



CAPE COD  
COMMISSION

# Shank Painter Road Corridor Study Provincetown

September 2012





# Executive Summary

At the request of the Provincetown Selectmen, Cape Cod Commission staff have prepared a study of Shank Painter Road in regard to safety and accommodation of motorists, pedestrians and bicyclists. This study included an extensive public outreach process to incorporate concerns of area stakeholders.

As a primary access way to the downtown business district and a destination in and of itself, Shank Painter Road is frequented not just by motorists but by many pedestrians and bicyclists. This is despite minimal (or no) sidewalks or bike facilities at many segments along the road. There are many stretches of roadway with wide-open curb cuts serving businesses. Most of Shank Painter Road's "sidewalk" is merely roadway shoulder with pavement markings designating pedestrian use.

An analysis of motor vehicle operations and review of crash history show a good level of service and 10 reported crashes from the period from 2006-2008. These results suggest that operations and safety are adequate for motorists. The existing road design is prone to flooding during heavy rains. Roadway runoff directly discharges into nearby wetlands leading to decreased water quality and introduction of pollutants in environmentally sensitive areas.

Alternatives were identified including stormwater improvements, removing overhead utilities and installing them underground, and several alternative cross sections to accommodate the various categories of roadway users. The following list is a summary of the recommendations:

- Stormwater Improvements
  - Infiltration trenches
  - Rain gardens
  - Gravel filters
  - Grassy swales
  - Bioinfiltration basins
  - Roof disconnectivity
  - Porous pavers/permeable pavement
- Remove overhead utilities and install them underground
- Variable cross sections to include two bike lanes throughout and sidewalks as noted:
  - From Route 6 to Court Street: 47' includes sidewalks on both sides
  - From Court Street to Browne Street: 47' includes at-grade sidewalk on west side, traditional sidewalk on east side
  - From Browne Street to Bradford Street: 39.5' includes sidewalk on west side
- Curb cut consolidation, sidewalk buffers and access management improvements

The expected cost to construct the recommended cross sections (shown in the following figure) is \$1.025 million. Next steps include a cooperative effort between Provincetown officials and the Cape Cod Commission to explore funding opportunities such as the Cape Cod Transportation Improvement Program (TIP) and other sources.



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# Introduction

## BACKGROUND – STUDY OBJECTIVES

The Provincetown Selectmen approached Cape Cod Commission transportation staff to assist the Town with conducting a corridor study for Shank Painter Road. Shank Painter Road faces a number of transportation challenges. The roadway provides access for motorists, bicyclists and pedestrians in limited space. There is minimal sidewalk and no bike lanes currently existing within the right-of-way and the roadway has numerous wide driveways.

Shank Painter Road provides access to the commercial district and has the potential to become the main access way for the commercial district. Intersections along Shank Painter Road, including Route 6, Jerome Smith Road, Court Street and Bradford Street (Route 6A) are also a concern for the town.

The Cape Cod Commission 2009 Safety Study highlighted many issues along Shank Painter Road and identified potential solutions to address the pedestrian/bicycle conflicts that currently exist on Shank Painter Road. Cape Cod Commission transportation staff used the 2009 Safety Study to develop preliminary alternatives for Shank Painter Road for presentation at a public information meeting.

The Cape Cod Commission, through a technical assistance request, has conducted a corridor study for Shank Painter Road in Provincetown with the following study goals:

- Through a public outreach effort, determine the roadway width (cross section) that will provide safe and convenient access for all users.
- Identify safe and effective pedestrian and bicycle accommodations along Shank Painter Road.
- Assist Provincetown to identify improvements at key intersections (Route 6, Jerome Smith Road, Court Street and Route 6A) with Shank Painter Road.
- Assist Provincetown to identify funding sources for design and construction of the “Preferred Alternative” for Shank Painter Road.

## STUDY AREA

The study area consists of Shank Painter Road from Route 6 on its northern end to Bradford Street (Route 6A) on its southern end.



FIGURE 1 - STUDY AREA

## PROBLEM IDENTIFICATION/PUBLIC PARTICIPATION PROCESS

The Cape Cod Commission has participated in a series of meetings with town officials and interested members of the public. From initial consultations with town officials, the following problems were identified:

- High-volume, key entrance to commercial district
- Attracts many pedestrians and bicyclists, yet has relatively few accommodations
- Narrow built right-of-ways, many curb cuts
- Perceived safety/congestion issues

Problem identification generated from public meetings includes:

### October 20, 2010 Public Meeting:

- General dislike towards on-street parking (changes road's character)
- Dual sidewalks north of Court Street; only west side south of Court Street
- Interest in underground utilities
- Concerns with storm water management
- How much will it cost, and who will pay?

### April 14, 2011 Public Meeting:

- Concerned with losing on-street parking north of Court Street
- Residents want to look at impacts at driveways
- Concerned with cost of underground utilities
- Storm water can be address with project design
- How much will it cost, and who will pay?

## Existing Conditions

Cape Cod Commission staff have performed several site visits and collected traffic volume and safety data.

### SIDEWALK INVENTORY

Through visits by Cape Cod Commission staff to identify Shank Painter Road's bicycle & pedestrian accommodations, the following summary has been produced:

East side of the roadway:

- 180' sidewalk
- 1,420' curb cut
- 960' no shoulder

West side of the roadway:

- 1,000' painted sidewalk
- No shoulder north of the supermarket

The figure on the following page shows an overview of the roadway's bicycle & pedestrian accommodation's characteristics.

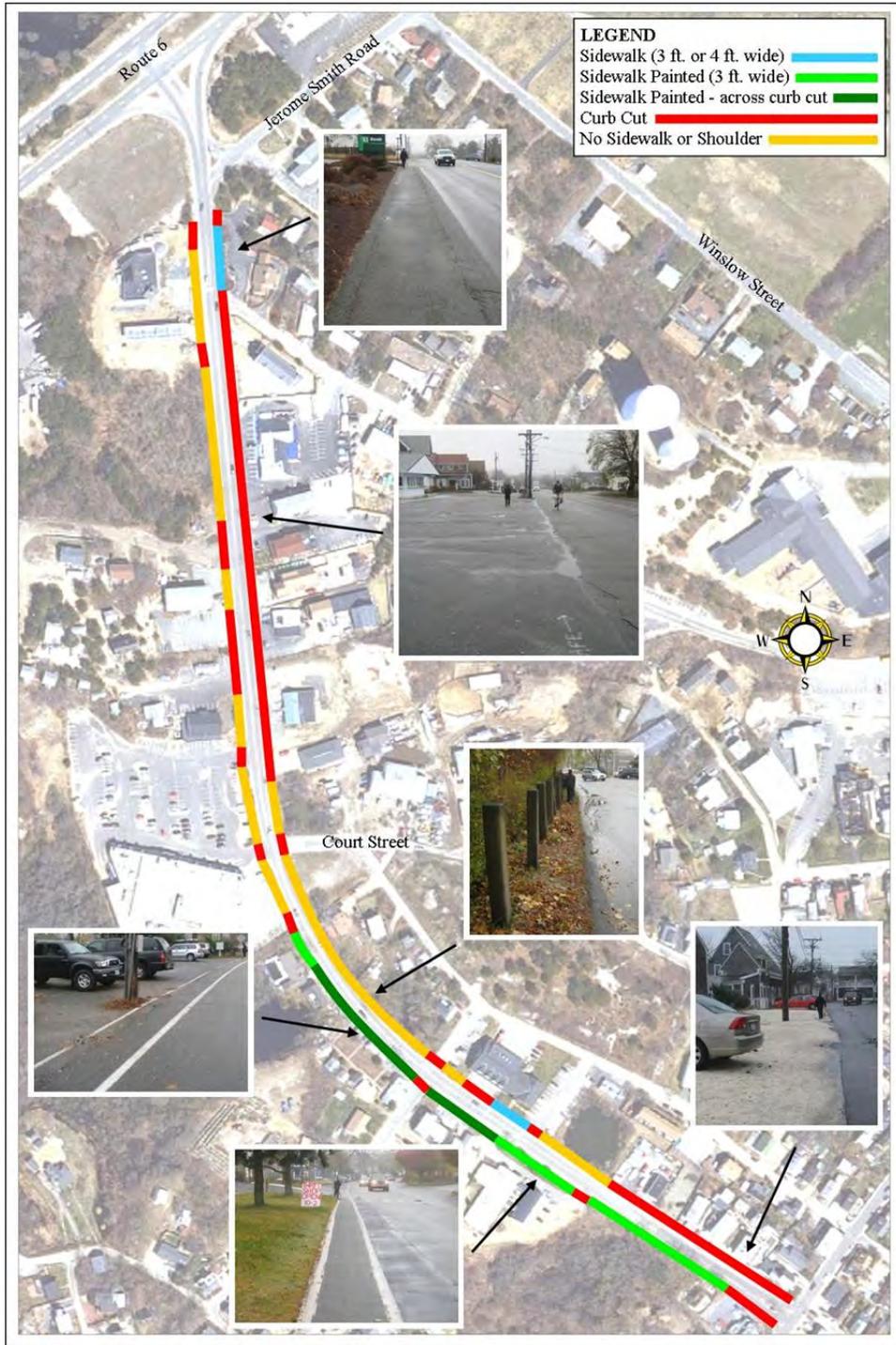


FIGURE 2 - SIDEWALK INVENTORY

## TRAFFIC VOLUMES: ATRS, TMCS

Cape Cod Commission staff collected traffic data using Automatic Traffic Recorders (ATRs) and through manual Turning Movement Counts (TMCs). ATRs consist of a pair of pneumatic tubes stretched across the roadway and connected to a recorder. The recorder monitors traffic in both directions of travel continuously throughout the installation period (usually 48 hours). To monitor operations at intersections, TMCs are collected by manual observations of vehicles turning left, right, and straight.

The following figures present ATR and TMC results for Shank Painter Road in the vicinity of Route 6.

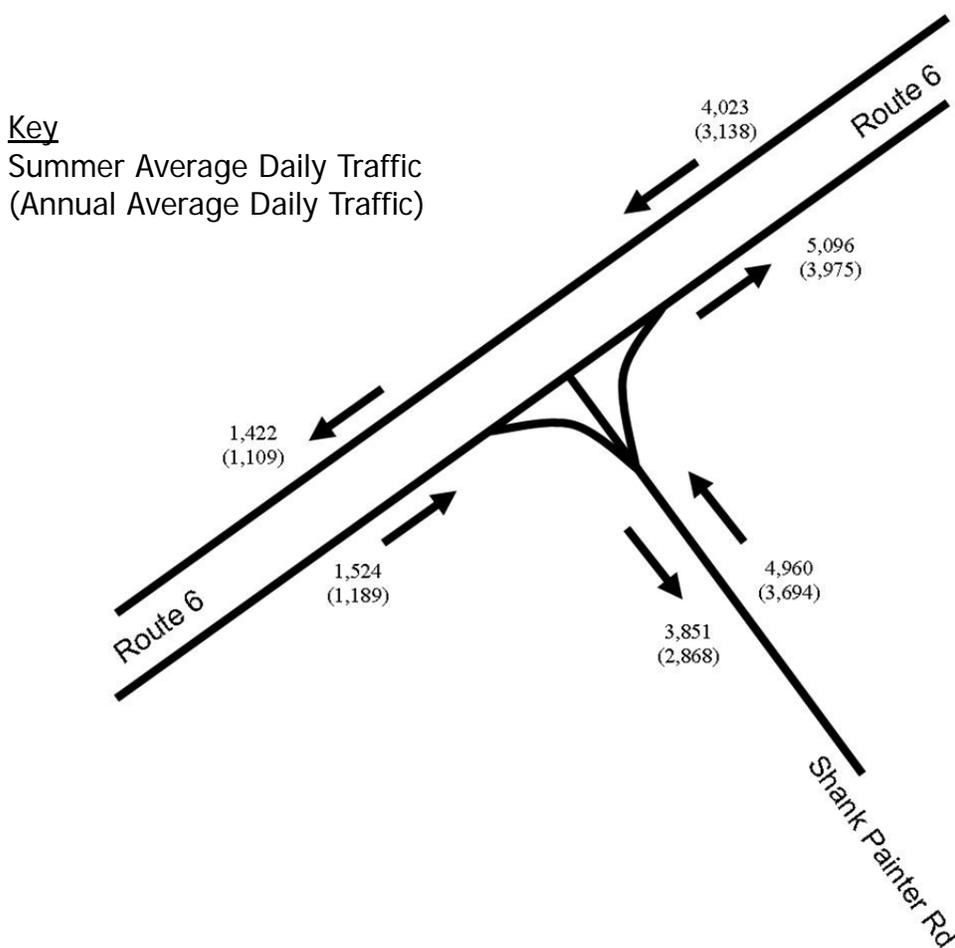


FIGURE 3 - AVERAGE DAILY TRAFFIC

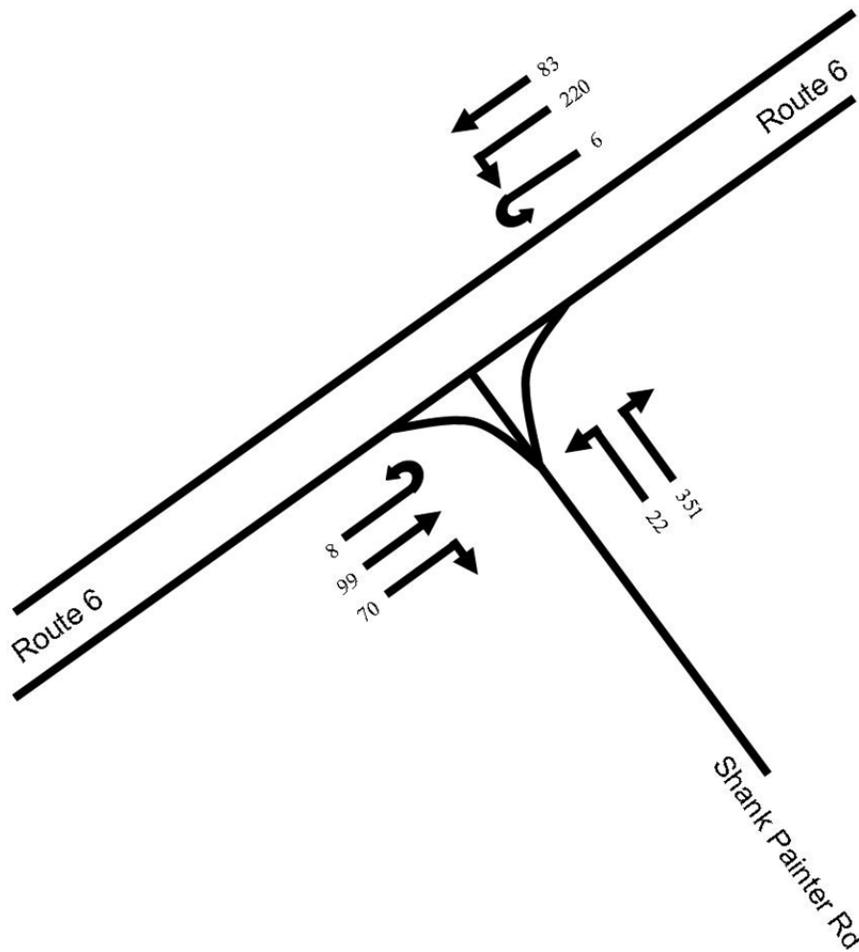


FIGURE 4 - PEAK HOUR TURNING MOVEMENT COUNTS

#### VOLUME TO CAPACITY RATIO

The volume/capacity ratio (“V/C Ratio”) of a roadway is a measurement of congestion. It is a comparison of the road’s volume to the road’s assumed capacity.

Based on its geometric characteristics, Shank Painter Road has a theoretical peak hour capacity of 1000 vehicles per hour. Based on the observed peak hour volume of 611 vehicles per hour, this results in a volume/capacity ratio (V/C Ratio) of 0.61. This ratio corresponds to Level of Service “B” which is considered to be good.

## SAFETY DATA: CRASH HISTORY

There were 10 reported crashes during the period from January 1, 2006 to December 31, 2008.

- 3 Crashes at Route 6/Shank Painter Road
- 4 Crashes at Shank Painter Road / Court Street
- 2 Crashes at Shank Painter Road / Route 6A
- 1 Crash at 25 Shank Painter Road

The following figure provides a graphic depiction of the location, type, and severity of crashes at the Route 6/Shank Painter Road intersection.

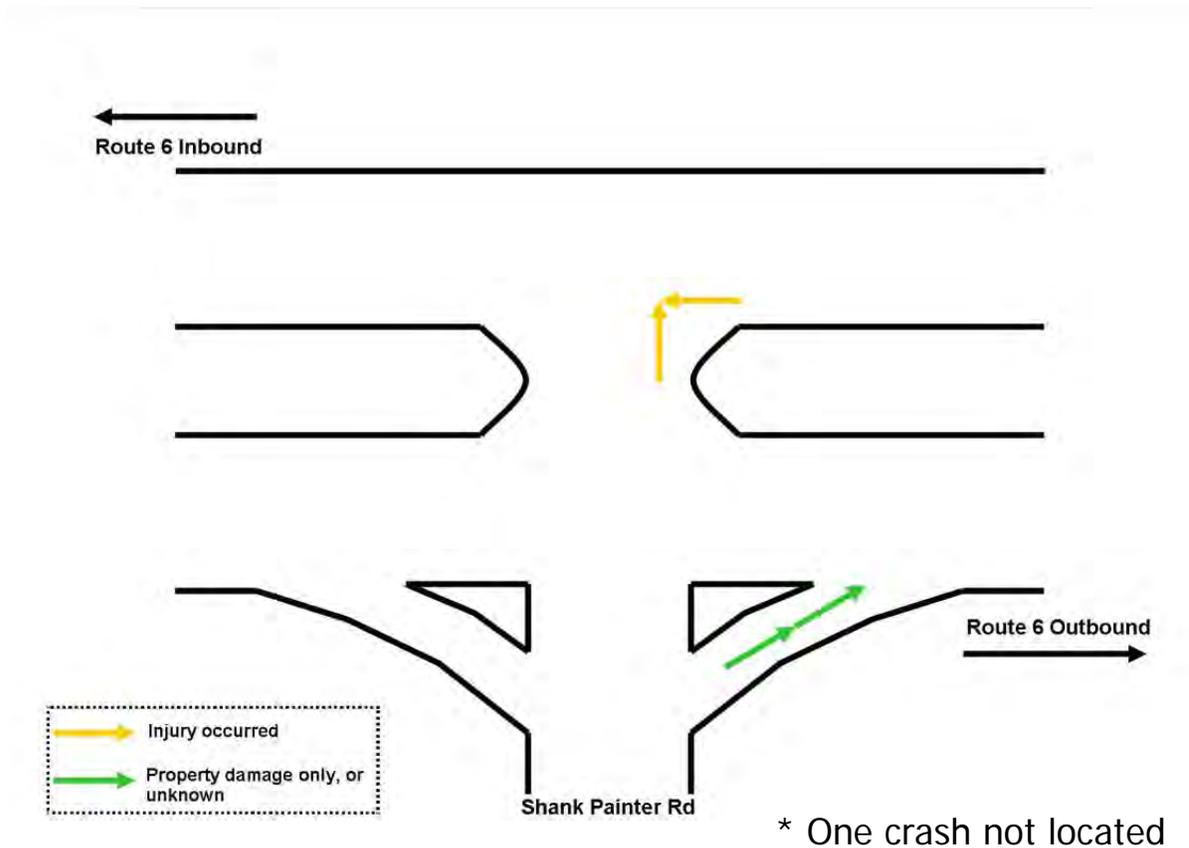


FIGURE 5 - CRASH DIAGRAM

Source: Provincetown Police Department, 2006-2008 Crashes

## ENVIRONMENTAL (STORMWATER)

**The roadway's drainage system is inadequate to handle heavy rains. This results in localized flooding. In addition, roadway runoff directly discharges into nearby wetlands leading to decreased water quality and introduction of pollutants in environmentally sensitive areas.**

## Development of Alternatives

Cape Cod Commission staff, in consultation with Provincetown officials and with input gathered at meetings with the public, has developed several alternatives for further analysis. These alternatives include improvements to stormwater discharges, various roadway cross-sections to better accommodate bicycles and pedestrians, and other corridor changes such as the conversion of utilities from overhead/pole-mounted to underground.

### STORMWATER IMPROVEMENTS

Several stormwater drainage issues were identified for Shank Painter Road:

- High groundwater
- Wetlands (Shank Painter Pond)
- Residential properties contributing runoff
- Shared parking with the roadway
- Limited open space for new drainage features

Potential stormwater disposal options include:

- Infiltration trenches in “planting strips”
- Rain gardens
- Gravel filters
- Grassy swales
- Bioinfiltration basin
- Roof disconnectivity
- Porous pavers/ permeable pavement

A combined approach likely offers the best solution. In addition, there are a few non-municipal solutions such as:

- Residents need to address runoff onto Shank Painter Road
- Eliminate roof drainage using trench drains, or rain gardens
- Eliminate parking area runoff by using gravel trench, porous pavers and rain gardens

## UNDERGROUND UTILITIES

Removing overhead utilities and installing them underground has several positive effects:

- Aesthetics
- Less storm damage
- No safety risk from downed lines

Conversely, there are several negative effects:

- Cost: \$5.3M/mi vs. \$618K/mi for overhead
- Additional \$3K/property to connect to system
- More difficult to service
- More potential for loss of right-of-way

## BUS SHELTERS

Bus shelters provide a safe waiting area for bus patrons, shelter from wind, sun and rain, and are a key feature in building awareness of local bus services. Schedules and transit information are posted for riders. The following considerations should be taken into account during the selection and siting of bus shelters:

- Bus shelters near intersections should be set back from the crosswalk approximately 10 feet to avoid conflicts with pedestrian traffic. If a bus stop is on the far side of an intersection, the shelter should be located a minimum of 40 feet from the crosswalk to allow adequate room for the bus to stop.
- A distance of 3 feet should be allowed between the bus shelter and the curb for free movement in boarding and exiting from the bus.
- Bus shelters should have their long side parallel to the sidewalk to minimize interference with pedestrian traffic.
- Exit and entry openings should be oriented so that people are protected from the wind. However, it is important to keep the side of the shelter facing the street open to allow passengers to board or exit the bus easily.
- **Visibility & Accessibility**

Bus shelters should allow for the maximum visibility of oncoming buses, as well as full deployment of lifts for wheelchair accessibility. Bus shelters should be fully accessible and ADA compliant.

- **Comfort and Convenience**

Shelters should provide a place to sit, protection from weather, and a feeling of safety and security.

- **Information**

People need to know when a bus will arrive and where it will go. This is especially important for people who are unfamiliar with the service, such as tourists.

- **Side Panels**

Side panels should generally not be used on the curbside of the shelter, except on very narrow streets with heavy traffic. If side panels are used on the curbside, an opening at least 3 feet wide needs to be provided to allow people access to the buses.

Side panels should be mounted 3 inches off the ground so that debris will not collect inside the shelter. If more than 3 inches off the ground, they will not keep out drafts.

Side panels should be made of clear glass, as noted below.

- **Roof**

A pitched roof should be used to prevent the collection of rain, snow and debris.

- **Seating and Leaning Rails**

The amount of seating should be based on both the number of people who will use the shelter and the amount of time people will spend waiting. Where people wait for a long time, or where the shelter is used by the elderly or infirm, more seating is generally needed than in areas where the bus comes more frequently.

Leaning rails should be provided whenever possible. A wood rail at 3 feet 6 inches above the ground is best.

- **Lighting**

Lights should be housed in a protective casing to reduce vandalism, and directed so that they illuminate the waiting and boarding areas.

- **Size**

The size of a bus shelter depends on the climate as well as the number of people who are expected to use it. (In order to determine the expected use, count the number of people who currently use a particular stop at different times of day and week.)

**Some examples to follow (shown on next page):**



## 37' CROSS SECTION

This alternative provides sidewalks on both sides of Shank Painter Road with 2' landscaped buffers. Bicycles are accommodated within the travel lanes, possibly through a "share the road" program with signage and pavement markings such as "sharrows." As part of this alternative several curb cuts would be narrowed or combined to improve access management and pedestrian safety.

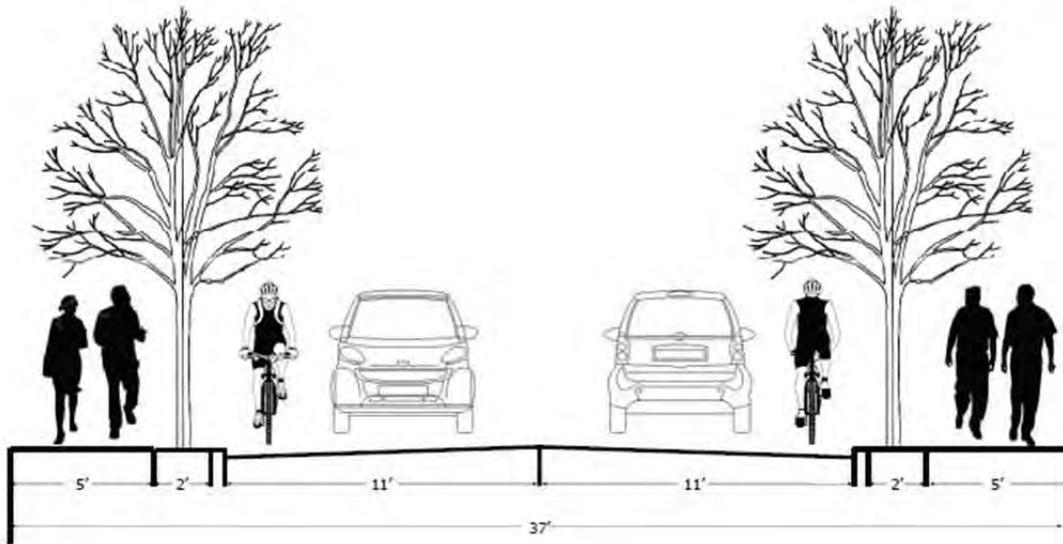


FIGURE 6 - 37' CROSS SECTION

## 47' CROSS SECTION:

This alternative provides sidewalks on both sides of Shank Painter Road with 2' landscaped buffers. Bicycles are accommodated within 5' bicycle lanes. As part of this alternative several curb cuts would be narrowed or combined to improve access management and pedestrian safety.

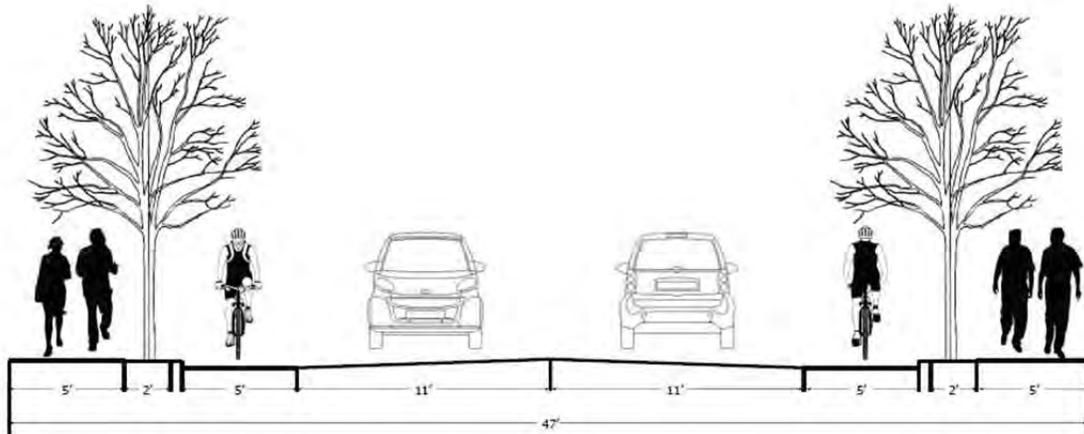


FIGURE 7 - 47' CROSS SECTION

### 60' CROSS SECTION

This alternative provides sidewalks on both sides of Shank Painter Road with 2' landscaped buffers. An additional buffer would be provided through an 8' parking lane. Bicycles are accommodated within 5' bicycle lanes. As part of this alternative several curb cuts would be narrowed or combined to improve access management and pedestrian safety.

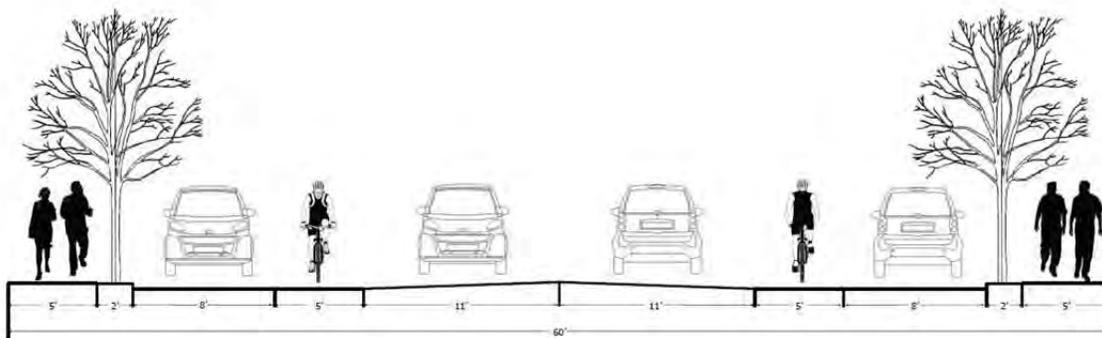


FIGURE 8 - 60' CROSS SECTION

### POTENTIAL CONCEPT – NORTH OF COURT STREET

This alternative provides sidewalks on both sides of Shank Painter Road with 2' landscaped buffers. Bicycles are accommodated within 5' bicycle lanes. As part of this alternative several curb cuts would be narrowed or combined to improve access management and pedestrian safety.

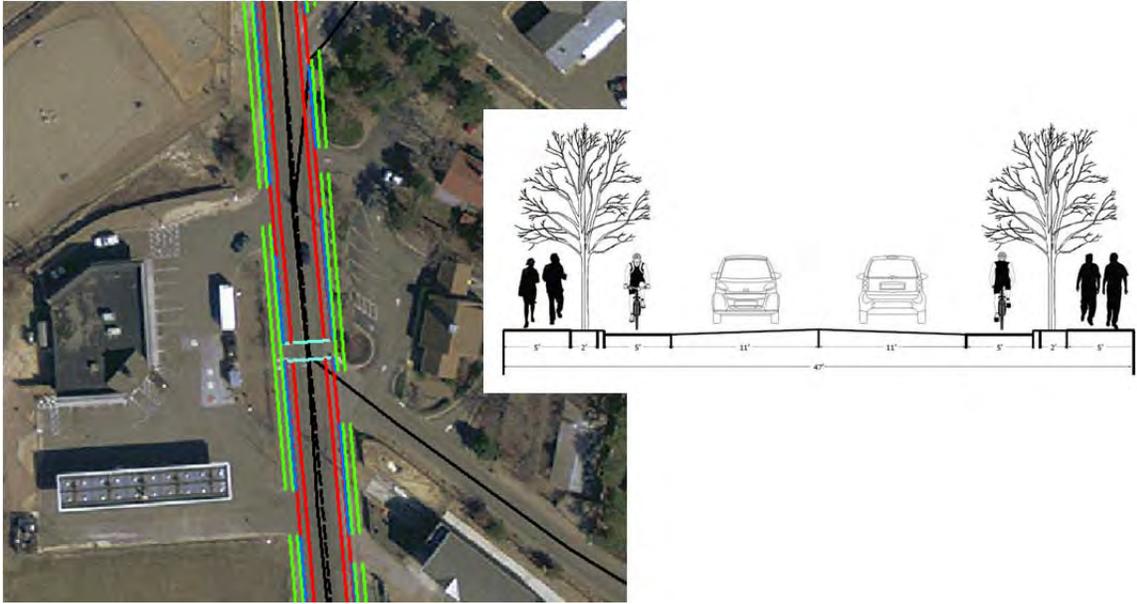


FIGURE 9 - POTENTIAL CONCEPT: NORTH OF COURT STREET

## POTENTIAL CONCEPT – SOUTH OF COURT STREET

This alternative provides a sidewalk on the west side of Shank Painter Road with a 2' landscaped buffers. Bicycles are accommodated within 5' bicycle lanes. As part of this alternative several curb cuts would be narrowed or combined to improve access management and pedestrian safety. The total right-of-way required for this concept is 40'.

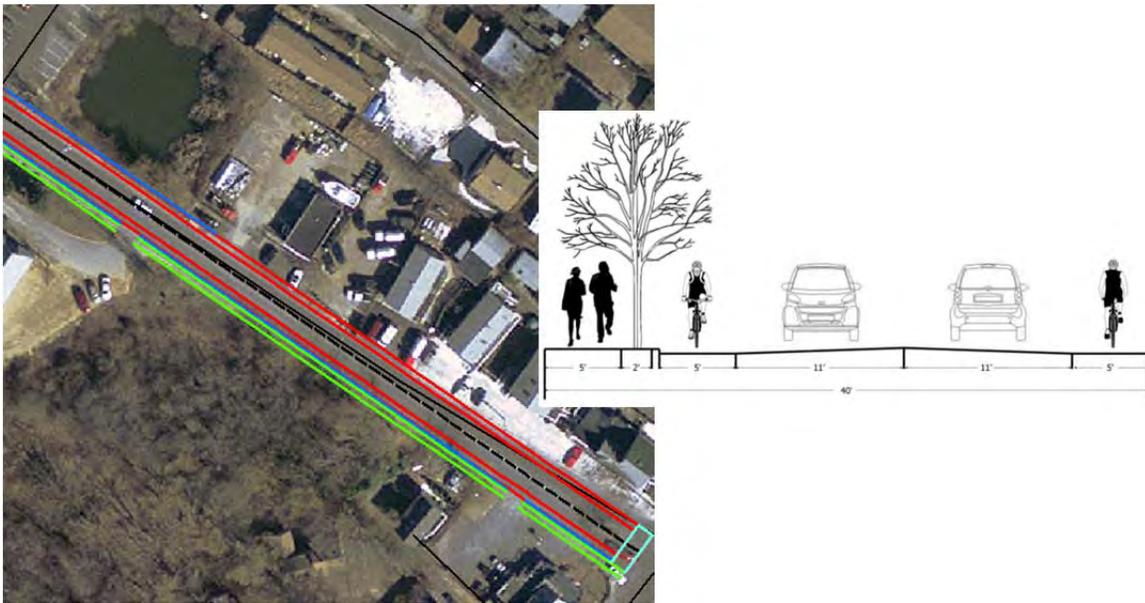
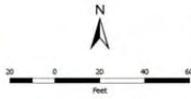


FIGURE 10 - POTENTIAL CONCEPT: SOUTH OF COURT STREET

## CONCEPT – OVERVIEWS

The following nine figures present a summary of the various cross-section concepts and the associated aerial views delineating the potential features (sidewalks, bike lanes, etc.).



4-13 Shank Painter Road  
Proposed 40' Concept  
Draft: August 22, 2011



FIGURE 11 - #4-13 SHANK PAINTER RD, 40' CONCEPT



20-30 Shank Painter Road  
Proposed 40' Concept  
Draft August 22, 2011

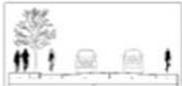


FIGURE 12 - #20-30 SHANK PAINTER RD, 40' CONCEPT



36-56 Shank Painter Road  
Proposed 40' Concept  
Draft August 22, 2011

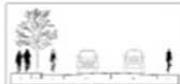
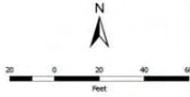


FIGURE 13 - #36-56 SHANK PAINTER RD, 40' CONCEPT



56-74 Shank Painter Road  
Proposed 47' Concept  
Draft: August 22, 2011

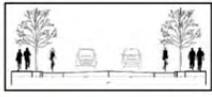
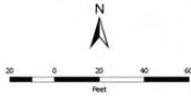


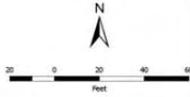
FIGURE 14 - #56-74 SHANK PAINTER RD, 47' CONCEPT



56-74 Shank Painter Road  
Proposed 60' Concept  
Draft: August 22, 2011



FIGURE 15 - #56-74 SHANK PAINTER RD, 60' CONCEPT



79-89 Shank Painter Road  
Proposed 47' Concept  
Draft: August 22, 2011

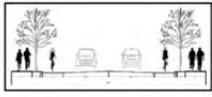
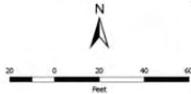


FIGURE 16 - #79-89 SHANK PAINTER RD, 47' CONCEPT



79-89 Shank Painter Road  
Proposed 60' Concept  
Draft: August 22, 2011

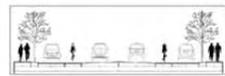


FIGURE 17 - #79-89 SHANK PAINTER RD, 60' CONCEPT



100-103 Shank Painter Road  
Proposed 47' Concept  
Date: August 22, 2011

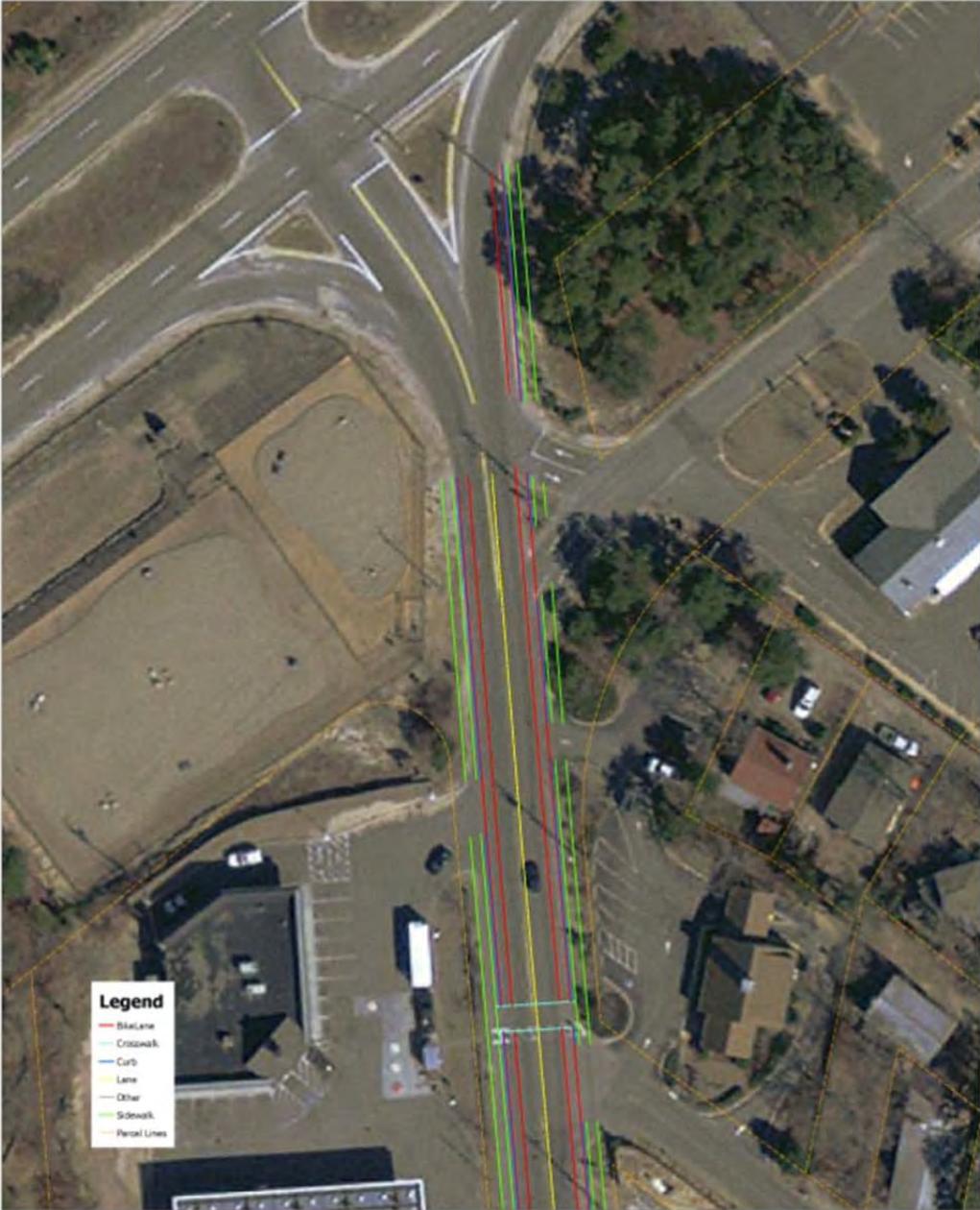


FIGURE 18 - #100-103 SHANK PAINTER RD, 47' CONCEPT



FIGURE 19 - #100-103 SHANK PAINTER RD, 60' CONCEPT

## SHANK PAINTER ROAD/BRADFORD STREET INTERSECTION

The southern end of Shank Painter Road terminates in a T-intersection with Bradford Street (Route 6A). Motorists traveling southbound on Shank Painter Road intending to turn left onto Bradford Street are subject to sight-distance obstructions on their right-hand side. These obstructions (signs, fence, etc.) obscure the view of Bradford Street's eastbound traffic. As a result, Shank Painter Road motorists pull forward into the crosswalk to await safe gaps in traffic. Similar obstructions exist to the east, obscuring views of Bradford Street's westbound traffic.

It is recommended that the Town of Provincetown work with property owners adjacent to this intersection in order to reduce obstructions to sight distance.

## Recommendations

The following general recommendations were developed from the public participation process:

- Create sidewalk plan, then initiate the plan
  - Seek grant funding for sidewalk improvements
  - Bylaw change: include sidewalk standards with new development and redevelopment
- Consolidate curb cuts
  - Construct curb cuts to town standards
  - Bylaw change: hold redevelopments to same standards as new developments
- Restripe crosswalks

Potential funding sources for recommended improvements include:

- Transportation Improvement Program (TIP)
- State/Federal Grants
- A lot of potential for bike/ped funding in next federal transportation funding and authorization bill

## RECOMMENDED ALTERNATIVE

Implementation of the recommended alternative will require continued coordination with local businesses. Commission staff have had contact (telephone, local meetings) with businesses owners during the development of the recommended alternative. As the town moves toward implementation, communication with businesses is essential to refine final designs of access for vehicles, bicyclists and pedestrians. As a result of an extensive public participation process and review of alternatives, the following figures show recommended cross sections for Shank Painter Road. The features of these figures are summarized below:

### SECTION 1: SHANK PAINTER ROAD FROM ROUTE 6 TO COURT STREET

The recommended cross section for this segment consists of 5' sidewalks on both sides of Shank Painter Road, 5' bike lanes on both sides, two 11' travel lanes, curbing and buffers bringing the total width to 47'.

- Segment length: 1,312 feet
- Total length of sidewalks: 2,190 feet
- Total length of bike lanes: 2,723 feet

## SECTION 2: SHANK PAINTER ROAD FROM COURT STREET TO BROWNE STREET

The recommended cross section for this segment consists of an at-grade 5' sidewalk on the west side of Shank Painter Road, a 5' traditional sidewalk on the east side, 5' bike lanes on both sides, two 11' travel lanes, curbing on the east side and buffers bringing the total width to 47'.

- Segment length: 487 feet
- Total length of sidewalks: 1,000 feet
- Total length of bike lanes: 950 feet

## SECTION 3: SHANK PAINTER ROAD FROM BROWNE STREET TO BRADFORD STREET

The recommended cross section for this segment consists of 5' sidewalk on the west side of Shank Painter Road with curbing and buffer, 5' bike lanes on both sides, and two 11' travel lanes bringing the total width to 39.5'.

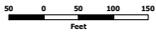
- Segment length: 796 feet
- Total length of sidewalks: 898 feet
- Total length of bike lanes: 1,544 feet

The total expected cost to construct these features for all three sections is \$1,025,086.65. A detailed breakdown of cost estimates is available in the appendix.

## SHANK PAINTER ROAD OVERVIEW PLANS FOR RECOMMENDED CROSS SECTIONS

The following figures show features for the recommended cross sections for Shank Painter Road. The first figure shows an overview of the entire roadway from Bradford Street to the south to Route 6 to the north. This figure is followed by six detailed views starting at the southern end of Shank Painter road and moving north.

Features include curbing, sidewalks, bicycle lanes, parking spaces, plantings, and parcel lines. Locations of these features are accurate within the limitations of the source data. For design and construction, survey and site plans would be required.

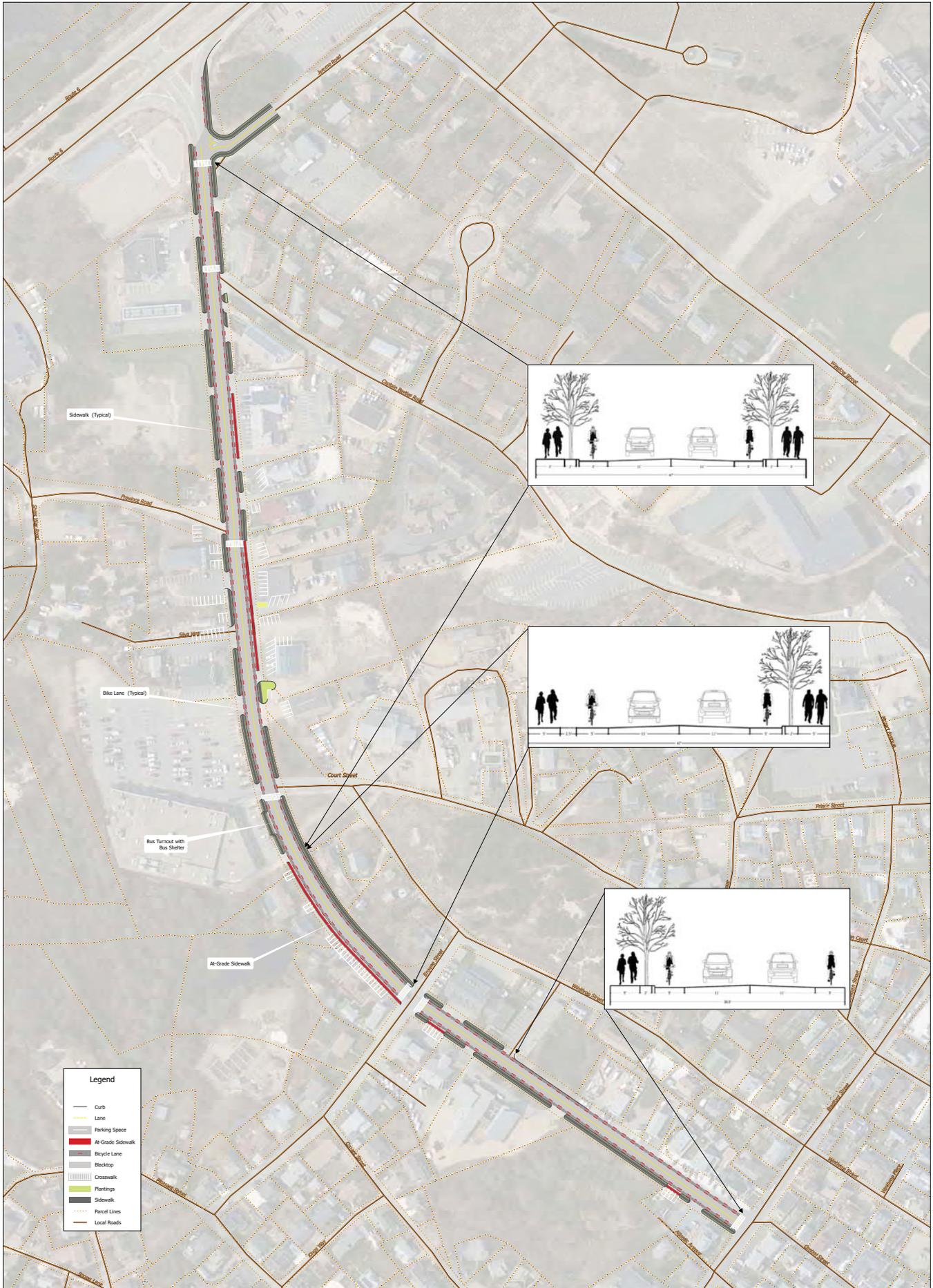


# Shank Painter Road Preferred Concept

Draft: June 14, 2012



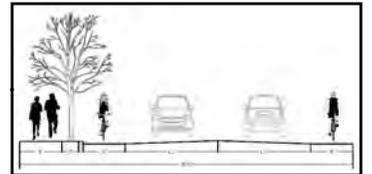
CAPE COD  
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- Legend**
- Curb
  - Lane
  - ▭ Parking Space
  - ▭ At-Grade Sidewalk
  - ▭ Bicycle Lane
  - ▭ Blacktop
  - ▭ Crosswalk
  - ▭ Plantings
  - ▭ Sidewalk
  - ⋯ Parcel Lines
  - Local Roads

# Shank Painter Road Preferred Concept

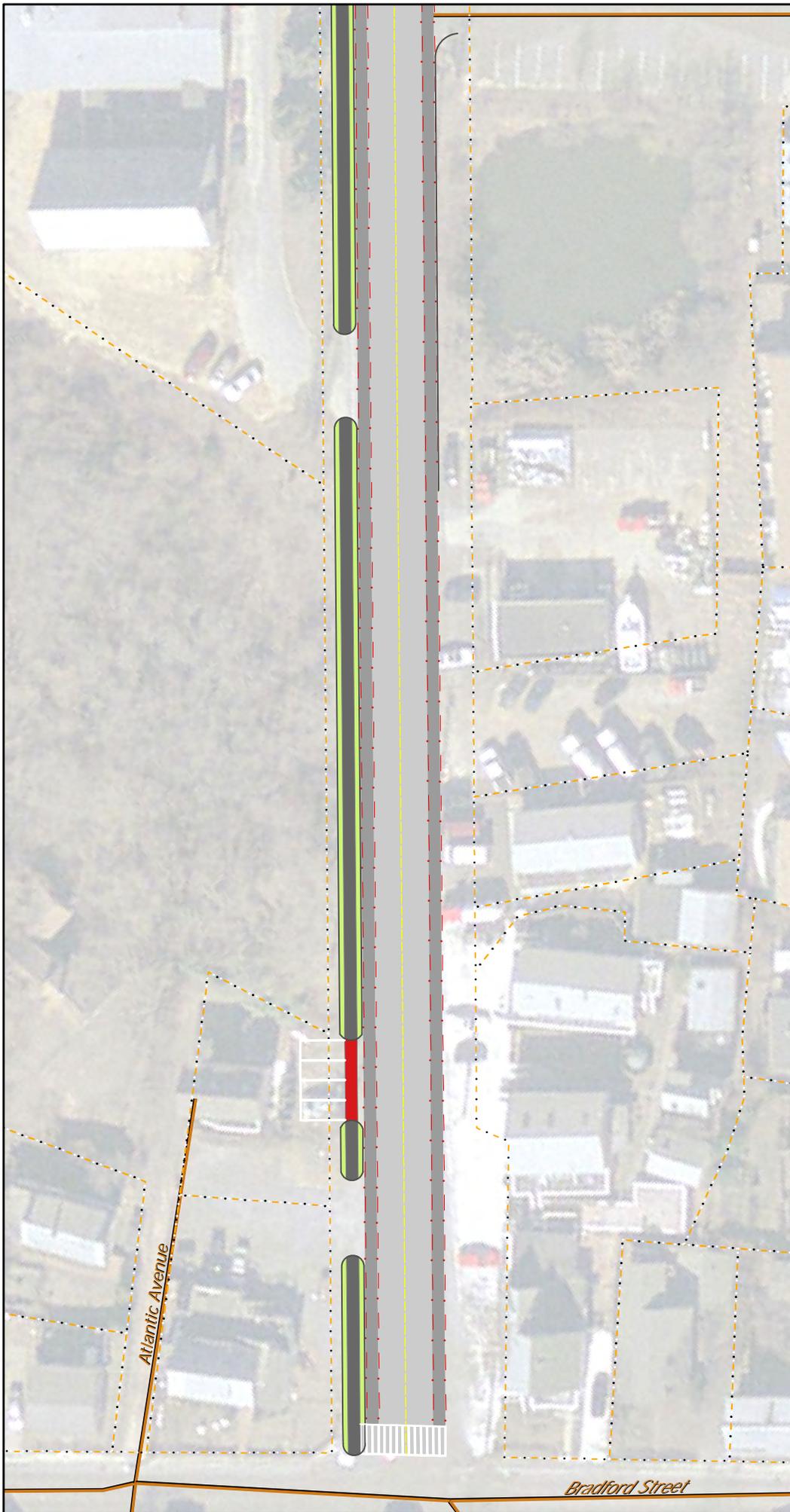
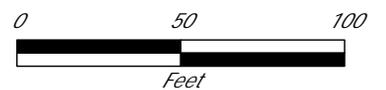
Draft: June 14, 2012



Road Segment  
1

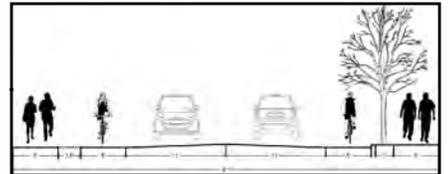
## Legend

- Curb
- Lane
- At-Grade Sidewalk
- Bicycle Lane
- Blacktop
- ▨ Crosswalk
- ▭ Parking Space
- Plantings
- Sidewalk
- - - Parcel Lines
- Local Roads



# Shank Painter Road Preferred Concept

Draft: June 14, 2012

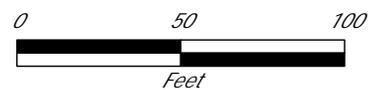


Road Segment  
2



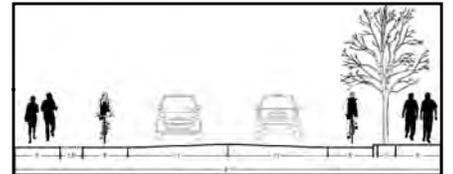
## Legend

- Curb
- Lane
- At-Grade Sidewalk
- Bicycle Lane
- Blacktop
- Crosswalk
- Parking Space
- Plantings
- Sidewalk
- - - Parcel Lines
- Local Roads



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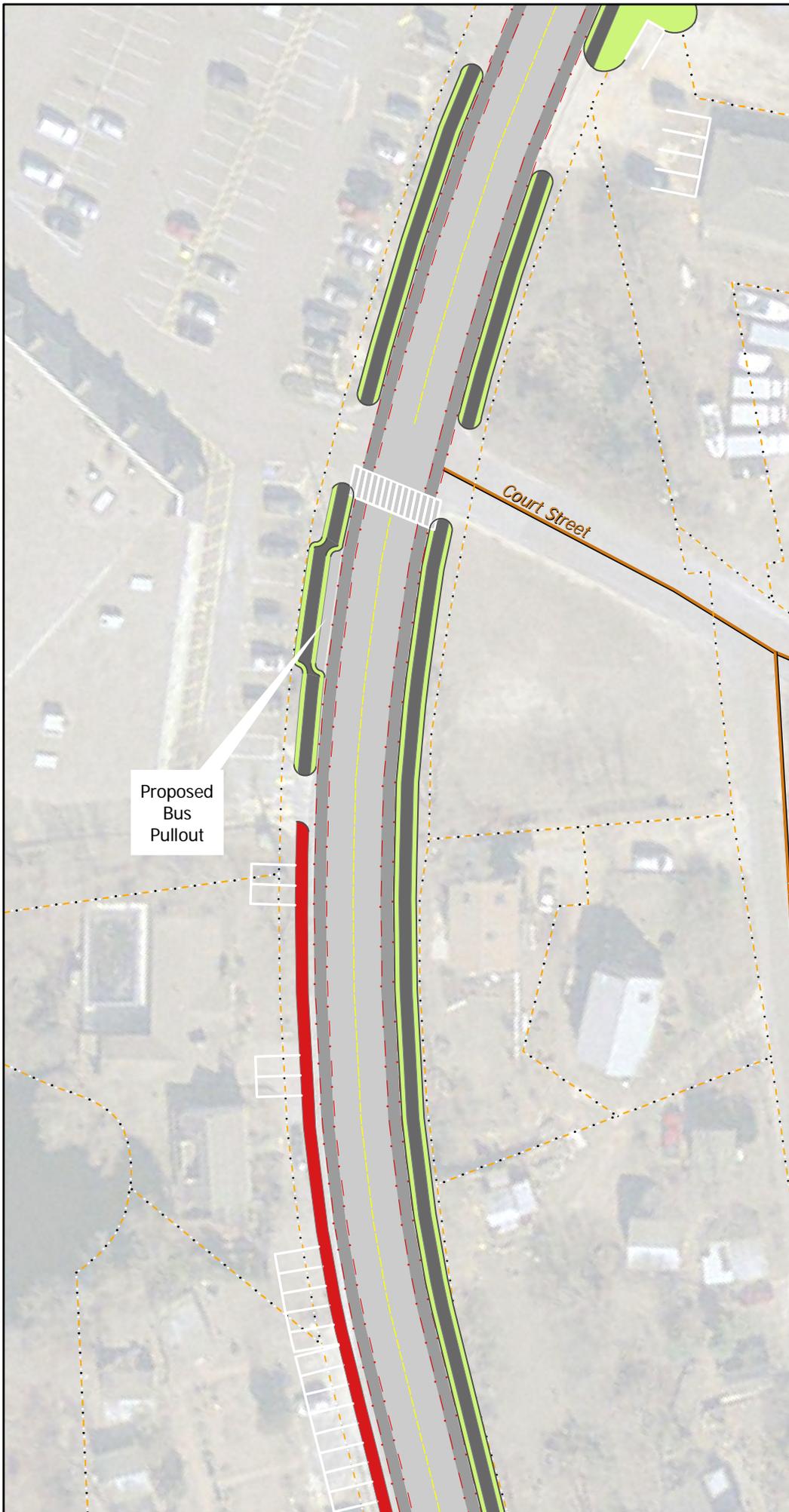
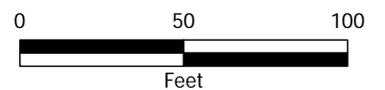
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## Road Segment 3

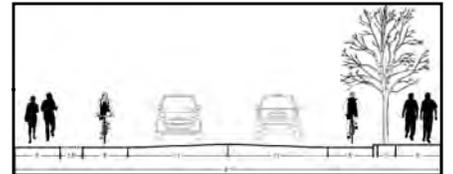
### Legend

- Curb
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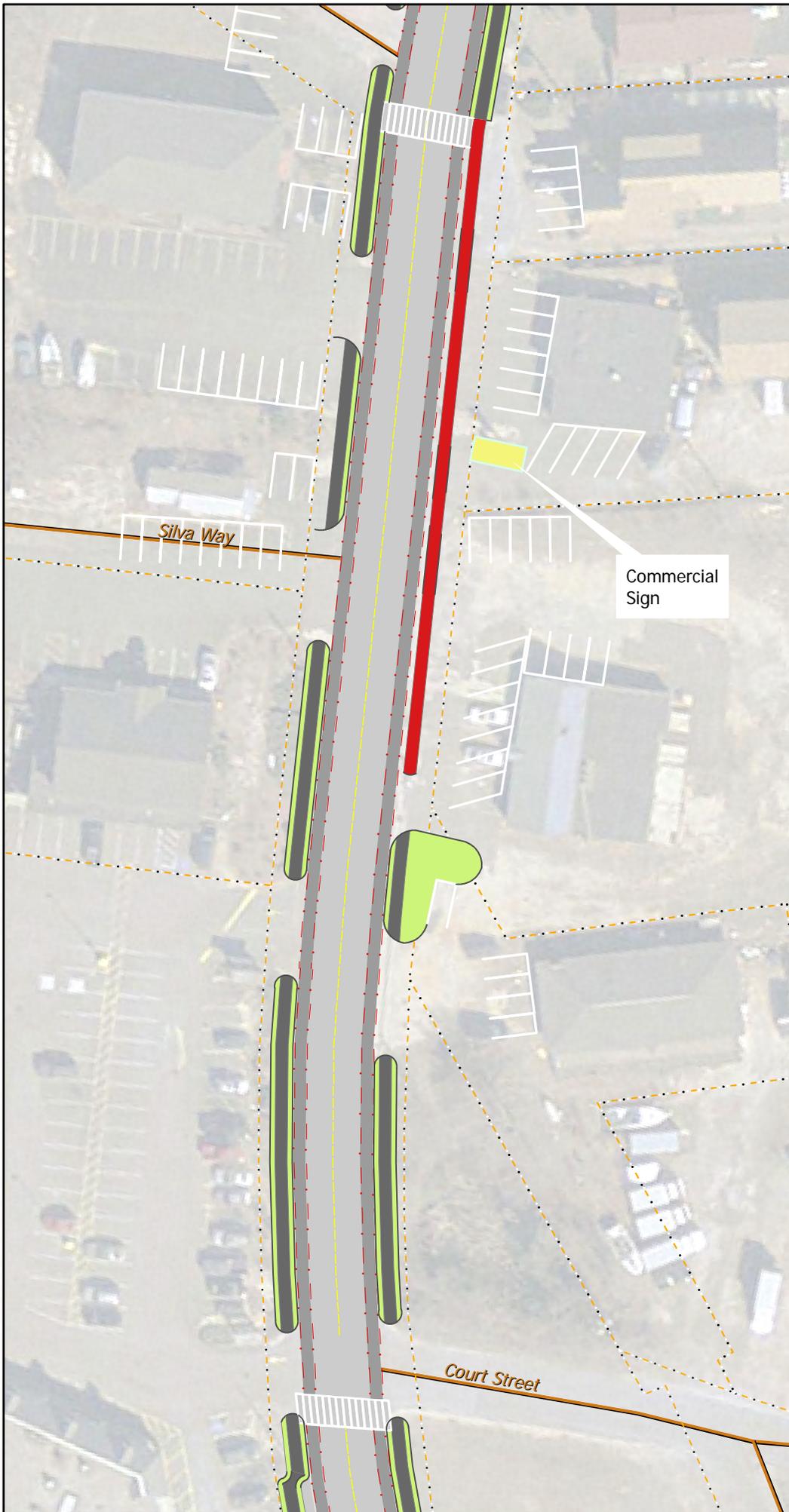
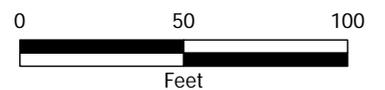
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Road Segment  
4

## Legend

- Curb
- Lane
- At-Grade Sidewalk
- Bicycle Lane
- Blacktop
- ▨ Crosswalk
- ▨ Parking Space
- Plantings
- Sidewalk
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- Local Roads



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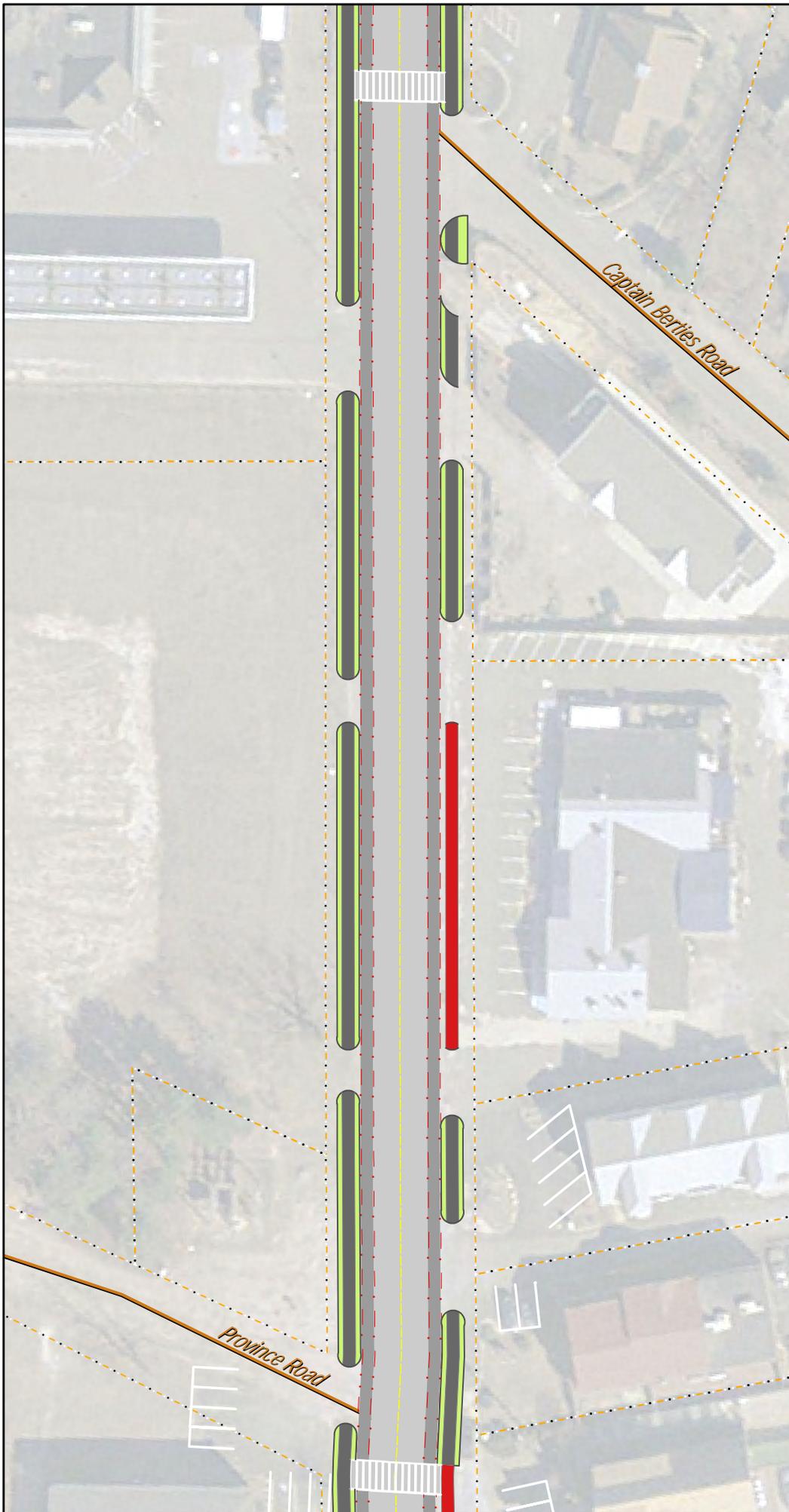
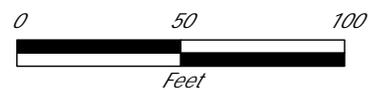
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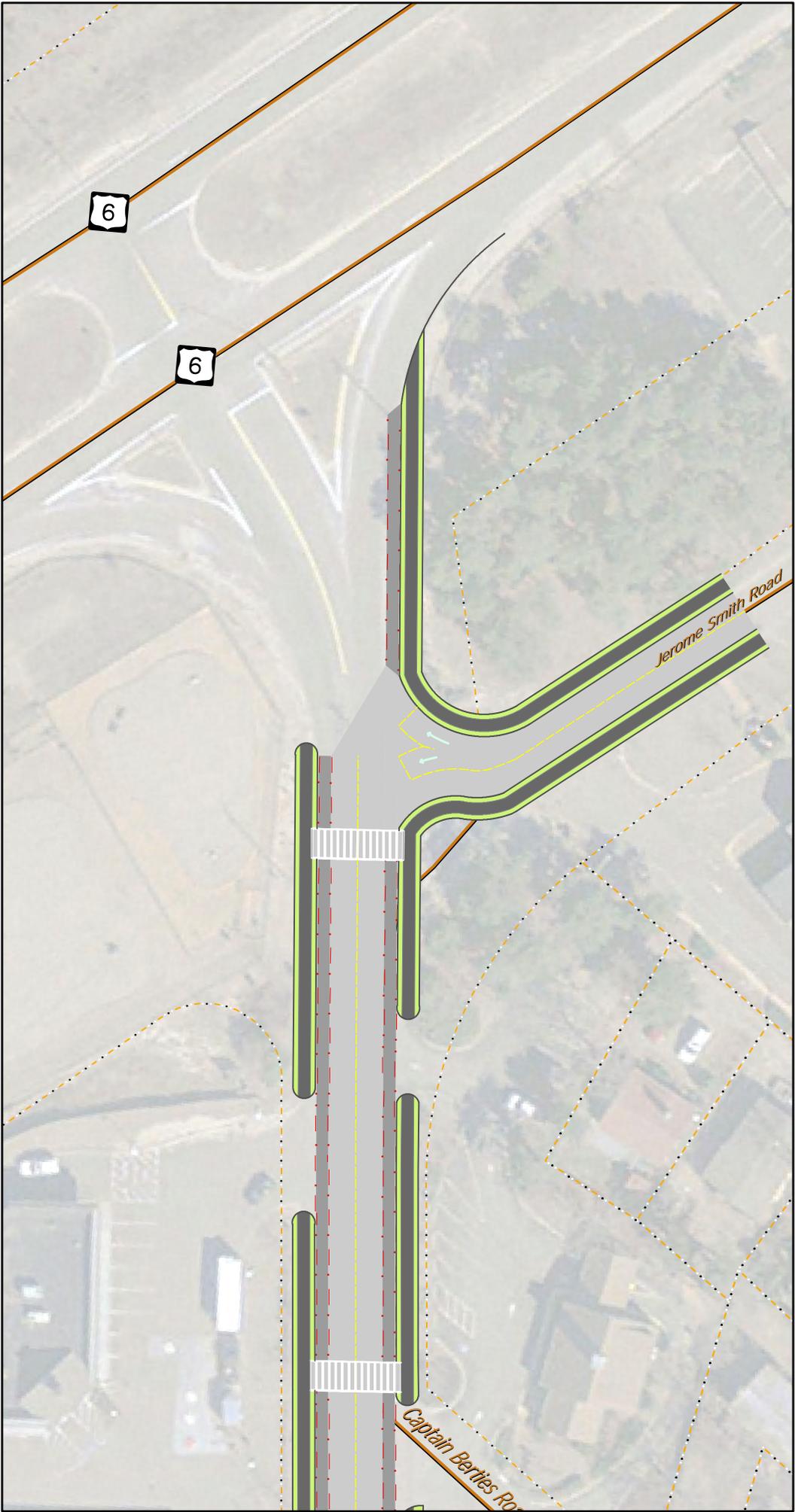


## Road Segment 5

### Legend

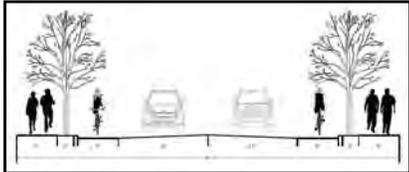
- Curb
- Lane
- At-Grade Sidewalk
- Bicycle Lane
- Blacktop
- ▤ Crosswalk
- ▭ Parking Space
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- - - Parcel Lines
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Shank Painter Road  
Preferred Concept

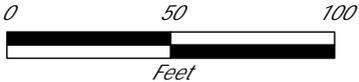
Draft: June 14, 2012



Road Segment  
6

Legend

- Curb
- Lane
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Appendix:  
Detailed Cost Estimates for Recommended Cross Sections



**Shankpainter Road Improvements - Conceptual Cost Estimate**

	Station	Distance Ft	Existing		Cross Section Ft	Roadway		Sidewalk		Drainage			Misc				
			Width Ft	Section Ft		Excavation CY	Rdwy Base CY	AC CY	Curb LF	Sidewalk LF	Sides LF	Add Base CY	PCC CY	24" Conc Pipe LF	Catch Basins EA	Relocate Poles EA	Striping LF
Crosssection 1																	
Begin roadway changes	100	0	41														
Pavement Change	102	50	41	47	47	55.56	36.11	19.44	500.00	500.00	2	32.41	32.41	500	10		
Pavement Change	108	27	36	47	47	235.07	152.80	82.28	1154.00	1154.00	2	74.80	74.80	1154	23		
Pavement Change	109	8	28	47	47	57.00	37.05	19.95	162.00	162.00	2	10.50	10.50	162	3		
Crosssection 2	113	3	395	28	47	277.96	180.68	97.29	395.00	395.00	1	25.60	25.60	395	8		
Crosssection 3	120	68	28	39.5	39.5	325.83	211.79	114.04	765.00	765.00	1	49.58	49.58	765	15		
Pavement Change	125	23	35	39.5	39.5	75.83	49.29	26.54	455.00	455.00	1	29.49	29.49	455	9		
End/Roadway Changes	126	63	140	35	39.5	23.33	15.17	8.17	140.00	140.00	1	9.07	9.07	140	3		
Total Quantity						1050.59	682.89	367.71	3571	3571		231.45	231.45	3571	71	22	13315
Unit Cost						\$75.00	\$65.00	\$215.00	\$25.00	\$70.00		\$250.00	\$75.00	\$450.00	\$300.00	\$3.00	\$3.00
						\$78,794.44	\$44,387.54	\$79,057.09	\$89,275.00	\$16,201.76		\$57,863.43	\$267,825.00	\$32,139.00	\$6,600.00	\$39,945.00	\$712,088.26

**Structural Assumptions**

Structural Section	Base	%
AC	0.35	0.35
Sidewalk	D	W
PCC	0.25	7
Add Base	0.25	7

Construction Subtotal	Contingency	Survey	Design and Construction Management	Total Estimated Cost
\$712,088.26	30%	5%	7%	\$1,025,086.65
	\$213,626.48	\$ 46,285.74	\$ 53,086.18	

CAPE COD COMMISSION

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