



Complete Streets for the Sound Shore Community



City of Rye
Village of Mamaroneck
Town of Mamaroneck
Village of Larchmont

May 2011

NYUWagner

Robert F. Wagner Graduate School of Public Service



Complete Streets for the Sound Shore Community

Prepared by:

Paul Chenard

Rebecca Krauss

Scott Johnson

Albert Silvestri

Elisabeth Wooton

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The Rye YMCA

Helen Gates, Director of Marketing and Community Impact, Rye YMCA
Gregg Howells, Executive Director, Rye YMCA
Dan Gallagher, Board Member, Rye YMCA

City of Rye

Steve Cadenhead, Shared Roadways Committee, Rye
Douglas French, Mayor, City of Rye
Maureen Gomez, Shared Roadways Committee, Rye
Dinah Howland, Shared Roadways Committee, Rye
Suzanna Keith, Council Member, Rye
Christian Miller, City Planner, Rye
Scott Pickup, City Manager, Rye

Village of Mamaroneck

Harry Hazelwood, Board Member Traffic Commission, Village of Mamaroneck
Norman Rosenblum, Mayor, Village of Mamaroneck
Daniel Sarnoff, Assistant Village Manager, Village of Mamaroneck
Richard Slingerland, Village Manager, Village of Mamaroneck
John Winters, Building Inspector, Village of Mamaroneck

Town of Mamaroneck

Stephen V. Altieri, Administrator, Town of Mamaroneck
Nancy Angiulo, Traffic Committee, Town of Mamaroneck
Christina Battalia, Clerk, Town of Mamaroneck
Doris Shaw Block, Traffic Committee, Town of Mamaroneck
David J. Fishman, Council Member, Town of Mamaroneck
Michael Harrington, Traffic Committee, Town of Mamaroneck
William Maker, Jr., Attorney, Town of Mamaroneck
Camille Odierna, Traffic Committee, Town of Mamaroneck
Ernest C. Odierna, Council Member, Town of Mamaroneck
Valerie M. O'Keefe, Town Supervisor, Town of Mamaroneck
Nancy Seligson, Council Member, Town of Mamaroneck
Donald Sutherland, Traffic Committee, Town of Mamaroneck
Phyllis Wittner, Council Member, Town of Mamaroneck
William F. Zelenka, Traffic Committee, Town of Mamaroneck

Village of Larchmont

Josh Mandell, Mayor, Village of Larchmont
Anne McAndrews, Trustee, Village of Larchmont
Maria Stanton, Traffic Commission, Village of Larchmont

New York State Department of Transportation

Greg Hart, New York State Department of Transportation
Lisa Mondello, New York State Department of Transportation
Jim Rapoli, New York State Department of Transportation
Sanyal Tapas, New York State Department of Transportation

Westchester County Department of Transportation

Naomi Klein, Principal Planner, Westchester County Department of Transportation
Lukas Herbert, Associate Planner, Westchester County Department of Planning
Charles Sutter, Westchester County Department of Transportation

New York State Assembly

George Latimer, NYS Assemblyman, District 91

New York State Senate

Suzi Oppenheimer, NYS Senator, District 37

Westchester County Legislature

Judith Myers, County Legislator

Alta Planning

Phil Goff, Alta Planning
Jeff Olson, Alta Planning

Bike Walk Alliance of Westchester & Putnam

David McKay Wilson

East Coast Greenway

Michael Oliva

Eastchester Environmental Committee

Peter McCartt

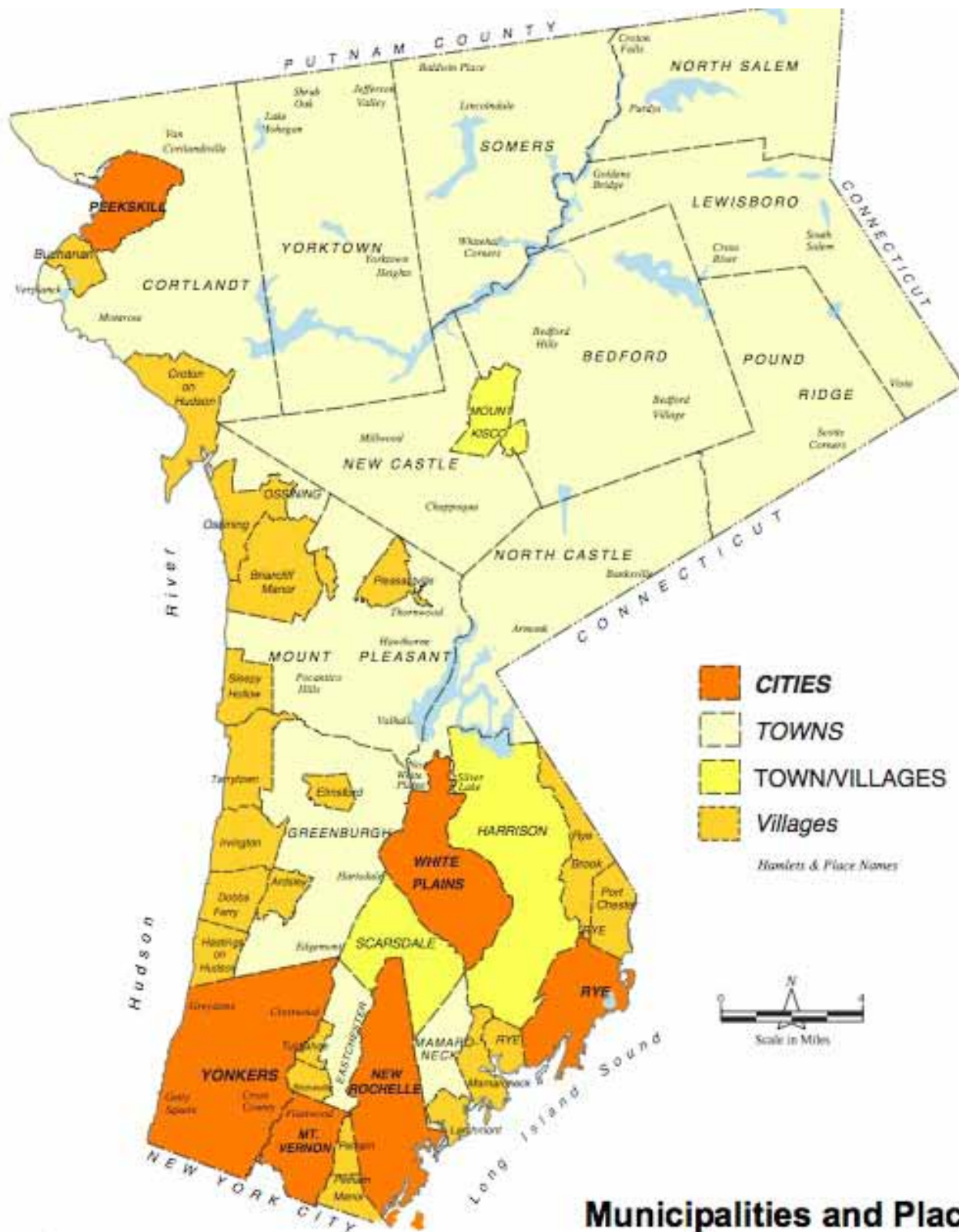
New York University - Robert F. Wagner Graduate School of Public Service

Melissa Kaplan-Macey, Capstone Advisor
David Schachter, Assistant Dean for Student Affairs, NYU Wagner



I	Project Overview	Page 11
1.0	Introduction	Page 12
1.1	Study Purpose and Goals	Page 12
1.2	Complete Streets	Page 13
1.3	Community Participation	Page 14
II	Complete Streets Overview	Page 17
2.0	Complete Streets History	Page 18
3.0	Complete Streets Physical Design	Page 20
3.1	Interventions	Page 20
3.1.1	Pedestrian	Page 20
3.1.2	Bicycle	Page 22
3.1.3	Vehicle	Page 23
3.1.4	Environment	Page 26
III	Sound Shore Case Studies	Page 29
4.0	Village of Larchmont	Page 30
4.1	Existing Conditions	Page 30
4.2	Stakeholder Participation	Page 31
4.3	Case Study Area	Page 31
4.4	Goals	Page 31
4.5	Recommendations	Page 32
4.5.1	Chatsworth Avenue and Larchmont Avenue	Page 32
4.5.2	Larchmont Avenue	Page 33
5.0	Village of Mamaroneck	Page 36
5.1	Existing Conditions	Page 36
5.2	Stakeholder Participation	Page 36
5.3	Goals	Page 37
5.4	Case Study Area 1, 2, 3	Page 37
5.5	Recommendations	Page 38
5.5.1	Section 1	Page 38
5.5.2	Section 2	Page 40
5.5.3	Section 3	Page 43

6.0	Town of Mamaroneck	Page 44
6.1	Existing Conditions	Page 44
6.2	Stakeholder Participation	Page 44
6.3	Goals	Page 44
6.4	Case Study Area	Page 45
6.5	Recommendations	Page 46
7.0	City of Rye	Page 49
7.1	Existing Conditions	Page 49
7.2	Stakeholder Participation	Page 49
7.3	Goals	Page 49
7.4	Case Study Area	Page 49
7.5	Recommendations	Page 50
IV	Implementation Strategy	Page 55
8.0	Implementation Strategy	Page 56
8.1	Implementing Policy	Page 56
9.0	Funding	Page 57
9.1	Funding Approach	Page 57
9.2	Federal	Page 58
9.3	Private Grants	Page 60
9.4	Local Funding	Page 61
10.0	Sound Shore Application	Page 62
10.1	City of Rye	Page 62
10.2	Village of Mamaroneck	Page 63
10.3	Town of Mamaroneck	Page 64
10.4	Village of Larchmont	Page 64
11.0	Utilizing this Report	Page 65



Map courtesy of Westchester County Databook, Dept. of Planning 2010

SECTION I

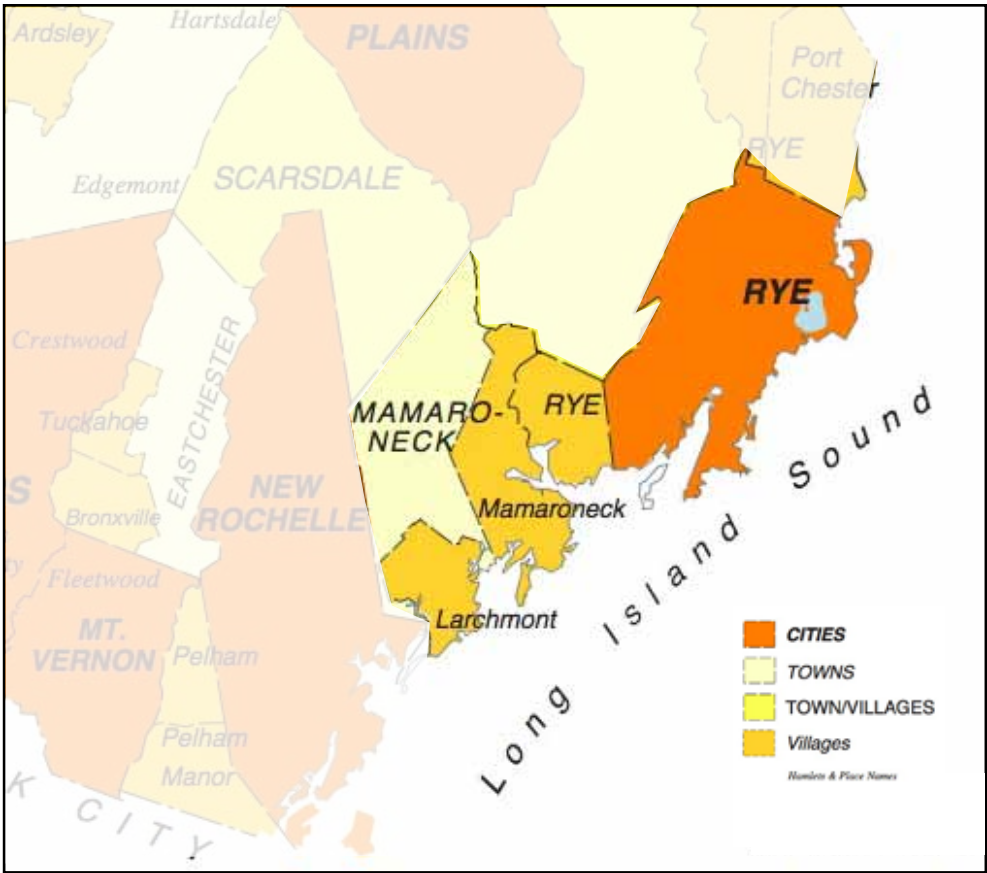
Project Overview

CHAPTER ONE

1.0 Introduction

The Rye YMCA, acting as a facilitator on behalf of four Sound Shore communities, tasked the NYU Wagner Capstone team with developing a Complete Streets strategy. This includes developing recommendations for design interventions as well as strategies for implementing policy and securing funding. The four member communities of the Rye YMCA that participated in this study were:

- City of Rye
- Village of Mamaroneck
- Town of Mamaroneck
- Village of Larchmont



Map courtesy of Westchester County Databook, Dept. of Planning 2010

The Sound Shore communities constitute an approximately 10 mile stretch of coastline in New York state, 15 miles northeast of New York City in Westchester County. These established communities were settled as far back as the 1600s. Each community has a downtown commercial district within walking distance to a train station along the MTA Metro-North New Haven line.

1.1 Study Purpose and Goals

The member communities of the Rye YMCA have realized their roads can do more than simply transport cars. Using the Complete Streets approach, the full potential of the Sound Shore’s roads can be realized. Along with getting cars from Point A to Point B, roads can provide social interaction, economic development, and physical fitness opportunities, such as trail-ways, bike lanes, and recreational space.

The Rye YMCA, through their *Activate America* program which focuses on long term, sustainable improvements to lifestyle and health, has formed a coalition of community leaders that have recognized the issue and are excited to see the potential strategies for the improvement and enhancement of their villages, towns, and cities. The strategy entails identifying and considering key concerns, outcomes, objectives, stakeholders, and opportunities of a Complete Streets approach to area roadways.



The project culminates in this report and a presentation to the community, both of which contain policy and funding recommendations as well as recommendations for implementing specific Complete Streets treatments for identified project sites in each community. These project site recommendations are meant as examples of ways in which streets with varying characteristics might be treated with the Complete Streets objectives.

1.2 Complete Streets

According to the National Complete Streets Coalition, nearly all policies regarding streets are directed at providing for and controlling automobile traffic primarily, with little focus on other users. While the current paradigm in the United States is to provide for capacity, speed, and efficiency for automobiles, Complete Streets aims to change that paradigm to include all users, including, but not limited to pedestrians, youth, elderly, disabled, bicyclists, public transportation, and freight vehicles. To achieve this paradigm shift, new policies must be included strategically.



America Bikes coined the term “Complete Streets” in 2003, and a Complete Streets Task Force was inceptioned. This task force evolved into the National Complete Streets Coalition in 2005, with founding members including the American Planning Association, AARP, American Public Transportation Association, Smart Growth America, America Walks, America Bikes, and other organizations.

The definition of Complete Streets, as used in this report, is:

To implement policy measure and design features that make streets safe and accessible for all users, regardless of age, ability, or mode of transportation

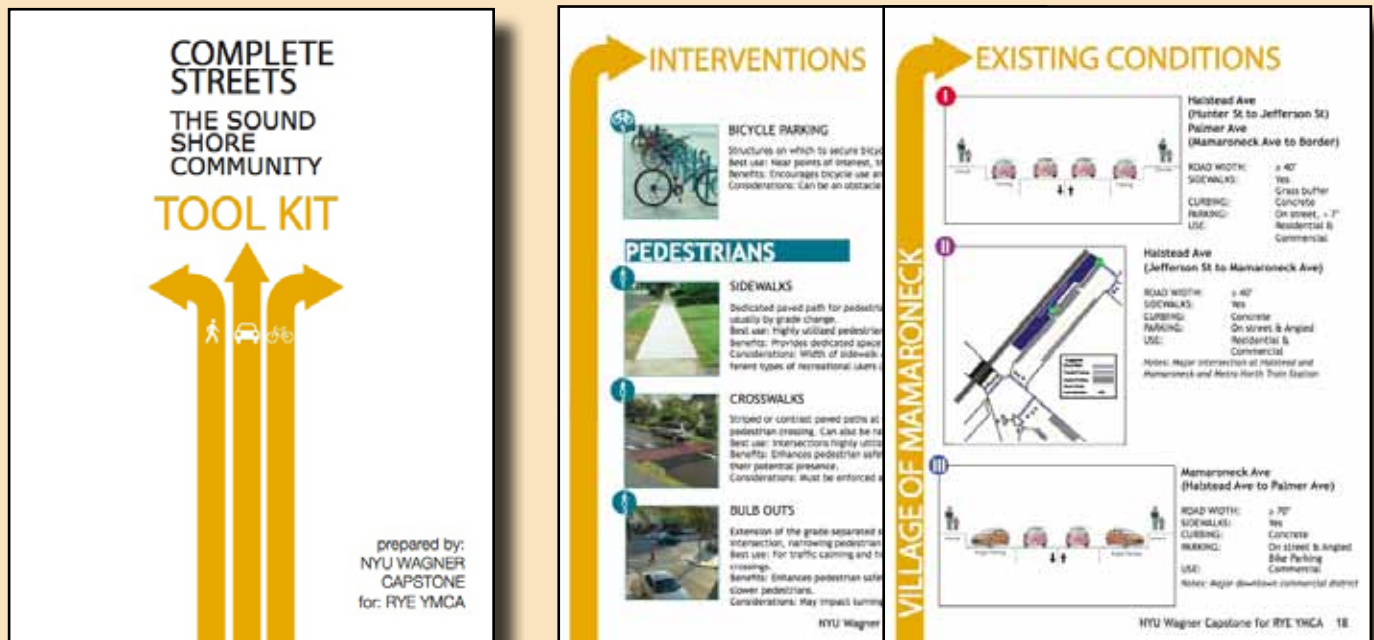
The objectives Complete Streets aims to achieve are:

SAFETY, FITNESS & RECREATION, ECONOMIC DEVELOPMENT, INTERMODAL CONNECTIVITY, and ENVIRONMENTAL BENEFITS

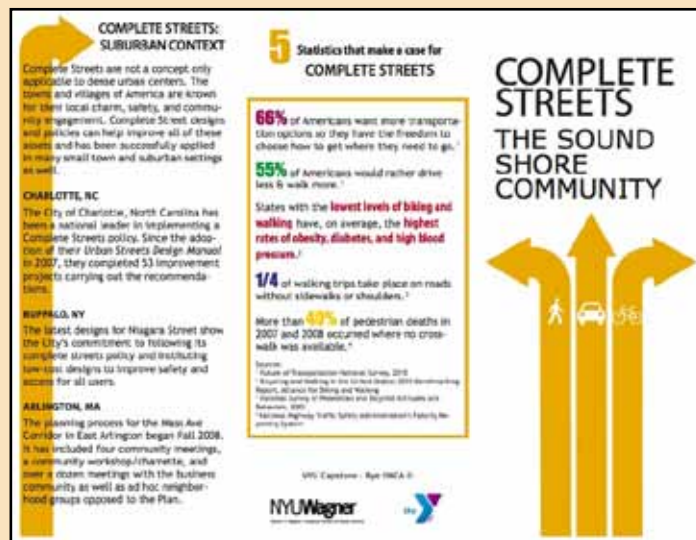
Complete Streets is a concept most well known for use in dense urban centers but is also highly applicable to communities of any size. The local charm, safety, and community engagement of the communities in Westchester County can be accentuated by the application of Complete Streets design and policy.

1.3 Community Participation

The Capstone team began work in October 2010, developing a Scope of Work with the client that included identifying project sites in each community. In November and December 2010, the team met with representatives from each of the four municipalities to discuss preferences and guidelines for the project. In November, each community submitted a site selection form which identified the specific roadway section to be addressed in the case study and outlined the goals they hoped to achieve.



Above, sample pages from the Complete Streets Tool Kit which was submitted in January 2011. It contained preliminary recommendations to the member communities that were followed by feedback meetings.



At left, a sample of the Complete Streets brochure provided to the Rye YMCA and the member communities to assist them in communicated the goals and rationale for Complete Streets Policy.

The first deliverable to the client and the participating municipalities was a Tool Kit of preliminary recommendations for each of the project sites, presented at the end of January 2011. In addition, the team provided the client with a Complete Streets overview which outlined the objectives and application of Complete Streets in a succinct and digestible brochure format.

Using the Tool Kit, each community provided feedback in meetings held in February 2011. Finalized site recommendations were then presented to the client and participating communities at the end of February, followed by policy and funding recommendations delivered in the draft of this document in early March 2011.

The project culminated in this final report and PowerPoint presentation, which was given to the community in a public forum held in the City of Rye on April 28, 2011.

Reason for the Rise of Complete Streets



Photos courtesy of National Complete Streets Coalition

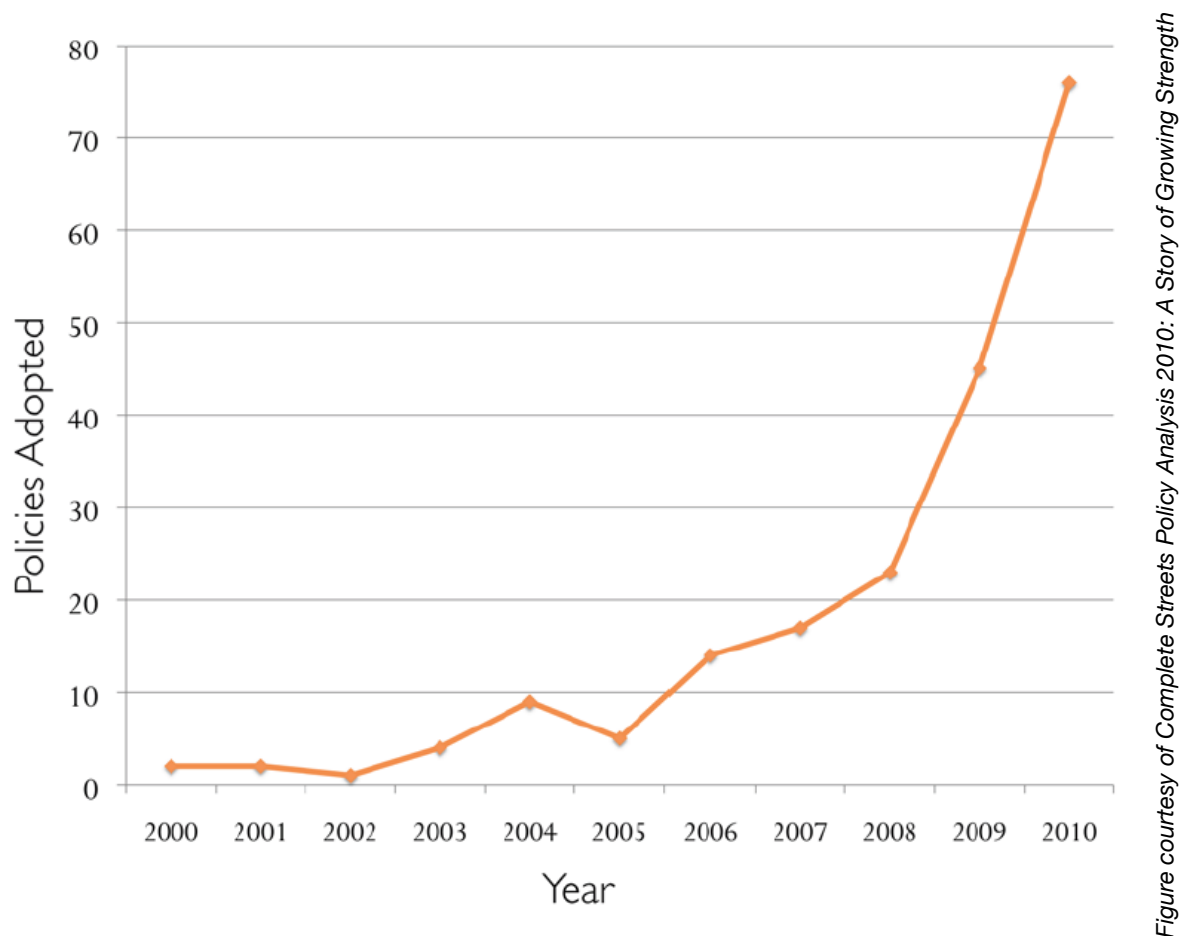
SECTION II

Complete Streets Overview

CHAPTER TWO

2.0 Complete Streets Policy

The National Complete Streets Coalition, formed in 2005, acts as a clearinghouse for Complete Streets policies. To date, some of the instrumental policy types that have been used to forward Complete Streets include ordinances and resolutions; design manuals; comprehensive plans; internal memos from directors of transportation agencies; and executive orders from elected officials. The most prevalent form of policy is a simple resolution; over one third of policies are of this type. Complete Streets policies have been enacted on several different levels of government, including state and county, and two thirds of policies in the United States are enacted at the city level. The Coalition has found that a variety of approaches have been successful and the best course of action will vary from place to place.



One of the first policy changes implemented in the country was Massachusetts Department of Transportation's (DOT) Project Development and Design Guidelines, completed in 2006. Following that was Charlotte, North Carolina's Urban Streets Design Guidelines, published in 2007. The following year, California DOT issued Deputy Directive 64-R1, and Decatur, Georgia published its Community Transportation Plan. Since 2009, the movement has gained significant momentum with over 200 communities adopting Complete Streets policies and guidelines, ranging from New York City's Street Design Manual to Ada County, Idaho Highway District's Resolution No. 895.



*At left, an image from Columbia, MO.
Below, an image from Decatur, GA.*



Photos courtesy of Flickr, DaveReid2 and Whitefield

Policy has grown out of many perspectives and goals. In Pierce County, Washington, the Complete Streets movement was led by the Board of Health, which put out an Obesity Prevention Resolution in 2005 that included a call for urban planning action toward the cause. As a result, a multi-disciplinary collaboration developed around creating a landscape that encourages physical activity. In 2008, the Board of Health issued a Complete Streets Resolution, which in turn prompted a Pierce County Council Complete Streets Resolution that same year. The Senior Planner in Rochester, Minnesota, also approached Complete Streets from a health perspective, partnering with health organizations to enact policy measures. Using funding from a Blue Cross/Blue Shield grant, a Steering Committee was formed and staffed to coordinate the efforts toward all modes of transportation.

In Columbia, Missouri, multimodal streets that accommodate pedestrian and bicyclists and effect traffic calming were the goal. The resulting street design manual in 2004 enacted Complete Streets principles and called for the integration of modes in all right of way projects. Decatur, Georgia, also looked for opportunities to plan for pedestrians. Utilizing a phone survey and four technical studies to examine the possibilities and desires in the city, Decatur was able to build community support and enact its own Community Transportation Plan. Despite conflicts with the State DOT's policies, as well as a low budget, the city's plan has provided a context for working with the DOT to implement Complete Streets measures.

Chapter Three

3.0 Complete Streets Design

This section illustrates a number of common design interventions which are often used to achieve the Complete Streets objectives described earlier. The following interventions have been categorized according to beneficiary group: 1) Pedestrians, 2) Bicycles, 3) Vehicles, and 4) Environment.

Not all of the interventions listed here are included in the recommendations that follow in the case studies. When considering which intervention is most appropriate to apply to a road section or intersection, it is important to keep in mind what user groups are present on the chosen road. Additionally, the interventions included in this report range in the cost and intensity of work required for implementation which can have implications for which type of intervention is most feasible.

Many cities have published design manuals which act as guidelines for transportation planners to coordinate and orchestrate the overall development of a municipality's road network. Some notable design guidelines to consult are from Charlotte, North Carolina and New York City, New York.

3.1 Interventions

3.1.1 Pedestrians

Sidewalks

Sidewalks are dedicated paved paths for pedestrians separated from a roadway, usually by a grade change. Enhanced features include a planted strip between the sidewalk and the roadway. They are best for highly utilized pedestrian routes, but are useful along any roadway. In implementing sidewalks, care should be taken to determine the width, considering all potential users.



Crosswalks

Crosswalks are striped or contrast-paved paths across roadways delineating pedestrian crossing. Usually located at intersections, they can also be raised for additional safety. They are best used for highly utilized pedestrian crossings and are especially useful where children are likely to be present. Additional safety features include signage alerting motorists to the presence of a crosswalk, rumble strips leading up to the crosswalk, and refuge islands (see below).





Refuge Islands

Refuge Islands are median striping or grade-separated paving at crosswalks that allow for pedestrians to cross the roadway in two phases. They are best used on wide roadways, especially with multi-lane traffic, but are also useful in highly utilized pedestrian crossings.

While the primary purpose is to ease pedestrian crossing and enhance safety, they secondarily slow traffic by narrowing the roadway and providing a change to the open roadway. This feature can be enhanced by enlarging the refuge islands, including plantings, and other visual cues to further slow traffic. Special considerations include road navigability for larger vehicles, drainage, and snow removal.



Curb Extensions

Curb extensions are an extension of the grade-separated sidewalk into the roadway at an intersection, narrowing the pedestrian crossing distance. While the primary purpose is to ease pedestrian crossing and enhance safety, they also serve to narrow the intersection, slowing cars and delineating travel space. They increase the sight lines of cars approaching an intersection and eliminate the hazard of cars parked too closely to the intersection, blocking the sight lines of pedestrians and motorists alike. Special considerations include turn radius, drainage, and snow removal, all of which can be negatively impacted by bulb outs.



Wayfinding

Wayfinding is signage intended to orient users and direct them to points of interest. They are best used in areas with visitors unfamiliar to the area, or with distant points of interest. Secondly, they can create an area identity. Consideration must be given to the maintenance they will require.

3.1.2 Bicycles

Shoulders

Shoulders are the undefined area between an edge line of a roadway and the curb, and are useful primarily as an emergency buffer but also can be utilized as additional space for recreational use. While they can be left unpaved, they are most useful when paved and maintained along with the roadway.

They are best for roadways too narrow for a dedicated bike lane but with some additional right-of-way space that can be paved. However, one consideration is the unprotected status of recreational users utilizing the shoulder.



Sharrows

Sharrows are painted markings on the roadway of a bicyclist and a directional arrow oriented in the same direction as prevailing traffic. They remind all users that the roadway is shared space for motorists and recreational users, as per state law.

They are best used on narrow roadways where a dedicated bike lane is not possible, and especially important on roadways heavily utilized by recreational users.

A sharrow route has successfully been implemented in nearby Eastchester along California Road. The project has been positively received and there have been no official complaints lodged with the Eastchester government. The Eastchester Environmental Committee, which is independent of the local government, purchased the sharrow stencil, leaving only the cost of labor and paint.¹



Dedicated Bike Lanes

Dedicated bike lanes are delineated space for bicyclists along roadways, at least 5 feet in width and in the same direction as prevailing traffic. Usually painted a contrasting color or marked by painted bicycle symbols, these lanes provide for safety and comfort of bicyclists and motorists alike, with clear space for each type of user along the roadway.



¹ Peter McCartt, *Discussion of Sharrows in Eastchester*, Scott Johnson (Eastchester, January 2010).



They are best used along roadways heavily traveled by bicyclists, and any roadway with enough width to accommodate a dedicated bike lane. They can be combined with buffer areas – striped areas that prohibit any use – to separate the bike lane from the roadway or from parked cars, for additional safety. Special care must be taken at intersections, narrow parts of the roadway, and any other points of possible conflict between users.

Two Way Bike Lanes

Like dedicated bike lanes, two way bike lanes provide delineated space for bicyclists, however they are wider (at least 10 feet wide) and accommodate two directions of bicycle traffic.

They are best suited to extremely wide roadways where there are many bicyclists and other recreational users present. Configuration of the two way bike lane must be carefully done, especially at intersections and other points of conflict. To provide additional safety, they can be configured to run along the curb edge and have a buffer from motorists of parked cars.



Bicycle Parking

Bicycle parking consists of structures dedicated for securing bicycles, usually placed on sidewalks. They are best used near points of interest or transit. They encourage bicycle use for commuting and short trips.

3.1.3 Vehicle

Signage

Signage along the roadway provides information about the rules of the road to enhance safety for all users. Signage can include information about what users to expect, speed limits, upcoming lane changes, and much more.

Signage is best applied in areas of potential conflicts or confusion and areas where unlawful use of the roadway is common. Signage should be kept as clear and simple as possible to ensure it can be read and understood quickly. Special attention must be paid to the frequency of use to ensure that it conveys the desired information and is not easily ignored.



Lane Narrowing

Narrowing of vehicle traveling lanes to between 9' and 10' can help to reduce the speed of traffic and may create space on the road to accommodate other users, such as bikes or pedestrians. Lane narrowing can be accomplished physically by moving the curb line along the street or visually by painting a shoulder line or buffer along the side of the road. Either technique would make motorists perceive the road as narrower which has been proven to reduce traveling speeds.



Lane narrowing is best applied to roads that have widths of greater than 10' roadways, where speeding is a common problem and/or where multiple users need to be accommodated. When implementing lane narrowing, emergency and oversized vehicles should be considered in the design.

Signal Timing

The optimization of signal timing at intersections ensures that traffic flows as efficiently as possible, especially in heavily trafficked intersections where multiple user groups are present. Improved signal timing can dramatically reduce congestion, and therefore reduce accidents, travel times, and air pollution levels.



Signal timing design can be very complex, varying according to traffic patterns and time of day. Therefore, optimizing signal timing requires careful analysis, design, and implementation.

Reverse Angle Parking

Reverse angle parking requires drivers to back into angled parking spaces, as opposed to pull in, which increases a driver's visibility while pulling into traffic after leaving a parking space. Drivers are able to more easily see approaching vehicles, bicycles, and pedestrians which reduces collision rates. In addition, it makes loading and unloading easier and when children exit the car their access to the roadway is blocked.



In areas with increased parking needs, such as downtown business districts, the reverse angle

orientation is recommended to improve safety for all users. Implementing this change may require the repainting of the parking lanes, motorist education, and parking enforcement.

Reverse angle parking has been shown to significantly reduce motorist, bicycle, and pedestrian accidents. After the implementation of reverse angle parking in Pottstown, Pennsylvania, the city saw an approximately 25% reduction in accidents. Reverse angle parking has been successfully implemented in many cities including Charlotte, North Carolina, Tacoma, Washington, and Wilmington, Delaware.²



Speed Humps

Speed humps are gently raised areas of the road which require motorists to slow down to avoid damaging their vehicle. In areas of high pedestrian crossing rates and/or areas where speeding is a concern, speed humps can help to slow traffic and improve safety.

When installing speed humps, they must be accompanied by the appropriate street markings and signage. In addition, emergency vehicles and bicyclists may experience difficulty in crossing speed humps and should be taken into consideration during design.



Traffic Diverters

Traffic diverters are raised areas, either placed along the curb or in the median, which force motorists to take an indirect route along the roadway. Maneuvering around these medians requires the motorist to slow and pay more attention to the road.

Like speed humps, traffic diverters are best utilized in areas where speeding is a concern, especially along residential roads. Traffic diverters may cause difficulties for emergency vehicles, snow plows, and drainage, all of which need to be taken into account during design.

² Paul Nawn, "Back in Angle Parking in the Central Business District," Pennsylvania Department of Transportation, 2005.

3.1.4 Environment

Permeable Pavement

Permeable pavement is specially engineered to allow water to flow through to the subsurface. While it can be an especially appropriate treatment for areas prone to flooding, it can be utilized in other areas as well to achieve reduced stormwater runoff and decrease the need for additional infrastructure. Engineering has created superior products that can withstand heavy use, however it is still most often used in areas that experience less frequent use, such as excess parking facilities, along roadway shoulders, or bike lanes. Ongoing maintenance is a consideration.



Bioswales

Bioswales are a planted area along a roadway engineered to filter stormwater. They are planted with a specific selection of plants over a carefully designed subsurface that combine to filter and slow the rate of water infiltration. This may alleviate flooding, but is most commonly used to divert storm water from other infrastructure or to filter runoff before it reaches environmentally sensitive areas. Bioswales are best used in excess roadbeds or shoulder areas that are of high storm water concern.



Street Trees

Street trees are planted along the roadway to accomplish a multitude of goals, including improving environmental health, providing shade and shelter to pedestrians, and as a measure of traffic calming. They are recommended wherever possible along roadways, with consideration given to emergency roadside uses.



Median Plantings

Median plantings are vegetated beds located in the center of the street. Benefits of median plantings include beautification, environmental enhancement, and traffic calming. They are best placed in large median islands where the benefits of such plantings are desired.



SECTION III

Sound Shore

Case Studies

Chapter Four

4.0 Village of Larchmont

4.1 Existing Conditions

The Village of Larchmont is consistently ranked as one of the best places to live in the United States. The residential community of 5,864 (2010 Census) is surrounded by the Town and Village of Mamaroneck and located on the shore of the Long Island Sound, a characteristic that has influenced both its road network and land use decisions.

Located along the New Haven Line of the Metro-North Railroad, the Village lies eighteen miles north of Midtown Manhattan via commuter rail (with a terminus in Grand Central Station). The Village is also served by two commuter bus options provided by Westchester County, the number 70 Bonnie Briar line and the number 71 Larchmont Manor line.

Boston Post Road (Route 1), which opened in 1672 as part of the Boston-New York mail route, bisects the Village of Larchmont. The area to the south of Route 1 is the oldest section of the village, known locally as Larchmont Manor. In this area most of the Village's streets are named after trees, an appropriate choice considering the arboreal nature of the Village's thoroughfares. Of these streets the widest and most heavily travelled are Larchmont Avenue and Chatsworth Avenue, which are designated by the Village's certified land use plans as collector streets.

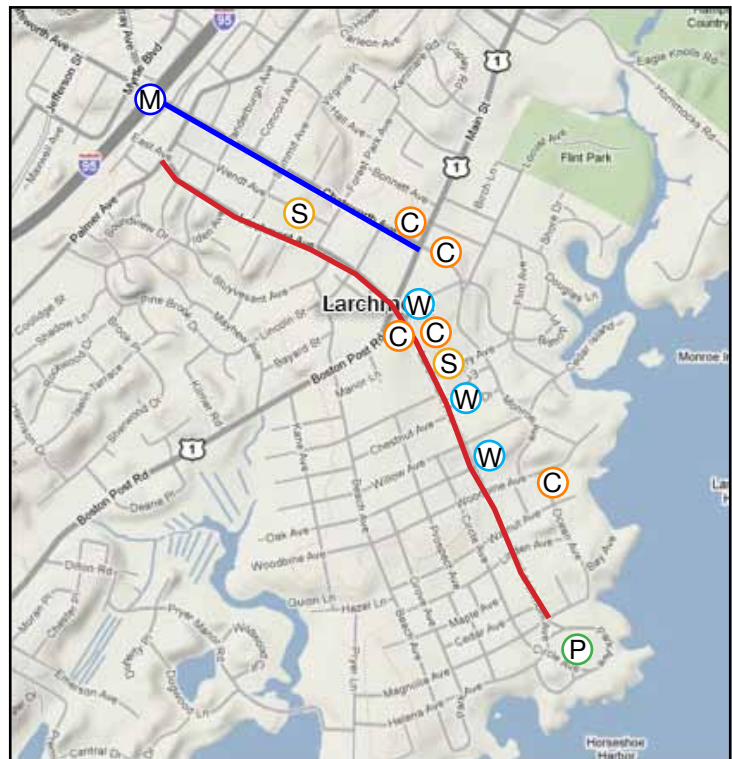
Points of interest include:

Larchmont Avenue

Larchmont Avenue Church Preschool
Village Business District
Beth Emeth Synagogue
Larchmont Public Library
French-American School of New York
St. Augustine R.C. Church
Larchmont Temple
Larchmont Yacht Club
Manor Beach Park

Chatsworth Avenue

Metro-North Station
Chatsworth Avenue School
U.S. Post Office
Village Shopping District



—	Larchmont Ave	S	School
—	Chatsworth Ave	W	House of Worship
M	MetroNorth Station	C	Community Facility
P	Manor Park		



A historical look at the intersection of Larchmont Avenue and Boston Post Road, the center of Larchmont's shopping district.

Photo courtesy of Larchmont Historical Society

4.2 Stakeholder Participation

During initial meetings, the Village of Larchmont representative was Anne McAndrews, a Village Trustee. Subsequent meetings were set up with the Mayor of Larchmont, Josh Mandell, in order to gauge interest, concerns, and site-specific issues. The Rye YMCA Capstone group held two meetings with Mr. Mandell, including a fact-finding meeting on December 8, 2010 and a feedback meeting after initial recommendations on February 14, 2011.

4.3 Goals

When asked initially, Mayor Mandell wrote that the Village's goal for Complete Streets is: *"To encourage biking within the Village wherever possible along a safely delineated bike path. The Village has installed twelve new bike racks this year; new bike lanes would be a great way to transport residents safely to these bike racks and encourage the expansion of bicycle usage in general."*

The Capstone team sees the benefits of complete streets in Larchmont addressing three specific objectives: 1) economic, encouraging more pedestrian and bicycle traffic in the central business district; 2) recreation, encouraging bicycle use throughout the community; 3) intermodal, encouraging the use of modes beside the automobile as a means of connecting with the Metro North station, the central shopping district, and other area amenities

4.4 Case Study Area

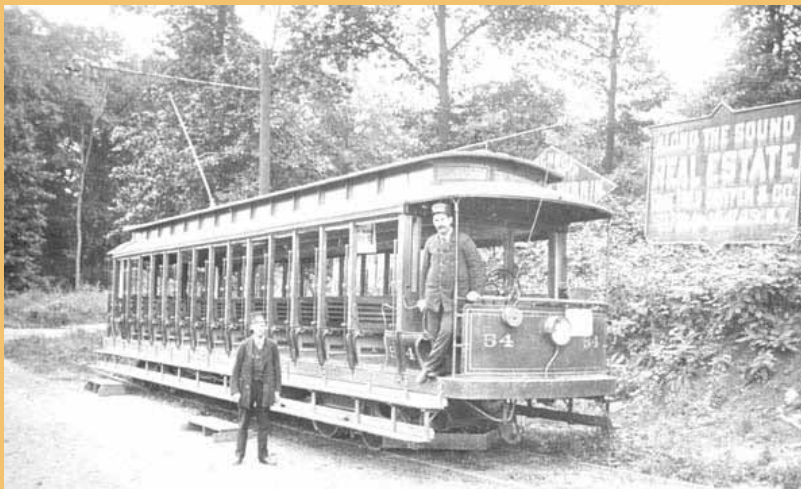
The case studies selected by the Village of Larchmont were:

1. **Chatsworth Avenue**, from Palmer Avenue south to Boston Post Road
2. **Larchmont Avenue**, from Palmer Avenue south to Magnolia Avenue

Larchmont and Chatsworth Avenues range from 54 to 57 feet wide at different points, exceptionally wide for avenues in a residential setting. The reason for this design was to accommodate a trolley system that served the village from the end of the 1800s into the 1930s, allowing residents at the southern end of Larchmont Avenue to connect to the village core around Boston Post Road and Palmer Avenue.

The existence of schools, public buildings, houses of worship, and the Larchmont Yacht Club produce moderately constant usage and peak period delays at certain intersections including Chatsworth Avenue and Boston Post Road and Larchmont Avenue and Boston Post Road.

Photo courtesy of Larchmont Historical Society



Why are these avenues so wide?

At right, a historical look at why both Larchmont and Chatsworth Avenues are today wider than all other roadways in the Village of Larchmont. A trolley system that served the village from the end of the 1800s into the 1930s, allowed residents to connect to the village core around Boston Post Road and Palmer Avenue.

4.5 Recommendations

4.5.1 Chatsworth Avenue and Larchmont Avenue (Palmer Avenue to Boston Post Road)

Recommendations:

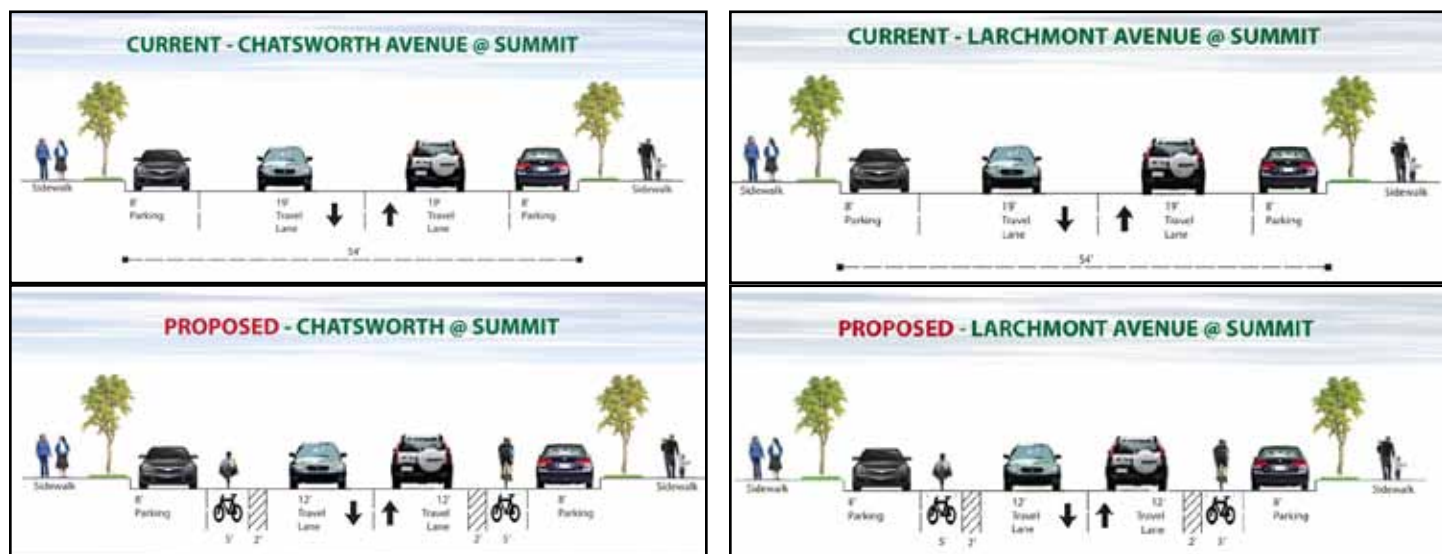
- Dedicated bike lanes on both sides of the road
- Sharrows used in areas where the avenue has four vehicle lanes



Chatsworth Avenue at Summit Avenue

Dedicated Bike Lanes

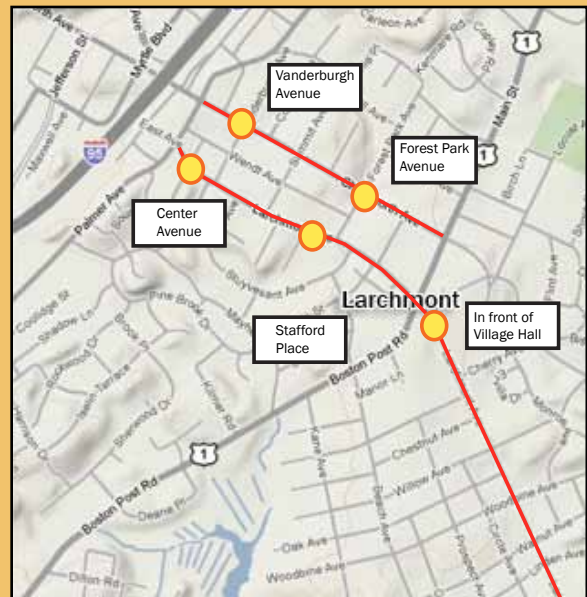
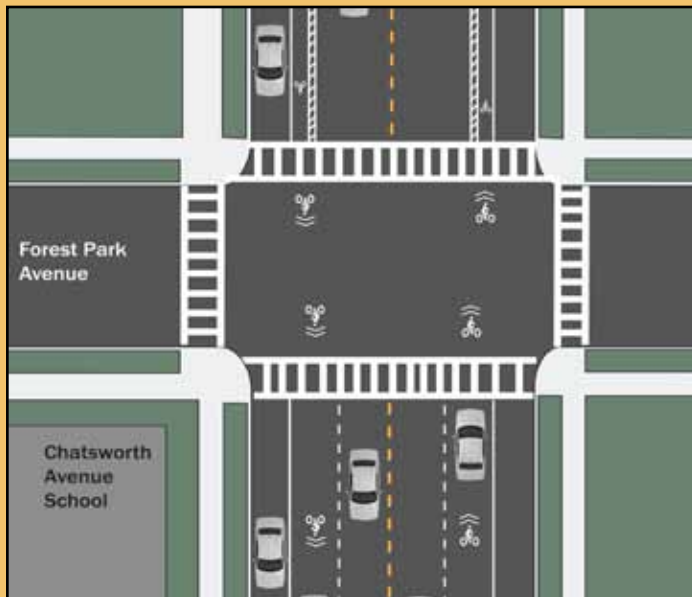
Considering the 54' width of Chatsworth Avenue and the goals of the Village, dedicated bike lanes are not only feasible but would assist the village in utilizing an underused community asset, promoting safe recreational amenities to bicyclists, intermodal connectivity and transportation options for residents seeking to enter the shopping district or approach the MetroNorth station.



Sharrows

There are points along Chatsworth and Larchmont avenues where the travel lanes transition from two to four to accommodate right-turning lanes onto Boston Post Road and Palmer Avenue as well as the queuing for pickup and drop-off for the Chatsworth Avenue School.

At these points, indicated on the map at right, it is recommended that dedicated bike lanes be transitioned to sharrows and sharrow marking be placed in the intersection to direct bicyclists.



Above left, the proposed transition from dedicated bike lanes to sharrows and at right, the locations where this transition is recommended.

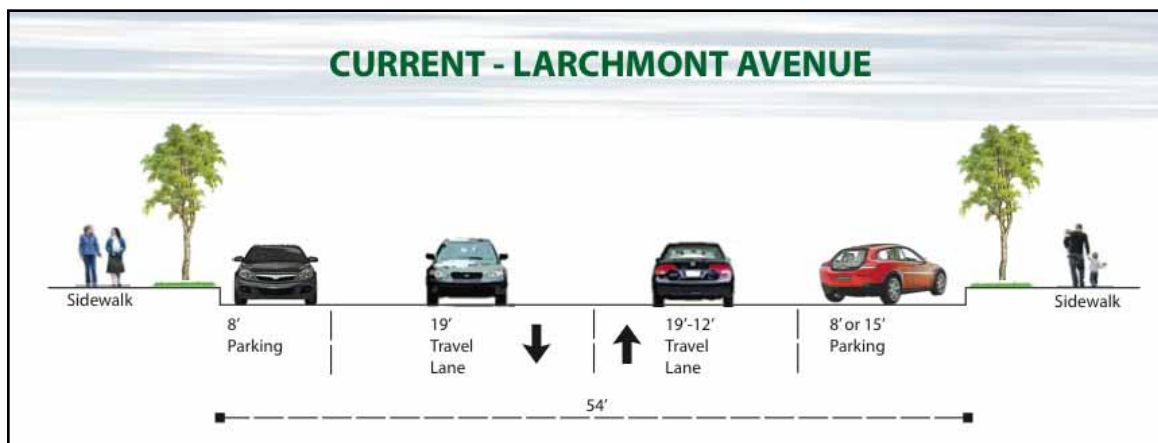
4.5.2 Larchmont Avenue (Boston Post Road to Magnolia Avenue)

Recommendations:

- ☐ Option 1: Two-Way Bike Lane
- ☐ Option 2: Dedicated Bike Lane and Sharrows (*Recommended Option)
- ☐ Option 3: Single Southbound Dedicated Bike Lane



Larchmont Avenue at Willow Avenue



Option 1: Two-Way Bike Lane

In an effort to accommodate the feature of diagonal parking along the northbound side of Larchmont Ave and to also provide a safe bike route going north and south, one option is a Two-Way Bike Lane on the southbound side. Considering the fact that the average car is approximately 13.5 feet long and a large-sized truck or SUV is approximately 15 feet long the lanes could be drawn to accommodate 15 feet of diagonal parking.

Additional safety measures would need to be taken at intersections considering that village residents approaching Larchmont Avenue from the west at Cedar, Linden, Walnut, Woodbine, Oak, Willow, Chestnut, and Elm avenues would be looking to cross a two-way bike lane. Some low-cost options would be painted curb extensions, signage, and recessed stop lines.



□ Benefits

- Provide bicycle access heading south to Manor Park and north to shopping district
- Creates an increased buffer zone for pedestrians
- A unique village amenity

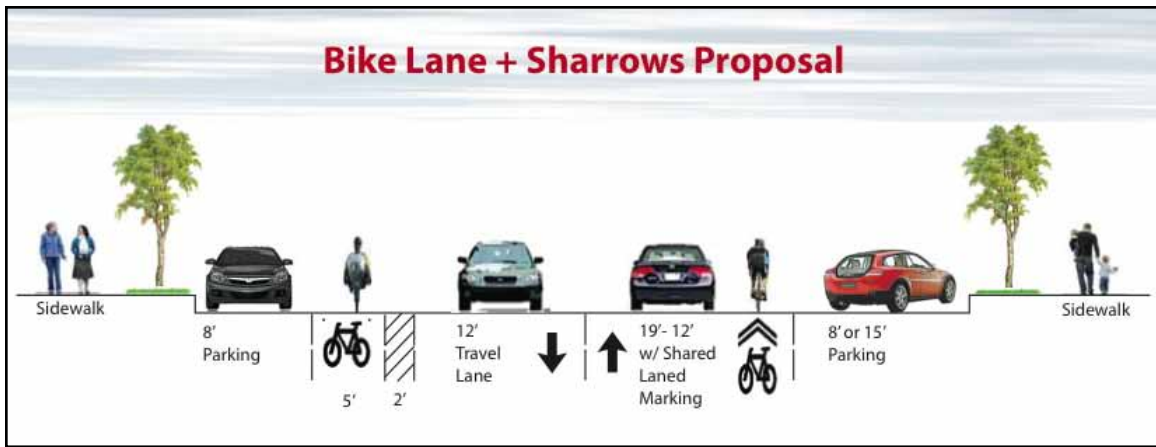
□ Challenges

- Necessitates the removal and repainting of the center line
- Additional treatments necessary at intersections
- Setting aside 15' for diagonal parking necessitates narrower than optimal vehicle lane and buffer zone

Option 2: Dedicated Bike Lane and Sharrows (*Recommended Option)

In an effort to accommodate diagonal parking on the northbound side of Larchmont Avenue, this option provides a southbound dedicated bike lane and sharrows placed strategically in the center of the travel lane along the northbound side of Larchmont Avenue. This option would provide a dedicated lane heading south to Manor Park and a road marking that alerts drivers to be mindful of cyclists heading north.

This option would not affect the diagonal parking and would alert cyclists and drivers alike that they are in a shared roadway. Bicyclists would have the benefit of a clearly delineated route but must be wary of vehicles pulling in and out of the diagonal parking spots.



□ Benefits

- Provide bicycle access heading south to Manor Park and a delineated route northbound towards the village shopping district

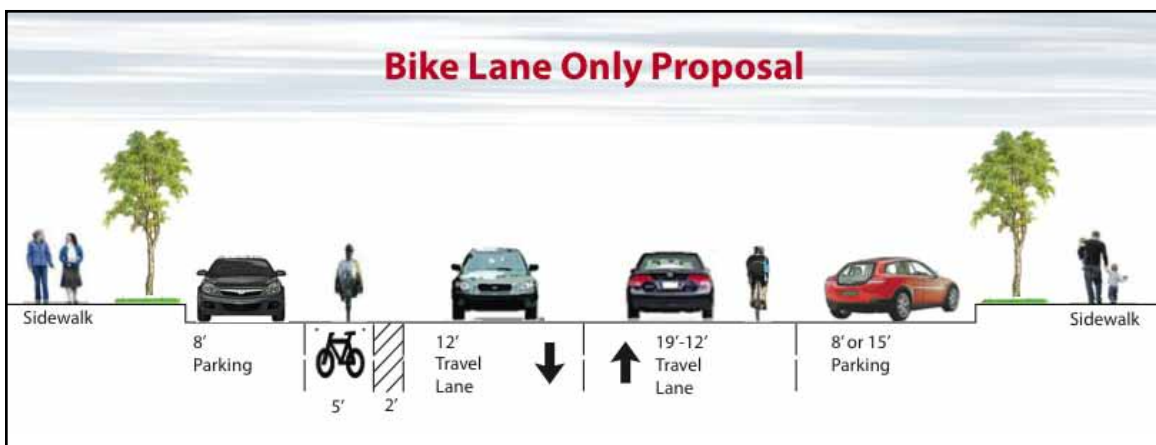
□ Challenges

- No protected lane for bicyclists

Option 3: Single Southbound Dedicated Bike Lane

One-Way Bike Lane on southbound side of Larchmont Avenue

Another alternative for accommodating the diagonal parking on the northbound side of Larchmont Avenue is to provide a southbound dedicated bike lane only.



□ Benefits

- Provide bicycle access heading south to Manor Park

□ Challenges

- No northbound route would be provided for bicyclists.

Chapter Five

5.0 Village of Mamaroneck

5.1 Existing Conditions

The Village of Mamaroneck is known as “The Friendly Village - A place for all to enjoy living in a community that welcomes different cultures and appreciates their differences.” The Village encompasses approximately 6.7 square miles and is bordered to the north by Harrison and by the Town of Mamaroneck to the south.

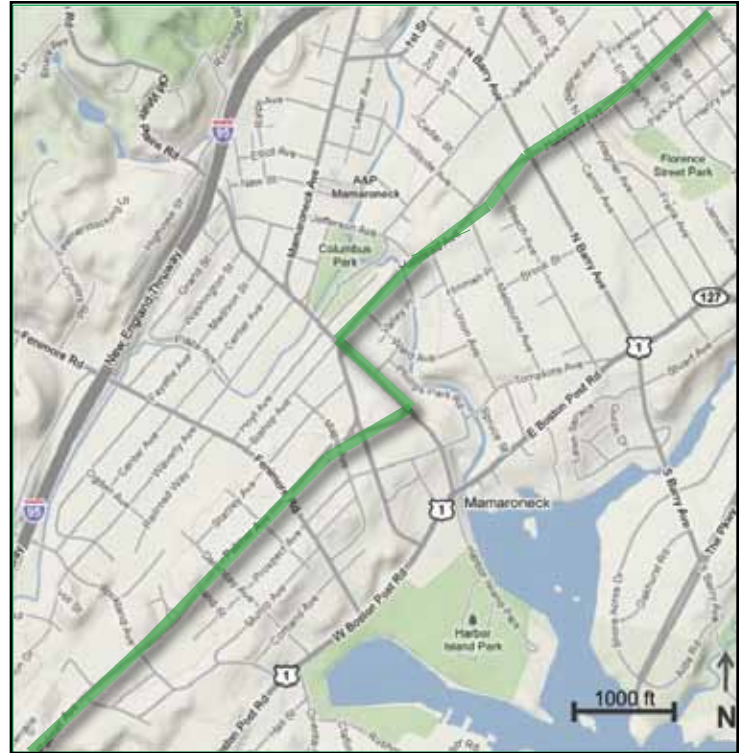
The Village is served by the Metro-North’s New Haven Line, and the community train station is located on Halstead Avenue near the Mamaroneck Avenue business district. Grand Central Terminal and Midtown Manhattan are approximately 50 minutes away by train. The Village is also served by Bee-Line Bus Route 61 that runs along Halstead and Palmer Avenue. In addition to these transportation assets

the Village of Mamaroneck has a beautiful waterfront, with Harbor Island Park only a 15-minute walk from the local train station. The area is predominantly residential but the Village does have a distinct central business district along Mamaroneck Ave that extends approximately from the Halstead and Mamaroneck intersection to the Eastern waterfront.

5.2 Stakeholder Participation

The Capstone Team had several meetings with Village of Mamaroneck community stakeholders. At the initial meeting held by the Rye YMCA on October 5, 2010 the Village of Mamaroneck was represented by Mr. Richard Slingerland, the Village Manager. At this meeting an overview of the capstone project was given along with an outline of the capstone project scope.

After a case study section of roadway was selected, a meeting was arranged with the Village Manager Richard Slingerland on December 3, 2010. Helen Gates of the YMCA, Dan Sarnoff Assistant Village Manager, Dan Gallagher Member of the YMCA Board, John Winters the Village of Mamaroneck Building Inspector, and Harry Hazelwood Traffic Commission board member were also in attendance. The purpose of this meeting was to gather additional information from the Village regarding their strategic goals for the road section they selected. Based on this feedback the Tool Kit was developed for the Village of Mamaroneck. A second meeting was arranged and held on February 16, 2011 to review the Tool Kit with Village Manager Richard Slingerland and other community stakeholders.



5.3 Goals

The major goal was to increase the economic vitality of the central business district by improving parking, wayfinding, and pedestrian and bicyclist safety. The road section chosen for the Village purposely parallels the East Coast Greenway.

Part of the aim of the Complete Street recommendations is to entice visiting East Coast Greenway bicyclists to frequent the Village's central business district establishments. A secondary but related goal was to improve access to the nearby Metro-North train station.

5.4 Case Study Area – Section 1, 2, & 3

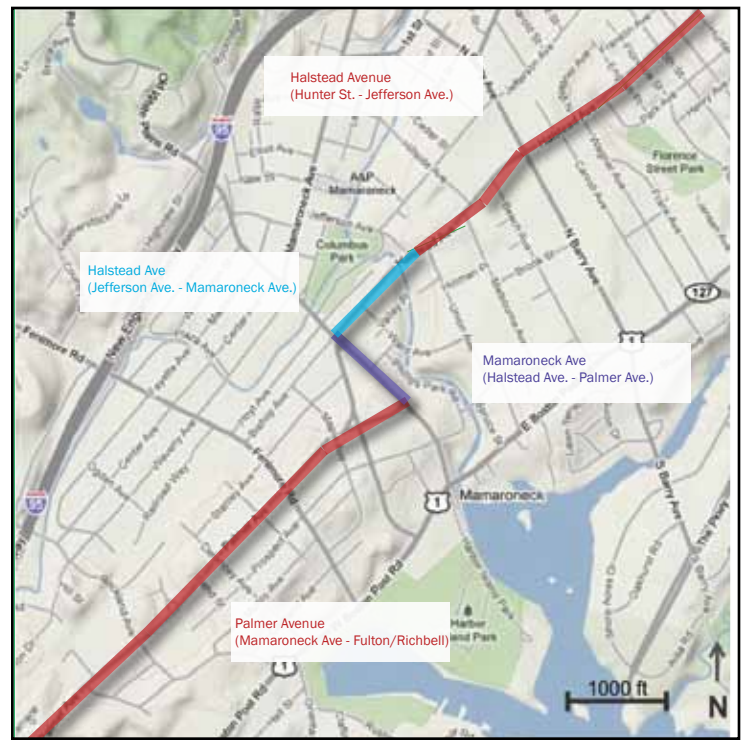
The case study area has three distinct sections and follows the proposed East Coast Greenway path. Heading south the route starts at Halstead and Hunter Street and continues along Halstead until it diverts east along Mamaroneck Avenue. The route continues along Mamaroneck Avenue and then heads south along Palmer until it reaches the Town of Mamaroneck border.

It is important to note that the Halstead/Mamaroneck Avenue intersection and Palmer Avenue are under the jurisdiction of Westchester County.

Current Conditions

Section 1 - Halstead (Hunter to Jefferson) and Palmer (Mamaroneck Ave to Fulton/Richbell)

Two road segments - Halstead Ave from Hunter Street to Jefferson and Palmer Ave from Mamaroneck Ave to Fulton/Richbell - have similar road characteristics and have been grouped together into section I. They are identified in red on the map at right. These two road sections are both approximately 40 feet in width. Both of these road segments are two lanes with some areas widening to three lanes to accommodate left turns. In addition these road segments have on-street parking located on both sides.



Existing conditions along Case Study route

The land use along both road sections is primarily residential housing with some commercial stores at major intersections. The land use along both road sections is primarily residential housing with some commercial stores at major intersections.

Section 2 - Halstead (Jefferson Street to Mamaroneck Avenue)

Section II, identified in blue, is Halstead Ave from Jefferson Street to Mamaroneck Ave. This section has several key features as it includes a major traffic intersection at Halstead and Mamaroneck Ave and the Metro-North Train station.

Section 3 - Mamaroneck Avenue (Halstead to Palmer)

Section III, identified in purple, runs along Mamaroneck Avenue from Halstead to Palmer. This is the main central business district of the Village of Mamaroneck. The road is approximately 70 feet in width with two lanes in both directions and angled parking on both sides. Parking in this section is metered and bicycle parking is provided at various points.

5.5 Recommendations

- ☐ Sharrows
- ☐ Defining On-Street Parking
- ☐ Curb Extensions
- ☐ *N. Barry and Halstead*
 - On-Street Crosswalk Sign
 - Curb Extensions
- ☐ Train Station Bicycle Parking
- ☐ Pedestrian walkway at train station
- ☐ Defined Lanes
- ☐ Wayfinding & Parking signage
- ☐ Reverse Angle Parking
- ☐ “Smart” Parking Meter Stations
- ☐ Peak Hour Parking



5.5.1 Section 1 - Halstead (Hunter to Jefferson) and Palmer (Mamaroneck Ave to Fulton/Richbell)

Sharrows

The main intervention recommendation is to paint sharrows on the Halstead and Palmer segments. Sharrows are simple road markings that encourage bicyclists to ride further from the parking lane and help eliminate “dooring” accidents, and remind motorists to watch for bicyclists.

It is important to note that sharrows are not a bike lane. Both road segments are too narrow to accommodate full bike lanes without removing parking spaces. In discussions with the Village it was agreed that parking spaces would be preserved. Sharrows are a good second choice where bike lanes are impractical.

Sharrows would be particularly beneficial as a safety measure on Halstead and Palmer because both segments have on street parking. On street parking increases the likelihood of “dooring” occurring as motorists open their door into the travel lane. Sharrows, because they are painted in the middle of the lane, influence bicyclists to ride in the center of the lane rather than dangerously close to parked

cars. In Austin, Texas a study showed sharrows influenced bicyclist to ride a safe 5 feet away from parked cars where they previously bicyclists rode a dangerous 1 foot way from parked cars.¹

The overall strategic aim would be to have the sharrows continue down Halstead and Palmer and direct bicyclists to the central business district shopping area along Mamaroneck Avenue, and act to visually show the East Coast Greenway route.

Striping On-Street Parking

Another recommendation that would complement sharrows is delineating parking areas with a simple painted line. It would not be necessary to individually mark each parking space. This would act to clarify where it is legal to park and also would visually narrow the width of the road, calming traffic by inducing drivers to drive the speed limit.

Curb Extensions

Another recommendation for this area is curb extensions at intersections with poor motorist sight lines. A major issue noted by the Village of Mamaroneck is that there have been several accidents because of visibility problems. Motorists have difficulty seeing oncoming traffic when pulling out from smaller feeder streets onto Halstead and Palmer. Curb extensions help alleviate this by improving sight lines. They allow motorists to better see pedestrians and oncoming traffic.

It is also a pedestrian safety improvement as it reduces the crossing distance at the intersection and makes pedestrians more visible to motorists as they are no longer blocked from view by parked cars.

The configuration of both Palmer and Halstead would allow the installation of Curb Extensions at most intersections as these streets have on street parking. Curb extensions would be beneficial at almost all intersections along Palmer and Halstead, but there are certain intersections that should be prioritized. In particular along Halstead, N. Barry was identified as a priority intersection.

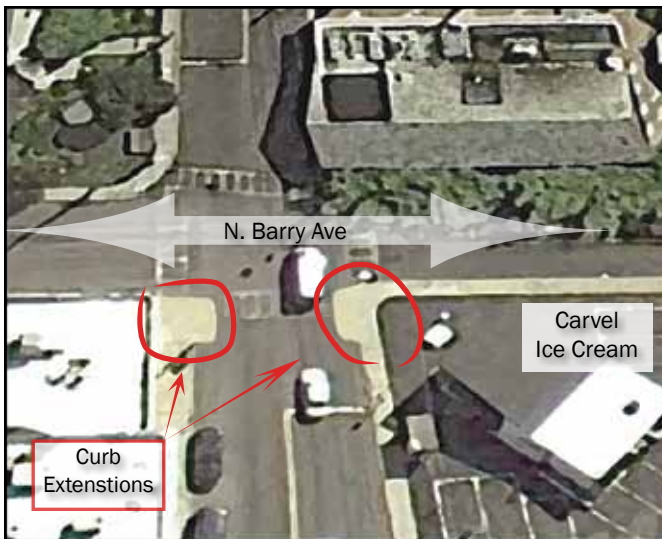


Example of Sharrows & Striped On-Street Parking



Priority Intersections for Curb Extensions

¹ "Experimental bicycle traffic devices appear to be working" by Shelton Green KVUE ABC News



Intersection of N. Barry and Halstead

This intersection was specifically identified because Carvel Ice Cream is located there and it therefore has significant pedestrian traffic. Groups of children tend to congregate at Carvel. The curbs on the south side could be extended. Curb extensions are impractical on the north side of the intersection because of the utility pole on the east side and the bus stop on the west side.

The intersection is also dangerous because there are no pedestrian crossing signals, which makes it difficult for pedestrians to tell if oncoming cars have a green or red light. Ideally pedestrian signals would be installed but there are other less costly measures that could be immediately applied.

A low cost safety improvement would be to install in-street crosswalk signs to alert motorists to pedestrians and emphasize that cars need to stop for pedestrians at the crosswalk. These devices have already been used successfully on Mamaroneck Avenue.

5.5.2 Section 2 - Halstead (Jefferson Street to Mamaroneck Ave)

The recommendations for Section 2 look to improve downtown wayfinding, better define the complex Halstead and Mamaroneck Ave intersection, and also improve access to the Metro North Train Station.

Wayfinding

A major objective is to improve wayfinding to and in the central business district. A central business district wayfinding signage system is recommended. A map listing downtown stores, parking, and major amenities would be placed in an attractive outdoor structure that would allow it to be replaced easily and inexpensively.

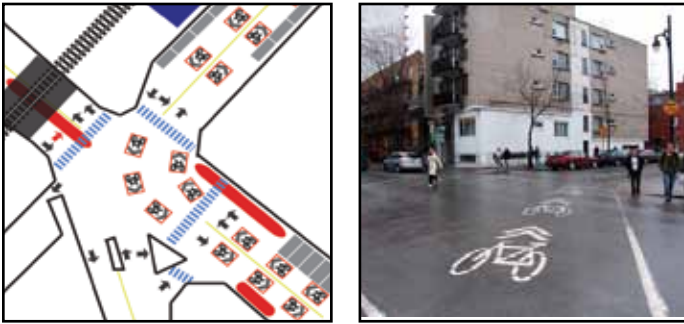
The wayfinding map would allow visitors to easily orient themselves and also identify commercial places of interest. The wayfinding signage could be designed to include a space to advertise new store openings and or festivals and events. These wayfinding signs would be ideally located at the Metro-North train station and at the beginning of the retail



district at the northeastern corner of Halstead and Mamaroneck, which has bicycle parking and an extended curb.

Sharrows

Sharrows would be extended from Halstead to direct bicycles down Mamaroneck Ave and through the central business district. This would help clarify the intersection for bicycles making it clear how to turn and what lane to stay in.



Recommended Sharrow Route at Halstead and Mamaroneck



Metro North Station Exit

Parking spaces directly about the Metro-North station exit along Halstead Ave. This creates an unsafe and unpleasant pedestrian experience departing the Metro-North station. While a mid-block crossing directing pedestrians to the nearest crosswalk on the opposite side of Halstead was considered, mid-block crossings are not recommended by state road guidelines.²

Currently the parking spaces that abut the wall supporting the Metro-North station are separated from the travel lane of Halstead Ave by approximately 3 feet of undefined space. An alternative suggestion is to move out the parking spaces approximately three feet to create a small pedestrian walkway between the wall and parked cars.

This could be a concrete walkway or done more inexpensively with paint. As there are parking meters currently installed along the wall of the Metro-North station, a painted walkway is recommended until the meters require replacement, at which time a capital improvement of a permanent sidewalk may be feasible.



² New York State Department of Transportation, "Highway Design Manual," New York State, 2011.



Bicycle Parking

Another recommendation is to improve the bicycle parking at the Metro-North station. The parking is frequently at or near capacity. Improving bicycle parking at the train station would involve working with Metro-North.

Halstead/Mamaroneck Ave Intersections

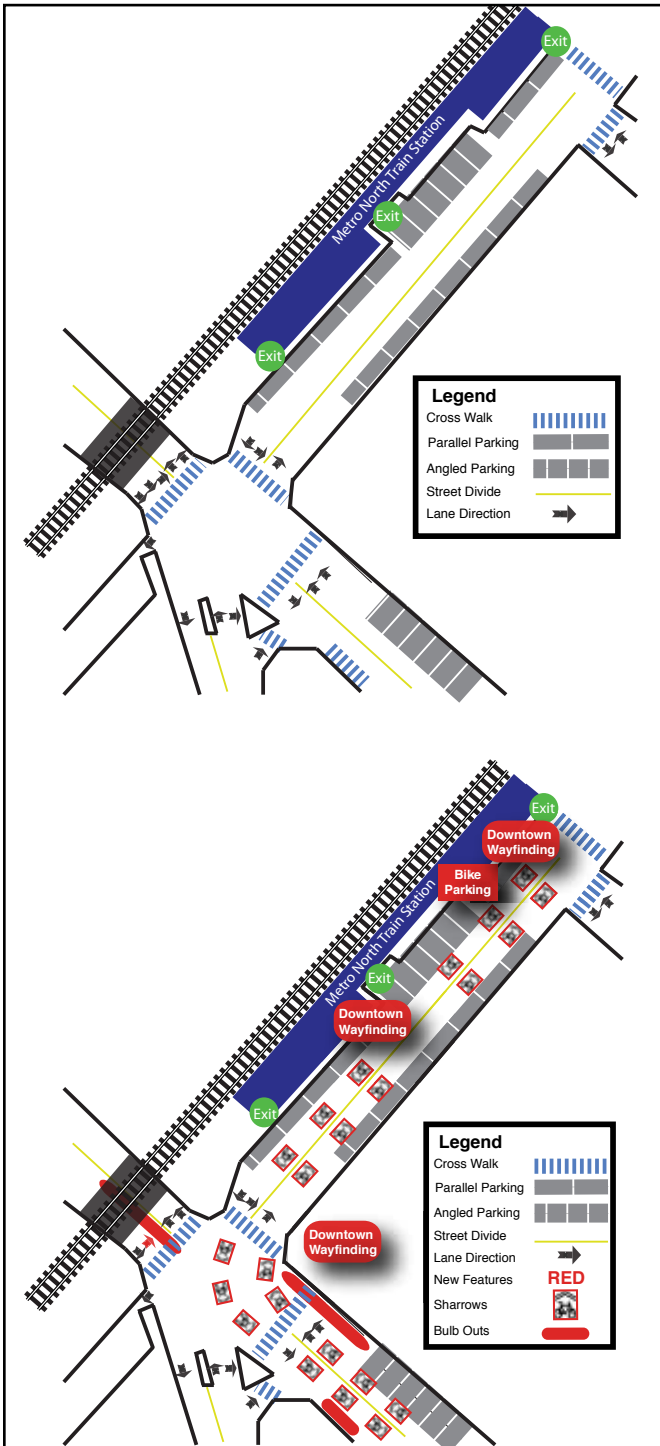
Curb extensions and medians are recommended to help better define traffic lanes. The objective would be to improve traffic flow by making lanes clearer. The improvements would eliminate the lane reduction transitions that are required of motorists as they cross the intersection.

The final implementation of these improvements would require a more detailed consultant traffic survey, but initial suggestions are listed here.

On Mamaroneck Avenue west of Halstead, a median could be added. Currently there are two lanes going eastbound and one left turn lane as well as two westbound lanes. The recommendation is to have one dedicated eastbound lane and one left turn lane. The two westbound lanes would remain. This would improve traffic flow as currently cars are forced to quickly transition from two to one lane when Halstead Avenue is crossed. In addition the median would make it safer for pedestrians to cross the intersection.

A curb extension is suggested on the southeast corner of Halstead and Mamaroneck Avenue. Currently this space is not usable for cars or pedestrians. Cars cannot use this space because the lane immediately ends after 8 feet where the angled parking for the central business district begins. This curb extension could be created with concrete or paint and movable planters.

On the northeast corner of Halstead and Mamaroneck Avenue, a painted bus box near the bus stop is recommended. This would help define the lanes by bringing the 2.5 lanes down to 2 lanes and create a clear space for the bus to pull over.



5.5.3 Section 3 - Mamaroneck Avenue (Halstead to Palmer)

Wayfinding Signage & Sharrows

Wayfinding will be a major component in Section III. Strategically placed wayfinding maps will direct customers to stores. The sharrow route will direct bikers coming from Halstead and Palmer to the central business district. The sharrows would induce bicyclists to ride in the center of the lane at a safe distance from the cars pulling out from parking spaces.

The sharrows would be a good compliment to the bicycling parking that the Village has already installed in the central business district.



Sharrows to Improve Safety in the Central Business District, Mamaroneck Ave

Reverse Angle Parking

Another safety improvement would be to implement reverse angle parking. This dramatically increases safety as motorists are no longer blindly backing out into oncoming traffic. This would have a neutral effect on street congestion, as although it would take longer to pull into the space this is offset by the fact that it is easier to pull out of the parking space.

Peak Hour Parking

As a long term goal, peak hour parking could be implemented. Peak hour parking is when parking is charged at a higher rate during peak usage and pricing is aligned to match demand. This improves space turnover and reduces needless congestion from cars circling for spaces. This improves efficiency as the same amount of parking spaces are used by more shoppers. Most major studies indicate that the peak parking rate should be set to at a level that will achieve 85% parking occupancy.³ This level of occupancy ensures there are available spaces for shoppers so they can conveniently find parking without having to waste time searching for spaces.



This would be a long term improvement and would require the installation of solar powered “smart” parking meters. Electronic meters would also allow payment by multiple means (credit, debit, and cash) making downtown shopping more convenient. These “smart” parking meters serve approximately 9 spaces and work by dispensing tickets that are displayed in car windows.⁴

³ Michael Kodransky & Gabrielle Hermann, “Europe’s Parking U Turn: From Accommodation to Regulation,” ITDP, 2011.

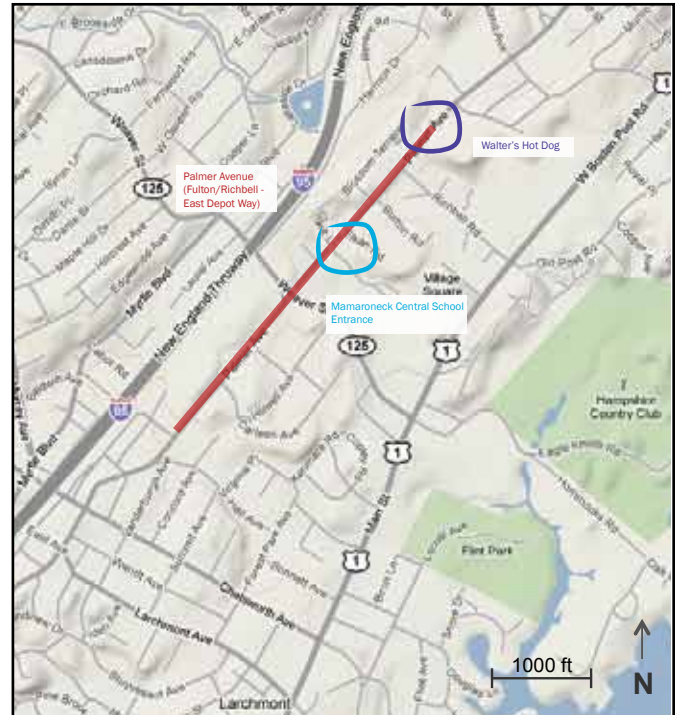
⁴ Ransford McCourt, “Smart Parking Meters Take Over the West,” DKS Associates, n.d.

Chapter Six

6.0 Town of Mamaroneck

6.1 Existing Conditions

The Town of Mamaroneck, founded in 1661, is one of the Westchester's first settlements. It has a beautiful coastal area and bucolic residential streets. The Town includes the entire Village of Larchmont (one square mile), an unincorporated area (5.7 square miles which is not part of either village), and the part of the Village of Mamaroneck west of the Mamaroneck River bordering Rye Neck (2.3 square miles). Both Villages are self-governing with the Town of Mamaroneck providing direct services to the unincorporated area and recreation, property assessment services, and election supervision to the Villages. For purposes of this case study the label Town of Mamaroneck refers to the unincorporated area located between the Village of Mamaroneck and the Village of Larchmont.



Unlike the other communities in the Sound Shore area, there is not a train station directly serving the Town of Mamaroneck. The Town is served by Bee-Line Bus Route 61 that runs along Palmer Avenue. The majority of the town is primarily residential; there is no defined shopping district. Some commercial stores are located along Boston Post Road.

6.2 Stakeholder Participation

The Town of Mamaroneck was represented by Town Council Member Nancy Seligson. During the initial conference call with Nancy Seligson the overall project was discussed and specific information was gathered on Palmer Avenue, which was selected as the case study area.

On March 3, 2011, the Capstone group presented the project to the Town Council. Gregg Howells, the Executive Director of the Rye YMCA, introduced the Capstone group and Scott Johnson and Paul Chenard answered questions the Town had regarding the project and explained several possible recommendations for Palmer Avenue. In addition to the Town Council, Helen Gates of the YMCA and members of the public were present at this presentation.

The Capstone group also gave a presentation to the Town Traffic committee on March 9, 2011. Specific recommendations at intersections were discussed as well as the design feasibility of specific safety interventions. In addition to the traffic committee, Nancy Seligson and Helen Gates attended the meeting.

6.3 Goals

The major goal for the Town of Mamaroneck is to improve safety for pedestrians and bicycles without infringing on the traffic flow of the street. A secondary goal is to add features that compliment the proposed East Coast Greenway route.

6.4 Case Study Area – Palmer Avenue

The case study area focused on the section of Palmer Avenue located in the Town of Mamaroneck, beginning between Fulton and Richbell Road and heading south ending at Depot Road, near the border with the Village of Larchmont.

This parallels the proposed East Coast Greenway path. It is important to note the East Coast Greenway section for the Town of Mamaroneck is still in the planning stages and has not been officially approved.

Improving this road segment would help improve connectivity with both the Villages of Mamaroneck and Larchmont. The entrance to Mamaroneck Central School on Palmer Avenue is specifically identified and discussed because of safety concerns due to pedestrian traffic. The location around Walter's Hot Dog Stand, a food institution in the area, is also specifically identified in the report.

Current Conditions

Palmer Avenue (Fulton/Richbell to East Depot Way)

Palmer Avenue is approximately 40 feet in width with two lanes and street parking on both sides. The land use along both road sections is mainly residential housing.

Mamaroneck Central School Entrance

This school entrance is located on Palmer Avenue at Cargil Park Road. There currently are two crosswalks: one positioned east to west crossing Palmer Avenue and another positioned north to south across Cargil Park Road. Sidewalks only exist on the east side of Palmer at this intersection. The Palmer crosswalk is problematic due to the street configuration; the crosswalk does not align with Garit Lane on the west side of Palmer.

Walter's Hot Dog Stand

The famous Walters' Hot Dog Stand is a culinary institution in the area. It has been voted the number one Hot dog in America by Gourmet Magazine, and it has been featured in the New York Times, and CBS News Sunday Morning.⁵ The building faces the street and is located on the west side of Palmer Avenue.



Palmer Avenue



Mamaroneck Central School Entrance



Walter's Hot Dog Stand

⁵ Critical Acclaim, April 3, 2011, <<http://www.waltershotdogs.com>>

6.5 Recommendations

- Sharrows
- Curb Extensions

Mamaroneck Central School - Palmer Avenue Entrance

- Widen Crosswalk to align with Garit
- Curb Extension on north east corner

Walter's Hog Dog Stand

- Bicycle Parking
- Pop up cafe



Sharrows & Striped On Street Parking

Sharrows

The main intervention recommendation is to paint sharrows on Palmer Avenue. Sharrows would be particularly beneficial as a safety measure on Palmer because of the on-street parking along the avenue. Sharrows can aid in eliminating dooring accidents from occurring, because they are painted in the middle of the lane influencing bicyclists to ride in the center of the lane rather than dangerously close to parked cars.

The overall strategic aim would be to have the sharrows continue down Palmer and connect to the sharrow path that continues through the Village of Mamaroneck. This would create a continuous path with numerous attractive destinations such as the shopping district on Mamaroneck Avenue and Harbor Island Park.

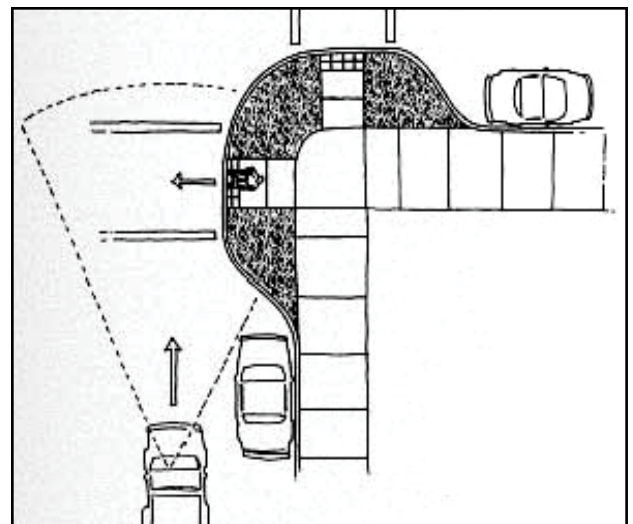
Striped On-Street Parking

A recommendation that would complement the sharrow symbols is to delineate the parking lane with a simple painted line between the travel and on-street parking lanes. It would not be necessary to mark each individual parking space. This would act to clarify where it is legal to park and also would visually narrow the width of the road, inducing motorists to drive the speed limit on this primarily residential road.

Curb Extensions

Another recommendation is curb extensions at intersections with poor motorist sight lines. Motorists have difficulty seeing oncoming traffic when pulling out from smaller feeder streets onto Palmer. Curb extensions help alleviate this by improving sight lines. It is also a pedestrian safety improvement as it reduces the crossing distance at the intersection and makes pedestrians more visible to motorists as they are no longer blocked from view by parked cars.

The configuration of Palmer would allow the installation of curb extensions at most intersections



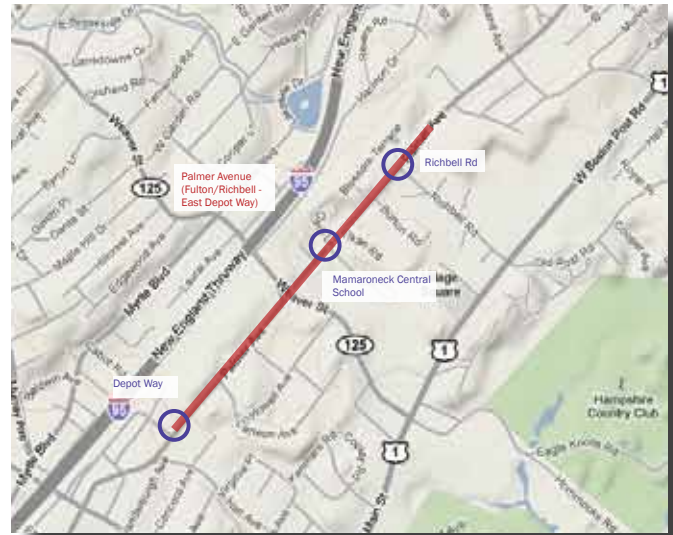
due to the on-street parking lanes. Curb extensions would be beneficial at almost all intersections along Palmer. In addition to Mamaroneck Central School, curb extensions should be considered for Richbell and Depot Road on the west side. This would be particularly beneficial along these road sections as they are primarily residential in character and there is the possibility of children crossing the street.

Bioswales

Bioswales can be a useful feature to add to curb extensions in areas with poor storm water drainage. Bioswales are purposefully designed plantings and drainage systems that improve storm-water absorbency. The plants absorb water and direct it into the soil through the natural designed drainage system. These devices have been used successfully in places like Portland, Oregon and are substantially cheaper than implementing a traditional storm-water system.⁶

Entrance to Mamaroneck Central School

The intersection to the school is currently an awkward crossing as the crosswalk leads to a vegetated area on the other side of the street. To improve the safety of the intersection it would be advisable to extend the curb at the Northeast corner of the school entrance. This would eliminate the ability of cars to illegally park at the corner and thus would keep sight lines clear for motorists. This design feature would make it easier for motorists on Palmer and Cargil Park Road to see pedestrians. To compliment this feature the crosswalk could be increased in width to better align with Garit Lane on the west side of Palmer. Safety could be further improved with an on-street crosswalk sign which would dramatically increase the visibility of the intersection and remind motorists to stop at the crosswalk.



Priority Intersections for Curb Extensions



Curb Extension combined with a Bioswale



Curb Extension & Expanded Crosswalk at the Mamaroneck Central School Entrance on Palmer

⁶ Portland Bureau of Environmental Services, *A Sustainable Approach to Stormwater Management*, 3 April 2011 <<http://www.portlandonline.com/bes>>.

Walter's Hot Dog Stand

The recommendation for Walter's Hot Dog Stand involves working with the owner to provide public bike parking near the stand. This will promote biking by providing a secure location for patrons to park their bikes. This would help create a destination for local recreational bicyclists and be a simple yet effective business improvement.

The bike rack could also serve as public art. For example it could be in the shape of a hot dog, similar in concept to the artistic bike racks done by David Byrne in New York City. These bike racks were simple outlines of objects such as a shoe bike rack that was created for the fashion district.⁷

Pop-up Café

The Town of Mamaroneck could explore the potential of pop-up cafés via public-private partnership with local restaurants. Pop-up cafés are temporary structures, set up in the summer and maintained by agreement between municipalities and business owners. On-street dining areas may require additional permitting and should be implemented according to local regulations.

Recent examples have been successful in California and Canada. In downtown New York where Fika Café and Bombay restaurant saw 14 percent increase in business.⁸ Restaurants typically reach an agreement with the municipality to maintain the café and the terms of the agreement require the space to be open to the public and not just for business patrons.



Creative Bike Parking



A Pop-up café in the summer of 2010, Pearl Street, New York City

⁷ Ariel Kaminer, "David Byrne, Cultural Omnivore, Raises Cycling Rack to an Art Form," *New York Times* 8 August 2008.

⁸ Branden Klayko, *New York Expands Pop-Up Cafe Program in 2011*, 30 November 2010, <<http://blog.archpaper.com/wordpress/archives/10495>>.

Chapter Seven

7.0 City of Rye

7.1 Existing Conditions

The City of Rye is a beautiful suburban community of 20 square miles, only 5.8 of which are land. It includes the landmark designated Playland amusement park. The city is approximately 45 minutes by train to Midtown Manhattan via Metro-North. In addition, the Westchester County Bee-Line bus service operates buses in the community with bus line 76 traveling down portions of Forest Avenue.

The City of Rye has previously implemented Complete Streets interventions on the Boston Post Road with a road-diet. This project changed the road configuration from four narrow 9' lanes to two standard width lanes, with a painted center median and painted shoulder lines. At times the median gives way to left turn lanes, providing safer turning conditions. The project has been a great success, encouraging safer driving conditions and allowing for more recreational use.



7.2 Stakeholder Participation

At the initial meeting on December 6, 2010, Rye representatives discussed the case study site of Forest Avenue. An additional meeting was held in February 2011 to gather feedback in regards to the Tool Kit. Members of the Capstone team also attended meetings of the Rye Shared Roadways Committee in December, January, and February.

Throughout this process the Capstone team worked closely with Rye City Planner Christian Miller, Rye City Manager Scott Pickup, as well as Steve Cadenhead, Maureen Gomez, and Dinah Howland from the Rye Shared Roadways Committee. In addition, Helen Gates, the Director of Marketing and Strategic Initiatives, and Gregg Howells, Executive Director, of the Rye YMCA were consulted.

7.3 Goals

The goal outlined by the community stakeholders was to make Forest Avenue safer for all roadway users, to calm traffic on Forest Avenue, and highlight the presence and use of Forest Avenue by non-motor vehicle users, such as walkers, runners, and cyclists.

7.4 Case Study of Area

Forest Avenue is 2.53 miles long running north to south from Grace Church Street to Van Wagenen Avenue, and is abutted by large single-family homes. Along Forest Avenue are feeder streets, two of which lead to access points for schools. These are Hewlett Avenue, leading to Milton Middle School and Eve

Lane leading to Midland Elementary School. As a result of parents picking up and dropping off their children, traffic flow increases at the start and end of the school day.

Adjacent to Forest Avenue is the Playland amusement park. The amusement park is active during the summer season and is accessible by Playland Parkway that crosses Forest Avenue on its way to Interstate 95. During the summer when Playland is in operation, pedestrian and vehicle traffic increase on Forest Avenue. Just south of Playland Parkway is Town Park, which is a Westchester County park in the City of Rye that attracts many users.



Current Conditions

Forest Avenue is a very narrow roadway, at 20' to 30'. Currently Forest Avenue is used for recreational walking, running, cycling, as well as daily vehicle travel. Along the northern portion of Forest Avenue there are no sidewalks, while sidewalks are present on one or both sides of the road from Apawamis Avenue and heading south to Hewlett Avenue.

7.5 Recommendations

- Bicycle sharrows and painted pedestrian markings
- Signage alerting drivers to be aware of cyclist and pedestrians
- Pave soft shoulders where space is available and maintain travel lane at 10'
- Raised crosswalks at Eve Lane and Hewlett Avenue
- Institute a shared streets educational campaign

Bicycle Sharrows and Pedestrian Markings

To protect walkers, runners, and cyclists, painted roadway markings such as bicycle sharrows and pedestrian symbols can be utilized to make drivers aware of non-motor vehicle users.

Where sidewalks are present, we recommend painting sharrows on the roadway, and directing pedestrians to utilize sidewalks. Where sidewalks are not present, we recommend painting both a pedestrian symbol and a sharrow to alert motorists to both types of users. The symbols should be placed appropriately to indicate where each user should be on the roadway; pedestrians should be near the shoulder while bicyclists should utilize the center of the travel lane.





Road Markings and Signage

Northern Section (purple): no sidewalks or shoulder present

Recommendation: road markings and signage should remind all users of pedestrians and cyclists in the roadway

Southern Section (yellow): sidewalks present on one or both sides

Recommendation: road markings and signage should direct cyclists to utilize the travel lane and pedestrians to utilize sidewalks

Road Signage

To complement painted roadway markings, road signage should be installed along Forest Avenue reminding drivers of the presence of pedestrians and cyclists and that they must share the road with them. This signage should indicate where pedestrians may be present on the travel lane and where pedestrians should utilize the sidewalks.

Paved Shoulder

Where room is available the soft shoulder should be paved, allowing for a painted shoulder to be installed and driving lane maintained at 10'. This would provide some space for non-motorist users to safely travel on the road. The width would not be significant enough to be a sidewalk or bike lane.

Paving this area would necessitate removing the rocks that are currently placed along the soft shoulder by homeowners. While this area appears to be a continuation of private lawn space in many instances, it is actually part of the public right-of-way that extends beyond the edge of the current paved surface.

In certain areas along Forest Avenue, paving the shoulder would not be feasible due to obstruc-



Current Condition: Rocks placed on soft shoulder



After: Paved shoulder with rocks removed

tions immediately abutting the roadway, such as utility poles and retention walls. In areas where paving is not feasible but white rocks are present in the public right-of-way, an alternative recommendation is to simply remove the rocks to allow pedestrians and runners a less obstructed refuge area.

However, south of Hewlett Avenue is conducive to being paved, with a soft shoulder containing few trees and utility poles to obstruct the paving process. This area is especially appropriate for paving because it is the narrowest stretch of Forest Avenue.

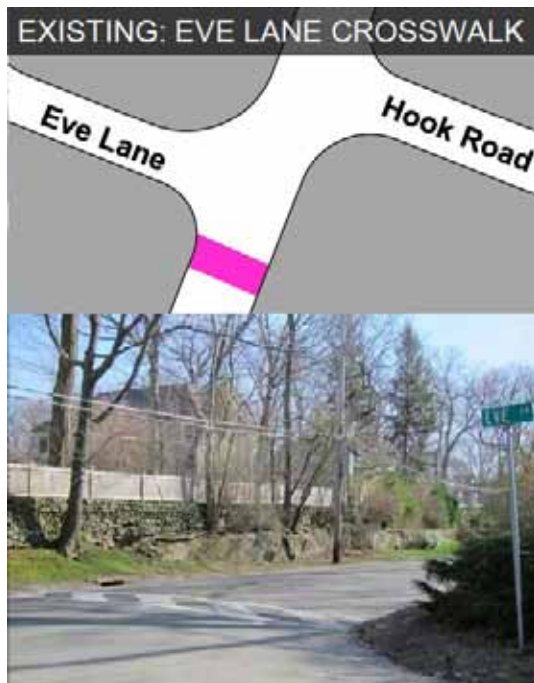
Raised Crosswalks

To protect the safety of school children walking to and from the schools located near Forest Avenue, we recommend installing raised crosswalks at the locations where there are currently painted crosswalks across Forest Avenue, at Eve Lane and Hewlett Avenue.

These raised crosswalks would provide an additional measure of safety for pedestrians crossing Forest Avenue. First, raised crosswalks provide an element in the roadway that motorists must be mindful of and reduce their speed to traverse. Second, it makes the crosswalk more prominent and a larger feature in the roadway. Third, it elevates school children and provides a safer crossing for pedestrians. It may also encourage pedestrians to cross at this marked point instead of crossing at other points along the road where they are less protected and expected by motorists.

Eve Lane Crossing

We recommend the realignment of the crosswalk at Eve Lane. As seen in the diagram at right, the current crosswalk is south of Eve Lane. We recommend aligning it between Hook Road and Eve Lane to better emphasize this intersection and to direct pedestrians coming from all directions to utilize the raised crosswalk.



Shared Streets Education Campaign

Along with these design changes to Forest Avenue, the City of Rye should embark on a driver and non-motorist education campaign to promote the concept of shared streets among its residents.



SECTION IV

Implementation

Strategy

Chapter Eight

8.0 Implementation Strategy

This chapter and the following two outline three key elements to implementing Complete Streets in the Sound Shore community: the process of implementing policy, funding approach and sources, and implementation recommendations specific to the Sound Shore communities.

8.1 Implementing Policy

As discussed in Chapter 2, Complete Streets policies have been implemented around the country at the state, county, and city levels. Policies range from simple resolutions to design manuals and specific legislation. At whatever level the community decides to enact policy, implementation requires a process for achieving desired outcomes. We recommend the following process for forming a Complete Streets policy for each of the participating Sound Shore communities.

A. State a vision

During this first phase, each community must decide what it is they hope to achieve with policy. This Capstone report provides a framework with which to begin that process. Within this process, each community has identified the main goals they hope to achieve, and whether it is accommodating bicycles or providing safer routes to schools. Along with this is identifying users that will benefit from the policy. These users can be selected by mode type or characteristics (e.g. bicyclist, elderly). To further narrow the scope, determining the extent of policy coverage is necessary. This includes defining included roadway types (e.g. residential roadways, commercial strips) and target locations (e.g. near schools, commercial corridors). At this stage it is also imperative to begin to build political, agency, and public buy in the project.

B. Create a context

Creating a context requires creating a scope for the policy by defining the parameters within which the policy will apply. Roadways can be classified according to use, conditions, adjacencies, and other characteristics. To further refine the scope of the policy it should be made clear what issues will be specifically addressed. These issues will follow closely from the vision stated in Step A.

C. Create a policy

During Step C the community must decide how to implement the policy – who to involve and exactly how to achieve the goals set in Steps A and B with policy language. It is critical to review what agencies and departments will be most affected and include them in development of the policy to the extent practicable. A detailed timeline will be necessary to coordinate the elements of policy to be implemented. For example, will a resolution be followed by changes to the street design manual? In writing the policy, attention must also be paid to when the policy will be applied, defining what types of projects require implementation of Complete Streets elements.

D. Implement policy

Implementing the policy is the final step, and includes creating the policy itself. Using all the elements determined in the process thus far, a community can craft a policy to reflect the goals, incorporate the needs of identified users, and define the applicability of the policy. Continued outreach will be necessary to ensure political, agency, and public buy-in for the policy and facilitate its implementation.

Chapter Nine

9.0 Funding

Securing the necessary funding is one of the biggest hurdles to implementing any capital improvement project. When resources are scarce, every effort should be made to ensure each investment has the highest possible return. Incorporating Complete Streets objectives does not necessarily impose a significant additional cost at the construction phase of a project, especially when the cost is spread out over the useful life of the asset or incorporated into necessary improvements from the beginning. For example, when striping a road, the cost difference between a conventional design and a Complete Streets layout may be negligible. Below is a table of sample costs for some Complete Streets elements.

Road Space Feature	Cost	Per
Sharrows	250	per Symbol
Striping On-Street Parking	1000	per Mile
Bicycle Lane	5000	per Mile
Crosswalk	300-1000	per Crosswalk
Raised Crosswalk	15000	variable depending on length
Mid-Street Crosswalk Sign	450	per Sign
Sidewalk Space Feature	Cost	Per
Curb Extension	5000	per Curb
Bicycle Rack	300	per Rack
Smart Parking Meter	680	per Space
Wayfinding Map Kiosk	4000	per Kiosk

Source:

www.walkinginfo.org

Michigan Street Wayfinding Signs Conceptual Approach JJR LLC, Jan 2008, www.grand-rapids.mi.us

9.1 Funding Approach

When considering how to fund a Complete Streets intervention or program, there are several key approaches to keep in mind. Below are three such approaches, followed by specific funding sources to be considered.

Value the Invaluable

When making investment decisions, local governments and organizations often use cost-benefit analysis to determine the economic effectiveness of a project. However, a traditional cost-benefit analysis can be difficult to apply to a Complete Streets project because many of the expected benefits are hard to monetize, such as increased safety or public health. For example, a dedicated bike lane can provide safety for riders, promote bicycling and lead to an increase in the share of commuters on bikes instead of cars, and improve health for riders. Further, if that lane were paved with a permeable material, it could improve stormwater management. All of these benefits are difficult to monetize, but are real benefits the community will accrue.

While many benefits are hard to put into monetary terms, some studies have been able to show the direct correlation between Complete Street objectives and economic benefits. For instance, a study conducted for CEOs for Cities by Joe Cortright found a positive correlation between walkability and home values in metropolitan areas of different sizes across the country.¹

Start Small

Generating public support and interest around Complete Streets can be one of the biggest challenges to implementing a project. Stakeholders are often apprehensive of change and have a misunderstanding of Complete Streets objectives. To build public support and trust, start with small-scale, easy-to-implement interventions. Once these smaller initiatives are successfully implemented and shown to provide the expected community benefits, support for the higher-impact, more costly projects will be easier to obtain.

Prepare Plans

When applying for funding of any kind, well-planned project proposals with detailed estimates and designs are essential. Having well developed plans prepared will expedite the grant application process as they become available. This is especially important because federally funded projects are expected to be carried out within the project scope and cost estimate that was approved in the application process. While the recommendations made in this report can serve as a basis for future projects in the participating Sound Shore communities, further study and planning will need to be undertaken before these projects are ready to be funded.

9.2 Federal Programs

The Federal government's Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU), which was passed in August 2005, represents the largest surface transportation investment in the history of the United States. Over the past five years, SAFETEA-LU has funded over \$244 billion worth of projects which address many of the pressing challenges of today's transportation systems such as improving safety, reducing traffic congestion, increasing intermodal connectivity, and limiting environmental impacts.² SAFETEA-LU effectively awarded state and local decision makers the power and flexibility to implement transportation solutions tailored to meet the needs of their communities. The specific SAFETEA-LU programs that have been used in suburban areas to support to Complete Streets initiatives are described in below.

¹ http://blog.walkscore.com/wp-content/uploads/2009/08/WalkingTheWalk_CEOsforCities.pdf

² <http://www.fhwa.dot.gov/safetealu/summary.htm>

Safe Routes to School (SRTS)

The purpose of the Safe Routes to School (SRTS) program is to enable and encourage children to walk and bicycle to school and facilitate the planning and implementation of projects that increase safety, reduce traffic and fuel consumption, and reduce air pollution within a 2 mile radius of primary and middle schools.

Funds are allocated to each state relative to their share of primary and middle school enrollment with no state receiving



less than \$1 million. Between 10% and 30% of each state's SRTS allotment must be used to finance non-infrastructure related activities such as educational and promotional campaigns. Eligible SRTS projects include travel route studies, sidewalk improvements, traffic calming or speed reduction interventions, pedestrian and/or bicycle crossing improvements, and bicycle parking facilities.

On April 19, 2011 the National Center for Safe Routes to School announced the availability of SRTS mini-grants of \$1,000 for use in Fall 2011. Applications are due by May 18. For more information, visit: <http://minigrants.saferoutesinfo>.

Transportation Enhancements Program (TEP)

Transportation Enhancement Program (TEP) funds are a set-aside account for 10% of all the Surface Transportation Program funds received by each state. TEP is a reimbursement program, not a grant program. A single governmental agency must sponsor the project and enter into a legal agreement with the state Department of Transportation. The sponsor is responsible for paying all the project expenses before receiving reimbursement. While TEP can be used to fund up to 80% of a project, at least 20% of the funds must be provided by a non-federal source. All proposed projects must have a minimum estimated cost of \$200,000 and the federal share cannot exceed \$2.5 million.

A wide range of surface transportation projects that include a public use element are eligible to apply, including construction of bicycle and pedestrian infrastructure as well as educational programs to encourage safe biking and walking practices. TEP funds can be used for planning, design, environmental studies, property acquisition, construction, and inspection costs associated with the project.

Climate Mitigation and Air Quality Program (CMAQ)

Funds available through the Climate Mitigation and Air Quality (CMAQ) program are to be used for cost-effective emission reduction and congestion mitigation activities that provide air quality benefits. States are apportioned CMAQ funds according a formula based on population and severity of pollution in ozone and carbon monoxide areas.

While the CMAQ program is generally more applicable to urbanized areas where traffic congestion is more prevalent and public transit is more abundant, some projects in suburban or rural areas can still be supported by the program. Some cities have funded significant non-motorized infrastructure using CMAQ funds, for example planted medians and bioswales, when the cost of the infrastructure was shown to be relatively inexpensive in comparison to the air quality benefits expected to be realized. CMAQ funds have been used in Westchester and Rockland counties to support traffic signal projects aimed at reducing traffic congestion.

As of March 2011, SAFETEA-LU expired and Congress is currently working on passing new transportation legislation. At this time, it is unknown what level of federal funding will be made available to state and local municipalities to carry out transportation projects in the near future. However, it is likely some, if not all, of these programs will be extended.

The Federal legislation which authorizes spending nationally for transportation improvements requires metropolitan regions to follow a comprehensive planning process in order to obtain Federal funding. Many of these Federal funding opportunities are funneled through the State Department of Transportation (DOT) and the regional Municipal Planning Organization (MPO). New York Metropolitan Transportation Council (NYMTC) is the MPO which serves Westchester County. NYMTC, in conjunction with the New York State Department of Transportation (NYSDOT), is responsible for developing the Transportation Improvement Program (TIP) which outlines the transportation improvement projects in the region planned over a five year period. When Federal funding becomes available, local agencies and organizations should follow the procedures of NYSDOT to apply.

9.3 Private Grants

Private grants are usually administered by not-for-profit organizations and foundations. Most of private funding sources tend to support pedestrian and bicycle improvements, advocacy, and education programs. Private grant programs are available, and though sources of funds change over time, we have identified two programs that have provided Complete Streets funding in the past and are still available.

Advocacy Advance

Advocacy Advance is a partnership between the Alliance for Biking & Walking and the League of American Bicyclists which aims to boost bicycle and pedestrian advocacy on the state and local levels. Since 2009, they have awarded over \$500,000 in direct grants, scholarships, and technical assistance to promote the bicycle and pedestrian movement across the country. Advocacy Advance Grants enable state and local bicycle and pedestrian advocacy organizations to develop, transform, and provide innovative strategies in their communities. In the 2011 grant cycle, another \$125,000 is available to member organizations of the Alliance for Biking & Walking and League of American Bicyclists under three grant programs: Model Grants, Rapid Response Grants, and Capacity Building Grants.

To learn more visit: www.advocacyadvance.org/grants.

Bikes Belong Coalition

Bikes Belong formed in 1999 as a national coalition of bike retailers and suppliers with the mission to get more people riding bikes more often. Since forming, the organization has awarded 215 grants across the United States, investing \$1.7 million in fundable community bicycling projects such as building paved bike lanes, paths, parks, as well as large-scale bicycle advocacy initiatives. Bikes Belong accepts grant applications primarily from non-profit organizations and while they accept applications from public agencies on local and regional levels they prefer municipalities to partner with a bicycle advocacy group to help advance the project or program. Many of the bike infrastructure projects that are proposed in this report would be eligible for Bikes Belong funding as well as any educational programs that might be carried out to support biking initiatives.

To learn more visit: www.bikesbelong.org/grants

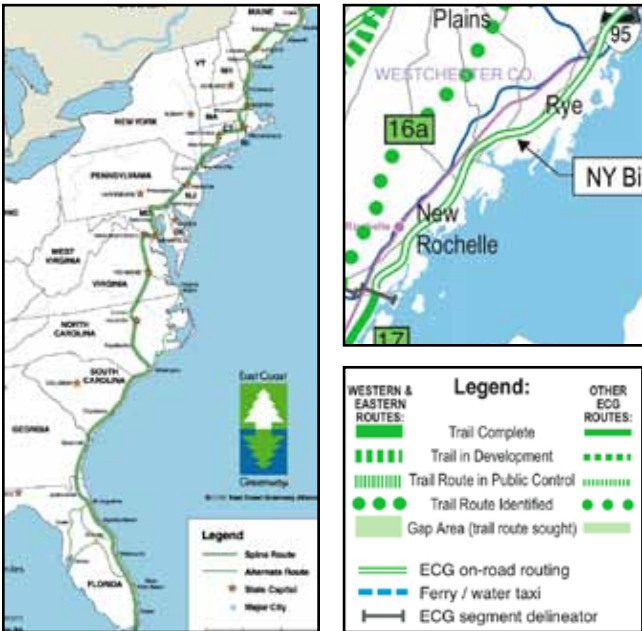
9.4 Local Funding

There are a number of local funding options that can be utilized to pay for Complete Streets interventions such as tax revenues, municipal bonds, or raising funds through local business coalitions. However, given the current economic climate, it is unlikely that funds will be acquired through these channels. The best course of action is to look to the Capital Improvement Plan to fund Complete Streets projects, using the resources already earmarked for transportation investments.

When prioritizing transportation investments, municipalities should coordinate Complete Streets projects with the regularly planned replacement and upgrade of transportation infrastructure. Careful planning and scheduling of improvement projects can ensure the best possible use of existing municipal funds and tax dollars. By spending more time in the planning phase, costly and inconvenient retrofits can be avoided down the line.



Boston Post Road Diet



East Coast Greenway

Chapter Ten

10.0 Sound Shore Application

There are many indications that the Sound Shore communities are ready to embrace the paradigm shift exemplified by Complete Streets. The completion of such projects as the Boston Post Road Road-Diet in Rye, the formation of the Rye Shared Roadways Committee, the support for the East Coast Greenway Project, and the request for an NYU Capstone Team to carry out this study, all serve as testaments that momentum is building around Complete Streets.

Below are recommendations for implementation in each community. Additionally, the recommendations in this report were created with the input of municipal leaders, but would require further agency outreach before being carried out. For example, certain roadways in each community are under the jurisdiction of the Westchester County Department of Transportation (DOT), and changes will require close collaboration with that agency. However, any project that changes the nature of a roadway will require engineering and professional review. Proper public review processes should be followed.

Another element to consider is the East Coast Greenway. This project, which seeks to connect a bikeway from Maine to Florida and would run through the Sound Shore communities, can be a galvanizing element for Complete Streets policy.

The close proximity of municipalities in this area is another consideration. As a result, working with neighboring municipalities to coordinate plans may be advisable, especially when connecting routes and maintaining roadway standards.

10.1 City of Rye

The City of Rye is fortunate to have completed the Boston Post Road Diet, which provides a successful example of how Complete Streets treatments can improve the City. In approaching implementation of the recommendations made in this report on Forest Avenue, it is advisable to consider implementing less expensive and less intensive interventions first, such as painting pedestrian and sharrow markings. It may be possible to partner with other municipalities to share the cost of purchasing stencils for roadway markings, or contacting municipalities that may already have a stencil purchased.

Our recommendations should be more thoroughly discussed with area residents to achieve a successful transformation of the roadway. Furthermore, the City should consult roadway engineers as appropriate and consider mandating that objects in the public right of way be a certain distance from the street center line.

10.2 Village of Mamaroneck

On roadways under the jurisdiction of the Village of Mamaroneck, such as Halstead from Hunter Street to Jefferson Street, our recommendation for implementation follows closely those made for the City of Rye. Additional painted markings are the most cost effective intervention for the Village of Mamaroneck. This includes sharrows, crosswalks, and potentially other roadway definition such as shoulder lines and curb extensions. Painting should also be carefully coordinated with repaving efforts to further maximize cost effectiveness. In discussions with the Village, Halstead and Palmer were not identified as roads that will be repaved in the immediate future.



Smart Parking Meters

Paving changes such as curb extensions can be implemented more slowly, and with more detailed consideration as to their appropriateness and engineering. Curb extensions and other similar interventions are excellent additions to the capital improvement plan and should be considered when repaving and curbing work is performed. On roadways under the jurisdiction of Westchester County, such as Palmer Road and Halstead Ave between Jefferson Ave and Mamaroneck Ave, it will be necessary to work closely with the Westchester County DOT. Per personal communication with a Westchester County DOT official, their position is generally to allow for street improvements but to require the community take over maintenance responsibility of the improvement.³

Metro-North stations require coordination with the Metropolitan Transportation Authority (MTA), which owns and manages the station property. Recommendations such as changing pedestrian pathways and adding bicycle racks should be discussed with the MTA. However, in the case of the Village of Mamaroneck the station directly abuts Village property, and such recommended amenities as bicycle racks could be placed on Village property if it is infeasible to work with the MTA.

Wayfinding is another intervention that could be coordinated with the MTA, or done on Village property. The Village should identify the most advantageous places for the wayfinding signage. We suggest signage at the beginning and end of the commercial district as well as in the middle of the commercial strip at the intersection of Palmer and Mamaroneck Avenue.

Reverse-angle parking will take careful coordination and especially education throughout the entire community. It may be best to proceed initially with a pilot program preferably coinciding with a capital resurfacing project to help reduce cost and eliminate duplicative work. The pilot method can then be used to gauge people's preferences in regards to this new parking scheme.

Peak hour parking would be a longer-term capital improvement. It would require the replacement of current meters with new technology. If current parking meters have reached the end of their useful life "smart" parking systems can be cost competitive compared to reinstalling traditional coin me-

³ [Lukas Herbert, Discussion on Westchester County Owned Roads, Scott Johnson \(Westchester, January 2011\).](#)

ters. Installing a solar powered “smart” parking station, which allows credit, debit, and cash, would replace nine parking meters and cost approximately \$6,100, or \$680 per space. New coin meters cost approximately \$650 per space or \$5850 for nine meters. Additionally “Smart” Parking meters can streamline meter revenue collection. For example they can be setup to communicate electronically when their coin storage is full and collection is required.⁴

10.3 Town of Mamaroneck

Palmer Avenue is under Westchester County jurisdiction, requiring communication with the DOT to undertake any changes. Sharrows and on-street crosswalk signage could be installed quickly and with relatively little expense. Bicycle racks could likewise be implemented easily, and in conjunction with sharrows will significantly increase bicycle amenities in the Town.

Larger interventions such as painting a shoulder line to define parking and travel lanes should be considered as part of capital improvement efforts, and with consideration of repaving schedules. According to the discussions with the Town Palmer Ave is not due for repaving. Curb extensions should likewise be planned as part of the capital improvement program to coincide with road repaving.

10.4 Village of Larchmont

Both Chatsworth and Larchmont Avenues are controlled by the Village. Implementation should follow a similar trajectory as outlined for the other municipalities. Namely, sharrows are the least expensive intervention to implement.

⁴ [Ransford McCourt, “Smart Parking Meters Take Over the West,” DKS Associates, n.d.](#)

Chapter Eleven

11.0 Utilizing this Report

The information presented in this report is meant to serve as a starting point for the Sound Shore region towards the implementation of Complete Streets policy and design interventions throughout the area. The recommendations made for the selected road sections in each of the participating communities are meant to demonstrate how Complete Streets interventions could be applied to improve conditions for all users. These recommendations are provided as ideas and are not meant to be limited to the specific road sections found in this study, but instead should be used as an example of how to apply these kinds of interventions to other ‘incomplete’ streets in the community. It is important to note that further analysis and design would be required to determine whether these recommendations are feasible and cost effective. For example, though we recommend sharrows be placed along most of the roadways studied in this report, when considering sharrow implementation it is best to look at roadway classification and other features and focus on creating a network of bicycle-friendly streets, as opposed to painting sharrows in an uncoordinated fashion.

Each case study provides a vision for how Complete Streets elements can be combined to achieve a specific goal. In the Village of Mamaroneck case study, we identified elements that would enhance a downtown corridor and facilitate an improved bike route. In the City of Rye case study, we showcased the elements that would best enhance a quieter but still heavily utilized roadway to allow for recreational use alongside safer motorists. The Town of Mamaroneck case study examined a heavily traveled corridor that connects distinct areas, prescribing treatments that support all users. And in the Village of Larchmont, we examined two of the community’s most prominent thoroughfares, and sought out treatments that would best use underutilized space and accommodate all users.

