street approach has relatively low traffic volumes, and the overall intersection operates at LOS A during this period.

#27 High Ridge Road at Hartswood Road

- During the morning peak period, the eastbound Hartswood Road approach operates at LOS E; however, the side street approach has relatively low traffic volumes, and the overall intersection operates at LOS A during this period.

#31 High Ridge Road at Cedar Heights Road / Turn of River Road

- During the morning peak period, the eastbound Cedar Heights Road through/right lane operates at LOS E. In addition, vehicle queues in the westbound Turn of River Road left-turn lane exceed the capacity of the storage bay and block access to the adjacent through/right lane. Additionally, vehicle queues in the northbound High Ridge Road approach back up to the upstream signalized intersection with Vine Road to the south. The intersection operates with an overall LOS C during this period.
- During the evening peak period, the eastbound Cedar Heights Road through/right lane operates at LOS E. In addition, vehicle queues in the westbound Turn of River Road left-turn lane exceed the capacity of the storage bay and block access to the adjacent through/right lane. Vehicle queues in the northbound High Ridge Road approach back up into the upstream signalized intersection with Vine Road to the south. The intersection operates with an overall LOS D during this period.

#32 High Ridge Road at Olga Drive / Private Drive

- During the evening peak period, the westbound private driveway operates at LOS E; however, the side street approach has relatively low traffic volumes, and the overall intersection operates at LOS A during this period.

#35 High Ridge Road at Route 15 SB Ramps

- During the morning peak period, the eastbound Route 15 SB Off-Ramp approach operates at LOS F with long delays and queues.
- During the morning and evening peak periods, vehicle queues in the westbound approach exceed the storage capacity of the jug handle and extend into the right lane on the northbound High Ridge Road approach. As a result, vehicle delays and queues in the northbound High Ridge Road approach likely are longer than indicated by the results of the capacity analyses.

#37 High Ridge Road at Scofieldtown Road

- During the morning peak period, the southbound High Ridge Road approach operates at LOS E with excessive vehicle queues. It is noted that the start of the school day at the nearby Northeast Elementary School (at 8:10 a.m.) and Scofield Magnet Middle School (at 8:00 a.m.) overlap with the peak-hour (from 8:00 to 9:00 a.m.) contributing to the brief congestion experienced at this intersection.

2.5.2.2 Unsignalized Intersections

The results of the capacity analyses indicate that seven of the unsignalized study intersections operate with LOS E or F conditions on the side street during one or both peak periods. The excessive delays on the side street approaches are mostly attributed to the high traffic volumes along Long Ridge Road and High Ridge Road. Due to these high traffic volumes, vehicles at some side street approaches experience long delays during the peak periods as they wait for acceptable gaps in traffic to safely enter the traffic stream. The unsignalized intersections currently operating with LOS E or F conditions are discussed below.

#12 Long Ridge Road at Chestnut Hill Road / Butternut Lane

- During the morning and evening peak periods, the eastbound Butternut Lane approach operates at LOS E; however, this approach has relatively low traffic volumes (20 to 50 vehicles per hour), and the maximum vehicle queue is only projected to be one to two vehicles during the peak periods.
- During the morning and evening peak periods, the westbound Chestnut Hill Road approach operates at LOS F with excessive delays.
- During the morning and evening peak periods, the southern connector roadway from Chestnut Hill Road operates at LOS E; however, this approach has relatively

low traffic volumes (10 vehicles per hour), and the maximum vehicle queue is not projected to exceed one vehicle during the peak periods.

#13 Long Ridge Road at Hunting Ridge Road South

- During the morning and evening peak periods, the westbound Hunting Ridge Road South approach operates at LOS F with excessive delays.

#14 Long Ridge Road at Wildwood Road

- During the morning peak period, the eastbound Wildwood Road approach operates at LOS E.
- During the morning and evening peak period, the westbound Wildwood Road approach operates at LOS F; however, this approach has relatively low traffic volumes (40 vehicles per hour).

#16 Long Ridge Road at Erskine Road

- During the morning peak period, the westbound Erskine Road approach operates at LOS E. However, this approach has relatively low traffic volumes (60 vehicles per hour), and the maximum vehicle queue is only projected to be one to two vehicles during the peak period.

#29 High Ridge Road at Merriman Road

- During the morning peak period, the westbound Merriman Road approach operates at LOS E.
- Vehicle queues on the northbound approach at the signalized intersection with Vine Road to the north frequently extend beyond Merriman Road during the peak periods. When this occurs, motorists on Merriman Road have to wait for these queues to dissipate or for other motorists to yield the right-of-way before turning onto High Ridge Road.

#36 High Ridge Road at Wire Mill Road

- During the morning peak period, the eastbound Wire Mill Road approach operates at LOS F in the face of more than 1,400 vehicles per hour in the single southbound lane on High Ridge Road during the peak period.
- Vehicle queues on the southbound approach at the signalized intersection with the Route 15 southbound ramps to the south frequently extend beyond Wire Mill Road during the morning peak period. When this occurs, motorists on Wire Mill Road have to wait for these queues to dissipate or for another motorist to yield the right-of-way before turning onto High Ridge Road.

#37A High Ridge Road at the Unsignalized Scofieldtown Road Connector

- During the morning peak period, the eastbound Scofieldtown Road connector approach operates at LOS F with excessive delays.
- During the evening peak period, the eastbound Scofieldtown Road connector approach operates at LOS E.
- Vehicle queues on the southbound approach at the signalized intersection with Scofieldtown Road to the south frequently extend beyond the unsignalized connector during the morning peak. When this occurs, motorists on the connector road have to wait for these queues to dissipate or for another motorist to yield the right-of-way before turning onto High Ridge Road.

2.6 Safety Analysis

In order to assess safety conditions along the Long Ridge Road and High Ridge Road corridors, accident history was reviewed at each of the study intersections for the most recent available three-year period, January 2006 through December 2008. These records were obtained from the Stamford Police Department and the Connecticut Department of Transportation Bureau of Planning and Research. It should be noted that only accidents that result in death, injury, or property damage in excess of $1,000 are required to be reported.

The findings of this safety research are summarized on Figures 2-6S and 2-6N, which depict the total number and severity (property damage only, personal injury, or fatality) of all accidents that occurred at the study intersections during the three-year analysis period. For the purposes of this study, signalized intersections that experienced 30 or more accidents or unsignalized intersections that experienced 15 or more accidents were identified as high accident locations.

Path: J:\41769.00\GIS\Project\Figures\Figure 7 Vehicle Accident Summary.mxd

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-6 (S)

Vehicle Accident Summary (2006 - 2008)

Legend

Total Accidents in 3-year Analysis Period (2006-2008)
- 0 - 9
- 10 - 19
- 20 - 29
- 30+

Accident Type
- Property Damage Only
- Personal Injury
- Project Corridor

#	Study Intersection	PDO	Injury	Total Accidents
1	Long Ridge Rd at High Ridge/Bedford/Summer St	4	90	94
2	Long Ridge Rd at Cold Spring Rd	18	2	20
3	Long Ridge Rd at Olin Chemicals/ Lord & Taylors Dr	4	3	7
4	Long Ridge Rd at Terrace Ave/260 Long Ridge Dr	7	1	8
5	Long Ridge Rd at Woodridge Dr. South	2	3	5
6	Long Ridge Rd at Stillwater Road/Buckingham Dr	19	11	30
7	Long Ridge Rd at Drive to Long Ridge Office Park	3	4	7
8	Long Ridge Rd at Loughran Ave/G.E. Energy Dr	0	1	1
9	Long Ridge Rd at Nestle/Oracle Drives	1	0	1
10	Long Ridge Rd at Route 15 NB Off Ramp/Wire Mill Rd	10	5	15
11	Long Ridge Rd at Route 15 SB Ramps/Webbs Hill Rd	10	5	15
12	Long Ridge Rd at Chestnut Hill Rd/Butternut Ln	4	8	12
13	Long Ridge Rd at Hunting Ridge Rd South	4	0	4
14	Long Ridge Rd at Wildwood Rd	6	2	8
15	Long Ridge Rd at River Bank Rd	1	1	2
16	Long Ridge Rd at Erskine Rd	4	0	4
17	Long Ridge Rd at Old Long Ridge Rd (northern)	3	0	3
18	High Ridge Rd at Cold Spring Rd (Route 137)	14	6	20
19	High Ridge Rd at Lord & Taylor/Bulls Head Shop Ctr	2	2	4
20	High Ridge Rd at Oaklawn Ave/Cross Rd	16	2	18
21	High Ridge Rd at Terrace Ave	10	2	12
22	High Ridge Rd at Unity Rd/Brownley Rd	3	2	5
23	High Ridge Rd at Lakeview Dr/Rippowam School	10	3	13
24	High Ridge Rd at Loveland Rd	8	3	11
25	High Ridge Rd at Dannel Dr/Mercedes Lane	11	5	16
26	High Ridge Rd at Ridge Park Rd	0	3	3
27	High Ridge Rd at Hartswood Rd	6	2	8
28	High Ridge Rd at Bradley Place	2	1	3
29	High Ridge Rd at Merriman Rd	4	6	10
30	High Ridge Rd at Vine Rd/Private Drive	23	5	28
31	High Ridge Rd at Cedar Height Rd/Turn of River Rd	31	6	37
32	High Ridge Rd at Olga Drive/Private Drive	9	3	12
33	High Ridge Rd at Square Acres Dr/Shopping Plaza	19	6	25
34	High Ridge Rd at Route 15 NB Ramps/Buxton Farms	32	8	40
35	High Ridge Rd at Route 15 SB Ramps	8	4	12
36	High Ridge Rd at Wire Mill Rd	19	5	24
37	High Ridge Rd at Scofieldtown Rd	1	0	1
38	High Ridge Rd at Interlaken Rd	2	5	7
39	High Ridge Rd at Brookdale Rd	4	5	9
40	High Ridge Rd at North Stamford Rd (southern)	0	0	0
41	High Ridge Rd at North Stamford Rd (northern)	6	4	10
42	High Ridge Rd at Sunset Rd	5	1	6
43	High Ridge Rd at Briar Brae Rd	2	2	4
44	High Ridge Rd at Mayapple Rd	0	0	0

High Accident Location
(30 or more accidents at signalized location)
(15 or more accidents at unsignalized location)

City of Stamford, Connecticut

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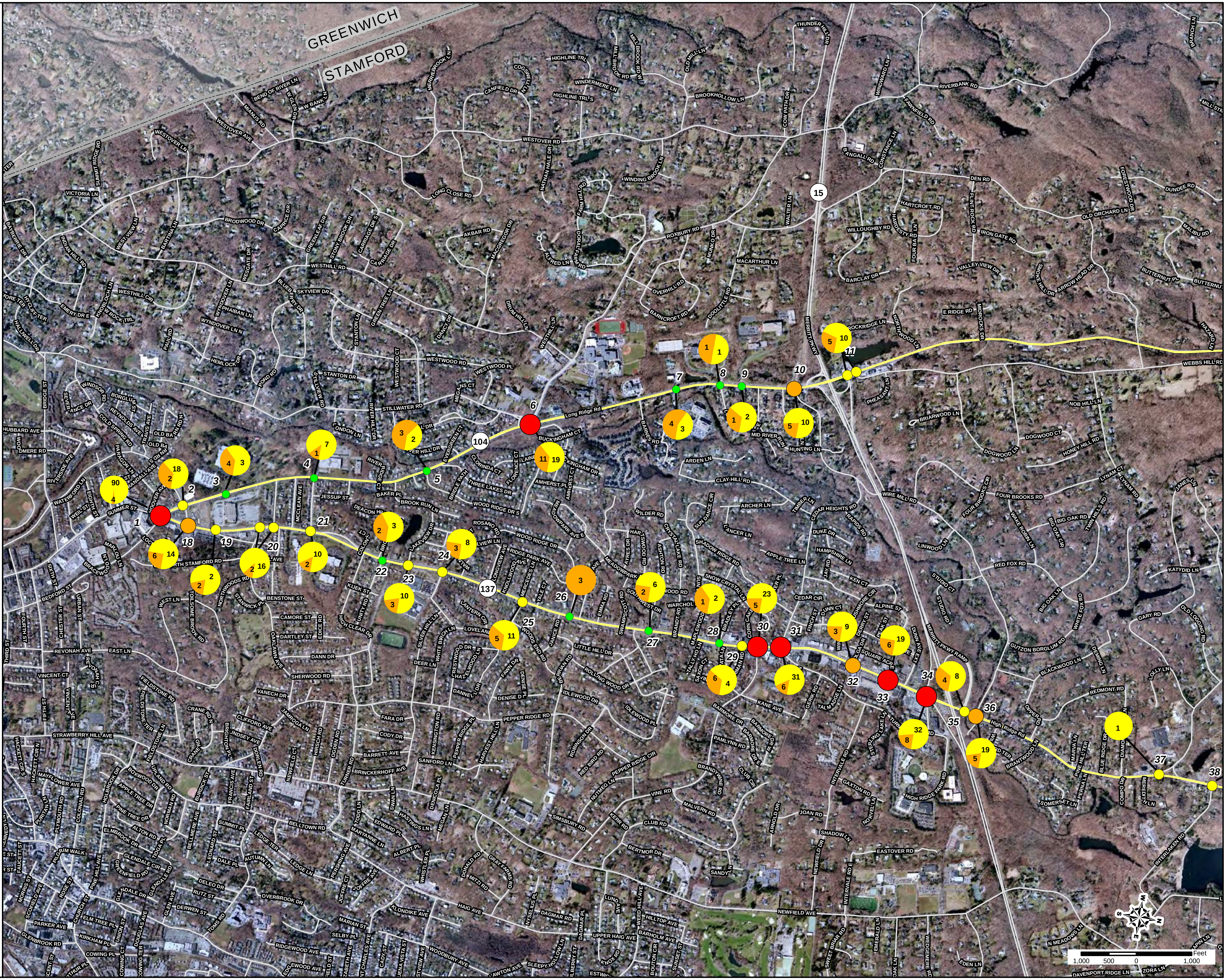
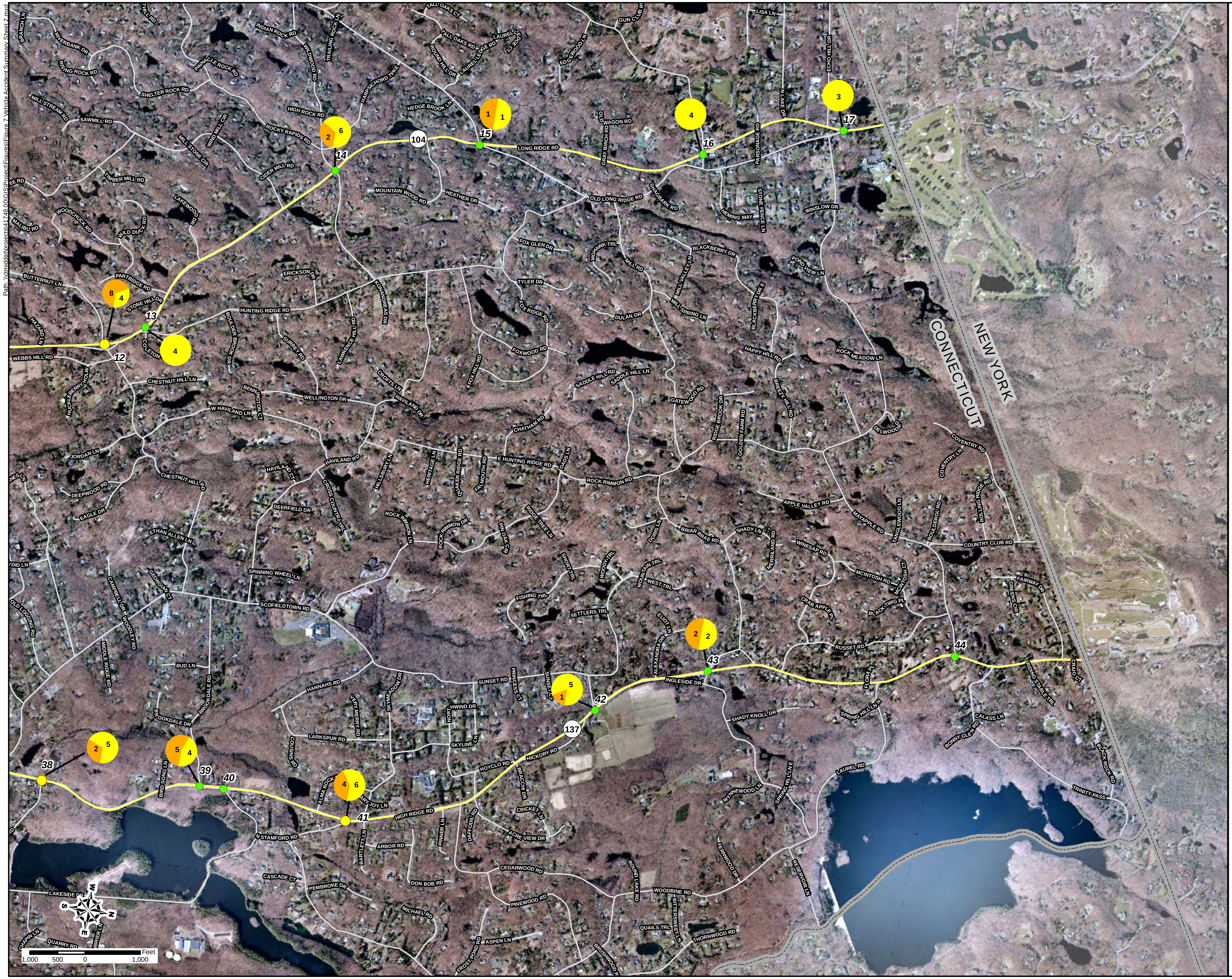
Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)





Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-6 (N)

Vehicle Accident Summary (2006 - 2008)

Legend

Total Accidents in 3-year Analysis Period (2006-2008)

- 0 - 9
- 10 - 19
- 20 - 29
- 30+

Accident Type

- Property Damage Only
- Personal Injury
- Project Corridor

#	Study Intersection	PDO	Injury	Total Accidents
1	Long Ridge Rd at High Ridge/Bedford/Summer St	90	4	94
2	Long Ridge Rd at Cold Spring Rd	18	2	20
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5	Long Ridge Rd at Woodridge Dr. South	2	3	5
6	Long Ridge Rd at Stillwater Road/Buckingham Dr	19	11	30
7	Long Ridge Rd at Drive to Long Ridge Office Park	3	4	7
8	Long Ridge Rd at Loughran Ave/G.E. Energy Dr	0	1	1
9	Long Ridge Rd at Nestle/Oracle Drives	1	0	1
10	Long Ridge Rd at Route 15 NB Off Ramp/Wire Mill Rd	10	5	15
11	Long Ridge Rd at Route 15 SB Ramps/Webbs Hill Rd	10	5	15
12	Long Ridge Rd at Chestnut Hill Rd/Butternut Ln	4	8	12
13	Long Ridge Rd at Hunting Ridge Rd South	4	0	4
14	Long Ridge Rd at Wildwood Rd	6	2	8
15	Long Ridge Rd at River Bank Rd	1	1	2
16	Long Ridge Rd at Erskine Rd	4	0	4
17	Long Ridge Rd at Old Long Ridge Rd (northern)	3	0	3
18	High Ridge Rd at Cold Spring Rd (Route 137)	14	6	20
19	High Ridge Rd at Lord & Taylor/Bulls Head Shop Ctr	2	2	4
20	High Ridge Rd at Oaklawn Ave/Cross Rd	16	2	18
21	High Ridge Rd at Terrace Ave	10	2	12
22	High Ridge Rd at Unity Rd/Brownley Rd	3	2	5
23	High Ridge Rd at Lakeview Dr/Rippowam School	10	3	13
24	High Ridge Rd at Loveland Rd	8	3	11
25	High Ridge Rd at Dannel Dr/Mercedes Lane	11	5	16
26	High Ridge Rd at Ridge Park Rd	0	3	3
27	High Ridge Rd at Hartswood Rd	6	2	8
28	High Ridge Rd at Bradley Place	2	1	3
29	High Ridge Rd at Merriman Rd	4	6	10
30	High Ridge Rd at Vine Rd/Private Drive	23	5	28
31	High Ridge Rd at Cedar Height Rd/Turn of River Rd	31	6	37
32	High Ridge Rd at Olga Drive/Private Drive	9	3	12
33	High Ridge Rd at Square Acres Dr/Shopping Plaza	19	6	25
34	High Ridge Rd at Route 15 NB Ramps/Buxton Farms	32	8	40
35	High Ridge Rd at Route 15 SB Ramps	8	4	12
36	High Ridge Rd at Wire Mill Rd	19	5	24
37	High Ridge Rd at Scofieldtown Rd	1	0	1
38	High Ridge Rd at Interlaken Rd	2	5	7
39	High Ridge Rd at Brookdale Rd	4	5	9
40	High Ridge Rd at North Stamford Rd (southern)	0	0	0
41	High Ridge Rd at North Stamford Rd (northern)	6	4	10
42	High Ridge Rd at Sunset Rd	5	1	6
43	High Ridge Rd at Briar Brae Rd	2	2	4
44	High Ridge Rd at Mayapple Rd	0	0	0

High Accident Location
(30 or more accidents at signalized location)
(15 or more accidents at unsignalized location)

City of Stamford, Connecticut

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

As can be seen from Figures 2-6S and 2-6N, most of the study intersections reported a much higher incidence of property damage only accidents as compared to personal injury type accidents. Five study intersections were identified as high accident locations. These intersections are discussed below, and a detailed analysis, including collision diagrams, is included in the technical appendix.

#1 Long Ridge Road at High Ridge Road / Summer Street / Bedford Street

- A total of 94 reportable accidents were recorded during the three-year study period at this signalized intersection, of which 95 percent were property-damage-only accidents. An injury occurred in the remaining 5-percent of the reported accidents.
- The most common collision types to occur at this location during the analysis period were rear-end accidents, which comprised 57-percent of the reported accidents.

#6 Long Ridge Road at Stillwater Road / Buckingham Drive

- A total of 30 reportable accidents were recorded during the three-year study period at this signalized intersection, of which 63 percent were property-damage-only accidents. An injury occurred in the remaining 37-percent of the reported accidents.
- The most common collision types to occur at this location during the analysis period were rear-end accidents, which comprised 63-percent of the reported accidents. Most of these rear-end accidents occurred in the southbound direction on Long Ridge Road. It was noted in the capacity analyses that vehicle queues in the southbound right-turn lane occasionally exceed the capacity of the storage bay and spill into the southbound through lanes. This could be a potential contributing factor for the high frequency of rear-end accidents on this approach.

#31 High Ridge Road at Cedar Heights Road / Turn of River Road

- A total of 37 reportable accidents were recorded in the three-year study period at this signalized intersection, of which 84 percent were property-damage-only accidents. An injury occurred in the remaining 16-percent of the reported accidents.
- The most common collision types to occur at this location during the analysis period were rear-end accidents, which comprised 59-percent of the reported accidents.

#34 High Ridge Road at NB Merritt Parkway Off-Ramp / Buxton Farms Road

- A total of 40 reportable accidents were recorded in the three-year study period at this signalized intersection, of which 60 percent were property-damage-only accidents. An injury occurred in the remaining 16-percent of the reported accidents.

- The most common collision types to occur at this location during the analysis period were rear-end accidents, which comprised 60-percent of the reported accidents.

#36 High Ridge Road at Wire Hill Road

- A total of 24 reportable accidents were recorded in the three-year study period at this unsignalized intersection, of which 79 percent were property-damage-only accidents. An injury occurred in the remaining 21-percent of the reported accidents.
- The most common collision types to occur at this location during the analysis period were rear-end accidents, which comprised 38-percent of the reported accidents, and sideswipe accidents, which comprised 21-percent of the reported accidents.
- In order to identify other locations along the study corridors that may experience a high frequency of accidents, data from the Traffic Accident Surveillance Report (TASR)[5] and Suggested List of Surveillance Study Sites (SLOSSS)[5], which are both maintained by CTDOT, were reviewed. The TASR includes accident frequency statistics by location for all state roads. The SLOSSS is a list of locations on state owned roads with high accident rates that have been identified by CTDOT to have the greatest promise of accident reduction. A description of the methodology used by CTDOT to generate the SLOSSS is included in the technical appendix.

- Based on the information contained in the TASR & SLOSSS reports, safety concerns were identified at four mid-block locations within the study area. These locations are discussed in the following section.

Cold Spring Road, between Long Ridge Road and High Ridge Road

- A total of 15 reportable accidents were recorded in the three-year study period at this mid-block location, of which 73-percent were property-damage-only accidents. injury accidents. An injury occurred in the remaining 27-percent of the reported accidents.
- The most common collision types to occur at this location during the analysis period were rear-end accidents, which comprised 67-percent of the reported accidents.
- The capacity analyses identified congested traffic operating conditions and excessive vehicle queuing along Cold Spring Road at the intersections with Long Ridge Road and High Ridge Road. These suboptimal operating conditions could

▼

5 *Pursuant to Title 23 United States Code Section 409, this data is not admissible and not discoverable in any federal or state court proceeding, and cannot be considered for any other purpose in any action for damages arising from an occurrence at a location address in this report.*

be a potential contributing factor for the high frequency of accidents at this location.

Long Ridge Road, between Webbs Hill Road and Northwood Lane

- A total of 19 reportable accidents were recorded in the three-year study period at this mid-block location, of which 79-percent were property-damage-only accidents. An injury occurred in the remaining 21-percent of the reported accidents.
- The most common collision types to occur at this location during the analysis period were turning accidents and sideswipe accidents, which comprised 42-percent and 26-percent of the reported accidents, respectively.
- Numerous closely spaced commercial driveways are located along this segment of Long Ridge Road. The vehicle conflicts caused by the presence of these driveways are a likely contributing factor to the high frequency of accidents at this location.

High Ridge Road, between Merriman Road and Vine Road

- A total of 17 reportable accidents were recorded in the three-year study period at this mid-block location, of which 88-percent were property-damage-only accidents. injury accidents. An injury occurred in the remaining 12-percent of the reported accidents.
- The most common collision types to occur at this location during the analysis period were parking accidents, which comprised 47-percent of the reported accidents.
- Street-side perpendicular parking spaces, which serve adjacent retail uses, are located on the east side of High Ridge Road along this block. Motorists must back out of these spaces in order to enter the traffic stream on High Ridge Road. This is a difficult maneuver to make due to the very high traffic volumes on High Ridge Road and limited visibility while backing up.

High Ridge Road, between Square Acres Drive and Dunn Avenue

- A total of 24 reportable accidents were recorded in the three-year study period at this mid-block location, of which 71-percent were property-damage-only accidents. An injury occurred in the remaining 29-percent of the reported accidents.
- The most common collision types to occur at this location during the analysis period were rear-end accidents and turning accidents, which comprised 58-percent and 25-percent of the reported accidents, respectively.
- Multiple commercial driveways are located along this segment of High Ridge Road. The vehicle conflicts caused by the presence of these driveways are a likely contributing factor to the high frequency of accidents at this location.

- Although the segment of High Ridge Road between Interlaken Road and Birdsong Lane is not listed in the SLOSSS, a review of the TASR revealed that 11 accidents were reported at this location during the three-year analysis period. There is a horizontal curve along this section of roadway with curve ahead warning signs, but chevrons are not provided along this curve.

2.7 Active Transportation System: Walking, Bicycling and Transit

A key focus of this study was to investigate the existing conditions along the Long Ridge Road and High Ridge Road corridors that affect access to active forms of transportation: walking, bicycling, and transit. Walking is the oldest, most basic, healthiest, and most sustainable form of transportation. It is also the most affordable and accessible form of movement for short distances, up to a half-mile. Bicycling provides comfortable, convenient and affordable active movement for one to five miles. Transit interfaces with walking and bicycling to cover much longer ranges.

The current system along Long Ridge Road and High Ridge Road, including the design, operations and maintenance of these two corridors, doesn't adequately support active transportation; it was built for moving cars, not necessarily people. Although both Long Ridge Road and High Ridge Road were settled in ways that don't support walking, bicycling, and transit, the opportunity to transform these corridors to support active transportation is good in most areas.

A detailed evaluation of the issues currently impacting access to active forms of transportation in the study area is discussed in the following sections.

2.7.1 General Observations

This section addresses active transportation conditions found along the High Ridge Road and Long Ridge Road corridors in general.

2.7.1.1 Sidewalks

The existing sidewalks along the Long Ridge Road and High Ridge Road corridors are not adequate. Where they exist at all, the sidewalks commonly are too narrow and are obstructed by utility poles, signal control boxes, and other utilities. Many driveway ramps are overly wide and too steep for crossing level surfaces. Cars cross the walkways in many areas, and their movements are not predictable. Sidewalks start and end in many places, and inadequate care is taken to provide good or maintained environments near many bus stops and corners.

The existing sidewalk along the Long Ridge Road and High Ridge Road corridors was inventoried using aerial photography and verified in the field. The locations where sidewalk is provided along the corridors is depicted on Figures 2-7S and 2-7N.

High Ridge Road, along a portion between Merriman and Vine, shows the complexity of the task to create order and meaning out of active transportration modes. Where the sidewalk may be wide enough to support walking by the most capable, the constant turning movements of cars, lack of defined driveways, lack of shade and edges, building setbacks, utility poles, and numerous other barriers makes any travel outside of the car an adventurous challenge.

Path: J:\41749.00\GIS\Project\Figures\Sideways Map1.mxd

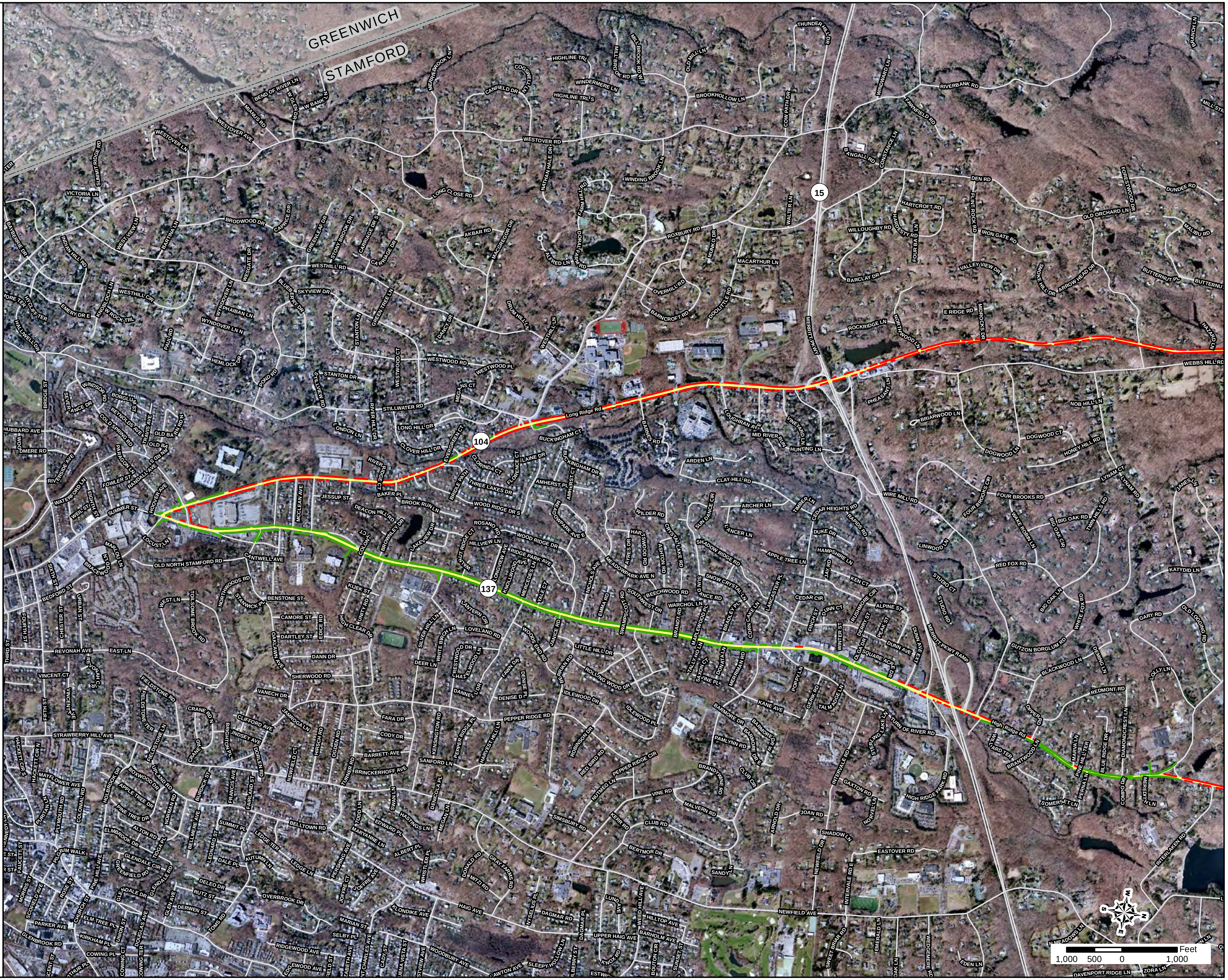
Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-7 (S)

Sidewalk Location

Legend

- Sidewalk
- No Sidewalk
- Project Corridor



City of Stamford, Connecticut

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Base Map Source: U SGS 2008 High Resol utio n Orthoim agery for the Bridgepor t, Hartford, & New Haven, CT U rban Areas (1 - Foot resolution)

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-7 (N)

Sidewalk Location

Legend

Sidewalk

No Sidewalk

Project Corridor

City of Stamford, Connecticut

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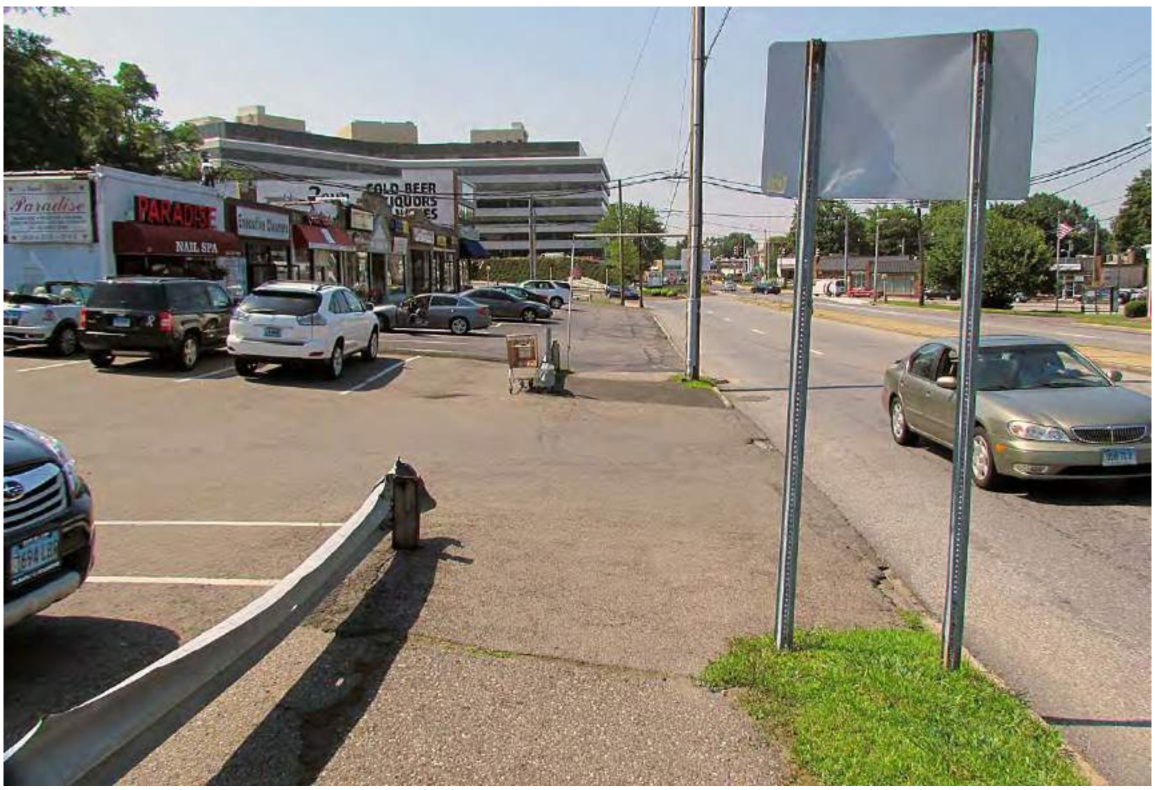
Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

2.7.1.2 Buffers

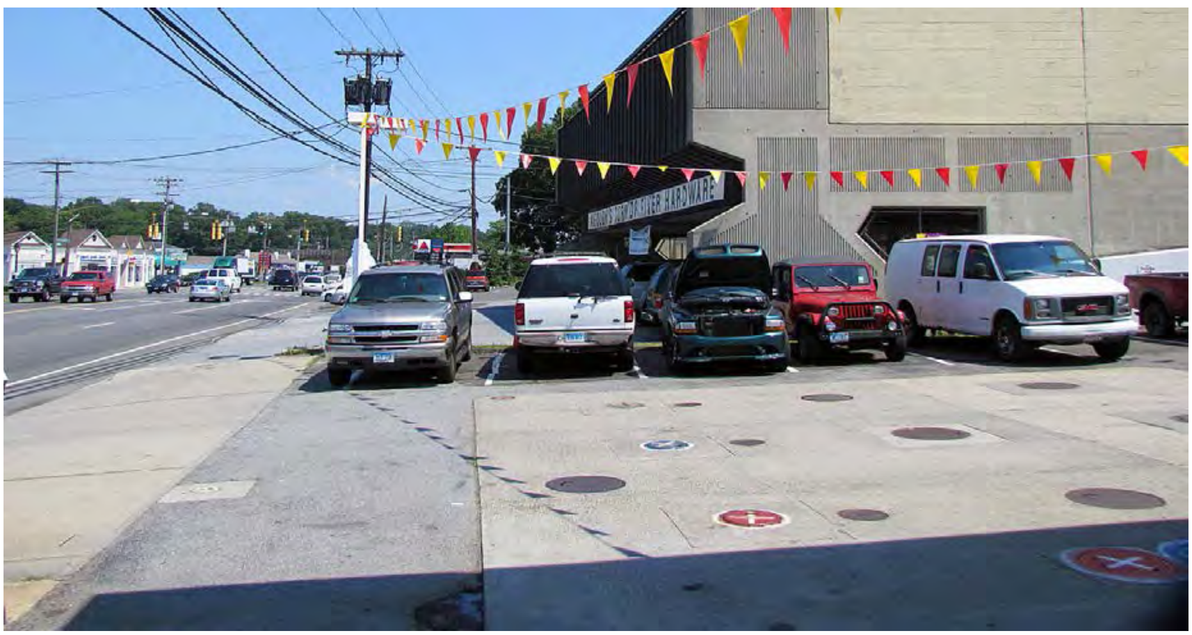
People on foot are most comfortable when adequate buffers separate them from moving traffic. In most locations along the corridors, sidewalks are attached to curbs, creating an immediate sense of danger and discomfort. New sidewalk installations should be set back, and planter strips or other buffers installed. Planter strips often include ground cover, rows of trees, and other horizontal and vertical separation.



The lack of buffers along this portion of High Ridge near Summer Street creates uncomfortable walking condtions.

2.7.1.3 Driveways

Driveways can be a danger to pedestrians and bicyclists. The wider the entry and the higher the speed of a vehicle's entry or exit, the more risk to people in general. Overall, the corridors have many high-speed entries and exits. Driveways should be designed to leave the impression with motorists that they are intruders into the pedestrian world, and that they are to be on alert to expect people on foot. Many study area driveways lack these qualities. The resulting chaos and disorder creates considerable discomfort to people walking, bicycling, or even driving through the area. This is a responsibility of land-use regulations.



High Ridge Road between Vine Road and Turn of River Road has overly wide, ill defined driveways.

2.7.1.4 Guardrails/Barrier Walls

Guardrails have been abused in their uses in some portions of the study area. Not only is the existing urban-placed guard rail aesthetically in poor taste, it creates barriers and sharp edges facing people walking. Most of the guardrails observed along the corridors are poorly maintained and unsightly; ugliness has the potential to suppress the social and retail life of the street. As a general rule, the use of guardrails in urban areas is a symptom of poor urban planning that has resulted in vehicle speeds higher than appropriate for the retail life of streets.

People on foot feel more comfortable with a guardrail where it separates them from vehicles and the dangers vehicles can pose. There is some leeway in where guardrails are placed in rural areas with low rates of walking. But in urban and suburban places, guardrails belong close to roadway edges.

High Ridge Road near Cold Spring Road is just one area in Stamford where the guardrail has been placed at the back of the sidewalk. This is a significant comfort and safety issue for people walking or bicycling.

2.7.1.5 Parking Lots

On-street parking, which generally helps to calm traffic, is missing on both streets. The overabundance of off-street parking and driveways adds to chaos and confusion along the corridors. Many of the off-street parking lots in the study area are very large and lack pedestrian connections to the streets. Most of the driveways that cross pedestrian pathways are poorly marked and present significant threats for pedestrians and bicyclists.

2.7.1.6 Intersections

Overall, intersections along the corridors are neither friendly to nor fully supportive of active transportation. At both signalized and unsignalized intersections, vehicles are turning through the intersections at rates of speed too high for pedestrian safety. High vehicle speeds also make motorists unlikely to yield to pedestrians. Nighttime lighting is missing in many areas. The majority of unsignalized intersections don't have adequate crossings; markings aren't visible, and a driver's attention isn't called to the fact that pedestrians should be expected to be crossing there.

Although many signalized intersections are now marked well (such as the juncture of High Ridge Road, Long Ridge Road, Bedford Street, and Summer Street), other problems are noted, including people purposefully crossing away from signals in order to avoid conflicts with vehicles and minimize delays. Also, many intersections harbor multiple turn lanes and/or overly wide lanes without refuges in place to allow the pedestrian to cross these wide roads in stages, such as medians or crossing islands. Pedestrian push button controls are located where they aren't needed. All of the noted problems are of special concern along school routes, near transit stops, near medical centers, in commercial areas, and near parks.

2.7.1.7 Pedestrian Activity

Peak-hour counts at the 44 study intersections also included pedestrian activity, which is summarized graphically in Figures 2-8S and 2-8N. As can be seen from the figures, the level of pedestrian activity at the study intersections was relatively modest, although these volumes would likely be higher if pedestrian facilities were more supportive of pedestrian activity.

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Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-8 (S)

Peak Hour Pedestrian Activity

Legend

Volume of Pedestrians Crossing Intersection During Peak Hour of Pedestrian Activity

16+
11 - 15
6 - 10
0 - 5

Project Corridor

#	Study Intersection	Morning Peak Hour	Evening Peak Hour
1	Long Ridge Rd at High Ridge/Bedford/Summer St	15	21
2	Long Ridge Rd at Cold Spring Rd	5	8
3	Long Ridge Rd at Olin Chemicals/ Lord & Taylors Dr	1	0
4	Long Ridge Rd at Terrace Ave/260 Long Ridge Dr	0	2
5	Long Ridge Rd at Woodridge Dr. South	1	2
6	Long Ridge Rd at Stillwater Road/Buckingham Dr	3	5
7	Long Ridge Rd at Drive to Long Ridge Office Park	1	1
8	Long Ridge Rd at Loughran Ave/G.E. Energy Dr	1	3
9	Long Ridge Rd at Nestle/Oracle Drives	3	2
10	Long Ridge Rd at Route 15 NB Off Ramp/Wire Mill Rd	2	0
11	Long Ridge Rd at Route 15 SB Ramps/Webbs Hill Rd	2	5
12	Long Ridge Rd at Chestnut Hill Rd/Butternut Ln	1	1
13	Long Ridge Rd at Hunting Ridge Rd South	1	0
14	Long Ridge Rd at Wildwood Rd	1	2
15	Long Ridge Rd at River Bank Rd	3	0
16	Long Ridge Rd at Erskine Rd	2	0
17	Long Ridge Rd at Old Long Ridge Rd (northern)	0	1
18	High Ridge Rd at Cold Spring Rd (Route 137)	1	8
19	High Ridge Rd at Lord & Taylor/Bulls Head Shop Ctr	0	7
20	High Ridge Rd at Oaklawn Ave/Cross Rd	7	8
21	High Ridge Rd at Terrace Ave	6	3
22	High Ridge Rd at Unity Rd/Brownley Rd	11	4
23	High Ridge Rd at Lakeview Dr/Rippowam School	8	13
24	High Ridge Rd at Loveland Rd	6	6
25	High Ridge Rd at Dannel Dr/Mercedes Lane	6	5
26	High Ridge Rd at Ridge Park Rd	7	7
27	High Ridge Rd at Hartswood Rd	6	6
28	High Ridge Rd at Bradley Place	3	9
29	High Ridge Rd at Merriman Rd	11	3
30	High Ridge Rd at Vine Rd/Private Drive	3	15
31	High Ridge Rd at Cedar Height Rd/Turn of River Rd	6	7
32	High Ridge Rd at Olga Drive/Private Drive	6	11
33	High Ridge Rd at Square Acres Dr/Shopping Plaza	0	5
34	High Ridge Rd at Route 15 NB Ramps/Buxton Farms	0	2
35	High Ridge Rd at Route 15 SB Ramps	0	1
36	High Ridge Rd at Wire Mill Rd	2	1
37	High Ridge Rd at Scofieldtown Rd	3	0
38	High Ridge Rd at Interlaken Rd	0	0
39	High Ridge Rd at Brookdale Rd	2	2
40	High Ridge Rd at North Stamford Rd (southern)	1	2
41	High Ridge Rd at North Stamford Rd (northern)	0	0
42	High Ridge Rd at Sunset Rd	1	1
43	High Ridge Rd at Briar Brae Rd	1	0
44	High Ridge Rd at Mayapple Rd	2	0

City of Stamford, Connecticut

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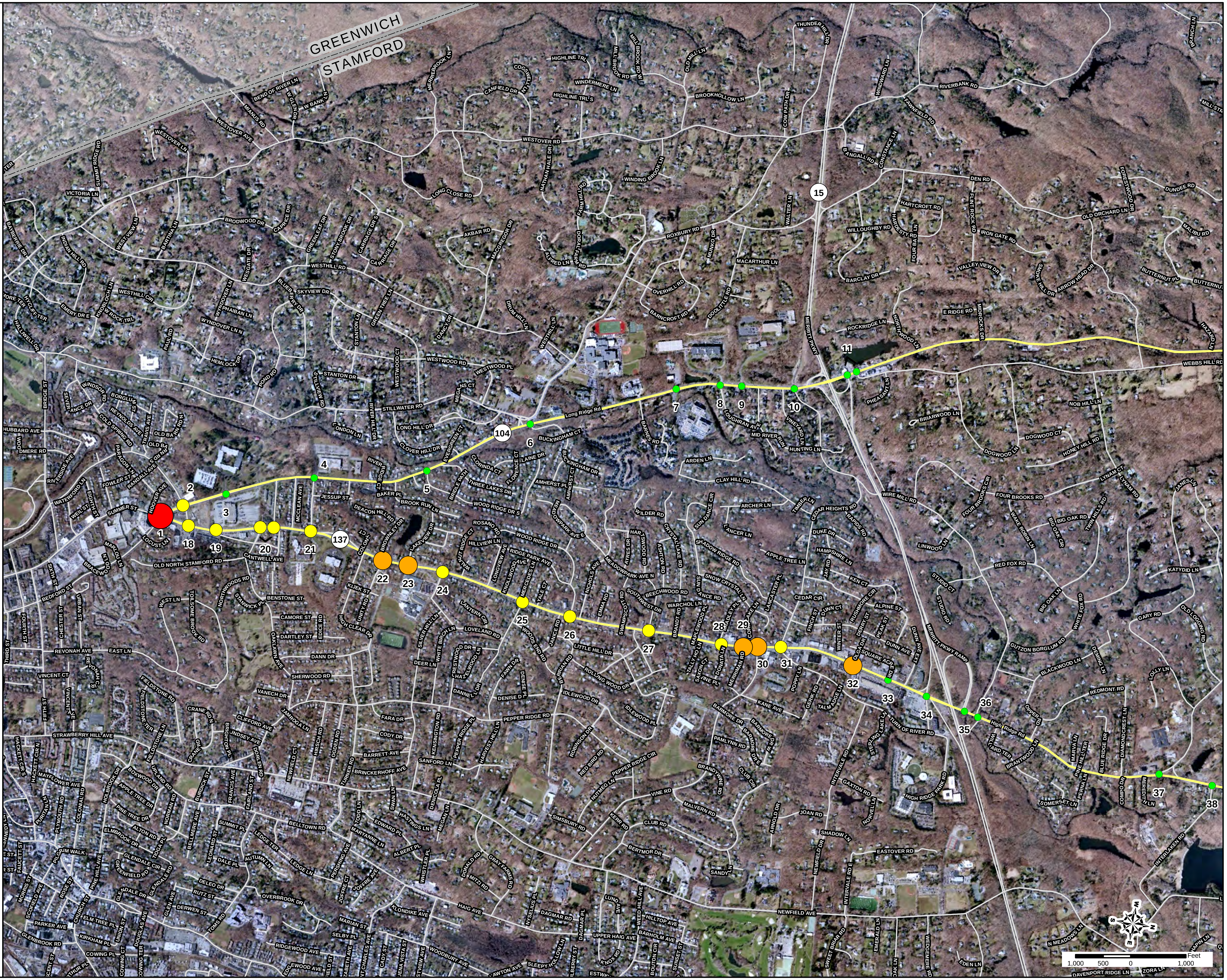
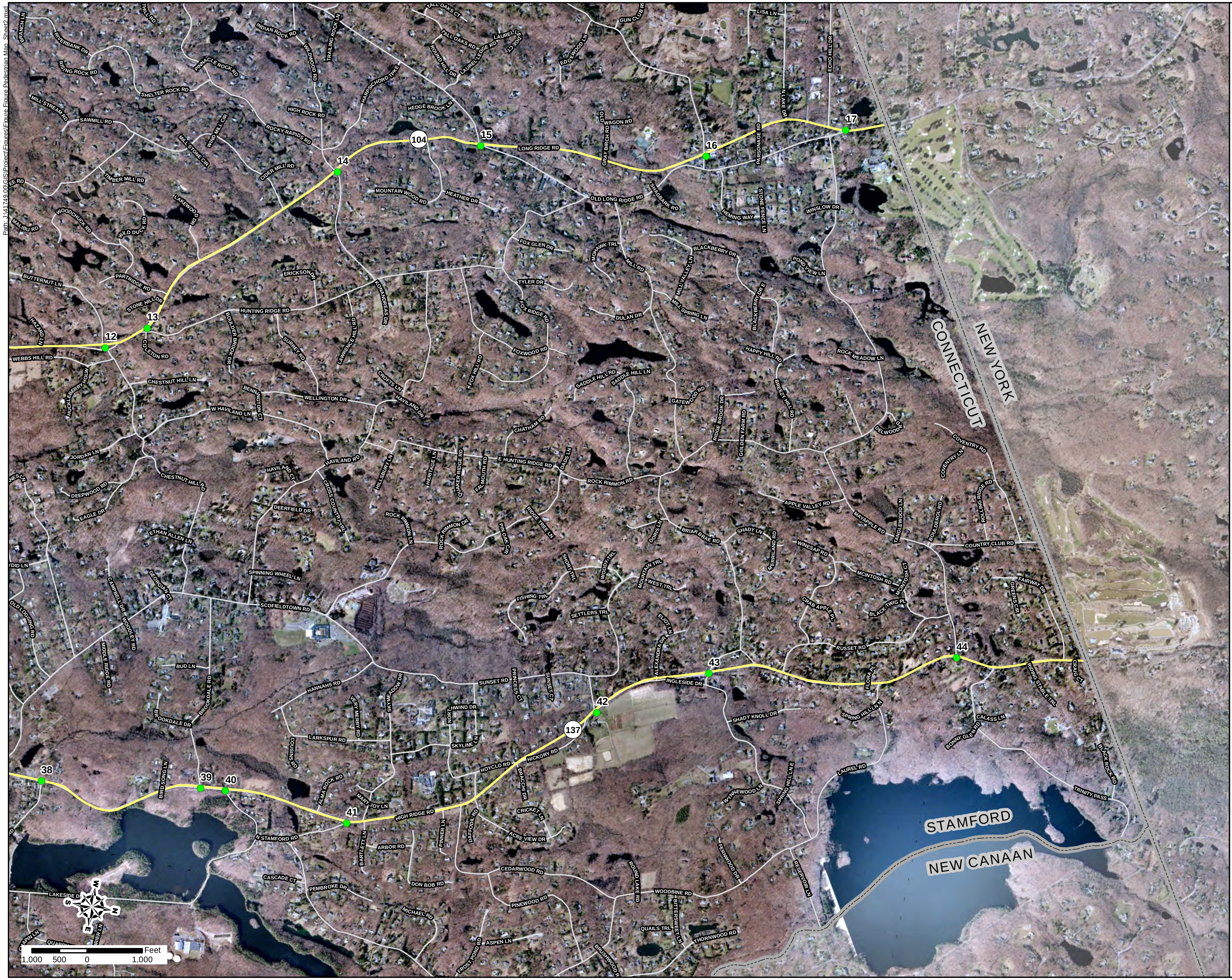
Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)





Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-8 (N)

Peak Hour Pedestrian Activity

Legend

Volume of Pedestrians Crossing Intersection During Peak Hour of Pedestrian Activity

- 16+
- 11 - 15
- 6 - 10
- 0 - 5

Project Corridor

#	Study Intersection	Morning Peak Hour	Evening Peak Hour
1	Long Ridge Rd at High Ridge/Bedford/Summer St	15	21
2	Long Ridge Rd at Cold Spring Rd	5	8
3	Long Ridge Rd at Olin Chemicals/ Lord & Taylors Dr	1	0
4	Long Ridge Rd at Terrace Ave/260 Long Ridge Dr	0	2
5	Long Ridge Rd at Woodridge Dr. South	1	2
6	Long Ridge Rd at Stillwater Road/Buckingham Dr	3	5
7	Long Ridge Rd at Drive to Long Ridge Office Park	1	1
8	Long Ridge Rd at Loughran Ave/G.E. Energy Dr	1	3
9	Long Ridge Rd at Nestle/Oracle Drives	3	2
10	Long Ridge Rd at Route 15 NB Off Ramp/Wire Mill Rd	2	0
11	Long Ridge Rd at Route 15 SB Ramps/Webbs Hill Rd	2	5
12	Long Ridge Rd at Chestnut Hill Rd/Butternut Ln	1	1
13	Long Ridge Rd at Hunting Ridge Rd South	1	0
14	Long Ridge Rd at Wildwood Rd	1	2
15	Long Ridge Rd at River Bank Rd	3	0
16	Long Ridge Rd at Erskine Rd	2	0
17	Long Ridge Rd at Old Long Ridge Rd (northern)	0	1
18	High Ridge Rd at Cold Spring Rd (Route 137)	1	8
19	High Ridge Rd at Lord & Taylor/Bulls Head Shop Ctr	0	7
20	High Ridge Rd at Oaklawn Ave/Cross Rd	7	8
21	High Ridge Rd at Terrace Ave	6	3
22	High Ridge Rd at Unity Rd/Brownley Rd	11	4
23	High Ridge Rd at Lakeview Dr/Rippowam School	8	13
24	High Ridge Rd at Loveland Rd	6	6
25	High Ridge Rd at Dannel Dr/Mercedes Lane	6	5
26	High Ridge Rd at Ridge Park Rd	7	7
27	High Ridge Rd at Hartswood Rd	6	6
28	High Ridge Rd at Bradley Place	3	9
29	High Ridge Rd at Merriman Rd	11	3
30	High Ridge Rd at Vine Rd/Private Drive	3	15
31	High Ridge Rd at Cedar Height Rd/Turn of River Rd	6	7
32	High Ridge Rd at Olga Drive/Private Drive	6	11
33	High Ridge Rd at Square Acres Dr/Shopping Plaza	0	5
34	High Ridge Rd at Route 15 NB Ramps/Buxton Farms	0	2
35	High Ridge Rd at Route 15 SB Ramps	0	1
36	High Ridge Rd at Wire Mill Rd	2	1
37	High Ridge Rd at Scofieldtown Rd	3	0
38	High Ridge Rd at Interlaken Rd	0	0
39	High Ridge Rd at Brookdale Rd	2	2
40	High Ridge Rd at North Stamford Rd (southern)	1	2
41	High Ridge Rd at North Stamford Rd (northern)	0	0
42	High Ridge Rd at Sunset Rd	1	1
43	High Ridge Rd at Briar Brae Rd	1	0
44	High Ridge Rd at Mayapple Rd	2	0

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Base Map Source: USGS 2008 High Resolution Orthoimagery for th Bridgeport t, Hartford, & New Haven, CT Urban Areas (1 - Foot resolutio

Facing south on High Ridge Road. Even though there are signalized crossings, little support is given to the pedestrian; the crossing is very wide and there is no refuge, or crossing island. Crossing islands are essential on multiple-lane roadways to separate conflicts by direction.

Facing Long Ridge Road at Summer Street, this complex intersection creates overly wide areas for pedestrians to cross. An able-bodied person faces significant challenges here, but this crossing is nearly impossible for someone with a visual impairment or other disability.

2.7.1.8 Public Transportation

Connecticut Transit (CT Transit) operates two bus routes through the project study area. These bus routes are described below and depicted on Figures 2-9S and 2-9N.

- **Route 31** runs from the Transportation Center in downtown Stamford to the Bull's Head along Summer Street and Bedford Street and then continues along High Ridge Road up as far as Briar Brae Road in northern Stamford.

- **Route 32** runs from the Transportation Center in downtown Stamford to the Bull's Head along Summer Street and Bedford Street and then continues along Long Ridge Road up to either Roxbury Road or all the way to Rock Rimmon Road near the New York State border.

Route 31 provides service seven days per week, and Route 32 provides service only on weekdays. The service frequency along each route varies by bus stop, day of the week, and time of day. In general, service on Route 31 is provided between two and four times per hour south of the Buxton Farms, while service is about half as frequent north of this location. Service on Route 32 south of Roxbury Road is provided twice per hour during the busier periods (7:00 to 9:00 a.m. and 3:00 to 7:00 p.m.) and once per hour for the remaining hours, while service is only provided once per hour, at most, north of Roxbury Road.

Detailed schedules for bus service and ridership statistics along Route 31 and Route 32 are included in the technical appendix. The hours of operation for the CT Transit bus service in the study area is summarized in Table 2-15.

Table 2-15 Bus Route Hours of Operations

		Hours of Operation	
Route	**Period**	**Inbound**	**Outbound**
31	Weekdays	5:58am-11:58pm	5:20am-11:10pm
	Saturday	7:23am-9:53pm	6:30am-9:05pm
	Sunday	7:53am-7:53pm	7:00am-7:00pm
32	Weekdays	6:58am-8:03pm	5:50am-7:05pm
	Saturday	—	—
	Sunday	—	—

Source: CT Transit, as of September 18, 2011

The Long Ridge and High Ridge corridor transit stops vary widely in their treatment and support for people - from areas where there is no safe place to stand and no sidewalks to get there, to areas where waiting for the bus is somewhat comfortable and safe. Overall, the quality of the transit stops is low, with few or no places to sit and shelters that are inadequate to protect from the weather.

Transit shelter on High Ridge Road near Vine Street. Flooding, collection of mud and debris, lack of ADA access, lack of security (land use), and limtited separation from moving traffic are a few of the problems with this shelter and transit stop.

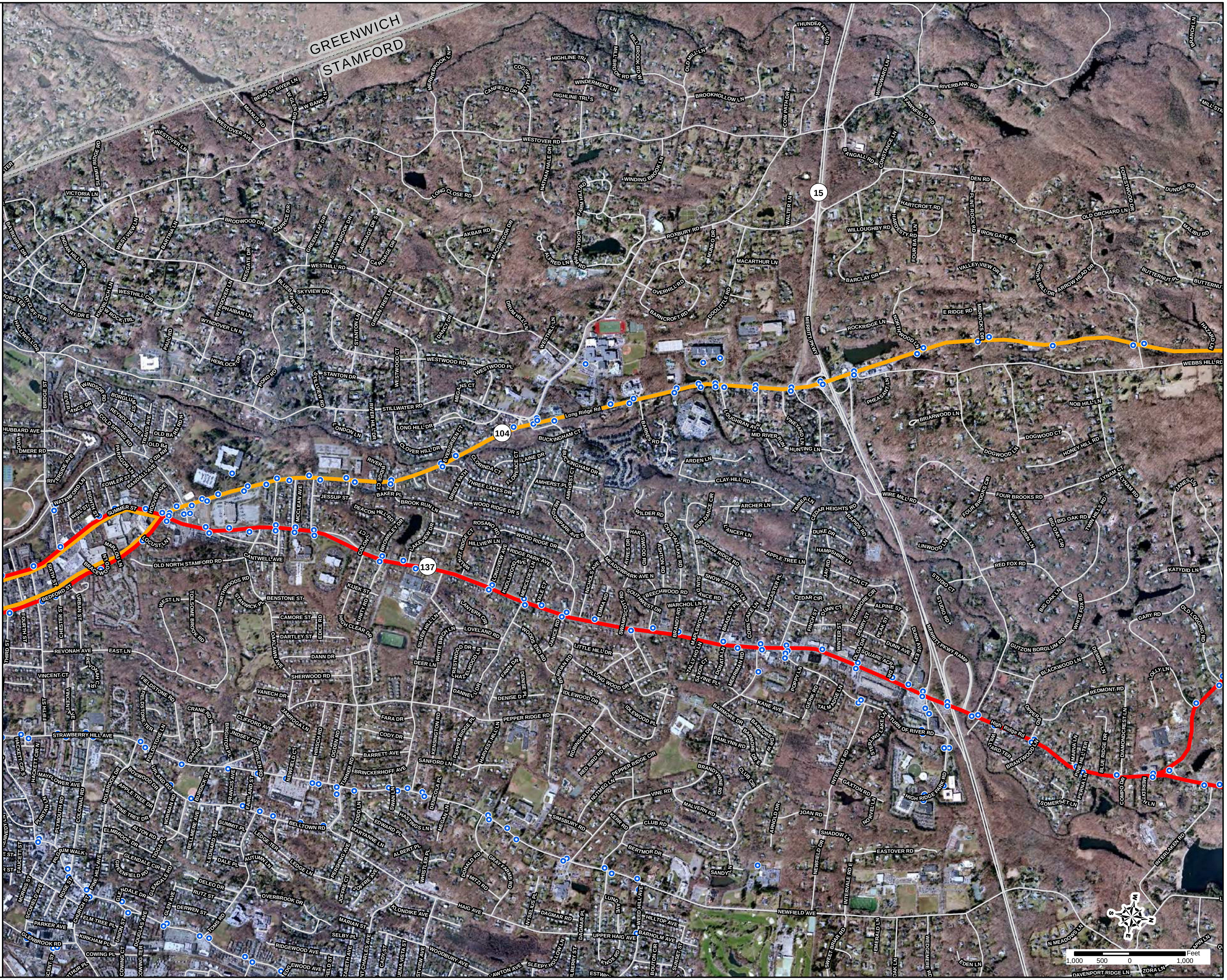
Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-9 (S)

Public Transportation

Legend

- Bus Stops
- CT Transit Route 31
- CT Transit Route 32
- Project Corridor



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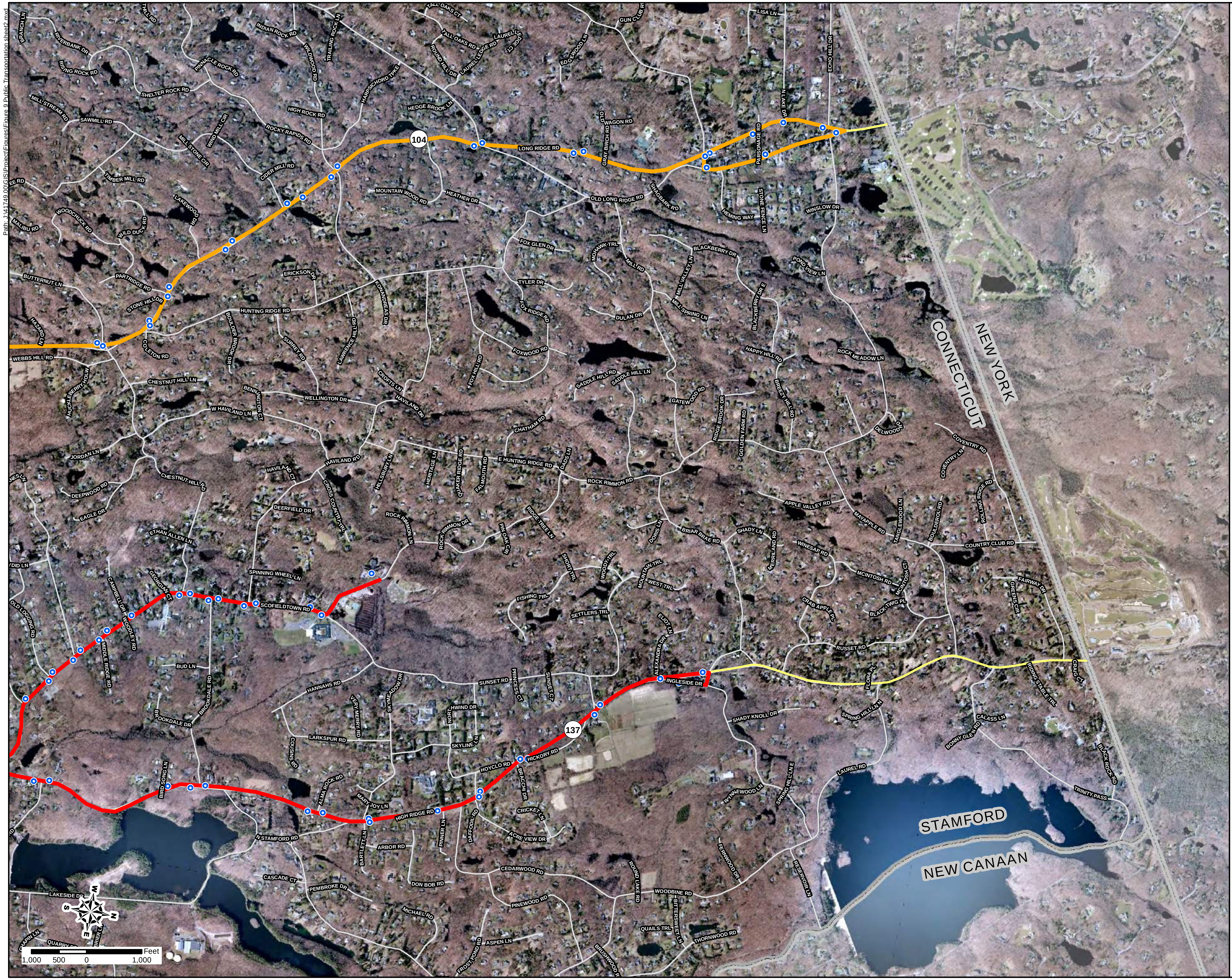
Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-9 (N)

Public Transportation



Legend

- Bus Stops
- CT Transit Route 31
- CT Transit Route 32
- Project Corridor

City of Stamford, Connecticut

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

2.7.1.9 Bicycling Facilities

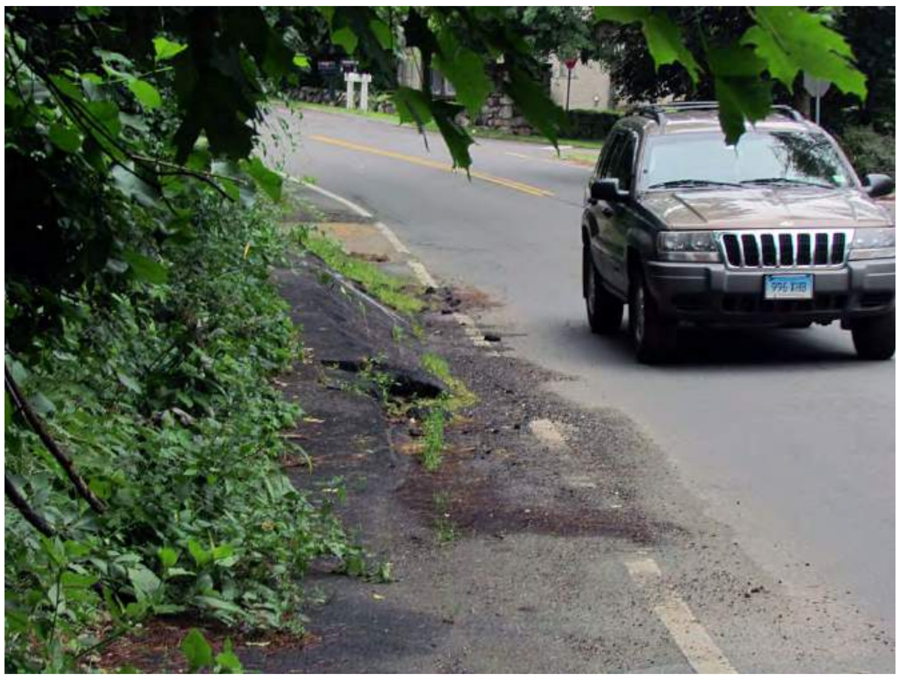
The corridors have an almost complete lack of bicycling facilities. The streets do not provide adequate paved shoulders, formal trails, bike lanes, or simple amenities, such as bike racks and wayfinding systems.

Most people observed riding were either on sidewalks or making quick, short trips. Bicyclists experience a range of motorist attitudes, from those giving a wide berth and remaining attentive, to those that were inattentive and bothered by the presence of people on bicycles.

In general, the higher the actual speed and traffic volume of a corridor, the more important it is to have adequate bicycling facilities. Based on these criteria, all areas of both Long Ridge Road and High Ridge Road should have quality bicycling facilities.

2.7.1.10 Schools, school trips and "safe routes to school"

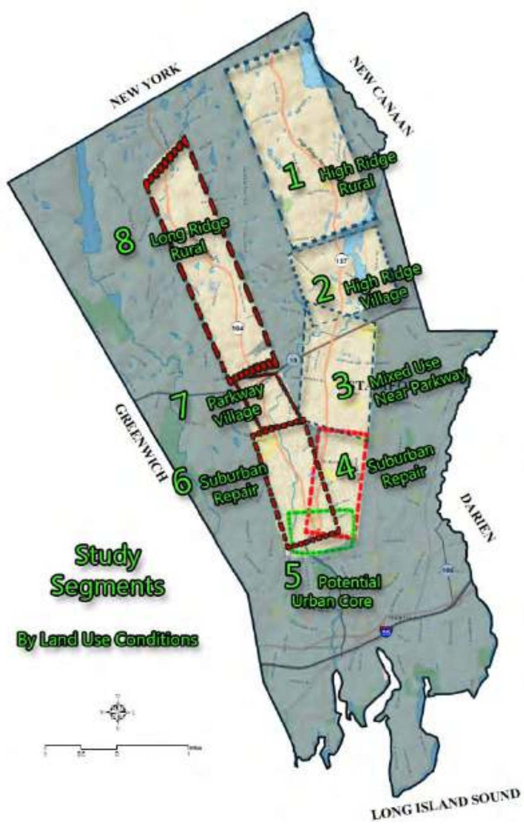
Students attending schools along both corridors have few ways to cross streets safely. Also, most sidewalks are connected to the street, which creates uncomfortable walking conditions. Vehicle speeds are high, and there are not enough crosswalks marked as school crossings. In general, "safe routes to school" appear to be lacking.



Walking conditions on approach to the Northeast Elementary School at Scoffieldtown Road and High Ridge.
In recent years, through a combination of the placement of schools, light density, widening of roads, and other factors, the number of children getting to school on their own has dropped dramatically.

2.7.2 Observations by Location

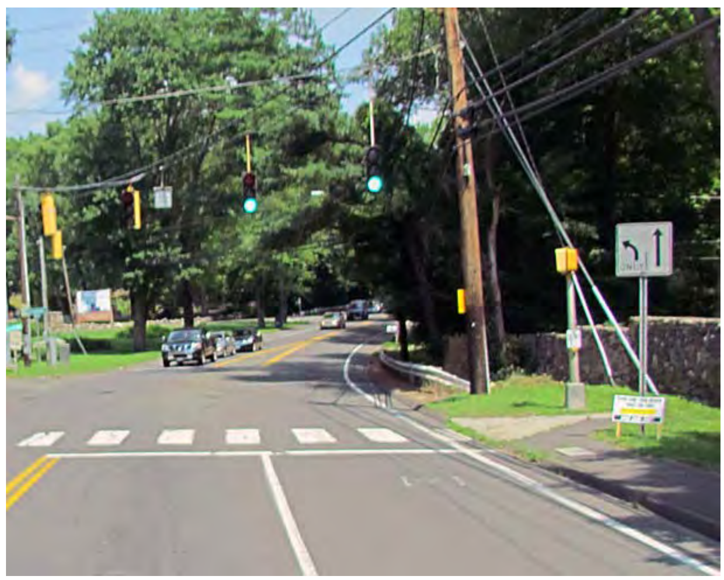
For a more in depth analysis of the existing active transportation conditions, the study area was divided into eight geographic segments (depicted below) based on similarities of topography, types of land uses, and related conditions. The existing active transportation conditions in each segment are described in the following section.



1. High Ridge Rural
2. High Ridge Village
3. Mixed Use Near Parkway
4. High Ridge Suburban Repair
5. Potential Urban Core
6. Long Ridge Suburban Repair
7. Parkway Village
8. Long Ridge Rural

2.7.2.1 High Ridge Rural

Walking in this semi-rural area is challenged by many winding, semi-hilly roadways. There are no sidewalks, but there is some use of narrow 18- to 24-inch-wide "goat trails." The area has numerous driveways. Many portions of this section have transit access. Most areas lack paved shoulders, and vehicle speeds are high. A small number of pedestrians were seen walking in traffic, typically attempting to get to a transit stop; one was a teenager going to visit a friend. Only a few bicyclists were observed. A number of intersections are overly wide, and lack median islands and other tools to keep vehicle speeds under control.



2.7.2.2 High Ridge Village

Walking or bicycling in this area is mixed. A few sidewalks exist on the eastern side of the street, but they are narrow and uneven. Some walkways are as narrow as 18 inches. Walkways are poorly maintained. Sidewalks leading up Scofieldtown Road are elevated with steep drops, uneven, and hazardous. There are no bike lanes or shoulders. Driveways are wide, traffic congestion is common at Scofieldtown Road, and challenging intersections have outlived their useful life. Meanwhile, historic buildings, quality open space, nearby schools, parks, potential plazas, and a small commercial zone makes this an ideal pedestrian village. The area lacks an adequate waiting area for transit. Commercial uses are set back, suburban style.

2.7.2.3 Mixed Use near Parkway

Walking is mixed in this area, with no walkways on the western side and intermittent walkways on the eastern side. Driveways elicit high-speed turns across unmarked crossing points. Vehicle speeds are high, especially as motorists are merging onto and off of the Merritt Parkway. There are no paved shoulders or bike lanes. Several intersections pose special challenges on both sides of the Merritt Parkway. Bicyclists or pedestrians attempting to pass through this area find an unending series of challenges, including several poorly located transit stops with no means to reach them without walking in the roadway, and no way to cross the street. This area should become a high priority for changes.

2.7.2.4 High Ridge Suburban Repair

Some very challenging and poorly conceived suburban land-use practices appear in this area, with the limited number of walkways, traffic-choked intersections (especially Vine Road), ill-defined driveways and other barriers. Some side roads peel off at high-speed angles. Several schools are found in this section. Bicycling is compromised throughout the entire segment. Transit is poorly supported, and getting across High Ridge Road, either at signalized intersections or in other locations, is very uncomfortable.

2.7.2.5 Potential Urban Core

This area has the highest collection of pedestrian and bicycle activity on High Ridge Road, but it is poorly laid out to support either. Intersections pose numerous risks, and a number of pedestrians were observed crossing away from signals. There is no support for bicycling, and transit stops have low support. The eastern side of High Ridge Road has even more complex features for walking. Driveways, guardrails, and frequent backing up and other movements of cars in suburban parking lots make a journey through here discomforting. The intersection of Long Ridge Road and High Ridge Road at Summer Street is very complex. Pedestrians (and motorists) have long waits and very long exposures in time and distance. The intersection with Cold Spring Road is also a significant challenge.

2.7.2.6 Long Ridge Suburban Repair

Only the first 1,000 feet of the Long Ridge Road corridor in the south has sidewalks. Walking opportunities are poor. Most of this portion of the corridor has four travel lanes and some paved shoulders. The roadway width doesn't include bike lanes. Transit stops are poorly supported, and there are too few ways to cross over Long Ridge Road after exiting transit. There are only limited driveways, so many of the conflicts found on High Ridge Road are absent in this corridor. Of the two roads, this is the more pleasing but less supported place to walk. Very few pedestrians or bicyclists were seen along this entire section. The exception was the presence of people trying to get to each of the challenging transit stops.

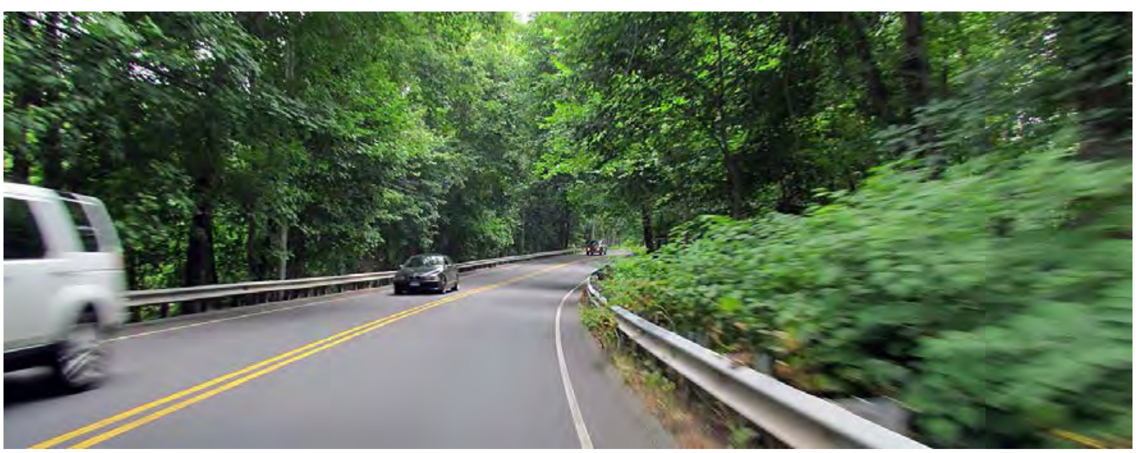
2.7.2.7 Parkway Village

Approaching the Merritt Parkway, walking support (as well as bicycling) drops off significantly. Pedestrians are forced into shoulder areas. On and off ramps present high-speed crossings, which are challenging to both bicyclists and pedestrians. Vehicle speeds are high. Crossing Long Ridge Road in any location is a complex challenge.

Meanwhile, this area has the transportation connections needed to create a pleasant shopping and living environment. For these reasons, significant investments in pedestrian and bicycling activities may be appropriate.

2.7.2.8 Long Ridge Rural

Much like the High Ridge Rural section, walking in this semi-rural area is challenged by many winding, semi-hilly roadways. There are no sidewalks, but in some areas there are narrow, 18- to 24-inch-wide "goat trails." The area has numerous driveways, but they are low-speed. This is a rural reserve, and homes are well kept. Many portions have transit access. Most areas lack adequate paved shoulders, and some vehicle speeds are high. A small number of pedestrians were seen walking in traffic. It is possible for some areas to be supported by an off-road trail. A number of intersections are overly wide and lack median islands and other tools to keep vehicle speeds under control.



2.8 Landscape Character

The Long Ridge Road and High Ridge Road corridors are each comprised of a series of streetscape environments that have distinctly different landscape and visual qualities. In both corridors these range from rural residential roads with an emphasis upon preserved trees and woodlands in their northern sections to densely developed commercial areas at their southern juncture at Bull's Head.

The sections lying between the northern and southern ends of the corridors are characterized on Long Ridge Road by corporate centers, a small commercial center and occasional single-family residential neighborhoods and on High Ridge Road by smaller commercial centers, office parks, and single-family residential neighborhoods. The crossing of both roads by the Merritt Parkway also presents a very distinct visual divide, as the landscape character changes dramatically as one crosses under the Merritt Parkway on both Long Ridge Road and High Ridge Road.

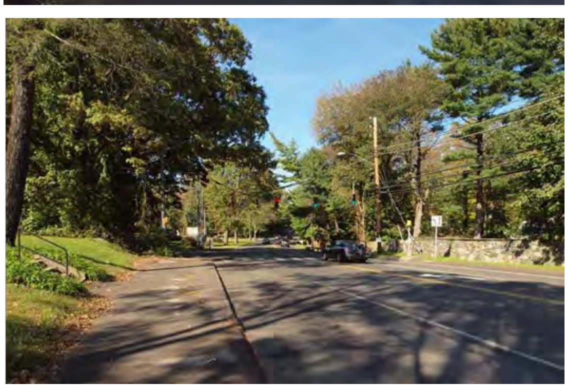
Detail on the landscape and visual qualities of the streetscape environment is provided in the following sections. The descriptions of each segment of the corridors have been arranged to follow a similar sequence to those discussed in the *Active Transportation System* section of this report, as the these two report sections are closely related in terms of user experience of the Long Ridge Road and High Ridge Road corridors.

2.8.1 High Ridge Road: New York State Line to Stamford Museum / Nature Center

This portion of High Ridge Road has a truly rural aspect characterized by large woodland tracts and steep terrain leading up to the North Stamford Reservoir and larger, predominantly-wooded lots with homes largely set well back from the road. The existing stone walls and mature trees contribute to the character of this portion of road, which has a “country road” feel. The mature trees often run down to the road’s edge, and present canopy “tunnels” in several locations. The landscape is punctuated in various locations by ornamental tree plantings, often of native varieties, in the front yards of residences.

As noted in other segments of the corridors, sidewalks are not provided through this section, and while functionally desirable, their introduction would visually compromise the rural character of this area. While overhead power lines flank the roadway, they are visually obscured by the lush canopies of the mature stands of trees alongside the road. This can present issues of significant concern, as evidenced by the recent early snow event that occurred during the fall of 2011.

The Stamford Museum and Nature Center introduces a transitional landscape as one approaches a small village area featuring the Stamford Historical Society beyond. The landscape of the Stamford Museum and Nature Center is characterized by lawn/meadow with scattered mature trees and sections of stone walls, a change from more wooded sections of High Ridge Road to the north, as well as from the more developed village area to the south.



2.8.2 High Ridge Road: Stamford Museum / Nature Center to Merritt Parkway

The Stamford Museum and Nature Center also serves as a gateway to a small village center comprised of the Stamford Historical Society, adjacent retail, and auto repair buildings along the west side of High Ridge Road. The frontage of the Stamford Historical Society is comprised of a lawn and several large trees, and is visually dominated by the historic stone building façade. The existing bituminous walkway, which is not separated from the curb by a green strip, takes away from the streetscape appearance. The commercial property alongside the museum doesn't provide any landscape treatment along its frontage. Instead, it includes a bituminous walkway flanked by bituminous traffic islands. The result is that it is a severe break in streetscape character from the surrounding treed edges of High Ridge Road.

The village center does not offer amenities such as street furnishings, bike racks or pedestrian scale lighting, resulting in a non-inviting environment for pedestrians and bicyclists.

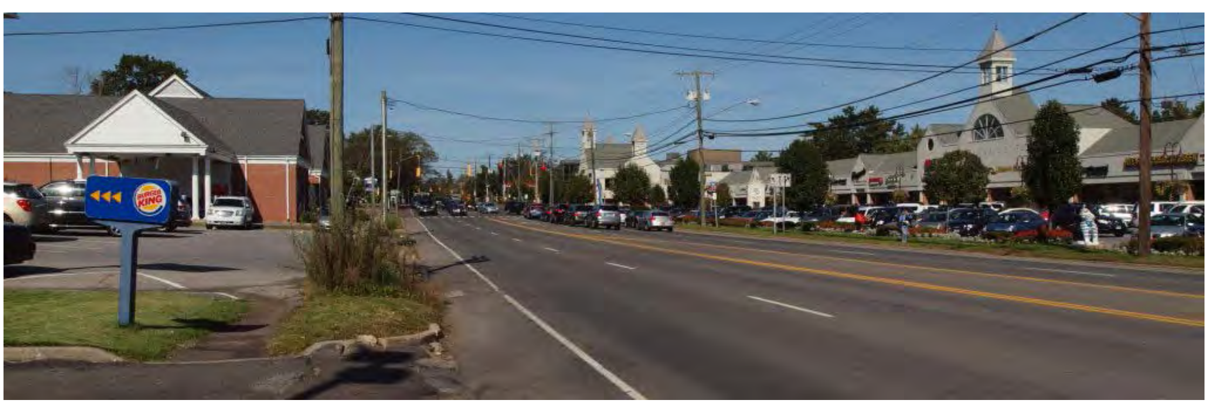
The landscape south of the village, and leading up to the Merritt Parkway overpass, is predominantly small-lot single-family residential, and is characterized by trees within front yards which have matured to a level that provides an informal edge to the roadway. There is continuous sidewalk (though of sub-standard width) along the easterly road edge, and some unconnected sections of sidewalk on the west side.

2.8.3 High Ridge Road: Merritt Parkway to Donata Lane

The landscape changes in character upon passing under the Merritt Parkway, transitioning to almost a mile-long stretch of "strip" retail development. While some sections in this area are tastefully landscaped with shrub/perennial beds and trees along the frontage, many other sections are devoid of landscaping and, in some cases, of sidewalks as well. This lack of landscape results in no visual relief from the existing open expanses of parking lot pavement, overly wide entrance drives, and overhead power lines.

The combined impact of these conditions is the impression of a vehicle-dominated environment with little sense of visual or functional refuge for pedestrians. This is exacerbated by the four-lane (plus center turn lane) layout of High Ridge Road in this section, which results in high vehicular speeds and is a major barrier to pedestrians trying to access both sides of the road. In terms of the streetscape experience, this broad area of pavement combined with the paucity of roadside plantings presents a forbidding environment for pedestrians.

In terms of the retail uses, lack of a consistent streetscape design theme through the corridor, combined with widely varying styles of buildings and signage, results in visual confusion to passing motorists and detracts from the appearance of the area.



2.8.4 High Ridge Road: Donata Ln. to Oaklawn Ave.

The predominant land use over this approximately 1.5 mile long portion of high Ridge Road returns to small-lot, single-family residential interspersed with institutional (Rippowam School) and corporate office park (225 High Ridge Road). Overhead power lines are present on both sides of the road, compromising the visual quality of the roadway edge and presenting a possible impediment to street tree plantings. Fortunately, many front yards of the residences lining the roadway are planted with shade and ornamental trees, providing a visually interesting roadside experience. There are, however, no seating areas or pocket parks to break up the long run of homes, which could offer pedestrian refuge areas.

High Ridge Road provides two drive lanes in each direction with a center turn lane through-out this portion of the corridor, resulting in a sixty foot (plus) cross-section of heavily trafficked pavement. This is very much out of scale and character with the residential land uses that line the road. Reducing the roadway width to allow for increased green space and lower vehicular speeds merits exploration. Another functional and visual issue that carries through much of the residential frontage in this portion of the corridor is the condition of the sidewalks, which are frequently as narrow as 18" due to lawn encroaching on edges of the bituminous surface over the years. This occurs on both sides of the road, resulting in Americans with Disabilities Act (ADA) non-compliance and an unattractive streetscape appearance.

The office park located on the east side of High Ridge Road presents an attractive and expansive landscape as viewed from the road, characterized by large open lawn areas with groups of large shade trees and views to office buildings beyond. The Rippowam School, further to the north, also presents open lawn areas with shade trees lining the road. The grounds of these two facilities "open up" the landscape relative to the single-family residences otherwise lining the road.

2.8.5 High Ridge Road: Oaklawn Avenue to Cold Spring Road

The east side of High Ridge Road south of Oaklawn Avenue is comprised of a retail plaza with overgrown shrubs, lawn, and a few mature trees that front the roadway. Opposite, on the west side of High Ridge Road, are two entrance drives to Lord & Taylor. The embankment lying between these two entrances is characterized by steep slopes with predominantly browned-out lawn and areas of mulch devoid of plantings (at the time of the site visit), along with occasional ledge outcrops. While there are a few clusters of large trees, this area is visually dominated by an otherwise visually barren landscape with the only pedestrian amenities being the existing bus shelter.

The roadway cross-section in this location provides for four lanes plus a center turn lane, resulting in an approximately sixty foot expanse of heavily trafficked roadway pavement. The new CVS plaza along the west edge provides some visual relief with tree, shrub, and perennial bed plantings, however, significant areas have been left unplanted with expanses of bark mulch.

The strip retail center opposite CVS (east side of High Ridge Drive), by contrast, is attractively landscaped and separated from the roadway by a low retaining wall and mature tree plantings. Having the associated parking areas depressed relative to the road allows for attractive views to the storefront architecture, which is unimpeded by the parked cars. This presents one example of what may be accomplished with thoughtful site and landscape design, depending on the future vision for streetscape and land uses in the corridor.

2.8.6 Cold Spring Road

Cold Spring Road defines the north edge of the triangular-shaped area that comprises the southern ends the two corridors. This area is locally known as “Bull’s Head”. Cold Spring Road itself is characterized by a broad bituminous center median with lawn and only a few sporadic tree plantings alongside the road. There is also no evidence of benches, trash receptacles, or other pedestrian or cyclist amenities. This sends the visual message that this is a vehicular cut-through where pedestrians are not welcome.

Crosswalks are also poorly defined despite some large expanses of confusing striping at the Long Ridge Road intersection at Cold Spring Road. In some cases, crosswalks are simply not delineated with painted edges. In one case, a sidewalk terminus is inexplicably separated from the crosswalk by a small panel of lawn. This issue relates to the streetscape character, which creates confusion for pedestrians and motorists alike.

2.8.7 Junction of Long Ridge Road and High Ridge Road

This portion of the two corridors is visually dominated by the broad expanse of pavement where the two roads intersect. Some traffic islands are planted, offering visual relief, but street trees are almost entirely absent. Also absent are street furnishings, ornamental lighting, specialty pavements and other amenities which would support a pedestrian-friendly environment.

Sidewalks in this area are concrete, inconsistent in their locations, and have key sections that are either missing or otherwise ADA non-compliant along the west edge of Long Ridge Road. Sidewalks are also not provided along the frontage of the retail property adjacent to the intersection of High Ridge road with Cold Spring Road. These conditions send a strong message that this is not a walkable community and detract from the visual and functional experience of this area.

From a landscape design perspective, these conditions, in combination with the large expanses of roadway pavement, present a barren visual experience for drivers, cyclists, and pedestrians. Lack of pocket parks or other pedestrian refuge areas, tree-buffered roadway edges, and cyclist accommodations seriously detract from what could be a boldly designed landscape experience.

2.8.8 Long Ridge Road: Cold Spring Road to Merritt Parkway

North of Cold Spring Road, the character of Long Ridge Road changes dramatically. The west side comprises a corporate landscape of a well maintained roadside lawn panel as foreground to dense tree massing and stone walls. Opposite this on the east side of the road fronting Lord & Taylor, is a broad expanse of grassed embankment that is devoid of street trees.

An additional office facility is located on the west side of Long Ridge Road south of River Ridge Court and is comprised of an expansive lawn, which is devoid of tree plantings. Residential properties flanking and opposite of this facility have sporadic tree plantings along their frontage. There are no sidewalks in this portion of Long Ridge Road, which is an issue, as pedestrians and joggers were both observed using the lawn shoulders.

The landscape in the portion of Long Ridge Road between River Ridge Court and the Merritt Parkway is generally characterized by “buffers” with variable depths that include existing trees lining the roadway and provide screening for residential and office uses.

2.8.9 Long Ridge Road: Merritt Parkway to Northwood Lane

North of the Merritt Parkway on Long Ridge Road is a small commercial area that flanks both sides of the road. There are significant sections (on both sides of the road) that have no street trees or other plantings. A tall stone retaining wall fronting the more recent retail building on the east side of the road appears to reduce, and possibly eliminate, opportunities for new plantings that could upgrade the appearance of the road edge. There are no walkways on either side of the road, nor are there crosswalks, which are a real impediment to pedestrians trying to access village retail opportunities on both sides of Long Ridge Road.

2.8.10 Long Ridge Road: Northwood Lane to New York State Border

Long Ridge Road to the north of Northwood Lane returns to a low density rural residential character with homes set well back from the road on large wooded lots. Individual homes are often separated by natural woodland and, in some cases, long sections of roadside are characterized by stands of trees coming to the road's edge. This lends an attractive "country" road appearance and is in contrast to the more developed section further to the south. There are no sidewalks along the sides of this section of Long Ridge Road, which is in keeping with the rural quality of the landscape.

2.9 Natural Resources

This section provides an overview of natural resources within the Long Ridge/High Ridge Corridors study area, including wetlands, watercourses, floodplains, floodways, stream channel encroachment lines, groundwater resources, air quality and rare species habitat.

2.9.1 Wetlands and Watercourses

Wetlands are regulated on the federal level by the U.S. Army Corps of Engineers (ACOE) under Section 404 of the Clean Water Act and on the state and local levels by the Connecticut Department of Energy & Environment ("CTDEEP") under the Connecticut Inland Wetlands and Watercourses Act. Because wetlands exhibit many functions considered beneficial for both humans and wildlife, both Acts place strong emphasis on wetland avoidance as the primary means of protecting wetland resources. As such, provision of a detailed alternatives analysis that demonstrates efforts for avoidance or minimization of wetland impacts is prudent.

Wetlands within the study area include both state and federally designated inland wetlands. Federal inland wetlands, as defined by the *Corps of Engineers Wetland Delineation Manual* (U.S. Army Corps of Engineers, Waterways Experiment Station, 1987), are identified by a three-parameter approach that considers hydric soils, hydrophytic vegetation, and the presence of hydrologic indicators. The U.S. Corps of Engineers Wetlands Delineation Manual defines wetlands as, "[t]hose areas that are inundated or saturated by surface or ground water 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. Wetlands generally include swamps, marshes, bogs, and similar areas."

The Connecticut Inland Wetlands and Watercourses Act defines wetlands as areas of poorly drained, very poorly drained, floodplain, and alluvial soils, as delineated by a soil scientist. Watercourses are defined as bogs, swamps, or marshes, as well as lakes, ponds, rivers, streams, etc., whether natural or man-made, permanent or intermittent. Intermittent watercourse determinations are based on the presence of a defined permanent channel and bank, and two of the following characteristics: (1) evidence of scour or deposits of recent alluvium or detritus; (2) the presence of standing or flowing water for a duration longer than a particular storm incident; and (3) the presence of hydrophytic vegetation.

Publically available CTDEEP GIS data depicts a number of wetlands within the study area. Limited field reconnaissance confirmed that, while CTDEEP mapped wetland areas are substantially correct, some deviations would occur if wetland areas were field delineated. The majority of wetlands within the study area are forested systems.

Many of these systems are bordering wetlands associated with adjacent watercourse features.

2.9.2 Watercourses

Watercourses are prevalent throughout the study area and include rivers, named and unnamed perennial watercourses, and intermittent watercourses. Most notably, the Rippowam River crosses both High Ridge Road and Long Ridge Road, the East Branch of the Mianus River crosses Long Ridge Road, and the North Stamford Reservoir abuts High Ridge Road for a short distance. Table 2-16 lists the rivers and perennial streams crossed by Long Ridge Road and High Ridge Road within the study area and their general location. In addition, several small ponds and intermittent tributaries of the below-referenced perennial watercourses exist within the Long Ridge/High Ridge Corridors study area.

Table 2-16 River & Perennial Stream Crossings within the Long Ridge/High Ridge Corridors Study Area

Stream Name	General Location(s)
Rippowam River (2)	High Ridge Road, located north of southbound on-ramp to Merritt Parkway, flows west under road. Long Ridge Road, located between Three Lakes and Clover Hill Drive, flows south under road.
East Branch Minus River	Long Ridge Road, located approximately 700 feet north of Riverbank Road.
Poorhouse Brook	High Ridge Road, located north of Scofieldtown Road, flows southeast from Bendels Pond and into the Rippowam River.
Unnamed	High Ridge Road, located immediately south of Bel Aire Drive
Unnamed	High Ridge Road, located approximately 600 feet south of Alma Rock Road, connects two open waterbodies north of North Stamford Reservoir.
Unnamed	High Ridge Road, immediately north of Briar Brae Road.
Unnamed	Long Ridge Road, located between Wishing Well Lane and Wood Ridge Drive South. Drains west into the Rippowam River.
Unnamed	Long Ridge Road, located approximately 1,600 feet south of the newly constructed Merritt Parkway northbound off-ramp. Drains east beneath Long Hill Road and into the Rippowam River.
Unnamed	Long Ridge Road, located approximately 1,400 feet south of the newly constructed Merritt Parkway northbound off-ramp. Drains southeast beneath Long Hill Road and into the Rippowam River.
Unnamed	Long Ridge Road, located approximately 200 feet south of the intersection of Butternut Lane/Chestnut Hill Road and Long Ridge Road.
Unnamed	Long Ridge Road, located north of the intersection of Butternut Lane/Chestnut Hill Road and Long Ridge Road.

Stream Name	General Location(s)
Unnamed	Long Ridge Road, located between Stone Hill Drive and Hunting Ridge Road
Unnamed	Long Ridge Road, located approximately 1,000 feet southeast of Wildwood Road. Flows from Wildwood Pond southwest beneath road to a small pond northwest of Sawmill Road.
Unnamed	Long Ridge Road, located approximately 50 feet south of Gray Birch Road.
Unnamed	Long Ridge Road, located approximately 1,000 feet north of Gray Birch Road.
Unnamed	Long Ridge Road, located between south and Parsonage Road.
Unnamed	Long Ridge Road, located between north of North Lake Road

* CTDEEP GIS 2011 – Surface Water Quality Mapping

2.9.3 Floodplains, Floodways and Stream Channel Encroachment Lines

Floodplains are low-lying areas adjacent to rivers or streams that are inundated periodically by floodwaters. A 100-year floodplain ("floodplain") is an area that has a one-percent chance 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.

The CTDEEP Inland Water Resources Management Division administers Connecticut's Flood Management Program (C.G.S. Sections 25-68b through 25-68h inclusive), which regulates state agency actions affecting floodplains. State agencies undertaking such actions must submit a Flood Management Certification describing project activities and the measures taken to meet the program's standards. Additionally, projects receiving state funding should be reviewed for possible eligibility under the Flood Management Certification program. Standards relative to floodplain management apply to any proposed construction or activities in floodplains. The CTDEEP bases their approval on a variety of considerations including: conformance to the provisions of FEMA's National Flood Insurance Program (NFIP); prevention of flood hazards to human life, health, or property (e.g. provisions for compensatory flood storage if necessary); prevention of adverse impacts to fish populations or fish passage; and prevention of intensification of land uses or development in flood prone areas. The City of Stamford regulates activities within 100-year floodplains under Section 7.1-Flood Prone Area Regulations of the Zoning Regulations of the City of Stamford. The purpose of, and general requirements of these regulations is consistent with state laws which generally promote the health, safety and welfare of the public and limit damage to private and public property.

Floodplains within the study area and proximate to Long Ridge and High Ridge Roads are associated with the Rippowam River, East Branch of the Mianus River and Poorhouse Brook. Based on a review of available FEMA and CTDEEP GIS data, *floodplains* appear to cross or be partially located within Long Ridge or High Ridge Roads at the following locations:

- Long Ridge Road, north of Three Lakes Drive where the Rippowam River crosses;
- Long Ridge Road, south of Loughran Avenue where Rippowam River is in close proximity to east side of Long Ridge Road;
- Long Ridge Road, north of the intersection with Wildwood Road;
- Long Ridge Road, north of Riverbank Road where the East Branch of the Mianus River crosses;
- High Ridge Road, north of the Merritt Parkway where the Rippowam River crosses.

Based on a review of available FEMA and CTDEEP GIS data, *floodways* appear to cross or be partially located within Long Ridge or High Ridge Roads at the following locations:

- Long Ridge Road, north of Three Lakes Drive where the Rippowam River crosses;
- Long Ridge Road, north of the intersection with Wildwood Road;
- Long Ridge Road, north of Riverbank Road where the East Branch of the Mianus River crosses;
- High Ridge Road, north of the Merritt Parkway where the Rippowam River crosses.

The Stream Channel Encroachment Line (SCEL) program (C.G.S. 22a-342 through 22a-349a) is administered by CTDEEP's Bureau of Water Protection and Land Reuse's Inland Water Resources Division. Stream channel encroachment lines have been established for about 270 linear miles of riverine floodplain throughout Connecticut. The SCEL program regulates the placement of encroachments and obstructions riverward of stream channel encroachment lines, to lessen the hazards to life and property due to flooding.

The CTDEEP has designated a stream channel encroachment line along a portion of the Rippowam River, extending from Pulaski Street to the dam at Stillwater Pond. This area is to the south and outside of the study area.

2.9.4 Groundwater Resources

Groundwater is defined as water that collects or flows beneath the earth's surface, filling the porous spaces in soil, sediment, and rocks. Groundwater originates from rain and from melting snow and ice and is the source of water for aquifers, springs and wells. Groundwater movement is influenced to a great extent on the underlying surficial geologic materials; however, flows generally follow topographic gradients.

The study area is dominated by glacial till deposits largely comprised of nonsorted, generally unstratified particles of varying size. Glacial till deposits generally promote groundwater exfiltration or discharge, particularly on sloping terrain as opposed to groundwater infiltration which is more likely to occur within glacial outwash deposits. Within the study area glacial outwash deposits, largely comprised of stratified sand and gravel resulting from glacial meltwater, are found within portions of the Rippowam and East Branch of the Mianus River valleys. Outwash deposits may provide valuable groundwater recharge functions and often correspond to areas of high groundwater availability.

To protect high quality groundwater resources from potential degradation, regulations such as Connecticut's Aquifer Protection Act (C.G.S. 22a-345a-bb) was passed and subsequently the Aquifer Protection Area Program initiated. While the CTDEEP administers this program, municipalities have the option and responsibility of implementing it. The City of Stamford has adopted regulations in order to protect its aquifers, known as the Aquifer Protection Area Regulations of the City of Stamford. These regulations are generally intended to protect aquifers by regulating land use activities within designated aquifer protection areas.

The 2011 CTDEEP GIS database, City of Stamford Aquifer Protection Area Mapping, and available aquifer maps were consulted to identify the location and quality of groundwater resources along the study area. The research determined that a portion of the study area located along High Ridge Road and generally north of the Merritt Parkway, is within the Wire Kiln Wellfield and associated Wire Kiln Wellfield Aquifer Protection Area. Additionally, there may be individual (private) water supply wells within the study area, which may be identified in future phases of the study if necessary.

Groundwater quality classifications identified within the study area and designated uses are presented in Table 2-17.

Table 2-17 CTDEEP Groundwater Quality Classifications in Study Area

Class	Designated Uses	Description
GAA, GAAs	Existing or potential public supply of water suitable for drinking without treatment; baseflow for hydraulically-connected surface waterbodies.	GAA – Groundwater used or which may be used for public supplies of water suitable for drinking without treatment; baseflow for hydraulically-connected surface waterbodies. GAAs – Groundwater that is tributary to a public supply reservoir.
GA	Existing private and potential public or private supplies of water suitable for drinking without treatment; base-flow for hydraulically connected surface water bodies.	Groundwater within an area of existing private water supply wells or an area with the potential to provide water to public or private water supply wells. DEEP presumes that ground water in such an area is, at a

Class	Designated Uses	Description
		minimum, suitable for drinking or other domestic uses without treatment.
GB	Industrial process water and cooling waters; base-flow for hydraulically connected surface water bodies; presumed not suitable for human consumption without treatment.	Groundwater within a historically highly urbanized area or an area of intense industrial activity and where public water supply service is available. Such groundwater may not be suitable for human consumption without treatment due to waste discharges, spills or leaks of chemicals or land use impacts.

Source: DEEP Groundwater Quality Standards (Effective April 12, 1996).

Groundwater within the majority of the study area is classified as Class GA; however, portions of the study area are classified as Class GAA/GAAs and a minor component located at the southern extent is Class GB. Class GAA/GAAs groundwater areas are located beneath High Ridge Road, within the watersheds of North Stamford Reservoir and Laurel Reservoir. Additionally, Long Ridge Road from an area north of Lakewood Drive to the northern extent of the study area is underlain by Class GAA/GAAs groundwater.

2.9.5 Air Quality

Background

The 1990 Clean Air Act Amendments (CAAA) and the Connecticut State Implementation Plan (SIP) require that proposed projects not cause any new violation of the NAAQS for pollutants of concern, or increase the frequency or severity of any existing violations, or delay attainment of any NAAQS. Existing air quality study data includes a microscale and mesoscale evaluation of mobile source pollutants. The mesoscale analysis assessed attainment vs. non-attainment status for the Greater Connecticut area. The microscale analysis evaluated attainment vs. non-attainment status for Fairfield County as well as local monitoring data for the six common air pollutants. The EPA and CTDEEP have established guidance for modeling and review for air quality analysis.

2.9.6 Pollutants of Concern and Attainment Status

Air pollution is of concern because of its demonstrated effects on human health, in particular, the respiratory effects of the pollutants and their potential toxic effects, as described below.

Carbon monoxide is a colorless and odorless gas that is a product of incomplete combustion. Carbon monoxide is absorbed by the lungs and reacts with hemoglobin to reduce the oxygen carrying capacity of the blood. At low concentrations, CO has been shown to aggravate the symptoms of cardiovascular disease. It can cause headaches and nausea and, at sustained high concentration levels, can lead more serious health risks.

Ground-level or "bad" ozone is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NOx and VOC's. Breathing ozone, a primary component of smog, can trigger a variety of health problems including chest pain, coughing, throat irritation, and congestion. Additionally, it can worsen bronchitis, emphysema, and asthma. Ground-level ozone has also been attributed to reduced lung function and inflammation of the linings of the lungs. Repeated exposure has also been linked with permanent scarring of lung tissue.

Particle pollution (also called particulate matter or PM) is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope. Particle pollution includes "inhalable coarse particles," with diameters larger than 2.5 micrometers and smaller than 10 micrometers and "fine particles," with diameters that are 2.5 micrometers and smaller. Some particles, known as primary particles are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks or fires. Others form in complicated reactions in the atmosphere of chemicals such as sulfur dioxides and nitrogen oxides that are emitted from power plants, industries and automobiles. These particles, known as secondary particles, make up most of the fine particle pollution in the country. Fine particles (PM2.5) are the major cause of reduced visibility (haze) in parts of the United States. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing, for example;
- Decreased lung function;
- Aggravated asthma;
- Development of chronic bronchitis;
- Irregular heartbeat;
- Nonfatal heart attacks; and
- Premature death in people with heart or lung disease.

People with heart or lung diseases, children and older adults are the most likely to be affected by particle pollution exposure. However, even a healthy individual may experience temporary symptoms from exposure to elevated levels of particle pollution. Environmental damage from particle pollution includes the ability for particles to be carried over long distances by wind. These wind carried particles then settle on ground or water resulting in the acidification of lakes and streams, changing of the nutrient balance in coastal waters and large river basins, depletion of the nutrients in soil, damaging sensitive forests and farm crops, and affecting the diversity found in ecosystems.

The sum of nitric oxide (NO) and NO2 is commonly called nitrogen oxides or NOx. Other oxides of nitrogen including nitrous acid and nitric acid are part of the nitrogen oxide family. While EPA's National Ambient Air Quality Standard (NAAQS) covers this entire family, NO2 is the component of greatest interest and the indicator for the larger group of nitrogen oxides. Current scientific evidence links short-term NO2 exposures, ranging from 30 minutes to 24 hours, with adverse respiratory effects including airway inflammation in healthy people and increased respiratory symptoms in people with asthma.

Also, studies show a connection between breathing elevated short-term NO2 concentrations, and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma.

NO2 concentrations in vehicles and near roadways are appreciably higher than those measured at monitors in the current network. In fact, in-vehicle concentrations can be 2-3 times higher than measured at nearby area-wide monitors. Near-roadway (within about 50 meters) concentrations of NO2 have been measured to be approximately 30 to 100% higher than concentrations away from roadways. NOx react with ammonia, moisture, and other compounds to form small particles. These small particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis, and can aggravate existing heart disease, leading to increased hospital admissions and premature death.

EPA's National Ambient Air Quality Standard for SO2 is designed to protect against exposure to the entire group of sulfur oxides (SOx). SO2 is the component of greatest concern and is used as the indicator for the larger group of gaseous sulfur oxides (SOx). Other gaseous sulfur oxides (e.g. SO3) are found in the atmosphere at concentrations much lower than SO2. Emissions that lead to high concentrations of SO2 generally also lead to the formation of other SOx. Control measures that reduce SO2 can generally be expected to reduce people's exposures to all gaseous SOx. This may have the important co-benefit of reducing the formation of fine sulfate particles, which pose significant public health threats. Current scientific evidence links short-term exposures to SO2, ranging from 5 minutes to 24 hours, with an array of adverse respiratory affects including bronchoconstriction and increased asthma symptoms. These effects are particularly important for asthmatics at elevated ventilation rates (e.g., while exercising or playing). Additional health effects of SO2 are similar to those discussed for NOx as both pollutants are involved in similar chemical processes/ reactions.

2.9.7 Air Quality Standards

The EPA has established the National Ambient Air Quality Standards (NAAQS) to protect the public health. The NAAQS for the six common air pollutants is presented in Table 2-18 *National Ambient Air Quality Standards*. The predominant source of air pollution anticipated from typical project developments is emissions from Project related motor vehicle traffic. Concentrations can be calculated using the traffic study and compared to the NAAQS using the background levels provided in the microscale analysis.

Table 2-18 National Ambient Air Quality Standards

	Primary Standards		Secondary Standards	
Pollutant	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	35 ppm	1-hour[1]	None	None
	9 ppm	8-hour[1]	Same as Primary	Same as Primary
Ozone	0.075 ppm	8-hour	Same as Primary	Same as Primary
Nitrogen Dioxide	100 ppb	1-hour	None	None
	53 ppb	Annual	Same as Primary	Same as Primary
Sulfur Dioxide	75 ppb	1-hour	0.5 ppm	3-hour[1]
Particulate Matter				
$PM_{2.5}$	15 mg/m^3	Annual	Same as Primary	Same as Primary
	35 mg/m^3	24-hour	Same as Primary	Same as Primary
PM_{10}	150 mg/m^3	24-hour[2]	Same as Primary	Same as Primary

1 Not to be exceeded more than once per year.
2 Not to be exceeded more than once per year on average over 3 years
ppm parts per million
ppb parts per billion
mg/m^3 micrograms per cubic meter

2.9.8 Mesoscale Analysis of Existing Conditions

The 1990 Clean Air Act Amendments (CAAA) divided states into attainment and non-attainment areas with classifications based upon the severity of the air quality problem. Development of air quality standards and enforcement of the CAAA is done by the EPA. Attainment and non-attainment status was further divided into six common air quality pollutants. These six pollutants include carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, and particulate matter (two classifications of particulate matter exist, less than 10 microns and less than 2.5 microns). The state of Connecticut has not been divided into multiple areas as seen in some other states (Connecticut zone called 'Greater Connecticut'). Connecticut has been determined to be a non-attainment area, statewide, for ozone. The Greater Connecticut 8-hour ozone non-attainment area has been classified as "Moderate" by the EPA.

2.9.9 Microscale Analysis of Existing Conditions

The purpose of this section is to present the air quality microscale analysis conducted to evaluate the existing conditions of the County of Fairfield. The Greater Connecticut area classifications have further been broken down by county. Stamford, CT is located within Fairfield County. Similar to statewide classifications of attainment vs. non-attainment, each county has been given an attainment status for each of the six major air pollutants. The microscale analysis evaluates the status of these six air pollutants at the scale of Fairfield County. Fairfield County has been determined to be a non-attainment area for particulate matter with a diameter less than 2.5 microns. This classification was determined in 1997 and confirmed again in 2006. 8-hour ozone has also been classified as a non-attainment area for Fairfield County. The Fairfield County 8-hour ozone non-attainment area has been classified as “Moderate” by the EPA.

A second microscale analysis was conducted utilizing the EPA’s New England Regional Laboratory (Office of Environmental Measurement and Evaluation) database. The EPA has established numerous monitoring stations across New England for the purpose of examining air quality parameters. The nearest monitoring station to the Project is the Sherwood Island State Park located in Westport Connecticut. Similar to state-wide and county wide analyses, each monitoring station records data on the six major air pollutants discussed previously. The most recent published data from the EPA at this location is from 2010. Table 2-19 *Microscale Analysis Results* presents the microscale analysis results for the six common air pollutants from the Sherwood Island State Park monitoring station.

Table 2-19 Microscale Analysis Results
From Sherwood Island State Park
Monitoring Station in Westport, CT

Pollutant	Primary Standard Results Level	Primary Standard Results Averaging Time
Carbon Monoxide	1.63 ppm*	1-hour[1]
	1.1 ppm*	8-hour[1]
Ozone	.087 ppm*	8-hour
Nitrogen Dioxide	56 ppb*	1-hour
	10.13 ppb	Annual
Sulfur Dioxide	14.7 ppb	1-hour
Particulate Matter		
$PM_{2.5}$	8.58 mg/m^3	Annual
	45.2 mg/m^3*	24-hour
PM_{10}	42 mg/m^3*	24-hour[2]

1 Not to be exceeded more than once per year.
2 Not to be exceeded more than once per year on average over 3 years
* Highest Recorded Value during Averaging Time, otherwise arithmetic mean of data was used
ppm parts per million
ppb parts per billion
mg/m^3 micrograms per cubic meter

2.9.10 Rare Species Habitat

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). Established in 1983, the NDDB contains data from biological inventories conducted over the past 100 years. The NDDB currently contains information on the status of nearly 2,000 species of plants and animals, including invertebrates and 45 natural community types. It also lists unique and significant natural communities.

A review of the CTDEEP Natural Diversity Data Base (NDDB) was conducted for potential threatened or endangered species or designated critical habitats within the study area. The most recent (updated December 2011) digitally available NDDB map depicts NDDB areas of concern south of the Merritt Parkway and east of High Ridge Road, and west of Long Ridge Road and Gray Birch Road in the vicinity of Erskine Pond. In addition, a NDDB area of concern exists less than 0.5 miles downstream of the study area north of the Merritt Parkway in proximity to the East Branch of the Mianus River. The location of these NDDB areas of concern will necessitate submittal of a NDDB Review Request Form and supporting materials to the CTDEEP Bureau of Natural Resources.

A review of the most recently updated list (July 31, 2008) of Federally-listed Endangered and Threatened species in Connecticut indicates that there are no known occurrences of Federally-listed species in Stamford.

2.9.11 Section 4 (f) and 6 (f) Lands

This section provides an overview of Section 4(f) and Section 6(f) resources located within 500 feet of the Long Ridge/High Ridge Corridor Study. These resources are important to consider when planning transportation improvements, as they are protected by federal legislation.

Section 4(f) Properties

Section 4(f) of the Department of Transportation Act of 1966 (49 USC 303) applies to federally funded transportation projects that impact or require use of significant publicly owned parks, recreation areas, wildlife or waterfowl refuges, and historic and archaeological sites listed on or eligible for listing on the National Register of Historic Places (23 CFR 771.135). The act requires that special efforts be made to protect such lands during the course of project development. Prior to the FHWA approving the use of a Section 4(f) property for a transportation project, it must be demonstrated that there are no feasible or prudent alternatives avoiding such use. Additionally, it must be demonstrated that all possible planning has occurred to minimize harm to these important public resources.

When the significance of a property is unknown, such as when the importance of a park for recreation is unknown, or when project impacts to the property are not yet certain, the property is called a “potential” Section 4(f) property. Hence, at this early planning stage in the corridors study, all of the properties identified as Section 4(f) property types are considered potential Section 4(f) resources. In the case of historic resources that are part of an eligible historic district, such resources must be “contributing” features to the district in order to qualify as potential Section 4(f) resources. In some cases, Section 4(f) may not apply while Section 106 does apply, depending on the results of coordination among the State Historic Preservation Office (SHPO), CTDOT and the lead federal agency.

Mapping of 101 potential Section 4(f) resources in the study area is provided in Figures 2-10S and 2-10N. Historic Section 4(f) properties are identified in Table 2-20. Public parks, recreation areas, and wildlife or waterfowl refuges within the study area are listed in Table 2-21.

Table 2-20 Known Historic Resources within the Long Ridge/High Ridge Study Area

Address	Type
9 Cold Spring Rd	HRI
776 Den Road	HRI
1 Erskine Rd	HRI
55 Erskine Rd	HRI
70 Erskine Rd	HRI
5 Hickory Rd	HRI
107 Hickory Rd	HRI
230 High Ridge Rd	HRI
250 High Ridge Rd	HRI
433 High Ridge Rd	HRI
444 High Ridge Rd	HRI
456 High Ridge Rd	HRI
534 High Ridge Rd	HRI
572 High Ridge Rd	HRI
788 High Ridge Rd	HRI
808 High Ridge Rd	HRI
1239 High Ridge Rd	HRI
1296 High Ridge Rd	HRI
1303 High Ridge Rd	HRI
1380 High Ridge Rd	HRI
1392 High Ridge Rd	HRI
1415 High Ridge Rd	HRI
1508 High Ridge Rd	HRI
1758 High Ridge Rd	HRI
2130 High Ridge Rd	HRI
2530 High Ridge Rd	HRI
2588 High Ridge Rd	HRI
2810 High Ridge Rd	HRI
2811 High Ridge Rd	HRI
2829 High Ridge Rd	HRI
2844 High Ridge Rd	HRI
2901 High Ridge Rd	HRI
2921 High Ridge Rd	HRI
3013 High Ridge Rd	HRI
3043 High Ridge Rd	HRI
3047 High Ridge Rd	HRI
3052 High Ridge Rd	HRI
3061 High Ridge Rd	HRI
3064 High Ridge Rd	HRI
3070 High Ridge Rd	HRI
3081 High Ridge Rd	HRI
3099 High Ridge Rd	HRI
3116 High Ridge Rd	HRI
3143 High Ridge Rd	HRI
27 Hoyclo Rd	HRI
78 Hoyclo Rd	HRI

Address	Type
92 Hoyclo Rd – Hait Benjamin House	NR
24 Hunting Ridge Rd	HRI
17 Ingleside Dr	HRI
32 Interlake Rd	HRI
11 Laurel Rd	HRI
72 Little Hill Dr	HRI
313 Long Ridge Rd	HRI
367 Long Ridge Rd	HRI
679 Long Ridge Rd	HRI
710 Long Ridge Rd	HRI
945 Long Ridge Rd	HRI
1489 Long Ridge Rd	HRI
1566 Long Ridge Rd	HRI
1924 Long Ridge Rd	HRI
2635 Long Ridge Rd	HRI
2748 Long Ridge Rd	HRI
2874 Long Ridge Rd	HRI
2884 Long Ridge Rd	HRI
2891 Long Ridge Rd	HRI
2905 Long Ridge Rd	HRI
2916 Long Ridge Rd	HRI
12 North Stamford Rd	HRI
128 North Stamford Rd	HRI
172 North Stamford Rd	HRI
47 Old Long Ridge Rd	HRI
65 Old Long Ridge Rd	HRI
74 Old Long Ridge Rd	HRI
242 Old Long Ridge Rd	HRI
333 Old Long Ridge Rd	HRI
380 Old Long Ridge Rd	HRI
392 Old Long Ridge Rd	HRI
421 Old Long Ridge Rd	HRI
424 Old Long Ridge Rd	HRI
448 Old Long Ridge Rd	HRI
455 Old Long Ridge Rd	HRI
462 Old Long Ridge Rd	HRI
484 Old Long Ridge Rd	HRI
503 Old Long Ridge Rd	HRI
509 Old Long Ridge Rd	HRI
528 Old Long Ridge Rd	HRI
535 Old Long Ridge Rd	HRI
555 Old Long Ridge Rd	HRI
1374 Rockrimmon Rd	HRI
1377 Rockrimmon Rd	HRI
3 Roxbury Rd	HRI
19 Skymeadow Dr	HRI
28 Skymeadow Dr	HRI
190 Turn of River Rd	HRI

Address	Type
9 Webbs Hill Rd	HRI
78 Webbs Hill Rd	HRI
393 Webbs Hill Rd	HRI
464 Webbs Hill Rd	HRI
547 ebbs Hill Rd	HRI
29 West Trail	HRI
Turn of River Bridge	NR

HRI - Historic Resource Inventory
NR- National Register Listed Historic Property

Table 2-21 Public Parks, Recreation Areas and Wildlife and Waterfowl Refuge Areas within the Long Ridge/High Ridge Study Area

PARKS	
Address	**Common Name**
Riding Stable Trail	Dorothy Heroy Park
Chestnut Hill Road	Chestnut Hill Park Outbuilding
Meadowpark Avenue West	
Long Ridge Road	Vacant
Meadowpark Avenue South	
Long Ridge Road	Vacant Lot
RECREATION AREAS	
Address	**Common Name**
Long Ridge Road	Long Ridge Club
Brookdale Road	Bartlett Arboretum
Scofieldtown Road	Museum & Nature Center/Country
High Ridge Road	Hoyt School (Stamford Historic)
Chestnut Hill Road	Chestnut Hill Park Outbuilding
Long Ridge Road	Rockrimmon Country Club

Section 6(f) Properties

The Land and Water Conservation Fund Act of 1965 (LWCF) was enacted to help preserve, develop, and assure access to outdoor recreation facilities. Its objective was to facilitate participation in recreational activities and strengthen the overall health of United States citizens. The act sought to accomplish this objective by providing funds for federal acquisition and development of lands and other areas and by “providing funds for and authorizing” federal assistance to states in recreation planning, acquiring lands and waters, and development of recreation facilities.

Section 6(f) of the LWCA prohibits the conversion of a property acquired or developed with land and water conservation funds to a non-recreational purpose without the approval of the Department of Interior’s National Park Service (NPS). Properties that were either acquired or developed with these funds are referred to as Section 6(f) properties. Based on the National Park Service’s 2008 list of LWCF properties, there are **no** Section 6(f) properties within the study area.

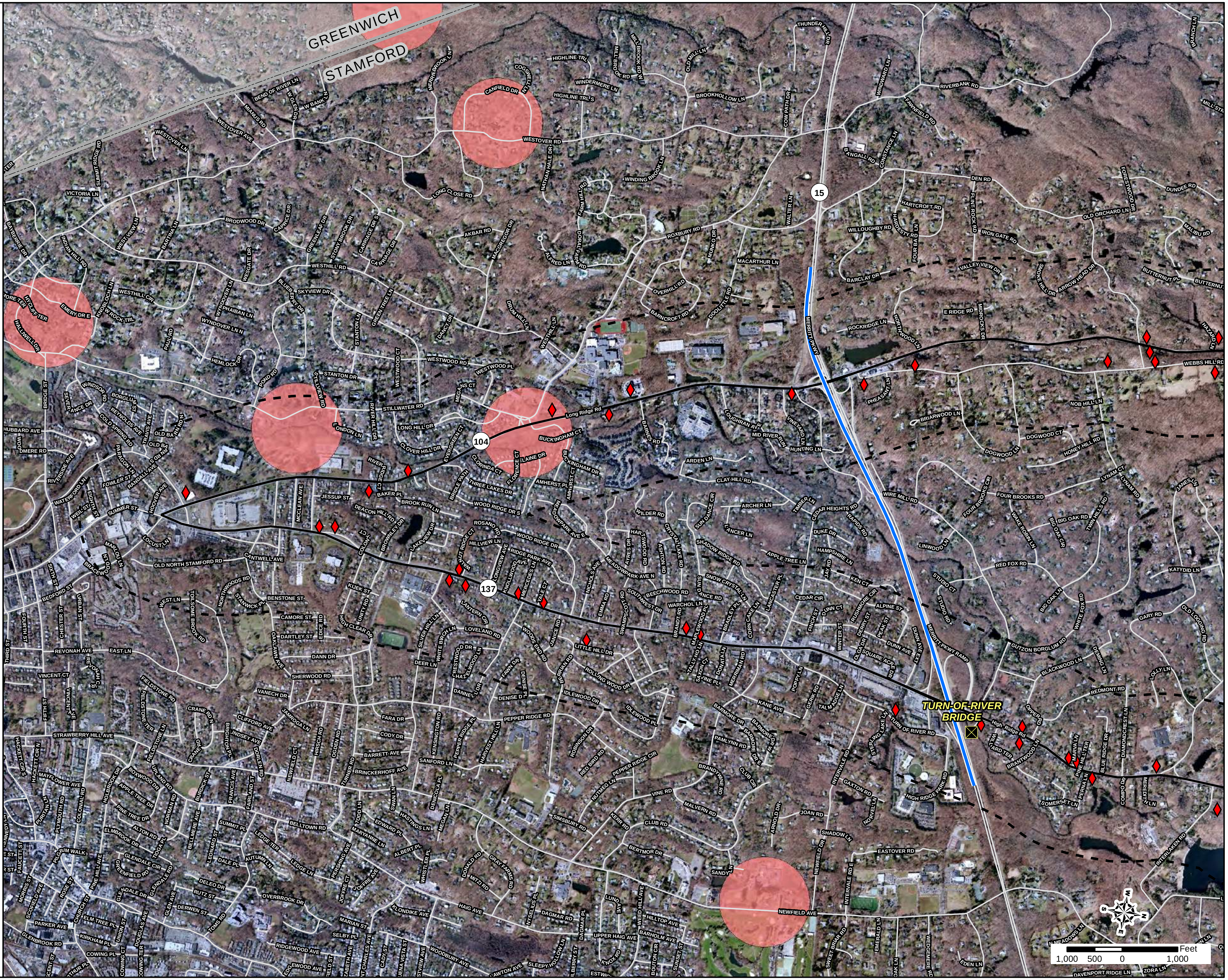
Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-10 (S)

Historic Area Map

Legend

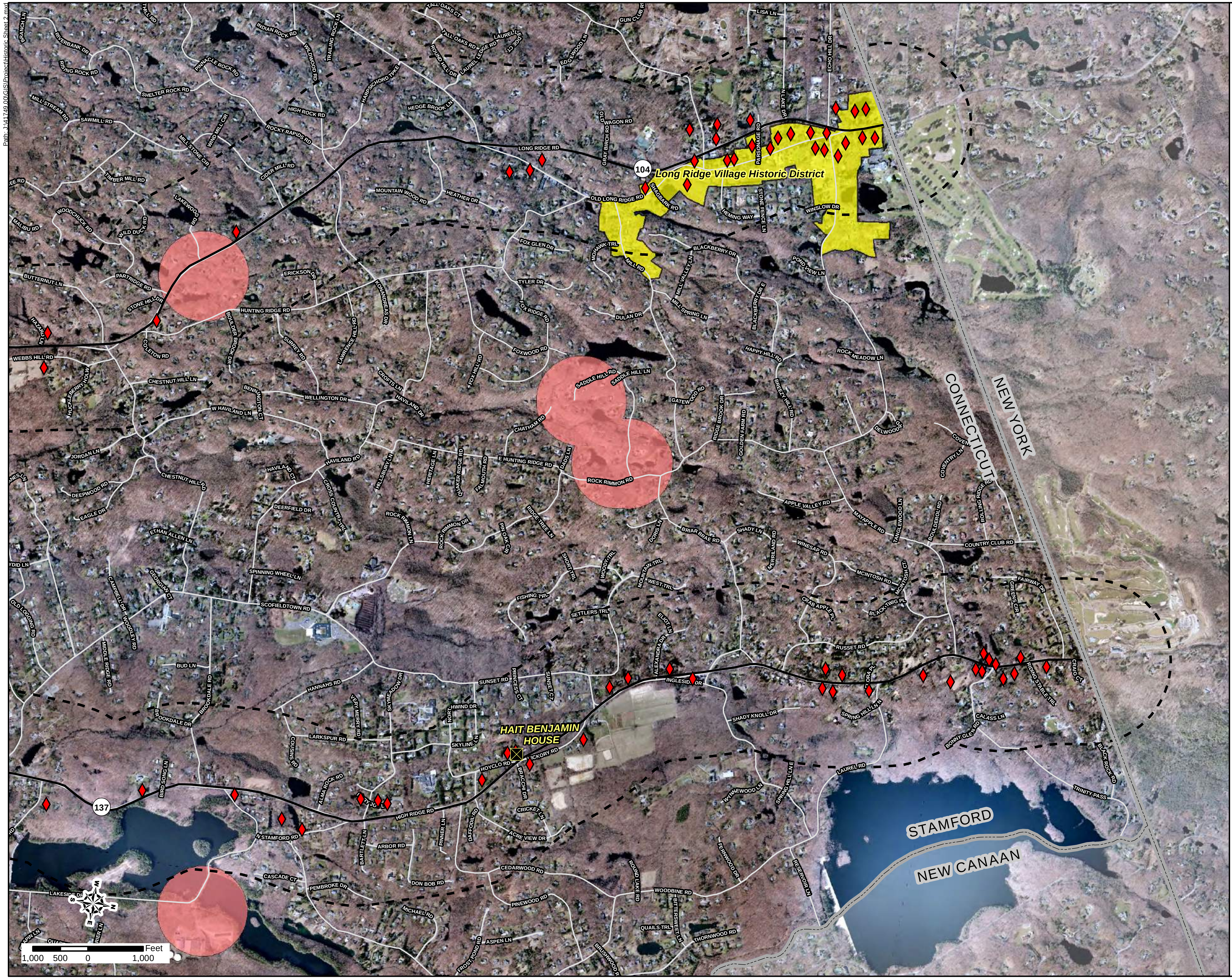
- Historic Resource Inventory for Buildings Conducted in 1978
- National Register Sites
- Scenic Highways
- Project Corridor
- Study Area Boundary (1,500-foot Radius)
- Archeology Areas
- National Register Areas



City of Stamford, Connecticut

Vanasse Hangen Brustlin, Inc.
Transportation | Land Development | Environmental Services

Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)



Long Ridge | High Ridge
CORRIDORS STUDY

Figure 2-10 (N)

Historic Area Map

Legend

- Historic Resource Inventory for Buildings Conducted in 1978
- National Register Sites
- Scenic Highways
- Project Corridor
- Study Area Boundary (1,500-foot Radius)
- Archeology Areas
- National Register Areas

City of Stamford, Connecticut

Vanasse Hangen Brustlin, Inc.
Transportation | Land Development | Environmental Services

Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

2.10 Other Environmental Factors

This section summarizes other environmental factors that could potentially affect alternatives development. Topics covered include hazardous materials and environmental justice populations.

2.10.1 Hazardous Materials

Data sources that were reviewed to identify potential hazardous materials and environmental risk sites within the study area include the Environmental Protection Agency's (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) GIS database (2011) and Resource Conservation and Recovery Act (RCRA) Treatment Storage and Disposal (TSD) and Generators (GEN) GIS databases (2011), the CTDEEP 2011 GIS databases including State Spills 90, State/Tribal LUST, UST/AST, and Brownfields, and the EPA's Federal Brownfield database. All of these databases were queried and compiled by FirstSearch Technology Corporation.

Study area communities in the City of Stamford have a long history of industrial and manufacturing-based economies. Early products manufactured in the city included dyes, licorice, stoves, shoes, and carriages. In 1868, The Yale Lock Company opened in Stamford, giving the city the nickname of The Lock City. Other industries flourished in the later years of the 19th and well into the 20th century including products ranging from wallpaper and chocolates to postage meters, typewriters, and electric razors.

By the 1950s and 60s, Stamford began to experience a decline in industry as the dominant force in its economy. Many manufacturers ceased operations or relocated from the Stamford. Stamford lost much of its economic base with the gradual retreat of the Yale & Towne Manufacturing Company which began in 1948. However, unlike many cities of similar size and type which were unable to bounce back from the devastating industrial decline, Stamford shifted gears and began to develop a new, broader-based economy. Therefore, it is not surprising that there are numerous sites with potential for environmental concerns located along the Long Ridge/High Ridge Corridor. Table 2-22 lists known oil/hazardous materials sites within the study area by address and type based on the source data that was reviewed.

Table 2-22 Properties with a Risk of Oil/Hazardous Contamination within the Long Ridge/High Ridge Study Area

Address	Owner	Type
1484 HIGH RIDGE RD	TANKNOLOGY	LUST
2790 HIGH RIDGE RD	MARIO TURIOGAGO	LUST
2619 HIGH RIDGE RD	CITY OF STAMFORD-LONG RIDGE FD	LUST
2588 HIGH RIDGE RD	MR. GEROGE HANNA	LUST
2256 HIGH RIDGE RD	UNKNOWN	LUST
2226 HIGH RIDGE RD	MARK SANTORO	LUST
821 LONG RIDGE RD	JOHN KANTZAS	LUST
1630 LONG RIDGE RD	KIMBERLY ROGERS	LUST
2132 LONG RIDGE RD	GEORGE PATERARIS	LUST
3151 HIGHRIDGE RED.	MASTLANARDI	LUST
3040 HIGH RIDGE RD	TAUBER	LUST
2975 HIGH RIDGE RD	UNITED METHODIST CHURCH VIRGINIA LA	LUST
2753 HIGH RIDGE RD	MITCH MCKIERNEY	LUST
12 RUSSET RD	MR. LOPEZ	LUST
2596 HIGH RIDGE RD	MARSHALL RAIDBARD	LUST
2 HOYCLO RD	JOHN LASKO	LUST
2216 HIGH RIDGE RD	TOM MC MAHON	LUST
2117 HIGH RIDGE RD	ALFRED REDMOND	LUST
1951 HIGH RIDGE RD	FORMER HIGH RIDGE MOBIL	LUST
1492 HIGH RIDGE RD	CUMBERLAND FARMS, ENV. DEPT	LUST
1431 HIGH RIDGE RD	ALDO LAEHMAN	LUST
1249 HIGHRIDGE RD	A J MARTINICH	LUST
1253 HIGH RIDGE RD	BERNICE MOON	LUST
899 HIGH RIDGE RD		LUST
674 HIGH RIDGE RD	PEGGY PORTER	LUST
631 HIGH RIDGE RD	EMILE HAUSCHILD	LUST
484 HIGH RIDGE RD	DOCTOR MARTIN WALKER	LUST
695 LONG RIDGE RD	PEMIMAR LLC	LUST
1018 LONG RIDGE RD	ANGELO ALTOMARI	LUST
1095 LONG RIDGE RD	CUMBERLAND FARMS	LUST
1807 LONG RIDGE RD	GABRIEL CARLIN	LUST
1566 LONG RIDGE RD	RAINEY RESIDENCE	LUST
2175 LONG RIDGE RD	SAPISH REDDY	LUST
2428 LONG RIDGE RD	JEFF MCTIKE	LUST
2471 LONG RIDGE RD	HERMAN	LUST
2469 LONG RIDGE RD	POMPA	LUST
85 PARSONAGE RD	ESTATE OF FJ BOARD	LUST
2661 LONG RIDGE RD	LONGO SUNOCO	LUST
301 LONG RIDGE RD	ROCKRIMMON COUNTRY CLUB	LUST
1070 HIGH RIDGE RD	CITGO STATION	LUST
316 LONG RIDGE RD	D AGOSTINO S TEXACO	LUST
311 LONG RIDGE RD	D AGOSTINO S SERVICE	LUST
1068 LONG RIDGE RD	GETTY PETROLEUM	LUST
1199 HIGH RIDGE RD	EXXON STATION 3-6158	LUST
HIGH RIDGE RD	HIGH RIDGE MOBIL	LUST
5 HICKORY RD	JACAKLYN DAY	LUST

Address	Owner	Type
8 SKYMEADOW DR	OLSON	LUST
1954 HIGH RIDGE RD	MOTTIER RESIDENCE	LUST
17 TURN OF RIVER RD	GUEST RES.	LUST
13 WIRE MILL RD	HERB NAIBERG	LUST
18 BRIAR BRAE RD	EDWARD BRILL	LUST
29 ALEXANDRA DR	ZORN RESIDENCE	LUST
14 BARLET LN	LOUIS LEVETOWN	LUST
1287 HIGH RIDGE RD	JOHN MORGENA	LUST
30 COLONY CT		LUST
15 EVERGREEN CT	DENNIS ESPOSITO	LUST
776 DEN RD	NOMMACK RESIDENCE	LUST
17 GRAY BIRCH RD	DAILEY	LUST
2687 HIGH RIDGE RD	JOHN MORGENA	LUST
21 BROWNLEY DR		LUST
15 MAYAPPLE RD	WILLIAM COCHRAN	LUST
32 INTERLAKEN RD	CHARLES PRICE	LUST
75 CLOVER HILL RD	LEONARD WILES	LUST
21 TERRACE AVE	RICH SAYERS	LUST
54 MCCLEAN AVE	MRS. CERETTA	LUST
16 EVERGREEN CT	HEALY	LUST
32 MAYAPPLE RD	JOSEPH CIPOLLA	LUST
23 BRANDT RD	MISS TAUSEND	LUST
26 MERRIMAN RD		LUST
63 CLOVER HILL DR	LITTLE	LUST
150 LONG HILL DR	BITETTO	LUST
83 WEBBS HILL RD	DOWNS	LUST
98 NORTHWOOD LN	MUKHERJEE	LUST
150 DON BOB RD	VELAZQUEZ	LUST
39 SCOFIELDTOWN RD	CITY OF STAMFORD, ROBERT MCGRATH	LUST
64 WILLARD TER	MARK DUNCAN	LUST
26 WILLARD TER	STEVE BOCHETTA	LUST
25 CEDAR HEIGHTS RD	BESON, AL	LUST
36 MERRIMAN RD	RUDY LEE	LUST
19 DUBOIS ST	SALZETTI RESIDENCE	LUST
89 LONG HILL RD	JACKIE PERROTTA	LUST
37 CRAIG CT	GAIL BUDIN	LUST
10 N WIND DR	M CARLUCI	LUST
96 SKY MEADOW DR	IRVING SUSSMAN	LUST
45 MERRIAN RD	MRS.ANN MALLEY	LUST
57 CLOVER HILL DR	JEAN BENDICK	LUST
14 AVE	SICILANO	LUST
12 MCCLEAN AVE	OMAR CARDONA	LUST
16 LONG RIDGE RD	GETTY OIL	LUST
310 WEBBS HILL RD	BARBARA FARREL	LUST
340 WEBBS HILL RD	PIADAULLO	LUST
49 ALEXANDRA DR	SCAFFIDI	LUST
49 ALEXANDRA DR	SCAFFIDI	LUST
4 WEST RD	KATZ RES	LUST
48 ARBOR RD	RICHARD COFFEY	LUST
50 MEREDITH LN	JOHNSON	LUST

Address	Owner	Type
35 CEDAR HEIGHTS RD	DAVID GURNEY	LUST
DAVID GURNEY, 35 CEDAR HEIGHTS	DAVID GURNEY	LUST
51 MERRIMAN RD	PRELLI	LUST
38 LITTLE HILL DR	CORP. FOR INDEPENDENT LIVING	LUST
38 LITTLEHILL DR	JOHN DODGE MGR	LUST
128 LONG HILL RD	MARY ANN TEDESCO	LUST
23 PHEASANT LN	ROBERT MARTINO	LUST
23 PHEASANT LN	ROBERT MARTINO	LUST
51 MOUNTAIN WOOD RD	HOWARD BURN	LUST
424 OLD LONG RIDGE RD	CHOLMAR	LUST
438 OLD RIDGE RD	GEORGE BARTHOLOMEAU	LUST
1374 ROCK RIMMON RD	CYNTHIA RUSSELL	LUST
118 LONG HILL DR	MIKE MATTIELLO	LUST
36 PHEASANT LN	GREGORY INKHANITSKY	LUST
30 PHEASANT LN	PINGOL	LUST
275 DOGWOOD LN	ERIC MACONANAUGHY	LUST
12 LINAM RD	JOHN BENISON	LUST
105 OLD LONG RIDGE RD	GIOVANNI S SUPERMARKET	LUST
3 HAPTON LN	SUE JEFFRIES	LUST
27 GERAIK RD	TERESSA MCKENNA	LUST
39 CLOVER HILL DR	WILLIS	LUST
75 LONG HILL DR	ELIZEBETH LONG WHEELER	LUST
123 LONG HILL DR	GREG DONOFRIO	LUST
6 DOGWOOD LN	LILLIAN LOTSTEIN	LUST
14 HEDGE BROOK RD	MR. CLEVELAND	LUST
481 OLD LONG RIDGE RD	ROFFMORE RESIDENCE	LUST
55 MAYAPPLE RD	MANNOS VOURKOUTIOTIS	LUST
105 ALEXANDRA DR	FRAN DEMYAN	LUST
15 SOUTHWEST DR	IRIS AMORGA	LUST
55 NICHOLS AVE	WANDA CHESKA	LUST
48 KNOLLWOOD AVE	ELIZABETH SHAPIRO	LUST
42 DEACON HILL RD	PETER GAYOWSKI	LUST
19 REED PL	WRIGHT	LUST
80 LONG HILL DR	DENTE	LUST
114 LONG HILL RD		LUST
45 BARNES RD	PEMIMAR	LUST
38 HEDGEBROOK LN	DAVID WENTE	LUST
8 HEDGE BROOK RD	DOUG SMOOT	LUST
12 HEDGEBROOK LN	DRU NARWANI	LUST
1516 RIVERBANK RD	ROGER PRICE	LUST
1065 HIGH RIDGE RD	JASMINE S SEA BREEZE CLEANERS, INC.	PTP
873 HIGH RIDGE RD	WILLARD CLEANERS	PTP
225 HIGH RIDGE RD	CBS TECHNOLOGY CENTER	PTP
225 HIGH RIDGE RD	WALDEN BOOK CO.	PTP
47 HIGH RIDGE RD	BECKLEY CLEANERS	PTP

Address	Owner	Type
227 HIGH RIDGE RD	CBS, INC.	PTP
60 LONG RIDGE RD	MINUTE MEN CLEANERS	PTP
878 HIGH RIDGE RD	SNET	PTP
21 A HIGH RIDGE RD	EXECUTIVE CORPORATE CLEANERS	PTP
1484 HIGH RIDGE RD	CUMBERLAND FARMS INC 60980	RCRAGEN
910 HIGH RIDGE RD	HIGH RIDGE CONVENIENCE SERVICES LLC	RCRAGEN
1032 HIGH RIDGE RD	NEW DOLLAR CLEANERS	RCRAGEN
1065 HIGH RIDGE RD	SEA BREEZE CLEANERS	RCRAGEN
873 HIGH RIDGE RD	WILLARD CLEANERS and TAILORS	RCRAGEN
225 HIGH RIDGE RD	VISCOM INC	RCRAGEN
47 HIGH RIDGE RD	BULLS HEAD DRY CLEANERS	RCRAGEN
923 HIGH RIDGE RD	ONE STOP CLEANER	RCRAGEN
1199 HIGH RIDGE RD	ALLIANCE ENERGY	RCRAGEN
920 HIGH RIDGE RD	MOBIL OIL CORP SERV STA FF	RCRAGEN
910 HIGH RIDGE RD	HIGH RIDGE CONVENIENCE SERVICES LLC	UST
939 HIGH RIDGE RD	HIGH RIDGE CITGO	UST
939 HIGH RIDGE RD	HIGH RIDGE CITGO	UST
227 HIGH RIDGE RD	FORMER CBS TECHNOLOGY CENTER	UST
201 HIGH RIDGE RD	GENERAL ELECTRIC CAPITOL CORP.	UST
2949 LONG RIDGE RD	ROCKRIMMON COUNTRY CLUB	UST
1951 HIGH RIDGE RD	MOBIL GAS STATION	UST
1492 HIGH RIDGE RD	HIGH RIDGE GULF 060980	UST
1285 HIGH RIDGE RD	NICOS FOREIGN CAR REPAIR, INC	UST
899 HIGH RIDGE RD	SHELL SERVICE STATION	UST
777 LONG RIDGE RD	LONG RIDGE OFFICE PARK	UST
1095 LONG RIDGE RD	LONG RIDGE SERVICE	UST
2661 LONG RIDGE RD	ALBA MOTORS	UST
878 HIGH RIDGE RD	NORTH CENTRAL STAMFORD C.O. (3511)	UST
1070 HIGH RIDGE RD	HIGH RIDGE CITCO	UST
1004 HIGH RIDGE RD	TWIN RIDGE EXXON 0439	UST
313 LONG RIDGE RD	CRYSTAL ROCK WATER COMPANY	UST
316 LONG RIDGE RD	D AGONISTO BROTHERS	UST
1068 LONG RIDGE RD	GETTY STATION 91072	UST
2856 LONG RIDGE RD	JOSEPH S. NEGYESI	UST
1999 HIGH RIDGE RD	HIGH RIDGE EXXON	UST
920 HIGH RIDGE RD	MOBIL 976	UST
800 LONG RIDGE RD	800 LONG RIDGE RD	UST
82 SCOFIELDTOWN RD	NORTHEAST SCHOOL	UST
684 LONG RIDGE RD	STAMFORD AMBULANCE CORPS	UST
3676 OLD LONG RIDGE RD	LONG RIDGE FIRE CO. INC.	UST
381 HIGH RIDGE RD	RIPPOWAM HIGH SCHOOL	UST
260 LONG RIDGE RD	GENERAL ELECTRIC CAPITAL CORP.	UST
21 HIGH RIDGE RD	RIDGEWAY LAUNDERAID INC.	UST
16 LONG RIDGE RD	GVO 6748	UST
131 BRIAR BRAE RD	MR. ALAN TISHMAN	UST
38 VINE RD	WILLARD SCHOOL	UST

Type Key:

UST	Registered Underground Storage Tank
LUST	Leaking Underground Storage Tank
RCRAGEN	Resource Conservation and Recovery Act Generators of Hazardous Waste
PTP	Enrolled in State's Property Transfer Program

In addition to these listings, numerous, documented spill incidents have occurred within the Long Ridge/High Ridge Study Area (not included in Table 2-22). These incidents are related to traffic accidents and the discharge of small quantities of gasoline and/or oil. In the majority of cases, the spills were immediately contained and cleaned and the incidents considered “closed” by CTDEEP.

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3

Future Conditions

This chapter describes the future 2016, 2026 and 2036 transportation conditions in the Corridor. The future conditions described in this chapter assume that the transportation improvements currently under construction or programmed have occurred. Programmed improvements include projects that are state-led efforts on the Transportation Improvement Program (TIP) or local efforts led by the City.

Sections of this chapter present the future scenarios, any planned infrastructure improvements, travel demand forecasts, and future traffic operations. Subsequent chapters present the range of alternatives considered, provide an evaluation of these alternatives, and packaged/phased recommendations to address the short, medium, and long-term transportation needs in the study area.

Key points from this chapter include:

- **Future baseline scenarios –** Three future scenarios were developed through close consultation with the TAG:
- **Scenario 1 - 2016 Short-term Condition** (including background growth associated with likely projects to the year 2016);
- **Scenario 2 - 2026 Mid-term Condition** (including background growth associated with likely projects to the year 2026); and
- **Scenario 3 - 2036 Long-term Condition** (including speculative projects with development potential to the year 2036).
- **Planned infrastructure upgrades –** The following infrastructure upgrades are planned along the corridors:
  - Reconfiguration of access to High Ridge Road in the vicinity of Olga Drive for access to the Trader Joes store;
  - Reconstruction of the intersection of Long Ridge Road with Stillwater Road/Buckingham Drive (being planned by others).

These efforts, excepting the Stillwater Road improvements, have been included in the 2016, 2026 and 2036 assessments of traffic operations.

- **Growth in traffic demands –** Growth in traffic demand along the corridor was forecast by the Connecticut Department of Transportation and included reoccupying of major existing but vacant buildings, most notable at 260 Long Ridge Road (225,000 sf of office space). The potential for the reoccupying of 292 Long Ridge Road (55,000 sf of office space), the potential for the development of an additional 160,000 sf of office space at 160 Long Ridge Road (under current FAR) and for the development of an additional 320,000 sf of office space at 900 Long Ridge Road (under current FAR) was also presented to CTDOT for consideration. The DOT projects that traffic volumes will grow by 5% between 2011 and 2016, by 11.3% between 2011 and 2026 and 16% between 2011 and 2036.
- **Vehicle-miles traveled (VMT) –** The annual VMT along the corridors is projected to grow from the 2011 value of 80 million miles to 84 million miles by 2016, 89 million miles by 2026 and 93 million miles by 2036.
- **Traffic Operations –** The annual number of hours spent by individuals traveling on the corridors by commuters is projected to increase at approximately twice the rate of the number of miles traveled (i.e., by 34% between 2011 and 2036), with the number of hours spent travelling along the corridors expected to grow from approximately 3.17 million hours per year in 2011 to 3.46 million hours in 2016, to 3.87 million hours in 2026, and 4.24 million hours in 2036.

Intersections along the corridors are projected to experience increases in delay. While some intersections that currently operate at acceptable levels of service will experience a minor increase in delay, intersections that currently operate poorly will experience significant delays with the increase in traffic volumes.

3.1 Defining Future Scenarios

An important component of this study involved forecasting travel demands and land use changes. Doing so ensures that alternatives studied and that the recommended transportation infrastructure investments anticipate future needs and provide long-term benefits for the City. City of Stamford Land Use Bureau staff were consulted to understand future development potential along the corridor. Discussions related to new development opportunities, targeted areas for revitalization, and targeted areas for business retention.

With regard to targeted areas for revitalization and business retention, the Land Use Bureau indicated that the City anticipates maintaining a vibrant commercial element along High Ridge Road between Bradley Place and the Merritt Parkway, as well as in the vicinity of Bulls Head. There are opportunities to possibly repurpose existing office space along the corridors, particularly on Long Ridge Road, although there were no actual applications at the time that the future conditions analysis was performed. In addition, the City indicated that there was the potential for additional development on some of the large corporate campuses on Long Ridge Road, particularly at the south end. Finally, it is anticipated that the office building at 260 Long Ridge Road would be reoccupied for office use. This information was passed along the Connecticut Department of Transportation Bureau of Policy and Planning's Office of Strategic Planning and Projects for consideration in determining future traffic volumes.

Three future year scenarios were developed: (1) 2016 Near Term; (2) 2026 Mid Term; and (3) 2036 Long Term. Existing 2011 traffic volumes were quantified and summarized in Chapter 2. Predicting changes in future travel demand over the long term is best accomplished through the use of a regional travel demand model. Travel demand models are calibrated using planned and speculative changes in land uses, demographics, and infrastructure.

Once the future scenarios have been defined from the land use perspective, the next step in the study process involved layering planned roadway enhancements into the three defined scenarios.

3.2 Planned Infrastructure Improvements

Section 3.1 defined the three future scenarios from a land use perspective. This section discusses the planned infrastructure enhancements from Connecticut's TIP and incorporates these plans into the appropriate future scenario. Doing so ensures that the study accounts for benefits from infrastructure investments that are already programmed and that future recommendations complement the programmed improvements to the extent possible.

Based on discussions with the City and State, it was noted that modifications are proposed to the intersection of High Ridge Road with Olga Drive to accommodate the opening of a Trader Joes store on the property across the street from Olga Drive. In addition, the City has a separate contract out for the improvement of the intersection of Long Ridge Road with Stillwater Road, Roxbury Road and Buckingham Drive, which is outside the scope of this study.

Funds are included on the STIP for various bus, and CT Transit projects in the City, while a previously contemplated project to construct a ramp from High Ridge Road southbound, providing turn lanes, widening the Merritt Parkway Bridge and signal revisions was not included on the TIP due to renewed emphasis by CTDOT to develop a fiscally constrained STIP.

Once the three future scenarios were fully defined in terms of land use changes and transportation infrastructure upgrades, the next step involved employing a travel demand model to quantify travel demands for these scenarios. This is an important step that will help assess recommendations in terms of improved mobility, safety, and efficiency.

3.3 Travel Demand Forecasts

Sections 3.1 and 3.2 defined the three future scenarios in terms of land use changes and transportation infrastructure upgrades. This section quantifies travel demands associated with the scenarios through the use of a regional travel demand model. The travel demand assessment is a critical step. The development of improvement alternatives hinges largely on travel demand benefits in terms of improved mobility, safety, and efficiency.

For this study, projected future traffic volumes in 2016, 2026 and 2036 were provided by the Connecticut Department of Transportation Bureau of Policy and Planning's Office of Strategic Planning and Projects. The Department's Trip and Traffic Analysis unit prepared the forecasts of travel demand for 2016, 2026 and 2036 based on the socioeconomic, demographic and transportation systems characteristics previously identified in this study as well as the contemplated development patterns and physical improvements identified above. Detailed summary figures (3-1 thru 3-18) are contained in the future condition appendix.

3.3.1 Resulting Forecasts

Based on the efforts of the CTDOT, it is projected that that traffic volumes will grow by 5% between 2011 and 2016, by 11.3% between 2011 and 2026 and 16% between 2011 and 2036. Growth at individual intersections will vary between 2.7% and 4.2% in the first five years, between 8.8% and 14.8% from 2011 and 2026, and between 13.7% and 18.3% from 2011 and 2036.

As a result, **t**he annual Vehicle Miles Traveled (VMT) along the corridors is projected to grow from the 2011 value of approximately 80 million miles to 84 million miles by 2016, 89 million miles by 2026 and 93 million miles by 2036.

When the data was entered into the Synchro™ model, it indicated that the resulting increases in Vehicle Hours Traveled would be approximately twice the forecast increase in traffic growth, indicating significantly worsening operating conditions along the corridor. The annual number of hours spent by individuals traveling on the corridors by commuters is projected to increase by approximately 33% between 2011 and 2036, with the number of hours spent travelling along the corridors expected to grow from approximately 3.17 million hours per year in 2011 to 3.46 million hours in 2016, to 3.87 million hours in 2026, and 4.24 million hours in 2036.

3.4 Future Traffic Operations

Traffic operations assessment for the three future scenarios is discussed in this section.

- Scenario 1 - 2016 Near-Term Condition – Figure 3-19N and 3-19S;
- Scenario 2 - 2026 Mid-Term Condition –Figure 3-20N and 3-20S; and
- Scenario 3 - 2036 Long-Term Condition –Figure 3-21N and 3-21S.

On these figures, the intersections labeled with two green semi-circles (one for the AM peak hour and a second for the PM peak hour) are considered to be under capacity (LOS A or B) in both the AM and PM peak hours. The intersections shown in yellow semi-circles are approaching the generally-accepted limits of tolerable peak-hour conditions (LOS C or D). Red semi-circled intersections are approaching or over capacity (LOS E or F).

3.4.1 Scenario 1 – 2016 Near-term Condition Capacity Analysis Results (Figure 3-19)

For the 2016 Near-term Condition traffic analysis, the projected traffic volumes for 2016 were entered into the Synchro™ model, as were all known roadway improvement projects, including infrastructure upgrades and signal equipment enhancements. Optimized signal timings at all study area intersections were also applied to accurately account for the regular "fine tuning" of traffic signals by the CTDOT.

The following is a summary of traffic operating conditions for 2016 and a comparison to existing conditions. The results of the study intersection capacity analyses under 2016 conditions are summarized on Figures 3-19S and 3-19N. These figures show the overall intersection LOS for signalized intersections and the LOS of the side street approaches for unsignalized intersections. The intersection capacity analyses indicate that suboptimal operating conditions are projected to be experienced at numerous intersections along the corridors.

The analyses results for the signalized and unsignalized study intersections are discussed in more detail in the following sections, and the Synchro™ output reports are included in the technical appendix.

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 3-19 (S)

Intersection Level of Service
2016 Baseline Conditions

Long Ridge Road

1 Long Ridge Road at High Ridge Road/Bedford St/Summer St.
2 Long Ridge Road (Route 104) at Cold Spring Road (Route 137)
3 Long Ridge Road (Route 104) at Drives to Olin Chemicals/ Lord & Taylors
4 Long Ridge Road (Route 104) at Terrace Avenue/South Drive to G.E. Credit Corp
5 Long Ridge Road (Route 104) at Woodridge Drive South
6 Long Ridge Road (Route 104) at Stillwater Road/Buckingham Drive
7 Long Ridge Road (Route 104) at Drive to Long Ridge Office Park
8 Long Ridge Road (Route 104) at Loughran Avenue/G.E. Energy Financial Services
9 Long Ridge Road (Route 104) at Nestle/Oracle Drives (formerly Hyperion)
10 Long Ridge Road (Route 104) at Route 15 NB Off Ramp/Wire Mill Road
11 Long Ridge Road (Route 104) at Route 15 SB Ramps/Webbs Hill Road
12 Long Ridge Road (Route 104) at Chestnut Hill Road/Butternut Lane
13 Long Ridge Road (Route 104) at Hunting Ridge Road S
14 Long Ridge Road (Route 104) at Wildwood Road
15 Long Ridge Road (Route 104) at River Bank Road
16 Long Ridge Road (Route 104) at Erskine Road
17 Long Ridge Road (Route 104) at Old Long Ridge Road (northern)

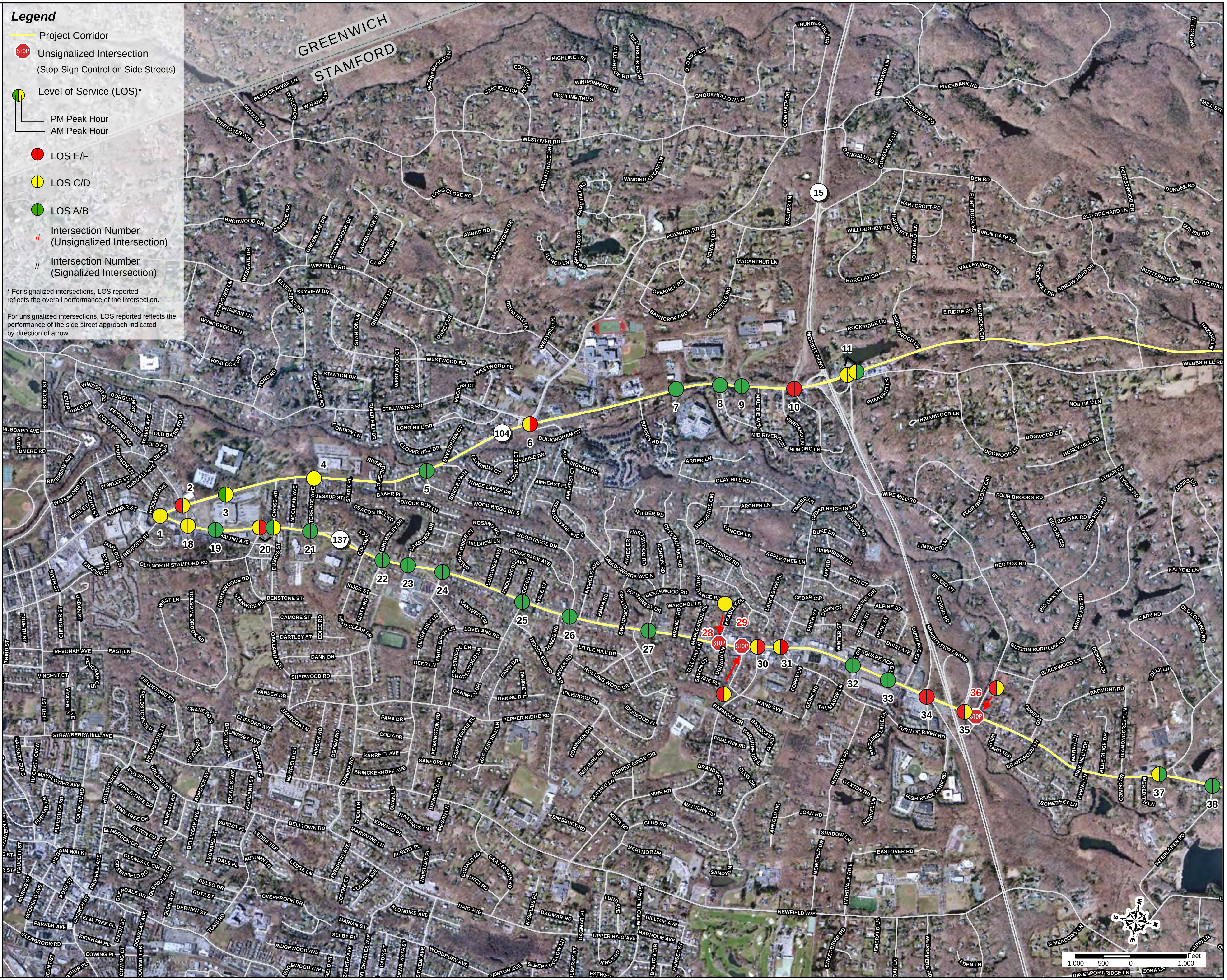
High Ridge Road

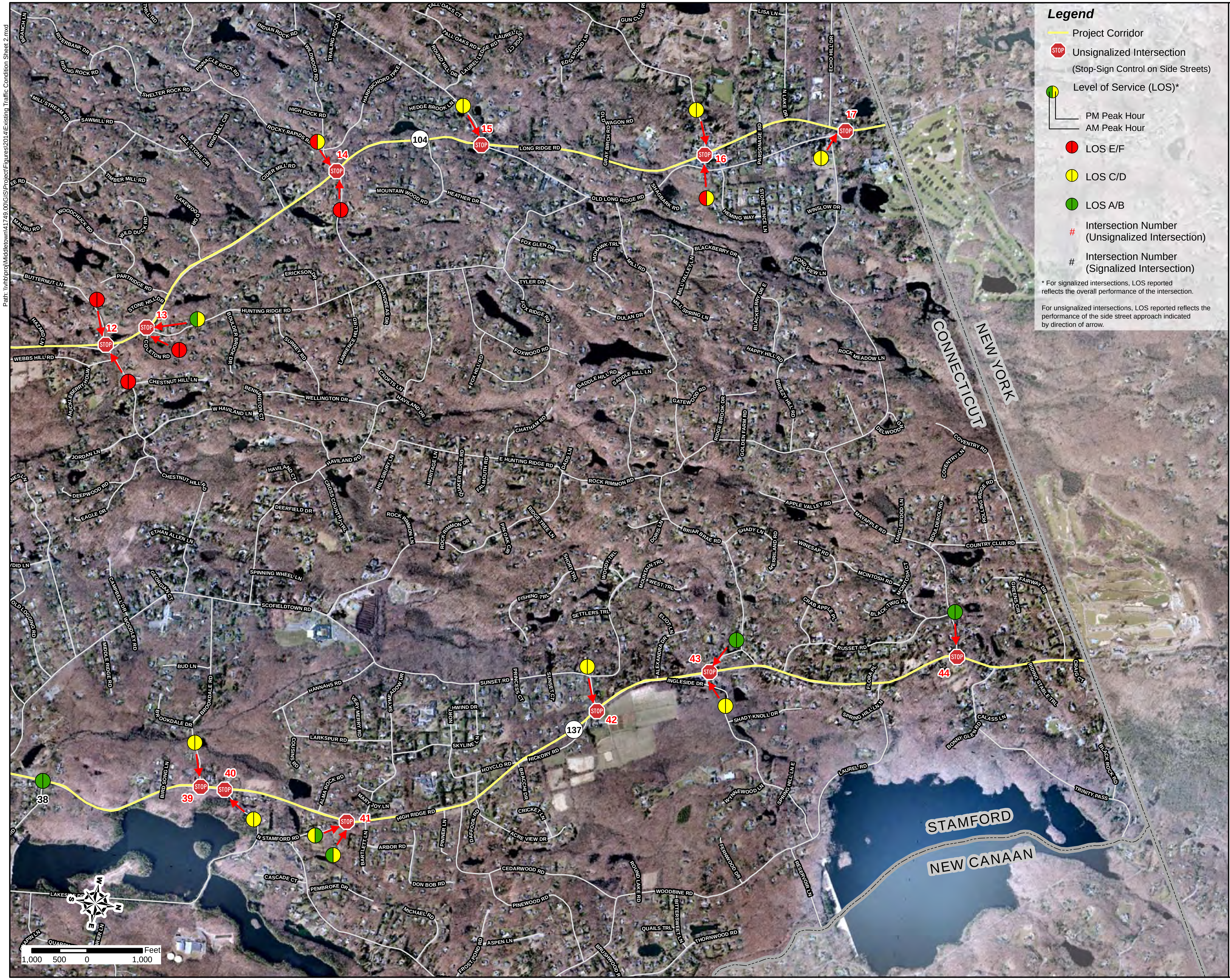
18 High Ridge Road (Route 137) at Cold Spring Road (Route 137)
19 High Ridge Road (Route 137) at Lord & Taylor Drive
20 High Ridge Road (Route 137) at Oaklawn Avenue/Cross Road
21 High Ridge Road (Route 137) at Terrace Avenue
22 High Ridge Road (Route 137) at Unity Road/Brownley Road
23 High Ridge Road (Route 137) at Lakeview Drive/Rippowam High School Drive
24 High Ridge Road (Route 137) at Loveland Road
25 High Ridge Road (Route 137) at Dannel Drive/Mercedes Lane
26 High Ridge Road (Route 137) at Ridge Park Road
27 High Ridge Road (Route 137) at Hartswood Road
28 High Ridge Road (Route 137) at Bradley Place
29 High Ridge Road (Route 137) at Merriman Road
30 High Ridge Road (Route 137) at Vine Road/Private Drive
31 High Ridge Road (Route 137) at Cedar Height Road/Turn of River Road
32 High Ridge Road (Route 137) at Olga Drive/Private Drive
33 High Ridge Road (Route 137) at Square Acres Drive/Shopping Plaza
34 High Ridge Road (Route 137) at Route 15 NB Ramps/Buxton Farms Road
35 High Ridge Road (Route 137) at Route 15 SB Ramps
36 High Ridge Road (Route 137) at Wire Mill Road
37 High Ridge Road (Route 137) at Scofieldtown Road
38 High Ridge Road (Route 137) at Interlaken Road
39 High Ridge Road (Route 137) at Brookdale Road
40 High Ridge Road (Route 137) at North Stamford Road (southern)
41 High Ridge Road (Route 137) at North Stamford Road (northern)
42 High Ridge Road (Route 137) at Sunset Road
43 High Ridge Road (Route 137) at Briar Brae Road
44 High Ridge Road (Route 137) at Mayapple Road

City of Stamford, Connecticut

Vanasse Hangen Brustlin, Inc.
Transportation | Land Development | Environmental Services

Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)





Long Ridge | High Ridge
CORRIDORS STUDY

Figure 3-19 (N)

Intersection Level of Service 2016 Baseline Conditions

Long Ridge Road

1	Long Ridge Road	at	High Ridge Road/Bedford St/Summer St.
2	Long Ridge Road (Route 104)	at	Cold Spring Road (Route 137)
3	Long Ridge Road (Route 104)	at	Drives to Olin Chemicals/ Lord & Taylors
4	Long Ridge Road (Route 104)	at	Terrace Avenue/South Drive to G.E. Credit Corp
5	Long Ridge Road (Route 104)	at	Woodridge Drive South
6	Long Ridge Road (Route 104)	at	Stillwater Road/Buckingham Drive
7	Long Ridge Road (Route 104)	at	Drive to Long Ridge Office Park
8	Long Ridge Road (Route 104)	at	Loughran Avenue/G.E. Energy Financial Services
9	Long Ridge Road (Route 104)	at	Nestle/Oracle Drives (formerly Hyperion)
10	Long Ridge Road (Route 104)	at	Route 15 NB Off Ramp/Wire Mill Road
11	Long Ridge Road (Route 104)	at	Route 15 SB Ramps/Webbs Hill Road
12	Long Ridge Road (Route 104)	at	Chestnut Hill Road/Butternut Lane
13	Long Ridge Road (Route 104)	at	Hunting Ridge Road S
14	Long Ridge Road (Route 104)	at	Wildwood Road
15	Long Ridge Road (Route 104)	at	River Bank Road
16	Long Ridge Road (Route 104)	at	Erskine Road
17	Long Ridge Road (Route 104)	at	Old Long Ridge Road (northern)

High Ridge Road

18	High Ridge Road (Route 137)	at	Cold Spring Road (Route 137)
19	High Ridge Road (Route 137)	at	Lord & Taylor Drive
20	High Ridge Road (Route 137)	at	Oaklawn Avenue/Cross Road
21	High Ridge Road (Route 137)	at	Terrace Avenue
22	High Ridge Road (Route 137)	at	Unity Road/Brownley Road
23	High Ridge Road (Route 137)	at	Lakeview Drive/Rippowam High School Drive
24	High Ridge Road (Route 137)	at	Loveland Road
25	High Ridge Road (Route 137)	at	Dannel Drive/Mercedes Lane
26	High Ridge Road (Route 137)	at	Ridge Park Road
27	High Ridge Road (Route 137)	at	Hartswood Road
28	High Ridge Road (Route 137)	at	Bradley Place
29	High Ridge Road (Route 137)	at	Merriman Road
30	High Ridge Road (Route 137)	at	Vine Road/Private Drive
31	High Ridge Road (Route 137)	at	Cedar Height Road/Turn of River Road
32	High Ridge Road (Route 137)	at	Olga Drive/Private Drive
33	High Ridge Road (Route 137)	at	Square Acres Drive/Shopping Plaza
34	High Ridge Road (Route 137)	at	Route 15 NB Ramps/Buxton Farms Road
35	High Ridge Road (Route 137)	at	Route 15 SB Ramps
36	High Ridge Road (Route 137)	at	Wire Mill Road
37	High Ridge Road (Route 137)	at	Scofieldtown Road
38	High Ridge Road (Route 137)	at	Interlaken Road
39	High Ridge Road (Route 137)	at	Brookdale Road
40	High Ridge Road (Route 137)	at	North Stamford Road (southern)
41	High Ridge Road (Route 137)	at	North Stamford Road (northern)
42	High Ridge Road (Route 137)	at	Sunset Road
43	High Ridge Road (Route 137)	at	Briar Brae Road
44	High Ridge Road (Route 137)	at	Mayapple Road

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

3.4.1.1 2016 Signalized Intersections

The results of the signalized intersections capacity analyses indicate that eight signalized study intersections are projected to operate with an overall LOS E or F during the peak periods, up from four for the existing conditions. These intersections are discussed below.

#2 Long Ridge Road at Cold Spring Road

The overall intersection is projected to operate at LOS E during the weekday morning peak period but LOS D during the weekday evening peak period.

During the morning and evening peak periods, vehicle queues in the eastbound left-turn lanes on Cold Spring Road will exceed the available storage and will partially obstruct the flow of eastbound through vehicles on Cold Spring Road.

During the morning peak period, vehicle queues in the westbound through lanes on Cold Spring Road will exceed the available storage partially obstructing the flow of southbound through vehicles on High Ridge Road.

During the morning and evening peak periods, vehicle queues in the southbound right-turn lane on Long Ridge Road will exceed the available storage partially obstructing the flow of southbound through vehicles on Long Ridge Road.

In the morning peak-hour, average delays are projected to increase from approximately 45 seconds to approximately 59 seconds, precipitating a change in Level-of-Service from D to E.

#6 Long Ridge Road at Stillwater Road/Buckingham Drive

The overall intersection is projected to operate at LOS D during the weekday morning peak period but LOS F during the weekday evening peak period.

During the morning and evening peak periods, vehicle queues in the southbound right-turn lane will exceed the available storage and interrupt the flow of southbound through vehicles on Long Ridge Road.

During the evening peak period, vehicle queues in the northbound left-turn lane will exceed the available storage and interrupt the flow of through vehicles on Long Ridge Road.

During the morning and evening peak periods, vehicle queues on the eastbound Stillwater Road approach will extend past Roxbury Road, greatly interfering with the ability of vehicles to make left-turns from Roxbury Road to Stillwater Road.

In the evening peak-hour, average delays are projected to increase from approximately 61 seconds to approximately 90 seconds, precipitating a change in Level-of-Service from E to F. The entire intersection configuration is currently being studied for redesign by Tighe & Bond.

#10 Long Ridge Road at Route 15 Northbound Off-ramp / Wire Mill Road

The overall intersection will operate at LOS F during the weekday morning and evening peak periods.

During the morning peak period, long vehicle queues in the southbound through lanes will block access to the southbound left-turn lane.

During the evening peak period, long vehicle queues in the northbound through lanes will extend past Wire Mill Road and Maltbie Avenue, interfering with the ability of vehicles to make left-turns from these streets to Long Ridge Road.

In the morning peak-hour, average delays are projected to increase from approximately 80 seconds to approximately 110 seconds, while in the evening peak-hour, average delays are projected to increase from approximately 99 seconds to approximately 130 seconds.

#20 High Ridge Road at Oaklawn Avenue

The overall intersection is projected to operate at LOS C during the weekday morning peak period but LOS E during the weekday evening peak period.

During the morning peak period, vehicle queues on the westbound Oaklawn Avenue approach will extend past Halpin Avenue, greatly interfering with the ability of vehicles to make left-turns from Halpin Avenue to Oaklawn Avenue.

During the evening peak period, vehicle queues on the northbound approach on High Ridge Road will extend past the Lord & Taylor driveway, greatly interfering with the ability of vehicles to make left-turns from the Lord & Taylor driveway onto High Ridge Road.

In the evening peak-hour, average delays are projected to increase from approximately 45 seconds to approximately 57 seconds, precipitating a change in Level-of-Service from D to E.

#30 High Ridge Road at Vine Road/Private Drive

The overall intersection operates at LOS D during the weekday morning peak period but a LOS F during the weekday evening peak period.

During the morning peak period, long vehicle queues in the westbound left-turn lane and on the northbound approach will spill back and block the adjacent lanes and intersections, respectively.

During the evening peak period, long vehicle queues in the westbound right-turn lane, the southbound left-turn lane and on the northbound approach will spill back and block the adjacent lanes and intersections.

In the evening peak-hour, average delays are projected to increase from approximately 112 seconds to approximately 116 seconds.

#31 High Ridge Road at Cedar Heights Road/Turn of River Road

The overall intersection operates at LOS C during the weekday morning peak period but a LOS E during the weekday evening peak period.

During the morning peak period, long vehicle queues on the southbound approach will spill back and block the adjacent driveways.

During the evening peak period, long vehicle queues on the southbound approach, the northbound approach and in the northbound left-turn lane will spill back and block the adjacent driveways, lanes and intersections, respectively.

In the evening peak-hour, average delays are projected to increase from approximately 58 seconds to approximately 70 seconds.

#34 High Ridge Road at Route 15 NB Ramps/Buxton Farms Road

The overall intersection is projected to operate at LOS F during the weekday morning peak period and LOS E during the weekday evening peak period.

During the morning and evening peak periods, long vehicle queues in the Route 15 off-ramp left-turn and through lanes will block access to the channelized right-turn lane, vehicle queues in the westbound Buxton Farms right-turn lane onto Long Ridge Road will block access to the adjacent turning lanes. Excessive vehicle queues in the northbound Long Ridge Road through lanes will back up to the upstream signalized intersection with Square Acres Drive and the shopping plaza driveway to the south, while excessive vehicle queues in the southbound Long Ridge Road through lanes will back up to the upstream signalized intersection with the southbound off-ramp.

In the morning peak-hour, average delays are projected to increase from approximately 78 seconds to approximately 90 seconds, precipitating a change in Level of Service from E to F, while in the evening peak-hour, average delays are projected to increase from approximately 54seconds to approximately 76 seconds, precipitating a change from E to F.

#35 High Ridge Road at Route 15 SB Ramps

The overall intersection operates at LOS F during the weekday morning peak period and LOS C during the weekday evening peak period.

During the morning and afternoon peak periods, long vehicle queues on the jug handle to the southbound ramp will spill back and interrupt the flow of northbound through vehicles on High Ridge Road, while long vehicle queues on southbound High Ridge Road will spill back and block the intersection of Wire Mill Road.

In the morning peak-hour, average delays are projected to increase from approximately 76seconds to 93 seconds, precipitating a change in Level of Service from E to F.

The remaining signalized study intersections will operate with overall LOS D or better conditions during the peak periods. However, LOS E or F conditions were identified for individual turning movements, commonly from side street approaches, at many of these intersections. The long delays on the side streets, generally caused by relatively long intersection cycle lengths, allow for greater capacity for the higher volume Long Ridge Road and High Ridge Road approaches. Progression along Long Ridge Road and High Ridge Road should take priority, and therefore, LOS E or F should be considered tolerable for some of the low volume side street movements. The signalized study intersections with projected individual turning movements experiencing LOS E or F conditions and/or excessive vehicle queuing are identified below.

#1 Long Ridge Road at High Ridge Road / Bedford Street / Summer Street

During the morning peak period, the Long Ridge Road eastbound left-turn movement onto High Ridge Road will operate at LOS F. Additionally, the High Ridge Road southbound approach will operate at LOS E with excessive vehicle queues that back up through the upstream signalized intersection with Cold Spring Road to the north.

#3 Long Ridge Road at Drives to Olin Chemicals / Lord & Taylor

During the morning peak period, the Olin Chemicals eastbound approach and Lord & Taylor westbound approach will operate at LOS E; however, these side street approaches have relatively low traffic volumes.

#4 Long Ridge Road at Driveway to # 260 Driveway/Terrace Avenue

During the morning and evening peak periods, the reoccupying of #260 will precipitate LOS E on the eastbound and westbound, however, these approaches have relatively low traffic volumes.

#5 Long Ridge Road at Woodridge Drive South

During the morning peak period, the westbound Woodridge Drive South approach will operate at LOS E; however, this side street approach has relatively low traffic volumes.

#18 High Ridge Road at Cold Spring Road (Route 137)

During the morning peak period, the eastbound Cold Spring Road approach and the westbound will operate at LOS F with long vehicle queues that back up through the upstream signalized intersection with Long Ridge Road to the west. The westbound Home Goods driveway approach will also operate at LOS F.

During the evening peak period, the eastbound Cold Spring Road approach and the westbound will operate at LOS F with long vehicle queues that back up through the upstream signalized intersection with Long Ridge Road to the west. The westbound Home Goods driveway approach will operate at LOS E, while the northbound approach will also operate at LOS E and will back up through Bedford Street.

#19 High Ridge Road at Lord & Taylor Drive / Bull's Head Shopping Center

During the morning peak period, the left-turn exiting movement from the Bull's Head Shopping Center will operate at LOS E with vehicle queues that extend into the shopping center parking aisles. Additionally, vehicle queues in the northbound through lanes on High Ridge Road back up into the upstream signalized intersection with Cold Spring Road to the south.

During the evening peak period, vehicle queues from the Bull's Head Shopping Center driveway and from the Lord & Taylor Driveway will operate at LOS E, and vehicle queues in the northbound through lanes on High Ridge Road will back up into the upstream signalized intersection with Cold Spring Road to the south.

#21 High Ridge Road at Terrace Avenue

During the evening peak period, the westbound left-turning movement from the private drive will operate at LOS F.

#22 High Ridge Road at Unity Road / Brownley Road

During the morning and evening peak periods, the eastbound Brownley Road approach and the westbound Unity Road approach will operate at LOS E; however, the side street approaches have relatively low traffic volumes.

#23 High Ridge Road at Lakeview Drive / Rippowam High School Drive

During the morning and evening peak periods, the eastbound Lakeview Drive approach will operate at LOS E.

#32 High Ridge Road at Olga Drive / Private Drive

During the evening peak period, the westbound private driveway will operate at LOS E; however, the side street approach has relatively low traffic volumes.

#37 High Ridge Road at Scofieldtown Road

During the morning peak period, the southbound High Ridge Road approach operates at LOS E with excessive vehicle queues.

3.4.1.2 2016 Unsignalized Intersections

The results of the capacity analyses indicate that several of the unsignalized study intersections operate with LOS E or F conditions on the side street during one or both peak periods. The excessive delays on the side street approaches are mostly attributed to the high traffic volumes along Long Ridge Road and High Ridge Road. Due to these high traffic volumes, vehicles at some side street approaches experience long delays during the peak periods as they wait for acceptable gaps in traffic to safely enter the traffic stream. The unsignalized intersections currently operating with LOS E or F conditions are discussed below.

#12 Long Ridge Road at Chestnut Hill Road / Butternut Lane

During the morning peak period, the eastbound Butternut Lane approach will operate at LOS F; however, this approach has relatively low traffic volumes (20 to 50 vehicles per hour), and the maximum vehicle queue is only projected to be one to two vehicles during the peak periods.

During the morning and evening peak periods, the westbound Chestnut Hill Road approach operates at LOS F with excessive delays.

During the morning peak period, the southern connector roadway from Chestnut Hill Road operates at LOS F; however, this approach has relatively low traffic volumes (10 vehicles per hour), and the maximum vehicle queue is not projected to exceed one vehicle during the peak periods.

In the morning peak-hour, average delays are projected to increase from approximately 270 seconds to approximately 340 seconds. In the evening peak-hour, average delays are projected to increase from approximately 83 seconds to approximately 110 seconds.

#13 Long Ridge Road at Hunting Ridge Road South

During the morning and evening peak periods, the westbound Hunting Ridge Road South approach will operate at LOS F with excessive delays.

In the morning peak-hour, average delays are projected to increase from approximately 68 seconds to approximately 80 seconds. In the evening peak-hour, average delays are projected to increase from approximately 64 seconds to approximately 81 seconds.

#14 Long Ridge Road at Wildwood Road

During the morning peak period, the eastbound Wildwood Road approach will operate at LOS F.

During the morning and evening peak period, the westbound Wildwood Road approach will operate at LOS F.

In the morning peak-hour, average delays on the eastbound approach are projected to increase from approximately 46 seconds to 65 seconds, while on the westbound approach, they are projected to increase from approximately 170 seconds to 240 seconds. In the evening peak-hour, average delays on the westbound approach are projected to increase from approximately 56 seconds to approximately 67 seconds.

#16 Long Ridge Road at Erskine Road

During the morning peak period, the westbound Erskine Road approach will operate at LOS E.

In the morning peak-hour, average delays on the westbound approach are projected to increase from approximately 36 seconds to 40 seconds.

#29 High Ridge Road at Merriman

During the morning peak period, the westbound Merriman Road approach will operate at LOS F. This condition will also likely prevail during the evening peak period, although motorists will probably l™™ok for alternative ways to go south on High Ridge Road other than turning left from Merriman Road.

In the morning peak-hour, average delays are projected to increase from approximately 56 seconds to approximately 63 seconds.

#36 High Ridge Road at Wire Mill Road

During the morning peak period, the eastbound Wire Mill Road approach will operate at LOS F.

In the morning peak-hour, average delays are projected to increase from approximately 195 seconds to approximately 235 seconds.

#37A High Ridge Road at the Unsignalized Scofieldtown Road Connector

During the morning and evening peak periods, the eastbound Scofieldtown Road connector approach will operate at LOS F with excessive delays.

In the morning peak-hour, average delays are projected to increase from approximately 137 seconds to approximately 199 seconds, while in the evening peak-hour, average delays are projected to increase from approximately 45 seconds to approximately 52 seconds.

3.4.2 Scenario 2 – 2026 Mid-term Condition Capacity Analysis Results (Figure 3-20)

For the 2026 Mid-term Condition traffic analysis, the projected traffic volumes for 2026 were entered into the Synchro™™ model, as were all known roadway improvement projects, including infrastructure upgrades and signal equipment enhancements. Optimized signal timings at all study area intersections were also applied to accurately account for the regular "fine tuning" of traffic signals by the CTDOT.

The following is a summary of traffic operating conditions for 2026 and a comparison to existing conditions. The results of the study intersection capacity analyses under 2026 conditions are summarized on Figures 3-20S and 3-20N. These figures show the overall intersection LOS for signalized intersections and the LOS of the side street approaches for unsignalized intersections. The intersection capacity analyses indicate that suboptimal operating conditions are projected to be experienced at numerous intersections along the corridors.

The analyses results for the signalized and unsignalized study intersections are discussed in more detail in the following sections, and the Synchro™ output reports are included in the technical appendix.

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 3-20 (S)

Intersection Level of Service
2026 Baseline Conditions

Long Ridge Road

1	Long Ridge Road	at	High Ridge Road/Bedford St/Summer St.
2	Long Ridge Road (Route 104)	at	Cold Spring Road (Route 137)
3	Long Ridge Road (Route 104)	at	Drives to Olin Chemicals/ Lord & Taylors
4	Long Ridge Road (Route 104)	at	Terrace Avenue/South Drive to G.E. Credit Corp
5	Long Ridge Road (Route 104)	at	Woodridge Drive South
6	Long Ridge Road (Route 104)	at	Stillwater Road/Buckingham Drive
7	Long Ridge Road (Route 104)	at	Drive to Long Ridge Office Park
8	Long Ridge Road (Route 104)	at	Loughran Avenue/G.E. Energy Financial Services
9	Long Ridge Road (Route 104)	at	Nestle/Oracle Drives (formerly Hyperion)
10	Long Ridge Road (Route 104)	at	Route 15 NB Off Ramp/Wire Mill Road
11	Long Ridge Road (Route 104)	at	Route 15 SB Ramps/Webbs Hill Road
12	Long Ridge Road (Route 104)	at	Chestnut Hill Road/Butternut Lane
13	Long Ridge Road (Route 104)	at	Hunting Ridge Road S
14	Long Ridge Road (Route 104)	at	Wildwood Road
15	Long Ridge Road (Route 104)	at	River Bank Road
16	Long Ridge Road (Route 104)	at	Erskine Road
17	Long Ridge Road (Route 104)	at	Old Long Ridge Road (northern)

High Ridge Road

18	High Ridge Road (Route 137)	at	Cold Spring Road (Route 137)
19	High Ridge Road (Route 137)	at	Lord & Taylor Drive
20	High Ridge Road (Route 137)	at	Oaklawn Avenue/Cross Road
21	High Ridge Road (Route 137)	at	Terrace Avenue
22	High Ridge Road (Route 137)	at	Unity Road/Brownley Road
23	High Ridge Road (Route 137)	at	Lakeview Drive/Rippowam High School Drive
24	High Ridge Road (Route 137)	at	Loveland Road
25	High Ridge Road (Route 137)	at	Dannel Drive/Mercedes Lane
26	High Ridge Road (Route 137)	at	Ridge Park Road
27	High Ridge Road (Route 137)	at	Hartswood Road
28	High Ridge Road (Route 137)	at	Bradley Place
29	High Ridge Road (Route 137)	at	Merriman Road
30	High Ridge Road (Route 137)	at	Vine Road/Private Drive
31	High Ridge Road (Route 137)	at	Cedar Height Road/Turn of River Road
32	High Ridge Road (Route 137)	at	Olga Drive/Private Drive
33	High Ridge Road (Route 137)	at	Square Acres Drive/Shopping Plaza
34	High Ridge Road (Route 137)	at	Route 15 NB Ramps/Buxton Farms Road
35	High Ridge Road (Route 137)	at	Route 15 SB Ramps
36	High Ridge Road (Route 137)	at	Wire Mill Road
37	High Ridge Road (Route 137)	at	Scofieldtown Road
38	High Ridge Road (Route 137)	at	Interlaken Road
39	High Ridge Road (Route 137)	at	Brookdale Road
40	High Ridge Road (Route 137)	at	North Stamford Road (southern)
41	High Ridge Road (Route 137)	at	North Stamford Road (northern)
42	High Ridge Road (Route 137)	at	Sunset Road
43	High Ridge Road (Route 137)	at	Briar Brae Road
44	High Ridge Road (Route 137)	at	Mayapple Road

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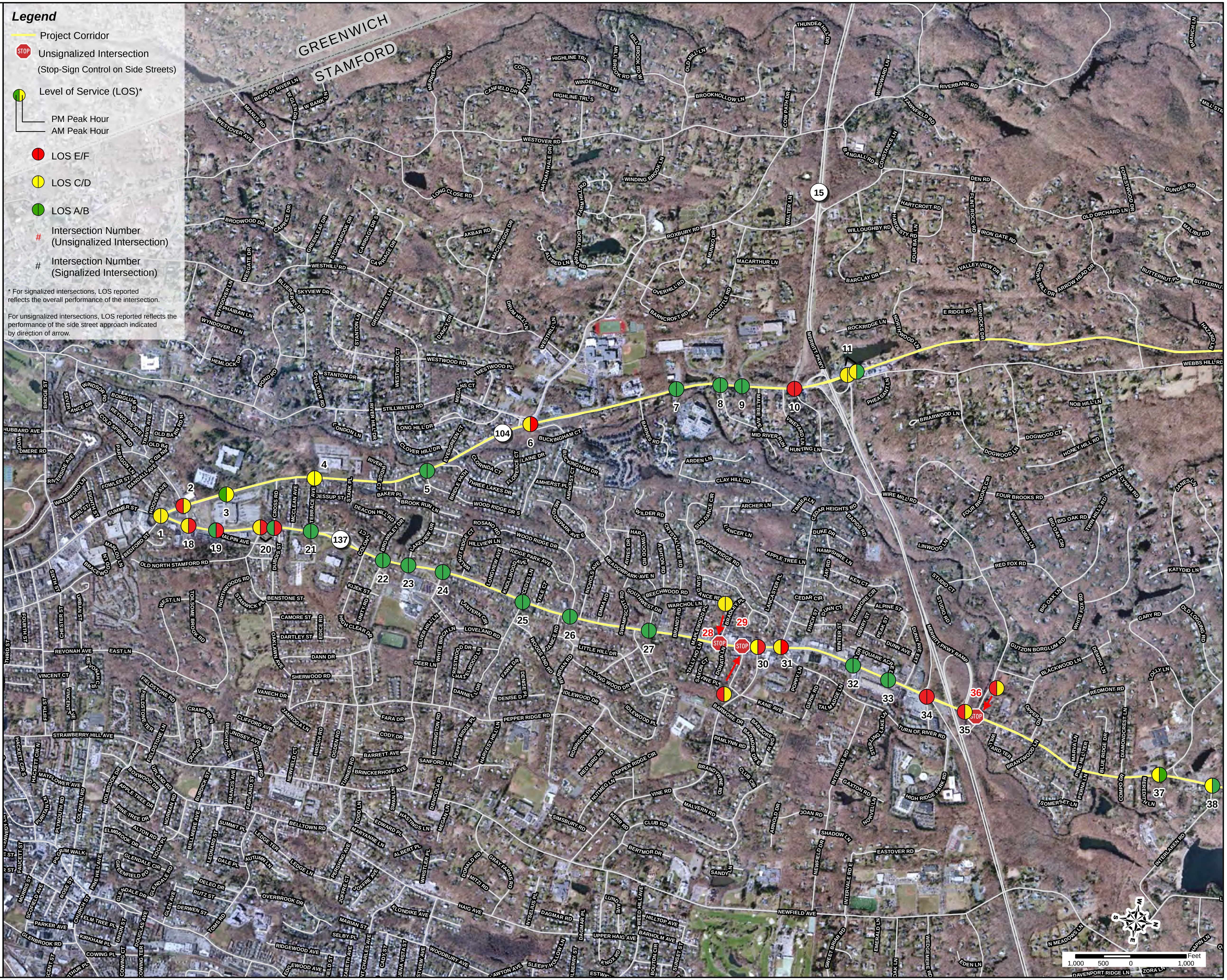
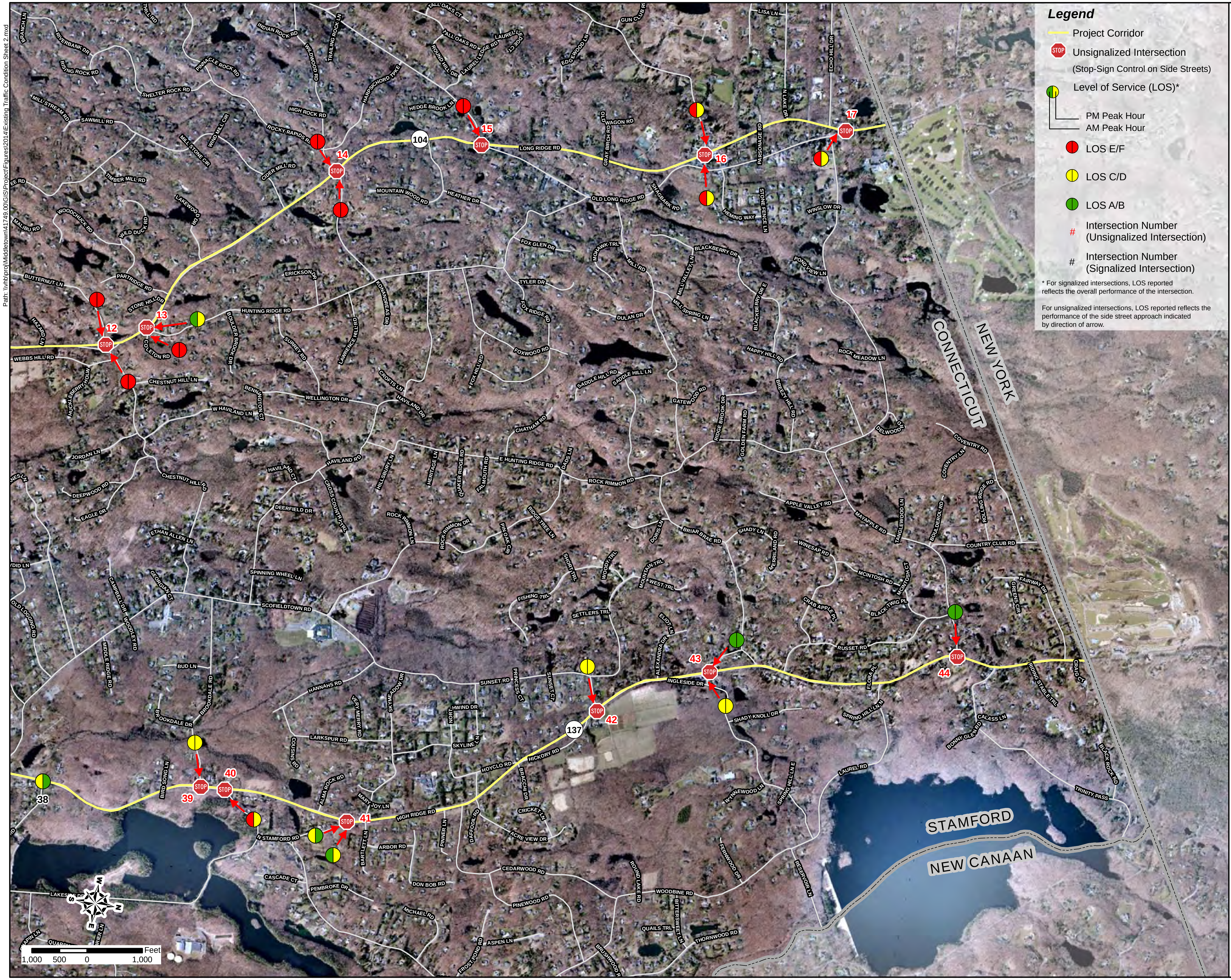
Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)





Long Ridge | High Ridge
CORRIDORS STUDY

Figure 3-20 (N)

Intersection Level of Service 2026 Baseline Conditions

	Long Ridge Road		
1	Long Ridge Road	at	High Ridge Road/Bedford St/Summer St.
2	Long Ridge Road (Route 104)	at	Cold Spring Road (Route 137)
3	Long Ridge Road (Route 104)	at	Drives to Olin Chemicals/ Lord & Taylors
4	Long Ridge Road (Route 104)	at	Terrace Avenue/South Drive to G.E. Credit Corp
5	Long Ridge Road (Route 104)	at	Woodridge Drive South
6	Long Ridge Road (Route 104)	at	Stillwater Road/Buckingham Drive
7	Long Ridge Road (Route 104)	at	Drive to Long Ridge Office Park
8	Long Ridge Road (Route 104)	at	Loughran Avenue/G.E. Energy Financial Services
9	Long Ridge Road (Route 104)	at	Nestle/Oracle Drives (formerly Hyperion)
10	Long Ridge Road (Route 104)	at	Route 15 NB Off Ramp/Wire Mill Road
11	Long Ridge Road (Route 104)	at	Route 15 SB Ramps/Webbs Hill Road
12	Long Ridge Road (Route 104)	at	Chestnut Hill Road/Butternut Lane
13	Long Ridge Road (Route 104)	at	Hunting Ridge Road S
14	Long Ridge Road (Route 104)	at	Wildwood Road
15	Long Ridge Road (Route 104)	at	River Bank Road
16	Long Ridge Road (Route 104)	at	Erskine Road
17	Long Ridge Road (Route 104)	at	Old Long Ridge Road (northern)
	High Ridge Road		
18	High Ridge Road (Route 137)	at	Cold Spring Road (Route 137)
19	High Ridge Road (Route 137)	at	Lord & Taylor Drive
20	High Ridge Road (Route 137)	at	Oaklawn Avenue/Cross Road
21	High Ridge Road (Route 137)	at	Terrace Avenue
22	High Ridge Road (Route 137)	at	Unity Road/Brownley Road
23	High Ridge Road (Route 137)	at	Lakeview Drive/Rippowam High School Drive
24	High Ridge Road (Route 137)	at	Loveland Road
25	High Ridge Road (Route 137)	at	Dannel Drive/Mercedes Lane
26	High Ridge Road (Route 137)	at	Ridge Park Road
27	High Ridge Road (Route 137)	at	Hartswood Road
28	High Ridge Road (Route 137)	at	Bradley Place
29	High Ridge Road (Route 137)	at	Merriman Road
30	High Ridge Road (Route 137)	at	Vine Road/Private Drive
31	High Ridge Road (Route 137)	at	Cedar Height Road/Turn of River Road
32	High Ridge Road (Route 137)	at	Olga Drive/Private Drive
33	High Ridge Road (Route 137)	at	Square Acres Drive/Shopping Plaza
34	High Ridge Road (Route 137)	at	Route 15 NB Ramps/Buxton Farms Road
35	High Ridge Road (Route 137)	at	Route 15 SB Ramps
36	High Ridge Road (Route 137)	at	Wire Mill Road
37	High Ridge Road (Route 137)	at	Scofieldtown Road
38	High Ridge Road (Route 137)	at	Interlaken Road
39	High Ridge Road (Route 137)	at	Brookdale Road
40	High Ridge Road (Route 137)	at	North Stamford Road (southern)
41	High Ridge Road (Route 137)	at	North Stamford Road (northern)
42	High Ridge Road (Route 137)	at	Sunset Road
43	High Ridge Road (Route 137)	at	Briar Brae Road
44	High Ridge Road (Route 137)	at	Mayapple Road

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

3.4.2.1 Signalized Intersections

The results of the signalized intersections capacity analyses indicate that several signalized study intersections are projected to operate with an overall LOS E or F during the peak periods, up from four for the existing conditions. These intersections are discussed below.

#2 Long Ridge Road at Cold Spring Road

The overall intersection is projected to operate at LOS E during the weekday morning peak period but LOS D during the weekday evening peak period.

During the morning and evening peak periods, vehicle queues in the eastbound left-turn lanes on Cold Spring Road will exceed the available storage and will partially obstruct the flow of eastbound through vehicles on Cold Spring Road.

During the morning peak period, vehicle queues in the westbound through lanes on Cold Spring Road will exceed the available storage partially obstructing the flow of southbound through vehicles on High Ridge Road.

During the morning and evening peak periods, vehicle queues in the southbound right-turn lane on Long Ridge Road will exceed the available storage partially obstructing the flow of southbound through vehicles on Long Ridge Road.

In the morning peak-hour, average delays are projected to increase from approximately 45 seconds (existing) to approximately 74 seconds, precipitating a change in Level-of-Service from D to E.

#6 Long Ridge Road at Stillwater Road/Buckingham Drive

The overall intersection is projected to operate at LOS D during the weekday morning peak period but LOS F during the weekday evening peak period.

During the morning and evening peak periods, vehicle queues in the southbound right-turn lane will exceed the available storage and interrupt the flow of southbound through vehicles on Long Ridge Road while vehicle queues in the northbound left-turn lane will exceed the available storage and interrupt the flow of through vehicles on Long Ridge Road. Vehicle queues on the eastbound Stillwater Road approach will extend past Roxbury Road during both periods, greatly interfering with the ability of vehicles to make left-turns from Roxbury Road to Stillwater Road.

In the evening peak-hour, average delays are projected to increase from approximately 61(existing) seconds to approximately 117 seconds, precipitating a change in Level-of-Service from E to F. The entire intersection configuration is currently being studied for redesign by Tighe & Bond.

#10 Long Ridge Road at Route 15 Northbound Off-ramp / Wire Mill Road

The overall intersection will operate at LOS F during the weekday morning and evening peak periods.

During the morning peak period, long vehicle queues in the southbound through lanes will block access to the southbound left-turn lane and long vehicle queues in the eastbound through/right-turn lane will block the eastbound left-turn lane. LOS F conditions will persist on these movements. LOS E conditions will persist on the eastbound left and northbound through movements.

During the evening peak period, long vehicle queues in the northbound through lanes will extend past Wire Mill Road and Maltbie Avenue, interfering with the ability of vehicles to make left-turns from these streets to Long Ridge Road. LOS F conditions will persist on this movement. Long vehicle queues in the eastbound through/right-turn lane will block the eastbound left-turn lane.

In the morning peak-hour, average delays are projected to increase from approximately 80 seconds (existing) to approximately 131 seconds, while in the evening peak-hour, average delays are projected to increase from approximately 99 seconds (existing) to approximately 148 seconds.

#18 High Ridge Road at Cold Spring Road (Route 137)

The overall intersection is projected to operate at LOS D during the weekday morning peak period but LOS E during the weekday evening peak period.

During the morning peak period, the eastbound Cold Spring Road approach will operate at LOS F with long vehicle queues on the eastbound approach that back up through the upstream signalized intersection with Long Ridge Road to the west. The westbound retail center driveway approach will also operate at LOS F.

During the evening peak period, the eastbound Cold Spring Road approach will operate at LOS F with long vehicle queues that back up through the upstream signalized intersection with Long Ridge Road to the west, while the northbound approach will also operate at LOS F and queues will back up through Bedford Street. The westbound Home Goods driveway approach will operate at LOS E.

In the evening peak-hour, average delays are projected to increase from approximately 44 seconds to approximately 77 seconds, precipitating a change in Level-of-Service from D to E.

#20 High Ridge Road at Oaklawn Avenue

The overall intersection is projected to operate at LOS C during the weekday morning peak period but LOS F during the weekday evening peak period.

During the morning peak period, the northbound approach on High Ridge Road will operate at LOS E and vehicle queues on will extend past the Lord & Taylor driveway, greatly interfering with the ability of vehicles to make left-turns from the Lord & Taylor driveway onto High Ridge Road. Vehicle queues on the westbound Oaklawn Avenue approach will extend past Halpin Avenue, greatly interfering with the ability of vehicles to make left-turns from Halpin Avenue to Oaklawn Avenue.

During the evening peak period, the northbound approach on High Ridge Road will operate at LOS F and vehicle queues on will extend past the Lord & Taylor driveway, greatly interfering with the ability of vehicles to make left-turns from the Lord & Taylor driveway onto High Ridge Road. The westbound Oaklawn Avenue approach will operate at LOS E and vehicle queues will extend past Halpin Avenue, greatly interfering with the ability of vehicles to make left-turns from Halpin Avenue to Oaklawn Avenue.

In the evening peak-hour, average delays are projected to increase from approximately 45 seconds (existing) to approximately 87 seconds, precipitating a change in Level-of-Service from D to F.

#20 High Ridge Road at Cross Road

The overall intersection is projected to operate at LOS B during the weekday morning peak period but LOS E during the weekday evening peak period.

During the evening peak period, the northbound approach on High Ridge Road will operate at LOS F and vehicle queues on will extend past the Oaklawn Avenue intersection, greatly interfering with the ability of vehicles to exit Oaklawn Avenue onto High Ridge Road.

In the evening peak-hour, average delays are projected to increase from approximately 21 seconds (existing) to approximately 77 seconds, precipitating a change in Level-of-Service from B to E.

#30 High Ridge Road at Vine Road/Private Drive

The overall intersection operates at LOS D during the weekday morning peak period but a LOS F during the weekday evening peak period.

During the morning peak period, long vehicle queues in the westbound left-turn lane and on the northbound approach will spill back and block the adjacent lanes and intersections, respectively.

During the evening peak period, long vehicle queues in the westbound right-turn lane, the southbound left-turn lane and on the northbound approach will spill back and block the adjacent lanes and intersections.

In the evening peak-hour, average delays are projected to increase from approximately 112 seconds (existing) to approximately 152 seconds.

#31 High Ridge Road at Cedar Heights Road/Turn of River Road

The overall intersection operates at LOS C during the weekday morning peak period but a LOS F during the weekday evening peak period.

During the morning peak period, long vehicle queues on the southbound approach will spill back and block the adjacent driveways while queues in the eastbound right-turn lane and westbound left-turn lane will exceed the storage capacity and partially block the other movements on those approaches.

During the evening peak period, long vehicle queues on the southbound approach, the northbound approach, in the northbound left-turn lane, the westbound left-turn lane and the eastbound through/right-turn lane will spill back and block the adjacent driveways, lanes and intersections, respectively.

In the evening peak-hour, average delays are projected to increase from approximately 58 (existing) seconds to approximately 94 seconds.

#34 High Ridge Road at Route 15 NB Ramps/Buxton Farms Road

The overall intersection operates at LOS F during the weekday morning and evening peak periods.

During the morning and evening peak periods, long vehicle queues in the Route 15 off-ramp left-turn and through lanes will block access to the channelized right-turn lane, vehicle queues in the westbound Buxton Farms right-turn lane onto Long Ridge Road will block access to the adjacent turning lanes. Excessive vehicle queues in the northbound Long Ridge Road through lanes will back up to the upstream signalized intersection with Square Acres Drive and the shopping plaza driveway to the south, while excessive vehicle queues in the southbound Long Ridge Road through lanes will back up to the upstream signalized intersection with the southbound off-ramp.

In the morning peak-hour, average delays are projected to increase from approximately 78 seconds (existing) to approximately 114 seconds, precipitating a change in Level of Service from E to F, while in the evening peak-hour, average delays are projected to increase from approximately 54 seconds (existing) to approximately 93 seconds, precipitating a change from E to F.

#35 High Ridge Road at Route 15 SB Ramps

The overall intersection is projected to operate at LOS F during the weekday morning peak period and LOS C during the weekday evening peak period.

During the morning and afternoon peak periods, long vehicle queues on the jug handle to the southbound ramp will spill back and interrupt the flow of northbound through vehicles on High Ridge Road, while long vehicle queues on southbound High Ridge Road will spill back and block the intersection of Wire Mill Road.

In the morning peak-hour, average delays are projected to increase from approximately 76 seconds (existing) to 133 seconds, precipitating a change in Level of Service from E to F.

The remaining signalized study intersections will operate with overall LOS D or better conditions during the peak periods. However, LOS E or F conditions were identified for individual turning movements, commonly from side street approaches, at many of these intersections. The long delays on the side streets, generally caused by relatively long intersection cycle lengths, allow for greater capacity for the higher volume Long Ridge Road and High Ridge Road approaches. Progression along Long Ridge Road and High Ridge Road should take priority, and therefore, LOS E or F should be considered tolerable for some of the low volume side street movements. The signalized study intersections with projected individual turning movements experiencing LOS E or F conditions and/or excessive vehicle queuing are identified below.

#1 Long Ridge Road at High Ridge Road / Bedford Street / Summer Street

During the morning peak period, the Long Ridge Road eastbound left-turn movement onto High Ridge Road and the southbound High Ridge Road through movement will operate at LOS F, the latter with excessive vehicle queues that back up through the upstream signalized intersection with Cold Spring Road to the north.

#3 Long Ridge Road at Drives to Olin Chemicals / Lord & Taylor

During the morning peak period, the Olin Chemicals eastbound approach and Lord & Taylor westbound approach will operate at LOS E; however, these side street approaches have relatively low traffic volumes.

During the evening peak period, the Olin Chemicals eastbound approach will operate at LOS E; however, this side street approach has relatively low traffic volumes.

#4 Long Ridge Road at #260 Driveway/Terrace Avenue

During the morning peak period, the eastbound, westbound and southbound approaches will operate at LOS E.

During the evening peak period, the eastbound left-turn movement will operate at LOS E.

#5 Long Ridge Road at Woodridge Drive South

During the morning peak period, the westbound Woodridge Drive South approach will operate at LOS E; however, this side street approach has relatively low traffic volumes.

#11 Long Ridge Road at the SB Merritt Parkway Ramps

During the evening peak period, the westbound right-turn movement from the Merritt Parkway off ramp will operate at LOS F and long queues will partially obstruct the left-turn movement.

#19 High Ridge Road at Lord & Taylor Drive / Bull's Head Shopping Center

During the morning peak period, the left-turn exiting movement on the eastbound and westbound approaches will operate at LOS E, as will the northbound through movement. Vehicle queues in the northbound through lanes on High Ridge Road back up into the upstream signalized intersection with Cold Spring Road to the south.

During the evening peak period, vehicle queues from the Bull's Head Shopping Center driveway and from the Lord & Taylor Driveway will operate at LOS E, and vehicle queues in the northbound through lanes on High Ridge Road will back up into the upstream signalized intersection with Cold Spring Road to the south.

#21 High Ridge Road at Terrace Avenue

During the evening peak period, the westbound left-turning movement from the private drive will operate at LOS F.

#22 High Ridge Road at Unity Road / Brownley Road

During the morning and evening peak periods, the eastbound Brownley Road approach and the westbound Unity Road approach will operate at LOS E; however, the side street approaches have relatively low traffic volumes.

#23 High Ridge Road at Lakeview Drive / Rippowam High School Drive

During the morning and evening peak periods, the eastbound Lakeview Drive approach will operate at LOS E.

#24 High Ridge Road at Loveland Road

During the morning peak period, the eastbound Loveland Road approach will operate at LOS E.

#32 High Ridge Road at Olga Drive / Private Drive

During the evening peak period, the westbound private driveway will operate at LOS E; however, the side street approach has relatively low traffic volumes.

#37 High Ridge Road at Scofieldtown Road

During the morning peak period, the southbound High Ridge Road approach operates at LOS F with excessive vehicle queues.

3.4.2.2 Unsignalized Intersections

The results of the capacity analyses indicate that several of the unsignalized study intersections operate with LOS E or F conditions on the side street during one or both peak periods. The excessive delays on the side street approaches are mostly attributed to the high traffic volumes along Long Ridge Road and High Ridge Road. Due to these high traffic volumes, vehicles at some side street approaches experience long delays during the peak periods as they wait for acceptable gaps in traffic to safely enter the traffic stream. The unsignalized intersections currently operating with LOS E or F conditions are discussed below.

#12 Long Ridge Road at Chestnut Hill Road / Butternut Lane

During the morning peak period, the eastbound Butternut Lane approach will operate at LOS F, while during the evening peak period it will operate at LOS E.

During the morning and evening peak periods, the westbound Chestnut Hill Road approach operates at LOS F with excessive delays.

During the morning and evening peak periods, the southern connector roadway from Chestnut Hill Road operates at LOS F.

In the morning peak-hour, average delays are projected to increase from approximately 270 seconds (existing) to approximately 576 seconds. In the evening peak-hour, average delays are projected to increase from approximately 83seconds (existing) to approximately 182 seconds.

#13 Long Ridge Road at Hunting Ridge Road South

During the morning and evening peak periods, the westbound Hunting Ridge Road South approach will operate at LOS F with excessive delays.

In the morning peak-hour, average delays are projected to increase from approximately 68 seconds (existing) to approximately 129 seconds. In the evening peak-hour, average delays are projected to increase from approximately 64 seconds (existing) to approximately 125 seconds.

#14 Long Ridge Road at Wildwood Road

During the morning peak period, the eastbound Wildwood Road approach will operate at LOS F.

During the morning and evening peak periods, the westbound Wildwood Road approach will operate at LOS F.

In the morning peak-hour, average delays on the eastbound approach are projected to increase from approximately 46 seconds (existing) to 97 seconds, while on the westbound approach, they are projected to increase from approximately 170 seconds (existing) to 790 seconds. In the evening peak-hour, average delays on the westbound approach are projected to increase from approximately 56 seconds (existing) to approximately 152 seconds.

#15 Long Ridge Road at Riverbank Road

During the morning and evening peak periods, the eastbound Riverbank Road approach will operate at LOS E.

In the morning peak-hour, average delays are projected to increase from approximately 29 seconds (existing) to approximately 46 seconds. In the evening peak-hour, average delays are projected to increase from approximately 24 seconds (existing) to approximately 37 seconds.

#16 Long Ridge Road at Erskine Road

During the morning peak period, the eastbound Erskine Road approach will operate at LOS E, while the westbound approach will operate at LOS F.

In the morning peak-hour, average delays on the eastbound approach are projected to increase from approximately 36 seconds (existing) to 75 seconds while average delays on the westbound approach are projected to increase from approximately 30 seconds (existing) to 41 seconds.

#17 Long Ridge Road at Old Long Ridge Road

During the morning peak period, the westbound Old Long Ridge Road approach will operate at LOS E.

In the morning peak-hour, average delays on the westbound approach are projected to increase from approximately 30 seconds (existing) to 46 seconds.

#29 High Ridge Road at Merriman

During the morning peak period, the westbound Merriman Road approach will operate at LOS F. This condition will also likely prevail during the evening peak period, although motorists will probably look for alternative ways to go south on High Ridge Road other than turning left from Merriman Road.

In the morning peak-hour, average delays are projected to increase from approximately 56 seconds to approximately 87 seconds.

#36 High Ridge Road at Wire Mill Road

During the morning peak period, the eastbound Wire Mill Road approach will operate at LOS F.

In the morning peak-hour, average delays are projected to increase from approximately 195 seconds to approximately 388 seconds.

#37A High Ridge Road at the Unsignalized Scofieldtown Road Connector

During the morning and evening peak periods, the eastbound Scofieldtown Road connector approach will operate at LOS F with excessive delays.

In the morning peak-hour, average delays are projected to increase from approximately 137 seconds to approximately 390 seconds, while in the evening peak-hour, average delays are projected to increase from approximately 45 seconds to approximately 652 seconds.

#40 High Ridge Road at North Stamford Road (south)

During the morning peak period, the westbound North Stamford Road approach will operate at LOS E.

In the morning peak-hour, average delays on the westbound approach are projected to increase from approximately 31 seconds (existing) to 42 seconds.

3.4.3 Scenario 3 – 2036 Long-term Condition Capacity Analysis Results (Figure 3-21)

For the 2036 Mid-term Condition traffic analysis, the projected traffic volumes for 2036 were entered into the Synchro™ model, as were all known roadway improvement projects, including infrastructure upgrades and signal equipment enhancements. Optimized signal timings at all study area intersections were also applied to accurately account for the regular “fine tuning” of traffic signals by the CTDOT.

The following is a summary of traffic operating conditions for 2036 and a comparison to existing conditions. The results of the study intersection capacity analyses under 2036 conditions are summarized on Figures 3-21S and 3-21N. These figures show the overall intersection LOS for signalized intersections and the LOS of the side street approaches for unsignalized intersections. The intersection capacity analyses indicate that suboptimal operating conditions are projected to be experienced at numerous intersections along the corridors.

The analyses results for the signalized and unsignalized study intersections are discussed in more detail in the following sections, and the Synchro™ output reports are included in the technical appendix.

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 3-21 (S)

Intersection Level of Service
2036 Baseline Conditions

	Long Ridge Road		
1	Long Ridge Road	at	High Ridge Road/Bedford St/Summer St.
2	Long Ridge Road (Route 104)	at	Cold Spring Road (Route 137)
3	Long Ridge Road (Route 104)	at	Drives to Olin Chemicals/ Lord & Taylors
4	Long Ridge Road (Route 104)	at	Terrace Avenue/South Drive to G.E. Credit Corp
5	Long Ridge Road (Route 104)	at	Woodridge Drive South
6	Long Ridge Road (Route 104)	at	Stillwater Road/Buckingham Drive
7	Long Ridge Road (Route 104)	at	Drive to Long Ridge Office Park
8	Long Ridge Road (Route 104)	at	Loughran Avenue/G.E. Energy Financial Services
9	Long Ridge Road (Route 104)	at	Nestle/Oracle Drives (formerly Hyperion)
10	Long Ridge Road (Route 104)	at	Route 15 NB Off Ramp/Wire Mill Road
11	Long Ridge Road (Route 104)	at	Route 15 SB Ramps/Webbs Hill Road
12	Long Ridge Road (Route 104)	at	Chestnut Hill Road/Butternut Lane
13	Long Ridge Road (Route 104)	at	Hunting Ridge Road S
14	Long Ridge Road (Route 104)	at	Wildwood Road
15	Long Ridge Road (Route 104)	at	River Bank Road
16	Long Ridge Road (Route 104)	at	Erskine Road
17	Long Ridge Road (Route 104)	at	Old Long Ridge Road (northern)
	High Ridge Road		
18	High Ridge Road (Route 137)	at	Cold Spring Road (Route 137)
19	High Ridge Road (Route 137)	at	Lord & Taylor Drive
20	High Ridge Road (Route 137)	at	Oaklawn Avenue/Cross Road
21	High Ridge Road (Route 137)	at	Terrace Avenue
22	High Ridge Road (Route 137)	at	Unity Road/Brownley Road
23	High Ridge Road (Route 137)	at	Lakeview Drive/Rippowam High School Drive
24	High Ridge Road (Route 137)	at	Loveland Road
25	High Ridge Road (Route 137)	at	Dannel Drive/Mercedes Lane
26	High Ridge Road (Route 137)	at	Ridge Park Road
27	High Ridge Road (Route 137)	at	Hartswood Road
28	High Ridge Road (Route 137)	at	Bradley Place
29	High Ridge Road (Route 137)	at	Merriman Road
30	High Ridge Road (Route 137)	at	Vine Road/Private Drive
31	High Ridge Road (Route 137)	at	Cedar Height Road/Turn of River Road
32	High Ridge Road (Route 137)	at	Olga Drive/Private Drive
33	High Ridge Road (Route 137)	at	Square Acres Drive/Shopping Plaza
34	High Ridge Road (Route 137)	at	Route 15 NB Ramps/Buxton Farms Road
35	High Ridge Road (Route 137)	at	Route 15 SB Ramps
36	High Ridge Road (Route 137)	at	Wire Mill Road
37	High Ridge Road (Route 137)	at	Scofieldtown Road
38	High Ridge Road (Route 137)	at	Interlaken Road
39	High Ridge Road (Route 137)	at	Brookdale Road
40	High Ridge Road (Route 137)	at	North Stamford Road (southern)
41	High Ridge Road (Route 137)	at	North Stamford Road (northern)
42	High Ridge Road (Route 137)	at	Sunset Road
43	High Ridge Road (Route 137)	at	Briar Brae Road
44	High Ridge Road (Route 137)	at	Mayapple Road

City of Stamford, Connecticut

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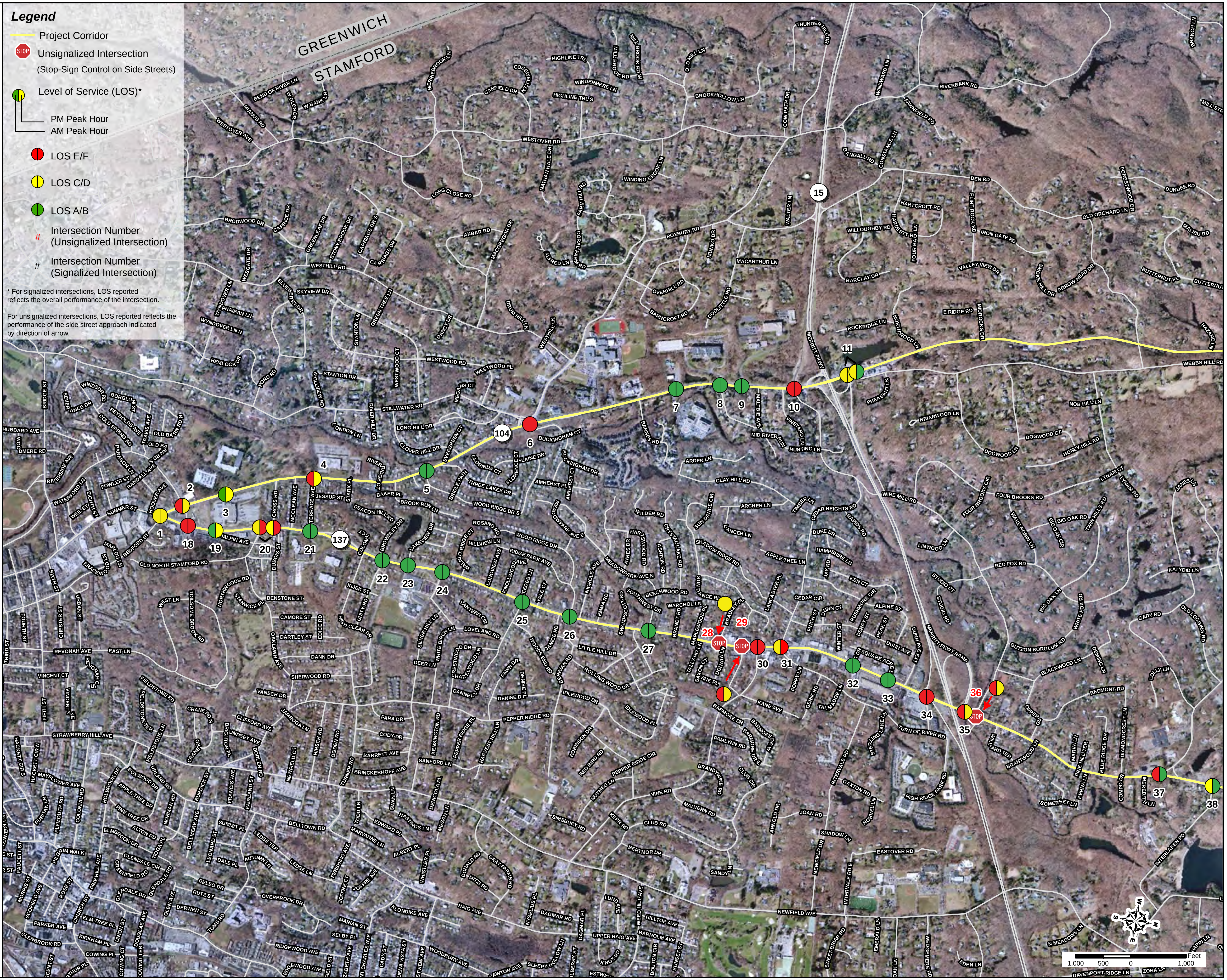
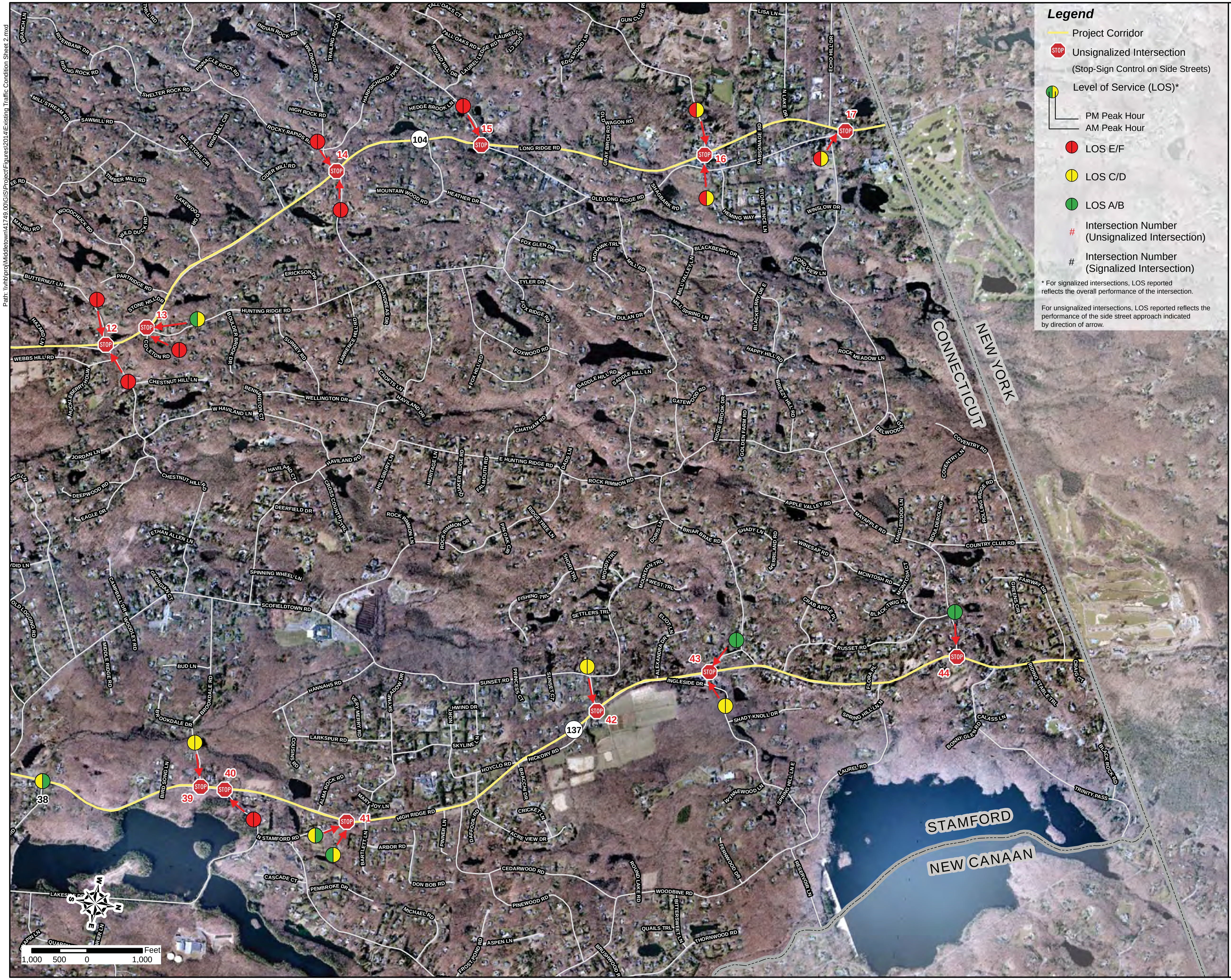
Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)





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Long Ridge | High Ridge
CORRIDORS STUDY

Figure 3-21 (N)

Intersection Level of Service
2036 Baseline Conditions

	Long Ridge Road		
1	Long Ridge Road	at	High Ridge Road/Bedford St/Summer St.
2	Long Ridge Road (Route 104)	at	Cold Spring Road (Route 137)
3	Long Ridge Road (Route 104)	at	Drives to Olin Chemicals/ Lord & Taylors
4	Long Ridge Road (Route 104)	at	Terrace Avenue/South Drive to G.E. Credit Corp
5	Long Ridge Road (Route 104)	at	Woodridge Drive South
6	Long Ridge Road (Route 104)	at	Stillwater Road/Buckingham Drive
7	Long Ridge Road (Route 104)	at	Drive to Long Ridge Office Park
8	Long Ridge Road (Route 104)	at	Loughran Avenue/G.E. Energy Financial Services
9	Long Ridge Road (Route 104)	at	Nestle/Oracle Drives (formerly Hyperion)
10	Long Ridge Road (Route 104)	at	Route 15 NB Off Ramp/Wire Mill Road
11	Long Ridge Road (Route 104)	at	Route 15 SB Ramps/Webbs Hill Road
12	Long Ridge Road (Route 104)	at	Chestnut Hill Road/Butternut Lane
13	Long Ridge Road (Route 104)	at	Hunting Ridge Road S
14	Long Ridge Road (Route 104)	at	Wildwood Road
15	Long Ridge Road (Route 104)	at	River Bank Road
16	Long Ridge Road (Route 104)	at	Erskine Road
17	Long Ridge Road (Route 104)	at	Old Long Ridge Road (northern)
	High Ridge Road		
18	High Ridge Road (Route 137)	at	Cold Spring Road (Route 137)
19	High Ridge Road (Route 137)	at	Lord & Taylor Drive
20	High Ridge Road (Route 137)	at	Oaklawn Avenue/Cross Road
21	High Ridge Road (Route 137)	at	Terrace Avenue
22	High Ridge Road (Route 137)	at	Unity Road/Brownley Road
23	High Ridge Road (Route 137)	at	Lakeview Drive/Rippowam High School Drive
24	High Ridge Road (Route 137)	at	Loveland Road
25	High Ridge Road (Route 137)	at	Dannel Drive/Mercedes Lane
26	High Ridge Road (Route 137)	at	Ridge Park Road
27	High Ridge Road (Route 137)	at	Hartswood Road
28	High Ridge Road (Route 137)	at	Bradley Place
29	High Ridge Road (Route 137)	at	Merriman Road
30	High Ridge Road (Route 137)	at	Vine Road/Private Drive
31	High Ridge Road (Route 137)	at	Cedar Height Road/Turn of River Road
32	High Ridge Road (Route 137)	at	Olga Drive/Private Drive
33	High Ridge Road (Route 137)	at	Square Acres Drive/Shopping Plaza
34	High Ridge Road (Route 137)	at	Route 15 NB Ramps/Buxton Farms Road
35	High Ridge Road (Route 137)	at	Route 15 SB Ramps
36	High Ridge Road (Route 137)	at	Wire Mill Road
37	High Ridge Road (Route 137)	at	Scofieldtown Road
38	High Ridge Road (Route 137)	at	Interlaken Road
39	High Ridge Road (Route 137)	at	Brookdale Road
40	High Ridge Road (Route 137)	at	North Stamford Road (southern)
41	High Ridge Road (Route 137)	at	North Stamford Road (northern)
42	High Ridge Road (Route 137)	at	Sunset Road
43	High Ridge Road (Route 137)	at	Briar Brae Road
44	High Ridge Road (Route 137)	at	Mayapple Road

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgepor t, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

3.4.3.1 Signalized Intersections

The results of the signalized intersections capacity analyses indicate that several signalized study intersections are projected to operate with an overall LOS E or F during the peak periods, up from four for the existing conditions. These intersections are discussed below.

#2 Long Ridge Road at Cold Spring Road

The overall intersection is projected to operate at LOS F during the weekday morning peak period but LOS D during the weekday evening peak period.

During the morning and evening peak periods, vehicle queues in the eastbound left-turn lanes on Cold Spring Road will exceed the available storage and will partially obstruct the flow of eastbound through vehicles on Cold Spring Road.

During the morning peak period, vehicle queues in the westbound through lanes on Cold Spring Road will exceed the available storage partially obstructing the flow of southbound through vehicles on High Ridge Road.

During the morning and evening peak periods, vehicle queues in the southbound right-turn lane on Long Ridge Road will exceed the available storage partially obstructing the flow of southbound through vehicles on Long Ridge Road.

In the morning peak-hour, average delays are projected to increase from approximately 45 seconds (existing) to approximately 85 seconds, precipitating a change in Level-of-Service from D to F.

#4 Long Ridge Road at Terrace Avenue

The overall intersection is projected to operate at LOS E during the weekday morning peak period but LOS C during the weekday evening peak period.

During the morning peak period, long vehicle queues on southbound Long Ridge Road will block upstream intersections making it difficult to make a left-turn onto Long Ridge Road at those locations.

In the morning peak-hour, average delays are projected to increase from approximately 16 seconds (existing) to approximately 57 seconds, precipitating a change in Level-of-Service from B to E.

#6 Long Ridge Road at Stillwater Road/Buckingham Drive

The overall intersection is projected to operate at LOS E during the weekday morning peak period but LOS F during the weekday evening peak period.

During the morning and evening peak periods, vehicle queues in the southbound right-turn lane will exceed the available storage and interrupt the flow of southbound through vehicles on Long Ridge Road while vehicle queues in the northbound left-turn lane will exceed the available storage and interrupt the flow of through vehicles on Long Ridge Road. Vehicle queues on the eastbound Stillwater Road approach will extend past Roxbury Road during both periods, greatly interfering with the ability of vehicles to make left-turns from Roxbury Road to Stillwater Road.

In the morning peak-hour, average delays are projected to increase from approximately 31(existing) seconds to approximately 62 seconds, precipitating a change in Level-of-Service from C to E. In the evening peak-hour, average delays are projected to increase from approximately 61(existing) seconds to approximately 140 seconds, precipitating a change in Level-of-Service from E to F. The entire intersection configuration is currently being studied for redesign by Tighe & Bond.

#10 Long Ridge Road at Route 15 Northbound Off-ramp / Wire Mill Road

The overall intersection will operate at LOS F during the weekday morning and evening peak periods.

During the morning peak period, long vehicle queues in the southbound through lanes will block access to the southbound left-turn lane and long vehicle queues in the eastbound through/right-turn lane will block the eastbound left-turn lane.

During the evening peak period, long vehicle queues in the northbound through lanes will extend past Wire Mill Road and Maltbie Avenue, interfering with the ability of vehicles to make left-turns from these streets to Long Ridge Road. Long vehicle queues in the eastbound through/right-turn lane will block the eastbound left-turn lane.

In the morning peak-hour, average delays are projected to increase from approximately 80 seconds (existing) to approximately 146 seconds, while in the evening peak-hour, average delays are projected to increase from approximately 99 seconds (existing) to approximately 165 seconds.

#11 Long Ridge Road at Route 15 Southbound Ramps

The overall intersection will operate at LOS E during the weekday evening peak period.

During the evening peak period, long vehicle queues in the westbound right-turn lane will block access to the westbound left-turn lane and long vehicle queues in the eastbound through/right-turn lane will block the eastbound left-turn lane.

In the evening peak-hour, average delays are projected to increase from approximately 26 seconds (existing) to approximately 49 seconds, precipitating a change in Level of Service from C to E.

#18 High Ridge Road at Cold Spring Road (Route 137)

The overall intersection is projected to operate at LOS E during the weekday morning peak period but LOS F during the weekday evening peak period.

During the morning peak period, the eastbound Cold Spring Road approach will operate at LOS F with long vehicle queues on the eastbound approach that back up through the upstream signalized intersection with Long Ridge Road to the west. The westbound retail center driveway approach will also operate at LOS F.

During the evening peak period, the eastbound Cold Spring Road approach will operate at LOS F with long vehicle queues that back up through the upstream signalized intersection with Long Ridge Road to the west, while the northbound approach will also operate at LOS F and queues will back up through Bedford Street. The westbound Home Goods driveway approach will operate at LOS E.

In the morning peak-hour, average delays are projected to increase from approximately 37 seconds to approximately 71 seconds, precipitating a change in Level-of-Service from D to E. In the evening peak-hour, average delays are projected to increase from approximately 44 seconds to approximately 103 seconds, precipitating a change in Level-of-Service from D to E.

#20 High Ridge Road at Oaklawn Avenue

The overall intersection is projected to operate at LOS D during the weekday morning peak period but LOS F during the weekday evening peak period.

During the morning peak period, the northbound approach on High Ridge Road will operate at LOS F and vehicle queues on will extend past the Lord & Taylor driveway, greatly interfering with the ability of vehicles to make left-turns from the Lord & Taylor driveway onto High Ridge Road. Vehicle queues on the westbound Oaklawn Avenue approach will operate at LOS E and will extend past Halpin Avenue, greatly interfering with the ability of vehicles to make left-turns from Halpin Avenue to Oaklawn Avenue.

During the evening peak period, the northbound approach on High Ridge Road will operate at LOS F and vehicle queues on will extend past the Lord & Taylor driveway, greatly interfering with the ability of vehicles to make left-turns from the Lord & Taylor driveway onto High Ridge Road. The westbound Oaklawn Avenue approach will also operate at LOS F and vehicle queues will extend past Halpin Avenue, greatly interfering with the ability of vehicles to make left-turns from Halpin Avenue to Oaklawn Avenue.

In the morning peak-hour, average delays are projected to increase from approximately 26 seconds (existing) to approximately 41 seconds, precipitating a change in Level-of-Service from C to D. In the evening peak-hour, average delays are projected to increase from approximately 45 seconds (existing) to approximately 136 seconds, precipitating a change in Level-of-Service from D to F.

#20-A High Ridge Road at Cross Road

The overall intersection is projected to operate at LOS C during the weekday morning peak period but LOS E during the weekday evening peak period.

During the morning peak period, vehicle queues on the northbound approach on High Ridge Road are projected to extend back to the Oaklawn Avenue intersection, interfering with the ability of vehicles to exit Oaklawn Avenue onto High Ridge Road.

During the evening peak period, the northbound approach on High Ridge Road will operate at LOS F and vehicle queues on will extend past the Oaklawn Avenue intersection, greatly interfering with the ability of vehicles to exit Oaklawn Avenue onto High Ridge Road.

In the evening peak-hour, average delays are projected to increase from approximately 21 seconds (existing) to approximately 125 seconds, precipitating a change in Level-of-Service from B to E.

#30 High Ridge Road at Vine Road/Private Drive

The overall intersection operates at LOS E during the weekday morning peak period but a LOS F during the weekday evening peak period.

During the morning peak period, long vehicle queues in the westbound left-turn lane and on the northbound approach will spill back and block the adjacent lanes and intersections, respectively. Long vehicle queues in the southbound left-turn lane will exceed the storage capacity, partially blocking the through movement.

During the evening peak period, long vehicle queues in the westbound right-turn lane, the southbound left-turn lane and on the northbound approach will spill back and block the adjacent lanes and intersections.

In the morning peak-hour, average delays are projected to increase from approximately 37 seconds (existing) to approximately 64 seconds, precipitating a change in Level of Service from D to E. In the evening peak-hour, average delays are projected to increase from approximately 112 seconds (existing) to approximately 180 seconds.

#31 High Ridge Road at Cedar Heights Road/Turn of River Road

The overall intersection operates at LOS D during the weekday morning peak period but a LOS F during the weekday evening peak period.

During the morning peak period, long vehicle queues on the southbound approach will spill back and block the adjacent driveways while vehicle queues in the eastbound right-turn lane and westbound left-turn lane will exceed the storage capacity and partially block the other movements on those approaches.

During the evening peak period, long vehicle queues on the southbound approach, the northbound approach, in the northbound left-turn lane, the westbound left-turn lane and the eastbound through/right-turn lane will spill back and block the adjacent driveways, lanes and intersections, respectively.

In the morning peak-hour, average delays are projected to increase from approximately 27 (existing) seconds to approximately 41 seconds, precipitating a change in Level of Service from C to D. In the evening peak-hour, average delays are projected to increase from approximately 58 (existing) seconds to approximately 112 seconds, precipitating a change in Level of Service from E to F.

#34 High Ridge Road at Route 15 NB Ramps/Buxton Farms Road

The overall intersection operates at LOS F during the weekday morning and evening peak periods.

During the morning and evening peak periods, long vehicle queues in the Route 15 off-ramp left-turn and through lanes will block access to the channelized right-turn lane, vehicle queues in the westbound Buxton Farms right-turn lane onto Long Ridge Road will block access to the adjacent turning lanes. Excessive vehicle queues in the northbound Long Ridge Road through lanes will back up to the upstream signalized intersection with Square Acres Drive and the shopping plaza driveway to the south, while excessive vehicle queues in the southbound Long Ridge Road through lanes will back up to the upstream signalized intersection with the southbound off-ramp.

In the morning peak-hour, average delays are projected to increase from approximately 78 seconds (existing) to approximately 132 seconds, precipitating a change in Level of Service from E to F, while in the evening peak-hour, average delays are projected to increase from approximately 54 seconds (existing) to approximately 116 seconds, precipitating a change from E to F.

#35 High Ridge Road at Route 15 SB Ramps

The overall intersection is projected to operate at LOS F during the weekday morning peak period and LOS D during the weekday evening peak period.

During the morning and afternoon peak periods, long vehicle queues on the jughandle to the southbound ramp will spill back and interrupt the flow of northbound through vehicles on High Ridge Road, while long vehicle queues on southbound High Ridge Road will spill back and block the intersection of Wire Mill Road.

During the morning peak hour, long vehicle queues on the Parkway off ramp will spill back to the parkway presenting a potential safety hazard for through vehicles on the Parkway, while vehicles queues on northbound High Ridge Road will spill back to Buxton Farm Road.

In the morning peak-hour, average delays are projected to increase from approximately 76 seconds (existing) to 152 seconds, precipitating a change in Level of

Service from E to F. In the evening peak-hour, average delays are projected to increase from approximately 26 seconds (existing) to 35 seconds, precipitating a change in Level of Service from C to D.

#37 High Ridge Road at Scofieldtown Road

The overall intersection is projected to operate at LOS A during the weekday morning peak period and LOS during the weekday evening peak period.

During the morning peak period, the southbound High Ridge Road approach operates at LOS F with excessive vehicle queues which block the unsignalized connector road accommodating left-turns from Scofieldtown Road to northbound High Ridge Road.

In the morning peak-hour, average delays are projected to increase from approximately 24 seconds (existing) to 56 seconds, precipitating a change in Level of Service from C to E.

The remaining signalized study intersections will operate with overall LOS D or better conditions during the peak periods. However, LOS E or F conditions were identified for individual turning movements, commonly from side street approaches, at many of these intersections. The long delays on the side streets, generally caused by relatively long intersection cycle lengths, allow for greater capacity for the higher volume Long Ridge Road and High Ridge Road approaches. Progression along Long Ridge Road and High Ridge Road should take priority, and therefore, LOS E or F should be considered tolerable for some of the low volume side street movements. The signalized study intersections with projected individual turning movements experiencing LOS E or F conditions and/or excessive vehicle queuing are identified below.

#1 Long Ridge Road at High Ridge Road / Bedford Street / Summer Street

During the morning peak period, the Long Ridge Road eastbound left-turn movement onto High Ridge Road and the southbound High Ridge Road through movement will operate at LOS F, the latter with excessive vehicle queues that back up through the upstream signalized intersection with Cold Spring Road to the north.

#3 Long Ridge Road at Drives to Olin Chemicals / Lord & Taylor

During the morning peak period, the Olin Chemicals eastbound approach and Lord & Taylor westbound approach will operate at LOS E; however, these side street approaches have relatively low traffic volumes.

During the evening peak period, the Olin Chemicals eastbound approach will operate at LOS E; however, this side street approach has relatively low traffic volumes.

#5 Long Ridge Road at Woodridge Drive South

During the morning peak period, the westbound Woodridge Drive South approach will operate at LOS E; however, this side street approach has relatively low traffic volumes.

#7 Long Ridge Road at Stamford Medical Center Driveway

During the evening peak period, the westbound left/thru lane will operate at LOS E; however, this side street approach has relatively low traffic volumes.

#11A Long Ridge Road at the Webbs Hill Road

During the morning peak period, the westbound left-turn movement from the Merritt Parkway off ramp will operate at LOS E.

#19 High Ridge Road at Lord & Taylor Drive / Bull's Head Shopping Center

During the morning peak period, the left-turn exiting movement from the Bull's Head Shopping Center will operate at LOS E with vehicle queues that extend into the shopping center parking aisles. Additionally, vehicle queues in the northbound through lanes on High Ridge Road back up into the upstream signalized intersection with Cold Spring Road to the south.

During the evening peak period, the left-turn movements from the Bull's Head Shopping Center driveway the Lord & Taylor Driveway will operate at LOS E, as will the northbound through movement on High Ridge Road. Vehicle queues in the northbound through lanes on High Ridge Road will back up into the upstream signalized intersection with Cold Spring Road to the south.

#21 High Ridge Road at Terrace Avenue

During the evening peak period, the westbound left-turning movement from the private drive will operate at LOS F.

#22 High Ridge Road at Unity Road / Brownley Road

During the morning and evening peak periods, the eastbound Brownley Road approach and the westbound Unity Road approach will operate at LOS E; however, the side street approaches have relatively low traffic volumes.

#23 High Ridge Road at Lakeview Drive / Rippowam High School Drive

During the morning and evening peak periods, the eastbound Lakeview Drive approach will operate at LOS E.

#24 High Ridge Road at Loveland Road

During the morning peak period, the eastbound Loveland Road approach will operate at LOS E.

#32 High Ridge Road at Olga Drive / Private Drive

During the evening peak period, the westbound private driveway will operate at LOS E; however, the side street approach has relatively low traffic volumes.

3.4.3.2 Unsignalized Intersections

The results of the capacity analyses indicate that several of the unsignalized study intersections operate with LOS E or F conditions on the side street during one or both peak periods. The excessive delays on the side street approaches are mostly attributed to the high traffic volumes along Long Ridge Road and High Ridge Road. Due to these high traffic volumes, vehicles at some side street approaches experience long delays during the peak periods as they wait for acceptable gaps in traffic to safely enter the traffic stream. The unsignalized intersections currently operating with LOS E or F conditions are discussed below.

#12 Long Ridge Road at Chestnut Hill Road / Butternut Lane

During the morning and evening peak periods, the eastbound Butternut Lane approach will operate at LOS F.

During the morning and evening peak periods, the westbound Chestnut Hill Road approach operates at LOS F with excessive delays.

During the morning and evening peak periods, the southern connector roadway from Chestnut Hill Road operates at LOS F.

In the morning peak-hour, average delays are projected to increase from approximately 270 seconds (existing) to approximately 761 seconds. In the evening peak-hour, average delays are projected to increase from approximately 83 seconds (existing) to approximately 259 seconds.

#13 Long Ridge Road at Hunting Ridge Road South

During the morning and evening peak periods, the westbound Hunting Ridge Road South approach will operate at LOS F with excessive delays.

In the morning peak-hour, average delays are projected to increase from approximately 68 seconds (existing) to approximately 167 seconds. In the evening peak-hour, average delays are projected to increase from approximately 64 seconds (existing) to approximately 202 seconds.

#14 Long Ridge Road at Wildwood Road

During the morning peak period, the eastbound Wildwood Road approach will operate at LOS F. During the evening peak period, it will operate at LOS E.

During the morning and evening peak periods, the westbound Wildwood Road approach will operate at LOS F.

In the morning peak-hour, average delays on the eastbound approach are projected to increase from approximately 46 seconds (existing) to 132 seconds, while in the evening peak hour, they are projected to increase from approximately 28 seconds (existing) to 47 seconds. On the westbound approach, they are projected to increase from approximately 170 seconds (existing) to more than 1,000 seconds. In the evening peak-hour, average delays on the westbound approach are projected to increase from approximately 56 seconds (existing) to approximately 186 seconds.

#15 Long Ridge Road at Riverbank Road

During the morning peak period, the eastbound Riverbank Road approach will operate at LOS F while during the evening peak period, it will operate at LOS E

In the morning peak-hour, average delays are projected to increase from approximately 29 seconds (existing) to approximately 51 seconds. In the evening peak-hour, average delays are projected to increase from approximately 24 seconds (existing) to approximately 40 seconds.

#16 Long Ridge Road at Erskine Road

During the morning peak period, the eastbound Erskine Road approach will operate at LOS E, while the westbound approach will operate at LOS F.

In the morning peak-hour, average delays on the eastbound approach are projected to increase from approximately 36 seconds (existing) to 88 seconds while average delays on the westbound approach are projected to increase from approximately 30 seconds (existing) to 46 seconds.

#17 Long Ridge Road at Old Long Ridge Road

During the morning peak period, the westbound Old Long Ridge Road approach will operate at LOS F.

In the morning peak-hour, average delays on the westbound approach are projected to increase from approximately 30 seconds (existing) to 50 seconds.

#29 High Ridge Road at Merriman

During the morning peak period, the westbound Merriman Road approach will operate at LOS F. This condition will also likely prevail during the evening peak period, although motorists will probably look for alternative ways to go south on High Ridge Road other than turning left from Merriman Road.

In the morning peak-hour, average delays are projected to increase from approximately 56 seconds to approximately 101 seconds.

#36 High Ridge Road at Wire Mill Road

During the morning peak period, the eastbound Wire Mill Road approach will operate at LOS F.

In the morning peak-hour, average delays are projected to increase from approximately 195 seconds to approximately 640 seconds.

#37A High Ridge Road at the Unsignalized Scofieldtown Road Connector

During the morning and evening peak periods, the eastbound Scofieldtown Road connector approach will operate at LOS F with excessive delays.

In the morning peak-hour, average delays are projected to increase from approximately 137 seconds to approximately 510 seconds, while in the evening peak-hour, average delays are projected to increase from approximately 45 seconds to more than 1,000 seconds.

#40 High Ridge Road at North Stamford Road (south)

During the morning and evening peak periods, the westbound North Stamford Road approach will operate at LOS E.

In the morning peak-hour, average delays on the westbound approach are projected to increase from approximately 31 seconds (existing) to 48 seconds, while in the morning peak-hour, average delays on the westbound approach are projected to increase from approximately 25 seconds (existing) to 35 seconds.

As can be seen from the analyses, traffic operating conditions are projected to get progressively worse with the passage of time. As a result excessive congestion will be experienced at the major signalized intersections, with the associated traffic safety issues. Similarly, excessive delays will be encountered on the busier unsignalized side street approaches to the corridor, particularly north of the Merritt Parkway.

3.5 Safety Analysis

As previously indicated in the existing conditions section of this report, in order to assess safety conditions along the Long Ridge Road and High Ridge Road corridors, accident history was reviewed at each of the study intersections for the most recent available three-year period, January 2006 through December 2008. This review indicated that there were 575 accidents in this study period along both corridors and that there were 4 signalized intersections which experienced 30 or more accidents and one unsignalized intersection which experienced 15 or more accidents.

While accidents are random occurrences and the number of accidents which will occur in any given three-year period will vary, statistically it would be expected that the projected 5% increase in traffic volumes between 2011 and 2016 would result in an additional 30 accidents, while the projected 11.3% increase in traffic volumes between 2011 and 2026 would result in an additional 65 accidents and the projected 16% increase in traffic volumes between 2011 and 2036 would result in an additional 93 accidents.

From a practical perspective, since these increases in traffic volumes are projected to result in increased in delays and congestions, and since congestion and longer delays are associated with higher accident rates, it is expected that the increase in accidents is more likely to be closer to the projected 9% increase in time spent by motorists on the corridor between 2011 and 2016, the projected 22% increase in time spent by motorists on the corridor between 2011 and 2026 and the projected 33% increase in time spent by motorists on the corridor between 2011 and 2036. Intersections which currently have a high accident rate (30 or more accidents at signalized intersections and 15 or more at unsignalized intersections) are listed below:

- Long Ridge Road at High Ridge Road/Summer Street;
- Long Ridge Road at Stillwater Road/Buckingham Drive;
- High Ridge Road at Cedar Heights Road/Turn of River Road;
- High Ridge Road at Rt 15 NB Ramps/Buxton Farm Road;
- High Ridge Road at Wire Mill Road.

It is expected that the following additional intersections will experience a high accident rate by 2016:

- High Ridge Road at Vine Road.

It is expected that the following additional intersections will experience a high accident rate by 2026:

- High Ridge Road at Square Acres Drive.

It is expected that the following additional intersections will experience a high accident rate by 2036:

- Long Ridge Road at Chestnut Hill Road/Butternut Lane.

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Alternatives

The analysis of existing and future transportation conditions (congestion and delays, accidents, physical infrastructure, speed, etc.) in the study area identified areas of the transportation network that require improvements, either infrastructure or system management improvements. Policy decisions related to access control, land assembly, zoning, and business assistance mechanisms were also considered. A range of transportation improvements were identified through TAG vetting and extensive public outreach throughout the study.

This chapter presents a summary of the alternatives that have been identified as having the greatest potential to address the transportation system issues, deficiencies, and opportunities. Included is a screening and evaluation assessment for each recommendation. Each category discussed in this chapter is not in any specific order of significance or priority. Key points from this chapter include:

Evaluation Criteria –Ranking the evaluation criteria (as described in Chapter 1) in order of importance was accomplished through input from the TAG, public meeting discussion, and surveys. The final evaluation of the criteria, places the greatest emphasis on the following mobility and safety considerations.

- Mobility Benefits;
- Cost Effectiveness;
- Economic Development Impact;
- Environmental Impacts;
- Degree of Local Support and State Goals and Plans; and
- Safety, Security, and Technology.

Alternatives Implementation – Potential alternatives were considered in three general categories:

- Immediate or Near-term
- Mid-term
- Long Term

4.1 Overview

The process of identifying and evaluating potential transportation system enhancements included in-depth public and TAG vetting. The identification of candidate options for each mode was accomplished over several TAG meetings and public input. The process initially began with the City Traffic and Planning staff traveling the corridor and reassessing deficiencies and opportunities identified at each location along the corridor and discussing practical options to address these needs and opportunities. The method of evaluating and screening these options involved applying weights to the evaluation criteria that were established at the outset of the study and refined during TAG Meetings. Doing so ensured that the candidate options for each transportation mode met the identified goals and objectives. The evaluation criteria were used as a decision-support mechanism used by the TAG to rate each proposed alternative to help guide phasing and prioritization recommendations.

The following is a brief description of each of the evaluation criteria.

4.1.1 Mobility Benefits

The project reduces delays and back-ups at intersections, improves transportation system reliability, reduces travel times and vehicle-miles traveled, improves modal accessibility by improved facilities and access for transit and pedestrian and bicycle transportation.

4.1.2 Cost Effectiveness

This considers the prospective cost/benefit of the project and the ability to phase the project over time.

4.1.3 Economic Development Impact

The project strengthens the City's economy by attracting/retaining existing businesses; sustaining residential development; or encouraging appropriate types of businesses which in turn creates jobs and an expanded tax base.

4.1.4 Environmental Impacts

The project considers preservation of the corridor's natural landscape (wetlands, floodplains, habitat, open spaces, historic areas), sustainability (vehicle emissions reductions), and the human environment (neighborhoods, schools, community facilities) which influence the overall quality of life on the corridors.

4.1.5 Degree of Local Support and State Goals and Plans

The project alternative is aligned with regional goals and municipal plans, goals, and visions so that the public agencies will "champion" the project for implementation.

4.1.6 Safety, Security, and Technology

The project results in safer conditions for drivers, bicyclists, pedestrians, and transit riders; and/or considers the use of technology for incident or event management.

4.2 Candidate Alternatives – Initial Screening

This section describes the alternatives that were identified as having the potential to address the transportation system issues and deficiencies and meet the goals and objectives of this study. This preliminary screening evaluation is the equivalent of a "fatal flaw" assessment that helped to discard recommendations that are either outside the scope of this study, do not address the goals or objectives, or deemed to be not realistic or feasible. Section 4.3 will discuss the evaluation and packaging of the screened alternatives from this section.

4.2.1 Previous Recommendations Considered

There have been many studies and recommendations for transportation-related improvements in the Corridors over the years. Among these were a complete and complex redesign/reconstruction of the interchange of the Merritt Parkway with High Ridge Road (which was deemed to be too ambitious, from both a cost and an environmental perspective).

These studies were reviewed prior to the development of new alternatives for the LRR-HRR Corridor Study, and many of the options were revisited, refined, and incorporated into the study recommendations.

4.2.2 Screening of Candidate Recommendations

Since the beginning of the LRR-HRR Corridor Study, many suggestions were made regarding potential transportation system enhancements. These suggestions were made through one of the many outreach mechanisms for the study, including: public meetings; online comment forms; TAG meetings; and stakeholder outreach meetings. The candidate improvements were organized into one of the following categories:

- Transit options;
- Pedestrian/Bicycle options;
- Roadway Improvements; and

- Policy Recommendations.

The specific recommendations considered in each category are highlighted in the following sections. Information on recommendations that were not carried forward for further consideration based on preliminary reviews can be found in the appendix.

4.2.2.1 Transit Options

The following transit improvements were carried forward for further consideration in this study:

- Upgrade pedestrian stops with improved facilities (sidewalks, shelters, ADA accessibility);
- Improve bus headways;
- Consolidate and formalize stops;
- Install GPS devices on CT Transit buses and develop an APP to let riders know where the next bus is and when it be will arrive;
- Coordinate CT Transit service with private shuttle services for businesses so that it provides an efficient connectivity; and
- Provide parking for bicycles adjacent to suitable key transit stop locations

4.2.2.2 Pedestrian/Bicycle Options

The following pedestrian/bicycle suggestions were carried forward for further consideration in this study:

- Implement consistent Corridor-long crosswalks and signs; use an approved standard;
- Install crosswalks with countdown timers at all crossings;
- Upgrades to pedestrian accommodations (sidewalks/crosswalks); provide sidewalks where possible or warranted, especially at pedestrian activity nodes and bus stop locations; install median islands for pedestrian refuge where warranted and feasible;
- With very few, if any, exceptions, provide walking pathways on both sides of both corridors;

- With very few, if any, exceptions, provide bike accommodations along both sides of both corridors (options that would allow for narrowing the roadway to two lanes (one lane each direction) with wider shoulders for bikes were considered but rejected due to existing heavy traffic demand and projected higher volumes);
- Provide pedestrian and bicycle connections across the Merritt parkway on both corridors;
- Update bicycle signage to current Manual on Uniform Traffic Control Devices (MUTCD) standards;
- Develop City-wide Bike Network Plan to connect the missing links between suitable roads for bicycles; and
- Provide additional bicycle parking along the corridors

4.2.2.3 Roadway Improvements

The following roadway improvements were carried forward for further consideration in this study:

- Pavement marking, signing and signal optimization at key signalized intersections;
- Widening key intersection approaches to accommodate turn lanes or additional turn lanes;
- New traffic signals at unsignalized intersections currently experience excessive delay and/or safety deficiencies and meeting one of the warrants per MUTCD;
- Squaring off Skewed "T" intersections to reduce speed and improve sight line and operations;
- Installing median barriers;
- Reduce speed limits incrementally along various sections of the corridors;
- Install individual vehicle-responsive traffic speed limit signs; and
- Improve intersection sightlines at key intersections

4.2.2.4 Policy Recommendations

The following policy recommendations were carried forward for further consideration in this study:

- Support transit-oriented development (TOD) within the confines of current zoning to promote/support enhanced transit services to and from the Bulls Head area;

- Eliminate on-street corridor parking;
- Promote the concept of car sharing and bike sharing services; and
- Promote the consolidation of driveways and the provision of primary egress to side streets under signal control;
- Establish TDM program requirements in zoning for new, large projects and include bicycle parking/sidewalks with new developments;
- Expand Complete Streets Program, identify candidate locations;
- Encourage the use of alternative fuels for transit vehicles and identify sites for future electric vehicle charging stations; and
- Establish a committee/staff position to progress the implementation of the LRR-HRR Corridor Study recommendations/Action Plan.

Bicycle parking at transit stops

Alternatives considered (See appendix) but rejected included:

- The aforementioned complete reconfiguration/reconstruction of the Merritt Parkway interchange with High Ridge Road – Rejected for financial and cost reasons;
- Replacing the signalized intersections of the Merritt Parkway with Long Ridge Road, as well as High Ridge Road at Buxton Farms Road with roundabouts – Rejected for lack-of-capacity reasons as well as for the fact that the roundabouts would experience gridlock when queues of vehicles on the ramps accessing the main line of the Merritt parkway spill back through these intersections;
- Implementing a "road diet" on Long Ridge Road and High Ridge Road south of the Merritt parkway (reducing the number of through lanes from 4 to 2, adding turn lanes as well as pedestrian and bicycle amenities) – Analyses indicated that the intersections delays would increase by an order of magnitude (10 times);
- Installing a traffic signal on Long Ridge Road at Barnes Road or River Oaks (Based on side street volumes, traffic signal warrants would not be satisfied);
- Replacing the three signalized intersection of the bulls head with roundabouts – Analyses indicated that delays would be substantially increased;
- Reconfiguring the Bulls Head to that it would operate as a one-way system (Long Ridge Road southbound to High Ridge Road north eastbound to Cold Spring Road westbound;
- Constructing a bypass of Bulls Head on its north side - Did not meet necessary levels of local public and City support with major right of way impact; and

Recommending increasing development densities in the Bulls Head to support increased transit use – Did not meet necessary levels of local public and City support.

4.3 Evaluation of Recommended Alternatives

Section 4.2 represented a preliminary "fatal flaw" screening of the recommendations to examine ideas with the potential to address the transportation system issues and deficiencies on the corridors. This section describes how more detailed assessments and evaluations were undertaken of each option carried forward.

4.3.1 Packaging and Rating Method

The options carried forward from the initial fatal-flaw screening were further refined by study design team and the TAG. Synchro™ and SimTraffic™ analyses were performed for the various intersection capacity improvement options to determine what most effectively addressed the capacity needs while, at the same time, the options were reviewed from the perspective of how they would accommodate pedestrian, bicycle and transit needs. The living options were conceptually laid out on aerial photographs of the corridor and identified options tabbed for discussion with the TAG, as well as for consideration of the prospective costs (this initial identification of improvements, which goes into very specific detail and which will be useful when the overall improvements projects are implemented at a later date, is included in the appendix of the report).

The options were then streamlined by key sections and intersections and "packaged" for detailed evaluation by the TAG. This critical step helped consolidate the number of individual alternatives and many of the ideas that were related to each other either spatially or operationally. A detailed discussion of candidate alternatives is provided in the following sections.

A "Consumer Reports" approach was used to rate and compare how each alternative performed against the evaluation criteria using a combination of quantitative and qualitative assessments. Each of the alternatives under the transit, pedestrian/bicycle, and roadway improvement packages was evaluated based on the categories listed in Table 4-1 below:

Table 4-1 Evaluation Matrix Legend

Benefits	Negligible	Some	Moderate	Substantial
Detractions	Negligible	Some	Moderate	Substantial

The following sections discuss each of the alternatives by segment or intersection relative to transit, pedestrian/bicycle, and roadway improvements packages in detail.

Bulls Head

Short-Term Alternatives

- Restripe Bedford Street north from Locust Lane to eliminate one of the two northbound right-turn lanes on approaching Bulls Head so that only one lane turns right onto northbound High Ridge Road (a single lane has more than adequate capacity to accommodate demand on that movement and will allow northbound High Ridge Road to be restriped to better accommodate cyclists and pedestrians ad described hereafter)
- Restripe northbound High Ridge Road to provide at least a 5-foot shoulder for cyclists (with 6" to 8" shoulder striping) extending from northbound Bedford Street and around the corner onto High Ridge Road. Change policy and practice along the entire length of both corridors to use curb inlet grates, and eliminate street inlets
- Construct a clearly discernible, 5-foot wide sidewalk (and curb where missing) on the west side of Long Ridge Road and High Ridge Road, between Cold Spring Road and Bedford Street and on the north side of Cold Spring Road. This will require demarcation and construction of appropriate driveways, proper driveway aprons and ADA treatments and, in many cases, considerable driveway width reductions / access management
- Restripe southbound Long Ridge Road between Cold Spring Road and Bedford Street to provide 10.5 foot lanes and a 5-foot shoulder (with 6" to 8" shoulder striping)
- Restripe northbound Long Ridge Road between Cold Spring Road and Bedford Street to provide 10.5 foot lanes and a 4-foot shoulder (with 6" to 8" shoulder striping)
- On east side of Long Ridge Road between Cold Spring Road and Bedford Street, add a 5-foot wide sidewalk, 3-feet back from the curb, to complete the pedestrian connection on that side
- Add high visibility crosswalks and appropriate pedestrian signal equipment (countdown signals) on the north and east legs at the Long Ridge Road and Cold Spring Road intersection
- Provide plantings (to make attractive) on the existing concrete median on the north leg of High Ridge Road at the Bedford Street intersection

- At each signalized intersection in the Bulls Head area, reduce the signal cycle lengths to 90 seconds (shorter cycle lengths normally have shorter red intervals resulting in shorter delays and shorter queues) and refine signal timings and coordination. Set offset at the Long Ridge Road/High Ridge Road intersection to optimize through flow progression along both streets to accommodate demand

- Restripe Long Ridge Road immediately north of Cold Spring Road to provide minimum 11-foot lanes and a 5-foot shoulder (6 to 8-inch wide white stripe) in the northbound direction with sharrows and "SHARE THE ROAD" signs in a wider, southbound, right-hand lane
- Consider reducing the speed limit on all roads approaching the Bulls Head Area to 35 mph
- Reconstruct sidewalk in disrepair as necessary
- Add a physical barrier (tubular markers) on Summer Street immediately south of Long Ridge Road to prevent crossovers from Bedford Street to driveways on the west side of the road
- On the Long Ridge Road southbound approach to Cold Spring Road, set back the left-turn stop line by 10 feet
- On the eastbound Cold Spring Road approach to Long Ridge Road, add a second "Left Turn Only" sign
- On the north leg of High Ridge Road at the Bedford Street/Long Ridge Road intersection, install a high visibility crosswalk and countdown pedestrian indications
- On the Long Ridge Road southbound approach to Cold Spring Road, evaluate the ability to reduce the right turning radii to support shorter and safer crossings
- Install interactive speed signs on Cold Spring Road west of Bulls Head
- Upgrade bus stops with improved facilities (sidewalks, shelters, ADA accessibility)
- Improve transit headways
- Install GPS devices on CT Transit buses and develop an app to let customers know where the next bus is and when it will come
- Coordinate CT Transit service with private shuttle services so that they complement each other
- Provide parking for bicycles adjacent to suitable transit stops
- Encourage TOD development within the existing zoning framework
- Promote the concept of car sharing and bike sharing services

- Promote the consolidation of driveways and the provision of primary egress to side streets under signal control
- Establish TDM program requirements in zoning for new, large projects and include bicycle parking/sidewalks with new developments
- Expand Complete Streets Program, identify candidate locations
- Encourage the use of alternative fuels for transit vehicles and identify sites for future electric vehicle charging stations

Bulls Head Short-term Improvements

<u>*Mid-Term Alternatives*</u>

- Evaluate the effectiveness of the interactive speed signs on Cold Spring Road west of Bulls head and ascertain the ability to reduce the Speed limit to 35 mph, thereby enabling the installation of "Share the Road" markings and signs (Sharrows) to promote cycling

- On the east side of High Ridge Road, north of Bedford Street, install a barrier along the curb and construct a 5′-wide sidewalk next to a 5′ shoulder (with a 6″ to 8″ stripe and colorized pavement) in the vacated lane

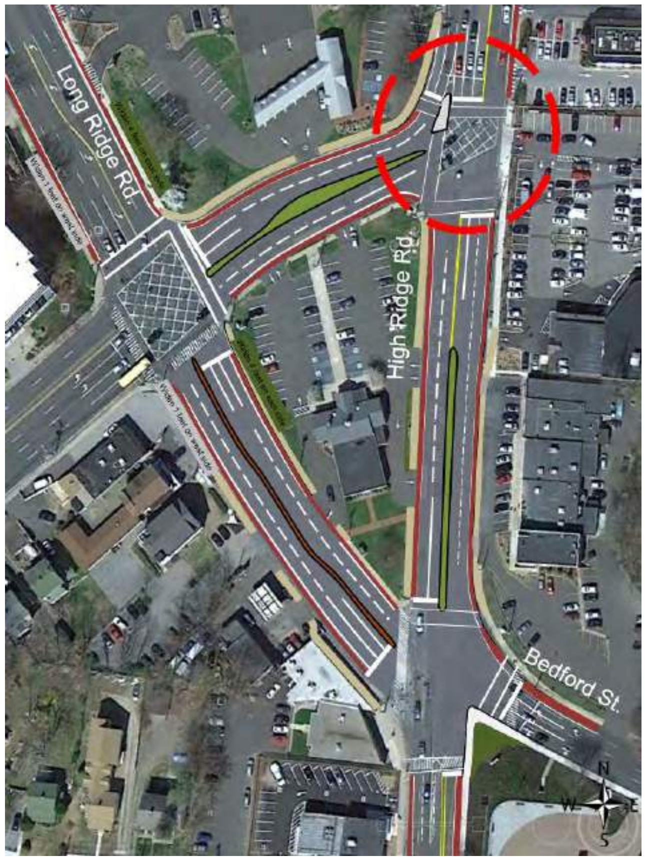
Bulls Head Mid-term Improvements

- Relocate the southern third of the median on the north leg of Long Ridge Road at the High Ridge Road/Bedford Street intersection one-foot to the west, to accommodate 10.5′ lanes and 5-foot shoulders in both directions
- Widen the east side of Long Ridge Road on the northbound approach to the Cold Spring Road intersection by 3 feet to accommodate 11′ lanes and a 5-foot shoulder (with a 6″ to 8″ stripe and colorized pavement)
- On Cold Spring Road between High Ridge Road and Long Ridge Road, narrow the center median by 2 feet on either side to provide 11′ lanes and 5-foot shoulders (with a 6″ to 8″ stripe and colorized pavement)

- Paint all shoulders suitable for bicycle use a different color to the roadway pavement
- Convert the north end of Summer Street to accommodate 2-way traffic, thereby at least allowing employees at 3001 Summer Street to exit to the north without first proceeding south on Summer Street and cutting across to return on Bedford Street

Long-Term Alternatives
- At each signalized intersection in the Bulls Head area, install textured crosswalks

- Construct a channelized, double right turn from High Ridge Road to Cold Spring Road



Long Ridge Road from Bulls Head to Stillwater Road

<u>*Short-Term Alternatives*</u>

- Restripe Long Ridge Road to provide 11-foot travel lanes, a 5-foot shoulder on the longer uphill sections of the roadway and a wider shoulder lane on the corresponding longer downhill sections of the road (transition 5-foot shoulder from one side of the road to the other would occur across signalized intersections). Five-foot shoulder line should be 6" to 8" wide
- Upgrade the existing sidewalk to ADA standards
- Upgrade bus stops with improved facilities (sidewalks, shelters, ADA accessibility)
- Upgrade pedestrian crossings at existing signalized intersections
- Improve transit headways
- Consolidate or formalize the number of bus stops
- Install GPS devices on CT Transit buses and develop an app to let customers know where the next bus is and when arriving

Long Ridge Road between Bulls Head and Stillwater Road - Short-term Improvements

<u>*Mid-Term Alternatives*</u>

- Add left-turn lanes at the main, signalized driveway serving 260 Long Ridge Road.
- Expand Complete Streets Program, by extending sidewalks and traffic calming measures into the cross/side streets

Long Ridge Road between Bulls Head and Stillwater Road - Mid-term Improvements

Long-Term Alternatives

- Widen the roadway to provide minimum 11′ travel lanes and 5′shoulder (colorized) for cyclists (with bold 6″ to 8″ shoulder striping) in each direction
- Add a new sidewalk along both sides of Long Ridge Road
- Provide connectivity to the proposed Mill River/Rippowam River pedestrian and bicycle trail

Long Ridge Road between Bulls Head and Stillwater Road - Long-term Improvements

Long Ridge Road at Stillwater Road

The City of Stamford is undertaking a separate project, being completed by others, at Stillwater Road, Roxbury Road and Buckingham Drive. That project will reconfigure these intersections to provide increased capacity and to simplify their operation (including upgraded pedestrian facilities).

Long Ridge Road from Stillwater Road to the Merritt Parkway

Short-Term Alternatives

- Restripe Long Ridge Road from Stillwater Road to 777 Long Ridge Road to provide 11-foot travel lanes, a 5-foot shoulder in the southbound direction and a wider shoulder lane in the northbound direction. Southbound shoulder line should be 6” to 8” wide
- Restripe Long Ridge Road from 900 Long Ridge Road to Vinyard lane to provide two 11-foot travel lanes, and two wider shoulder lanes
- Install “SHARE THE ROAD” signs and interactive speed signs
- Upgrade the existing sidewalk to ADA standards
- Vinyard Lane – Install measures to calm traffic along Vinyard Lane and Hunting Lane between Long Ridge Road and Wire Mill Road. Consideration may be given to speed humps and stop signs at key intersections, if and when warranted
- Upgrade bus stops with improved facilities (sidewalks, shelters, ADA accessibility)
- Improve transit headways

- Consolidate or formalize the number of bus stops
- Install GPS devices on CT Transit buses and develop an app to let customers know where the next bus is and when it will come
- Provide parking for bicycles adjacent to suitable transit stops

Long Ridge Road between Stillwater Road and Vinyard Lane - Short-term Improvements

<u>*Mid-Term Alternatives*</u>

- Future development of vacant parcels along the corridor, including at 710 Long Ridge Road, should include the construction of left-turn lanes on Long Ridge Road
- Construct left turn lanes on Long Ridge Road at River Oaks Driveway and at Barnes Road intersections. Consideration may also be given to installing a center turn lane on this segment of Long Ridge Road between the two intersections
- Install pedestrian crossings at existing signalized intersections
- Expand Complete Streets Program, by extending sidewalks and traffic calming measures into the cross/side streets

Long Ridge Road between Stillwater Road and Vinyard Lane

Long-Term Alternatives

- Add a new sidewalk along both sides of Long Ridge Road
- Widen the roadway to provide minimum 11′ travel lanes and 5 colorized shoulders (with bold 6″ to 8″ shoulder striping) in each direction
- Widen the roadway by 11 or more feet, to provide a center left-turn lane or a center two-way left-turn lane between the River Oaks Driveway and Barnes Lane with minimum 11′ through lanes and 5′, colorized shoulders (with bold 6″ to 8″ shoulder striping) in each direction. *Ped/Bicycle*

Long Ridge Road between Stillwater Road and Vinyard Lane - Long-term Improvements

Long Ridge Road at the Merritt Parkway

Short-Term Alternatives

- Traffic signal timing optimization and install interactive speed signs

Long-Term Alternatives

- Widen roadway to provide 5′ bike lanes and sidewalks on both sides of roadway
- At the northbound Parkway Exit Ramp, create a 110-foot long lane for through traffic to Wire Mill Road so that it does not block right-turning traffic and add a second right-turn lane off the ramp.
- Construct a path for pedestrians and cyclists parallel to Long Ridge Road and passing under the Merritt Parkway to connect the north and south sides of the Long Ridge corridor

Long Ridge Road at the Merritt Parkway - Long-term Improvements

Long Ridge Road at Chimney Corners

Short-Term Alternatives

- Install interactive speed signs
- Restripe Long Ridge Road to provide 11′ travel lanes and shoulder for cyclists (with 6″ to 8″ shoulder striping)
- Upgrade bus stops with improved facilities (sidewalks, shelters, ADA accessibility)

Long Ridge Road at the Chimney Corners - Short-term Improvements

Mid-Term Alternatives

- Expand Complete Streets Program, by extending sidewalks and traffic calming measures into the cross/side streets (Webbs Hill Road)

Long Ridge Road at the Chimney Corners - Mid-term Improvements

Long-Term Alternatives

- Widen the roadway to add 5′ wide colorized shoulder on both sides for cyclists
- Install a crosswalk and pedestrian signal indications on the north side of the intersection of Webbs Hill Road with Long Ridge Road

Long Ridge Road at the Chimney Corners - Long-term Improvements

Long Ridge Road at Chestnut Hill Road

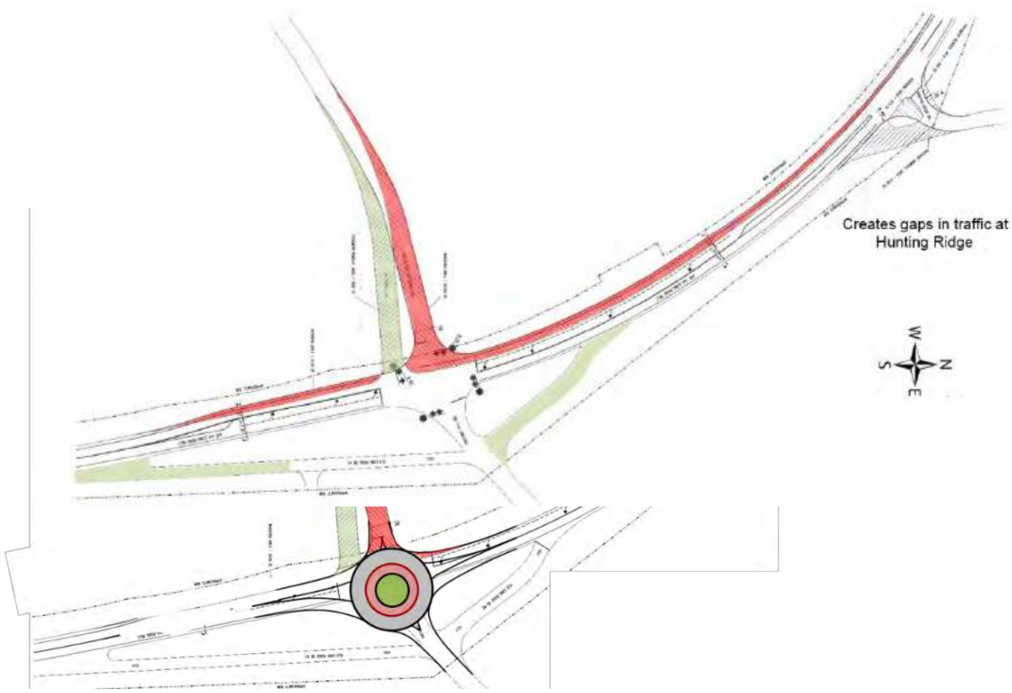
Short-Term Alternatives

- Install a W2-1 Intersection ahead warning sign with a W13-1P (30 mph) supplementary panel on southbound Long Ridge Road approaching Butternut Lane

Long-Term Alternatives

- Install a traffic signal and left-turn lanes on Long Ridge Road (preferred alternative)
- Construct a roundabout (second choice alternative)
- Square off the intersection of Hunting Ridge Road (south*)*

Long Ridge Road at the Chestnut Hill Road - Long-term Improvements



Long Ridge Road at Wildwood Road

Short-Term Alternatives

- Add a W13-1P (40 mph) supplementary panel to the intersection ahead warning sign on northbound Long Ridge Road approaching Wildwood Road.

Long-Term Alternatives

- Install a traffic signal
- Channelize the eastbound right-turn out Wildwood Road and cut back the rock outcrop to the north of the intersection to improve sightlines

Long Ridge Road at the Wildwood Road - Long-term Improvements

Channelize the eastbound Right-turn Movement and Improve Sightlines

Improvements to Long Ridge Road at Wildwood Road Install a Traffic Signal

Long Ridge Road at Mountain Wood Road

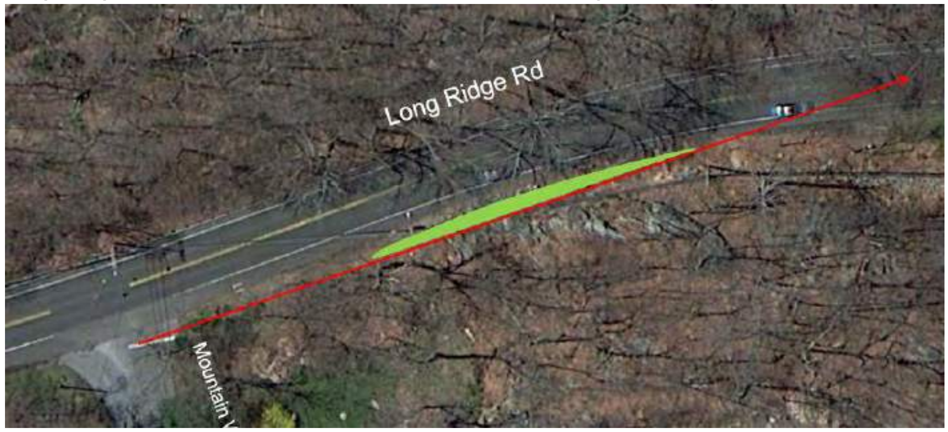
<u>*Short-Term Improvements*</u>

- Install a W2-1 Intersection ahead warning sign with a W13-1P (30 mph) supplementary panel on southbound Long Ridge Road approaching Mountain Wood Road

<u>*Long-Term Alternatives*</u>

- Cut back the rock outcrop on the east side of Long Ridge Road on the curve north of Mountain Wood Road to increase sightlines

Long Ridge Road at the Mountain Wood Road - Long-term Improvements

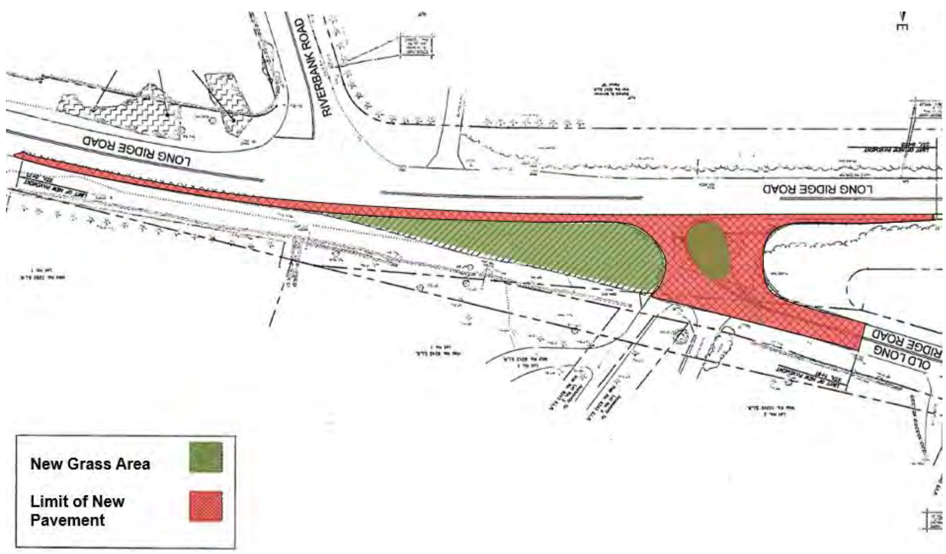


Long Ridge Road at Old Long Ridge Road (south)

Long-Term Alternatives

- Square off the intersection of Long Ridge Road and Old Long Ridge Road to reduce speed and provide safer sight lines

Long Ridge Road at the Old Long Ridge Road (South) - Long-term Improvements



Long Ridge Road from Chimney Corners to the NY State Line

Short-Term Alternatives

- Where travel lanes on Long Ridge Road is wider than 23 feet, restripe the roadway to provide 11-foot travel lanes and wider shoulders (with a 6" to 8 " wide shoulder line)
- Reduce speed limit to 40 mph, install interactive speed signs, and provide periodic speed enforcement

- Institute routine maintenance at key intersections on Long Ridge Road to maintain vegetation and maximize sightlines
- Add a W13-1P (40 mph) supplementary panel to the intersection ahead warning sign on northbound Long Ridge Road approaching River Bank Road
- Install a W2-1 Intersection ahead warning sign with a W13-1P (40 mph) supplementary panel on northbound Long Ridge Road approaching Erskine Road
- Upgrade bus stops with improved facilities (shelters)
- Improve transit headways
- Consolidate or formalize the number of bus stops
- Install GPS devices on CT Transit buses and develop an app to let customers know where the next bus is and when it arrive

Long Ridge Road from Chimney Corners to the NY State Line - Short-term Improvements

<u>*Long-Term Alternatives*</u>

- Widen the roadway by one to seven feet to provide 11-foot travel lanes and 5-foot colorized shoulders with a 6″ to 8″ shoulder line (preferred alternative)

Long Ridge Road from Chimney Corners to the NY State Line - Long-term Preferred Alternative Improvements

- Construct a 10-foot wide pedestrian and bicycle path parallel to Long Ridge Road (second choice alternative)

Long Ridge Road from Chimney Corners to the NY State Line - Long-term 2nd Choice Alternative Improvements

High Ridge Road from the NY State Line to Wire Mill Road

<u>*Short-Term Alternatives*</u>

- Where travel lanes on Long Ridge Road is wider than 23 feet, restripe the roadway to provide 11-foot travel lanes and wider shoulders (with a 6” to 8 “ wide shoulder line)
- Reduce speed limit to 40 mph, install interactive speed signs, and provide periodic speed enforcement
- Institute routine maintenance at key intersections on High Ridge Road to maintain vegetation and maximize sightlines
- Install Chevron signs on the east side of High Ridge Road on the curve between Interlaken Road and Birdsong Lane
- Install a W2-1 Intersection ahead warning sign with a W13-1P (35 mph) supplementary panel on southbound High Ridge Road approaching Brookdale Road and Briar Brae Road and on northbound High Ridge Road approaching North Stamford Road (both south and north intersections), Hoyclo Road (at Acre View Drive) and Sunset Road
- Relocate the W1-2 curve warnings signs which are located more than 500 feet north and south of Cedarwood Road closer to the curve, per the recommendations of FHWA MUTCD Table 2.4C and add W13-1P (40 mph) supplementary
- Upgrade the existing sidewalk on both sides of the road from Scofieldtown Road to Wire Mill Road to ADA standards
- Upgrade bus stops with improved facilities (shelters)
- Improve transit headways
- Consolidate or formalize the number of bus stops
- Install GPS devices on CT Transit buses and develop an app to let customers know where the next bus is and when it arrives

High Ridge Road from the NY State Line to Wire Mill Road - Short-term Improvements

<u>*Long-Term Alternatives*</u>

- Widen the roadway by up to five feet to provide 11-foot travel lanes and 5-foot colorized shoulders with a 6" to 8" shoulder line

High Ridge Road from the NY State Line to Wire Mill Road - Long-term Preferred Alternative Improvements

- Construct a 10-foot wide pedestrian and bicycle path parallel to High Ridge Road from the State line to Scofieldtown Road and widen High Ridge Road to provide 11-foot lanes and 5-foot colorized shoulders (with wider white edgelines) from Scofieldtown Road to Wire Mill Road

High Ridge Road from the NY State Line to Wire Mill Road - Long-term 2nd Choice Alternative Improvements

High Ridge Road at Sky View Drive and North Stamford Road (north)

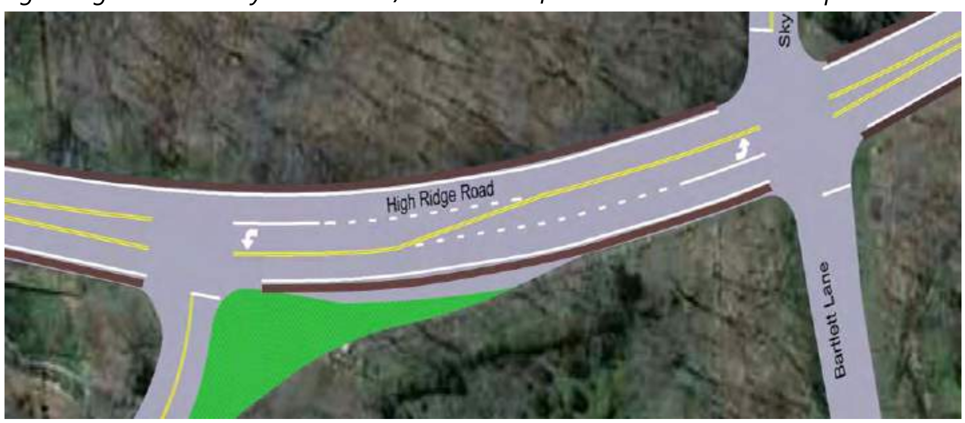
<u>Short-Term Alternatives</u>

- Remove excessive pavement and square off the North Stamford approach to High Ridge Road intersection to reduce speed and improve sight line. This short term improvement measure can be accomplished by constructing a slightly raised loam and seed area with low growing vegetation on the northeast corner
- Restripe the roadway approach and install a new stop sign

<u>Mid-Term Alternatives</u>

- Formalize the intersection geometry and install northbound and southbound left-turn lanes on High Ridge Road between Sky Meadow Drive and North Stamford Road*; Roadway*

High Ridge Road at Sky View Drive/North Stamford Road – Mid-term Improvements



High Ridge Road at Scofieldtown Road (north)

Short-Term Alternatives

- Upgrade bus stops with improved facilities (shelters)
- Install a crosswalk at the north leg of Scofieldtown Road
- Upgrade and extend the existing sidewalk to ADA standards
- Restripe High Ridge Road to provide 11-foot travel lanes and wider shoulders with a 6" to 8" white edge lines
- Optimize signal timing and progression

High Ridge Road at Scofieldtown Road - Short-term Improvements

Long-Term Alternatives

- Widen the High Ridge Road by up to five feet to provide 11-foot travel lanes and 5-foot colorized shoulders with a 6" to 8" shoulder line
- Construct sidewalks on both sides
- Lengthen left turn storage lane on High Ridge Road

High Ridge Road at Scofieldtown Road - Long-term Preferred Choice Improvements

- Replace the existing traffic signal with a roundabout (second choice alternative)

High Ridge Road at Scofieldtown Road - Long-term 2nd Choice Improvements

High Ridge Road from Willard Terrace to Buxton Farm Road

<u>Short-Term Alternatives</u>

- Restripe High Ridge Road between Willard Terrace and Wire Mill Road to provide two 11 –foot wide southbound lanes, an 11-foot wide northbound lane, a 5-foot wide northbound shoulder (using a 6" to 8" wide stripe) and a 6-inch wide southbound shoulder, at a minimum
- Provide routine maintenance at the intersection of High Ridge Road with Wire Mill Road to prevent vegetation from reducing sightlines below acceptable levels
- Install a "Do Not Block Intersection" sign and paint No standing box at the intersection of High Ridge Road and Wire Mill Road
- Signal timing optimization
- Upgrade bus stops with improved facilities (shelters)
- Improve transit headways
- Consolidate or formalize the number of bus stops, as required. *Transit*
- Install GPS devices on CT Transit buses and develop an app to let customers know where the next bus is and when it arrives

High Ridge Road from Willard Terrace to Buxton Farm Road - Short-term Improvements

<u>Long-Term Alternatives</u>

- Reconstruct the intersection of High Ridge Road with the southbound ramps to the Merritt Parkway to provide two lanes on the jug-handle and two receiving lanes for the on-ramp (two lanes transition to one-lane before merging with the parkway)
- Install a traffic control signal at Wire Mill Road (with a pedestrian crosswalk) and coordinate the signals

- Reconstruct the intersection of Buxton Farm Road with High Ridge Road to consolidate movements at that location (including to and from the park-and-ride), widening the roadway to provide a southbound left-turn lane and a northbound right-turn lane, Install a pedestrian crosswalk and pedestrian signal indications on the south side of the intersection of Buxton Farms Road with High Ridge Road
- Construct a path for pedestrians and cyclists parallel to Long Ridge Road and passing under the Merritt Parkway to connect the north and south sides of High Ridge Road
- With improved sidewalks along High Ridge Road, connectivity to the contemplated Rippowam River trail should be considered

High Ridge Road from Willard Terrace to Buxton Farm Road - Long-term Preferred Choice Improvements

- Replace the traffic signal with a roundabout concept (second choice alternative)

High Ridge Road from Willard Terrace to Buxton Farm Road - Long-term 2nd Choice Improvements

High Ridge Road from Buxton Farm Road to Cedar Heights Road

Short-Term Alternatives

- Restripe High Ridge Road to provide 11-foot travel lanes and 6-foot shoulders with 6″ to 8″ white edge lines
- Install a plastic curb with pop-back vertical plastic posts as a barrier between the northbound and southbound lanes
- Reduce the speed limit to 35 mph, install interactive speed signs and provide periodic police enforcement
- Install "SHARE THE ROAD" signs
- Upgrade the existing sidewalk to ADA standards
- Upgrade bus stops with improved facilities (sidewalks, shelters, ADA accessibility)
- Upgrade pedestrian crossings at existing signalized intersections
- Improve transit headways
- Consolidate or formalize the number of bus stops
- Install GPS devices on CT Transit buses and develop an app to let customers know where the next bus is and when it will come
- Provide parking for bicycles adjacent to suitable transit stops

High Ridge Road from Buxton Farm Road to Cedar Heights Road - Short-term Improvements

Mid-Term Alternatives

- Expand Complete Streets Program, by extending sidewalks and traffic calming measures into the cross/side streets
- Break the existing, long, left-turn lanes into separate, short left-turn lanes with a median between them and install a landscaped median in the center of the roadway, where feasible

Long-Term Alternatives

- Add new sidewalk along both sides of High Ridge Road
- Consolidate access with redevelopment opportunity and promote cross-access easements
- With any new development along this section of roadway, consideration should be given to eliminate on-street parking

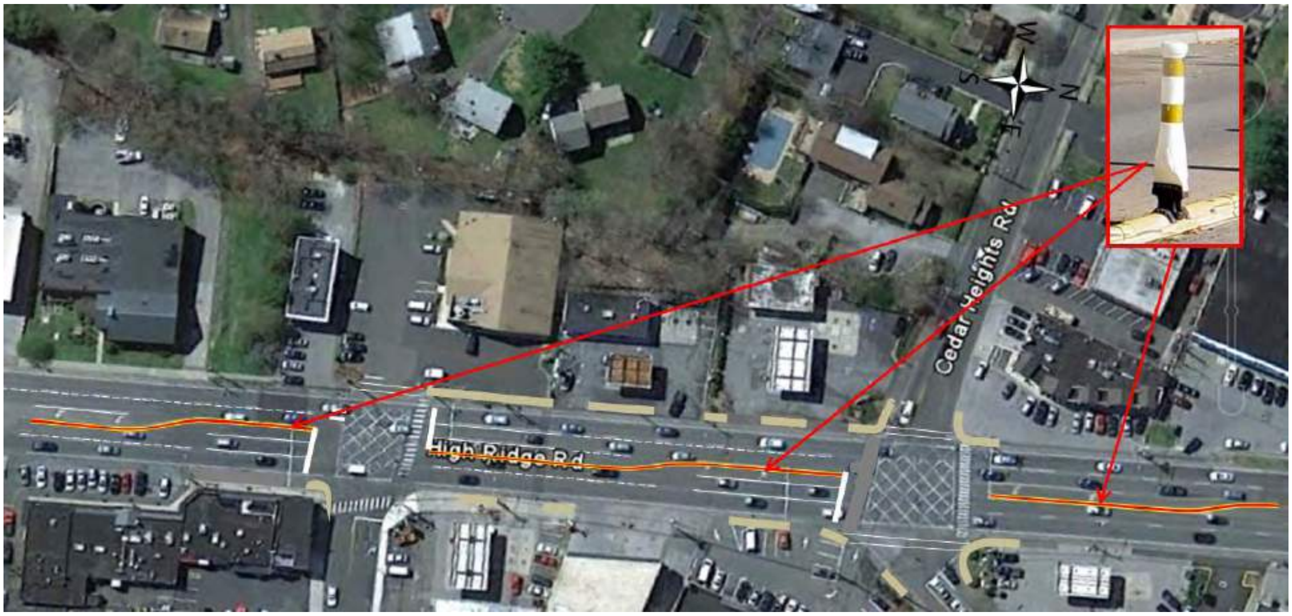
High Ridge Road from Cedar Heights Road to Vine Road

<u>Short-Term Alternatives</u>

- Remove the three on-street parallel parking spaces on the east side of High Ridge Road, immediately south of Vine Road intersection and extend the sidewalk around the southeast of the intersection
- Install a plastic curb with pop-back vertical plastic posts as a barrier between the northbound and southbound lanes both north of Cedar Heights Road and South of Vine Road
- Install "SHARE THE ROAD" signs
- Reduce speed limit to 35 MPH, install interactive speed signs, and provide periodic police enforcement
- At the High Ridge Road intersections with Cedar Heights Road/Turn of River Road and Vine Road, implement the following signal phasing changes:
- Split the eastbound and westbound signal phases (simplifies skewed intersection at Cedar Heights Road/Turn of River Road)
- Set signal coordination so that the High Ridge Road through movements end concurrently
- At Cedar Heights Road/Turn of River Road intersection, remove crosswalk on High Ridge Road on south side of intersection (maintain north side crosswalk)
- Provide crosswalks across south side of High Ridge Road at Vine Road
- Run pedestrian phases concurrent with Turn of River Road and private driveway opposite Vine Road phases
- Optimize signal cycle length and coordinate signals
- Restripe Cedar Heights Road to provide a left/through and a right-turn lane and modify signal to run the right turn on northbound left-turn overlap

- Restripe Turn of River Road to provide a left turn lane and a left/through/right-turn lane (provides extra capacity for left turn movement)
- Run the Vine Road right-turn lane on the southbound left-turn overlap

High Ridge Road from Cedar Heights Road to Vine Road - Short-term Improvements



<u>*Mid-term Alternatives*</u>

- Install pedestrian crosswalks and pedestrian signal indications (countdown) across Cedar Heights Road and Turning River Road
- Expand Complete Streets Program, by extending sidewalks and traffic calming measures into the cross/side streets

High Ridge Road from Cedar Heights Road to Vine Road - Mid-term Improvements

Long-Term Alternatives

- With any new development on High Ridge Road between Vine Road and Cedar Heights Road/Turn of River Road, consideration should be given to consolidate access and widen High Ridge Road on either side by 3 feet to provide 11 foot lanes, including side by side left turn lanes and 5 foot shoulders (with a 6" to 8"-wide white shoulder line and colorized pavement)
- With any new development along this section of roadway, eliminate on-street parking and parking which requires vehicles to back out into the street
- Future development along this corridor should be encouraged to share cross easements and consolidate access
- Add textured crosswalks and upgrade pedestrian facilities

High Ridge Road from Cedar Heights Road to Vine Road - Long-term Improvements

High Ridge Road from Vine Road to Bulls Head

Short-Term Alternatives

- Restripe High Road to provide 11-foot travel lanes and 6-foot shoulders with 6" to 8" white edge lines
- Reduce speed limit to 35 MPH, install "SHARE THE ROAD" signs and provide periodic police enforcement
- Upgrade the existing sidewalk to ADA standards
- Provide a curb bump out at Halpin Avenue to slow northbound, right-turning vehicles on High Ridge Road at Halpin Avenue and install a pedestrian crosswalk across Halpin Avenue
- Provide separate controllers for the intersections of High Ridge Road with Oaklawn Avenue and Cross Road so that they operate independently, but set the coordination so that green on the High Ridge Road through phases ends at the same time at both signals
- Reduce the signal cycle length of the traffic signal at the Lord & Taylor Driveway to match those at the intersection of High Ridge Road with Cold Spring Road and adjust the controller offset to coordinate with the signal at that intersection
- Upgrade bus stops with improved facilities (sidewalks, shelters, ADA accessibility)
- Convert the northbound right-turn lane at Terrace Avenue to a bus pull-off lane
- Upgrade pedestrian crossings at existing signalized intersections
- Improve transit headways

- Consolidate or formalize the number of bus stops
- Install GPS devices on CT Transit buses and develop an app to let customers know where the next bus is and when it arrives
- Provide parking for bicycles adjacent to suitable transit stops

High Ridge Road from Vine Road to Bulls Head -Short-term Improvements

Mid-Term Alternatives

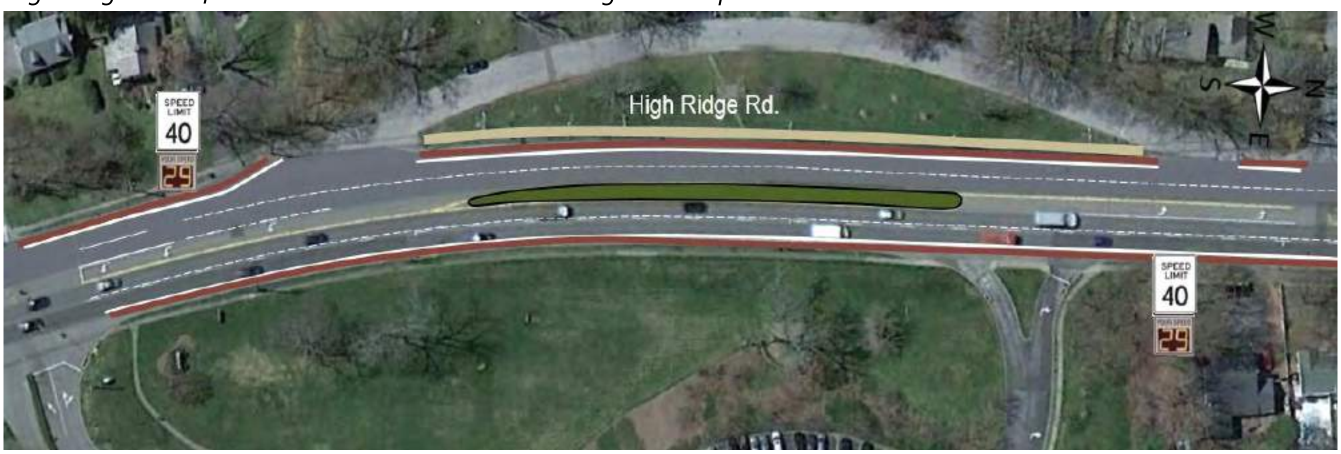
- Expand Complete Streets Program, by extending sidewalks and traffic calming measures into the cross/side streets
- Break the existing, long, left-turn lanes into separate, short left-turn lanes with a median between them and install a landscaped median (low growing vegetation) in the center of the roadway

High Ridge Road from Vine Road to Bulls Head -Short-term Improvements

Long-Term Alternatives

- Widen High Ridge Road from Cold Spring Road to Halpin Avenue by 8 feet to provide 11-foot travel lanes and 5-foot, colorized shoulders (6" to 8" wide white stripe); *Ped/Bicycle*
- Refinish the 6-foot shoulders north of Halpin Avenue to provide a different color surface to the travel lanes
- Add new sidewalk along both sides of High Ridge Road
- Install a textured crosswalk across High Ridge Road at the Lord & Taylor driveway intersection
- From Cold Spring Road to the Lord & Taylor Driveway, consolidate access for the properties on the east side of the road and then install a physical barrier on High Ridge Road between the two intersections

High Ridge Road from Vine Road to Bulls Head -Long-term Improvements



4.4 Preferred Alternatives

All of the actions, improvements and policies identified in the section immediately above were selected as the preferred alternatives in the plan, except for the following:

Long Ridge Road at Chestnut Hill Road

Long-Term Alternatives
- Construct a roundabout

Long Ridge Road at Wildwood Road

Long-Term Alternatives
- Install a traffic control signal

Long Ridge Road from Chimney Corners to the NY State Line

Long-Term Alternatives
- Construct a separate 10-foot wide pedestrian / bicycle path parallel to Long Ridge Road

High Ridge Road from the NY State Line to Wire Mill Road

Long-Term Alternatives
- Construct a separate 10-foot wide pedestrian / bicycle path parallel to High Ridge Road

High Ridge Road at Scofieldtown Road (north)

Long-Term Alternatives
- Replace the existing traffic signal with a roundabout

High Ridge Road from Willard Terrace to Buxton Farm Road

Long-Term Alternatives
- Replace the traffic signal and jug handle at the intersection of High Ridge Road with the southbound Parkway Ramps with a roundabout

4.5 Evaluation Summary

As described throughout this Chapter, each of the potential improvement alternatives was evaluated and ranked according to the specified evaluation criteria. The results of this evaluation process facilitate the comparison of each alternative to all other alternatives, regardless of transportation mode. The complete summarized results of the preferred alternatives evaluation is presented below.

4.5.1 Scenario 1 – 2016 Near-term Improvements

For the 2016 Near-term Condition traffic analysis, the projected traffic volumes for 2016 were entered into the Synchro™ model, as were all recommended near-term improvement projects, which mostly consisted of traffic signal optimization, pavement marking and the other easily implementable improvements identified in the previous section.

The following is a summary of traffic operating conditions for 2016 and a comparison to conditions without the improvements. The results of the study intersection capacity analyses under 2016 conditions are summarized on Figures 4-22S and 4-22N. These figures show the overall intersection LOS for signalized intersections and the LOS of the side street approaches for unsignalized intersections. The intersection capacity analyses indicate that suboptimal operating conditions are projected to be experienced at fewer intersections along the corridors than without the improvements, although the difference is not necessarily significant as the measures implementable in the near-term are somewhat limited.

The analyses results for the signalized and unsignalized study intersections are discussed in more detail in the following sections, and the Synchro output reports are included in the technical appendix.

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 4-22 (S)

Intersection Level of Service
2016 Preferred Alternative Conditions

	Long Ridge Road		
1	Long Ridge Road	at	High Ridge Road/Bedford St/Summer St.
2	Long Ridge Road (Route 104)	at	Cold Spring Road (Route 137)
3	Long Ridge Road (Route 104)	at	Drives to Olin Chemicals/ Lord & Taylors
4	Long Ridge Road (Route 104)	at	Terrace Avenue/South Drive to G.E. Credit Corp
5	Long Ridge Road (Route 104)	at	Woodridge Drive South
6	Long Ridge Road (Route 104)	at	Stillwater Road/Buckingham Drive
7	Long Ridge Road (Route 104)	at	Drive to Long Ridge Office Park
8	Long Ridge Road (Route 104)	at	Loughran Avenue/G.E. Energy Financial Services
9	Long Ridge Road (Route 104)	at	Nestle/Oracle Drives (formerly Hyperion)
10	Long Ridge Road (Route 104)	at	Route 15 NB Off Ramp/Wire Mill Road
11	Long Ridge Road (Route 104)	at	Route 15 SB Ramps/Webbs Hill Road
12	Long Ridge Road (Route 104)	at	Chestnut Hill Road/Butternut Lane
13	Long Ridge Road (Route 104)	at	Hunting Ridge Road S
14	Long Ridge Road (Route 104)	at	Wildwood Road
15	Long Ridge Road (Route 104)	at	River Bank Road
16	Long Ridge Road (Route 104)	at	Erskine Road
17	Long Ridge Road (Route 104)	at	Old Long Ridge Road (northern)
	High Ridge Road		
18	High Ridge Road (Route 137)	at	Cold Spring Road (Route 137)
19	High Ridge Road (Route 137)	at	Lord & Taylor Drive
20	High Ridge Road (Route 137)	at	Oaklawn Avenue/Cross Road
21	High Ridge Road (Route 137)	at	Terrace Avenue
22	High Ridge Road (Route 137)	at	Unity Road/Brownley Road
23	High Ridge Road (Route 137)	at	Lakeview Drive/Rippowam High School Drive
24	High Ridge Road (Route 137)	at	Loveland Road
25	High Ridge Road (Route 137)	at	Dannel Drive/Mercedes Lane
26	High Ridge Road (Route 137)	at	Ridge Park Road
27	High Ridge Road (Route 137)	at	Hartswood Road
28	High Ridge Road (Route 137)	at	Bradley Place
29	High Ridge Road (Route 137)	at	Merriman Road
30	High Ridge Road (Route 137)	at	Vine Road/Private Drive
31	High Ridge Road (Route 137)	at	Cedar Height Road/Turn of River Road
32	High Ridge Road (Route 137)	at	Olga Drive/Private Drive
33	High Ridge Road (Route 137)	at	Square Acres Drive/Shopping Plaza
34	High Ridge Road (Route 137)	at	Route 15 NB Ramps/Buxton Farms Road
35	High Ridge Road (Route 137)	at	Route 15 SB Ramps
36	High Ridge Road (Route 137)	at	Wire Mill Road
37	High Ridge Road (Route 137)	at	Scofieldtown Road
38	High Ridge Road (Route 137)	at	Interlaken Road
39	High Ridge Road (Route 137)	at	Brookdale Road
40	High Ridge Road (Route 137)	at	North Stamford Road (southern)
41	High Ridge Road (Route 137)	at	North Stamford Road (northern)
42	High Ridge Road (Route 137)	at	Sunset Road
43	High Ridge Road (Route 137)	at	Briar Brae Road
44	High Ridge Road (Route 137)	at	Mayapple Road

City of Stamford, Connecticut

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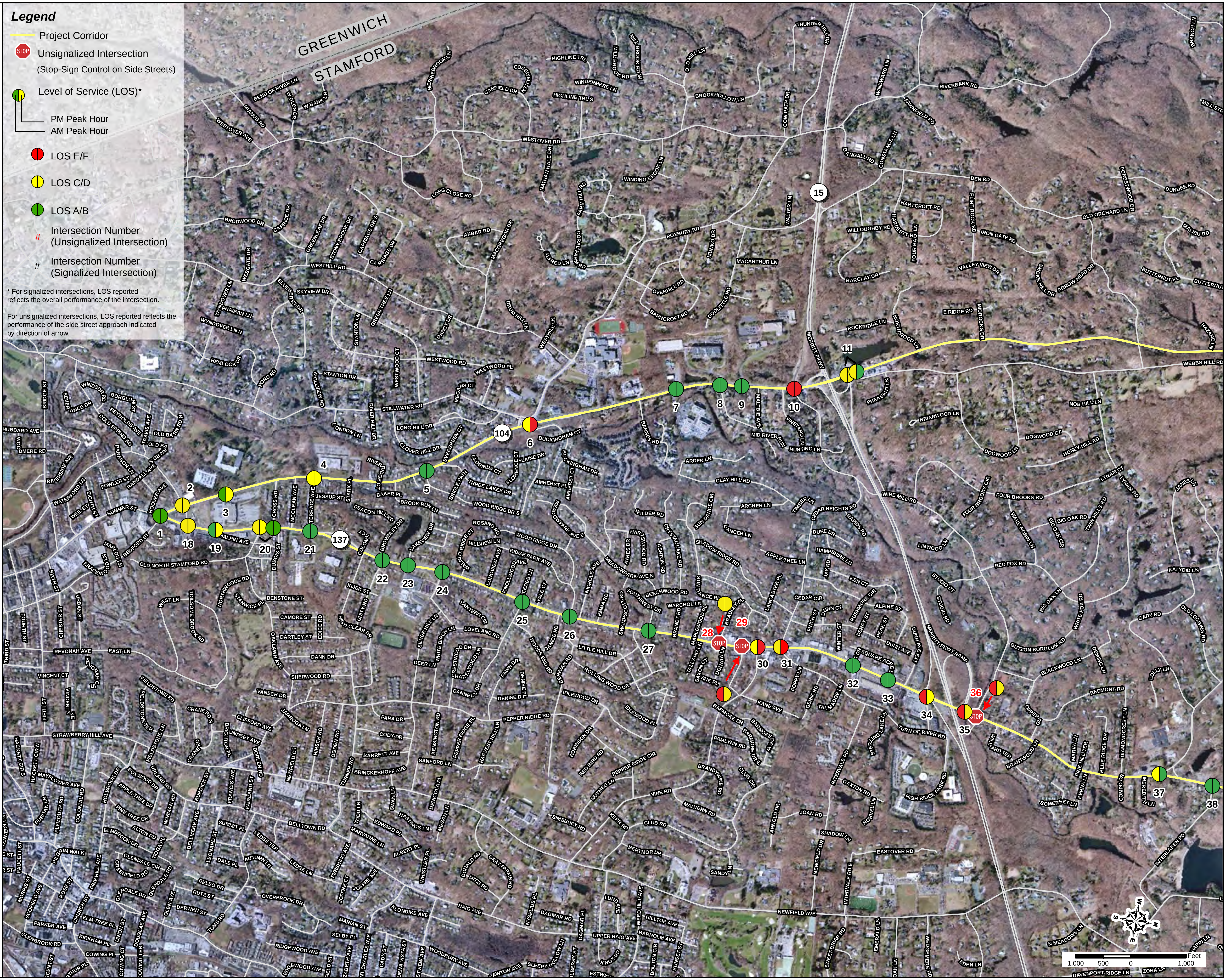
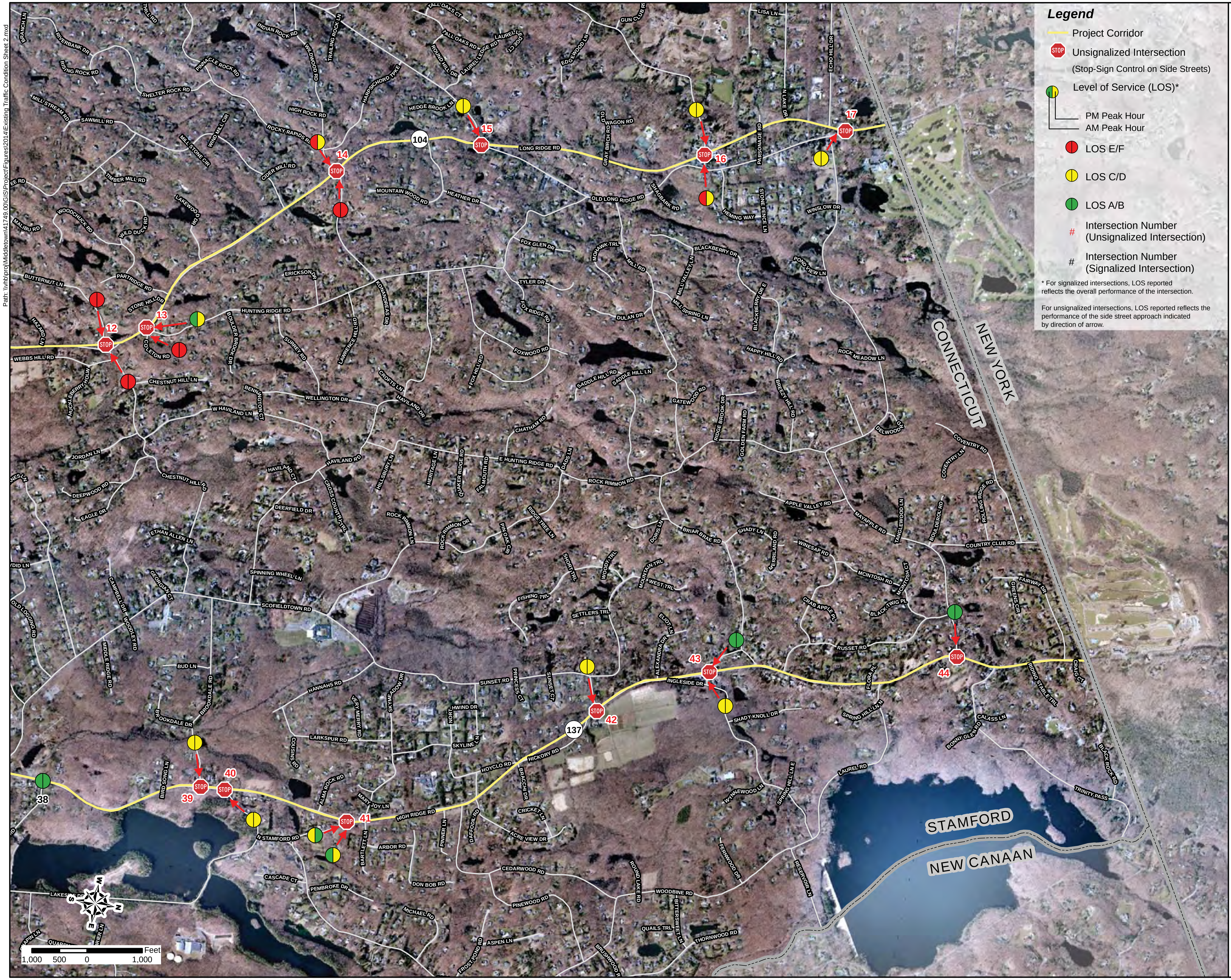
Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)





Long Ridge | High Ridge
CORRIDORS STUDY

Figure 4-22 (N)

Intersection Level of Service
2016 Preferred Alternative Conditions

	Long Ridge Road		
1	Long Ridge Road	at	High Ridge Road/Bedford St/Summer St.
2	Long Ridge Road (Route 104)	at	Cold Spring Road (Route 137)
3	Long Ridge Road (Route 104)	at	Drives to Olin Chemicals/ Lord & Taylors
4	Long Ridge Road (Route 104)	at	Terrace Avenue/South Drive to G.E. Credit Corp
5	Long Ridge Road (Route 104)	at	Woodridge Drive South
6	Long Ridge Road (Route 104)	at	Stillwater Road/Buckingham Drive
7	Long Ridge Road (Route 104)	at	Drive to Long Ridge Office Park
8	Long Ridge Road (Route 104)	at	Loughran Avenue/G.E. Energy Financial Services
9	Long Ridge Road (Route 104)	at	Nestle/Oracle Drives (formerly Hyperion)
10	Long Ridge Road (Route 104)	at	Route 15 NB Off Ramp/Wire Mill Road
11	Long Ridge Road (Route 104)	at	Route 15 SB Ramps/Webbs Hill Road
12	Long Ridge Road (Route 104)	at	Chestnut Hill Road/Butternut Lane
13	Long Ridge Road (Route 104)	at	Hunting Ridge Road S
14	Long Ridge Road (Route 104)	at	Wildwood Road
15	Long Ridge Road (Route 104)	at	River Bank Road
16	Long Ridge Road (Route 104)	at	Erskine Road
17	Long Ridge Road (Route 104)	at	Old Long Ridge Road (northern)
	High Ridge Road		
18	High Ridge Road (Route 137)	at	Cold Spring Road (Route 137)
19	High Ridge Road (Route 137)	at	Lord & Taylor Drive
20	High Ridge Road (Route 137)	at	Oaklawn Avenue/Cross Road
21	High Ridge Road (Route 137)	at	Terrace Avenue
22	High Ridge Road (Route 137)	at	Unity Road/Brownley Road
23	High Ridge Road (Route 137)	at	Lakeview Drive/Rippowam High School Drive
24	High Ridge Road (Route 137)	at	Loveland Road
25	High Ridge Road (Route 137)	at	Dannel Drive/Mercedes Lane
26	High Ridge Road (Route 137)	at	Ridge Park Road
27	High Ridge Road (Route 137)	at	Hartswood Road
28	High Ridge Road (Route 137)	at	Bradley Place
29	High Ridge Road (Route 137)	at	Merriman Road
30	High Ridge Road (Route 137)	at	Vine Road/Private Drive
31	High Ridge Road (Route 137)	at	Cedar Height Road/Turn of River Road
32	High Ridge Road (Route 137)	at	Olga Drive/Private Drive
33	High Ridge Road (Route 137)	at	Square Acres Drive/Shopping Plaza
34	High Ridge Road (Route 137)	at	Route 15 NB Ramps/Buxton Farms Road
35	High Ridge Road (Route 137)	at	Route 15 SB Ramps
36	High Ridge Road (Route 137)	at	Wire Mill Road
37	High Ridge Road (Route 137)	at	Scofieldtown Road
38	High Ridge Road (Route 137)	at	Interlaken Road
39	High Ridge Road (Route 137)	at	Brookdale Road
40	High Ridge Road (Route 137)	at	North Stamford Road (southern)
41	High Ridge Road (Route 137)	at	North Stamford Road (northern)
42	High Ridge Road (Route 137)	at	Sunset Road
43	High Ridge Road (Route 137)	at	Briar Brae Road
44	High Ridge Road (Route 137)	at	Mayapple Road

City of Stamford, Connecticut

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

4.5.1.1 2016 Signalized Intersections

The results of the signalized intersections capacity analyses indicate that six signalized study intersections are projected to operate with an overall LOS E or F during the peak periods, up from four for the existing conditions. These intersections are discussed below.

#6 Long Ridge Road at Stillwater Road/Buckingham Drive

The overall intersection is projected to operate at LOS D during the weekday morning peak period but LOS F during the weekday evening peak period.

During the morning and evening peak periods, vehicle queues in the southbound right-turn lane will exceed the available storage and interrupt the flow of southbound through vehicles on Long Ridge Road.

During the evening peak period, vehicle queues in the northbound left-turn lane will exceed the available storage and interrupt the flow of through vehicles on Long Ridge Road.

During the morning and evening peak periods, vehicle queues on the eastbound Stillwater Road approach will extend past Roxbury Road, greatly interfering with the ability of vehicles to make left-turns from Roxbury Road to Stillwater Road.

In the evening peak-hour, average delays are projected to reach approximately 90 seconds, precipitating, a Level-of-Service F. The entire intersection configuration is currently being studied for redesign by Tighe & Bond Engineering Consultant.

#10 Long Ridge Road at Route 15 Northbound Off-ramp / Wire Mill Road

The overall intersection will operate at LOS E during the weekday morning and evening peak periods.

During the morning peak period, long vehicle queues in the eastbound, westbound and southbound through lanes will block access to the adjacent auxiliary lanes.

During the evening peak period, long vehicle queues in the eastbound, westbound and northbound through lanes will block access to the adjacent auxiliary lanes.

In the morning peak-hour, the proposed signal optimization is projected to reduce the average delay from 110 seconds to 78 seconds, roughly the equivalent to existing AM peak-hour delays, while in the evening peak-hour, average delays are projected to be reduced from 130 seconds to 78 seconds, considerably less than the existing PM peak-hour delays.

#30 High Ridge Road at Vine Road/Private Drive

The overall intersection operates at LOS D during the weekday morning peak period but a LOS F during the weekday evening peak period.

During the morning peak period, long vehicle queues in the westbound right-turn lane and on the northbound approach will spill back and block the adjacent lanes and intersections, respectively.

During the evening peak period, long vehicle queues in the westbound right-turn lane, the southbound left-turn lane and on the northbound approach will spill back and block the adjacent lanes and intersections.

In the evening peak-hour, average delays are projected to be reduced from 116 seconds to approximately 90 seconds, considerably below current levels

#31 High Ridge Road at Cedar Heights Road/Turn of River Road

The overall intersection operates at LOS D during the weekday morning peak period but a LOS F during the weekday evening peak period.

During the morning peak period, long vehicle queues on the eastbound, westbound and southbound approaches will spill back and block the adjacent driveways.

During the evening peak period, long vehicle queues on the eastbound, westbound, northbound and southbound approaches will spill back and block the adjacent driveways, lanes and intersections.

In the evening peak-hour, average delays are projected to increase from approximately 70 seconds to approximately 85 seconds but will be offset by reductions in delay at the Vine Road intersection.

#34 High Ridge Road at Route 15 NB Ramps/Buxton Farms Road

The overall intersection is projected to operate at LOS F during the weekday morning peak period and LOS D during the weekday evening peak period.

During the morning and evening peak periods, long vehicle queues in the Route 15 off-ramp left-turn and through lanes will block access to the channelized right-turn lane, vehicle queues in the westbound Buxton Farms right-turn lane onto Long Ridge Road will block access to the adjacent turning lanes. Excessive vehicle queues in the northbound Long Ridge Road through lanes will back up to the upstream signalized intersection with Square Acres Drive and the shopping plaza driveway to the south, while excessive vehicle queues in the southbound Long Ridge Road through lanes will back up to the upstream signalized intersection with the southbound off-ramp.

In the morning peak-hour, average delays are projected to be reduced from approximately 90 to 85 seconds through signal optimization, while in the evening peak-hour, average delays are projected to be reduced from approximately 76 seconds to approximately 49 seconds.

#35 High Ridge Road at Route 15 SB Ramps

The overall intersection operates at LOS E during the weekday morning peak period and LOS C during the weekday evening peak period.

During the morning and afternoon peak periods, long vehicle queues on the jug handle to the southbound ramp will spill back and interrupt the flow of northbound through vehicles on High Ridge Road, while long vehicle queues on southbound High Ridge Road will spill back and block the intersection of Wire Mill Road.

In the morning peak-hour, average delays are projected to be reduced from approximately 93 seconds to 77 seconds, due to signal optimization, about the same as existing levels.

The remaining signalized study intersections will operate with overall LOS D or better conditions during the peak periods. However, LOS E or F conditions were identified for individual turning movements, commonly from side street approaches, at many of these intersections. The long delays on the side streets, generally caused by relatively long intersection cycle lengths, allow for greater capacity for the higher volume Long Ridge Road and High Ridge Road approaches. Progression along Long Ridge Road and High Ridge Road should take priority, and therefore, LOS E or F should be considered tolerable for some of the low volume side street movements. The signalized study intersections with projected individual turning movements experiencing LOS E or F conditions and/or excessive vehicle queuing are identified below.

#1 Long Ridge Road at High Ridge Road / Bedford Street / Summer Street

During the morning peak period, the Long Ridge Road eastbound left-turn movement onto High Ridge Road will operate at LOS F. Additionally, the High Ridge Road southbound approach will operate at LOS E with excessive vehicle queues that back up through the upstream signalized intersection with Cold Spring Road to the north.

#2 Long Ridge Road at Cold Spring Road

During the morning peak period, vehicle queues in the eastbound left-turn lanes on Cold Spring Road, which will operate at LOS E, will exceed the available storage and will partially obstruct the flow of eastbound through vehicles on Cold Spring Road.

#3 Long Ridge Road at Drives to Olin Chemicals / Lord & Taylor

During the morning peak period, the Olin Chemicals eastbound approach and Lord & Taylor westbound approach will operate at LOS E; however, these side street approaches have relatively low traffic volumes.

#4 Long Ridge Road at Driveway to # 260 Driveway/Terrace Avenue

During the morning and evening peak periods, the occupancy of #260 will precipitate LOS E on the eastbound approach, however, these approaches have relatively low traffic volumes.

#5 Long Ridge Road at Woodridge Drive South

During the morning peak period, the westbound Woodridge Drive South approach will operate at LOS E; however, this side street approach has relatively low traffic volumes.

#18 High Ridge Road at Cold Spring Road (Route 137)

During the morning peak period, the eastbound Cold Spring Road approach will operate at LOS E with long vehicle queues that back up through the upstream signalized intersection with Long Ridge Road to the west, while the westbound Home Goods driveway approach will also operate at LOS E.

During the evening peak period, the eastbound Cold Spring Road approach will operate at LOS F with long vehicle queues that back up through the upstream signalized intersection with Long Ridge Road to the west, while the westbound Home Goods driveway approach will operate at LOS E.

#20 High Ridge Road at Oaklawn Avenue

During the morning peak period, vehicle queues on the westbound Oaklawn Avenue approach will experience LOS E and will extend past Halpin Avenue, greatly interfering with the ability of vehicles to make left-turns from Halpin Avenue to Oaklawn Avenue.

#21 High Ridge Road at Terrace Avenue

During the evening peak period, the westbound left-turning movement from the private drive will operate at LOS E.

#22 High Ridge Road at Unity Road / Brownley Road

During the morning and evening peak periods, the eastbound Brownley Road approach and the westbound Unity Road approach will operate at LOS E; however, the side street approaches have relatively low traffic volumes.

#23 High Ridge Road at Lakeview Drive / Rippowam High School Drive

During the morning and evening peak periods, the eastbound Lakeview Drive approach will operate at LOS E.

#32 High Ridge Road at Olga Drive / Private Drive

During the evening peak period, the westbound private driveway will operate at LOS E; however, the side street approach has relatively low traffic volumes.

#37 High Ridge Road at Scofieldtown Road

During the morning peak period, the southbound High Ridge Road approach operates at LOS E with excessive vehicle queues.

4.5.1.2 2016 Unsignalized Intersections

The results of the capacity analyses indicate that several of the unsignalized study intersections operate with LOS E or F conditions on the side street during one or both peak periods. The excessive delays on the side street approaches are mostly attributed to the high traffic volumes along Long Ridge Road and High Ridge Road. Due to these high traffic volumes, vehicles at some side street approaches experience long delays during the peak periods as they wait for acceptable gaps in traffic to safely enter the traffic stream. The unsignalized intersections currently operating with LOS E or F conditions are discussed below.

#12 Long Ridge Road at Chestnut Hill Road / Butternut Lane

During the morning peak period, the eastbound Butternut Lane approach will operate at LOS F; however, this approach has relatively low traffic volumes (20 to 50 vehicles per hour), and the maximum vehicle queue is only projected to be one to two vehicles during the peak periods.

During the morning and evening peak periods, the westbound Chestnut Hill Road approach operates at LOS F with excessive delays.

During the morning peak period, the southern connector roadway from Chestnut Hill Road operates at LOS F; however, this approach has relatively low traffic volumes (10 vehicles per hour), and the maximum vehicle queue is not projected to exceed one vehicle during the peak periods.

In the morning peak-hour, average delays are projected to increase to approximately 340 seconds as no near-term capacity improvements are proposed. In the evening peak-hour, average delays are projected to increase to approximately 110 seconds.

#13 Long Ridge Road at Hunting Ridge Road South

During the morning and evening peak periods, the westbound Hunting Ridge Road South approach will operate at LOS F with excessive delays.

In the morning peak-hour, average delays are projected to increase to approximately 80 seconds as no near-term capacity improvements are proposed. In the evening peak-hour, average delays are projected to increase to approximately 81 seconds.

#14 Long Ridge Road at Wildwood Road

During the morning peak period, the eastbound Wildwood Road approach will operate at LOS F.

During the morning and evening peak period, the westbound Wildwood Road approach will operate at LOS F.

In the morning peak-hour, average delays on the eastbound approach are projected to increase to 65 seconds, while on the westbound approach, they are projected to increase to 240 seconds, as no near-term capacity improvements are proposed. In the evening peak-hour, average delays on the westbound approach are projected to increase to approximately 67 seconds.

#16 Long Ridge Road at Erskine Road

During the morning peak period, the westbound Erskine Road approach will operate at LOS E.

In the morning peak-hour, average delays on the westbound approach are projected to increase to 40 seconds as no near-term capacity improvements are proposed..

#29 High Ridge Road at Merriman

During the morning peak period, the westbound Merriman Road approach will operate at LOS F. This condition will also likely prevail during the evening peak period, although motorists will probably look for alternative ways to go south on High Ridge Road other than turning left from Merriman Road.

In the morning peak-hour, average delays are projected to increase to approximately 75 seconds.

#36 High Ridge Road at Wire Mill Road

During the morning peak period, the eastbound Wire Mill Road approach will operate at LOS F.

In the morning peak-hour, average delays are calculated to be reduced from approximately 235 seconds to 63 seconds by restriping the roadway to allow two lanes of travel in either direction past the intersection.

#37A High Ridge Road at the Unsignalized Scofieldtown Road Connector

During the morning and evening peak periods, the eastbound Scofieldtown Road connector approach will operate at LOS F with excessive delays.

In the morning peak-hour, average delays are projected to be reduced from approximately 199 seconds to approximately 175 seconds by retiming the adjacent traffic signal, while in the evening peak-hour, average delays are projected to remain at approximately 52 seconds.

4.5.1.3 Scenario 2 – 2026 Mid-term Improvements

For the 2026 Mid-term Condition traffic analysis, the projected traffic volumes for 2026 were entered into the Synchro model, as were all recommended mid-term improvement projects identified in the previous section.

The following is a summary of traffic operating conditions for 2026 and a comparison to existing conditions. The results of the study intersection capacity analyses under 2026 conditions are summarized on Figures 4-23S and 4-23N. These figures show the overall intersection LOS for signalized intersections and the LOS of the side street approaches for unsignalized intersections. The intersection capacity analyses indicate that suboptimal operating conditions are projected to be experienced at numerous intersections along the corridors.

The analyses results for the signalized and unsignalized study intersections are discussed in more detail in the following sections, and the Synchro output reports are included in the technical appendix.

Long Ridge | High Ridge
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Figure 4-23 (S)

Intersection Level of Service
2026 Preferred Alternative Conditions

Long Ridge Road

1	Long Ridge Road	at	High Ridge Road/Bedford St/Summer St.
2	Long Ridge Road (Route 104)	at	Cold Spring Road (Route 137)
3	Long Ridge Road (Route 104)	at	Drives to Olin Chemicals/ Lord & Taylors
4	Long Ridge Road (Route 104)	at	Terrace Avenue/South Drive to G.E. Credit Corp
5	Long Ridge Road (Route 104)	at	Woodridge Drive South
6	Long Ridge Road (Route 104)	at	Stillwater Road/Buckingham Drive
7	Long Ridge Road (Route 104)	at	Drive to Long Ridge Office Park
8	Long Ridge Road (Route 104)	at	Loughran Avenue/G.E. Energy Financial Services
9	Long Ridge Road (Route 104)	at	Nestle/Oracle Drives (formerly Hyperion)
10	Long Ridge Road (Route 104)	at	Route 15 NB Off Ramp/Wire Mill Road
11	Long Ridge Road (Route 104)	at	Route 15 SB Ramps/Webbs Hill Road
12	Long Ridge Road (Route 104)	at	Chestnut Hill Road/Butternut Lane
13	Long Ridge Road (Route 104)	at	Hunting Ridge Road S
14	Long Ridge Road (Route 104)	at	Wildwood Road
15	Long Ridge Road (Route 104)	at	River Bank Road
16	Long Ridge Road (Route 104)	at	Erskine Road
17	Long Ridge Road (Route 104)	at	Old Long Ridge Road (northern)

High Ridge Road

18	High Ridge Road (Route 137)	at	Cold Spring Road (Route 137)
19	High Ridge Road (Route 137)	at	Lord & Taylor Drive
20	High Ridge Road (Route 137)	at	Oaklawn Avenue/Cross Road
21	High Ridge Road (Route 137)	at	Terrace Avenue
22	High Ridge Road (Route 137)	at	Unity Road/Brownley Road
23	High Ridge Road (Route 137)	at	Lakeview Drive/Rippowam High School Drive
24	High Ridge Road (Route 137)	at	Loveland Road
25	High Ridge Road (Route 137)	at	Dannel Drive/Mercedes Lane
26	High Ridge Road (Route 137)	at	Ridge Park Road
27	High Ridge Road (Route 137)	at	Hartswood Road
28	High Ridge Road (Route 137)	at	Bradley Place
29	High Ridge Road (Route 137)	at	Merriman Road
30	High Ridge Road (Route 137)	at	Vine Road/Private Drive
31	High Ridge Road (Route 137)	at	Cedar Height Road/Turn of River Road
32	High Ridge Road (Route 137)	at	Olga Drive/Private Drive
33	High Ridge Road (Route 137)	at	Square Acres Drive/Shopping Plaza
34	High Ridge Road (Route 137)	at	Route 15 NB Ramps/Buxton Farms Road
35	High Ridge Road (Route 137)	at	Route 15 SB Ramps
36	High Ridge Road (Route 137)	at	Wire Mill Road
37	High Ridge Road (Route 137)	at	Scofieldtown Road
38	High Ridge Road (Route 137)	at	Interlaken Road
39	High Ridge Road (Route 137)	at	Brookdale Road
40	High Ridge Road (Route 137)	at	North Stamford Road (southern)
41	High Ridge Road (Route 137)	at	North Stamford Road (northern)
42	High Ridge Road (Route 137)	at	Sunset Road
43	High Ridge Road (Route 137)	at	Briar Brae Road
44	High Ridge Road (Route 137)	at	Mayapple Road

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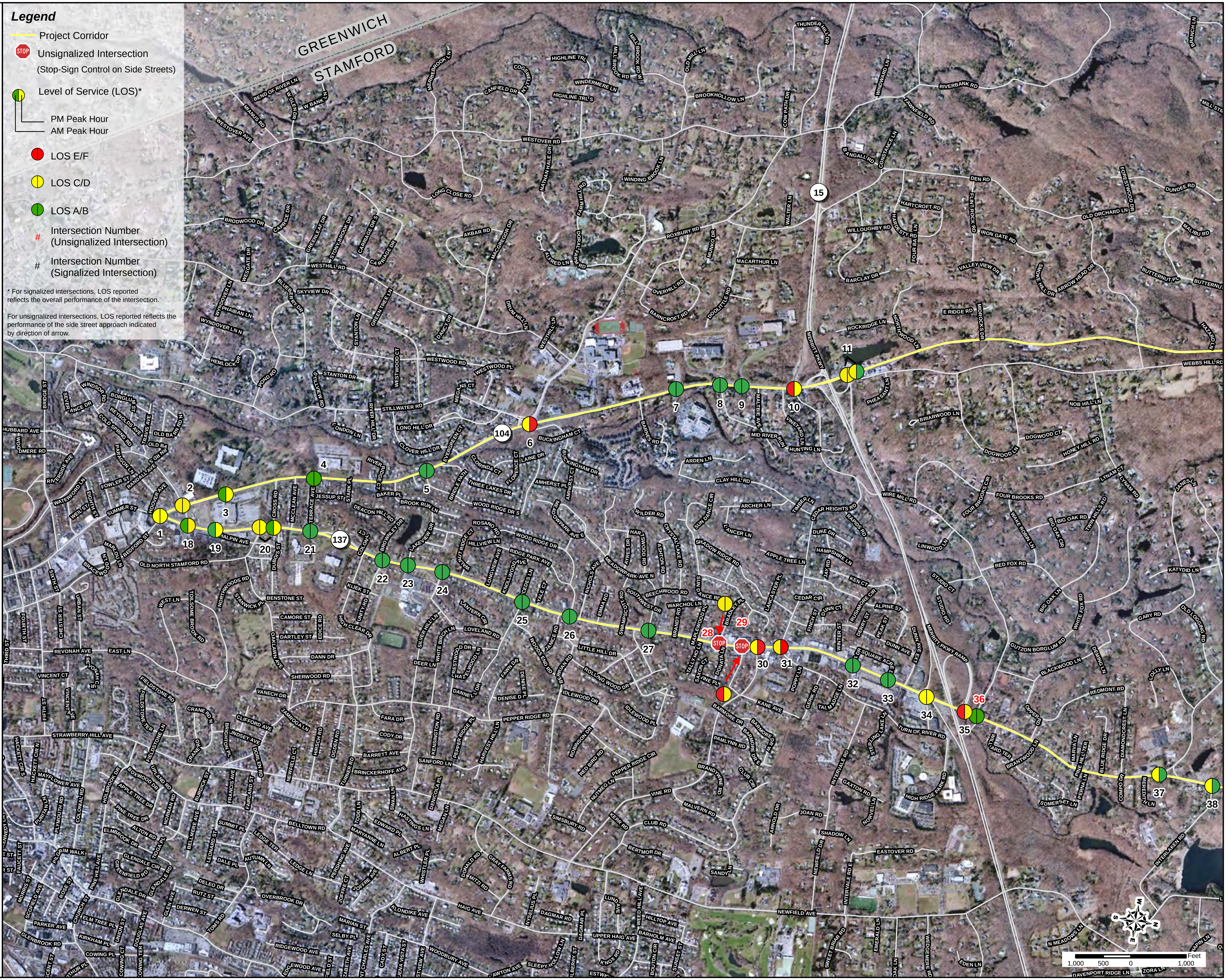
Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)



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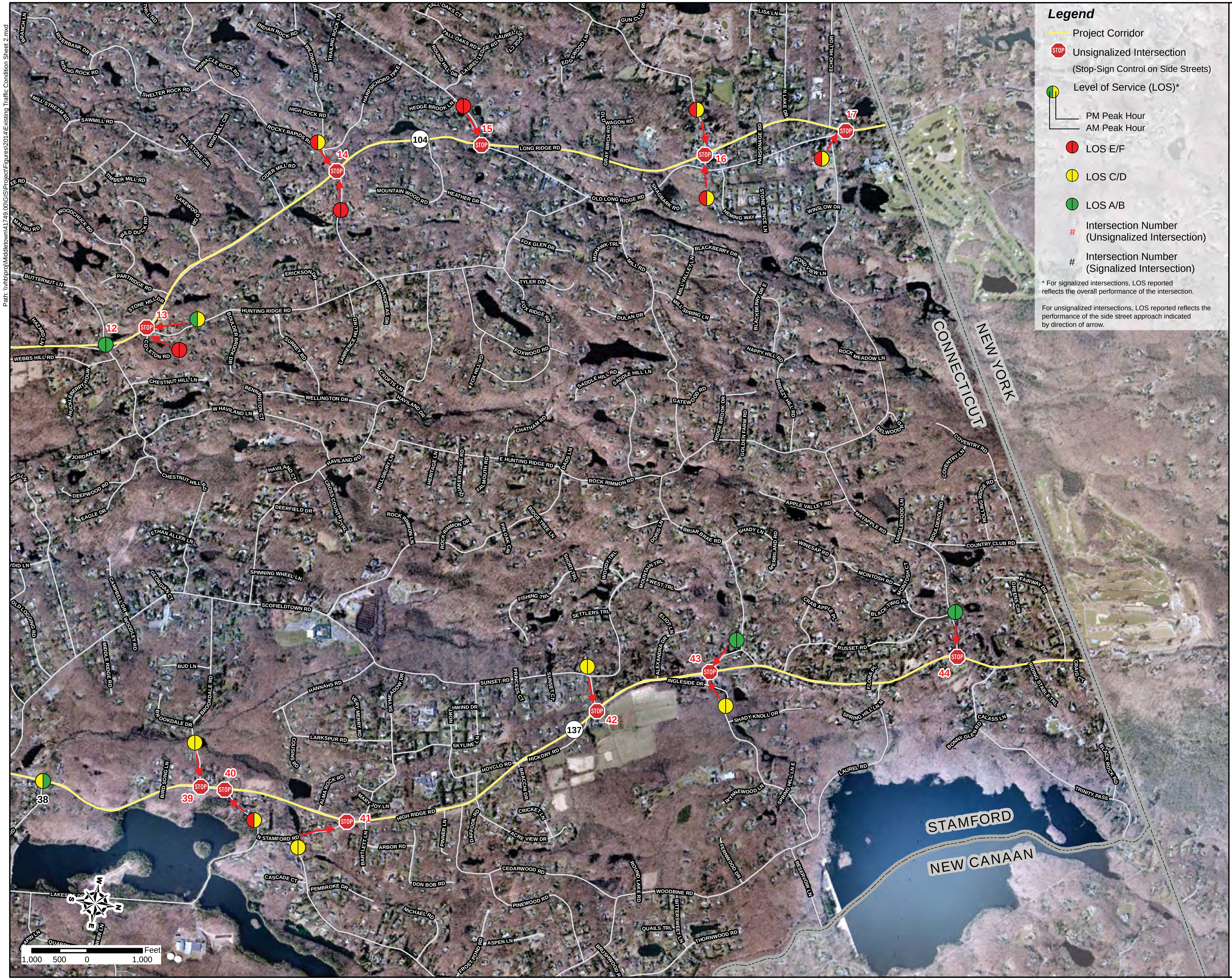

Long Ridge | High Ridge
CORRIDORS STUDY

Figure 4-23 (N)

Intersection Level of Service
2026 Preferred Alternative Conditions

Long Ridge Road

1 Long Ridge Road at High Ridge Road/Bedford St/Summer St.
2 Long Ridge Road (Route 104) at Cold Spring Road (Route 137)
3 Long Ridge Road (Route 104) at Drives to Olin Chemicals/ Lord & Taylors
4 Long Ridge Road (Route 104) at Terrace Avenue/South Drive to G.E. Credit Corp
5 Long Ridge Road (Route 104) at Woodridge Drive South
6 Long Ridge Road (Route 104) at Stillwater Road/Buckingham Drive
7 Long Ridge Road (Route 104) at Drive to Long Ridge Office Park
8 Long Ridge Road (Route 104) at Loughran Avenue/G.E. Energy Financial Services
9 Long Ridge Road (Route 104) at Nestle/Oracle Drives (formerly Hyperion)
10 Long Ridge Road (Route 104) at Route 15 NB Off Ramp/Wire Mill Road
11 Long Ridge Road (Route 104) at Route 15 SB Ramps/Webbs Hill Road
12 Long Ridge Road (Route 104) at Chestnut Hill Road/Butternut Lane
13 Long Ridge Road (Route 104) at Hunting Ridge Road S
14 Long Ridge Road (Route 104) at Wildwood Road
15 Long Ridge Road (Route 104) at River Bank Road
16 Long Ridge Road (Route 104) at Erskine Road
17 Long Ridge Road (Route 104) at Old Long Ridge Road (northern)

High Ridge Road

18 High Ridge Road (Route 137) at Cold Spring Road (Route 137)
19 High Ridge Road (Route 137) at Lord & Taylor Drive
20 High Ridge Road (Route 137) at Oaklawn Avenue/Cross Road
21 High Ridge Road (Route 137) at Terrace Avenue
22 High Ridge Road (Route 137) at Unity Road/Brownley Road
23 High Ridge Road (Route 137) at Lakeview Drive/Rippowam High School Drive
24 High Ridge Road (Route 137) at Loveland Road
25 High Ridge Road (Route 137) at Dannel Drive/Mercedes Lane
26 High Ridge Road (Route 137) at Ridge Park Road
27 High Ridge Road (Route 137) at Hartswood Road
28 High Ridge Road (Route 137) at Bradley Place
29 High Ridge Road (Route 137) at Merriman Road
30 High Ridge Road (Route 137) at Vine Road/Private Drive
31 High Ridge Road (Route 137) at Cedar Height Road/Turn of River Road
32 High Ridge Road (Route 137) at Olga Drive/Private Drive
33 High Ridge Road (Route 137) at Square Acres Drive/Shopping Plaza
34 High Ridge Road (Route 137) at Route 15 NB Ramps/Buxton Farms Road
35 High Ridge Road (Route 137) at Route 15 SB Ramps
36 High Ridge Road (Route 137) at Wire Mill Road
37 High Ridge Road (Route 137) at Scofieldtown Road
38 High Ridge Road (Route 137) at Interlaken Road
39 High Ridge Road (Route 137) at Brookdale Road
40 High Ridge Road (Route 137) at North Stamford Road (southern)
41 High Ridge Road (Route 137) at North Stamford Road (northern)
42 High Ridge Road (Route 137) at Sunset Road
43 High Ridge Road (Route 137) at Briar Brae Road
44 High Ridge Road (Route 137) at Mayapple Road

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

4.5.1.4 Signalized Intersections

The results of the signalized intersections capacity analyses indicate that several signalized study intersections are projected to operate with an overall LOS E or F during the peak periods, up from four for the existing conditions. These intersections are discussed below.

#6 Long Ridge Road at Stillwater Road/Buckingham Drive

The overall intersection is projected to operate at LOS D during the weekday morning peak period but LOS F during the weekday evening peak period.

During the morning and evening peak periods, vehicle queues in the southbound right-turn lane will exceed the available storage and interrupt the flow of southbound through vehicles on Long Ridge Road while vehicle queues in the northbound left-turn lane will exceed the available storage and interrupt the flow of through vehicles on Long Ridge Road. Vehicle queues on the eastbound Stillwater Road approach will extend past Roxbury Road during both periods, greatly interfering with the ability of vehicles to make left-turns from Roxbury Road to Stillwater Road.

In the evening peak-hour, average delays are projected to increase from approximately 61 (existing) seconds to approximately 117 seconds, precipitating a change in Level-of-Service from E to F. The entire intersection configuration is currently being studied for redesign by Tighe & Bond.

#10 Long Ridge Road at Route 15 Northbound Off-ramp / Wire Mill Road

The overall intersection will operate at LOS E during the weekday morning peak period and D during the evening peak period.

During the morning peak period, long vehicle queues in the southbound through lanes will block access to the southbound left-turn lane. Long vehicle queues will also prevail in the eastbound right-turn lanes and the westbound left-turn lane, blocking the adjacent lanes. LOS E conditions will persist on the southbound through movement while LOS F conditions will prevail on the eastbound right and westbound let-turn movements.

During the evening peak period, long vehicle queues will prevail in the eastbound right-turn lanes and the westbound left-turn lane, blocking the adjacent lanes. LOS E conditions will persist these movements. Long Queues and LOS E conditions will also prevail on the northbound through lanes.

In the morning peak-hour, average delays are projected to be reduced from approximately131 seconds to 56 seconds, considerably less than the existing AM peak hour delays. In the evening peak-hour, average delays are projected to be reduced to 45 seconds, also considerably less that current delays.

#30 High Ridge Road at Vine Road/Private Drive

The overall intersection will operate at LOS C during the weekday morning peak period but a LOS F during the weekday evening peak period.

During the morning peak period, long vehicle queues in the westbound right-turn lane and on the northbound approach will spill back and block the adjacent lanes and intersections, respectively.

During the evening peak period, long vehicle queues in the westbound right-turn lane, the southbound left-turn lane and on the northbound approach will spill back and block the adjacent lanes and intersections.

In the evening peak-hour, average delays are projected to be reduced from 152 seconds to 89 seconds, considerably less than the average existing delay.

#31 High Ridge Road at Cedar Heights Road/Turn of River Road

The overall intersection will operate at LOS C during the weekday morning peak period but a LOS E during the weekday evening peak period.

During the morning peak period, long vehicle queues on the southbound approach will spill back and block the adjacent driveways while queues in the eastbound right-turn lane and westbound left-turn lane will exceed the storage capacity and partially block the other movements on those approaches.

During the evening peak period, long vehicle queues on the southbound approach, the northbound approach, the westbound left-turn lane and the eastbound right-turn lane will spill back and block the adjacent driveways, lanes and intersections, respectively.

In the evening peak-hour, average delays are projected to be reduced from approximately 94 seconds to 62 seconds, or roughly equivalent to existing average delays.

#35 High Ridge Road at Route 15 SB Ramps

The overall intersection is projected to operate at LOS E during the weekday morning peak period and LOS C during the weekday evening peak period.

During the morning peak period, long vehicle queues on the jughandle to the southbound ramp will spill back and interrupt the flow of northbound through vehicles on High Ridge Road, long vehicle queues on southbound High Ridge Road will spill back and block the intersection of Wire Mill Road, and long vehicles queues on the eastbound right-turn movement will spill back and block the adjacent left-turn lane.

During the afternoon peak periods, long vehicle queues on the northbound approach will spill back and block access to the jughandle, while long vehicles queues on the eastbound right-turn movement will spill back and block the adjacent left-turn lane.

In the morning peak-hour, average delays are projected to be reduced from 133 seconds to 55 seconds, considerably less than existing levels, whiles delays in the evening peak hour are projected to remain virtually unchanged at 29 seconds.

The remaining signalized study intersections will operate with overall LOS D or better conditions during the peak periods. However, LOS E or F conditions were identified for individual turning movements, commonly from side street approaches, at many of these intersections. The long delays on the side streets, generally caused by relatively long intersection cycle lengths, allow for greater capacity for the higher volume Long Ridge Road and High Ridge Road approaches. Progression along Long Ridge Road and High Ridge Road should take priority, and therefore, LOS E or F should be considered tolerable for some of the low volume side street movements. The signalized study intersections with projected individual turning movements experiencing LOS E or F conditions and/or excessive vehicle queuing are identified below.

#1 Long Ridge Road at High Ridge Road / Bedford Street / Summer Street

During the evening peak period, the Summer Street northbound approach to Bedford Street will operate at LOS E, although the volume of traffic is projected to be relatively low.

#2 Long Ridge Road at Cold Spring Road

During the morning peak period, the eastbound left-turn movement and the westbound through movement on Cold Spring Road, as well as the southbound through movement on Long Ridge Road will experience LOS E.

#3 Long Ridge Road at Drives to Olin Chemicals / Lord & Taylor

During the morning peak period, the Olin Chemicals eastbound approach and Lord & Taylor westbound approach will operate at LOS E; however, these side street approaches have relatively low traffic volumes.

During the evening peak period, the Olin Chemicals eastbound approach will operate at LOS E; however, this side street approach has relatively low traffic volumes.

#4 Long Ridge Road at #260 Driveway/Terrace Avenue

During the morning and evening peak periods, the eastbound approach will operate at LOS E.

#5 Long Ridge Road at Woodridge Drive South

During the morning peak period, the westbound Woodridge Drive South approach will operate at LOS E; however, this side street approach has relatively low traffic volumes.

#11 Long Ridge Road at the SB Merritt Parkway Ramps

During the evening peak period, the westbound right-turn movement from the Merritt Parkway off ramp will operate at LOS E and long queues will partially obstruct the left-turn movement.

#18 High Ridge Road at Cold Spring Road (Route 137)

During the morning peak period, the eastbound Cold Spring Road approach will operate at LOS E with long vehicle queues on the eastbound approach that back up through the upstream signalized intersection with Long Ridge Road to the west. The westbound retail center driveway approach will also operate at LOS E.

During the evening peak period, the eastbound Cold Spring Road approach will operate at LOS F with long vehicle queues that back up through the upstream signalized intersection with Long Ridge Road to the west, while the northbound left-turn movement and the westbound Home Goods driveway approach will operate at LOS E.

#20 High Ridge Road at Oaklawn Avenue

During the morning peak period, the westbound Oaklawn Avenue approach will operate at LOS E and vehicle queues will extend past Halpin Avenue, interfering with the ability of vehicles to make left-turns from Halpin Avenue to Oaklawn Avenue.

During the evening peak period, the northbound approach on High Ridge Road will operate at LOS E and vehicle queues will extend past the Lord & Taylor driveway, interfering with the ability of vehicles to make left-turns from the Lord & Taylor driveway onto High Ridge Road.

#21 High Ridge Road at Terrace Avenue

During the evening peak period, the westbound left-turning movement from the private drive will operate at LOS E.

#22 High Ridge Road at Unity Road / Brownley Road

During the morning peak period, the eastbound Brownley Road approach and the westbound Unity Road approach will operate at LOS E; however, the side street approaches have relatively low traffic volumes.

During the evening peak period, the westbound Unity Road approach and the southbound left-turn movement the will operate at LOS E; however, the side street approaches have relatively low traffic volumes.

#23 High Ridge Road at Lakeview Drive / Rippowam High School Drive

During the morning and evening peak periods, the eastbound Lakeview Drive approach will operate at LOS E.

#24 High Ridge Road at Loveland Road

During the morning peak period, the eastbound Loveland Road approach will operate at LOS E.

#32 High Ridge Road at Olga Drive / Private Drive

During the evening peak period, the westbound private driveway will operate at LOS E; however, the side street approach has relatively low traffic volumes.

#34 High Ridge Road at Route 15 NB Ramps/Buxton Farms Road

During the morning and evening peak periods, long vehicle queues in the Route 15 off-ramp through lane will block access to the adjacent turn lanes, as will vehicle queues in the westbound Buxton Farms right-turn lane onto Long Ridge Road. Excessive vehicle queues in the northbound Long Ridge Road right-turn lane will back up to the upstream signalized intersection with Square Acres Drive and the shopping plaza driveway to the south, while excessive vehicle queues in the southbound Long Ridge Road left-turn lane will back up to the upstream signalized intersection with the southbound off-ramp.

#37 High Ridge Road at Scofieldtown Road

During the morning peak period, the southbound High Ridge Road approach will operate at LOS F with excessive vehicle queues.

4.5.1.5 Unsignalized Intersections

The results of the capacity analyses indicate that several of the unsignalized study intersections operate with LOS E or F conditions on the side street during one or both peak periods. The excessive delays on the side street approaches are mostly attributed to the high traffic volumes along Long Ridge Road and High Ridge Road. Due to these high traffic volumes, vehicles at some side street approaches experience long delays during the peak periods as they wait for acceptable gaps in traffic to safely enter the traffic stream. The unsignalized intersections currently operating with LOS E or F conditions are discussed below.

#13 Long Ridge Road at Hunting Ridge Road South

During the morning and evening peak periods, the westbound Hunting Ridge Road South approach will operate at LOS F with excessive delays.

In the morning peak-hour, average delays are projected to increase from approximately 68 seconds (existing) to approximately 129 seconds. In the evening peak-hour, average delays are projected to increase from approximately 64 seconds (existing) to approximately 125 seconds.

#14 Long Ridge Road at Wildwood Road

During the morning and evening peak periods, the eastbound Wildwood Road left-turn and through movements will operate at LOS F.

During the morning and evening peak periods, the westbound Wildwood Road approach will operate at LOS F.

In the morning peak-hour, average delays on the eastbound approach are projected to be reduced from 97 seconds to 41 seconds (roughly equivalent to the current delays), while on the westbound approach, they are projected to be reduced from 790 seconds to 216 seconds, also roughly equivalent to current delays. In the evening peak-hour, average delays on the eastbound approach are projected to be reduced from 42 seconds to 28 seconds, while average delays on the westbound approach are projected to be reduced from 152 seconds to 76 seconds (slightly more than current delays.

#15 Long Ridge Road at Riverbank Road

During the morning and evening peak periods, the eastbound Riverbank Road approach will operate at LOS E.

In the morning peak-hour, average delays are projected to increase from approximately 29 seconds (existing) to approximately 46 seconds. In the evening peak-hour, average delays are projected to increase from approximately 24 seconds (existing) to approximately 37 seconds.

#16 Long Ridge Road at Erskine Road

During the morning peak period, the eastbound Erskine Road approach will operate at LOS E, while the westbound approach will operate at LOS F.

In the morning peak-hour, average delays on the eastbound approach are projected to increase from approximately 36 seconds (existing) to 75 seconds while average delays on the westbound approach are projected to increase from approximately 30 seconds (existing) to 41 seconds.

#17 Long Ridge Road at Old Long Ridge Road

During the morning peak period, the westbound Old Long Ridge Road approach will operate at LOS E.

In the morning peak-hour, average delays on the westbound approach are projected to increase from approximately 30 seconds (existing) to 46 seconds.

#29 High Ridge Road at Merriman

During the morning peak period, the westbound Merriman Road approach will operate at LOS F. This condition will also likely prevail during the evening peak period, although motorists will probably look for alternative ways to go south on High Ridge Road other than turning left from Merriman Road.

In the morning peak-hour, average delays are projected to increase from approximately 56 seconds to approximately 120 seconds.

#37A High Ridge Road at the Unsignalized Scofieldtown Road Connector

During the morning and evening peak periods, the eastbound Scofieldtown Road connector approach will operate at LOS F with excessive delays.

In the morning peak-hour, average delays are projected to be reduced from 390 seconds to 340 seconds and to remain unchanged at 652 seconds in the afternoon peak hour.

#40 High Ridge Road at North Stamford Road (south)

During the morning peak period, the westbound North Stamford Road approach will operate at LOS E.

In the morning peak-hour, average delays on the westbound approach are projected to be approximately 42 seconds.

4.5.2 Scenario 3 – 2036 Long-term Condition

For the 2036 Mid-term Condition traffic analysis, the projected traffic volumes for 2036 were entered into the Synchro model, as were all known roadway improvement projects, including infrastructure upgrades and signal equipment enhancements. Optimized signal timings at all study area intersections were also applied to accurately account for the regular "fine tuning" of traffic signals by the CTDOT.

The following is a summary of traffic operating conditions for 2036 and a comparison to existing conditions. The results of the study intersection capacity analyses under 2036 conditions are summarized on Figures 4-24S and 4-24N. These figures show the overall intersection LOS for signalized intersections and the LOS of the side street approaches for unsignalized intersections. The intersection capacity analyses indicate that suboptimal operating conditions are projected to be experienced at numerous intersections along the corridors.

The analyses results for the signalized and unsignalized study intersections are discussed in more detail in the following sections, and the Synchro output reports are included in the technical appendix.

Long Ridge | High Ridge
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Figure 4-24 (S)

Intersection Level of Service
2036 Preferred Alternative Conditions

Long Ridge Road

1	Long Ridge Road	at	High Ridge Road/Bedford St/Summer St.
2	Long Ridge Road (Route 104)	at	Cold Spring Road (Route 137)
3	Long Ridge Road (Route 104)	at	Drives to Olin Chemicals/ Lord & Taylors
4	Long Ridge Road (Route 104)	at	Terrace Avenue/South Drive to G.E. Credit Corp
5	Long Ridge Road (Route 104)	at	Woodridge Drive South
6	Long Ridge Road (Route 104)	at	Stillwater Road/Buckingham Drive
7	Long Ridge Road (Route 104)	at	Drive to Long Ridge Office Park
8	Long Ridge Road (Route 104)	at	Loughran Avenue/G.E. Energy Financial Services
9	Long Ridge Road (Route 104)	at	Nestle/Oracle Drives (formerly Hyperion)
10	Long Ridge Road (Route 104)	at	Route 15 NB Off Ramp/Wire Mill Road
11	Long Ridge Road (Route 104)	at	Route 15 SB Ramps/Webbs Hill Road
12	Long Ridge Road (Route 104)	at	Chestnut Hill Road/Butternut Lane
13	Long Ridge Road (Route 104)	at	Hunting Ridge Road S
14	Long Ridge Road (Route 104)	at	Wildwood Road
15	Long Ridge Road (Route 104)	at	River Bank Road
16	Long Ridge Road (Route 104)	at	Erskine Road
17	Long Ridge Road (Route 104)	at	Old Long Ridge Road (northern)

High Ridge Road

18	High Ridge Road (Route 137)	at	Cold Spring Road (Route 137)
19	High Ridge Road (Route 137)	at	Lord & Taylor Drive
20	High Ridge Road (Route 137)	at	Oaklawn Avenue/Cross Road
21	High Ridge Road (Route 137)	at	Terrace Avenue
22	High Ridge Road (Route 137)	at	Unity Road/Brownley Road
23	High Ridge Road (Route 137)	at	Lakeview Drive/Rippowam High School Drive
24	High Ridge Road (Route 137)	at	Loveland Road
25	High Ridge Road (Route 137)	at	Dannel Drive/Mercedes Lane
26	High Ridge Road (Route 137)	at	Ridge Park Road
27	High Ridge Road (Route 137)	at	Hartswood Road
28	High Ridge Road (Route 137)	at	Bradley Place
29	High Ridge Road (Route 137)	at	Merriman Road
30	High Ridge Road (Route 137)	at	Vine Road/Private Drive
31	High Ridge Road (Route 137)	at	Cedar Height Road/Turn of River Road
32	High Ridge Road (Route 137)	at	Olga Drive/Private Drive
33	High Ridge Road (Route 137)	at	Square Acres Drive/Shopping Plaza
34	High Ridge Road (Route 137)	at	Route 15 NB Ramps/Buxton Farms Road
35	High Ridge Road (Route 137)	at	Route 15 SB Ramps
36	High Ridge Road (Route 137)	at	Wire Mill Road
37	High Ridge Road (Route 137)	at	Scofieldtown Road
38	High Ridge Road (Route 137)	at	Interlaken Road
39	High Ridge Road (Route 137)	at	Brookdale Road
40	High Ridge Road (Route 137)	at	North Stamford Road (southern)
41	High Ridge Road (Route 137)	at	North Stamford Road (northern)
42	High Ridge Road (Route 137)	at	Sunset Road
43	High Ridge Road (Route 137)	at	Briar Brae Road
44	High Ridge Road (Route 137)	at	Mayapple Road

City of Stamford, Connecticut

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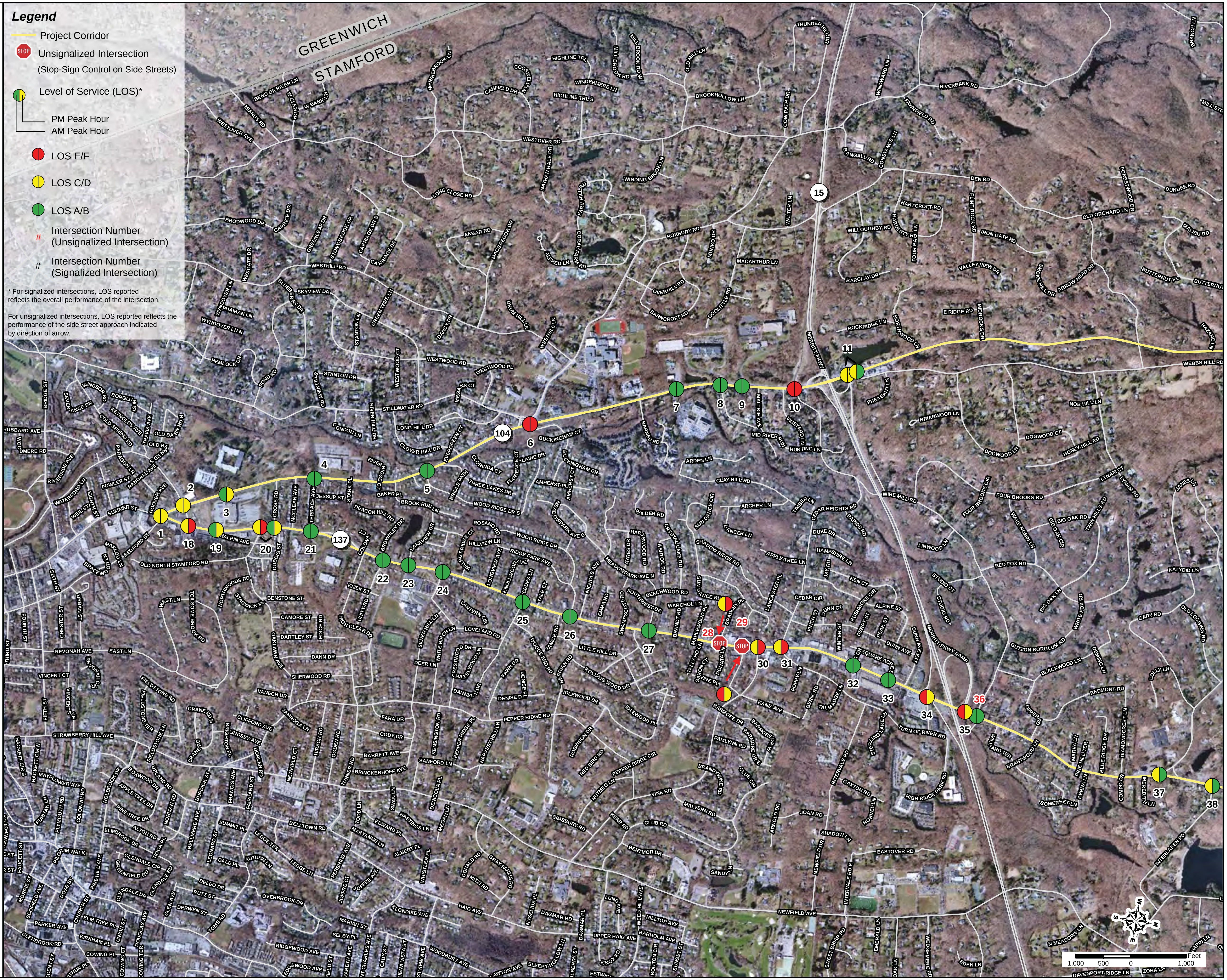
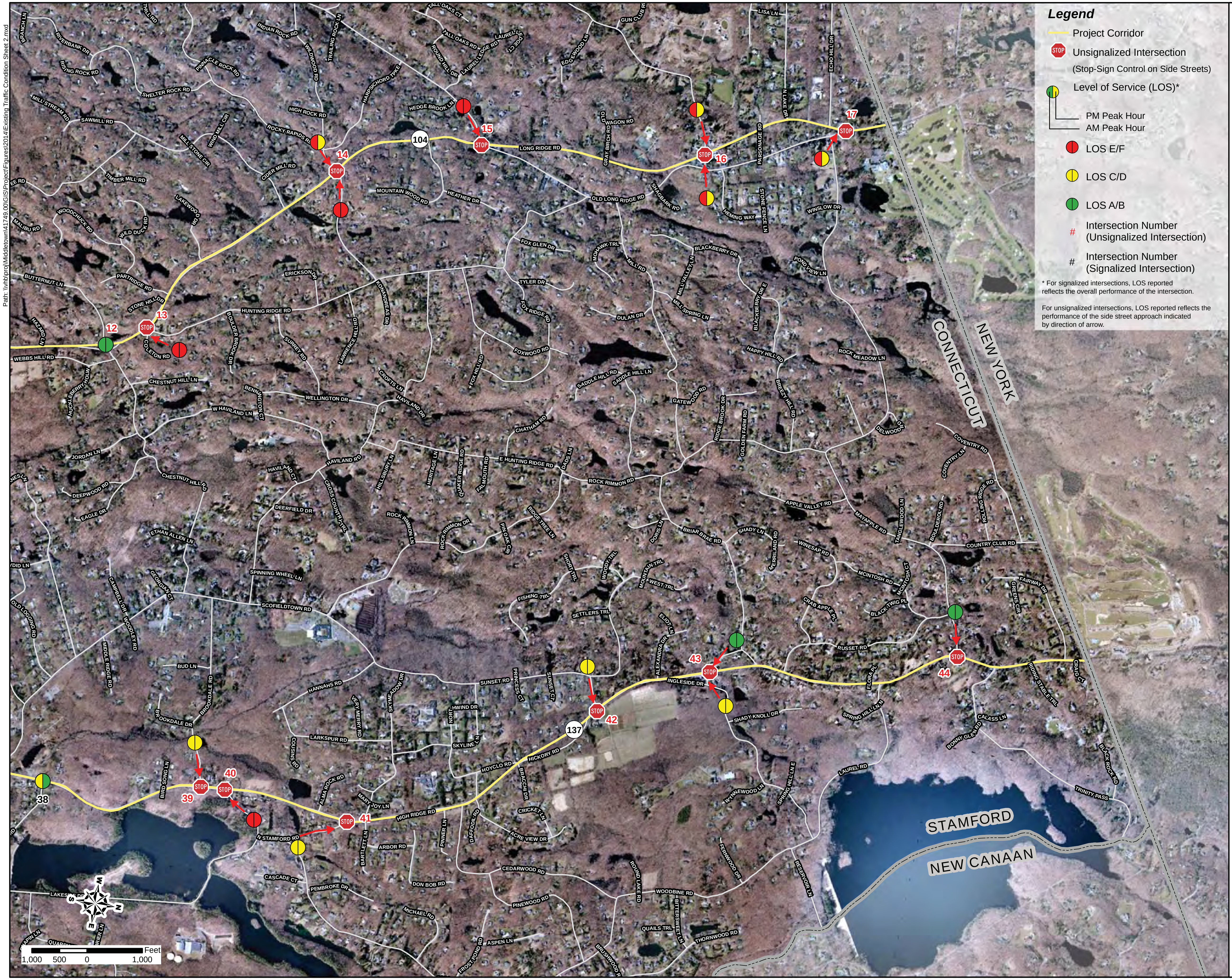
Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)





Long Ridge | High Ridge
CORRIDORS STUDY

Figure 4-24 (N)

Intersection Level of Service
2036 Preferred Alternative Conditions

	Long Ridge Road		
1	Long Ridge Road	at	High Ridge Road/Bedford St/Summer St.
2	Long Ridge Road (Route 104)	at	Cold Spring Road (Route 137)
3	Long Ridge Road (Route 104)	at	Drives to Olin Chemicals/ Lord & Taylors
4	Long Ridge Road (Route 104)	at	Terrace Avenue/South Drive to G.E. Credit Corp
5	Long Ridge Road (Route 104)	at	Woodridge Drive South
6	Long Ridge Road (Route 104)	at	Stillwater Road/Buckingham Drive
7	Long Ridge Road (Route 104)	at	Drive to Long Ridge Office Park
8	Long Ridge Road (Route 104)	at	Loughran Avenue/G.E. Energy Financial Services
9	Long Ridge Road (Route 104)	at	Nestle/Oracle Drives (formerly Hyperion)
10	Long Ridge Road (Route 104)	at	Route 15 NB Off Ramp/Wire Mill Road
11	Long Ridge Road (Route 104)	at	Route 15 SB Ramps/Webbs Hill Road
12	Long Ridge Road (Route 104)	at	Chestnut Hill Road/Butternut Lane
13	Long Ridge Road (Route 104)	at	Hunting Ridge Road S
14	Long Ridge Road (Route 104)	at	Wildwood Road
15	Long Ridge Road (Route 104)	at	River Bank Road
16	Long Ridge Road (Route 104)	at	Erskine Road
17	Long Ridge Road (Route 104)	at	Old Long Ridge Road (northern)
	High Ridge Road		
18	High Ridge Road (Route 137)	at	Cold Spring Road (Route 137)
19	High Ridge Road (Route 137)	at	Lord & Taylor Drive
20	High Ridge Road (Route 137)	at	Oaklawn Avenue/Cross Road
21	High Ridge Road (Route 137)	at	Terrace Avenue
22	High Ridge Road (Route 137)	at	Unity Road/Brownley Road
23	High Ridge Road (Route 137)	at	Lakeview Drive/Rippowam High School Drive
24	High Ridge Road (Route 137)	at	Loveland Road
25	High Ridge Road (Route 137)	at	Dannel Drive/Mercedes Lane
26	High Ridge Road (Route 137)	at	Ridge Park Road
27	High Ridge Road (Route 137)	at	Hartswood Road
28	High Ridge Road (Route 137)	at	Bradley Place
29	High Ridge Road (Route 137)	at	Merriman Road
30	High Ridge Road (Route 137)	at	Vine Road/Private Drive
31	High Ridge Road (Route 137)	at	Cedar Height Road/Turn of River Road
32	High Ridge Road (Route 137)	at	Olga Drive/Private Drive
33	High Ridge Road (Route 137)	at	Square Acres Drive/Shopping Plaza
34	High Ridge Road (Route 137)	at	Route 15 NB Ramps/Buxton Farms Road
35	High Ridge Road (Route 137)	at	Route 15 SB Ramps
36	High Ridge Road (Route 137)	at	Wire Mill Road
37	High Ridge Road (Route 137)	at	Scofieldtown Road
38	High Ridge Road (Route 137)	at	Interlaken Road
39	High Ridge Road (Route 137)	at	Brookdale Road
40	High Ridge Road (Route 137)	at	North Stamford Road (southern)
41	High Ridge Road (Route 137)	at	North Stamford Road (northern)
42	High Ridge Road (Route 137)	at	Sunset Road
43	High Ridge Road (Route 137)	at	Briar Brae Road
44	High Ridge Road (Route 137)	at	Mayapple Road

City of Stamford, Connecticut

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Base Map Source: USGS 2008 High Resolution Orthoimagery for the Bridgeport, Hartford, & New Haven, CT Urban Areas (1 - Foot resolution)

4.5.2.1 Signalized Intersections

The results of the signalized intersections capacity analyses indicate that several signalized study intersections are projected to operate with an overall LOS E or F during the peak periods, up from four for the existing conditions. These intersections are discussed below.

#6 Long Ridge Road at Stillwater Road/Buckingham Drive

The overall intersection is projected to operate at LOS E during the weekday morning peak period and LOS F during the weekday evening peak period.

During the morning and evening peak periods, vehicle queues in the southbound right-turn lane will exceed the available storage and interrupt the flow of southbound through vehicles on Long Ridge Road while vehicle queues in the northbound left-turn lane will exceed the available storage and interrupt the flow of through vehicles on Long Ridge Road. Vehicle queues on the eastbound Stillwater Road approach will extend past Roxbury Road during both periods, greatly interfering with the ability of vehicles to make left-turns from Roxbury Road to Stillwater Road.

In the morning peak-hour, average delays are projected to increase from approximately 31 (existing) seconds to approximately 62 seconds, precipitating a change in Level-of-Service from C to E. In the evening peak-hour, average delays are projected to increase from approximately 61 (existing) seconds to approximately 140 seconds, precipitating a change in Level-of-Service from E to F. The entire intersection configuration is currently being studied for redesign by Tighe & Bond.

#10 Long Ridge Road at Route 15 Northbound Off-ramp / Wire Mill Road

The overall intersection will operate at LOS E during the both the weekday morning peak period the evening peak period.

During the morning peak period, long vehicle queues in the southbound through lanes will block access to the southbound left-turn lane. Long vehicle queues will also prevail in the eastbound right-turn lanes and the westbound left-turn lane, blocking the adjacent lanes. LOS E conditions will persist on the southbound through movement while LOS F conditions will prevail on the eastbound right and westbound let-turn movements.

During the evening peak period, long vehicle queues will prevail in the eastbound right-turn lanes and the westbound left-turn lane, blocking the adjacent lanes. LOS E conditions will persist these movements. Long Queues and LOS E conditions will also prevail on the northbound through lanes.

In the morning peak-hour, average delays are projected to be reduced from approximately131 seconds to 56 seconds, considerably less than the existing AM peak hour delays. In the evening peak-hour, average delays are projected to be reduced to 45 seconds, also considerably less that current delays.

#18 High Ridge Road at Cold Spring Road (Route 137)

The overall intersection will operate at LOS C during the morning peak period and LOS E during the evening peak period.

During the morning peak period, the eastbound Cold Spring Road approach will operate at LOS E with long vehicle queues on the eastbound approach that back up through the upstream signalized intersection with Long Ridge Road to the west. The westbound retail center driveway approach will also operate at LOS E.

During the evening peak period, the eastbound Cold Spring Road approach will operate at LOS F with long vehicle queues that back up through the upstream signalized intersection with Long Ridge Road to the west, while the northbound left-turn movement and the westbound Home Goods driveway approach will operate at LOS E.

#30 High Ridge Road at Vine Road/Private Drive

The overall intersection will operate at LOS C during the weekday morning peak period but a LOS F during the weekday evening peak period.

During the morning peak period, long vehicle queues in the westbound right-turn lane and on the northbound approach will spill back and block the adjacent lanes and intersections, respectively.

During the evening peak period, long vehicle queues in the westbound right-turn lane, the southbound left-turn lane and on the northbound approach will spill back and block the adjacent lanes and intersections.

In the evening peak-hour, average delays are projected to be reduced from 152 seconds to 105 seconds.

#31 High Ridge Road at Cedar Heights Road/Turn of River Road

The overall intersection will operate at LOS D during the weekday morning peak period but a LOS E during the weekday evening peak period.

During the morning peak period, long vehicle queues on the northbound and southbound approaches will spill back and block the adjacent driveways while queues in the eastbound left-turn lane and westbound left-turn lane will exceed the storage capacity and partially block the other movements on those approaches.

During the evening peak period, long vehicle queues on the southbound approach, the northbound approach, the westbound left-turn lane and the eastbound right-turn lane will spill back and block the adjacent driveways, lanes and intersections, respectively.

In the evening peak-hour, average delays are projected to be reduced from approximately 94 seconds to 80 seconds.

#34 High Ridge Road at Route 15 NB Ramps/Buxton Farms Road

The overall intersection will operate at LOS E during the weekday morning period and a LOS D during the evening peak period.

During the morning and evening peak periods, long vehicle queues in the Route 15 off-ramp through lane will block access to the adjacent turn lanes, as will vehicle queues in the westbound Buxton Farms right-turn lane onto Long Ridge Road. Excessive vehicle queues in the northbound Long Ridge Road right-turn lane will back up to the upstream signalized intersection with Square Acres Drive and the shopping plaza driveway to the south, while excessive vehicle queues in the southbound Long Ridge Road left-turn lane will back up to the upstream signalized intersection with the southbound off-ramp.

In the morning peak-hour, average delays are projected to be reduced from approximately 114 seconds to 60 seconds, considerably below existing levels, while in the evening peak-hour, average delays are projected to be reduced from approximately 93 seconds to 40 seconds, also considerably below existing levels.

#35 High Ridge Road at Route 15 SB Ramps

The overall intersection is projected to operate at LOS E during the weekday morning peak period and LOS C during the weekday evening peak period.

During the morning peak period, long vehicle queues on the jughandle to the southbound ramp will spill back and interrupt the flow of northbound through vehicles on High Ridge Road, long vehicle queues on southbound High Ridge Road will spill back and block the intersection of Wire Mill Road, and long vehicles queues on the eastbound right-turn movement will spill back and block the adjacent left-turn lane.

During the afternoon peak periods, long vehicle queues on the northbound approach will spill back and block access to the jughandle, while long vehicles queues on the eastbound right-turn movement will spill back and block the adjacent left-turn lane.

In the morning peak-hour, average delays are projected to be reduced from 133 seconds to 61 seconds, considerably less than existing levels, whiles delays in the evening peak hour are projected to remain virtually unchanged at 32 seconds.

The remaining signalized study intersections will operate with overall LOS D or better conditions during the peak periods. However, LOS E or F conditions were identified for individual turning movements, commonly from side street approaches, at many of these intersections. The long delays on the side streets, generally caused by relatively long intersection cycle lengths, allow for greater capacity for the higher volume Long Ridge Road and High Ridge Road approaches. Progression along Long Ridge Road and High Ridge Road should take priority, and therefore, LOS E or F should be considered tolerable for some of the low volume side street movements. The signalized study intersections with projected individual turning movements experiencing LOS E or F conditions and/or excessive vehicle queuing are identified below.

#2 Long Ridge Road at Cold Spring Road

During the morning peak period, the westbound through/right-turn movements on Cold Spring Road will operate at LOS F. The eastbound left-turn movement on Cold Spring Road, as well as the southbound through and right-turn movements on Long Ridge Road will experience LOS E.

During the evening peak period, southbound through movements on Long Ridge Road will experience LOS E.

#3 Long Ridge Road at Drives to Olin Chemicals / Lord & Taylor

During the morning peak period, the Olin Chemicals eastbound approach and Lord & Taylor westbound approach will operate at LOS E; however, these side street approaches have relatively low traffic volumes.

During the evening peak period, the Olin Chemicals eastbound approach will operate at LOS E; however, this side street approach has relatively low traffic volumes.

#4 Long Ridge Road at #260 Driveway/Terrace Avenue

During the morning and evening peak periods, the eastbound approach will operate at LOS E.

During the evening peak period, the southbound left-turn lane will operate at LOS E, however, there are only modest volumes on this movement.

#5 Long Ridge Road at Woodridge Drive South

During the morning peak period, the westbound Woodridge Drive South approach will operate at LOS E; however, this side street approach has relatively low traffic volumes.

#7 Long Ridge Road at Stamford Medical Center

During the evening peak period, the westbound Synchrony Driveway left-turn movement will operate at LOS E; however, this movement has relatively modest traffic volumes.

#11 Long Ridge Road at the SB Merritt Parkway Ramps

During the evening peak period, the westbound right-turn movement from the Merritt Parkway off ramp will operate at LOS F and long queues will obstruct the left-turn movement.

#19 High Ridge Road at the Lord & Taylor Driveway

During the evening peak period, long queues will spill back on the northbound through movement, which will operate at LOS E.

#20 High Ridge Road at Oaklawn Avenue

During the morning peak period, the westbound Oaklawn Avenue approach will operate at LOS E and vehicle queues will extend past Halpin Avenue, interfering with the ability of vehicles to make left-turns from Halpin Avenue to Oaklawn Avenue. The northbound through movement will also operate at LOS E with long queues.

During the evening peak period, the northbound approach on High Ridge Road will operate at LOS F and vehicle queues will extend past the Lord & Taylor driveway, interfering with the ability of vehicles to make left-turns from the Lord & Taylor driveway onto High Ridge Road. The southbound left-turn movement will operate at LOS F.

#21 High Ridge Road at Terrace Avenue

During the evening peak period, the westbound left-turning movement from the private drive will operate at LOS F.

#22 High Ridge Road at Unity Road / Brownley Road

During the morning peak period, the eastbound Brownley Road approach and the westbound Unity Road approach will operate at LOS E; however, the side street approaches have relatively low traffic volumes.

During the evening peak period, the southbound left-turn movement will operate at LOS F while the westbound Unity Road approach will operate at LOS E; however, these movements have relatively low traffic volumes.

#23 High Ridge Road at Lakeview Drive / Rippowam High School Drive

During the morning and evening peak periods, the eastbound Lakeview Drive approach will operate at LOS E.

#24 High Ridge Road at Loveland Road

During the morning peak period, the eastbound Loveland Road approach will operate at LOS E.

#32 High Ridge Road at Olga Drive / Private Drive

During the evening peak period, the westbound private driveway will operate at LOS E; however, the side street approach has relatively low traffic volumes.

#37 High Ridge Road at Scofieldtown Road

During the morning peak period, the southbound High Ridge Road approach will operate at LOS E with excessive vehicle queues.

4.5.2.2 Unsignalized Intersections

The results of the capacity analyses indicate that several of the unsignalized study intersections operate with LOS E or F conditions on the side street during one or both peak periods. The excessive delays on the side street approaches are mostly attributed to the high traffic volumes along Long Ridge Road and High Ridge Road. Due to these high traffic volumes, vehicles at some side street approaches experience long delays during the peak periods as they wait for acceptable gaps in traffic to safely enter the traffic stream. The unsignalized intersections currently operating with LOS E or F conditions are discussed below.

#13 Long Ridge Road at Hunting Ridge Road South

During the morning and evening peak periods, the westbound Hunting Ridge Road South approach will operate at LOS F with excessive delays.

In the morning peak-hour, average delays are projected to increase from approximately 68 seconds (existing) to approximately 182 seconds. In the evening peak-hour, average delays are projected to increase from approximately 64 seconds (existing) to approximately 233 seconds.

#14 Long Ridge Road at Wildwood Road

During the morning and evening peak periods, the eastbound Wildwood Road left-turn and through movements will operate at LOS F.

During the morning and evening peak periods, the westbound Wildwood Road approach will operate at LOS F.

In the morning peak-hour, average delays on the eastbound approach are projected to be reduced from 97 seconds to 46 seconds (slightly more than current delays), while on the westbound approach, they are projected to be reduced from 790 seconds to 327 seconds. In the evening peak-hour, average delays on the eastbound approach are projected to be reduced from 42 seconds to 30 seconds, while average delays on the westbound approach are projected to be reduced from 152 seconds to 88 seconds (slightly more than current delays.

#15 Long Ridge Road at Riverbank Road

During the morning peak periods the eastbound Riverbank Road approach will operate at LOS E., while in the evening peak period it will operate at LOS E.

In the morning peak-hour, average delays are projected to increase from approximately 29 seconds (existing) to approximately 51 seconds. In the evening peak-hour, average delays are projected to increase from approximately 24 seconds (existing) to approximately 40 seconds.

#16 Long Ridge Road at Erskine Road

During the morning peak period, the eastbound Erskine Road approach will operate at LOS E, while the westbound approach will operate at LOS F.

In the morning peak-hour, average delays on the eastbound approach are projected to increase from approximately 36 seconds (existing) to 88 seconds while average delays on the westbound approach are projected to increase from approximately 30 seconds (existing) to 46 seconds.

#17 Long Ridge Road at Old Long Ridge Road

During the morning peak period, the westbound Old Long Ridge Road approach will operate at LOS F.

In the morning peak-hour, average delays on the westbound approach are projected to increase from approximately 30 seconds (existing) to 50 seconds.

#28 High Ridge Road at Bradley Place

During the morning peak period, the eastbound Bradley Place approach will operate at LOS E.

Average delays in the morning peak-hour are projected to increase from approximately 27 seconds (existing) to approximately 37 seconds.

#29 High Ridge Road at Merriman

During the morning peak period, the westbound Merriman Road approach will operate at LOS F. This condition will also likely prevail during the evening peak period, although motorists will probably look for alternative ways to go south on High Ridge Road other than turning left from Merriman Road.

In the morning peak-hour, average delays are projected to increase from approximately 56 seconds to approximately 146 seconds.

#37A High Ridge Road at the Unsignalized Scofieldtown Road Connector

During the morning and evening peak periods, the eastbound Scofieldtown Road connector approach will operate at LOS F with excessive delays.

In the morning peak-hour, average delays are projected to be 445 seconds and to be 1577 seconds in the afternoon peak hour.

#40 High Ridge Road at North Stamford Road (south)

During the morning and evening peak period, the westbound North Stamford Road approach will operate at LOS E.

Average delays on the westbound approach are projected to be approximately 35 seconds in the morning peak-hour and 48 seconds in the evening peak hour.

4.5.2.3 Network Performance

The Synchro analyses for each of the three conditions studied was reviewed relative to the overall network performance. This summary, which lists performance measures such as average delay at intersections, average speed and fuel consumption.is summarized in Table 4-2. Also listed in Table 4-2 are the number of miles traveled through the network for each of the three scenarios studied.

Table 4-2 Network Performance Summary*

Peak Period		AM				PM			
Performance Measure	**Condition**	**2011**	**2016**	**2026**	**2036**	**2011**	**2016**	**2026**	**2036**
Total Miles Traveled	No Improvements	19,345	20,912	22,162	23,088	19,824	20,912	22,144	23,185
	Improvements	-	20,912	22,202	23,127	-	20,129	22,206	23,185
Average Intersection Delay per Vehicle (seconds)	No Improvements	17	22	29	34	22	26	34	41
	Improvements	-	19	18	21	-	21	22	27
Average Speed (mph)	No Improvements	17	15	13	12	15	14	11	10
	Improvements	-	17	17	16	-	16	15	13
Average Miles per Gallon	No Improvements	11.7	11.1	10.1	9.3	11.2	10.6	9.4	8.7
	Improvements	-	11.9	12.0	11.4	-	11.3	11.0	10.2

Note, the number of miles traveled is marginally higher in the improved condition (as compared to the unimproved conditions) as it reflects the slightly longer route taken by northbound motorists anticipated to divert from Bedford Street to Summer Street when Summer Street is made 2-way. However, the network does not include the reduction in miles traveled or the associated benefits south of the intersection of Bedford Street with Summer Street.

As can be seen from Table 4-2, with steadily increasing traffic volumes between 2011 and 2036, level of traffic activity along the corridors is projected to increase significantly, as reflected by the increase in vehicle miles traveled. At the same time, the average delay at intersections is projected to steadily increase while speed and fuel efficiency decrease as congestion increases along the corridors.

With the implementation of the identified improvement measures, the Synchro™ network analyses indicate that vehicles will spend less time at intersections, will move along the corridors faster and will have a higher fuel efficiency. By 2026, even with the projected double-digit percentage increase in travel by 2026, delays, speed and fuel consumption will remain at or close to 2011 levels. By 2036, even with the identified improvements, delay will have increased somewhat while speed and fuel efficiency will decline.

4.5.3 Next Steps

The next step in the study process is to provide recommendations and an implementation plan for short, medium, and long-term actions. *Chapter 5 – Transportation Improvement Plan* outlines this action plan and identifies potential funding mechanisms.

A preliminary order-of-magnitude cost estimates is prepared for each preferred alternative based on CTDOT Weighted Average Unit Prices (WAUP), recent costs from other projects, and previously published reports. The preliminary construction cost estimates do not include any required right-of-way acquisitions, hazardous materials mitigation, or utility relocation. A summary evaluation criteria matrix with costs for each improvement package is presented in Table 4.3. A detailed cost matrix breakdown for each location summarizing all improvement measures is included in the Appendix.

Table 4-3 Alternatives Evaluation Summary – Ranked by Performance

TRANSPORTATION IMPROVEMENTS	ENHANCED MOBILITY	COST EFFECTIVENESS	ADVANCEMENT OF ECONOMIC DEVELOPMENT	REDUCTION OF ENVIRONMENTAL IMPACTS	DEGREE OF LOCAL SUPPORT AND STATE GOALS AND PLANS	IMPROVEMENT OF SAFETY, SECURITY, AND TECHNOLOGY	COST	WEIGHTED INDEX (MAX=100)
High Ridge Road Corridor - South of Merritt Parkway – Bike Lanes, Median Improvements & Sidewalk	+	+	+	+	++	++	**$6,100,000**	**44**
Install Separator Curbs (Vine Rd to Cedar St; Cedar St to Buxton Farm Rd)	-	++	-	=	-	+++	**$400,000**	**11**
Improve Traffic Signal Coordination	+	+++	+	++	++	+	**$90,000**	**56**
Remove Pavement Markings and Restripe Travel Lanes to 11'	+	++	+	+	++	++	**$210,000**	**50**
Install new ADA Ramps and Pedestrian Signals & Restripe Crosswalks	++	+	+	=	++	++	**$700,000**	**44**
Install Interactive Speed Signs and Speed Limit Signs	=	+++	=	=	++	+++	**$60,000**	**44**
Construct Landing Area for Bus Shelters and Install Shelters	+	+	+	+	++	+	**$730,000**	**39**
High Ridge Road Corridor - North of Merritt Parkway - Bike Lanes	+	+	=	+	+	++	**$6,300,000**	**33**
Remove Pavement Markings and Restripe Travel Lanes to 11'	+	++	=	+	++	++	**$220,000**	**44**
Install new ADA Ramps and Restripe Crosswalks	++	++	=	=	++	++	**$110,000**	**44**
Install Interactive Speed Signs and Speed Limit Signs	=	+++	=	=	++	+++	**$70,000**	**44**
Improve Traffic Signal Coordination (Schofield Town Rd to Interlaken Rd)	+	+++	=	++	++	+	**$23,000**	**50**
Construct Landing Area for Bus Shelters and Install Shelters	+	++	+	+	+	+	**$480,000**	**39**
Long Ridge Road Corridor - South of Merritt Parkway - Bike Lanes, Turn lanes, & Sidewalk	++	+	+	+	++	++	**$8,300,000**	**50**
Improve Traffic Signal Coordination	+	+++	+	++	++	+	**$54,000**	**56**
Remove Pavement Markings and Restripe Travel Lanes to 11'	+	++	+	+	++	++	**$200,000**	**50**
Install new ADA Ramps and Pedestrian Signals & Restripe Crosswalks	++	+	+	=	++	++	**$560,000**	**44**
Install Interactive Speed Signs	=	+++	=	=	++	+++	**$70,000**	**44**
Construct Landing Area for Bus Shelters and Install Shelters	+	+	+	+	++	+	**$660,000**	**39**
Long Ridge Road Corridor - North of Merritt Parkway – Bike Lanes & Signals	+	+	=	+	+	++	**$5,900,000**	**33**
Remove Pavement Markings and Restripe Travel Lanes to 11'	+	++	=	+	++	++	**$220,000**	**44**
Install new ADA Ramps and Restripe Crosswalks	++	++	=	=	++	++	**$100,000**	**44**
Install Interactive Speed Signs and Speed Limit Signs	=	+++	=	=	++	+++	**$80,000**	**44**
Construct Landing Area for Bus Shelters and Install Shelters	+	++	+	+	+	+	**$320,000**	**39**

Table 4-3 (Continued) Alternatives Evaluation Summary – Ranked by Performance

		ENHANCED MOBILITY	COST EFFECTIVENESS	ADVANCEMENT OF ECONOMIC DEVELOPMENT	REDUCTION OF ENVIRONMENTAL IMPACTS	DEGREE OF LOCAL SUPPORT AND STATE GOALS AND PLANS	IMPROVEMENT OF SAFETY, SECURITY, AND TECHNOLOGY	COST	WEIGHTED INDEX (MAX=100)
TRANSPORTATION IMPROVEMENTS	**Bulls Head Area – Short term**	+	++	+	+	+	+	**$140,000**	**39**
	Bulls Head Area - Mid term	++	+	+	=	+	+	**$730,000**	**33**
	Bulls Head Area - Long Term	++	+	+	+	+	+	**$1,330,000**	**39**
	Bulls Head Area (2-Way Summer Street Alternative)	+	+	=	+	+	+	**$1,100,000**	**28**
	Long Ridge Road @ 260 Long Ridge Road	++	+	+	+	+	++	**$1,630,000**	**44**
	Long Ridge Road at Cross Street, Terrace Avenue & McClean Avenue -Short Term	+	+++	=	=	+	+	**$80,000**	**33**
	Long Ridge Road at Cross Street, Terrace Avenue & McClean Avenue - Long Term	+	+	=	+	+	+	**$500,000**	**28**
	Long Ridge Road @ Stillwater Road (By Others)	+	+	+	+	+	++	**$7,500,000**	**39**
	Long Ridge Road Between River Oaks Driveway & Burns Lane	+	+	=	=	+	++	**$2,190,000**	**28**
	Long Ridge Road @ Merritt Parkway Ramps - Short Term	+	++	+	+	+	+	**$240,000**	**39**
	Long Ridge Road @ Merritt Parkway Ramps - Long Term	++	+	+	++	+	++	**$12,700,000**	**50**
	Long Ridge Road @ Chimney Corners – Short Term	+	++	=	+	+	+	**$280,000**	**33**
	Long Ridge Road @ Chimney Corners – Long Term	++	+	+	+	=	+	**$2,010,000**	**33**
	Long Ridge Road @ Chestnut Hill Road	++	+	=	+	++	++	**$3,410,000**	**44**
	Long Ridge Road @ Wildwood Road	+	+	=	+	+	+	**$540,000**	**28**
	Long Ridge Road @ Mountain Wood Road	=	+	=	=	+	++	**$2,040,000**	**22**
	Long Ridge Road @ Old Long Ridge Road	=	+	=	=	+	++	**$1,500,000**	**22**
	High Ridge Road @ Sky Meadow Drive – Short term	=	++	=	=	+	++	**$330,000**	**28**
	High Ridge Road @ Sky Meadow Drive – Long Term	=	+	=	=	+	++	**$790,000**	**22**
	High Ridge Road @ Scofieldtown Road – Short Term	+	++	=	=	+	+	**$280,000**	**28**
	High Ridge Road @ Scofieldtown Road – Short Term	+	+	=	=	=	++	**$2,470,000**	**22**
	High Ridge Road @ Merritt Parkway Ramps - Short term	+	++	+	+	+	+	**$170,000**	**39**
	High Ridge Road @ Merritt Parkway Ramps – Long Term	+++	+	+	++	+	+	**$12,810,000**	**50**
	High Ridge Road @ Cedar Heights and Vine Road –Short Term	+++	++	++	++	+	+	**$170,000**	**61**
	High Ridge Road @ Cedar Heights and Vine Road – Long Term	++	+	++	+	+	+	**$610,000**	**44**

Legend				
	Negligible	Some	Moderate	Substantial
Benefits	=	+	++	+++
Detractions	=	-	- -	- - -

As depicted in Table 4.3, the top ranked improvements measures at key locations, in order, are:

- The short-term signal, signing and striping improvements at the intersection of High Ridge Road with Vine Road and Cedar Heights Road
- Traffic signal Coordination improvements on High Ridge Road south of the Merritt Parkway
- Traffic signal Coordination improvements on Long Ridge Road south of the Merritt Parkway
- The long-term physical improvements to the intersection of High Ridge Road with the Merritt Parkway Ramps
- The long-term physical improvements to the intersection of Long Ridge Road with the Merritt Parkway Ramps
- Restriping High Ridge Road South of the Merritt Parkway to provide 11-foor travel lanes and 6-foot shoulders
- Restriping Long Ridge Road South of the Merritt Parkway to provide 11-foor travel lanes and wider shoulders
- Widening Long Ridge Road south of the Merritt Parkway to provide a left-turn lane at key locations, 5-foot shoulders and sidewalks

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Transportation Improvement Plan

Chapter 4 presented detailed screening and packaging of potential improvement options measured against the evaluation criteria established for this study, including consideration of preliminary costs. Chapter 4 also presented concept plans for the recommended transportation improvement alternatives.

This chapter builds on the alternatives evaluated in Chapter 4 by establishing the phasing of recommendations into immediate, short, mid, and long-term actions and policies that will comprise the overall transportation improvement plan for the LRHR corridor. Each category discussed in this chapter is not in any specific order of significance or priority

5.1 Overview

From the outset of the study, ideas for transportation system improvements were solicited from the public, stakeholders, and the Technical Advisory Group (TAG). The alternatives were screened against the project scope, physical and environmental constraints, and further refined to address any undesirable consequences by the Study Team and the TAG. This was accomplished through iterative reviews conducted during meetings and working sessions, where the priority and phasing for the recommendations were also identified and refined.

From Chapter 4, the range of alternatives were described in detail and grouped into the following packages:

- Transit Improvements;
- Pedestrian/Bicycle Improvements;
- Roadway Improvements; and
- Policy Recommendations.

The TAG and Study Team jointly developed and refined a matrix of the alternatives which included potential implementation timeframes for each recommendation. The time line utilized for the recommendations included immediate-term actions (under one year), short-term actions (1 to 5 years), mid-term actions (5 to 10 years), and long-term actions (over 10 years). Sections 5.2 through 5.5 summarize the immediate-term, short-term, mid-term, and long-term recommended actions. Section 5.6 focuses on the policy recommendations. Implementation of the recommendations is expected to be influenced by external factors such as the region's economy, funding availability, and ease of right-of-way acquisition where needed.

5.2 Immediate-Term (less than 1 year) Recommendations

Immediate-term actions can be implemented within one year and address existing safety and operational deficiencies or advance some aspects of longer-term improvement projects. For the most part, the improvements that can be completed within one year include low-cost options that do not require environmental permitting, prolonged design or approvals, or extensive community vetting.

The following immediate-term recommendations are recommended:

- Add a physical barrier (plastic curb with tubular markers) on Summer Street immediately south of Long Ridge Road to prevent crossovers from Bedford Street to driveways on the west side of the road
- At each signalized intersection in the Bulls Head area, reduce the signal cycle lengths to 90 seconds (shorter cycle lengths normally have shorter red intervals resulting in shorter delays and shorter queues) and refine signal timings and coordination
- Consider reducing the speed limit on all roads approaching the Bulls Head Area to 35 mph
- On the Long Ridge Road southbound approach to Cold Spring Road, set back the left-turn stop line by 10 feet
- On the eastbound Cold Spring Road approach to Long Ridge Road, add a second "Left Turn Only" sign
- Install a plastic curb with pop-back vertical plastic posts as a barrier on High Ridge Road between the northbound and southbound lanes from Buxton Farm Road to south of Vine Road (except at intersections and major driveways)
- Install GPS devices on CT Transit buses and develop an APP to inform customers where the next bus is and when it will arrive

- Optimize traffic signal timing at the intersections of Long Ridge Road with the northbound and southbound Merritt Parkway ramps
- Optimize traffic signal timing at the intersections of High Ridge Road with the northbound and southbound Merritt Parkway ramps
- Install an Intersection ahead warning sign (W2-1) with a an advisory 30 mph supplementary plate on southbound Long Ridge Road approaching Butternut Lane
- Add a W13-1P (40 mph) supplementary plate to the intersection ahead warning sign on northbound Long Ridge Road approaching Wildwood Road
- Install an Intersection ahead warning sign (W2-1) with a an advisory 30 mph supplementary plate on southbound Long Ridge Road approaching Mountain Wood Road
- Add a W13-1P (40 mph) supplementary plate to the intersection ahead warning sign on northbound Long Ridge Road approaching River Bank Road
- Install a W2-1 Intersection ahead warning sign with a W13-1P (40 mph) supplementary panel on northbound Long Ridge Road approaching Erskine Road
- Reduce the 45 mph speed limit on Long Ridge Road and High Ridge Road north of the Merritt Parkway to 40 mph and provide periodic speed enforcement
- Institute routine maintenance at key intersections on Long Ridge Road and High Ridge Road north of Merritt Parkway to maintain vegetation and maximize sightlines
- Install Chevron signs on the east side of High Ridge Road on the curve between Interlaken Road and Birdsong Lane
- Install a W2-1 Intersection ahead warning sign with a W13-1P (35 mph) supplementary panel on southbound High Ridge Road approaching Brookdale Road and Briar Brae Road and on northbound High Ridge Road approaching North Stamford Road (both south and north intersections), Hoyclo Road (at Acre View Drive) and Sunset Road
- Relocate the W1-2 curve warnings signs which are located more than 500 feet north and south of Cedarwood Road closer to the curve, per the recommendations of FHWA MUTCD Table 2.4C and add W13-1P (40 mph) supplementary
- Install a "Do Not Block Intersection" sign and paint No Standing box at the intersection of High Ridge Road and Wire Mill Road

5.3 Short-Term (1 to 5 years) Recommendations

Short-term recommendations include those actions that address existing safety and transportation infrastructure deficiencies within the study area. For the most part, these improvements include low-cost options that can be substantially completed in a short time-frame (1-5 years), with limited design and permitting efforts, and little to no environmental impact. These recommendations also include early phases of longer-term alternatives.

The recommended short-term actions described in detail in Chapter 4 include:

- Restripe Bedford Street north from Locust Lane to eliminate one of the two northbound right-turn lanes on approaching Bulls Head and restripe northbound High Ridge Road to better accommodate cyclists and pedestrians
- Restripe northbound High Ridge Road to provide at least a 5-foot shoulder for cyclists (with 6" to 8" shoulder striping) extending from northbound Bedford Street and around the corner onto High Ridge Road. Change policy and practice along the entire length of both corridors to use curb inlet grates, and eliminate street inlets
- Construct a clearly discernible, 5-foot wide sidewalk (and curb where missing) on the west side of Long Ridge Road and High Ridge Road, between Cold Spring Road and Bedford Street and on the north side of Cold Spring Road. This will require demarcation and construction of appropriate driveways, proper driveway aprons and ADA treatments and, in many cases, considerable driveway width reductions / access management
- Restripe southbound Long Ridge Road between Cold Spring Road and Bedford Street to provide 10.5 foot lanes and a 5-foot shoulder (with 6" to 8" shoulder striping)
- Restripe northbound Long Ridge Road between Cold Spring Road and Bedford Street to provide 10.5 foot lanes and a 4-foot shoulder (with 6" to 8" shoulder striping)
- On east side of Long Ridge Road between Cold Spring Road and Bedford Street, add a 5-foot wide sidewalk, 3-feet back from the curb, to complete the pedestrian connection on that side
- Add high visibility crosswalks and appropriate pedestrian signal equipment (countdown signals) on the north and east legs at the Long Ridge Road and Cold Spring Road intersection
- Provide plantings (to make attractive) on the existing concrete median on the north leg of High Ridge Road at the Bedford Street intersection
- Restripe Long Ridge Road immediately north of Cold Spring Road to provide minimum 11-foot lanes and a 5-foot shoulder (6 to 8-inch wide

white stripe) in the northbound direction with sharrows and "SHARE THE ROAD" signs in a wider, southbound, right-hand lane

- Reconstruct sidewalk in disrepair as necessary
- Add a physical barrier (tubular markers) on Summer Street immediately south of Long Ridge Road to prevent crossovers from Bedford Street to driveways on the west side of the road
- On the north leg of High Ridge Road at the Bedford Street/Long Ridge Road intersection, install a high visibility crosswalk and countdown pedestrian indications
- On the Long Ridge Road southbound approach to Cold Spring Road, evaluate the ability to reduce the right turning radii to support shorter and safer crossings
- Install interactive speed signs on Cold Spring Road west of Bulls Head
- Upgrade bus stops with improved facilities (sidewalks, shelters, ADA accessibility)
- Improve transit headways
- Restripe Long Ridge Road between the Bulls Head and the Merritt Parkway to provide 11-foot travel lanes and 6" to 8"shoulder lines to provide a 5-foot shoulder on the longer uphill sections of the roadway and a wider shoulder lane on the corresponding longer downhill sections of the road
- Upgrade the existing sidewalk to ADA standards
- Upgrade pedestrian crossings at existing signalized intersections
- Consolidate or formalize the number of bus stops
- Install "SHARE THE ROAD" signs and interactive speed signs at key locations along the entire length of both corridors
- Install measures to calm traffic along Vineyard Lane and Hunting Lane between Long Ridge Road and Wire Mill Road.
- Provide parking for bicycles adjacent to suitable transit stops
- Where travel lanes on Long Ridge Road north of the Merritt Parkway and on High Ridge Road north of Willard Terrace are wider than 23 feet, restripe the roadway to provide 11-foot travel lanes and wider shoulders (with a 6" to 8 " wide shoulder line)
- Restripe High Ridge Road between Willard Terrace and Wire Mill Road to provide two 11 –foot wide southbound lanes, an 11-foot wide northbound lane, a 5-foot wide northbound shoulder (using a 6" to 8" wide stripe) and a 6-inch wide southbound shoulder, at a minimum
- Upgrade the existing sidewalk on both sides of the High Ridge Road from Scofieldtown Road to Wire Mill Road to ADA standards
- On High Ridge Road, remove excessive pavement and square off the North Stamford approach to High Ridge Road intersection to reduce speed and improve sight lines.
- Install a crosswalk across High Ridge Road on the north leg of Scofieldtown Road

- Optimize traffic signal timing and progression at the remaining traffic signals not optimized as part of the short-term improvements
- Restripe High Ridge Road to provide 11-foot travel lanes and 6-foot shoulders with 6” to 8” white edge lines
- Consider reducing the speed limit on High Ridge Road from Buxton Farm Road to Vine Road to 35 mph
- Remove the three on-street parallel parking spaces on the east side of High Ridge Road, immediately south of Vine Road intersection and extend the sidewalk around the southeast of the intersection
- Reduce speed limit to 35 MPH, install interactive speed signs, and provide periodic police enforcement
- Implement pavement marking and signal phasing changes at the intersection of High Ridge Road with Cedar Heights Road/Turn of River Road and Vine Road
- Provide a curb bump out at Halpin Avenue to slow northbound, right-turning vehicles on High Ridge Road at Halpin Avenue and install a pedestrian crosswalk across Halpin Avenue
- Provide separate controllers for the intersections of High Ridge Road with Oaklawn Avenue and Cross Road so that they operate independently, but set the coordination so that green on the High Ridge Road through phases ends at the same time at both signals
- Reduce the signal cycle length of the traffic signal at the Lord & Taylor Driveway to match those at the intersection of High Ridge Road with Cold Spring Road and adjust the controller offset to coordinate with the signal at that intersection
- Convert the northbound right-turn lane at Terrace Avenue to a bus pull-off lane

5.4 Mid-Term (5-10 years) Recommendations

Mid-term recommendations include improvements that focus on future transportation needs, have longer permitting and design efforts, and can be more costly than the previously presented immediate and short-term actions. It is anticipated that these would be substantially completed in a 5 to 10 year timeframe.

Implementation of the recommended mid-term actions (permitting, design, approval and funding sourcing) should begin in the short-term so that construction can begin in the 5 – 10 year time frame. The recommended mid-term actions described in detail in Chapter 4 include:

- Evaluate the effectiveness of the interactive speed signs on Cold Spring Road west of Bulls head and ascertain the ability to reduce the Speed limit to 35 mph, thereby enabling the installation of "Share the Road" signs and markings (Sharrows) to promote cycling

- On the east side of High Ridge Road, north of Bedford Street, install a barrier along the curb and construct a 5'-wide sidewalk next to a 5' shoulder (with a 6" to 8" stripe and colorized pavement) in the vacated lane
- Relocate the southern third of the median on the north leg of Long Ridge Road at the High Ridge Road/Bedford Street intersection one-foot to the west, to accommodate 10.5' lanes and 5-foot shoulders in both directions
- Widen the east side of Long Ridge Road on the northbound approach to the Cold Spring Road intersection by 3 feet to accommodate 11' lanes and a 5-foot shoulder (with a 6" to 8" stripe and colorized pavement)
- On Cold Spring Road between High Ridge Road and Long Ridge Road, narrow the center median by 2 feet on either side to provide 11' lanes and 5-foot shoulders (with a 6" to 8" stripe and colorized pavement)
- Convert the north end of Summer Street to accommodate 2-way traffic, thereby at least allowing employees at 3001 Summer Street to exit to the north without first proceeding south on Summer Street and cutting across to return on Bedford Street
- Paint all shoulders along both corridors and in the Bulls Head area which are suitable for bicycle use a different color to the roadway pavement
- Add left-turn lanes at the main, signalized driveway serving 260 Long Ridge Road.
- Expand Complete Streets Program along both corridors south of the Parkway by extending sidewalks and traffic calming measures into the cross/side streets
- Future development of vacant parcels along the Long Ridge Road corridor, including at 710 Long Ridge Road, should include the construction of left-turn lanes on Long Ridge Road
- Install pedestrian crossings where they are absent at existing signalized intersections along both corridors
- Normalize the intersection geometry at the intersections of Sky Meadow Drive and North Stamford Road (north) with High Ridge Road, and install northbound and southbound left-turn lanes on High Ridge Road between
- Break the existing, long, left-turn lanes on High Ridge Road south of the Parkway into separate, short left-turn lanes with a median between them and install a landscaped median in the center of the roadway, where feasible

5.5 Long-Term (beyond 10 years) Recommendations

Long-term recommendations are capital intensive and often take longer periods of time to design, fund, and construct. It is anticipated that these projects would be implemented beyond the 10 year timeframe. They include those actions that may not be necessary under existing conditions, but will be needed to handle future traffic demands if the trends highlighted in this report remain accurate.

The recommended long-term actions (all part of phases actions that begin in immediate-term, mid-term or short-term) described in detail in Chapter 4 include:

- At each signalized intersection in the Bulls Head area as well as on High Ridge Road at Vine Road and Cedar Heights Road, install textured crosswalks
- Construct a channelized, double right turn from High Ridge Road to Cold Spring Road
- Widen Long Ridge Road south of the Parkway to provide minimum 11′ travel lanes and 5′shoulder (colorized) for cyclists (with bold 6″ to 8″ shoulder striping) in each direction
- Add a new sidewalk along both sides of Long Ridge Road
- Widen Long Ridge Road by 11 or more feet, to provide a center left-turn lane or a center two-way left-turn lane between the River Oaks Driveway and Barnes Lane with minimum 11′ through lanes and 5′, colorized shoulders (with bold 6″ to 8″ shoulder striping) in each direction
- Provide connectivity to the proposed Mill River/Rippowam River pedestrian and bicycle trail
- Widen roadway to provide 5′ bike lanes and sidewalks on both sides of roadway
- At the northbound Parkway Exit Ramp, create a 110-foot long lane for through traffic to Wire Mill Road so that it does not block right-turning traffic and add a second right-turn lane off the ramp.
- Construct a path for pedestrians and cyclists parallel to both Long Ridge Road and High Ridge Road passing under the Merritt Parkway to connect the north and south sides of the Long Ridge corridor
- Widen Long Ridge Road through Chimney Corners to add sidewalks and 5′ wide colorized shoulder on both sides for pedestrians and cyclists
- Install a crosswalk and pedestrian signal indications on the north side of the intersection of Webbs Hill Road with Long Ridge Road
- Install a traffic signal and left-turn lanes on Long Ridge Road at Chestnut Hill Road
- Square off the intersection of Hunting Ridge Road (south)

- Channelize the eastbound right-turn out Wildwood Road onto Long Ridge Road and cut back the rock outcrop to the north of the intersection to improve sightlines
- Cut back the rock outcrop on the east side of Long Ridge Road on the curve north of Mountain Wood Road to increase sightlines
- Square off the intersection of Long Ridge Road with Old Long Ridge Road to reduce speed and provide safer sight lines
- Widen the Long Ridge Road from Chimney Corners to the State line and High Ridge Road from Willard Terrace to the State line by one to seven feet to provide 11-foot travel lanes and 5-foot colorized shoulders with a 6″ to 8″ shoulder line
- Lengthen the left turn storage lane on High Ridge Road approaching Scofieldtown Road
- Restripe High Ridge Road between Willard Terrace and Wire Mill Road to provide two 11 –foot wide southbound lanes, an 11-foot wide northbound lane, a 5-foot wide northbound shoulder (using a 6″ to 8″ wide stripe) and a 6-inch wide southbound shoulder,
- Reconstruct the intersection of High Ridge Road with the southbound ramps to the Merritt Parkway to provide two lanes on the jug-handle and two receiving lanes for the on-ramp (two lanes transition to one-lane before merging with the parkway)
- Install a traffic control signal at Wire Mill Road (with a pedestrian crosswalk) and coordinate the signals
- Reconstruct the intersection of Buxton Farm Road with High Ridge Road to consolidate movements at that location (including to and from the park-and-ride), widening the roadway to provide a southbound left-turn lane and a northbound right-turn lane,
- Provide a pedestrian and bicycle connection to the contemplated Rippowam River trail
- Consolidate access along High Ridge Road from Buxton Farm Road to Mercedes Lane with redevelopment opportunity and promote cross-access easements
- With any new development along High Ridge Road from Buxton Farm Road to Merriman Road, eliminate on-street parking
- With any new development on High Ridge Road between Vine Road and Cedar Heights Road/Turn of River Road, consideration should be given to consolidating access and widening High Ridge Road on either side by 3 feet to provide 11 foot lanes, including side by side left turn lanes and 5 foot shoulders (with a 6″ to 8″-wide white shoulder line and colorized pavement)
- Install a textured crosswalk across High Ridge Road at the Lord & Taylor driveway intersection

- On High Ridge Road from Cold Spring Road to the Lord & Taylor Driveway, consolidate access for the properties on the east side of the road and then install a physical barrier on High Ridge Road between the two intersections

5.6 Policy Recommendations

Policy recommendations that have been carried forward are aimed at refining the framework for transportation and land use planning on both corridors. The policies are intended to promote the principles of Livable and Sustainable Communities and enhance the economic and social well-being of all people along and adjacent to the corridors by creating and maintaining a safe, reliable, integrated and accessible transportation network that enhances choices for transportation users, provides easy access to employment opportunities and other destinations, and promotes positive effects on the surrounding community. This will be accomplished through collaboration among federal, state, and City partners to accomplish the planning, educating, and institution of coordinated, Livable and Sustainable Community activities.

Implementation of the policy recommendations is expected to vary for each recommendation. It is envisioned that the policy recommendations would evolve over time and require refinement as statewide and municipal transportation and land use policy and zoning regulations change. The City Comprehensive Plan and zoning would evolve to reflect goals, objectives, and policies consistent with the LRR-HRR Corridor Study policies and vision.

External factors such as the region's economy, the price of fuel, and the advancement of alternative fuels and sustainable transportation options will heavily influence these policies and could have a much more significant impact on future transportation on the corridors.

Recommended transportation and land use policies described in detail in Chapter 4 include:

- Promote safety as a top priority within transportation planning and in the delivery of all infrastructure projects
- Target educational activities to current and future travelers to improve safety for all transportation modes
- Continue to develop land use policies/Zoning Ordinances that support transit-oriented development with housing, retail, and jobs collocated with each other near transit;

- Ensure that the City Comprehensive Land Use Plans and Zoning Ordinances reflect goals, objectives, and policies that support safety and access management where appropriate and incorporate the LRR-HRR Corridor Study policies; policies should:
  - Promote the concept of car sharing and bike sharing services
  - Promote the consolidation of driveways and the provision of primary egress to side streets under signal control
  - Include bicycle parking/sidewalks with new developments
  - Expand Complete Streets Program,
  - Encourage the use of alternative fuels for transit vehicles and identify sites for future electric vehicle charging stations
- Establish TDM program requirements in Zoning Ordinance for new, large projects; for projects over certain thresholds, consider traffic monitoring requirements for exceeding traffic thresholds and requiring that private shuttle services be provided and coordinated with CT Transit service
- Promote a Complete Streets approach to design and renovation of infrastructure that ensures safety and mobility for all travelers are considered and identify candidate locations
- Reduce GHG emissions through comprehensive actions that lower VMT and allow safe non-motorized travel, reduce vehicle idling time, enable the use of lower GHG fuels, and encourages fuel efficient vehicles
- Plan, design, build, and standardize the delivery, preservation, and maintenance solutions necessary to achieve green infrastructure. Comprehensive solutions include materials, elements, systems, activities, and performance connected to the infrastructure
- Develop and expand a city-wide bicycle network through bicycle suitability studies for local roads and the development of bicycle plans to increase the number of suitable roads for bicycles linking key destinations to improve mobility

5.7 Summary

This chapter coalesced the phasing of recommendations for the study, which includes projects and policies. Table 5-1 summarizes the suggested implementation timeframes for the study recommendations. This phasing plan, coupled with the policy recommendations in section 5.6, comprises the Transportation Improvement Plan, or blueprint, for enhancements to the corridors' transportation system. Chapter 7 will build on these phasing recommendations by identifying "next steps" and calling out the organizations responsible for the implementation of each phased action. Chapter 7 is the final chapter which will provide an overview of the resulting "blueprint" that has been presented in previous chapters. This blueprint will serve as a coordinated and sustainable development plan for the corridors' transportation system.

Table 5-1 Suggested Implementation Timeframes

		Implementation Timeframe (multiple timeframes indicate phased implementation)			
		Immediate (0- 1 year)	Short-term (1-5 years)	Mid-term (5-10 years)	Long-term (10+ years)
TRANSIT IMPROVEMENTS	Encourage Transit Oriented Development	✓	x	x	x
	Improve transit headways	✓	x	✓	✓
	Consolidate or formalize the number of bus stops	✓	x	✓	✓
	Upgrade bus stops with improved facilities	✓	x	✓	✓
	Convert the northbound right-turn lane at Terrace Avenue to a bus pull-off lane	✓	x	✓	✓
	Provide parking for bicycles adjacent to suitable transit stops	✓	✓	✓	✓
	Install GPS devices on CT Transit buses and develop an appropriate App	x	✓	✓	✓
PEDESTRIAN/BICYCLE IMPROVEMENTS	Pedestrian and Bicycle improvements on High Ridge Road at Bedford Street	✓	x	✓	✓
	Install Bicycle-friendly drainage inlet grates	✓	x	✓	✓
	Complete and extend Sidewalks and upgrade to ADA standards	✓	x	x	x
	Restripe the roadways on both corridors to better accommodate cyclists	✓	x	x	✓
	Upgrade pedestrian crossings on both corridors		x	x	x
	Provide parking for bicycles adjacent to suitable transit stops	✓	x	✓	✓
	Provide connections to the Rippowam River Rail Trail	✓	✓	✓	x
	Construct Path for Pedestrians and Cyclists under the Parkway on both corridors	✓	✓	✓	x
ROADWAY IMPROVEMENTS	Lane Reduction from Bedford Street to High Ridge Road	✓	x	✓	✓
	Traffic Signal Optimization	x	x	✓	✓
	Install Traffic Calming & Traffic Control Measures at key locations	x	✓	✓	✓
	Add a physical barrier (plastic curb and tubes) at key locations	x	x	✓	✓
	Localized Intersection Capacity/ Safety Improvements	x	x	x	x
	Intersection roadside maintenance to improve sightlines	x	x	x	x
	Install Interactive speed signs and SHARE THE ROAD signs	✓	x	✓	✓
	Reduce Speed Limits at key locations	x	x	x	
	Widen Corridors to accommodate bike lanes, turn lanes and sidewalks	✓	✓	✓	x
	Upgrade/Install Warning Signs at key locations	x	✓	✓	✓
	Improve corridor aesthetics with plantings and upgrade medians	✓	x	x	✓

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Urban Design Improvement Plan

Chapter 6 presents a series of Toolkits to correspond with the traffic improvements outlined in Chapter 5. This chapter has reviewed, evaluated and outlined the benefits of Complete Street Design and Smart Growth to provide a framework for providing improvements applicable within the corridors. The purpose of the Toolkits is to provide Stamford with guiding criteria, based in current theory, to consider in conjunction with the proposed roadway improvements. Both Complete Street Design and Smart Growth were outlined separately and individual Toolkits developed.

What are Complete Streets?

Complete Streets are more than just roads, sidewalks, buildings and cars. They are overlapping, integrated and woven systems where equal attention is given to promoting public health, user safety, overall sustainability, and operational efficiency all within a typical street cross section. It is a holistic design approach that allows everyone to travel to and from work, school, and other destinations with the same level of safety and convenience. Complete streets do not segregate; they do not discriminate; they provide equal and well thought design whether or not users have a mobility, vision, or cognitive disability.

Complete Streets are streets for everyone, whether young or old, cyclist, motorist, walker, bus rider or business owner. They are designed and operated to be safer, more livable, and welcoming to all users. Complete Streets provide opportunities for increased physical activity by incorporating features that promote regular walking, cycling and transit use. They help people fight obesity, avoid heart disease, and receive the many other benefits of physical activity. Alternative modes of transportation increase access to downtown destinations, help increase tourism, raise property values, and reduce our dependence on oil. Complete Streets can transform the way our roadways are used, promote social equity, stimulate the local economy and encourage healthy and active lifestyles.

Complete Streets are most effective when they rely on utilizing key Active Transportation principals. Active transportation refers to non-motorized transportation modes, such as bicycling and walking that are well integrated with public transportation. Active Transportation is the most overlooked need in this study area. Each section of High Ridge Road and Long Ridge Road poses unique challenges to walking and bicycling. Solutions to specific locations will be a combination of on-road treatments achieved through adherence to the most modern and tested geometric, operations and maintenance principles, as well as policy and practices. Workable solutions that bring back active transportation are a partnership with land uses and must include off-street solutions, including driveways, parking, building siting and placement and overall land use planning and street connectivity, built form and developer investment strategies.

Background

Over the past 40 years, most communities throughout the country, made walking, bicycling, transit and all forms of active transportation unnatural, uncomfortable, difficult and unsafe acts. Structural and policy changes to our built environment were made to fund, design, favor, and fuel single occupant vehicle travel. This action secluded over 30% of our population, including our children and elders. Traffic grew five times faster than the population, and has led to systems that are failing, not sustainable or healthy. Other forms of movement became unfriendly, unsafe and challenging. This policy shift occurred in many ways: with building placements and orientations (car focused strip malls versus people focused urban forms), urban area roadways were designed for speed, parking incentives, street designs, street patterns, broken street connectivity, school placement and more. As a result of these actions, most other places in the nation saw declines in their health, social engagement, social involvement and access to healthy lifestyles. Policy and design made it easier to do everything by car. We stopped accommodating other modes of transport, and thus made it necessary to do everything by car.

Why are Complete Streets Important?

We have a recognized problem, and this corridor study expects to set a new model in response to shifting demographics and demand for livability and healthier lifestyles. Why is this important, and will a focus on Complete Streets and Active Transportation benefit the life of the city? Do we need added rationale for shifting to the healthy, sustainable, more economically and community responsive action? A few key notes on health, lifestyle and economic effects related to active transportation are as follows:

What are the Detriments of not having Complete Streets?

The built environment has a significant impact on health and well-being by either encouraging or discouraging physical activity. In 2008, 107 million Americans, almost half of all adults 18 years of age or older, had at least 1 of 6 reported chronic illnesses: cardiovascular disease, arthritis, diabetes, asthma, cancer or chronic obstructive pulmonary disease (COPD). Today, two out of three American adults twenty years of age or older is overweight or obese. Childhood obesity has more than tripled in the past 30 years. By 2050 it is predicted that obesity could hit 50% of our population.

The built environment also reflects our social inequities. Today, seniors have a higher pedestrian injury risk than the rest of the population. Older populations are over-represented in intersection fatalities by a factor of more than 2-to-1. 21 percent of seniors today do not drive and half of all non-drivers age 65 and over – 4 million Americans – stay at home on a given day because they lack transportation. Seniors in the United States are at great risk for social isolation once they lose their ability to drive. Aging in place is a significant concern for all of us. The Baby Boomers (those born between 1946 and 1964) started turning 65 in 2011. The number of those 65 years of age and older will grow to 71.5 million by 2030, representing nearly 20 percent of the total U.S. population.

What are the Benefits of having Complete Streets?

The cure too much of what ails us resides in building walkable communities. Our goal must be to create communities that are accessible, efficient and that work for all. Transportation should offer choices and spur economic growth. Development must be sustainable and contribute to social cohesion and work-life balance. Our cities and towns must contribute to improved air, land and water quality.

- Muscle power is the most energy efficient, personally rewarding and least costly mode of transportation.
- Active transportation incorporates exercise into one's daily schedule and eliminates the stress of driving on congested streets.
- Health care costs are reduced, and employee productivity goes up, when people lead active lifestyles. When children walk to school on a regular basis their ability to learn and their test scores increase 20%.
- A study published by CEOs for Cities in 2009 shows that in 13 of 15 housing markets evaluated, a one point increase in a neighborhood's WalkScore (www.walkscore.com) increased home values as much as $3,000.

- When cities and towns provide equitable access to a complete transportation system, they send the message that people – not just cars — belong. No matter one's age, income, ability, or mode of transport, the place works and the benefits are tremendous. Our street design can minimize those things that halt productivity (congestion, accidents) because users know where they belong, how to navigate and how to interact with others. The benefits of active living through active transportation should be celebrated:

- Active transportation mode reduces traffic congestion, air pollution and noise pollution.

- Active transportation infrastructure is far less expensive than building new roads and parking structures, and therefore a greater value for the dollar spent.

Meanwhile, from a jobs creation point of view sidewalks and bike trails are five times more labor intensive than other transportation facilities, employing more people for each dollar invested.

Shifting to active modes of transportation results in lower transportation costs for families. This is especially important for those at the poverty line, where transportation costs can consume 40% of their household budget.

Increases in active transportation leads to reductions in crime and a greater sense of personal and family security by placing more "eyes on the street."

The active transportation provides opportunities for social connections and community building.

Who do Complete Streets Help?

Complete Streets means attention to detail. At intersections, curb ramps should be installed, with audible or tactile signals for blind pedestrians, as well as providing longer crossing times. Along pedestrian routes, smooth sidewalks free of obstacles should be provided, with clearly defined and usable benches. Finally, at transit stops, areas with ample space to approach, wait, and board safely need to be considered.

Universal Design

Complete Streets policies remove barriers to independent travel by considering the needs of all users at the outset of every transportation project. They allow everyone to travel to and from work, school, and other destinations with the same level of safety and convenience, whether or not they have mobility, vision, or cognitive disabilities. Complete Streets also help people who are coping with temporary disabilities as well as those pushing strollers, pulling wheeled luggage, or managing large packages. Complete

Streets also create safe space for older adults to walk or bike as exercise, helping them achieve a healthier lifestyle. Proven methods to create Complete Streets for aging pedestrians include retiming signals to account for slower walking speed, constructing median refuges or sidewalk bulb-outs to shorten crossing distances, and installing curb ramps, sidewalk seating, and bus shelters with seating.

Economic Driver

Making it easier for residents and visitors to take transit, walk, or bike to their destinations can help stimulate the local economy. Local businesses see many benefits in improving access to people traveling by foot or bicycle. Road improvement projects that include bike and pedestrian facilities create more jobs during construction than those that are only designed for vehicles, per dollar spent. Better bicycle infrastructure can create jobs directly… through increased tourism, bicycle manufacturing, sales and repair, bike tours, and other activities. The investment that communities make in implementing Complete Streets policies can stimulate far greater private investment, especially in retail districts and downtowns where pedestrians and cyclists feel unwelcome. Complete Streets policies lead to networks of streets that are safe and accessible for people on foot or riding bikes, which in turn raises property values.

Sustainable

The potential to shift trips to less oil-dependent modes and to save money by doing so is undeniable. Walking and bicycling of course require no gasoline and transit's use of fuel is much more efficient than automobiles. Walking, biking, and taking public transportation save money and reduce our dependence on oil. Walking and bicycling are zero-emission transportation modes, and transit is a lower-emissions mode – using transit can help a solo commuter who switches from driving to transit to reduce carbon dioxide emissions by 20 pounds per day, or more than 4,800 pounds in a year.

Cost Savings

Transportation expenses can be reduced if local infrastructure encourages active transportation, which helps families replace car trips with bicycling, walking, or taking public transit. When residents have the opportunity to walk, bike, or take transit, they have more control over their expenses. When roads are re-designed and maintained to attract pedestrians, the local economy improves and diversifies from increased buyers, which creates job growth and increased investment in the area, including surrounding property values.

A comprehensive, Complete Streets approach to transportation planning and design will increase transportation choices and encourage efficient use of current roadways by offering alternatives to the automobile, especially during peak travel times. Providing travel choices – walking, bicycling, and public transportation – can reduce the demand for peak-hour travel in cars, the principal cause of daily congestion.

Urban Design Toolkit

The urban design of a place has a direct effect on health, schools, taxes, traffic, the environment, economic growth, fairness, and opportunities. Adhering to a set of goals or principles that provide a guiding toolkit for quality place making is equally important to the Long Ridge/High Ridge roadway redevelopment project and Complete Streets Toolkit. By adopting the United States Environmental Protection Agency Smart Growth principles as a guide the Long Ridge/High Ridge Urban Design Toolkit is given a structure to measure success.

An Urban Design Toolkit that embraces the principals of Smart Growth can work to create and maintain communities that are attractive, convenient, safe and healthy. Teamed with the Complete Streets Toolkit, they can promote design that encourages, social, civic, and physical activity. Smart Growth principals allow for environmental protection while stimulating economic growth. They afford residents, workers, visitors, children, families, single people, and older adults more choices in how to get around and where to live, work, play, and interact. Having a strong set of goals and principles in place to guide urban design will allow Stamford to preserve the best of its past while creating a bright future.

Smart Growth and Urban Design

What is Smart Growth?

Smart Growth is all about how we build, or rebuild, our communities. The ten Smart Growth principles according to the Environmental Protection Agency (EPA) are as follows:

- Mix Land Uses
- Take Advantage of Compact Building Design
- Create a Range of Housing Opportunities and Choices
- Create Walkable Neighborhoods
- Foster Distinctive, Attractive Communities with a Strong Sense of Place
- Preserve Open Space, Farmland, Natural Beauty, and Critical Environmental Areas
- Strengthen and Direct Development Towards Existing Communities
- Provide a Variety of Transportation Choices
- Make Development Decisions Predictable, Fair, and Cost Effective
- Encourage Community and Stakeholder Collaboration in Development Decisions

The High Ridge and Long Ridge Corridors in Stamford, possess an exciting existing framework to begin to introduce quality and well thought out urban design and Smart Growth principles. Though not all 10 principals pertain to the corridor in this toolkit, the most applicable are described in the following sections:

Mix Land Uses

The existing High Ridge and Long Ridge roadway corridors have a long established pattern of single use zoning. Promoting a city backed effort of mixed-use development will provide a more balanced growth pattern. Mixed-use development zoning often allows for developers to build at higher densities, reduce parking requirements, reduce asphalt use and design more pedestrian friendly environments. By introducing mixed-use redevelopment projects along the corridor, specifically in the Bulls Head area, Stamford can better balance jobs and housing and give residents a wider range of housing options to reduce congestion caused by workers commuting into the city.

Compact Building Design

Building massing should adopt a more compact design approach. Identifying opportunities for building redevelopment, expansion or reuse and embracing vertical design integration allows for incorporating more density on either existing sites or reducing the horizontal development impact of new development sites. Specific sites in the Bulls Head area and the Vine Road and Cedar Heights Road area should be targeted to accept development infill through zoning modifications. The visual impact of taller more dense buildings can be mitigated through upper story setbacks and required building articulation to reduce to overall sense of mass.

Range of Housing Choices

The High Ridge/ Long Ridge roadway corridors already have a variety of housing options for residents in the area. The existing zoning already allows for various densities of single family housing and low density multi-family. These existing zoning are currently located in appropriate areas with higher single family densities connected commercial nodes along the corridor between the Merritt Parkway and Bulls Head and lower densities transitioning into the more rural fabric north of the Merritt Parkway. Though high density multifamily would fall outside of the current zoning and existing fabric, future design can and should accommodate this use to promote smart growth and complete streets principles, and is integral in creating an effective and sustainable walkable community. Higher density residential should be located around key multi-modal transportation hubs such as the Bulls Head area. In addition to higher density market rate residential choices, affordable housing should also be explored as an integral part to the overall range of housing choices. Various choices of homes including apartments, condominiums, single-family cottages, medium-lot single family homes with in-law suites, and large lot homes should be considered.

Walkable Neighborhoods

A major goal of this project is to rethink the walkability of the High Ride and Long Ridge roadway corridor. An integrated network of sidewalks and trails should connect all parcels along both legs of the corridor. A regional mall including a Lord & Taylor and well-known companies like GE already reside along the Long Ridge corridor. Improved measures of walkability will allow employees to bike and walk to work, removing cars from the highway and reducing congestion. Improving walkability and increasing residential density should pave the way for increased retailers moving to shopping districts once the residential community is large enough to support it. The design of streets and house should also encourages walking. Lane widths should be narrowed to slow traffic and make crossing easier. Park and ride facilities for commuter bus service should be considered at key points off the Merritt Parkway. These areas should be directly connected to the local network of pedestrian and bicycle circulation.

Distinctive and Attractive Places

The Bulls Head area possesses a unique and defining 5-point intersection as the convergence between Long Ridge road, High Ridge road, Bedford Street, Summer Street and Cold Spring Road. Matching this unique traffic pattern with the equally interesting topography, a natural and distinct sense of place is created. It is a memorable moment along a more routine transportation corridor. This area should be capitalized on with multistory urban infill, grade should be utilized to hide parking structures, and entries should be defined with landscape monuments, public art, or formal fountains. Combined together a truly distinctive and attractive place can be created.

Preserved Open Space and Farmland

The High Ridge/Long Ridge roadway corridor presents a very unique opportunity in its shift from a more urban setting to a very rural setting. Points close to Bull's Head present an urban transition, while stretches from Bulls Head to the Merritt Parkway mimic more traditional single use zoning associated with a suburban typology, finally points west of the Merritt Parkway assume a significantly more rural characteristic. It is in this rural area where zoning measures and protective overlay districts could be introduced to preserve the natural Open Space while still encouraging selective infill and development strategically targeted to meet overall goals and objectives.

Development in Existing Communities

The platform for development along the High Ridge/Long Ridge roadway corridor lends itself well to the principals of Smart Growth. Mainly, the corridor between Bulls Head and the Merritt Parkway is currently mostly developed with a standard suburban typology. Strategically located commercial centers such as Bulls Head Shopping Center and Lord and Taylor are already located along well traveled circulation networks. Rethinking these existing single-use, auto-centered, commercial nodes by introducing vertically integrated, pedestrian friendly mix of uses can transform shopping plazas into town centers. Matching this redevelopment with infrastructure improvements has been known to spur economic growth and investment within the surrounding community.

Transportation Choices

The urban core of Stamford is already well connected to the larger area by train and bus. By introducing a local public transportation hub and shuttle connector in the Bulls Head area, with outlier points at the Merritt Parkway and near the New York boarder, a variety of transportation options can help to relieve the stressed and overcrowded roadway system. Connecting those nodes with a well-planned and safe bike lane network can provide just one more layer of transportation choice to the residents of Stamford.

Smart Growth Urban Design Principles

There is an opportunity for the two corridors to advance aspects of Smart Growth as each corridor redevelops over time and as transportation improvement are implemented. The following Smart Growth Urban Design Principles are specific to the Long Ridge/High Ridge corridor. These design principals are not in any specific order of significance or priority.

- Incorporating underground or table top parking structures throughout the corridor.
- Encouraging development infill on existing sites to encourage mix of uses, strengthen the built edge, and hide parking through building placement specifically in the Bulls Head and Vine Road at High Ridge Road area.
- Adopting compact building design at select infill and new development sites

- Reducing at grade parking affords more opportunity for pedestrian plazas, courtyard and open spaces.
- Wide sidewalks with plenty of window space, attractive paving materials, on-street parking, street trees, and street furniture all combine to invite passing pedestrians to shop and spur economic growth. These strategies should be incorporated when redevelopment is considered within the Bulls Head and Vine Road at High Ridge Road areas.
- Second story offices should overlook active streetscapes.
- Vertical integration of uses allow for 24 hour building use, interest, and place making. This design encourages workers and residents to walk to daily errands and restaurants while allowing visitors to park once and enjoy the entire area on foot, helping to reduce vehicular congestion.
- Mixed-use apartment and condominium models offer an alternative to the single-family homes and garden apartments that are the typical styles in this area. The current Stamford Land Use Plan can help to identify areas for this type of housing stock.
- Stores and offices should face the primary street. This provides a buffer to the residential in back from the street noise. The mix of development creates a smooth transition from a commercial, commuter street, to the residential side streets.
- Larger buildings can be made to look smaller with recessed balconies and articulation.
- Vending stalls on major commercial streets are ideal for people who want to start a retail business but have limited funds.
- Public art should be located throughout the corridor. Art reflects the culture of the residents and is a key piece of place making.
- Larger companies and places of employment should designate priority parking for those who van pool.
- Town centers such as Bulls Head should provide a variety of shopping opportunities within walking distance of most of the homes.
- Front porches, narrow lots, sidewalks, and narrow streets are all design elements that make a neighborhood more pedestrian friendly.
- Clearly identified and safely located bike racks should be required with all new and redeveloped properties.
- Fountains and other icons within plazas located at entrances to major commercial buildings at intersections act as central meeting and gathering spaces.
- Street tables for cafes and restaurants located near the curb so people walking past get the sense of being in the middle of the restaurant where they can see and be seen. Street trees and on-street parking buffer the diners from traffic.
- Locating multi-story parking garages in the center of the development or block hides the structure behind shops, restaurants, and offices while still being easily accessible but out of sight.

It is the intent of this Urban Design Toolkit to provide the City of Stamford with a series of attainable goals aimed at the form and structure of the built environment that should be utilized when rethinking redevelopment and redrafting or updating current zoning or land use policies. By adopting these principals and encouraging the use of them in both public and private projects, it is the hope of this document that the Long Ridge and High Ridge Roadway corridors become more attractive, convenient, safe and healthy and the residents of Stamford ultimately benefit.

Synthesizing: The Long Ridge and High Ridge Roadway Vision

The overall vision for the Long Ridge and High Ridge (LRHR) Roadways is to improve transportation efficiency through roadway redesign and intersection improvements. What is equally important is to take the opportunity to provide quality design solutions in order to rethink the corridor character and identity as well. The roadways provide opportunities for improved urban design thinking and landscape enhancements for the residents and commuters of Stamford. Simple adjustments to land use planning, zoning, landscaping and streetscape requirements, matched with improvements to public and non-motorized transportation amenities will create a new and vibrant framework for public and private reinvestment to occur within the area.

Understanding the LRHR Development Transect

These two roadways cross a similar development transect transforming from a more urban core at the Bulls Head intersection with strip and regional commercial and office destinations, through a corridor transition area from Bulls Head to the Merritt Parkway, comprised of various single family and multi-family residential, office and commercial land uses, to a less urban, large lot, wooded residential typology at the Connecticut/New York border. Each area presents unique opportunities to enhance the public realm for residents and commuters concurrently with the proposed short-term, mid-term and long-term transportation improvements.

Developing a LRHR Organization

The framework for the urban design and landscape improvements begins with developing an overall organization for the two roadways. By breaking the roads down into a series of Gateways, Corridors, and Nodes, the roadway becomes more legible to its users and opportunities are created to establish an overall landscape character and corridor identity.

Gateways:

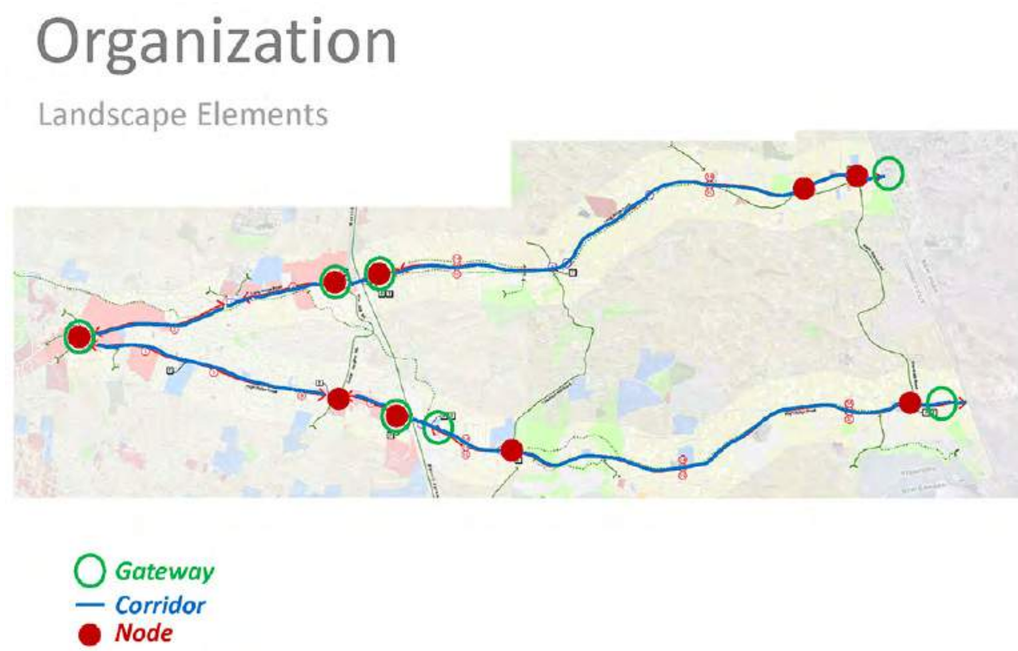
- A gateway is a passage or point at which a new area or region may be entered.

Corridors:

- A corridor is often a narrow tract of land forming a passageway or connection between two nodes. Entry or exit from a corridor may be marked by a gateway.

Nodes:

- A node is a centering of focus of component parts. Most often located at intersections where both pedestrians and vehicles pause and interact, its edges are sometimes marked with a change in intensity and land-use.



Identifying and creating unique **gateways** will allow commuters and residents to feel they have arrived at a specific location. The idea of crossing a threshold provides a transition between one type of landscape or area to another. The LRHR gateways should mark entry or exit from the more urban to transition to less urban areas. Gateway elements should utilize a recognized family of materials, be organized into a legible hierarchy, and should include lighting, specialty pavement, columns and walls, fences, and plant material.

The LRHR **corridors** are defined by the roadway cross-section. Great care has been taken to evaluate the transportation improvements that will upgrade traffic efficiency within the white lines of the asphalt paving, but by studying the area between the road and the fronting building property, an entire corridor experience can be created. Corridor elements respond to the road edge and the vehicles, but they also influence the pedestrian and building occupant experience. These elements may be more intensive in urban areas and less intensive in less urban areas.

The LRHR **nodes** are the centers or hubs of activity along the corridors. The excitement of the LRHR roadways is that there are a variety of experiential nodes that currently occur along the corridor. With simple, well thought design guidelines, the nodes can be enhanced to create well defined use areas that allow for a mix of living, working and playing for Stamford residents and commuters.

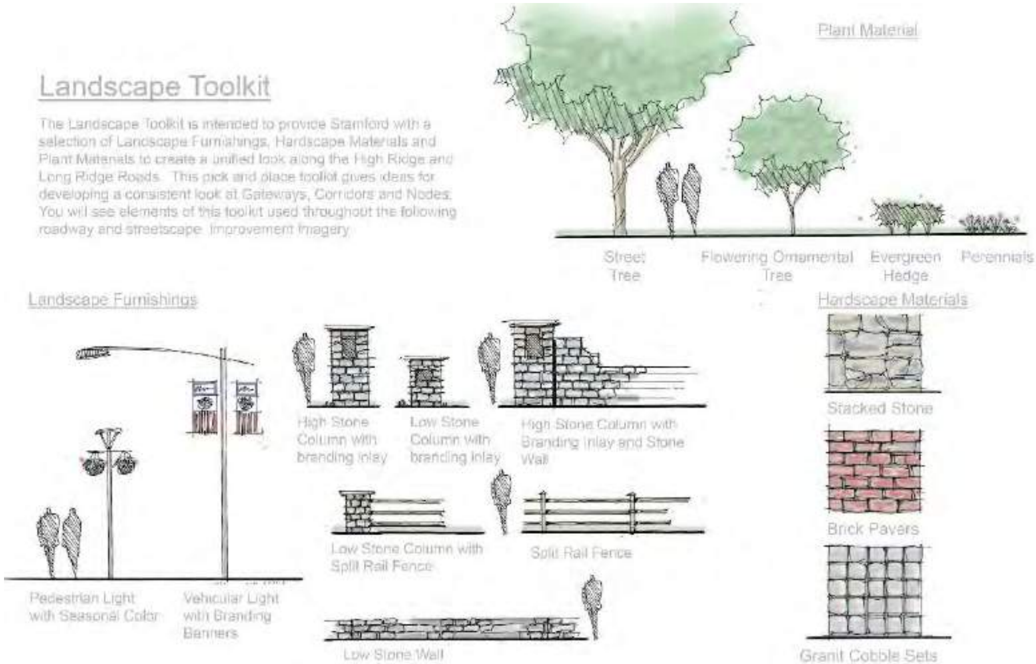
Creating a Corridor Character

LRHR users currently using the corridors are presented with a variety of disjointed and haphazard mix of land uses and landscapes. Current land use and zoning regulations dictate and control the intermixing of uses to assure compatibility, however, it appears that development has occurred parcel by parcel or area by area over the recent past without an overall vision for the two roads. Sidewalks end abruptly, plant material and screening vary, street lights change fixture types or are discontinued, hardscape materials switch, and building setbacks and parking fluctuate. All of these differing landscape components converge to create a chaotic and illegible corridor character. With a few small regulatory adjustments and the development of a possible overlay design district, standardized guidelines can provide the route to find order within the chaos. The development and adoption of a LRHR Landscape Toolkit is one option to provide legible organization to the corridor. A Landscape Toolkit is intended to provide Stamford with a selection of preapproved landscape furnishings, hardscape materials and plant materials to create a unified look along the LRHR roadways. Essentially, a pick and place toolkit, this would give ideas for developing a consistent look at Gateways, Corridors, and Nodes.

Selecting and standardizing Pedestrian and Vehicular Light fixtures and placing them on regular intervals along the corridors provide a recognizable rhythm. Incorporating banners and planting baskets on the light posts gives opportunities for branding and seasonal color at specific nodes or gateways.

Requiring street trees at regularly spaced intervals, alternating with street lights, reinforces the established rhythm as well as providing benefits of utilizing plant material within the developed environment. Requiring trees, buffer plantings, screening and entry plantings within parking areas and along the corridors provide shade, reduce the heat island effect, break up large amounts of paving, and provide seasonal color and interest. Selecting and promoting one or two types of flowering trees and shrubs and utilizing them at gateway entries help to provide a recognizable plant pallet the reinforces the recognizable sense of entry. Developing a consistent planting plan for traffic islands or medians provide an identity for the corridor.

Another key opportunity to help develop a recognizable corridor character is to select a simple yet durable consistent pallet of hardscape materials to utilize in plazas, traffic islands, intersections, sidewalks, crosswalks, and parking areas. Developing and selecting consistent materials and utilizing them in a uniform manner will help to provide order within a varied development. Utilizing precast concrete pavers or granite cobbles at every pedestrian area within the roadway islands begins to give both pedestrians and vehicles a recognizable pallet that signifies areas of pedestrian respite within the large expanse of vehicular roadways. By adopting a consistent change of materials at these areas, it should help to trigger drivers to slow down and recognize the need to share the roadways.



Another equally important opportunity to develop corridor character is to utilize these same hardscape materials on newly proposed landscape amenities. Developing a hierarchy of entry columns, walls, and fences will help to better establish the boundaries to the various corridors, gateways and nodes while reinforcing consistent materials. The intensity of the development along the corridor should directly affect the hierarchy of design. More rural areas should utilize the simplest pallet of materials, simple low stone walls, or spilt rail fences are setting appropriate. Moving toward the transition area around the Merritt Parkway materials can combine by having the split rail fence end in a low stone column or utilizing a variety of free standing low and high stone columns with branding inlay opportunities. Moving toward Bulls Head, where development and architecture is more prevalent, the utilization of higher stone columns with integrated stone walls is more appropriate. These features provide yet another level of recognizable materials, and when used in a well thought out and consistent manner, can provide the legible corridor character vital for the LRHR corridors.

Synthesizing the Ideas

The key to improving the corridor character and overall identity for the LRHR roadways is to apply the suggestions outlined in the LRHR Complete Streets Toolkit, LRHR Urban Design Toolkit and the aforementioned LRHR Landscape Toolkit to the corridor organization framework (gateways, corridors, nodes,) previously described.

The LRHR Complete Streets Toolkit was created to identify the principals and philosophies of Complete Street Design and ensure that those principals and philosophies would be explored and encouraged within the development of the vision of Long Ridge and High Ridge Roads. Specific attention was given to illustrating strategies and techniques relating to traffic calming, streetscape improvements, parking, information systems and transit, and pedestrian and bicycle facilities.

The LRHR Urban Design Toolkit was created to identify urban design tools such as building massing, setbacks, building orientation, consideration for parking, and consideration for general site and development patterns, for use by property owners, developers, and municipalities to better understand the goals behind the vision for the study are and preferred development scenario.

The LRHR Landscape Toolkit provides a consistent pallet of materials and amenities and framework for identifying targeted areas for improvements to develop a more legible and consistent corridor character to locate and implement the vision for the preferred development scenario

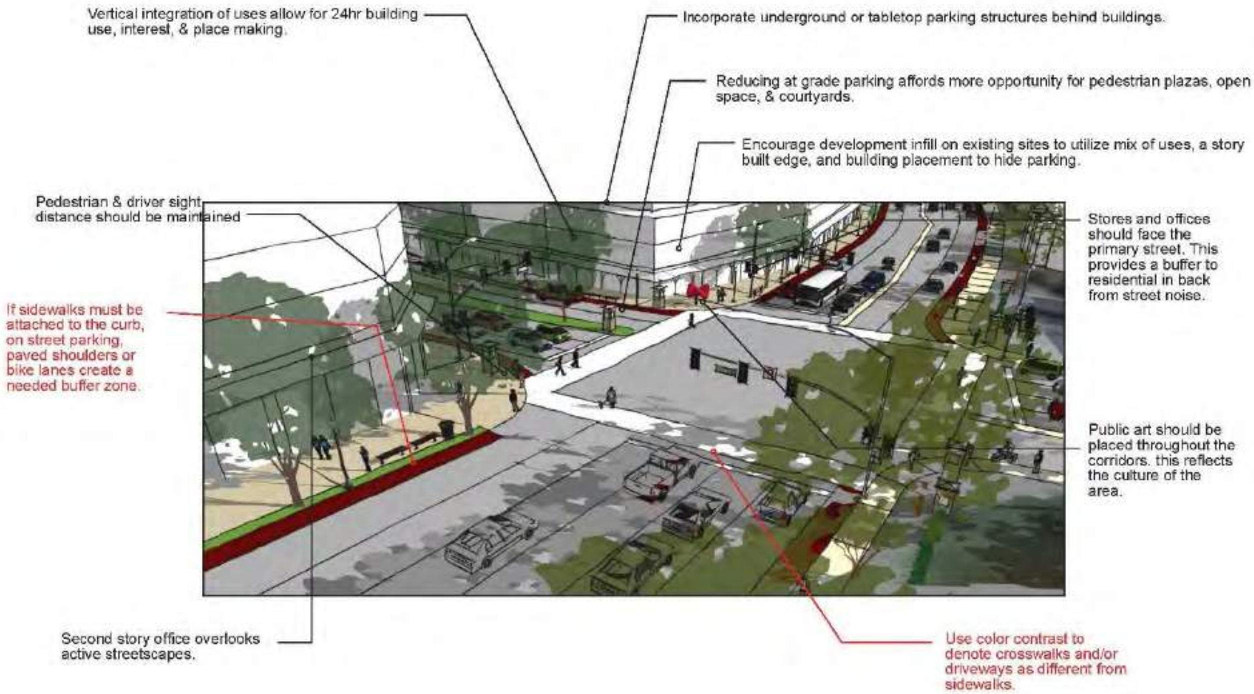
This report has select various case study areas along the roadways to graphically depict examples where ideas from these 3 documents can come together to provide overall enhancements.

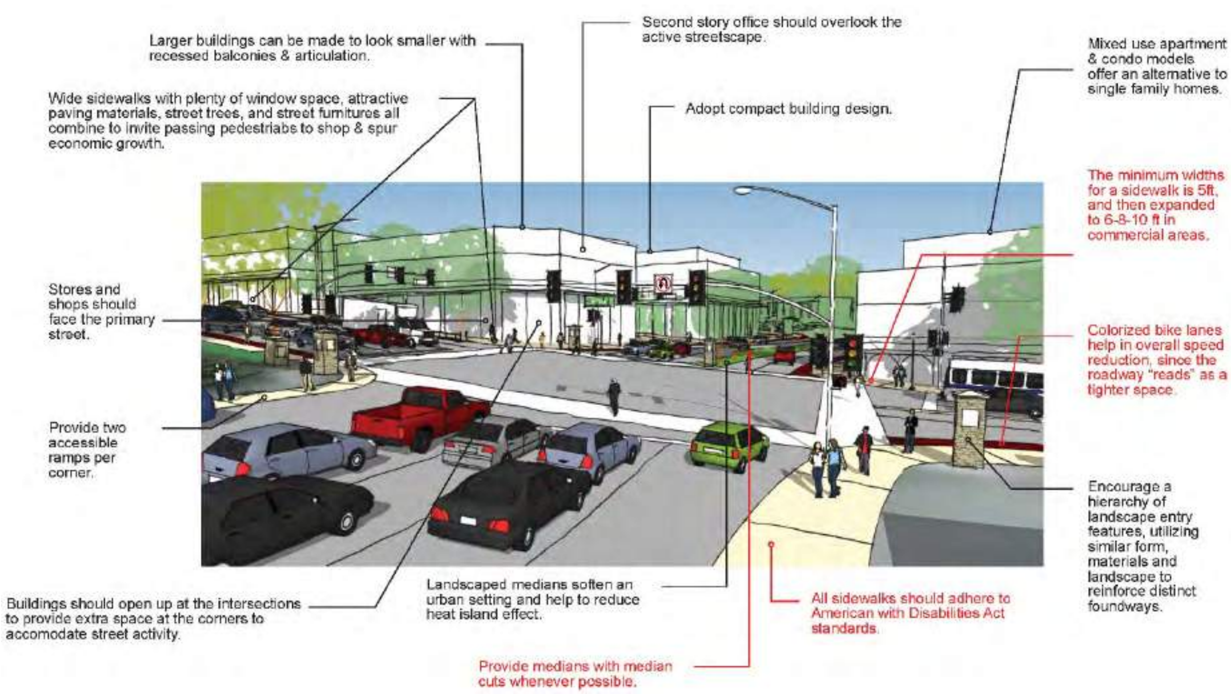
The specific areas selected were:

- Bulls Head at Cold Spring Road and Long Ridge Road
- North of the Merritt Parkway at the Parkway SB ramps and Long Ridge Road
- High Ridge Road from Vine Road to Cedar Heights Road

These three areas were specifically identified because they provided examples of three intersection types commonly found along the corridor. Bulls Head at Cold Springs Road and the intersection of Long Ridge and High Ridge Road is a representation of the most urban node present along the corridor. It is an area where ideas described in the Complete Street, Urban Design and Landscape Toolkits can be visualized. Specific improvements for these three areas include (It should be noted that these improvements are not listed in order of priority, but are listed based on the elements that are included in the long-term plans):

- Bulls Head at Cold Spring Road and Long Ridge Road

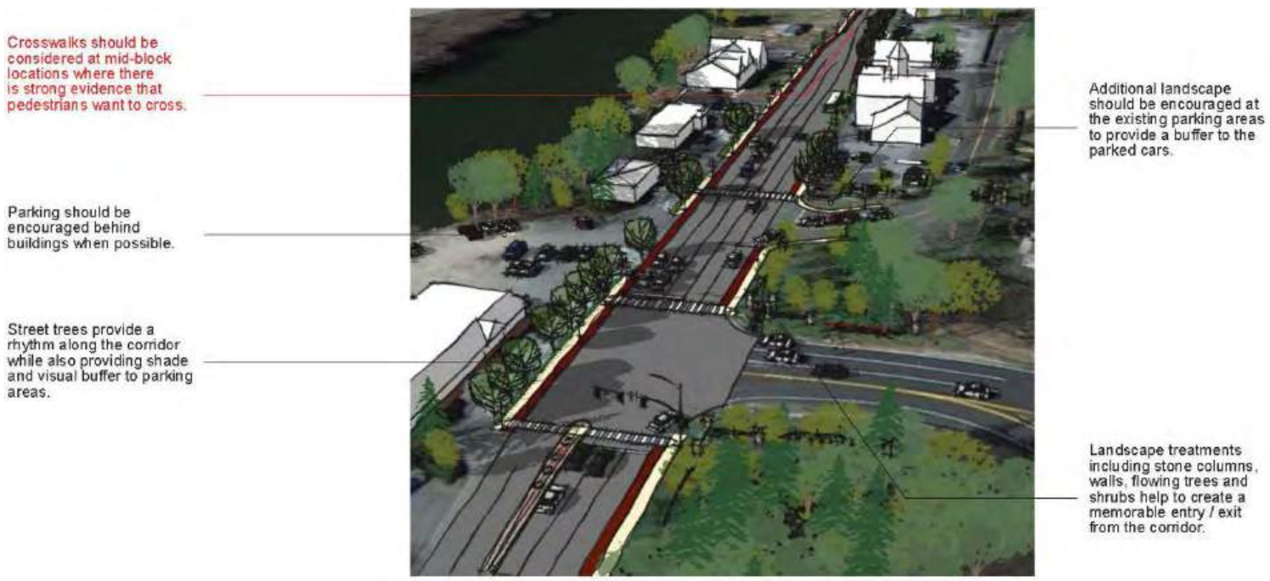


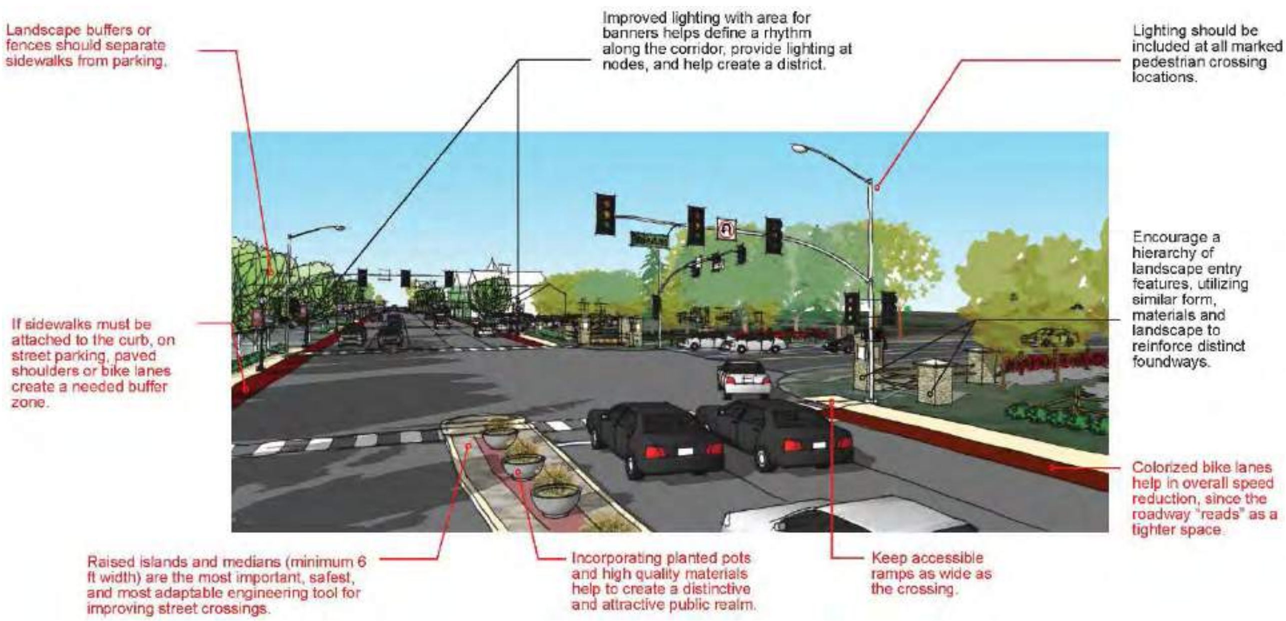


- Complete Streets improvements
    - If sidewalks must be attached to the curb, on street parking, paved shoulders or bike lanes create a need buffer zone
    - Use color contrast to denote crosswalks and/or driveways as different from sidewalks
    - Provide medians with median cuts whenever possible
    - All sidewalks should adhere to Americans with Disabilities Act Standards
    - Colorized bike lanes help in overall speed reduction, since the roadway "reads" as a tighter space
    - The minimum widths for a sidewalk is 5ft, and then to 6-8-10ft in commercial areas
- Urban Design improvements
    - Vertical integration of uses allow for 24 hour building use, interest, and place making
    - Incorporate underground or tabletop parking structures behind buildings
    - Reduce at grade parking affords more opportunity for pedestrian plazas, open space and courtyards
    - Encourage development infill on existing sites to utilize mix of uses, a story built edge, and building placement to hide parking
    - Stores and offices should face the primary street. This provides a buffer to residential in back from street noise
    - Public art should be placed throughout the corridors. It is an opportunity to reflect the culture of the neighborhood throughout the area
    - Pedestrian and drive sight distance should be maintained at intersections
    - Second story uses should overlook active streetscapes
    - Larger buildings can be made to look smaller with recessed balconies and building architecture articulation
    - The principals of compact building design should be adopted
    - Wide sidewalks with plenty of window space, attractive paving materials, street trees, and street furniture all combine to invite passing pedestrians to shop
    - Stores and shops should face the primary street
    - Buildings should open up at the intersections to provide extra space at the corners to accommodate street activity
    - Mixed use apartment and condominium models offer an alternative to single family homes
    - Provide two accessible ramps per corner
- Landscape Toolkit improvements
    - Encourage a hierarchy of landscape entry features, utilizing similar form, materials and landscape to reinforce distinct roadway character

- Landscape medians soften an urban setting and help to reduce heat island effect
- Provide a consistent rhythm of street trees
- Improved lighting with area for banners helps define a rhythm along the corridor, provide lighting at nodes, and helps to create a district identity

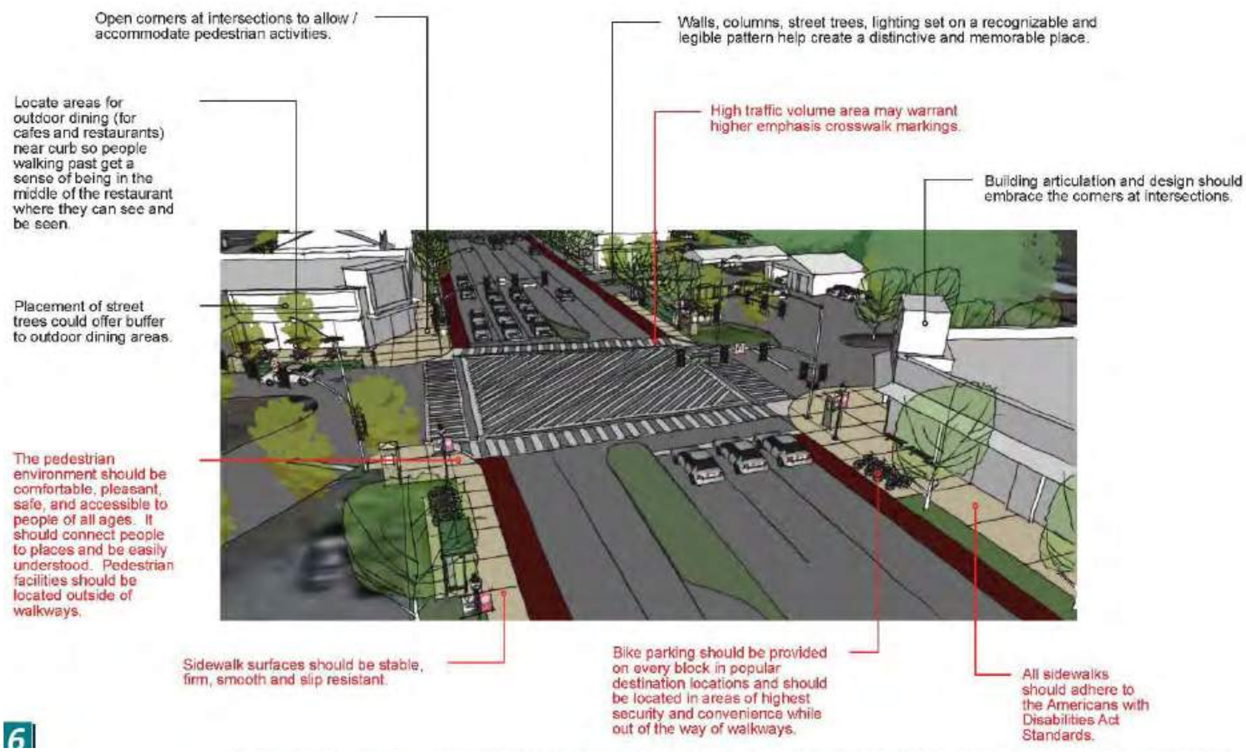
- North of the Merritt Parkway at the Parkway SB ramps and Long Ridge Road





- Complete Streets improvements
    - Crosswalks should be considered at mid-block locations where there is strong evidence that pedestrians want to cross
    - Landscape buffers or fences should separate sidewalks from parking
    - If sidewalks must be attached to the curb, on street parking, paved shoulders or bike lanes create a needed buffer zone
    - Raised islands and medians (minimum 6ft width) are the most important, safest, and most adaptable engineering tool for improved street crossing
    - Keep accessible ramps as wide as the crossing
    - Colorized bike lanes help in overall speed reduction, since the roadway “reads” as a tighter space
- Urban Design improvements
    - Parking should be encouraged behind buildings when possible
    - Lighting should be included at all marked pedestrian crossing locations
- Landscape Toolkit improvements
    - Encourage a hierarchy of landscape entry features, utilizing similar form, materials and landscape to reinforce distinct roadway character
    - Landscape treatments including stone columns, walls, flowering trees and shrubs help to create a memorable entry/exit from the corridor
    - Incorporating planted pots and high quality materials help to create a distinctive and attractive public realm
    - Street trees provide a rhythm along the corridor while also providing shad and visual buffer to parking areas
    - Additional landscape should be encouraged at the existing parking areas to provide a buffer to the parked cars
    - Improved lighting with area for banners helps define a rhythm along the corridor, provide lighting at nodes, and helps to create a district identity

- High Ridge Road from Vine Road to Cedar Heights Road



- Complete Streets improvements
  - The pedestrian environment should be comfortable, pleasant, safe, and accessible to people of all ages. It should connect people to places and be easily understood. Pedestrian facilities should be located outside of walkways
  - Raised crosswalks can be appropriate in areas with significant pedestrian traffic and where motor vehicles should move slowly
  - Where possible design driveways to be on-way combinations, reducing the number of directions in which pedestrians must look for motorists
  - High traffic volume area may warrant higher emphasis crosswalk markings
  - Sidewalk surfaces should be stable, firm, smooth and slip resistant
  - Bike parking should be provided on every block in popular destination locations and should be located in areas of highest security and convenience while out of the way of walkways
  - All sidewalks should adhere to the Americans with Disabilities Act Standards
- Urban Design improvements
  - Encourage development and redevelopment along the street edge with parking in the rear of facilities where possible
  - Existing uses can be accommodated with small improvements along the streetscape
  - Open corners at intersections to allow/accommodate pedestrian activities
  - Locate areas for outdoor dining near curbs so people walking past get a sense of being in the middle of the restaurant where they can see and be seen
  - Place street trees to allow for buffer from vehicles for outdoor dining
  - Building articulation and design should embrace the corners at intersections
- Landscape Toolkit improvements
  - Require 15% landscape area for parking lots, with a minimum of 5ft buffer to walking areas
  - Provide trees (min 2 inch caliper) within parking areas
  - For larger parking lots (50 or more spaces) require landscaped entry to the area businesses
  - Provide adequate landscape buffers to adjacent properties
  - Walls, columns, street trees, lighting set on a recognizable and legible pattern help create a distinctive and memorable place

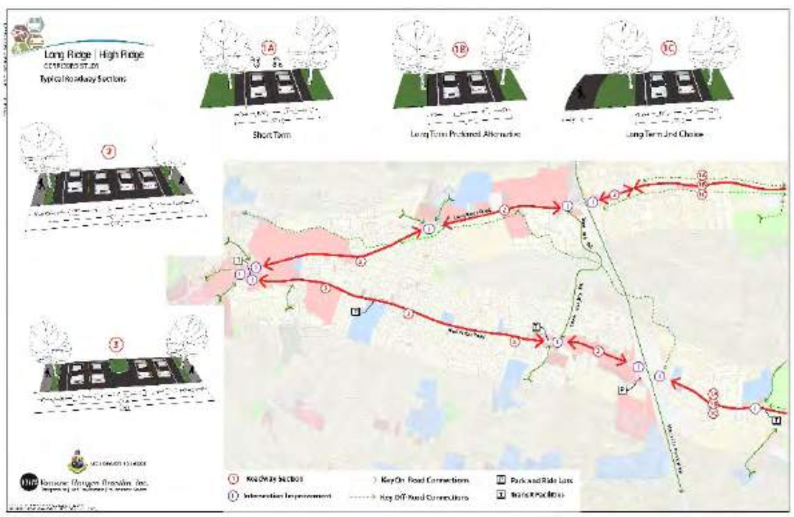
In addition, typical corridor improvements were developed and graphics created to depict specific improvements including:

- Special Landscape Features

  Fountains and other icons within plazas located at entrances to major commercial buildings or intersection act as central meeting and gathering spaces
- Crosswalks
  Provide medians with median cuts and keep ramps as wide as the crossing whenever possible
- Streetscape Planting
  Plant material helps to soften the relatively large amounts of impervious areas. The streetscape normally creates harsh living conditions for plants; select urban, drought and snow and salt tolerant plant material
- Transit-Oriented Development
  Stamford has several ideal locations for transit-oriented development. Several such opportunities are underway, but even more opportunities should be studied. At a minimum these areas should accommodate various levels of transportation options and a mix of land uses
- Transit Stops
  Transit cannot be expected to work until people who enter on one side of the street and exit on the other can get safely and comfortably across the roadway. Safe and marked waiting areas and crosswalks should be installed at all traffic stops
- Driveways
  When two-way driveways are necessary, keep the maximum continuous paved width to 28 feet and use a median, when possible, separate the two directions of travel

The Guiding Document

In order to achieve the overall vision for the LRHR Roadways of improving transportation efficiency through roadway redesign and intersection improvements, and providing quality design solutions in order to rethink the corridor character and identity, a guiding document or "plan" needed to be developed to better understand where these identified improvements should occur. The plan references proposed Roadway Cross-Sections, areas of Intersection Improvements, Key On-Road and Off-Road Connections, and proposed Park and Ride Lots and Transit Facility areas. When matched with the suggested Gateway, Corridor and Node locations, a holistic redevelopment picture is created. This document provides the blueprint for LRHR corridor improvements.



From Vision to Reality

It is the intent of this report to provide a synthesized and organized collection of suggestions and legible examples for possible improvements at these areas. This document is not a construction guideline, but rather a point where additional, more specific design can occur utilizing these suggestions and allowing them to influence improvements at other areas along the corridor. By providing these annotated graphics the hope is this report will act as a “go to” manual available to the city of Stamford to utilize in framing future development goals and directions.

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Implementation Plan

Chapters 4, 5 and 6 developed, screened, analyzed, packaged, and prioritized potential transportation and urban design improvements and policies for the LRHR Corridors. The analyses of the alternatives considered, combined with broad input from the general public (residents, employers, workers, and visitors), municipalities, state and federal agencies, and other stakeholders, led to the prioritized list of recommendations described in Chapters 5 & 6. These efforts resulted in the identification of a number of recommended improvement projects and policies to be considered for implementation. This chapter presents an "Action Plan" for implementation of the study recommendations. In total, the recommendations presented in this Action Plan present a holistic, coordinated, and sustainable development plan for the LRHR transportation system. These recommended Improvements are not in any specific order of significance or priority.

7.1 Overview

As discussed in Chapter 1, the goal of the LRR-HRR Corridor Study (LRR-HRR Corridor Study) is to develop a comprehensive multi-modal transportation Master Plan for Study corridors that will guide the investment of future funding into the City's overall transportation system.

The Master Plan must take a holistic approach to transportation infrastructure and urban design needs and recommend a program of immediate, short, mid, and long-term capital improvements suitable for inclusion into the State of Connecticut Transportation Improvement Program (STIP). The time lines for the recommendations included immediate-term actions (under one year), short-term actions (1 to 5 years), mid-term actions (5 to 15 years), and long-term actions (over 15 years).

This study does not identify specific funding sources for each recommendation because of the many variables and the uncertainty associated with funding sources and schedules for projects. While funding is always a consideration and was factored into the evaluation criteria, funding availability was not the primary driver for the development of the study's recommendations. Rather, improved safety and mobility were the primary drivers that guided the development of this recommended Action Plan.

Funding opportunities vary depending on federal programs, state programs, and the private sector, which all are influenced by the economy. Moreover, project priorities and schedules vary with administration changes, federal guidance, and political influence. For example, many of the current funding for projects from the economic stimulus program, or American Recovery and Reinvestment Act (ARRA), were not in existence until the recent economic downturn.

It is acknowledged that the recommendations presented herein represent a significant investment in potential transportation-related infrastructure. These projects represent an investment in total that currently far exceeds available TIP funding as presently programmed. Since most projects listed are not even on the TIP yet, the advancement of the recommendations developed as part of this study will require prioritization in order to address current fiscal constraints as related to transportation improvements. Besides prioritization, identification of potential funding sources and availability to leverage funding could alter priorities.

7.2 Recommended Action Plan

The recommended action plan for both corridors consist of policy recommendations and projects. The recommendations presented in this Action Plan present a holistic, coordinated, and sustainable development plan for LRHR transportation system.

Recommended transportation and land use policies described in detail in earlier chapters would be implemented and include:

7.2.1 Promote safety as a top priority within transportation planning and in the delivery of all infrastructure projects (including requiring Road Safety Assessments where appropriate), and target educational activities to current and future travelers to improve safety for all transportation modes.

7.2.2 Continue to develop land use policies/Zoning Ordinances that support transit-oriented development with housing, retail, and jobs collocated with each other a near transit hub.

7.2.3 Ensure that the City Comprehensive Land Use Plans and Zoning Ordinances reflect goals, objectives, and policies that support safety and access management where appropriate and incorporate the LRR-HRR Corridor Study policies.

7.2.4 Establish TDM program requirements in Zoning Ordinance for new, large projects; for projects over certain thresholds, consider traffic monitoring requirements for exceeding traffic thresholds.

7.2.5 Develop a bicycle parking/sidewalk Zoning Ordinance that includes bicycle parking and sidewalk requirements into each corridor plan review.

7.2.6 Promote the Stamford Street Smart Initiative Program in both corridors. Establish better communication and coordination between state and local agencies during development site plan reviews;

7.2.7

- Promote a Complete Streets approach to design and renovation of infrastructure that ensures safety and mobility for all travelers are considered;
- Reduce GHG emissions through comprehensive actions that lower VMT and allow safe non-motorized travel, reduce vehicle idling time, enable the use of lower GHG fuels, and encourages fuel efficient vehicles;
- Plan, design, build, and standardize the delivery, preservation, and maintenance solutions necessary to achieve green infrastructure. Comprehensive solutions include materials, elements, systems, activities, and performance connected to the infrastructure;
- Expand the bicycle network throughout both corridors linking key destinations to improve mobility, and connectivity to regional network ; and
- Establish the LRHR strategic transportation committee that would oversee the implementation of the recommended actions and policies from this study and discuss important policy issues mentioned in the plan but beyond the scope of the study. Potential members could include representation from City representatives, planning and zoning boards, planning and engineering departments, CTDOT, SWRPA or other citizen, social, or civic groups.

Projects

Table 7-1 presents an overview of the recommended projects that comprise the action plan including the prioritization of recommendations and the responsible implementation organizations. The SWRPA and CTDOT actively seek public input during the transportation planning process, especially for the:

- **Long Range Transportation Plan (LRTP):** A plan for transportation facilities for all modes of travel. The LRTP is also part of Connecticut's State Guide Plan.
- **Transportation Improvement Program (TIP):** The TIP is a biennial document developed by region and adopted by the State. It programs federal transportation dollars to individual projects and programs that are implemented primarily by CTDOT and the region. The TIP lists projects that are eligible for various funding sources, including Federal highway and transit funding. Projects must be included in the TIP to be eligible for federal and state funding.

Each of the projects will need to follow a process that will include to some degree the below steps (depending on the project, some of the early steps may have already been completed either under the LRR-HRR Corridor Study or in other studies):

- Problem/Need/Opportunity Identification;
- Project Planning;
- State Transportation Plan;

- Project Initiation;
- Environmental/Design/ROW Process (as needed);
- Programming (TIP);
- Procurement; and
- Construction.

More complex recommendations, such as long term alternatives with a high level of capital investment will likely require in-depth design, permitting, and environmental documentation. In addition, these recommendations need to be synchronized, both with regard to timing and scope, with ongoing initiatives which are already included on the TIP and advanced to various levels of Study & Development.

Table 7-1 Recommended Action Plan – Matrix of Priorities and Commitments

		Cost (xxxx Dollars)	ROW Acquisitions Required	TIP Eligible TIP[1]	Implementation Timeframe (multiple timeframes indicate phased implementation) Short-term (1-5 years)	Mid-term (5-10 years)	Long-term (10+ years)	City of Stamford	SWRPA	CTDOT	FHWA
TRANSPORTATION IMPROVEMENTS	High Ridge Road Corridor - South of Merritt Parkway	$6,100,000		✓		✓		✓	✓	✓	✓
	Install Separator Curbs (Vine Rd to Cedar St; Cedar St to Buxton Farm Rd)	$400,000		✓	✓			✓	✓	✓	✓
	Improve Traffic Signal Coordination	$90,000		✓	✓			✓	✓	✓	
	Remove Pavement Markings and Restripe Travel Lanes to 11'	$210,000		✓	✓			✓	✓	✓	
	Install new ADA Ramps and Pedestrian Signals & Restripe Crosswalks	$700,000		✓	✓			✓	✓	✓	✓
	Install Interactive Speed Signs and Speed Limit Signs	$60,000		✓	✓			✓	✓	✓	
	Construct Landing Area for Bus Shelters and Install Shelters	$730,000		✓	✓			✓	✓	✓	
	High Ridge Road Corridor - North of Merritt Parkway	$6,300,000		✓			✓	✓	✓	✓	✓
	Remove Pavement Markings and Restripe Travel Lanes to 11'	$220,000		✓	✓			✓	✓	✓	
	Install new ADA Ramps and Restripe Crosswalks	$110,000		✓	✓			✓	✓	✓	✓
	Install Interactive Speed Signs and Speed Limit Signs	$70,000		✓	✓			✓	✓	✓	
	Improve Traffic Signal Coordination (Schofield Town Rd to Interlaken Rd)	$23,000		✓	✓			✓	✓	✓	
	Construct Landing Area for Bus Shelters and Install Shelters	$480,000		✓	✓			✓	✓	✓	
	Long Ridge Road Corridor - South of Merritt Parkway	$8,300,000		✓		✓		✓	✓	✓	✓
	Improve Traffic Signal Coordination	$54,000		✓	✓			✓	✓	✓	
	Remove Pavement Markings and Restripe Travel Lanes to 11'	$200,000		✓	✓			✓	✓	✓	
	Install new ADA Ramps and Pedestrian Signals & Restripe Crosswalks	$560,000		✓	✓			✓	✓	✓	✓
	Install Interactive Speed Signs	$70,000		✓	✓			✓	✓	✓	
	Construct Landing Area for Bus Shelters and Install Shelters	$660,000		✓	✓			✓	✓	✓	
	Long Ridge Road Corridor - North of Merritt Parkway	$5,900,000		✓			✓	✓	✓	✓	✓
	Remove Pavement Markings and Restripe Travel Lanes to 11'	$220,000		✓	✓			✓	✓	✓	
	Install new ADA Ramps and Restripe Crosswalks	$100,000		✓	✓			✓	✓	✓	✓
	Install Interactive Speed Signs and Speed Limit Signs	$80,000		✓	✓			✓	✓	✓	
	Construct Landing Area for Bus Shelters and Install Shelters	$320,000		✓	✓			✓	✓	✓	
				✓							

TIP – Transportation Improvement Program for Connecticut. A check mark indicates that the action is listed on the TIP with funding allocations. A check with an “S” indicates that the action is on the TIP under “Study & Development” without funding.

Table 7-1 (Continued) Recommended Action Plan – Matrix of Priorities and Commitments

		Cost (xxxx Dollars)	ROW Acquisitions Required	TIP Eligible TIP[1]	Implementation Timeframe (multiple timeframes indicate phased implementation) Short-term (1-5 years)	Mid-term (5-10 years)	Long-term (10+ years)	City of Stamford	SWRPA	CTDOT	FHWA
TRANSPORTATION IMPROVEMENTS	Bulls Head Area	$140,000		✓	✓			✓	✓	✓	
	Bulls Head Area	$730,000		✓		✓		✓	✓	✓	✓
	Bulls Head Area	$1,330,000		✓			✓	✓	✓	✓	✓
	Bulls Head Area (2-Way Summer Street Alternative)	$1,100,000		✓		✓		✓	✓	✓	✓
	Long Ridge Road @ 260 Long Ridge Road	$1,630,000		✓		✓		✓	✓	✓	✓
	Long Ridge Road at Cross Street, Terrace Avenue & McClean Avenue	$80,000		?	✓			✓	✓		
	Long Ridge Road at Cross Street, Terrace Avenue & McClean Avenue	$500,000		?		✓		✓			
	Long Ridge Road @ Stillwater Road *	$7,500,000		✓			✓				
	Long Ridge Road Between River Oaks Driveway & Burns Lane	$2,190,000		✓		✓		✓	✓	✓	
	Long Ridge Road @ Merritt Parkway Ramps	$240,000		✓	✓			✓	✓	✓	✓
	Long Ridge Road @ Merritt Parkway Ramps	$12,700,000		✓			✓	✓	✓	✓	✓
	Long Ridge Road @ Chimney Corners	$280,000		✓	✓			✓	✓	✓	
	Long Ridge Road @ Chimney Corners	$2,010,000		✓			✓	✓	✓	✓	
	Long Ridge Road @ Chestnut Hill Road	$3,410,000		✓			✓	✓	✓	✓	✓
	Long Ridge Road @ Wildwood Road	$540,000		✓			✓	✓	✓	✓	✓
	Long Ridge Road @ Mountain Wood Road	$2,040,000		✓	✓			✓	✓	✓	
	Long Ridge Road @ Old Long Ridge Road	$1,500,000		✓		✓		✓	✓	✓	
	High Ridge Road @ Sky Meadow Drive	$330,000		?	✓			✓	✓		
	High Ridge Road @ Sky Meadow Drive	$790,000		✓		✓		✓	✓	✓	
	High Ridge Road @ Scofieldtown Road	$280,000		✓	✓			✓	✓	✓	
	High Ridge Road @ Scofieldtown Road	$2,470,000		✓			✓	✓	✓	✓	
	High Ridge Road @ Merritt Parkway Ramps	$170,000		✓	✓						
	High Ridge Road @ Merritt Parkway Ramps	$12,810,000		✓			✓	✓	✓	✓	✓
	High Ridge Road @ Cedar Heights and Vine Road	$170,000		✓	✓			✓	✓	✓	
	High Ridge Road @ Cedar Heights and Vine Road	$610,000		✓		✓		✓	✓	✓	
	High Ridge Road @ Cedar Heights and Vine Road	$2,610,000		✓			✓	✓	✓	✓	

7.3 Financial Plan

The purpose of the Financial Plan is to recommend a funding approach that can be used to finance the construction and operation of the recommended improvements for the LRHR corridors. This plan was developed by exploring the various funding mechanisms available for roadway improvements and identifying the most appropriate methods for funding the improvements recommended in this study. All potential sources of Federal, State and Local funding were considered so that the most efficient use of dollars can be achieved.

The South Western Regional Planning Agency (SWRPA) is responsible for setting priorities and programming federally funded highway and transit projects in Stamford. Any transportation project receiving federal funding must be included in the SWRPA five-year Transportation Improvement Program (TIP).

The Connecticut DOT also prepares the Statewide Transportation Improvement Program (STIP) every four years. No project is eligible for transportation funding unless it is included in both the TIP and STIP. Both programs are financially constrained and can only include projects for which funding is available. The programs are periodically amended as funding availability or the status of projects changes. The projects included in the TIP and STIP must be consistent with the state's Long Range Transportation Plan and the regional transportation plan. Therefore, the first step in implementing the recommendations of this report is to have them included in the long range plan and in the state's long range plan. Individual projects can then be moved onto the regions' TIP and the STIP to be allocated funding.

7.4 Sources of Funding

Table 7- 2 lists various transportation funding programs available, the federal-state (or local) shares and the potential applicability to recommended improvements in this report. The following sources of funding appear to be applicable or potentially applicable to the some of the recommended projects. These include:

- National Highway System (NHS)
- National Highway Transportation Safety Administration (NHSTA) – Funding for hazard elimination projects
- Surface Transportation Program Anywhere (STPA) – Funding for projects regardless of rural or urban designation
- Surface Transportation Program Other Urban – Funds for urban areas of less than 200,000 population
- STP Enhancement Program (STPT) -- related to intermodal transportation
- FHWA Congestion Mitigation and Air Quality (CMAQ) – Funding for projects which provide air quality benefits, such as traffic flow improvement programs that achieve emission reductions
- Local Transportation Capital Improvement Program (LOTCIP)- LRHR corridors meet criteria for LOTCIP funding program. City pays for all engineering design costs. Minimum construction cost under this funding is $300,000.

Table 7-2 Funding Sources for Roadway Improvements

Funding Source	Description	Federal/State Shares (%)	Applicability to LRHR Corridors
FEDERAL			
High Priority Projects (HPP)	Demonstration projects identified by Congress	100/0	No
FHWA National Highway System (NHS)	Any type of improvement on roadways designated as part of the NHS	80/20	No
FHWA Interstate Maintenance (I-M)	Funding to rehabilitate, restore and resurface the interstate highway system	90/10	No
National Highway Transportation Safety Administration (NHTSA)	Funds hazard elimination projects	100/0	Potentially
Surface Transportation Program (STP)	Funding for projects not on NHS or interstate system, except local roads		
STP Anywhere (STPA)	Funds for anywhere regardless of rural or urban designation	80/20	Yes
STP Reinvestment and Recovery (STRR)	Economic stimulus funding for rural major collectors or above	100	Yes
STP Other Urban (STPU)	Funding for collector and minor arterial roads in urban areas under 200,000 population	80/20	Yes
STP Rural (STPR)	Funding for any type of transportation project in rural areas less than 5,000 population	80/20	No
STP Transportation Alternatives (STP-TA)	Projects related to intermodal transportation	80/20 (local)	Yes
FHWA Congestion Mitigation and Air Quality (CMAQ)	Projects in Clean Air non-attainment areas for ozone and carbon monoxide with priority given to projects on the State Implementation Plan (SIP) as a Traffic Control Measure (TCM), which will provide air quality benefits, such as traffic flow improvement programs that achieve emission reductions	80/20	Yes
LOTCIP	Eligible for improvement on roadways classified as a collector or higher – design locally	0 (Design) 100 (Const.)	Yes

For the LRR-HRR Corridor Study, there are several other general or statewide TIP projects/programs that could potentially be leveraged. Close coordination through CTDOT and/or SWRPA would be needed to verify that the project, or elements thereof, would meet the project intention or potentially qualify for any non-allocated funds available. These potential TIP projects/programs include:

Bike/Pedestrian Program:

- Pedestrian/Sidewalk Improvements
- Bike Route Signing

Congestion Management/Air Quality (CMAQ) Program:

- Intermodal Transportation Initiatives
- Transit Service Initiatives
- Commuter Resources
- Passenger Initiatives
- Traffic Signalization
- Transportation Support Projects

Traffic Safety Program:

- Highway Safety Improvement Program (HSIP)

Transit Program:

- Bus Service, Operations, Passenger Initiatives, or other transit programs

Implementation Plan Summary

Table 7-2 provides a brief summary of each improvement measures project cost, the estimated cost and the funding programs potentially applicable to the project. The projects are categorized as near term, medium term and long term. A summary of the implementation plan including the next steps in the implementation process, the responsible party and the actions associated with each of the general timeframes was presented in Table 7-2. The "lead" agency for the projects with multiple responsible parties listed and for projects with phased implementation will need to be identified as the projects are advanced.

Glossary

Access Management – Broad set of techniques that balance the need to provide efficient, safe and timely travel with the ability to allow access to an individual destination. Commonly referenced core access management principles include: limit direct access to major roadways; limit conflict points and remove turning vehicles from through lanes; promote a roadway hierarchy (mobility vs. access); locate signals to favor through movements; and use of non-traversable medians to manage and restrict left-turn movements

Access, Limited – Access control applied to arterials where intersections are widely spaced and driveway connections are limited

Accommodation – Provision of safe, convenient, and comfortable travel for roadway users

Alignment, Horizontal – Horizontal location of a road

American Association of Retired Persons (AARP) – A non-governmental organization and interest group for people age 50 and over that is dedicated to enhancing the quality of life for the aging population

Americans with Disabilities Act (ADA) – The Americans with Disabilities Act (ADA) was enacted by the U.S. Congress in 1990. The ADA is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability. Specific to transportation, these Federal regulations provide Standards for Accessible Design

Approach Leg – Side of an intersection leg used by traffic approaching an intersection

Arterial Highways – This functional classification of roads are characterized by a capacity to move relatively large volumes of traffic. It primarily serves through–traffic and that secondarily provides access to abutting properties, with signal spacing of 1.0 miles or less

Automatic Traffic Recorder (ATR) – Machines which provides continuous traffic monitoring and collects traffic data for analysis, including volume, speed, classification, and gaps

Average Annual Daily Traffic (AADT) –The total volume of traffic passing a point of segment of a highway facility in both directions for one year divided by the number of days in the year

Bicycle Count – Data collection to determine bicycle flow and patterns usually conducted during peak hours when vehicle turning movement counts are being conducted

Bicycle Lane – Delineated road space for preferential use by bicyclists traveling in same direction as the adjacent motor vehicle traffic

Bus Pull-Out – Bus stop that requires buses to exit from and re–enter an adjacent lane of traffic; a bus bay

Bus Rapid Transit (BRT) – Public transportation system using buses to provide faster, more efficient service than an ordinary bus line with the goal of providing the service quality of rail transit while still enjoying the cost savings and flexibility of bus transit

Business District – The downtown retail trade and commercial area of a city or an area having high land values, traffic flow, and concentration of retail business offices, entertainment, lodging, and services

Capacity – The maximum sustainable flow rate at which vehicles or persons reasonably can be expected to traverse a point or uniform segment of a lane or roadway during a specified time period under given conditions; usually expressed as vehicles per hour, passenger cars per hour, or persons per hour

Census Transportation Planning Package (CTPP) – Set of tabulations from the decennial census designed for transportation planners; summarizes information by place of residence, by place of work, and for worker–flows between home and work

Channelized Turn Lane – Lane which uses raised islands to designate the intended vehicle path

Clean Air Act – A federal law enacted to control air pollution on a national level. It requires the Environmental Protection Agency (EPA) to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. The Clean Air Act was passed in 1963 and significantly amended in 1970 and 1990

Collector – A low to moderate-capacity road which serves to move traffic from local streets to arterial roads. Unlike arterials, collectors are also designed to provide access to residential properties

Complete Street – A roadway designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities

Community Characteristics – Influences the mode of transportation used by the residents, businesses, and commuters

Concentration – Density or occupancy

Concept – General term that refers to conceptual–level solutions to address transportation deficiencies identified by the analysis of existing and future transportation conditions in the study area

Congestion Mitigation and Air Quality Improvement (CMAQ) Program – Program created under the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, continued under the Transportation Equity Act for the 21st Century (TEA-21), and reauthorized by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Jointly administered by FHWA and the Federal Transit Administration (FTA), the CMAQ program provides funding to areas that face the challenge of attaining or maintaining the National Ambient Air Quality Standards (NAAQS). An apportioned program, each year's CMAQ funding is distributed to the States via a statutory formula based on population and air quality classification as designated by the EPA

Connecticut Department of Transportation (CTDOT) – State agency responsible for the design, construction, and maintenance of the State of Connecticut highways and bridges

Connecticut Transit Authority (CTTRANSIT) – State agency that provides bus service to the municipalities in the region

Corridor – A broad geographical band that follows a general directional flow connecting major sources of trips that may contain a number of streets, highways and transit route alignments

Cost Estimate – Preliminary order-of-magnitude cost estimate based on CTDOT Weighted Average Unit Prices (WAUP), recent costs from other projects, and previously published reports. The preliminary construction cost estimates do not include any required right-of-way acquisitions, hazardous materials mitigation, or utility relocation. The construction cost estimates also do not include design, contracting, and construction services costs

Crash (Highway) – An event that produces injury and/or property damage, involves a motor vehicle in transport, and occurs on a traffic way or while the vehicle is still in motion after running off the traffic way

Crash Data – Historical data used to identify crash patterns at an intersection

Critical Gap – The minimum time, in seconds, between successive major–stream vehicles, in which a minor–street vehicle can make a maneuver

Critical Movement – Lane groups with the maximum flow ratio for a given signal phase

Cross-Section – View of a vertical plane cutting through the roadway, laterally perpendicular to the center line, showing the relationship of various roadway components

Curb – A raised device used extensively on urban streets and highways, controls drainage, restricts vehicles to the pavement area and defines points of access to abutting properties

Curb Cut – A break in the curb that provides access to private or public property; a driveway

Delay – The additional travel time experienced by a driver, passenger, or pedestrian from not operating in a free–flow manner

Demand – The number of users desiring service on the highway system usually expressed as vehicles per hour or passenger cars per hour

Density – (1) Amount of development per acre on a parcel either existing or permitted under the zoning law, or (2) The number of access points or driveways in a given length of roadway, which is usually expressed in driveways/mile

Design Hour – An hour with a traffic volume that represents a reasonable value for designing the geometric and control features of a facility

Design Hour Volume (DHV) – One–hour volume in the design year selected for determining the highway design, typically given in units of vehicles per hour

Driveway – Point of access from a public street to private property

Environmental Justice (EJ) – Fair treatment and meaningful involvement of all people—regardless of race, ethnicity, income or education level—in environmental decision making, including protection of human health and the environment, empowerment via public participation, and the dissemination of relevant information to inform and educate affected communities

Evacuation Route – A roadway that is a specified route for hurricane or emergency evacuation

Fatal Crash – For purposes of statistical reporting on transportation safety, a fatal crash results in a death due to injuries in the transportation crash, accident, or incident that occurs within 30 days of that occurrence

Federal Highway Administration (FHWA) – A branch of the U.S. Department of Transportation that administers the federal–aid Highway Program, providing financial assistance to states to construct and improve highways, urban and rural roads, and bridges. The FHWA also administers the Federal Lands Highway Program, including survey, design, and construction of forest highway system roads, parkways and park roads, Indian reservation roads, defense access roads, and other federal lands roads. The federal agency within the U.S. Department of Transportation responsible for administering the Federal–Aid Highway Program. Became a component of the Department of Transportation in 1967 pursuant to the Department of Transportation Act (49 U.S.C. app. 1651 note). It administers the highway transportation programs of the Department of Transportation under pertinent legislation

Flow – Measurement of the number of pedestrians, bicycles, and/or motor vehicles moving through a transportation network; quality of flow is stated as "level of service" and maximum flow is stated as "capacity"

Freeway – A divided highway facility having two or more lanes for the exclusive use of traffic in each direction and full <u>control of access</u> (very high mobility, limited access); an expressway

Functional Classification – Classification of roadway types based on the degree of access and mobility provided

Gap – The time between passing vehicles. Pedestrian crossing opportunities can be measured in gaps, as well as opportunities for vehicles to enter a roadway from a side street

Geographic Information System (GIS) – Computerized data management system designed to capture, store, retrieve, analyze, and display geographically referenced information

Geometric Improvements – Improvements which focus on increasing intersection capacity and enhancing safety; often involve widening to provide auxiliary turn lanes and the installation or modification of traffic signals

Global Positioning System (GPS) Device – A device that receives Global Positioning System (GPS) signals for the purpose of determining the device's current location on Earth

Grade – Slope of roadway surface typically given in percent. For example, a two–percent grade represents two feet of elevation change over a 100–foot distance

Growth Center – Area designated for the purpose of studying economic growth performance

Heavy Vehicle – A vehicle with more than four wheels touching the pavement during normal operation

Heavy Vehicle Percent (HV %) – Percentage of vehicles on a roadway that are characterized as heavy vehicles

Highway – Any road, street, parkway, or freeway/expressway that includes rights–of–way, bridges, railroad–highway crossings, tunnels, drainage structures, signs, guardrail, and protective structures in connection with highways. The highway further includes that portion of any interstate or international bridge or tunnel and the approaches thereto (23 U.S.C. 101a).

Highway Capacity Manual (HCM) – Industry standard that defines transportation–facility capacity and how to evaluate it

Highway Safety Improvement Program (HSIP) – The HSIP is a federal program that includes projects to correct or improve a hazardous location or feature, or address a highway safety problem including improvements at intersections, pavement and shoulder widening or traffic control or other warning devices. The new HSIP expands the funding categories to include other opportunities including safety conscious planning, traffic records improvements, etc.

Hourly Volume (HV) – The volume of traffic (given in units of vehicle per hour) that traverses across a segment of a roadway in one hour. The HV may be determined from traffic counts or may be a projected calculation

Impact – Effect of any direct man–made actions or indirect repercussions of man–made actions on existing physical, environmental, social, or economic conditions

Infrastructure – Basic facilities, services, and installations needed for the functioning of a community or society, including water and sewage systems, lighting, drainage, parks, public buildings, roads and transportation facilities, and utilities

Intermodal Transportation – Transportation of persons and goods that involves the interchange between transportation modes such as surface routes (automobile, bus, rail, etc.), airways, and waterways

Intermodal Transportation Center – A multi–modal facility, often located within major activity center, connecting various regional, express, circulator and local bus services with each other and providing vehicular, bicycle and pedestrian access to these services

Intersection – Area where two or more streets cross at grade, including areas needed for all modes of travel (pedestrian, bicycle, motor vehicle, transit)

Journey-to-Work – Data based on the decennial census that quantifies where people work and on their commute between home and workplace

Land Use – Occupation or utilization of land or water area for any human activity purpose, typically classified under a system which designates the appropriate uses of particular properties

Land Use Plan – A plan which establishes strategies for the use of land to meet identified community

Left-Turn Lane – Lane which removes stopped or slow–moving left–turning vehicle from the stream of through traffic

Level of Service (LOS) – The concept of level of service uses qualitative measures that characterize operational conditions within a traffic stream and their perception by motorists and passengers. The descriptions of individual levels of service characterize these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels of service are defined, designated A through F, with A representing the best conditions and F the worst.

Local Road – Roadway that permits access to abutting land (high access, limited mobility)

Long Range Transportation Plan (LRTP) – A document resulting from regional or statewide collaboration and consensus on a region or state's transportation system, and serving as the defining vision for the region's or state's transportation systems and services. In metropolitan areas, the plan indicates all of the transportation improvements scheduled for funding over the next 20 years

LRR-HRR Corridor Study (LRR-HRR Corridor Study) – A regional transportation planning study that will result in the development of a Comprehensive Multi-Modal Transportation Master Plan for Long Ridge Road and High Ridge Road corridors to guide the investment of future funding. The LRR-HRR Corridor Study is an initiative of the City of Stamford working in close partnership with WCCOG and Connecticut Department of Transportation (CTDOT)

Main Street –Street at an intersection with greater traffic volume, larger cross section, higher functional class, and greater continuity than the other crossing street(s)

Major Collector – Roadway that links arterial roadways and provides connections between cities and towns (moderate mobility, moderate access)

Major Street – A street not controlled by stop signs at a two–way stop–controlled intersection

Manual on Uniform Traffic Control Devices (MUTCD) – A document issued by the Federal Highway Administration (FHWA) of the United States Department of Transportation (USDOT) to specify the standards by which traffic signs, road surface markings, and signals are designed, installed, and used

Median Island – Pedestrian refuge within the right–of–way and traffic lanes of a highway or street; also used as loading stops for light rail or buses

Merge – Occurs when a vehicle in one traffic stream joins another traffic stream moving in the same direction without the aid of traffic signals or other right–of–way controls, such as vehicles entering a freeway

Mid-Block Crossing – Crossing of a street at a location other than an intersection

Minor Arterial – Roadway that links cities and towns in rural areas and interconnects major arterials within urban areas (moderate mobility, limited access)

Minor Collector – Roadway that connects local roads to major collectors and arterials (moderate mobility, high access)

Mobility – Ability to move or be moved from place to place

Mode – Particular means of transportation (e.g., transit, automobile, bicycle, walking).

Mode choice – The process by which an individual selects a transport mode for use on a trip based on trip purpose, trip location, characteristics of the individual, and characteristics of the available modes.

Mode share – The number (or percentage) of trips between zones that are made by automobile and by transit respectively

Multi-modal – Serving multiple user groups, including motor vehicles, pedestrians, bicyclists, and transit vehicles

Non-Traversable Median – Median which separates opposing traffic

Off-Road Path – Dedicated pedestrian facility, often in rural and suburban low density areas, which follows but is set back from the roadway and can deviate around sensitive environmental areas

Origin-Destination (O–D) Survey – Conducted to aid in the understanding of why people travel and where they go. Topics of relevance include mode of transportation, locations of trips beginning and end, trip purpose, time of day, and a traveler's personal characteristics

Paratransit – Alternative mode of high occupancy passenger transportation that does not follow fixed routes or schedules

Park and Ride Facility – Lot which provides a collection point for travelers to transfer between the automobile mode and transit, or between the single occupant vehicle (SOV) and high occupancy vehicle modes; other modes potentially supported include pedestrian, bicycle, paratransit, intercity bus transit, airport service, and intercity and commuter rail

Parking Generation – Data and calculations used to project necessary/required parking by land use

Peak Period – The time(s) of day when the highest volume of vehicles, pedestrians, and/or cyclists are typically encountered on a roadway

Peak–Hour Traffic Volume – Highest number of vehicles passing over a section of highway during 60 consecutive minutes

Pedestrian Count– Data collection to determine sidewalk demands, crossing demands, and corner reservoir demands (total number of pedestrians waiting to cross the street); usually conducted when vehicle turning movement counts are completed

Person Trip – A trip by one or more persons in any mode of transportation. Each person is considered as making one person trip. For example, four persons traveling together in one automobile make four person trips

Planning – Phase of the project in which the proponent identifies issues, impacts, and potential approvals so that subsequent design and permitting processes are understood

Platoon – Group or 'slug' of traffic, often created by the regular release of traffic from an upstream or downstream traffic signal

Principle Arterial – Roadway that services statewide travel as well as major traffic movements within urbanized areas or between suburban centers (high mobility, limited access)

Progression – The manner in which a traffic stream advances through a defined corridor

Public Roadway – Any roadway under the jurisdiction of and maintained by a public authority (federal, state, county, town or township, local government, or instrumentality thereof) and open to public travel

Public-private Partnership (P3) – A government service or private business venture which is funded and operated through a partnership of government and one or more private sector companies

Public Workshop – Informal gathering of designers, officials, and local citizens to share and discuss proposed actions; a forum for public participation

Queue – A line of waiting people or vehicles in which the person or vehicle at the front is serviced first, followed by the one behind, and so on, and which newcomers join at the opposite end. For example, vehicles approaching an intersection under STOP-control would stop and wait for an acceptable gap in the main traffic stream. As additional vehicles arrive at the intersection, a queue would develop until all vehicles are able to be processed through the intersection

Ramp – All types, arrangements, and sizes of turning roadways that connect two or more legs at an interchange.

Regional Transportation Plan (RTP) – Plan which summarizes regional transportation goals and objectives, describes the regional transportation system and existing conditions, evaluates alternative courses of action, and recommends short– and long–term strategies and actions; prepared and approved by RPOs

Regional Travel Demand Model – Model in which traffic volumes are forecast through the interaction of transportation demand and supply. The model consists of a series of nodes that represent locations of roadway intersections and other elements of the network and are connected by links. Links represent highway segments and contain information such as speed and road capacity. Traffic Analysis Zones (TAZs) are defined to encompass areas of development that represent the demand, while the road network represents the supply

Regional Planning Organization (RPO) – The South Western Regional Planning Agency (SWRPA) serves as a regional agency fostering communication, coordination and consensus building among the municipalities in the south western part of the state. SWRPA became Western Connecticut Council of Governments as of January 1, 2015.

Responsive Traffic Control Signal – Intelligent signal operation responding to traffic demand where required based on a predetermined set of operational parameters.

Right Of Way (ROW) – The land (usually a strip) acquired for or devoted to transportation purposes. For example, highway ROW and railroad ROW

Right–Turn Lane – Lane which removes decelerating right–turning vehicles from the traffic stream.

Road Safety Audit (RSA) – A road safety audit or assessment (RSA) is a formal safety examination of a roadway or intersection conducted by an independent, experienced multidisciplinary RSA team

Roundabout – Channelized intersection that creates a one–way traffic stream circulating around a central island in which all entering vehicles must yield to the circulating traffic

Safe Routes to School (SRTS) Program – Program established in each state by federal legislation for the benefit of children in kindergarten through eighth grade with a goal of increasing the number of children safely walking and biking to school

Shared Roadway – Signed shared roadways are those that have been identified by signing as preferred bike routes. Signing of shared roadways indicates to cyclists that there are particular advantages to using these routes compared to alternate routes. This means the responsible agencies have taken action to ensure these routes are suitable as shared routes and will be maintained

Shared Use Path – Facility for non–motorized users that is independently aligned and not necessarily associated with parallel roadways; designed to accommodate a variety of users, including walkers, bicyclists, joggers, people with disabilities, skaters, pets and sometimes equestrians

Shoulder – Portion of a roadway adjacent to a traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of the base and surface courses

Sidewalk – Path for pedestrian travel which follows a street and occupies the border between the vehicular travel ways and private property

SIDRA – Software application for performing capacity analysis typically used to analyze roundabouts

Sight Distance – Line of sight available to the driver to see another roadway user or a fixed object

Signal Timing – The operational program for a traffic signal and resulting assignment of right–of–way to different users

Single-Occupant Vehicle (SOV) – A vehicle having only one occupant

Speed – (1) Operating speed – the speed at which drivers are observed operating their vehicles, or (2) Posted speed – the maximum speed limit posted on a section of roadway using a regulatory sign

Stakeholder – Individual having an interest or share in a project, or who may be impacted by the outcome of a project, either directly or indirectly

Statewide Transportation Improvement Program (STIP) – A staged, multi–year, statewide, intermodal program of transportation projects which is consistent with the Statewide Transportation Plan (STP) and planning processes and metropolitan plans, TIPs and processes. The STP is developed in cooperation with the Regional Planning Organizations (RPO) programs

Storage Bay – Auxiliary lane approaching an intersection which stores turning vehicles expected to accumulate during an average peak period

Streetscape – The road and its surrounding built environment as a whole

Study Team – The Study Team included representatives from the City, WCCOG, CTDOT and Vanasse Hangen Brustlin (VHB), Inc. (The Engineering Consultant)

SYNCHRO™ – Software application for optimizing traffic signal timing and performing capacity analysis. The software optimizes splits, offsets, and cycle lengths for individual intersections, an arterial, or a complete network

Technical Advisory Group (TAG) – The Technical Advisory Group for the study is comprised of representatives from the City of Stamford, WCCOG, and Connecticut Department of Transportation (CTDOT),

Traffic Analysis Zone (TAZ) – Unit of geography most commonly used in conventional transportation planning models

Traffic Calming – Physical road design elements intended to reduce vehicle speeds and improve driver attentiveness

Traffic Signal – Electronic device which assigns right–of–way to both motorized and non–motorized traffic through the use of alternating visual indicators

Transit – Public transportation, especially rail and bus services

Transit-Oriented Development (TOD) – Mixed-use residential or commercial area designed to maximize access to public transportation, and often incorporates features to encourage transit ridership

Transportation Advisory Committee (TAC) – Committee that advises the State Planning Council on transportation planning and encourages public involvement in the process. The TAC reviews and provides input into the transportation planning documents that are the responsibility of the State Planning Council (notably the long-range Ground Transportation Plan and Transportation Improvement Program)

Transportation Barriers – A natural or man-made physical obstacles like streams, rivers, hills, fences, culvers, structures, etc. that blocks or slows the way of transportation

Transportation Demand Management (TDM) – Programs designed to reduce demand for transportation through various means, such as the use of transit and alternative work hours

Transportation Improvement Program (**TIP)** –Federally mandated, biennial document developed by the Transportation Advisory Committee (TAC) and adopted by the State Planning Council that programs federal transportation dollars to projects and programs that are implemented primarily by CTDOT

Transportation Management Association – A non-profit consortium of businesses, employers, developers, and property managers in an area dedicated to easing commutes, reducing local traffic congestion and advancing the use of alternative transportation options

Transportation System Demand – Demand by motorists, pedestrians, and bicyclists for a facility, assessed in terms of volume, composition, and patterns

Travel Demand Forecast – Technical analysis and policy consensus on future traffic volumes resulting from the type and intensity of land use, future regional economic activity, presence of transit service, the needs of pedestrian and cyclists, and many other factors

Travel Lane – Portion of a roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes

Travel Time – The time it takes a vehicle or person to travel the length of a corridor or study–area.

Trip Assignment – The process of allocating the specific number of new trips, by mode choice, onto the links/roadways of the transportation network

Trip Distribution – The process by which trips generated in one zone are allocated to other zones in the study area

Trip Generation – The process of determining the number of trips that will begin or end in each traffic zone within a study area

Trip Purpose – An outward and return journey by a motorize and non-motorized transportation mode, often for a specific purpose

Turning Movement Count (TMC) – Peak–hour data collected at an intersection via electronic counting boards. Data is generally collected manually

Two-Way-Left-Turn-Lane (TWLTL) – A continuous lane located between opposing traffic streams that provides a refuge area for vehicles to complete left–turn movement from both directions.

Urban – Refers to central business districts, residential districts and open space parks typical of larger cities

Underserved Populations – to offer inadequate services or facilities to a sector of population

Variable Message Sign (VMS) – Sign for the purpose of displaying one of a number of messages that may be changed or switched on or off as required by traffic and roadway conditions

Vehicle Hour of Travel (VHT) – A unit to measure trip time made by a private vehicle, such as an automobile, van, pickup truck, or motorcycle. Each hour of travel is counted as one vehicle hour regardless of the number of persons in the vehicle

Vehicle Mile of Travel (VMT) – A unit to measure vehicle travel made by a private vehicle, such as an automobile, van, pickup truck, or motorcycle. Each mile traveled is counted as one vehicle mile regardless of the number of persons in the vehicle

Vehicle Occupancy Rate (VOR) – Average number of passengers in a vehicle (automobile, bus, rail car, aircraft, etc.)

Vehicles Per Day (VPD) – This is a measure of traffic volume and is used as the unit for Average Annual Daily Traffic

Vertical Clearance – Minimum unobstructed vertical passage space required along a roadway, sidewalk, or trail

Volume – Number of vehicles or persons that pass over a given section of a lane, roadway, or other traffic way during a time period of one hour or more; can be expressed in terms of daily traffic or annual traffic, as well as on an hourly basis

Volume-to-Capacity ratio (v/c) – Ratio of flow rate to capacity. The v/c ratio describes whether or not the physical geometry provides sufficient capacity for the subject movement. Low v/c ratios depict relatively free flow conditions. High v/c ratios depict more congested conditions.

Wetland – Land that is transitional between aquatic and terrestrial ecosystems and is covered with water for at least part of the year

Zoning – A section of an area or territory established for a specific purpose, as a section of a city restricted to a particular type of building, enterprise, or activity