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Livable/Complete Streets Study Route 28 in Yarmouth

West Yarmouth Road to Forest Road

December 2013

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Acknowledgments

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- Yarmouth Board of Selectmen

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Executive Summary

Route 28 in West Yarmouth is one of the most congested roadway segments on Cape Cod, and is also a roadway that is vulnerable to frequent flooding due to its proximity to the coast. To address these concerns, this report examined the applicability of Livable Streets improvements – those which balance beneficial green infrastructure with multimodal approaches – on a highly visible two mile segment which has been designated by the Town of Yarmouth for economic development (see Figure 1).

This year-long study collected a baseline inventory of existing conditions in the area and studied the feasibility of potential improvements through desktop analysis, field visits, and an active public participation component. The project team was able to focus improvements to where they were found most implementable by vetting priority considerations through the Yarmouth Planning Board and Board of Selectmen. Next steps that have been endorsed by the Yarmouth Board of Selectmen include:

- Pursuing Transportation Improvement Project (TIP) funding for improvements to realign the western gateway intersection of Winslow Gray/ South Sea Avenue and Route 28 and expand the roadway right of way by approximately 10-15' in order to fully accommodate livable street improvements on both sides of the roadway easterly to the Parkers River Bridge;
- Recommendations for negotiating with abutting property owners and Massachusetts Department of Transportation (MassDOT) to obtain necessary land rights to accomplish improvements;
- Recommendations for phasing future improvements, including signalization, safety, and community character upgrades for the remaining study area.

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Introduction

BACKGROUND

Route 28 in Yarmouth is one of three regional east-west transportation corridors on Cape Cod. It is a commercial destination for tourists and residents alike, with numerous attractions, businesses, hotels and restaurants. Owing to this fact, the roadway is often congested, particularly in the summer months. The corridor is used heavily by automobiles, cyclists and pedestrians as a major regional arterial; however, the current configuration of the roadway is focused on automotive use resulting in numerous conflict points with pedestrians and cyclists. A 2011 study by the Cape Cod Commission revealed the West Yarmouth segment of Route 28 to be one of the densest locations in the region for pedestrian/bicycle crashes (20 between 2002 and 2007) encompassing three high-crash locations in the designated study area. Curb cuts along the corridor impact traffic flow and non-automobile safety by creating conflict points and left turn movement backups.

The town has approved zoning changes for the area and aims to better accommodate multi-modal transportation along the corridor by improving streetscape conditions in a coordinated manner with land use changes. The roadway design is essential to the success of these town efforts, particularly at key intersections where redevelopment efforts may be focused.

The project team selected an approximately 2-mile section of Route 28 from West Yarmouth Road to Forest Road as the focus of a corridor study identifying "Livable Street" and "Complete Street" strategies that promote walkability, pedestrian safety, access management, and improved traffic safety and flow in the area, in support of the town's vision for the corridor.

STUDY AREA

This two mile segment of Route 28 (see following figure) has been identified by the town as a priority redevelopment area with the potential for improvements that could be replicated elsewhere along the corridor in the future. Route 28 in Yarmouth is a highly visible and heavily traveled regional arterial, serving as host to a variety of retail and commercial enterprises and accessing numerous residential areas. The Town's vision for the corridor is reflected by the recently adopted "Village Center Overlay District" designation for this section of Route 28 (see Figure 2).

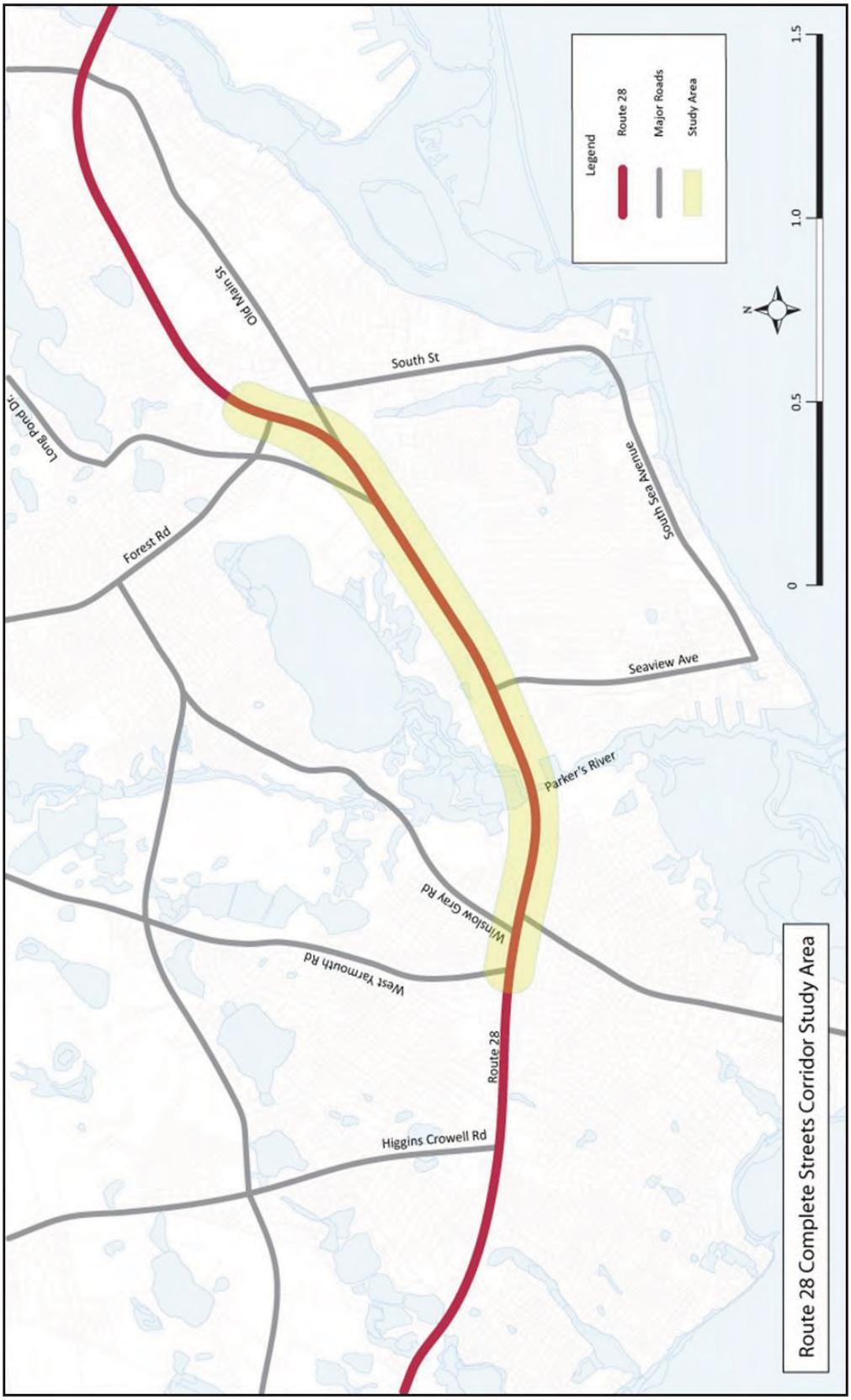

FIGURE 1 - STUDY AREA

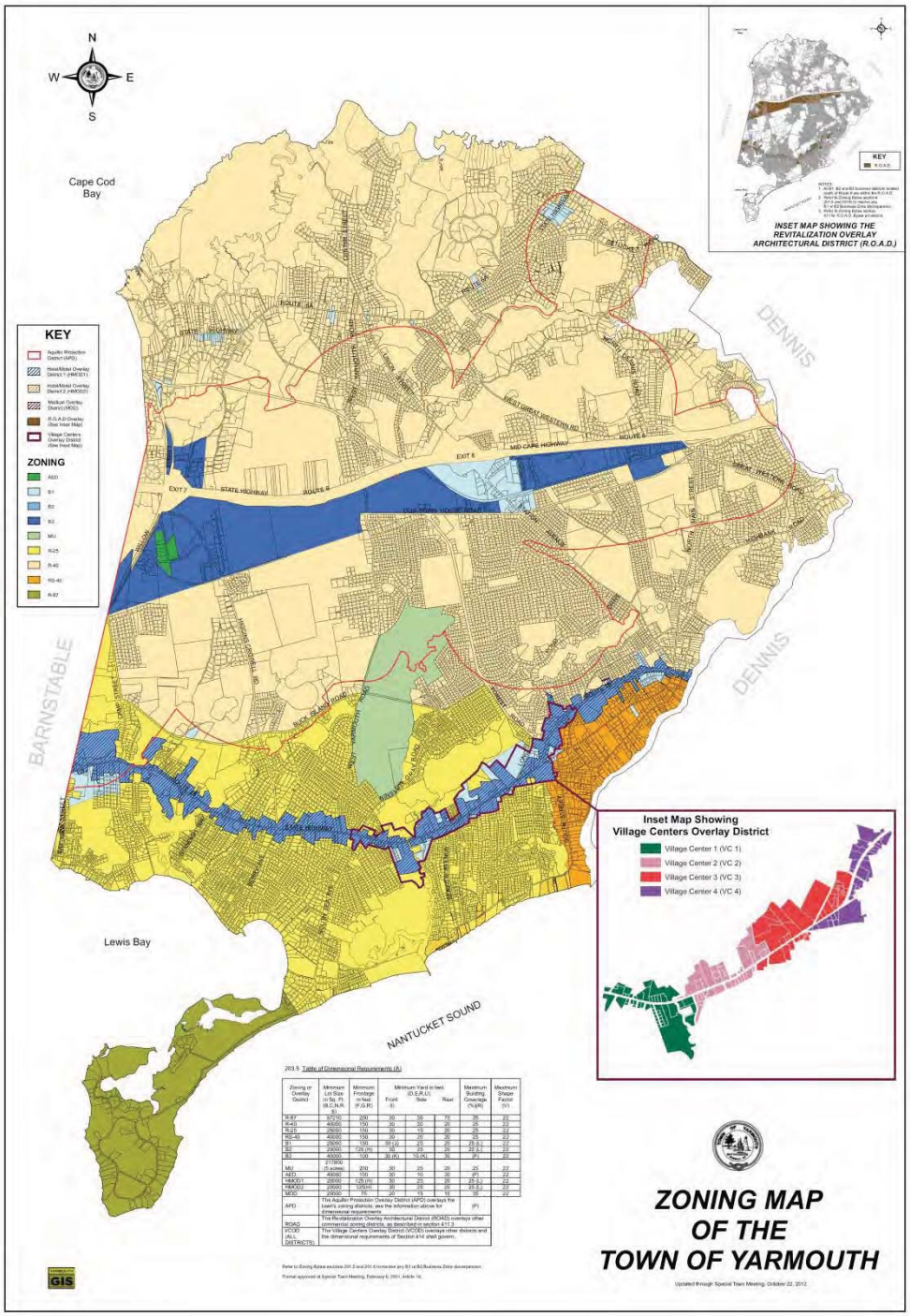

FIGURE 2 - YARMOUTH ZONING MAP

Living Streets Objectives:

Improve aesthetics and accommodation to create a sense of place

Provide economic benefit by promoting a transportation mode shift which capitalizes on existing infrastructure

Incorporate universal design principles to better accommodate all users (bike, pedestrian, ADA for disabled residents)

Reduce impervious surface area and promote green infrastructure/Low Impact Development (LID) for stormwater mitigation

STUDY OBJECTIVES

The purpose of this study is to explore transportation improvement alternatives that will reduce conflicts, improve traffic flow and incorporate multi-modal transportation options along the Route 28 corridor while furthering the creation of vibrant, pedestrian and bicycle oriented mixed-use centers along the roadway. The study proposed to utilize "Complete Streets" design strategies and Low Impact Development (LID) approaches to meet the Living Streets objectives described at left.

PREVIOUS STUDIES AND PLANS

To begin this planning study, Commission staff reviewed a number of previous studies and plans. These included:

- Design Plans for Forest Road/Long Pond Drive
- Cape Cod Commission RESET Study (2011)
- Bluestone Group Study of the Route 28 Corridor
- VHB Study of the Route 28 Corridor
- Cecil Group Study of the Route 28 Corridor

Existing Conditions

Cape Cod Commission (CCC) staff began this study by conducting a thorough analysis of the existing conditions of the study area. This included reviewing the newly formed zoning, completing site visits to ground truth assumptions formed in overlay analysis, and study of geometric considerations through survey and site analysis.

ZONING CONSIDERATIONS

The study area is zoned B2 (business) and falls entirely within a recently formed Village Center Overlay District (VCOD) which encourages mixed use development, increased height, greater lot coverage and closer setbacks to Route 28.

There are 4 subcategories of the Village Center Overlay District represented in the study area, set with the following goals:

VC1: Enhanced character, promotion of public recreation, encouragement of pedestrian activity.

VC2: Smaller commercial uses where people live, work, and shop in a walkable livable neighborhood.

VC3: A year-round family activities district, with job creation.

VC4: Focused on year-round commercial uses.

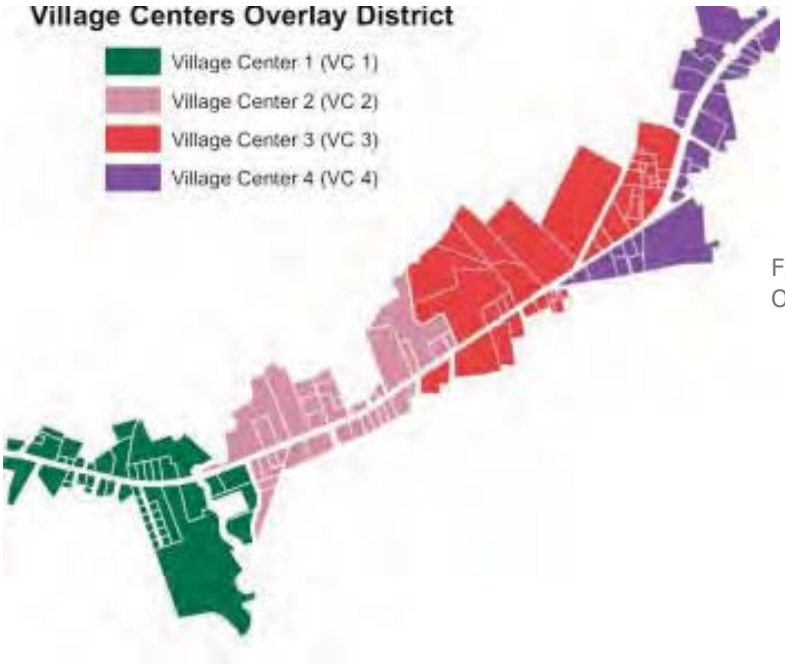

FIGURE 3 – VILLAGE CENTER OVERLAY DISTRICTS

SITE VISITS

To ground truth assumptions, take accurate measurements, and gain a complete awareness of conditions along the corridor, CCC staff made a number of site visits, where they noted a disconnected and incongruous pedestrian accommodation, no formal bike accommodation, a lack of ramps or proper passing areas for disabled patrons, clogged storm drains and ponding, and out of scale lighting.

FIGURE 4 – SIDEWALK OBSTRUCTIONS AND EXISTING CONDITIONS

RIGHT OF WAY CONSIDERATIONS

As a State-owned arterial, the Massachusetts Department of Transportation (MassDOT) owns a limited Right of Way (ROW) along this corridor. Because of this, the varying ROW widths along Route 28 (see next figure) are inconsistent in their accommodation for different roadway users. While automobiles are fully accommodated in a minimum twelve-foot travel lane, other users (bicyclists, pedestrians) are left with constrained or non-existent space.

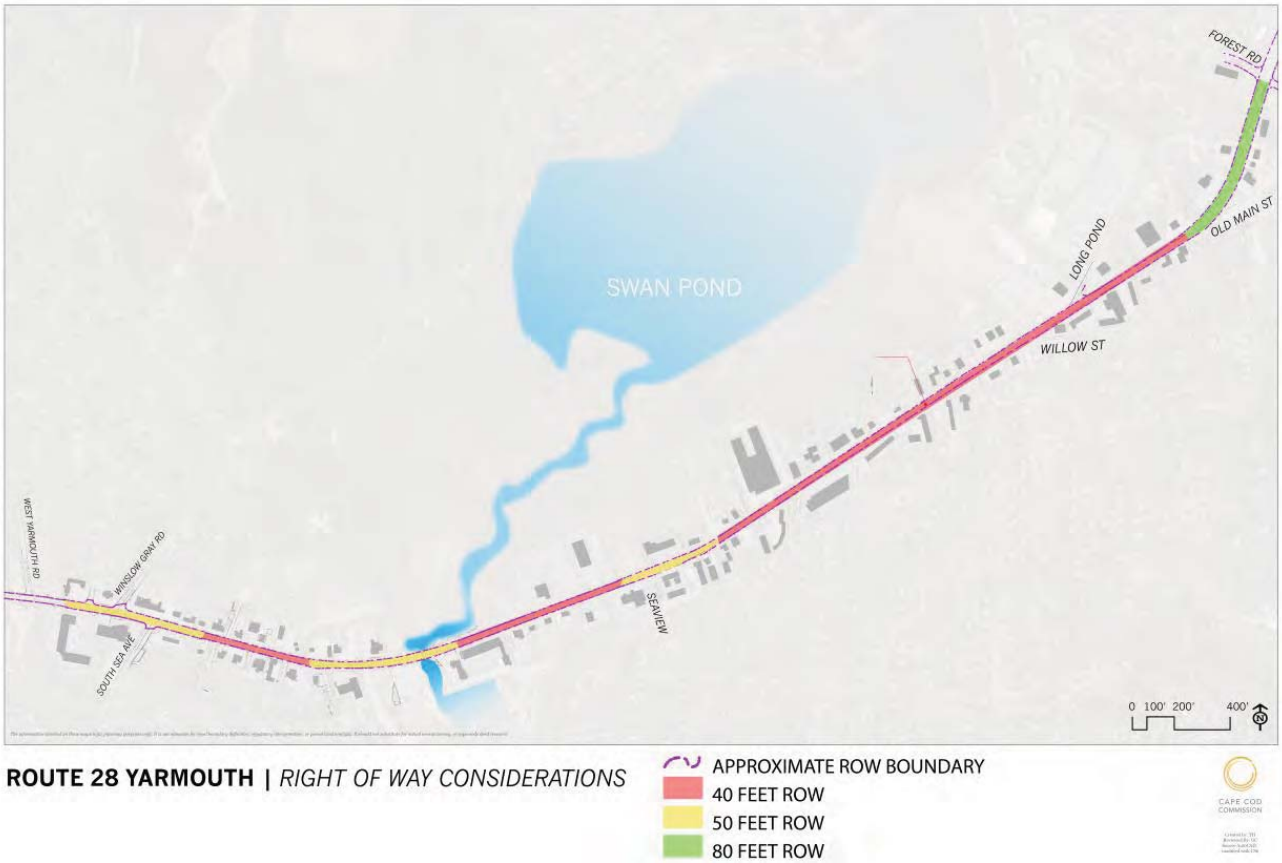

FIGURE 5 – RIGHT OF WAY CONSIDERATIONS

Varying right-of-way widths along Route 28 (and other past considerations) have resulted in an incomplete sidewalk network as shown in the following figure. Red lines represent missing or impassable sidewalk segments. While sidewalk accommodation exists on both sides of Route 28 for the majority of the study area, there are significant segments where sidewalks are missing on one or the other side of the road and in some cases from both sides. This pushes users into the roadway, and leads to unsafe conditions.

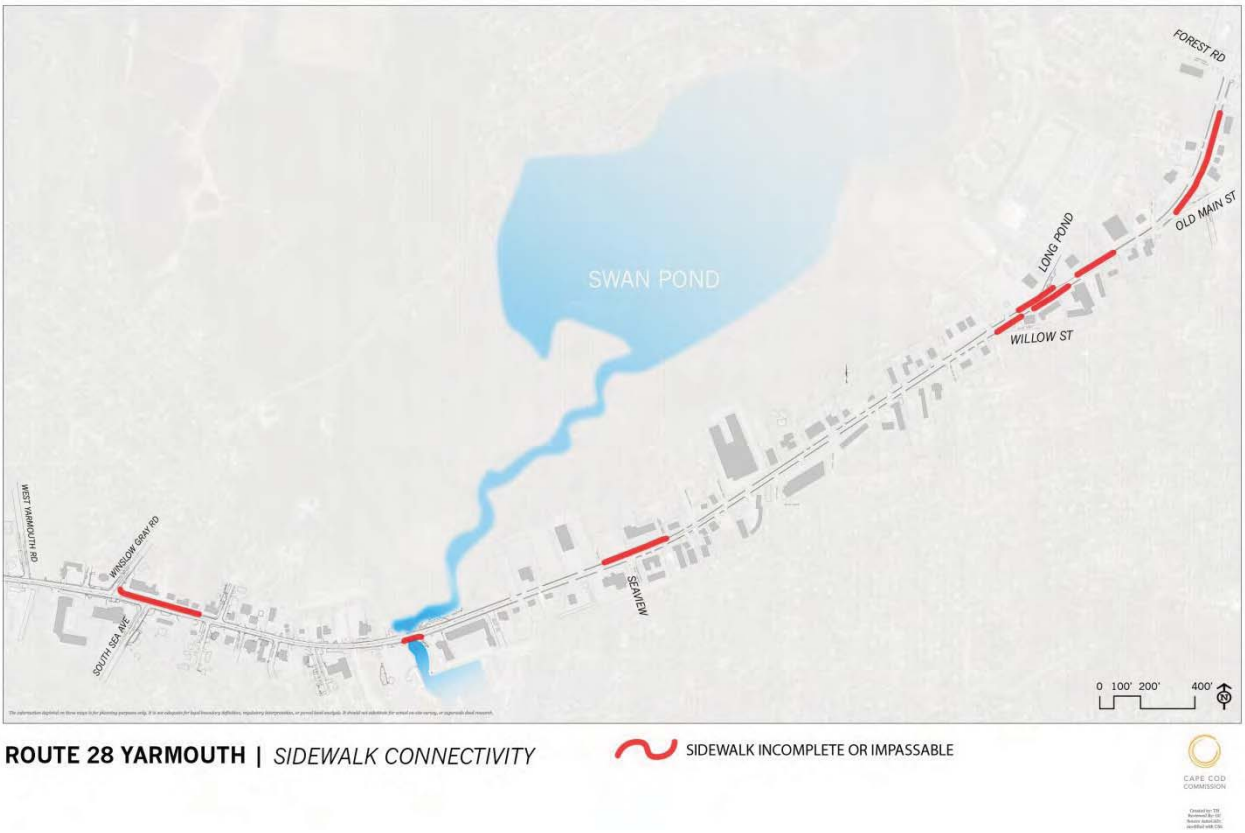

FIGURE 6- SIDEWALK CONNECTIVITY

TRAFFIC VOLUMES

Average daily traffic volumes on Route 28 exceed 25,000 vehicles during the peak month (July). The chart in the following figure shows the traffic for each day of the most recent full 12-month period (2010) as reported by the Massachusetts Department of Transportation from a permanent counting station located on Route 28 to the west of West Yarmouth Road.

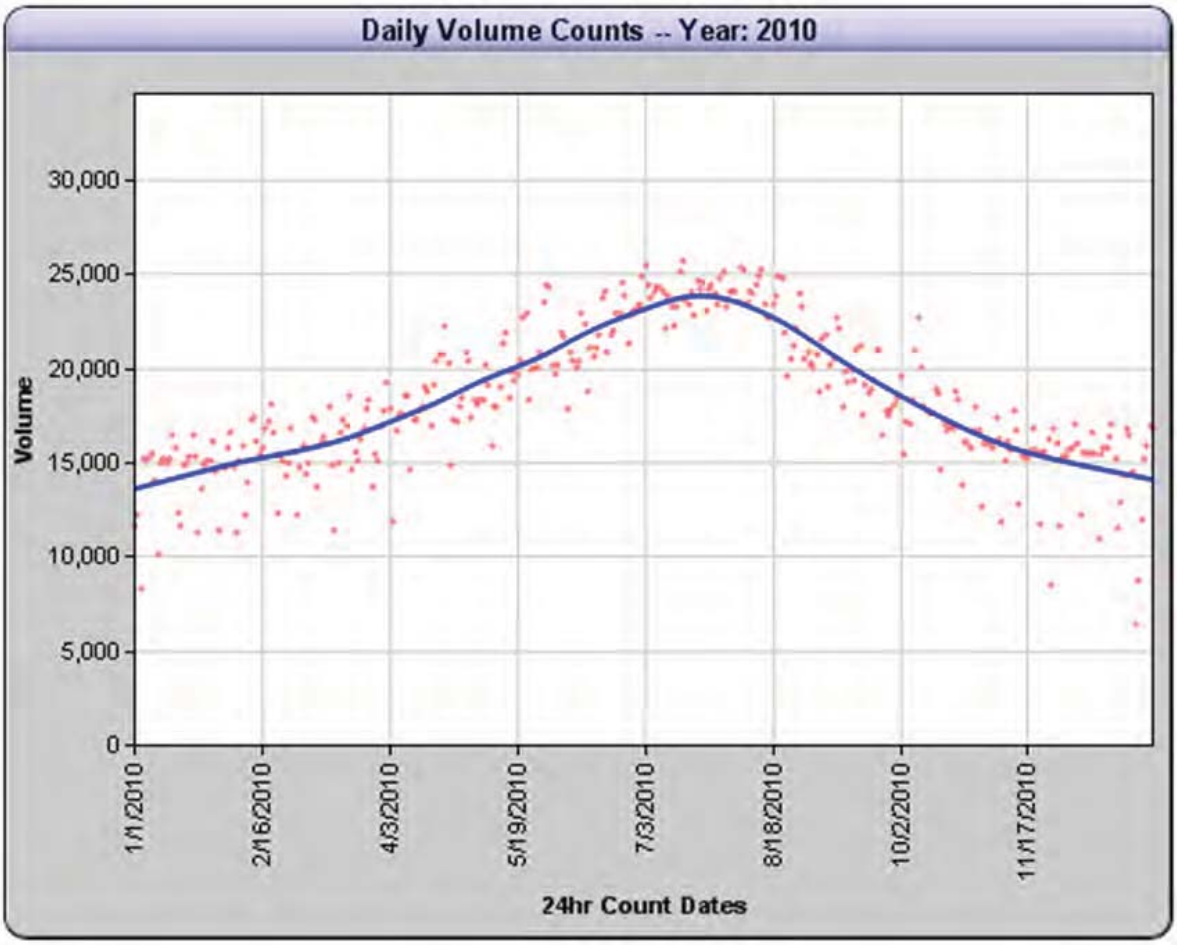

FIGURE 7 – DAILY VOLUME COUNTS

The Cape Cod Commission staff performed corridor-specific traffic counts both manually and by installing automated traffic recorders. Figure 8 provides a summary of peak season weekday evening peak hour traffic data, topping out at 25,000 users in the high summer season.

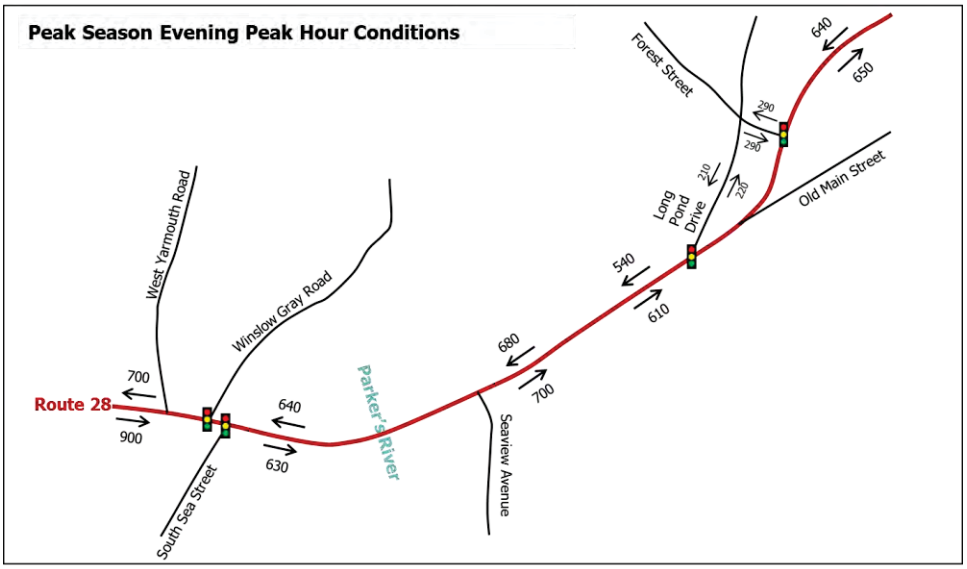

FIGURE 8 – STUDY AREA TRAFFIC VOLUMES

Based on most recent data available (2010-2012). Note: Imbalances due to additional roadways and curb cuts not shown and different collection dates.

LEVEL OF SERVICE ANALYSES

Intersection Level of Service (LOS) is essentially a letter-grade assigned to an intersection based on the level of traffic congestion and delay. LOS A represents uncongested conditions with very little delay. LOS C or D indicates busy but acceptable conditions. LOS E/F indicates an intersection at or over capacity. The following figure is a summary of LOS analyses at study area intersections.

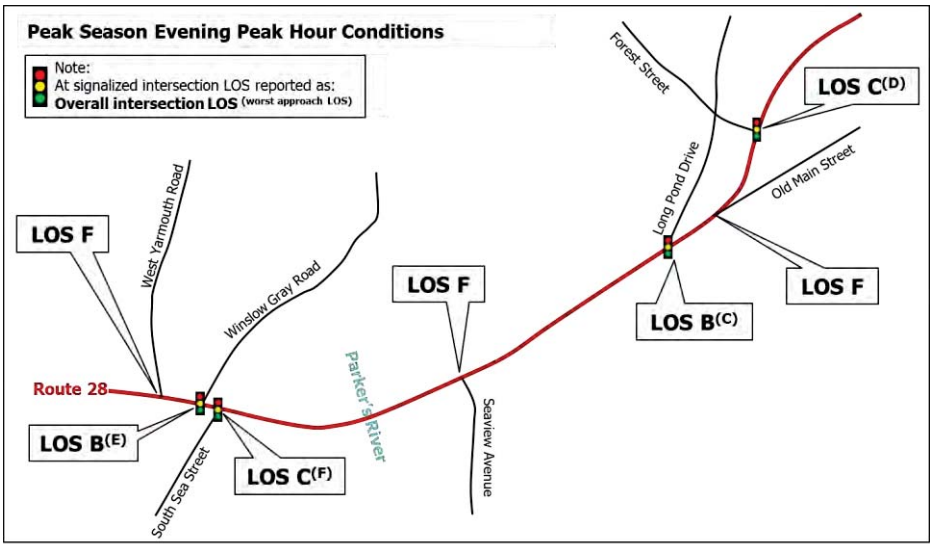

FIGURE 9 – INTERSECTION LEVEL OF SERVICE

LOS values presented in Route 28 Transportation Study*, Vanasse Hangen Brustlin, Inc., June 2012*

SAFETY DATA: CRASH HISTORY

The following figure presents the average number of reported crashes at study area intersections. These crashes were reported to MassDOT for the years 2007-2009 and it is important to note that additional crashes not properly reported or located may be missing from this analysis. An intersection with an average rate of three or more crashes per year is considered by the Cape Cod Commission to be a hazardous location and warrants further analysis. As shown below, several of the intersections in the study area can be deemed hazardous.

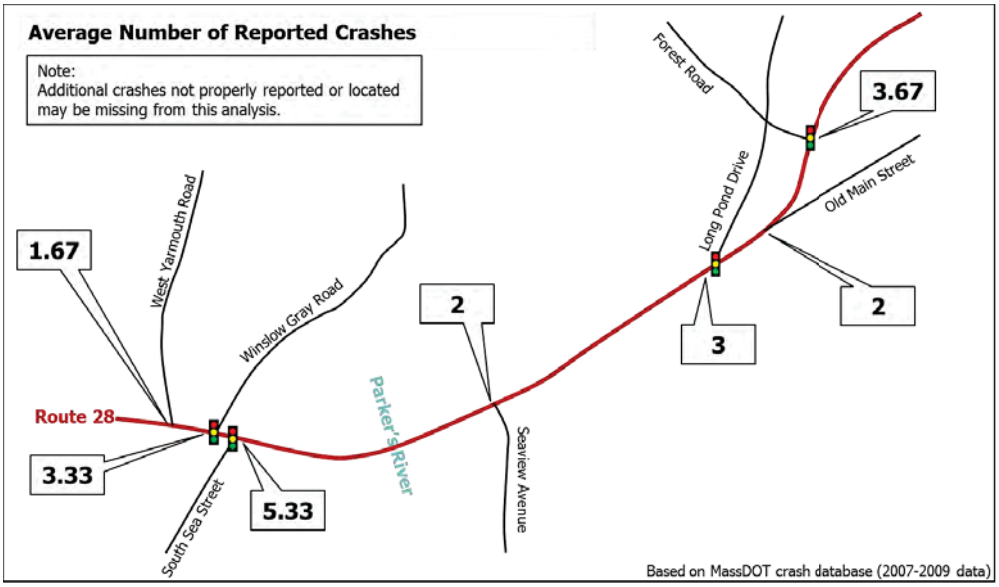

FIGURE 10 - INTERSECTIONS' CRASH HISTORY

MassDOT crash location data for the study area corridor is presented in the following figure. Each circle represents one or more crashes (larger circles represent greater numbers of crashes) and are color-coded according to severity (Non-fatal Injury, Not Reported, Property Damage Only, and Unknown). There were 170 crashes reported within the study area corridor from 2007 to 2009.

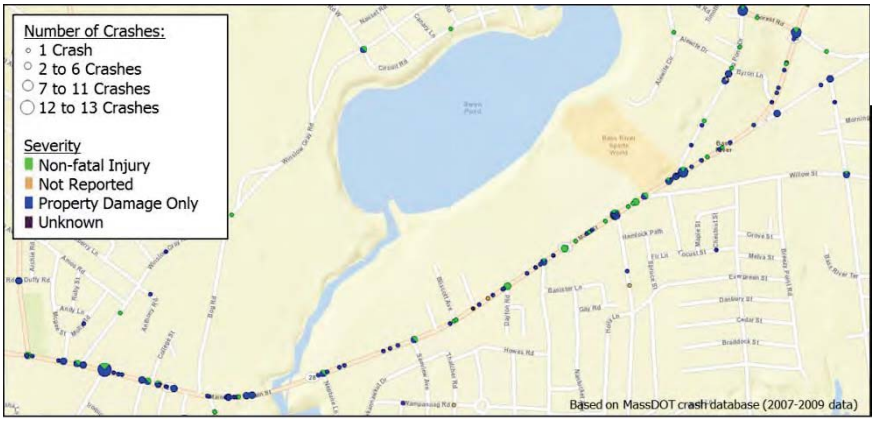

FIGURE 11 – CORRIDOR CRASH HISTORY

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Public Participation Plan

From the outset, the Yarmouth Route 28 Living Street project has benefitted from a robust public participation process, beginning with the following goals:

- Gather input from community stakeholders and the public to establish a vision for the corridor;
- Develop a forum for ideas aimed at achieving this vision as well as concerns regarding potential changes;
- Solicit feedback of potential alternatives.

TABLE 1 – PUBLIC PARTICIPATION FACILITATED AS PART OF THIS STUDY

Type	Date	Attendees	Purpose
Initial Kickoff Meeting	March 21, 2013	Advisory Committee, Public	To present existing conditions, establish a common vision, hear feedback & set goals
Focused Listening Sessions	May 2, 2013	Advisory Committee, Public	Gather comment regarding project goals, opportunities and constraints
Planning Board Meeting	June 19, 2013	Planning Board, Public	Present initial concepts, gather feedback and endorsement of priorities
Online (Surveymonkey) Survey	June 2013	Public	Gather feedback on concepts presented to Planning Board
Board of Selectmen	August 6, 2013	Board of Selectmen, Public	Present concepts for prioritization and solicit endorsement to further study
Technical Advisory Group Meeting	September 4, 2013	MassDOT, Town Staff, CCC Staff, Bike Rep	Engineering refinements
Planning Board Meeting	October 16, 2013	Planning Board, public	Present final concepts, gather endorsement of final recommendation to BOS
Board of Selectmen	November 19, 2013	Board of Selectmen	Presentation of Final concepts for endorsement

Initial Kickoff Meeting
The first step of this project was to meet with a taskforce of local representatives, technical staff, and abutters, as selected by reference from the town and previous studies. The purpose of this meeting was to:

- review and prioritize project goals
- identify opportunity areas and constraints

After the meeting, notes were synthesized into a map which identified priority areas, areas of opportunity and constraints. An additional outcome of this meeting was a formal statement of goals.

Focused Listening Sessions
At a later date, the Cape Cod Commission facilitated a series of three 60 minute listening sessions with local landowners representing 3 segments of the study area to gather comment and input regarding project goals, opportunities and constraints developed in the initial taskforce meeting.

All invitations and scheduling were organized by the Commission independent of Town representatives. The Commission prepared a summary of comments received at these sessions and delivered these to the town. Points raised during these sessions were aggregated and presented to the public at the subsequent public meeting.

A digitized compilation of comments received at the listening sessions, are listed in the Appendix, Attachment A.

Public Planning Board/Board of Selectmen Meeting
The Commission staff presented findings from the initial kickoff meeting and listening session(s) at a Yarmouth Planning Board meeting and a subsequent Yarmouth Board of Selectmen meeting. The goal of these meetings was to give the decision makers an interim update and allow them to weigh in on what concepts to prioritize. An outcome of the meetings was a July 22 memo (see Appendix, Attachment C) from the Planning Board, recommending prioritization of concepts, which the Selectmen later voted to endorse.

Plan Development & Technical Review
After Board of Selectmen endorsement of priority concepts, staff drafted three concept plans for the Winslow Gray/South Sea intersection, right-of-way cross section options for the corridor, and met internally with Town staff, MassDOT District 5 representatives, and a bicycle representative to discuss technical revisions to these drafts.

Final Public Planning Board/Board of Selectmen Meetings
CCC staff presented findings and preferred alternatives to the Planning Board, including order of magnitude cost estimates and recommendations for implementing proposed plans. The Planning Board expressed support for a preferred alternative that would realign Winslow Gray and South Sea Avenue and implement full accommodation along the roadway, requiring land takings financed by the Town on both accounts. CCC staff refined this concept to present to the Yarmouth Board of Selectmen, who endorsed the concept for implementation on November 19, 2013.

Additional Outreach

In addition to the above, CCC staff maintained an email listserv to project partners, frequently informing them of public outreach events and project updates through a dedicated website for the project, and also gathered feedback via online surveys.

FIGURE 12- DEDICATED PROJECT WEBSITE

Alternatives Development

Based on feedback from the public participation process and a review of existing conditions in the study area corridor, the study team identified a set of "priority intersections" (shown in the following figure) to focus study and established conceptual roadway cross-sections which could accommodate all corridor users.

FIGURE 13 - PRIORITY INTERSECTIONS

PRIORITY INTERSECTION 1-INITIAL ALTERNATIVES DEVELOPMENT

Route 28 at Winslow Gray Road and South Sea Avenue

Route 28 at Winslow Gray Road and South Sea Avenue experiences congestion and driver confusion due to the complex turning movements for vehicles traveling between the north and south sides of the intersection and the outdated signal equipment. As a high crash location, it was identified as a priority intersection for improvements by both the public and technical staff. The following graphic shows the existing lane configurations.

Design Ideas

1. Update & re-time signals
2. Re-align intersections into a single traffic signal
3. Re-align intersections into a roundabout

- Improved bicycle and pedestrian accommodations as well as access managements improvements should be included in any redesign

Note: Graphical depicts of design ideas and are conceptual in nature; intersection geometries have not been considered in detail at this point.

FIGURE 14 – EXISTING CONDITIONS AT ROUTE 28 AT WINSLOW GRAY ROAD AND SOUTH SEA AVENUE

The least expensive design idea identified by the study team at this early concept stage was to update and re-time the traffic signal equipment. The existing signal control equipment is outdated and limited in effectiveness. For example, vehicle detection loops are only installed on the minor street approaches. Mainline Route 28 traffic is given a fixed amount of green time regardless of demand. This idea would involve installing detection systems on all approaches to the intersection, modern signal heads, new controllers and would likely include pavement reconstruction of the intersection.

The second design idea presented was to re-align the minor street approaches to create a single signalized location. This would involve property takings on the north side of Route 28 to allow Winslow Gray Road to directly align with South Sea Avenue. The new signal would include full detection and new controllers. This idea maintains the general approach geometries (through plus left turn lanes on Route 28; one general purpose lane on minor street approaches). A graphic showing an outline of the general concept is shown in the following figure:

FIGURE 15 - RT 28 AT WINSLOW GRAY/SOUTH SEA: REALIGN W/SIGNAL

The third design idea would similarly relocate Winslow Gray Road to the opposite of South Sea Avenue with a roundabout, a concept proposed by the public at early meetings. It was found that the right-of-way required for the construction of the circle would be too difficult to acquire. This idea is presented in the next figure.

FIGURE 16 - RT 28 AT WINSLOW GRAY/SOUTH SEA: REALIGN W/ROUNDABOUT

Analyses of these early concepts were performed using *Synchro 7* traffic modeling software. By inputting roadway and intersection geometries, traffic volumes, signal timing plans, and traffic flow parameters, *Synchro* provides animated simulations showing vehicle flows and queuing behaviors and also provides tabular reporting of delays, queue lengths and many other measures of effectiveness. The graphic in the following figure shows a frame from the simulation.

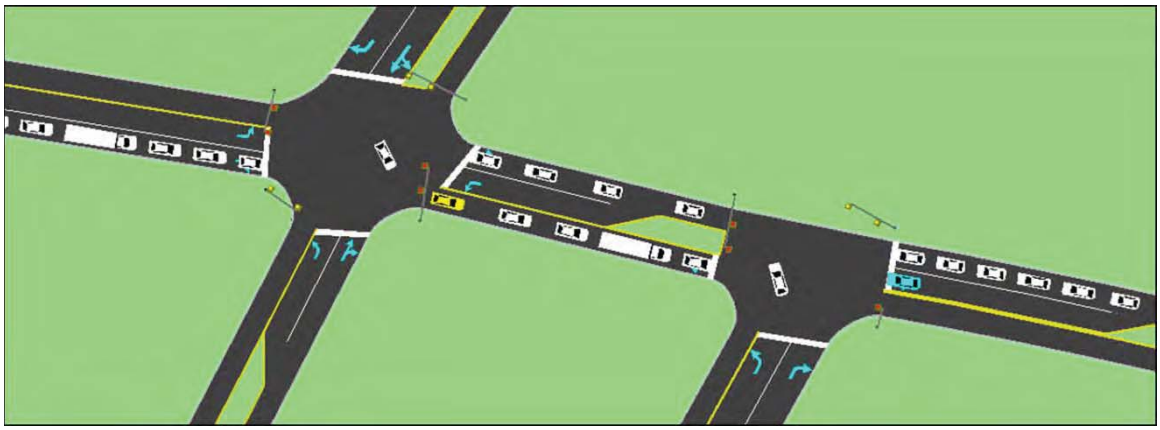

FIGURE 17 - SYNCHRO MODEL SHOWING RT 28 AT WINSLOW GRAY/SOUTH SEA

The Synchro software was used to analyze traffic flow operations at the intersection for each of the ideas listed above. Analyses were performed for both existing year 2013 and 20-year forecast for 2033 and the resulting intersection Levels of Service (LOS) are shown in the following table. LOS is similar to a report card, with the best traffic flow, minimal delay occurring at LOS A. LOS C or D are considered acceptable. LOS E and F are at or near capacity and considered to be a failing LOS.

TABLE 2- RT 28 AT WINSLOW GRAY/SOUTH SEA: INTERSECTION LEVEL OF SERVICE

	2013 Volumes	2033 Volumes*
No Improvement**	B	C
Signal Retiming**	A	B
Realigned Signalized Intersection	C	C
Realigned Single-lane Roundabout	D	F
Realigned Double-lane Roundabout	C	E

**Assumes 1% annual growth*
***Both intersections operate at the same Level of Service*

This initial analysis was presented early on, in order to gauge public support of build options of this magnitude. In the summer of 2013 the Yarmouth Planning Board made recommendations which were later endorsed by the Board of Selectmen (see July 22 memo, in Appendix) to prioritize Design Idea 2 (4-way realignment) for further study, and requested CCC staff to further analyze the potential of such a realignment, including the development of additional lanes and analysis of potential takings required.

PRIORITY INTERSECTION 1- REVISED ALTERNATIVES

Route 28 at Winslow Gray Road and South Sea Avenue

After a period of revision and technical review, the concepts for Winslow Gray and South Sea were refined into three build options, with associated cost estimates. Build Option 1 was a repeat of Figure 15, as previously shown. The revised options 2 & 3 are shown in the following figures:

FIGURE 20-BUILD OPTION 2 OF WINSLOW GRAY/SOUTH SEA/ROUTE 28 INTERSECTIONS

FIGURE 19- BUILD OPTION 3 REALIGNMENT OF WINSLOW GRAY/SOUTH SEA/ROUTE 28 INTERSECTIONS

The three options, associated project costs and potential land takings were presented in an October 2013 meeting of the Yarmouth Planning Board. At this meeting, board members chose to endorse **build option 2** as the preferred alternative, for its potential to create a gateway to the Village Center area, which in turn could benefit the local community character and economic development as well as reduce driver confusion. The town is considering using their own funding to initiate the necessary parcel takings to make this option possible.

TABLE 3 – COST ESTIMATES & CONSIDERATIONS FOR PROPOSED WINSLOW/SOUTH SEA BUILD OPTIONS

Build Options	Approx. Cost[1]	ROW Impacts	Safety Upgrade	Congestion Improvement	Bike/Ped Improvement
1 Signal & ADA Upgrades	$500,000	Minimal - related to sidewalk obstacles	Minimal	Minimal	Ped – Significant Bike - Minimal
2 Realign to single 4-Leg	$3.0 Million	Reorganization + small strip taking	Significant	Moderate	Significant
3 Realign to single expanded 4-Leg	$3.5 Million	Reorganization + significant strip taking	Significant (additional conflicts over Option 2)	Moderate (minimal improvement over Option 2)	Significant (additional conflicts over Option 2)

PRIORITY INTERSECTION 2: ANALYSIS OF ALTERNATIVES

Route 28 at Seaview Avenue

FIGURE 22 - ROUTE 28 AT SEAVIEW AVENUE-EXISTING CONDITIONS

[1] *Based on the costs of recently completed intersection reconstruction projects completed on Cape Cod adjusted to consider the additional complexities related to the realignment.*

At the request of the Yarmouth Planning Board and Board of Selectmen, CCC staff evaluated the need for a traffic signal at the intersection of Route 28 and Seaview Avenue. Cape Cod Commission technicians collected turning movement data that was used to determine if a signal is warranted under the guidelines from the *Manual on Uniform Traffic Control Devices*. The traffic volumes have indeed met five warrant thresholds as listed, and CCC staff recommended that the Town endorse signalization of the Seaview intersection based on the following:

- Warrant 1: Eight hour vehicular volume
- Warrant 1B: Interruption
- Warrant 2: Four hour vehicular volume
- Warrant 3: Peak hour
- Warrant 3b: Peak vehicular volumes

PRIORITY INTERSECTION 3: ANALYSIS & ALTERNATIVES DEVELOPMENT

Route 28 at Forest Road

Route 28 at Forest Road experiences congestion and driver confusion due to proximity of adjacent curb cuts and non-optimized signal timing. The study team evaluated several ideas for improvement. The existing intersection is shown in the following figure:

FIGURE 23 - ROUTE 28 AT FOREST ROAD

The least expensive design idea identified by the study team was to update and re-time the traffic signal equipment. The existing signal control equipment is outdated and limited in effectiveness. This idea would involve installing detection loops on all approaches to the intersection, adding modern signal heads and new controllers and would likely include pavement reconstruction of the intersection.

The second design idea would include geometric improvements as identified in the Massachusetts Highway Department's 1992 design (shown in the following figure). This concept adds a right-turn lane to Route 28 westbound, lengthens the left-turn storage of Route 28 eastbound, and improves detection and traffic control.

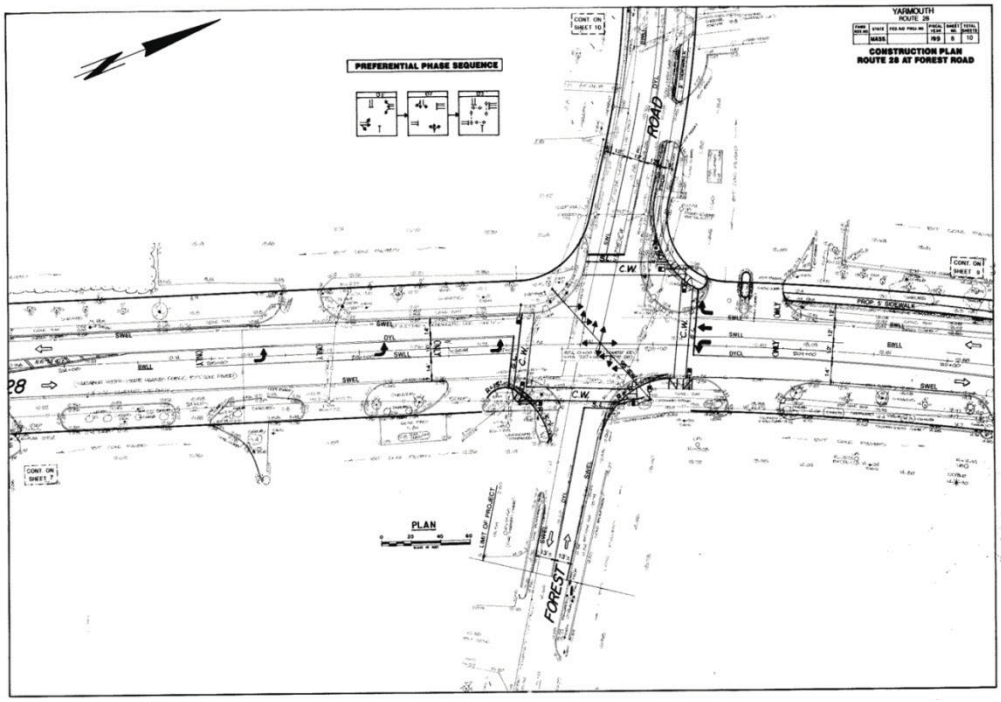

FIGURE 24 - RT 28 AT FOREST: MASSACHUSETTS HIGHWAY DEPARTMENT'S 1992 DESIGN PLAN

The Synchro software was used to analyze traffic flow operations at the intersection for each of the ideas listed above. Analyses were performed for both existing year 2013 and 20-year forecast for 2033 and the resulting intersection Levels of Service (LOS) are shown in the following table.

TABLE 4 - ROUTE 28 AT FOREST ROAD: INTERSECTION LEVEL OF SERVICE ANALYSIS

	2013 Volumes	2033 Volumes*
No Improvement	F	F
Signal Retiming	E	F
Geometric Improvements (add right-turn lane on Route 28 WB)	B	C

**Assumes 1% annual growth*

Upon presentation of these proposed alternatives, the Board of Selectmen endorsed the recommendation of the Planning Board to focus on developing alternatives for the Winslow Gray/South sea alignment and Corridor cross sections, rather than revisiting unpopular geometric considerations from the earlier work.

ROADWAY CORRIDOR ALTERNATIVES DEVELOPMENT

Route 28 Cross Sections of the Road profile

Due to the limited 40' State Right of Way in most areas, any design option developed which widens the road profile will require MassDOT negotiation with property owners to take land or obtain permanent easements.

Recognizing this restriction, the project team developed a set of scaled alternatives, from modest improvements within the existing Right of Way to full pedestrian and bicycle accommodation that would necessitate strip takings. All concepts ensure a minimum of 30' paved area in order to accommodate the passing needs of emergency vehicles, as a result of public concern regarding capacity along this regional arterial. The following figures represent the 3 options presented to the Yarmouth Planning Board as potential alternatives for improving the Right of Way, as well as the associated considerations for each.

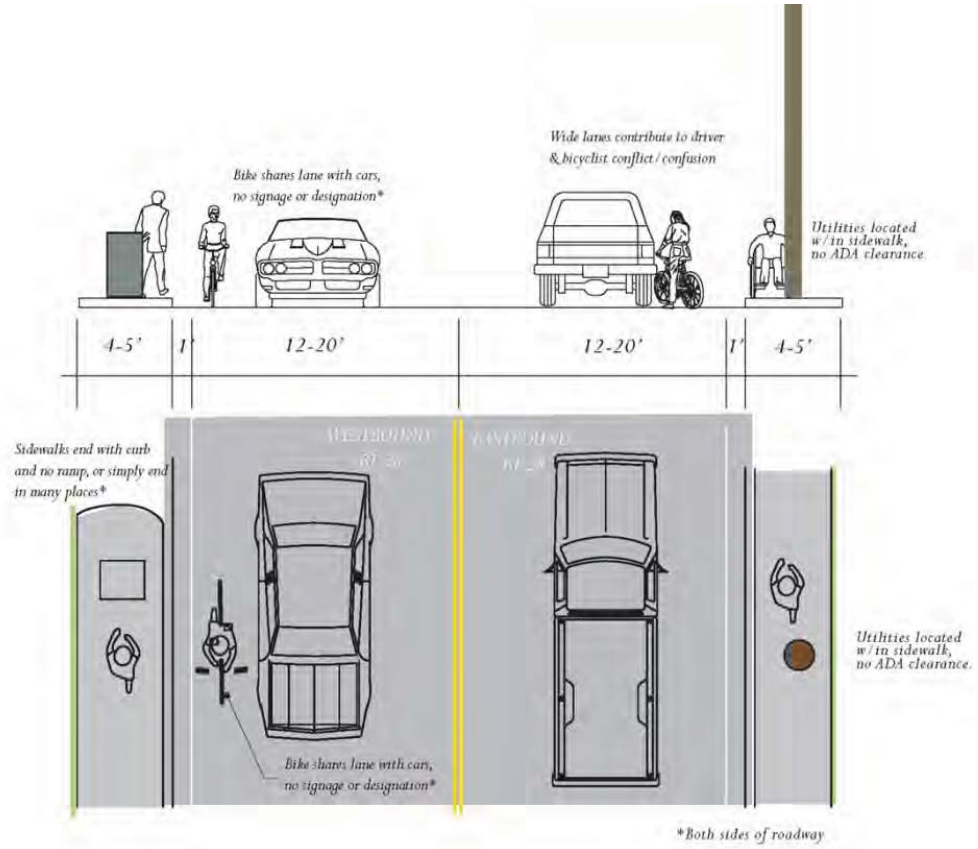

FIGURE 25-EXISTING ROADWAY TYPOLOGY

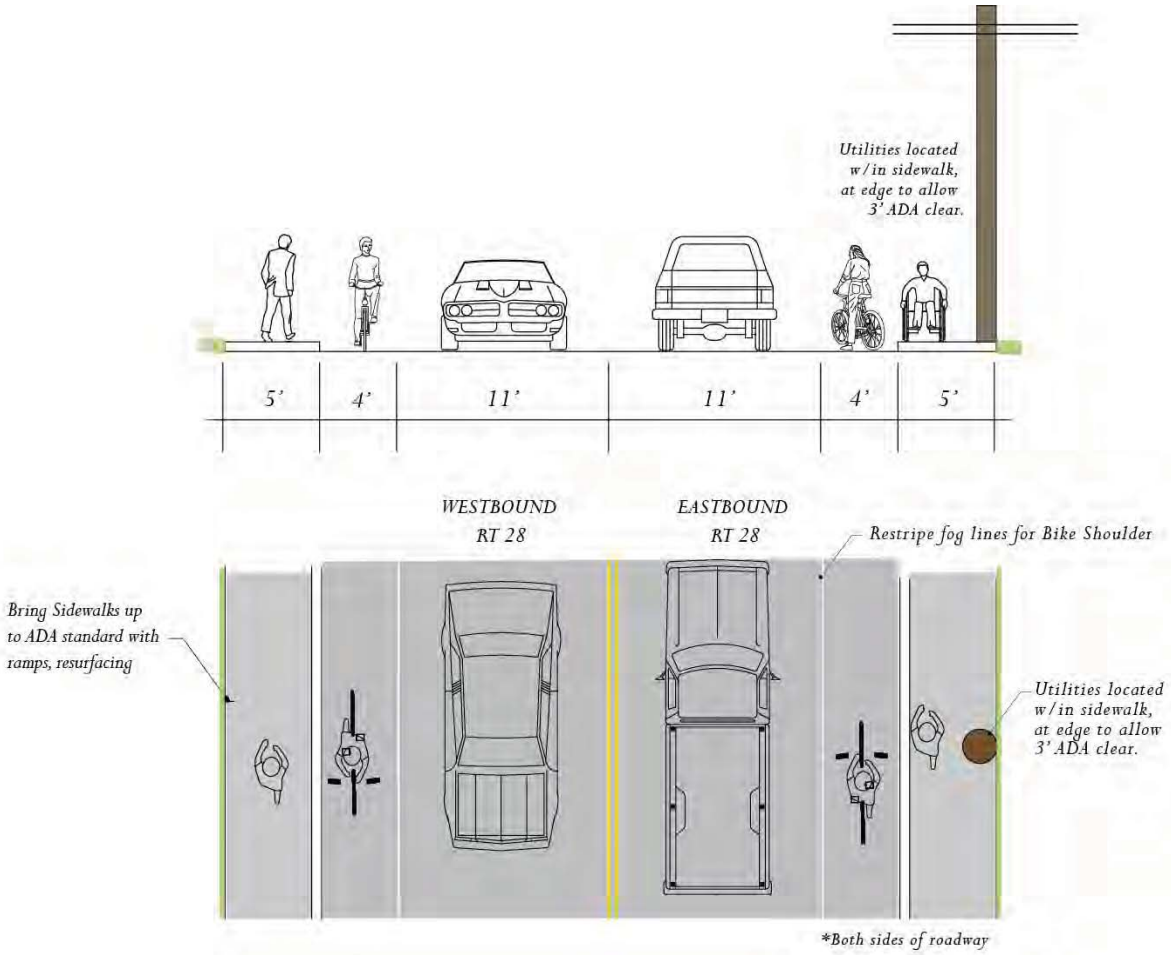

FIGURE 26 – LOOKING WEST AT PROPOSED 40' LAYOUT

Figure 26 represents the lowest cost build option, where improvements are contained within the current Right of Way in all areas. This option recommends a resurfacing and restriping to allow a 4' shoulder for bicycles, as well as sidewalk upgrades which move utilities and upgrade ramps and surfaces to bring current conditions up to Americans for Disabilities Act (ADA) standards. This option does not include landscaping or additional amenities, as space did not allow. See table 5 (to follow) for details on estimated costs.

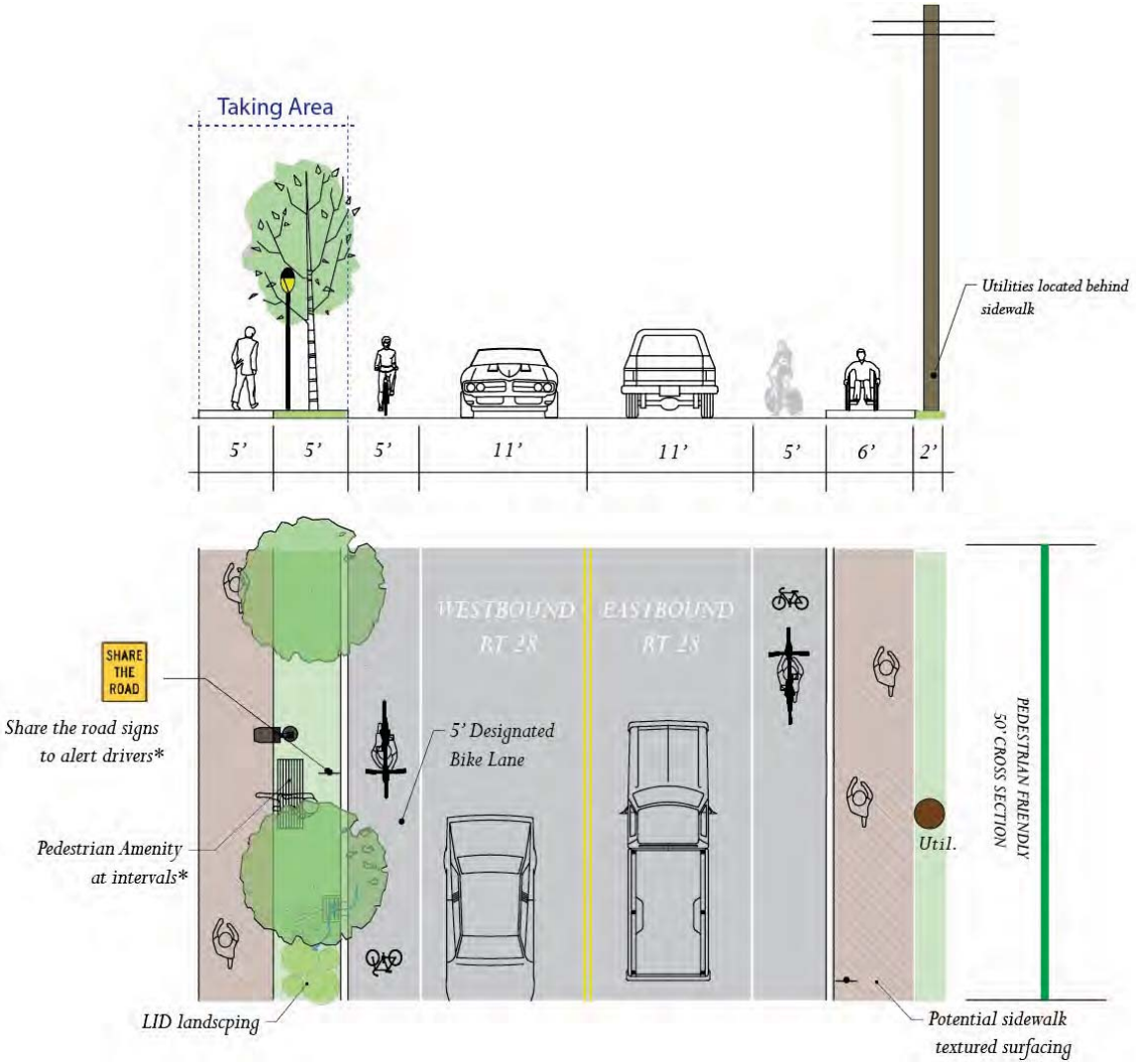

FIGURE 27-LOOKING WEST AT PROPOSED 50' LAYOUT, WITH TREEBELT ON SOUTH SIDE

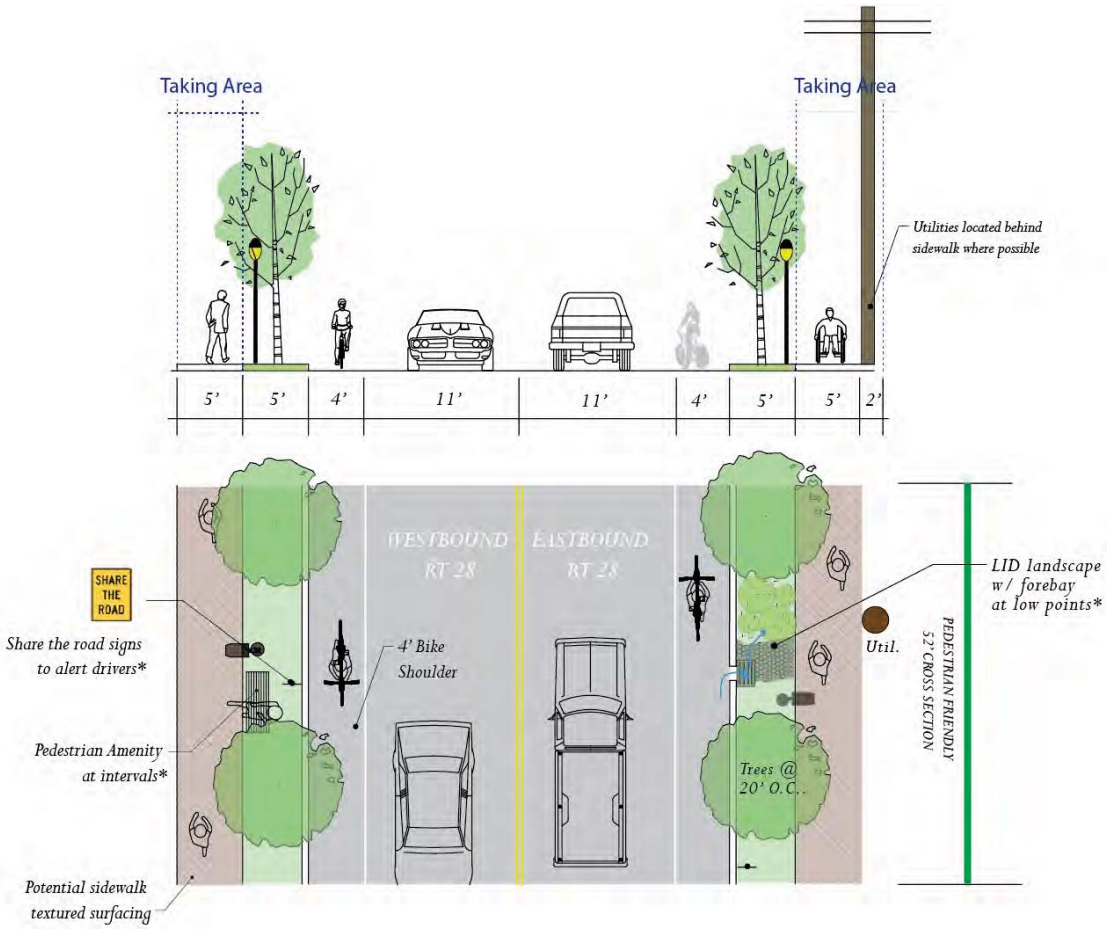

FIGURE 28- LOOKING WEST AT PROPOSED 52' LAYOUT, WITH TREEBELT ON BOTH SIDES

In Figures 27 and 29, the road Right of Way is shown as expanded via incremental strip takings to accommodate the additional space for landscaping and pedestrian accommodation on either one or both sides of the roadway. These two options were presented to the Yarmouth Planning Board in order to measure the public's acceptance of taking private property for roadway improvements. The following breakdown was presented for these options:

TABLE 5 – COST ESTIMATES FOR PROPOSED ROADWAY CROSS SECTIONS

Order of Magnitude Cost of Resurfacing/ Sidewalk upgrades for ADA compliance (keeping w/in ROW @40'):	$1.7 Million	Per Mile
Order of Magnitude Cost of expansion to 50' with green strip on one side, ADA sidewalks, resurfacing and strip taking (assumes $6/s.f. for takings):	$2.3 Million	Per Mile
Order of Magnitude Cost of expansion to 52' with green strip on both sides, ADA sidewalks, resurfacing and strip taking (assumes $6/s.f. for takings):	$2.7 Million	Per Mile

Additionally, CCC staff analyzed the potential cost of roadway improvements that would fall outside the MassDOT purview:

Order of Magnitude Cost of Streetlights/Benches/Trash Cans/Signage	$130,000	Per Mile
Order of Magnitude cost for landscaping over and above MassDOT Standard (LID)	$20,000	Per Mile

As a result of this analysis, Yarmouth Planning Board members recommended the implementation of a fully accommodating cross section (Figure 29) in all areas possible, to promote economic development through such upgrades to community character. This action would include strip takings. Due to the potential cost of this option, the board discussed an approach which would designate funds in a phased approach over several TIP years. This approach is outlined in the final recommendations, to follow.

ADDITIONAL CONSIDERATIONS

As part of this ambitious study, CCC staff also evaluated options for additional improvements to the study area that could be employed as strategies to meet the Living Street goals of improving the safety, character, traffic flow and pedestrian accommodation of the area while promoting shifts to alternative modes of transportation. These additional considerations were secondary alternatives which arose from the public input received early on.

TURNING LANES

After noting public interest in implementing turning lanes along the corridor, CCC staff considered the potential of left-turn storage areas, or turning pockets, on Route 28 as a strategy to separate stopped traffic waiting to turn left from through traffic. As part of the planning process, CCC staff collected information on what abutting parcels may necessitate this treatment. These parcels where identified as privately owned properties, and as such it was determined that pursuing dedicated turning lanes with public funding would not be appropriate. However, as conditions change along the roadway, turning lanes to public lands may prove viable in years to follow.

DEDICATED BUS ACCOMMODATIONS

The Cape Cod Regional Transit Authority (CCRTA) buses that frequent Route 28 employ a flag-down approach to operation. This study recommends a number of bus stops, designated with a simple sign and bench or more elaborate public art piece, to be employed to lessen rider confusion and create a sense of place.

FIGURE 29-POTENTIAL BUS ACCOMODATIONS

Additionally, the study recommends that in the section of Route 28 with the greatest Right of Way (@80') to the East between Old Main Street and Forest Road, a bus turn out could be employed in tandem with a Bus Shelter. This configuration proposed to create an eastern gateway to the district and provide greater visibility to multimodal options. This is shown in Figure 30.

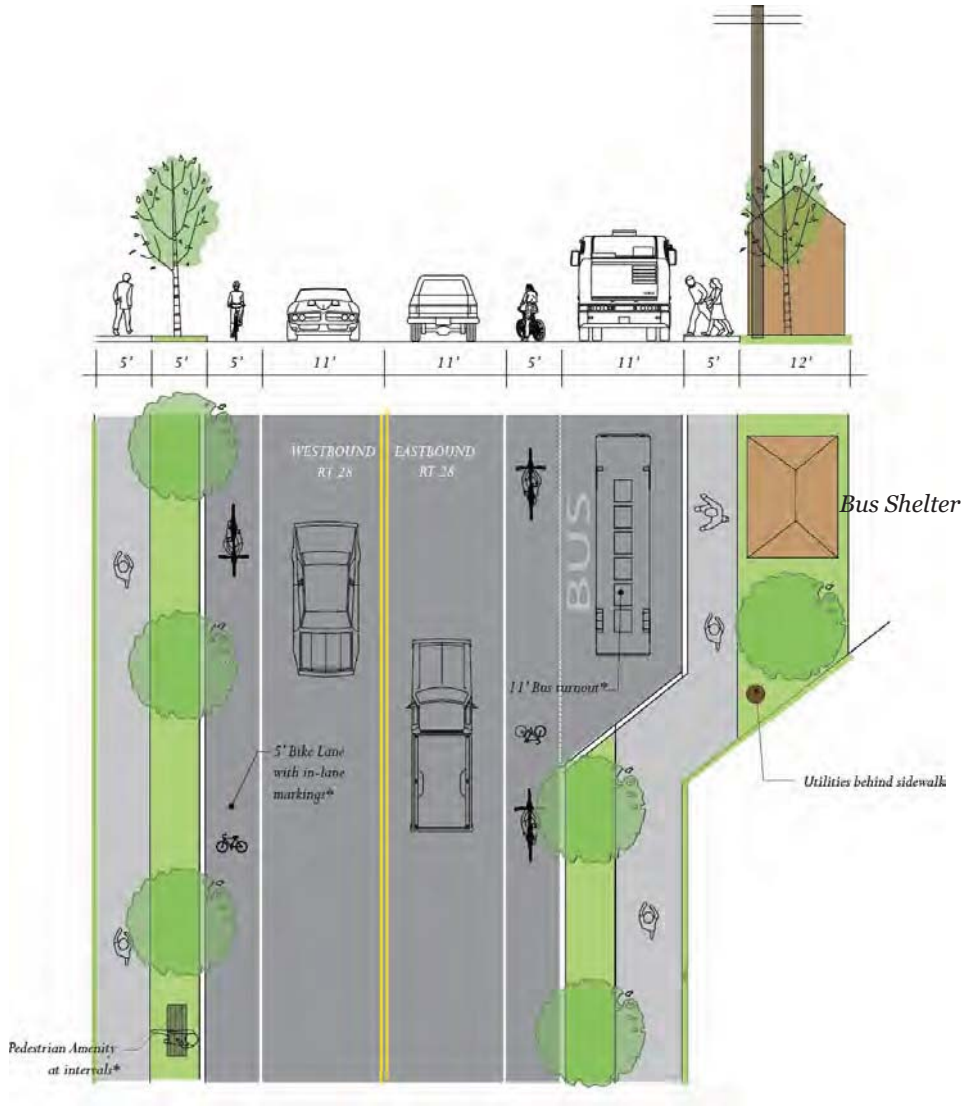

FIGURE 30 –POTENTIAL BUS TURNOUT DESIGN

PEDESTRIAN AMENITIES- LIGHTING, CROSSWALKS, STREET FURNITURE

Special care was taken throughout the planning study to consider pedestrian amenities which encourage safe and comfortable walking, biking and social interaction along the roadway. The study recommends the placement of pedestrian scaled lighting at gateway intersections, in primary economic zones and at crosswalks, to increase safety and add aesthetic value to the right of way. Benches and trash receptacles placed at frequent intervals would also serve to improve the pedestrian experience, and could double as public art pieces to add a sense of place to the commercial district. It is recommended that crosswalks utilize pavers or stamped concrete over simple striping, to calm traffic and improve roadway appearance.

Amenities such as lighting and street furniture fall outside the purview of typical MassDOT road improvements. The town may wish to consider funding such improvements with Chapter 90 funds or MassWorks grants.

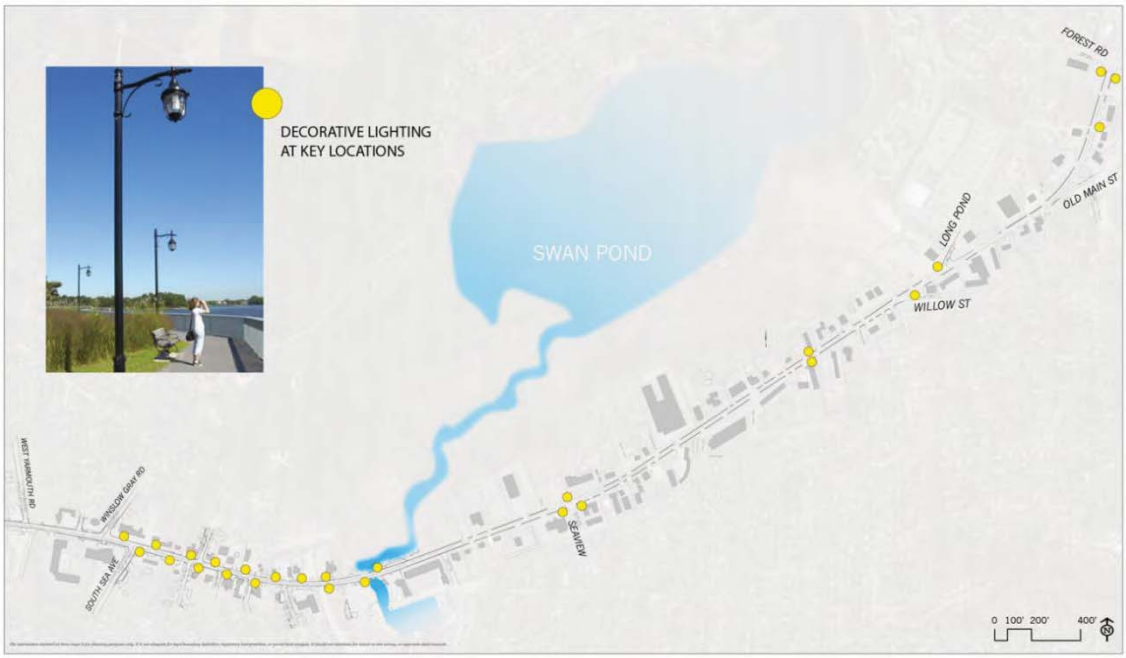

FIGURE 31 – PROPOSED LIGHTING ACCOMODATIONS

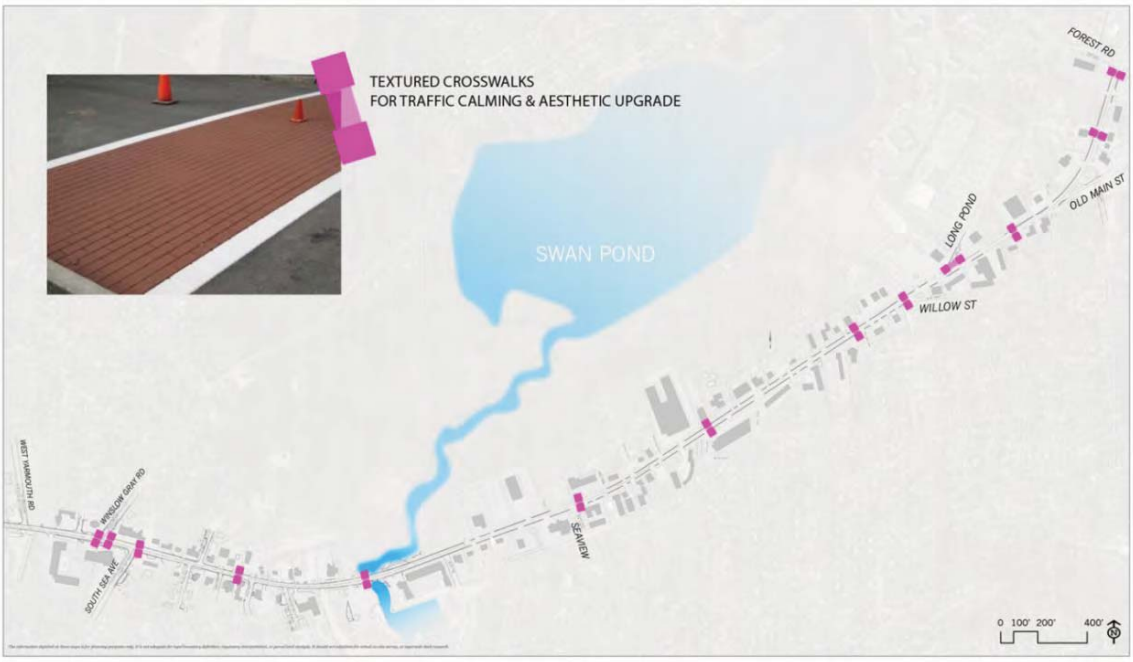

FIGURE 32 - NEW & UPGRADED CROSSWALKS

STORMWATER MANAGEMENT

Roadway flooding is not only an environmental issue, but also a social justice concern. Stormwater runoff picks up and carries pollutants, such as heavy metals, coliform, and nutrients of concern, into downstream water bodies.[2] Flooding along the roadway also creates a physical barrier to connectivity for bicyclists and pedestrians, and decreases safety for all users.

To examine the practicality of 'green street' design approaches which aim to mitigate stormwater runoff and allow infrastructure to adapt to the impacts of flooding, the staff team began by examining flood risk potential using statistical data for river flow, storm tides, hydrologic/hydraulic analyses, and rainfall and topographic surveys. The map below shows areas that are subject to frequent flooding (in purple), as well as areas that would be subject to flooding in a severe storm event (SLOSH, shown in pink).

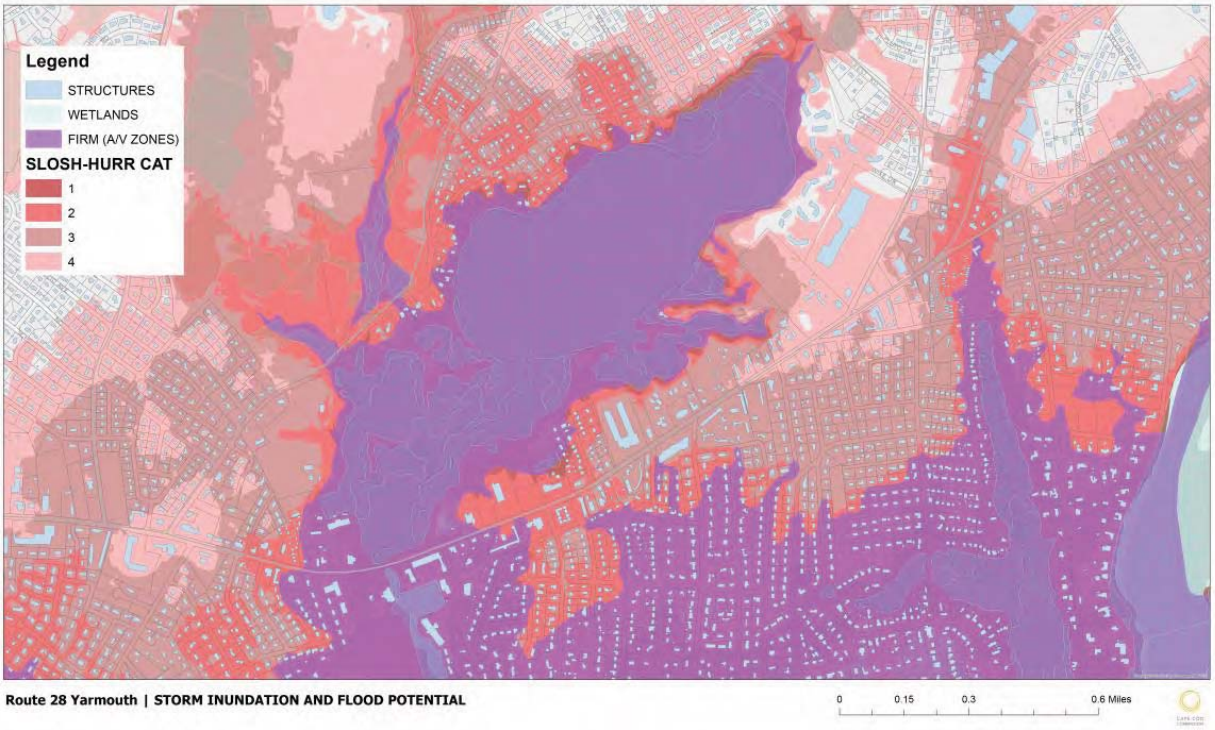

FIGURE 33– FLOOD POTENTIAL

Staff found the entirety of the study area at risk for potential flooding. In order to prepare for these potential conditions and benefit both user safety and downstream

[2] The study area is wholly within the Lewis Bay Watershed, which has been designated by the Massachusetts Estuaries Project as a Nitrogen impaired watershed.

water quality, this study recommends the following Low Impact Development (LID) approaches which capture and treat stormwater runoff in place, reduce flooding, and increase vegetative cover.

RECOMMENDED LID BEST MANAGEMENT PRACTICES

Increased tree canopy: Increasing tree canopy in impervious areas can reduce stormwater runoff and soil erosion through interception, absorption of rainwater, evapotranspiration and increased soil infiltration. This reduces the amount of water falling onto the roadway and accumulating at drains.

Strategically placed bioinfiltration and vegetated swales: A bioinfiltration area is a concave landscaped area with amended soils and/or an engineered subgrade which allows for rapid infiltration. These areas are designed to funnel water into a graded depression where it is captured and treated, diminishing on-road ponding and polishing water loaded with chemicals, oil and heavy metals by directing it through planting root zones. This study recommends using these infiltration areas in addition to existing storm drain infrastructure in landscaped tree belts, with wide curb cuts to allow road runoff to enter.

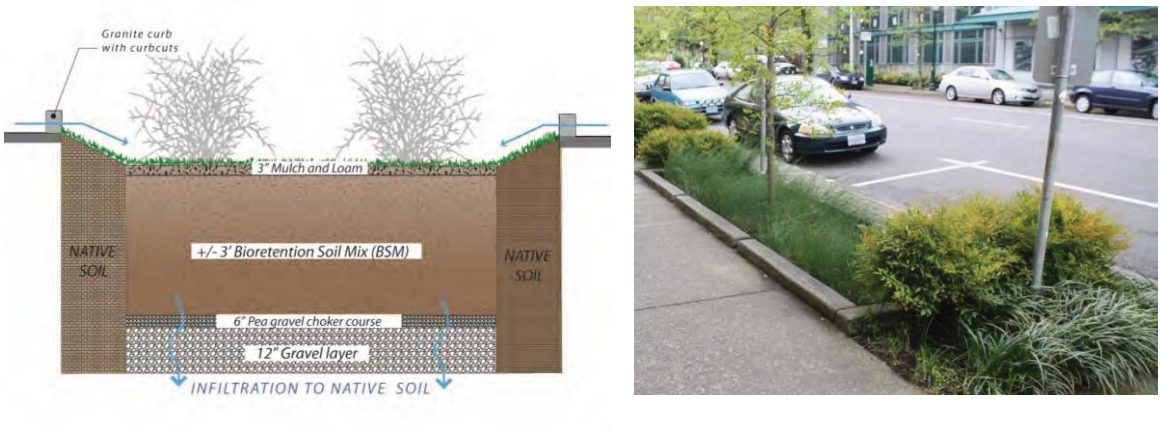

FIGURE 34 – TYPICAL INFILTRATION PLANTERS

ACCESS MANAGEMENT:

I accordance with earlier planning studies of this roadway, this report recommends that the town work to consolidate curb cuts in order to improve traffic flow on Route 28 and coordinate efforts of future layout alterations with an access management protocol. This work could include an assessment of individual curb cuts, permit search and determination of non-conforming lots according to MassDOT standards. This can result in a formally endorsed access management plan.

Final Recommendations

A Phased Approach

The ambitious scope of this project was realized early in the planning process and thusly components of the design were prioritized in order to both 1) dedicate appropriate study to their improvement and 2) identify funding and implementation goals which are cognizant of resource limitations. The following recommendation of implementing "Phase I" improvements was endorsed by the Yarmouth Board of Selectmen at their regular meeting November 19th, 2013.

PHASE I RECOMMENDATIONS

REALIGN THE WINSLOW GRAY/SOUTH SEA INTERSECTION

The primary recommendation of this study is to pursue the realignment of the Winslow Gray/Route 28 and South Sea Avenue/Route 28 intersections, to reconfigure the roadways into a single four-way intersection according to Build Option 2 (Figure 19), which would keep the current number of lanes, improve bicycle and pedestrian accommodations, and integrate landscaped tree belts and amenities. The estimated cost includes realignment, signal heads, controllers, detection, lane markings, crosswalks, and other typical roadway specifications (not including specialty landscaping, decorative street lights, or street furniture).

FIGURE 35- LOOKING EAST AT SOUTH SEA AVENUE INTERSECTION TODAY (LEFT) & PROPOSED 4-WAY REALIGNMENT (BELOW)

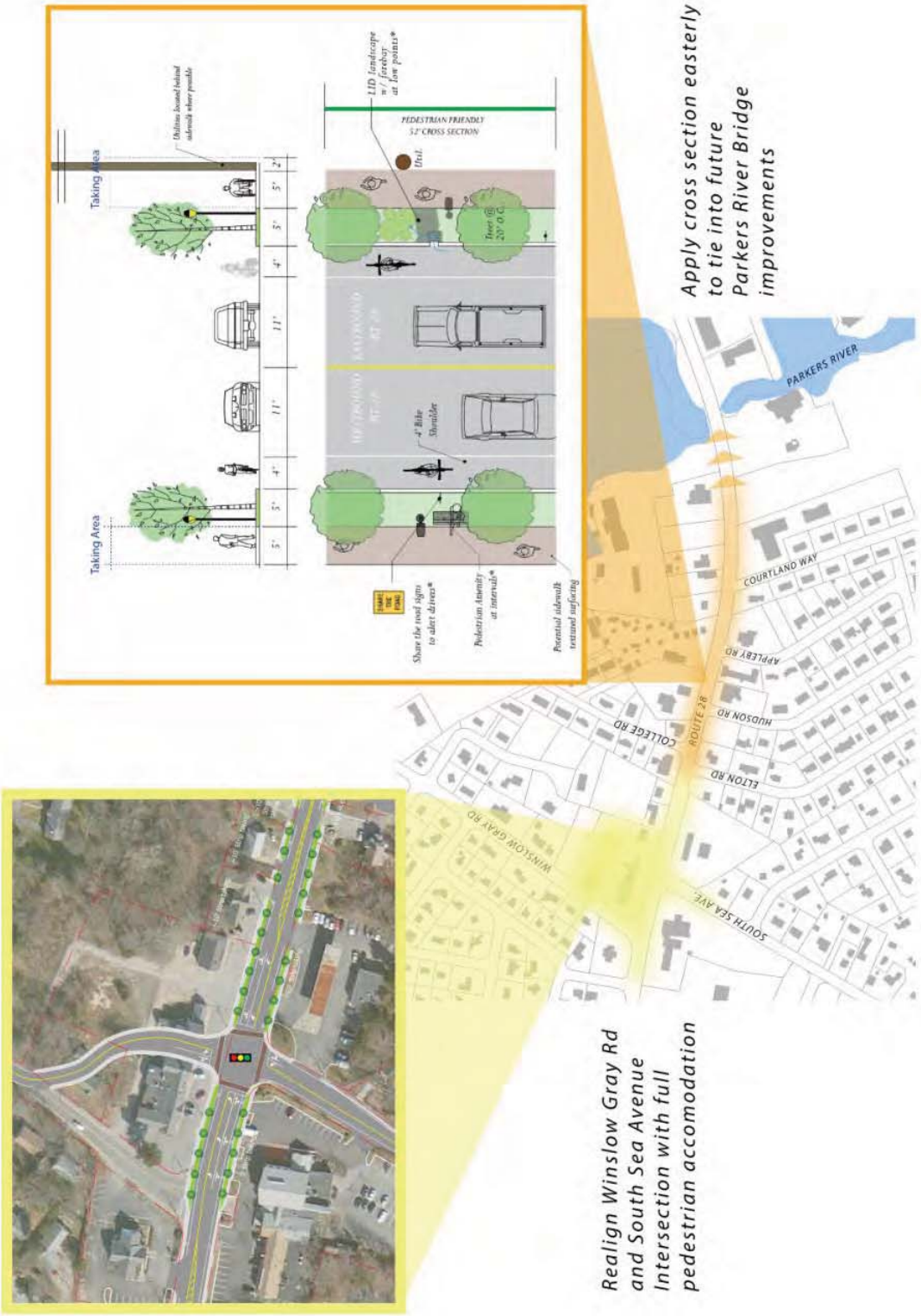

FIGURE 36-PHASE I IMPROVEMENT PLAN

FIGURE 37- POTENTIAL TAKINGS REQUIRED FOR PHASE I REALIGNMENT

NEGOTIATE WITH ABUTTING PROPERTY OWNERS TO ALTER ROAD LAYOUT

This study recommends that town staff continue negotiations with the necessary property owners for acquisition of the two parcels necessary for the realignment of Winslow Gray Road. As part of this process, it is recommended for the town to work with a professional real estate consultant to perform an accurate inspection of the properties abutting the proposed intersection and take into consideration the potential market factors that may influence their value, by issuing an appraisal and pro forma (financial statement used to estimate cash outlay and potential return on investment if underlying assumptions hold true). A pro forma developed at this early stage should communicate benefits to both public and private interests in order to attract developers or obtain public investment.

The potential cost to the town of purchasing these properties (based on 2012 County of Barnstable Assessors data) is $820, 000. The town will need to identify a funding strategy for this action, and obtain public support necessary to approve the transaction. If the town is unable to secure these parcels for the realignment, Option 1 upgrades to the signals should be pursued.

IMPLEMENT STREETSCAPE IMPROVEMENTS EXPANDING THE STATE OWNED RIGHT OF WAY TO 52′ EASTERLY TO THE PARKERS RIVER BRIDGE

As shown in the Phase I improvement plan (Figure 36) this study recommends that the town implement full streetscape improvements from the proposed intersection realignment easterly to tie into future improvements at the Parkers River Bridge. This widened cross-section would create a better sense of place and improve community character with universal accommodation and landscaping upgrades. After establishing this gateway to Route 28, this study recommends replicating this roadway treatment in future roadway improvements along the corridor.

The proposed cross-section would require minimal strip takings/permanent easements on either side of the roadway, which for the purposes of the analysis was estimated at approximately 5-10 feet on either side of the roadway at a cost to be borne by MassDOT.[3] It is recommended that Town staff work closely with MassDOT representatives in negotiating right-of-way alterations with landowners.

SUBMIT A PROJECT NOTIFICATION FORM (PNF) TO ADVANCE PHASE I PROJECT COMPONENTS TO THE TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

In order to advance these project components to the TIP, this study recommends submitting a PNF for the approximately $3.5 million roadway realignment and streetscape improvements described above. CCC staff is available to assist in negotiating the submission process, which requires Cape Cod Metropolitan Planning Organization (MPO) endorsement.

SUBSEQUENT PHASES

In subsequent TIP years, or utilizing a mixture of grants and Chapter 90 funds, this study recommends the following improvements be implemented in the near future to fully realize the goals of this Living Street project.

SIGNALIZE THE ROUTE 28/SEAVIEW INTERSECTION:

As evidenced in staff analysis, a signal is warranted at this intersection. The estimated cost of signalizing this intersection including signal heads, controllers, detection, lane markings, crosswalks, and other typical specifications is $1.5 Million.

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[3] *The values within are based on information from the County assessor's database (2012). This data is a point in time valuation that reflects the market conditions of that day, and assumes the properties are functioning at their highest potential. The methodology used here was that of a rough estimate, where the average assessed values of all lots along the study area (SUM/# of parcels), were divided by the average acreage (SUM of acreage/all parcels) to determine an average value per SF. This was then assigned to the new parcel size. This estimate takes into consideration both developed and undeveloped lots currently along the corridor, and does not factor for any potential rise in land values due to improvements to the corridor.*

UPGRADE SIGNAL EQUIPMENT AT THE ROUTE 28/FOREST ROAD INTERSECTION:

In order to improve safety and improve traffic flow, it is recommended that the town upgrade the signal equipment at the Forest Road and Route 28 intersection including new signal heads, controllers, and some additional detection. Potential cost of this option is $500,000. The town may also choose to consider removal of the "no right turn on red" signs at this intersection. The pedestrian phase of the signal timing plan would need to be adjusted to safely and efficiently accommodate this change.

UPGRADE ROADWAY LAYOUT EASTERLY OF THE PARKERS RIVER BRIDGE:

The Town of Yarmouth Planning Board endorsed the concept of applying a fully accommodating cross section for the entirety of the study area. Depending on costs, streetscape improvements may need to be phased over multiple years. The following outlines priority sections as recommended by the Yarmouth Planning Board:

a. Complete streetscape improvements from the Winslow Gray intersection to the Seaview Avenue intersection.

b. Complete streetscape improvements from the Seaview Avenue intersection to Willow Street.

CONCLUSION & INTERIM STEPS

A thorough analysis of this segment of Route 28 revealed the complicated and expansive upgrades that must be done to encourage a shift in the mode of travel on the local level. In seeking to alter this transportation network from an auto-centric throughway to a Livable Street, the study benefitted from a participatory process that engaged the town as a partner in these goals. As it can take many years to see this change occur on the ground, it is recommended that the town pursue interim steps to display public investment to visitors and residents alike, including:

- Repainting of existing crosswalks with additional signage as appropriate.
- Continue working with abutting properties on access management plan through town permitting process.
- Locating CCRTA bus stops, shelters, and bicycle racks in key locations as recommended.
- Implementing ADA ramps at problematic locations.
- Working with local garden clubs and landscaping companies to sponsor landscaping improvements and/or seasonal displays.

Appendix

- Attachment A: Maps digitized from focus group meetings May 2013
- Attachment B: Final presentation to the Yarmouth Board of Selectmen, November 19, 2013
- Attachment C: Yarmouth Planning Board Memo July 22, 2013
- Attachment D: Yarmouth Planning Board Memo November 7, 2013

ATTACHMENT A: ROUTE 28 Study

Yarmouth Route 28 Study: AREA 1
(West Yarmouth Road to Seaview)

NOTES FROM MARCH 21 WORKSHOP

Legend

- Telephone Pole
- Base_Layers.DBO.yaw_Footprints
- Yarmouth Parcel Lines, 2011

480 240 0 480 Feet

CAPE COD COMMISSION

ATTACHMENT A: ROUTE 28 Study

Yarmouth Route 28 Study: AREA 2
(Seaview Ave to Willow Street)

NOTES FROM MARCH 21 WORKSHOP

Legend

- Telephone Pole
- Base_Layers.DBO.yaw_Footprints
- Yarmouth Parcel Lines, 2011

480 240 0 480 Feet

CAPE COD COMMISSION

ATTACHMENT A: ROUTE 28 Study

Yarmouth Route 28 Study: AREA 3
(Willow St to Forest Rd)

NOTES FROM MARCH 21 WORKSHOP

Legend

- Telephone Pole
- Base_Layers.DBO.yaw_Footprints
- Yarmouth Parcel Lines, 2011

480 240 0 480 Feet

CAPE COD COMMISSION

CAPE COD COMMISSION

Yarmouth Route 28 – Living Streets Study

Final Recommendations

Presentation to Yarmouth Board of Selectmen

November 19, 2013

This presentation

CAPE COD COMMISSION

LIVING STREETS Cape Cod

- **Background Information**
- **Work to Date**
- **Findings**
- **Initial Recommendations**
- **Planning Board Suggestions**
- **Next Steps**

Study Area

GOALS OF THIS STUDY:

CCC for MASS DOT Unified Planning (UPWP) TASK 3.3

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- **Reduce conflicts, improve traffic flow** and incorporate multi-modal transportation options along the Route 28 corridor
- Further the creation of **vibrant, mixed-use centers** along the roadway.
- Provide **safe accommodation of pedestrians and bicycles**
- Incorporate **Low Impact Development (LID) techniques to mitigate stormwater runoff**.
- Establish a **preferred roadway redesign** which addresses the above and reflects a planning window of 2033.
- Ensure preferred alternatives are transferrable to a Massachusetts Department of Transportation (MassDOT) Project Need Form (PNF) and Project Initiation form (PIF) at project completion.

Work to Date

CAPE COD COMMISSION

- Kickoff Taskforce Meeting
- Data Collection/Site Visits
- Mapping and Analysis
- Identification of Opportunities
- Focus Group Meetings
- Planning Board Presentation of Interim Concepts
- Board of Selectmen Endorsement of Concepts
- Refinement and Technical Review
- Final Reporting

Findings & Considerations

-Crash History and Level of Service
-Bike & Pedestrian connectivity
-Signal performance
-Problematic Intersections
-Community Character goals
-Roadway Constraints
-Stormwater Constraints

Crash History and Level of Service

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- Crashes spread along the corridor - related to the many driveways and curb cuts
- Mainly rear-end crashes, also a significant number of angle crashes
- High crash totals at the Winslow Gray Road and South Sea Avenue intersections
- Congestion along the corridor causes failing Level-of-Service at unsignalized locations

Finding: Poor access management combined with high volumes results in corridor-wide safety and congestion issues.

Bike & Pedestrian Connectivity

ROUTE 28 YARMOUTH | *SIDEWALK CONNECTIVITY*

SIDEWALK INCOMPLETE OR IMPASSABLE

Finding: There is a high volume of users- both bike and pedestrian, along the roadway, but poor accommodation. This is a character and a safety issue.

Traffic Signal Performance

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- **All Existing study area Traffic Signal Equipment is limited in effectiveness:**
  - Over 30 years old
  - Timing schemes cannot be optimized
  - Certain detection (loops) areas unavailable
- **Seaview Avenue intersection meets warrants for signalization**
  - Meets 5 warrants* based on various patterns of traffic volumes

Manual on Uniform Traffic Control Devices

Finding: Traffic signal equipment should be upgraded at all intersections within the study area.

Problematic Intersections

ROUTE 28 YARMOUTH | *PRIORITY INTERSECTIONS*

Land Use goals & Community Character

CAPE COD COMMISSION

- Streetscaping is essential to Economic Development and Village Center revitalization goals, as it creates a sense of place. The current sidewalks are disconnected, and much of the road frontage lacks landscaping or tree canopy
- The investment that a community makes in implementing Complete Streets can stimulate private investment, especially in retail districts and downtowns where pedestrians and cyclists feel unwelcome.

Finding: The current roadway is incongruous and disconnected, and does not provide much pedestrian amenity of safe lighting.

Roadway Constraints

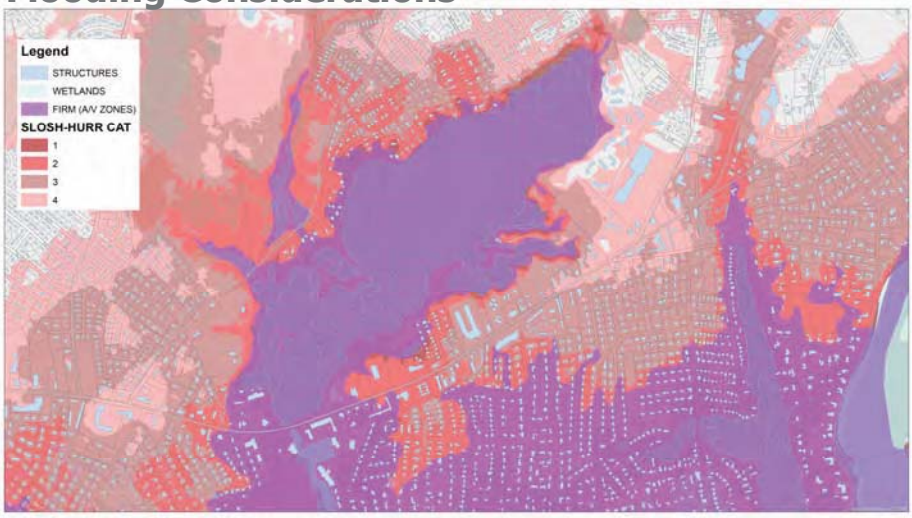
Finding: State Right of Way is constrained to 40' in most areas, and improvements beyond the current configuration would require takings.

Route 28 Yarmouth | Potentially Affected Properties

Findings:

- Utilities present conflict primarily on North Side
- North side properties have higher ratio of buffered frontage to parking in front
- Greater # of takings would be required east of Parkers River Bridge

Flooding Considerations



Route 28 Yarmouth | STORM INUNDATION AND FLOOD POTENTIAL

Finding: The entirety of the study area lies in an area subject to inundation. Increasing pervious surface and landscaping would improve road safety by decreasing the risk of standing water.

Initial Recommendations: All Concepts

As presented to Yarmouth Planning Board 10/16

-50' Streetscape cross section in selected areas
-Potential Realignment at Winslow Gray/South Sea Ave.
-Signal Upgrade and coordination at Forest Road
-Signalization of Seaview Avenue.

Improving the cross section of the roadway:

Improve/expand to accommodate bike/pedestrian safety, community character

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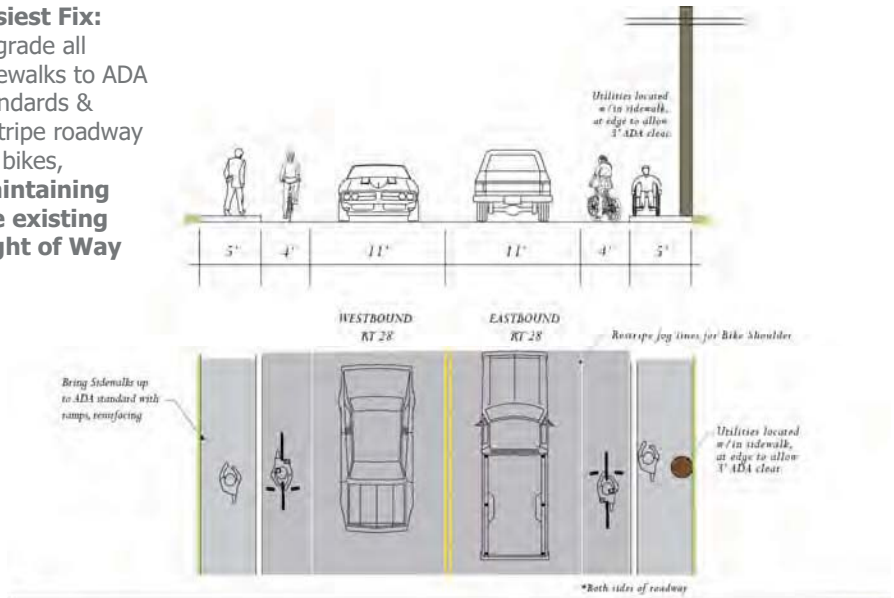
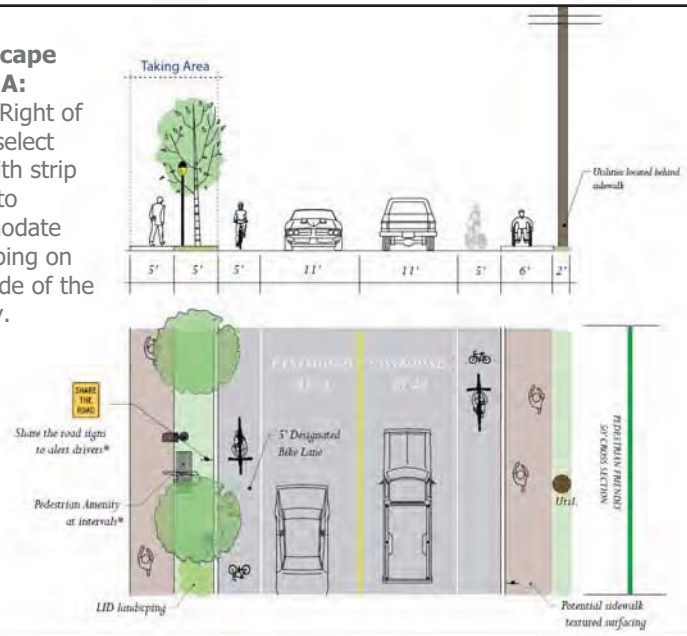
- **Current Road layout at 40' in most areas, 50' at turning lanes.**
- **Current Road layout would require ADA upgrades to accommodate bike/ped.** *See left*
- **Any expansion above the 40' ROW would require takings.**
- **MassDOT has right to take land, or pay a fee taking.**
- **Strip takings evaluated at an average of $6 per square foot**

Easiest Fix:
Upgrade all sidewalks to ADA standards & restripe roadway for bikes, **maintaining the existing Right of Way**



Rt 28 Yarmouth
PROPOSED 40' STANDARD LAYOUT

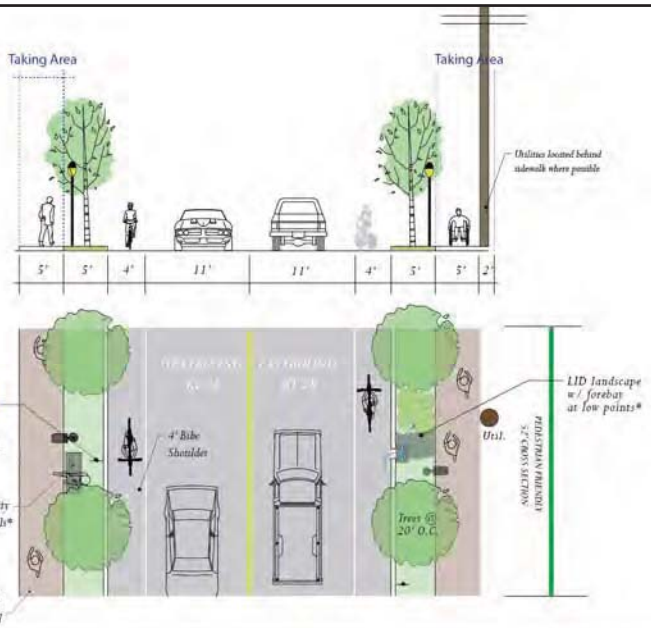
Streetscape Option A:
Expand Right of Way in select areas with strip takings to accommodate landscaping on South side of the roadway.



Rt 28 Yarmouth
PROPOSED OPTION B: +/-50' STREETSCAPE LAYOUT

Streetscape Option B:
Endorsed by YPB 10/16

Expand Right of Way with strip takings in select areas to accommodate landscaping on both sides of the roadway.



Rt 28 Yarmouth
PROPOSED OPTION A: +/-52' STREETSCAPE LAYOUT

CAPE COD COMMISSION

Estimated Street Cross Section Costs:

Expand to Accommodate Bike/Ped, Community Character
(Costs per mile – West Yarmouth Rd to Forest Rd = 1.7 mi.)

CAPE COD COMMISSION

Order of Magnitude Cost of Resurfacing/ **Sidewalk upgrades for ADA compliance** (keeping w/in ROW):	**$1.7 Million**	**Per Mile**
Order of Magnitude Cost of expansion to **50' with green strip on one side**, ADA sidewalks, resurfacing and strip taking (assumes $6/s.f. for takings):	**$2.3 Million**	**Per Mile**
Order of Magnitude Cost of expansion to **52' with green strip on both sides**, ADA sidewalks, resurfacing and strip taking (assumes $6/s.f. for takings):	**$2.7 Million**	**Per Mile**
Order of Magnitude Cost of **Streetlights/Benches/Trash Cans/Signage**	**$130,000**	**Per Mile**
Order of Magnitude cost for **landscaping over and above MassDOT Standard** (LID)	**$20,000**	**Per Mile**

**MassDOT will maintain basic design elements as specified in their design manual, and will not fund or maintain additional amenities, including electricity to privately funded fixtures.*

Winslow Gray/South Sea

Potential Realignment to create gateway, reduce conflict

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Build Option 1

- New traffic signal controller
- Add video detection approaches
- Retime traffic signal
- Add pedestrian- actuated count down signal heads
- Add accessible ramps
- Move sidewalk obstructions or diverting sidewalk around obstructions

Winslow Gray/South Sea

Potential Realignment to create gateway, reduce conflict

Endorsed by YPB 10/16

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Build Option 2

- Realign intersection into a single 4-way intersection
- Keep the number of lanes on each approach the same as existing
- Employ access management strategies to limit curb cuts in the vicinity of the new signal
- Provide full bicycle and pedestrian accommodations
- Consider redevelopment options for the reorganized lots north of Route 28

Note: Graphical depictions of design ideas and are conceptual in nature, further analysis required.

Winslow Gray/South Sea

Potential Realignment to create gateway, reduce conflict

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Build Option 3

- Realign intersection into a single 4-way intersection
- Flare Route 28 approaches to accommodate dedicated left, through, and right lanes
- Employ access management strategies to limit curb cuts in the vicinity of the new signal
- Provide full bicycle and pedestrian accommodations
- Consider redevelopment options for the reorganized lots north of Route 28

Winslow Gray/South Sea

Potential Realignment to create gateway, reduce conflict

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Build Options	Approx. Cost*	ROW Impacts	Safety Improvement	Congestion Improvement	Bike/Ped Improvement
1 Signal & ADA Upgrades	$500,000	Minimal - related to sidewalk obstacles	Minimal	Minimal	Ped – Significant Bike - Minimal
2 Realign to single 4-Leg	$3.0 Million	Reorganization + small strip taking	Significant	Moderate	Significant
3 Realign to single expanded 4-Leg	$3.5 Million	Reorganization + significant strip taking	Significant (additional conflicts over Option 2)	Moderate (minimal improvement over Option 2)	Significant (additional conflicts over Option 2)

*Approx. cost does not include Right-of-Way (ROW) costs

Forest Road and Seaview Ave.

Proposed upgrades and signalization

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- **Seaview Avenue: Install traffic signal. Estimated cost including signal heads, controllers, detection, lane markings, crosswalks, etc.: $1.5 Million**
- **Forest Road: Upgrade of signal equipment including new signal heads, controllers, some additional detection: $500,000**
- **Forest Road: Allow Right Turn on Red.**
  - 12%+ reduction in delay
  - Modify pedestrian phase from exclusive to concurrent
  - May compromise safety if bicyclist & pedestrian activity increase

Additional Recommendations

-Stormwater Mitigation
-Bus Accommodation
-Access Management

Planning Board Suggestions for Phased Approach 11/7/13

Planning Board Recommendations

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- A combination of all recommendations for entire study area results in a funding request of approximately **$5 to $11 million**
- The approximate Transportation Improvement Program (TIP) budget for Cape Cod is 7.5 million, with the average project at **$3-4 million**
- Phased approach **breaks the project into subcomponents** that could spread over several TIP years

Planning Board Recommendations: Phase I

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Phase 1 Project –Winslow Gray/South Sea Intersection:

*a. Request the Cape Cod Commission develop a Phase 1 project for Option 2 showing a **realigned, signalized Winslow Gray/South Sea intersection incorporating an Option B streetscape section with tree belts throughout the project.** The eastern and western limits of the streetscape improvements will be dependent upon remaining within the $3.5 million budget.*

*b. Request that the Cape Cod Commission **show in more detail the impacts associated with strip takings** for the Phase 1 project.*

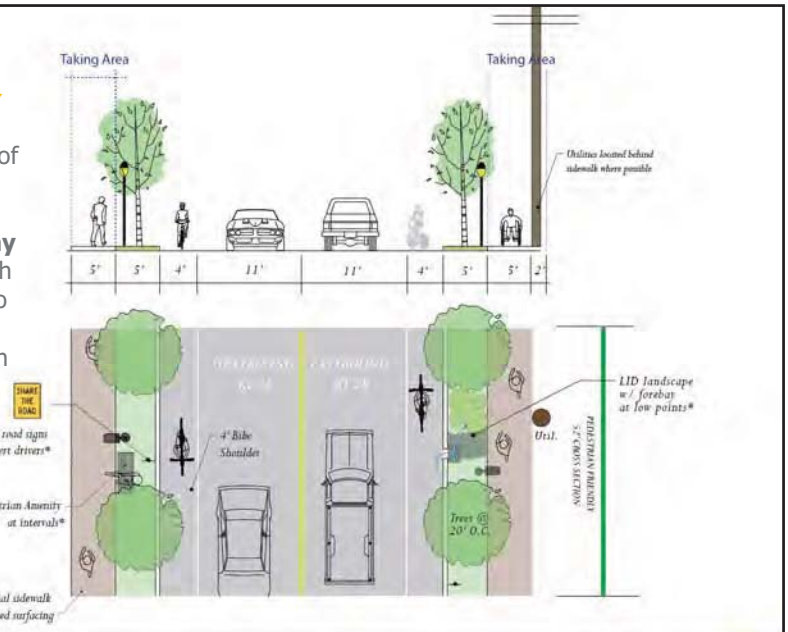
Preferred Alternative for Re-alignment

Existing Conditions : Looking east

Potential Conditions : Looking east

PHASE 1B: $500,000

Streetscape Option B:
Endorsed by YPB 10/16
Expand Right of Way **from realigned Winslow Gray to Bridge** with strip takings to accommodate landscaping on both sides of the roadway.



Rt 28 Yarmouth
PROPOSED OPTION A: +/-52' STREETSCAPE LAYOUT

Approximately 1/4 mile/$500,000 of roadway upgrades, Including approximately 45,000 SF of strip takings

Approximately 1/4 mile/$500,000 of roadway upgrades, Including approximately 45,000 SF of strip takings

Planning Board Recommendations: Phase I

CAPE COD COMMISSION

Phase 1 Project –Winslow Gray/South Sea Intersection:

*c. With assistance from the Cape Cod Commission, complete a **Project Need Form (PNF)** for submission to MassDOT. This would open further dialogue with MassDOT and could include public outreach and informational meetings. If there is local support, the project could then advance to a Project Initiation Form (PIF).*

*d. **Town staff to continue negotiations with the property owner** of Great Island Plaza for acquisition of two parcels necessary for the realignment of Winslow Gray Road. If the Town is unable to secure these parcels for the realignment, Option 1 upgrades to the signals and Option B streetscape improvements should be pursued.*

Proposed Town Investment

Potential Land Value after Re-alignment

Planning Board Recommendations: Phase II

Phase 2 Project –Seaview Avenue Signalization and Forest Road Signal Upgrade:

a. Install traffic signals and green belts at the Seaview Avenue intersection. ($1.5 million)

b. Upgrade the signal equipment at the Forest Road intersection. ($500,000)

Planning Board Recommendations: Phase III

Phase 3 Project – Streetscape Improvements:

Depending on costs, streetscape improvements may need to be phased over multiple years. The following outlines priority sections.

*a. **Phase 3a**: Complete streetscape improvements from the Winslow Gray intersection to the Seaview Avenue intersection.*

*b. **Phase 3b**: Complete streetscape improvements from the Seaview Avenue intersection to Willow Street.*

Next Steps

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Draft Report to MassDOT will be made public in next few weeks, Final report to follow 30 day comment period

Step I: ***Looking for BOS to:***

- Approve the phased concept
- Approve phase 1 for further investigation/PNF
- Direct town staff to continue to work with the landowners and consultants to obtain the necessary parcels, further evaluation of the impacts to individual lots, and investigate potential funding stream.

Next Steps

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Step II:

- Secure funding through the Town meeting process
- Continue discussion with landowners, and hire a real estate consultant for pro forma analysis & appraisal.
- Complete interim steps to improve the quality of the roadway character
- Complete draft Project Notification Form (PNF) from CCC and submit to MassDOT

Process: PNF -->PIF --> MassDOT Review --> Issuance of Project # to be TIP eligible --> MPO process to secure place on the Transportation Improvement Projects (TIP) list

Next Steps

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Step III:

- **Purchase land**
- **Secure place on the TIP (est. 2018-2019)**

Feedback?

CAPE COD COMMISSION

Contact

Tabitha Harkin
Community Design Planner
Phone: 508-362-3828
tharkin@capecodcommission.org

Thank You for attending!

Project materials available at:
www.capecodcommission.org

TOWN OF YARMOUTH

1146 ROUTE 28, SOUTH YARMOUTH, MASSACHUSETTS 02664-24451
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Planning Division

MEMORANDUM

To: Erik Tolley, Chairman
Yarmouth Board of Selectmen

cc: Tabitha Harkin, Cape Cod Commission
Karen Greene, Director of Community Development

From: Chris Vincent, Chairman
Yarmouth Planning Board

Date: July 22, 2013

Subject: Cape Cod Commission Route 28 Traffic Study

The Cape Cod Commission is making progress with the traffic and street improvement analysis requested by the Town for the segment of Route 28 from West Yarmouth Road to Forest Road. The Commission gave a presentation on general concept ideas to the Planning Board at their June 19, 2013 meeting. The Commission will be coming before the Board of Selectmen at their August 6, 2013 meeting to garner input from the Selectmen on the work completed to date and receive direction on how to proceed with the remainder of the study.

The Planning Board discussed the concept ideas and presentation materials at their July 17, 2013 meeting. In general, the Planning Board felt that improvements to the intersections should be done first to improved the flow of traffic, then proceed to improvements to the roadway cross section. This phasing concept will also give time to address the replacement of the Parker's River bridge and develop a better understanding of what is happening at the Marina site. Acknowledging that the projects may need to be phased for funding purposes, the following is a priority and preference list developed by the Planning Board at their July 17th meeting for consideration by the Board of Selectmen:

1. **Winslow Gray/South Sea Avenue Intersection**: This intersection has been discussed for many years and is deemed the highest priority for the Planning Board. The Planning Board prefers a four-way signalized intersection over a roundabout. It was felt that a roundabout would take up too much land and impact the future development of adjacent parcels.

2. **Forest Road Intersection:** The signal at this intersection should be upgraded and coordinated with the other signals along Route 28. No physical changes to the roadway appear warranted at this time. A roundabout is not recommended.

3. **Seaview Avenue:** Installation of a signal at Seaview Avenue is recommended to improve left hand turning movements onto Route 28 during the height of the tourist season. This light may only need to be used seasonally, and could be a flashing signal during the off-season. A signal at this intersection will help to reduce frustration and improve the overall experience for visitors. There is also the potential for significant redevelopment along South Shore Drive which would benefit from this signal.

4. **Roadway Section Reconstruction:** The CCC has developed a roadway section that could be contained within the existing 40' right-of-way and would accommodate vehicles, bicyclists and pedestrians. The Planning Board is in favor of a wider cross section that would create 11' travel lanes, 4' bike accommodations, 5' green strips and 5' sidewalks, resulting in an overall cross section of 50'. The Planning Board strongly felt that a green belt with street trees was more in line with the vision the Board had for this area during the Village Centers Overlay District (VCOD) planning process. The Planning Board supports using easements over land takings to reduce some of the negative zoning impacts to abutting properties. Impacts to buffer areas and parking spaces will need to be looked at on a parcel by parcel basis.

ATTACHMENT D: ROUTE 28 Study

TOWN OF YARMOUTH

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Planning Division

MEMORANDUM

To: Erik Tolley, Chairman
Yarmouth Board of Selectmen

cc: Tabitha Harkin, Cape Cod Commission
Karen Greene, Director of Community Development

From: Chris Vincent, Chairman
Yarmouth Planning Board

Date: November 7, 2013

Subject: Cape Cod Commission Route 28 Traffic Study – Refined Design Concepts

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The Cape Cod Commission is nearing completion of the traffic and streetscape improvement study requested by the Town for the segment of Route 28 from West Yarmouth Road to Forest Road. The Commission gave a presentation on refined concept designs to the Planning Board at their October 16, 2013 meeting. These refinements reflect input and recommendations from the Board of Selectmen, Planning Board, and MassDOT. The Commission will be making a presentation before the Board of Selectmen at their November 19, 2013 meeting to garner further input from the Selectmen prior to finalizing their report.

Based on previous recommendations from the Board of Selectmen and the Planning Board, the CCC prioritized their design refinements on the realignment of the Winslow Gray/South Sea intersection and a 50' streetscape cross section with tree belts. The CCC presentation to the Planning Board included 3 improvement options for the Winslow Gray/South Sea intersection (Options 1, 2 & 3), and two expanded streetscape cross section options (Options A & B). The presentation also included order of magnitude cost estimates to give a general idea of the cost variations between the options.

The Commission also has recommended developing the project in smaller phases that could be funded in a single year under the Transportation Improvement Program (TIP), rather than attempting to move forward with one large project. The TIP has approximately $7.5 million annually for transportation projects across the entire Cape. The Commission has estimated that keeping project costs to $3.5 million or less would maximize the likelihood of funding.

The Planning Board discussed the refined design concepts and potential phasing of the overall project at their November 6th meeting. In general, the Planning Board recommended phasing that would maximize the benefits from this public investment by improving traffic congestion and safety, fostering redevelopment of underutilized properties and promoting economic development along Route 28.

1. **Phase 1 Project –Winslow Gray/South Sea Intersection**:

    a. Request the Cape Cod Commission develop a Phase 1 project for Option 2 showing a realigned, signalized Winslow Gray/South Sea intersection incorporating an Option B streetscape section with tree belts throughout the project. The eastern and western limits of the streetscape improvements will be dependent upon remaining within the $3.5 million budget.

    b. Request that the Cape Cod Commission show in more detail the impacts associated with strip takings for the Phase 1 project.

    c. With assistance from the Cape Cod Commission, complete a Project Need Form (PNF) for submission to MassDOT. This would open further dialogue with MassDOT and could include public outreach and informational meetings. If there is local support, the project could then advance to a Project Initiation Form (PIF).

    d. Town staff to continue negotiations with the property owner of Great Island Plaza for acquisition of two parcels necessary for the realignment of Winslow Gray Road. If the Town is unable to secure these parcels for the realignment, Option 1 upgrades to the signals and Option B streetscape improvements should be pursued.

2. **Phase 2 Project –Seaview Avenue Signalization and Forest Road Signal Upgrade**:

    a. Install traffic signals and green belts at the Seaview Avenue intersection.

    b. Upgrade the signal equipment at the Forest Road intersection.

3. **Phase 3 Project – Streetscape Improvements**: Depending on costs, streetscape improvements may need to be phased over multiple years. The following outlines priority sections.

    a. **Phase 3a**: Complete streetscape improvements from the Winslow Gray intersection to the Seaview Avenue intersection.

    b. **Phase 3b**: Complete streetscape improvements from the Seaview Avenue intersection to Willow Street.

CAPE COD COMMISSION

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