



Town of Bowers Bicycle and Pedestrian Improvements Study

June 9, 2022 – MPO PAC

June 14, 2022 – MPO TAC

July 6, 2022 – MPO Council



Agenda

- Welcome & Introductions
- Study Overview & Purpose
- Existing Conditions Assessment
 - Bowers Beach Road between Little Heaven and Bowers
 - Town of Bowers
- Draft Recommendations
 - Bicycle and Pedestrian Improvements
 - Recreational Access Improvements
- Next steps
 - Collect feedback
 - Finalize recommendations



Study Overview & Purpose

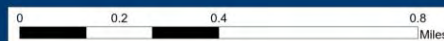


Study Overview & Purpose

- Evaluate opportunities for active recreation (walking and bicycling) access to key destinations in the Town of Bowers
- Identify safety and signage improvements
- Determine appropriate bicycle facilities along Bowers Beach Road/Main Street between Little Heaven Road and Bayshore Drive (3.6 miles)
- Evaluate how active recreation can benefit local economic development
- Encourage walking and bicycling in the Town of Bowers



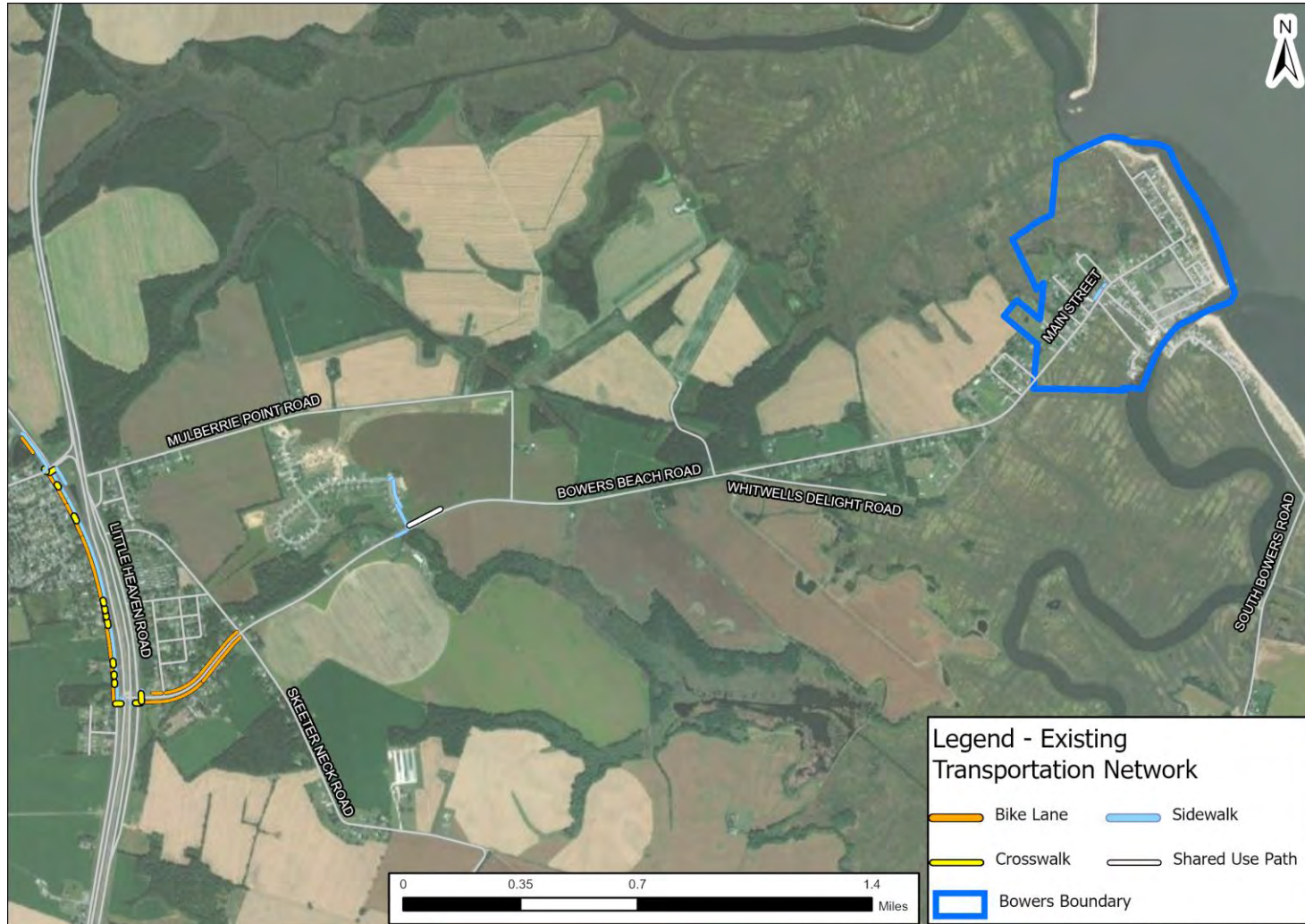
Study Overview & Purpose



Existing Conditions



Existing Conditions – Transportation



Existing Conditions – Transportation

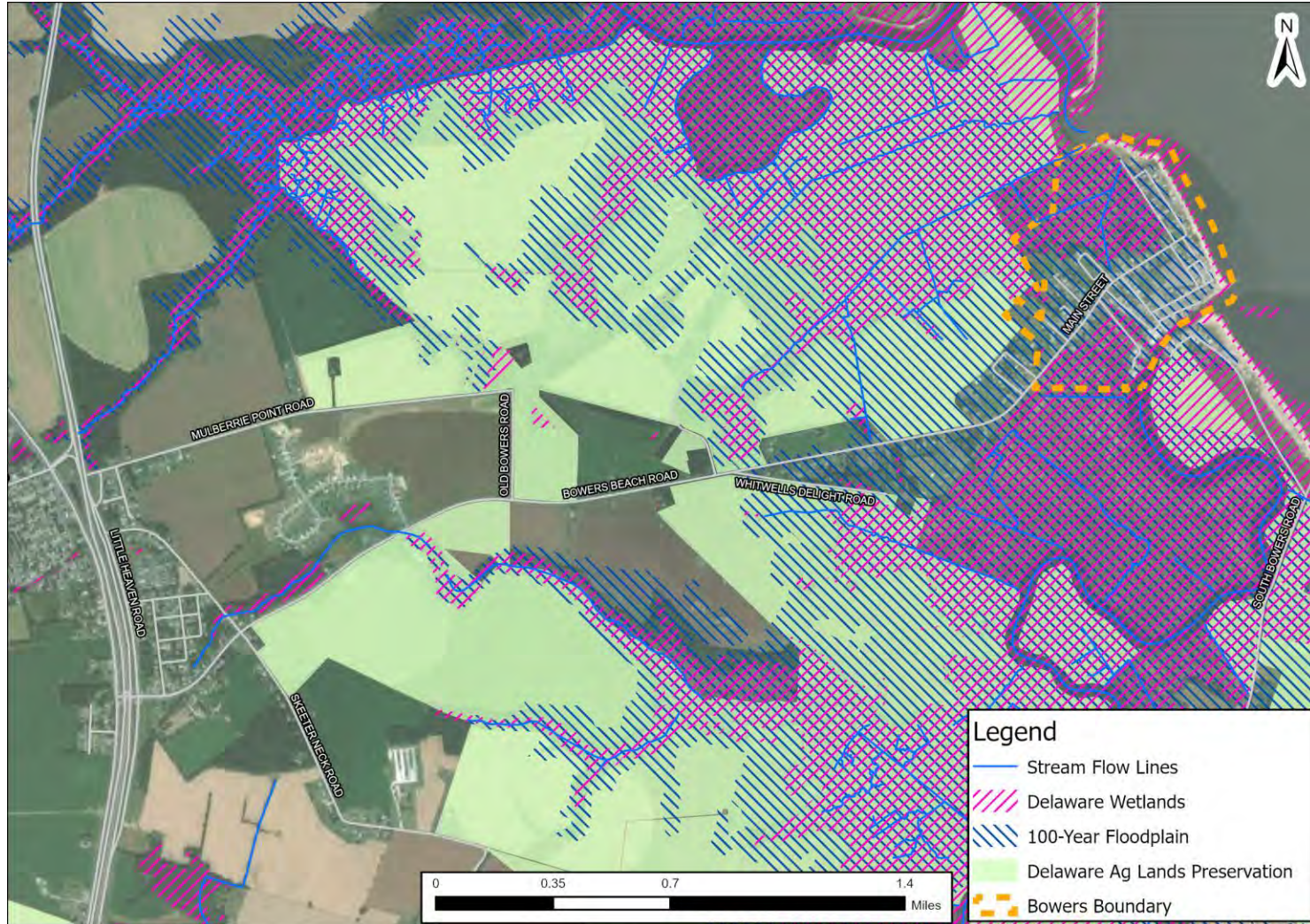


Existing Conditions – Transportation

- Public comments/desires expressed at Heritage Day
 - Safer, dedicated routes
 - Slow down the traffic
 - More sidewalks, paved and designated pathways
 - Trails by/on the beach



Existing Conditions – Environmental



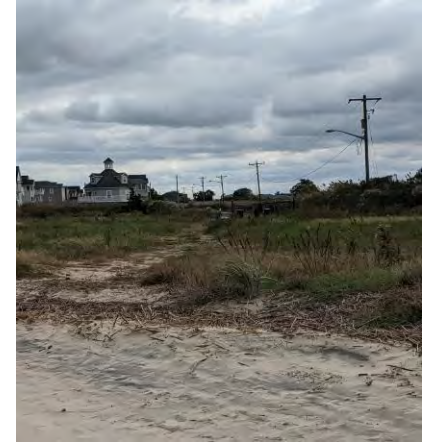
Existing Conditions – Flooding

- Need to address flooding to support all transportation types
- Clear storm drain channels and ditches



Existing Conditions – North Side

- Public comments/desires expressed at Heritage Day
 - Marsh boardwalk/shared used trails
 - Fishing pier, kayak launch
 - More sidewalks, paved and designated pathways
 - Trails by/on the beach



Existing Conditions – South Side

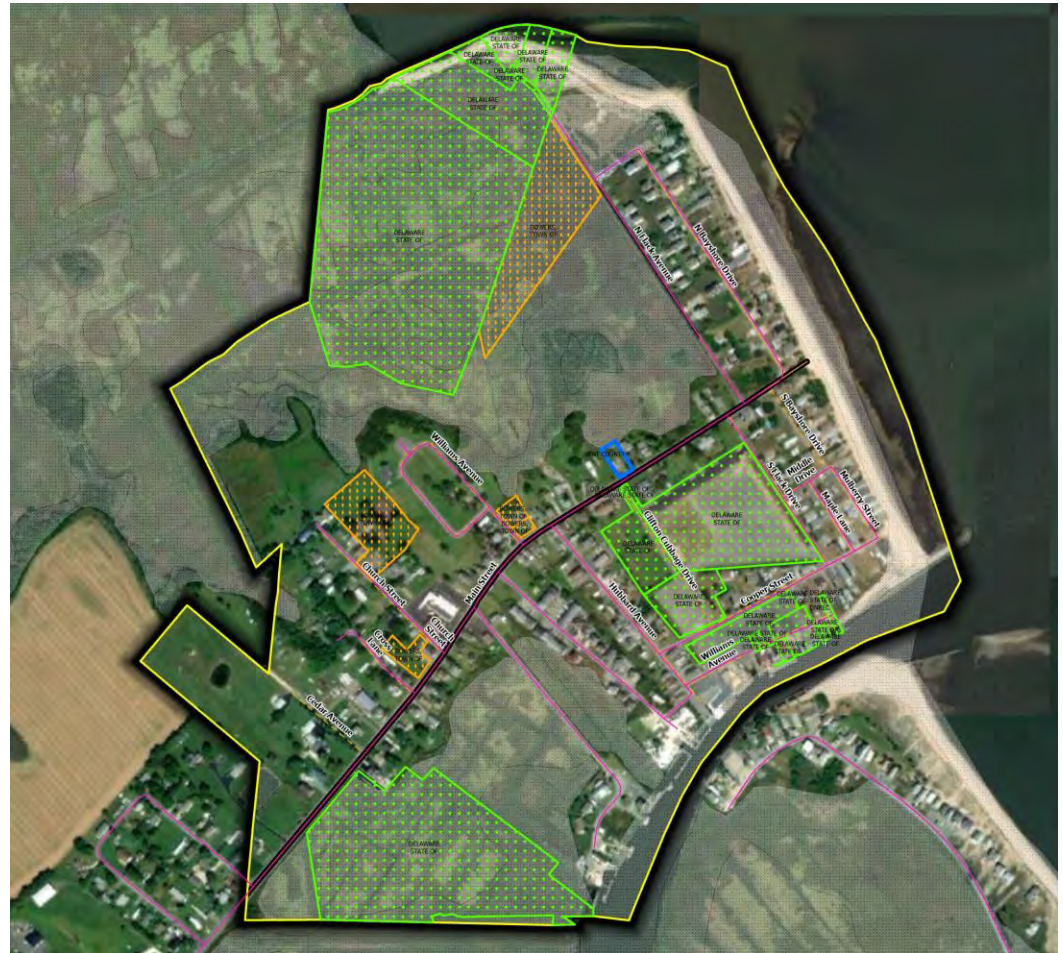
- Public interest in connecting Town of Bowers with South Bowers via biking/walking bridge
 - Due to flood elevation, bottom of bridge would have to be at least at 12 feet elevation (10 feet higher than roadway)
 - Would have to meet US Coast Guard Clearance requirements for navigable waterway
 - Long approaches (>120') necessary to meet ADA slope requirement and reach 12 foot elevation – likely would extend into wetlands



Existing Conditions – Public Land

- Publicly owned property (state and town)

PARCEL_ID	LOCATION	OWNERNAME	MAILINGADD
8-01-11420-01-1100-00001	3357 MAIN	BOWERS BEACH MARITIME MUSEUM I	C/O LINDA MEDUNICK
8-01-11420-01-3700-00001	MAIN	BOWERS FIRE CO. INC.	3285 MAIN ST. BOWERS
8-01-11420-01-1700-00001	3285 MAIN	BOWERS FIRE CO. INC.	3285 MAIN ST. BOWERS
8-01-11420-01-3500-00001	30 DAVIDSON	BOWERS FIRE COMPANY	PO BOX 348
8-01-11420-01-2600-00001	CROSS	BOWERS FIRE COMPANY, THE	3285 MAIN ST
8-01-11420-01-3300-00001	MAIN	BOWERS, TOWN OF	3308 MAIN ST
8-01-11420-01-0400-00001	CHURCH	BOWERS, TOWN OF	3308 MAIN ST
8-01-11513-01-0400-00001	FLACK	BOWERS, TOWN OF	3231 MAIN ST
8-01-11513-01-2900-00001	MAIN	BOWERS, TOWN OF	3308 MAIN STREET
8-01-11513-01-2800-00001	18 WILLIAMS	BOWERS, TOWN OF	3308 MAIN STREET
8-01-11420-01-5500-00001	MAIN	DELAWARE STATE OF	89 KINGS HWY
8-01-11517-02-6100-00001	90 MURDERKILL	DELAWARE STATE OF	89 KINGS HWY
8-01-11517-01-3100-00001	MURDERKILL	DELAWARE STATE OF	DNREC/BOARD OF FISH & GAME
8-01-11517-01-3200-00001	MURDERKILL	DELAWARE STATE OF	DNREC/BOARD OF FISH & GAME
8-01-11517-02-6400-00001	122 MURDERKILL	DELAWARE STATE OF	DNREC/BOARD OF GAME & FISH
8-01-11517-02-6500-00001	COOPER	DELAWARE STATE OF	DNREC/BOARD OF FISH & GAME
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8-01-11517-02-0700-00001	MAIN	DELAWARE STATE OF	DNREC/BOARD OF FISH & GAME
8-01-11517-02-0700-00001	MAIN	DELAWARE STATE OF	DNREC/BOARD OF FISH & GAME
8-01-11517-02-6800-00001	COOPER	DELAWARE, STATE OF, DNREC	89 KINGS HWY



Existing Conditions – Level of Traffic Stress

- Level of Traffic Stress concept
 - “Traffic stress ... is a combination of perceived danger and other stressors ... associated with riding a bike close to motor traffic.” – Dr. Peter Furth, 2012
 - The *Blueprint for a Bicycle-Friendly Delaware*, Delaware’s bicycle policy plan, recommends using the Level of Traffic Stress methodology to evaluate and improve the design of proposed projects and to improve bicycle network design
 - Based on traffic volume, speed, and roadway configuration



Level of Traffic Stress

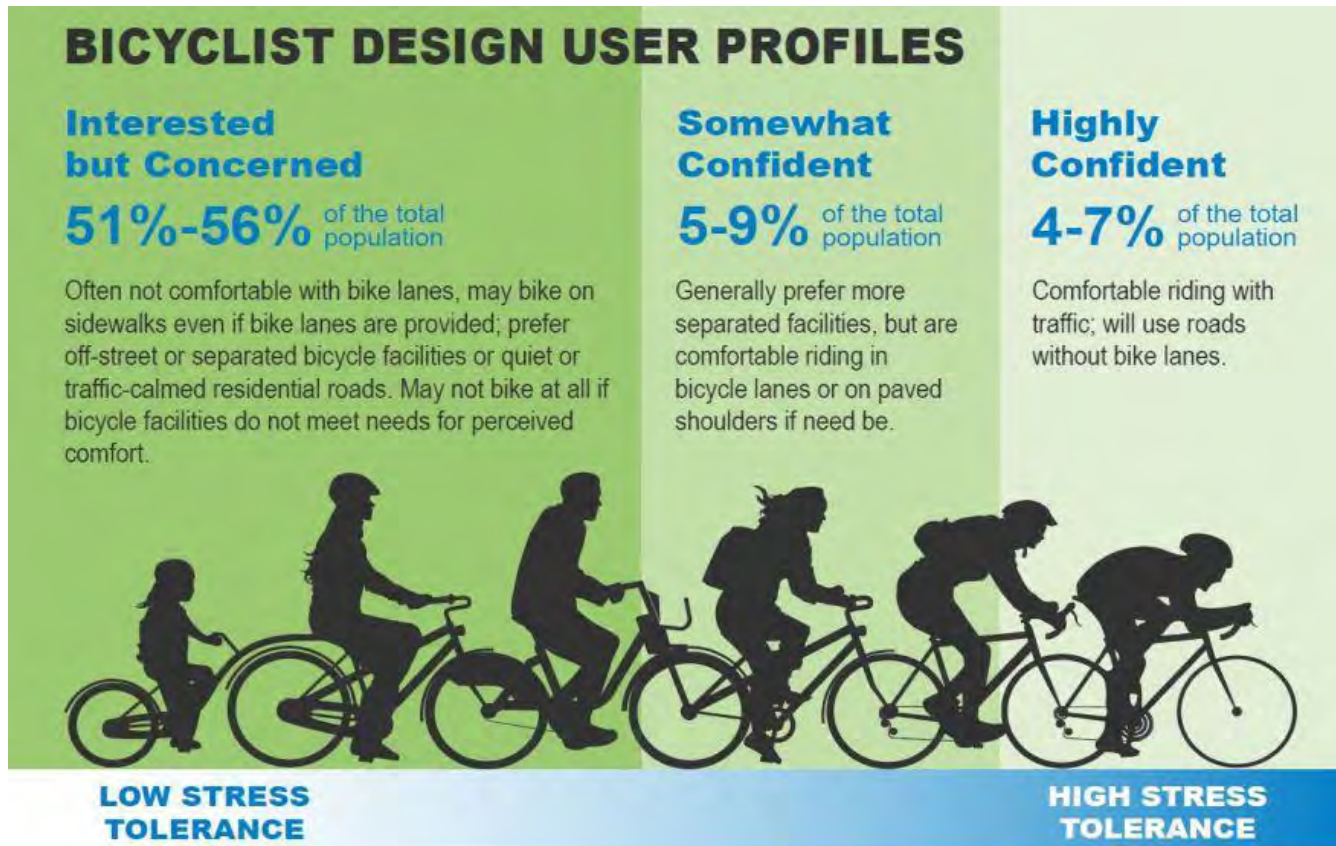
- Interested but concerned riders are comfortable riding streets designated LTS 1; trails and pathways are also considered LTS 1
- Somewhat confident riders are comfortable with LTS 1 or 2
- Highly confident riders are comfortable with LTS 1-4

Level of Traffic Stress	Description	Example
1	Safe for children to use; Usually completely separated from auto traffic	 Photo by Bob Patten
2	Tolerated by most mainstream adult populations of cyclists; Roads with low volume and low speed auto traffic	
3	Tolerated by riders who are enthused and confident; Heavy traffic with separated bike facility	
4	Only tolerated by strong and fearless riders; cyclists must interact with high volumes or speeds of auto traffic.	



Level of Traffic Stress

Only a Few People Have a High Tolerance for Traffic Stress



Source: FHWA Bikeway Selection Guide



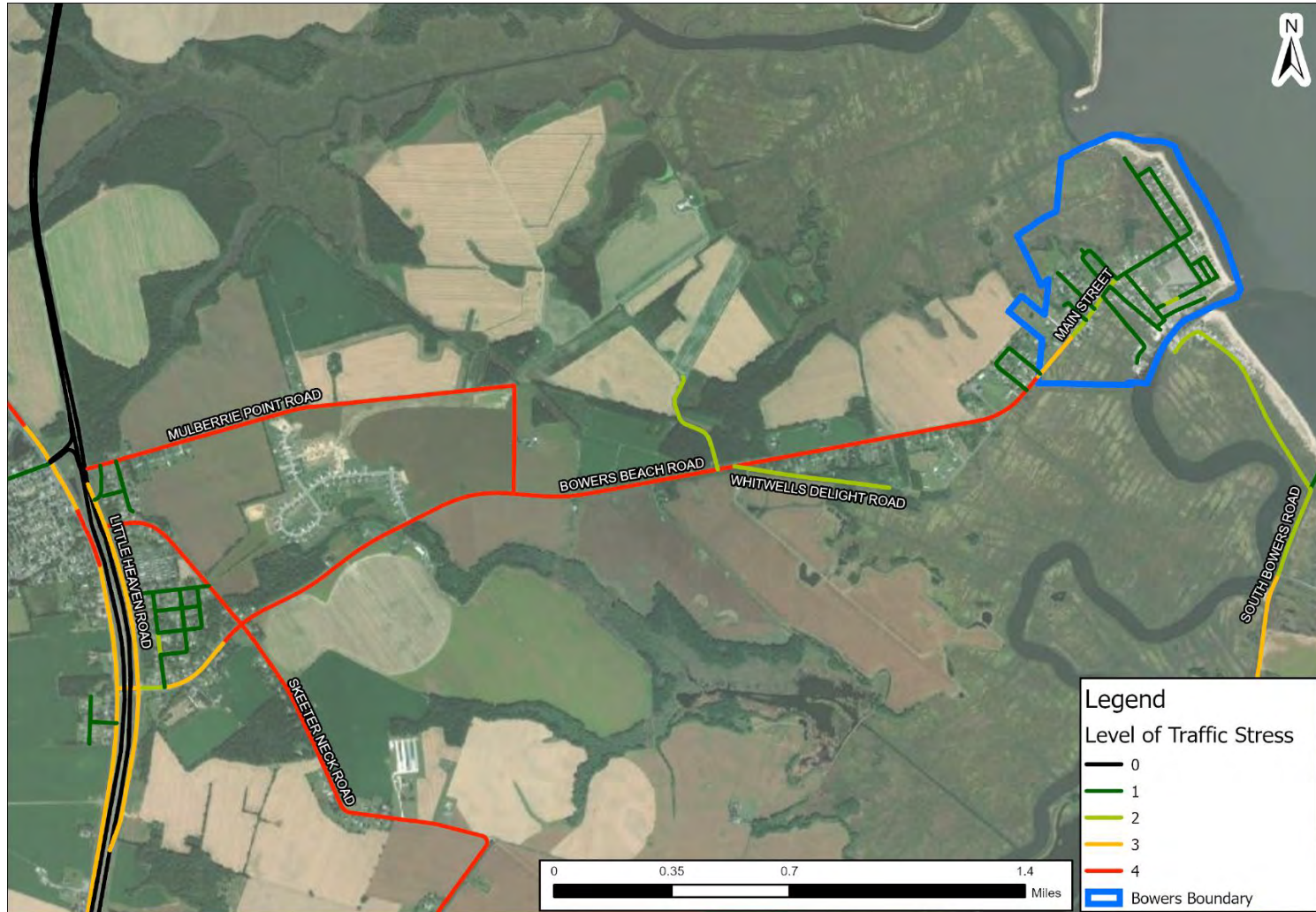
Level of Traffic Stress

This method allows us to evaluate each street to determine how stressful it feels on a scale of 1-4

Level of Traffic Stress (LTS) Criteria for Mixed Traffic

Number of Lanes	Average Daily Traffic	<25 mph	30 mph	35 mph	40 mph	45 mph	50+ mph
2-way street (no centerline)	0-750	LTS 1	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4
	751-2000	LTS 1	LTS 2	LTS 3	LTS 3	LTS 4	LTS 4
	2001-3000	LTS 1	LTS 2	LTS 3	LTS 4	LTS 4	LTS 4
	3001+	LTS 2	LTS 2	LTS 3	LTS 4	LTS 4	LTS 4
1 through lane per direction (1-way street or 2-way street with centerline)	0-750	LTS 1	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4
	751-2000	LTS 1	LTS 2	LTS 3	LTS 3	LTS 4	LTS 4
	2001-6000	LTS 2	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4
	6001+	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4
2 through lanes per direction	0-6000	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
	6001+	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4
3+ through lanes per direction	any ADT	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4

Level of Traffic Stress Mapping

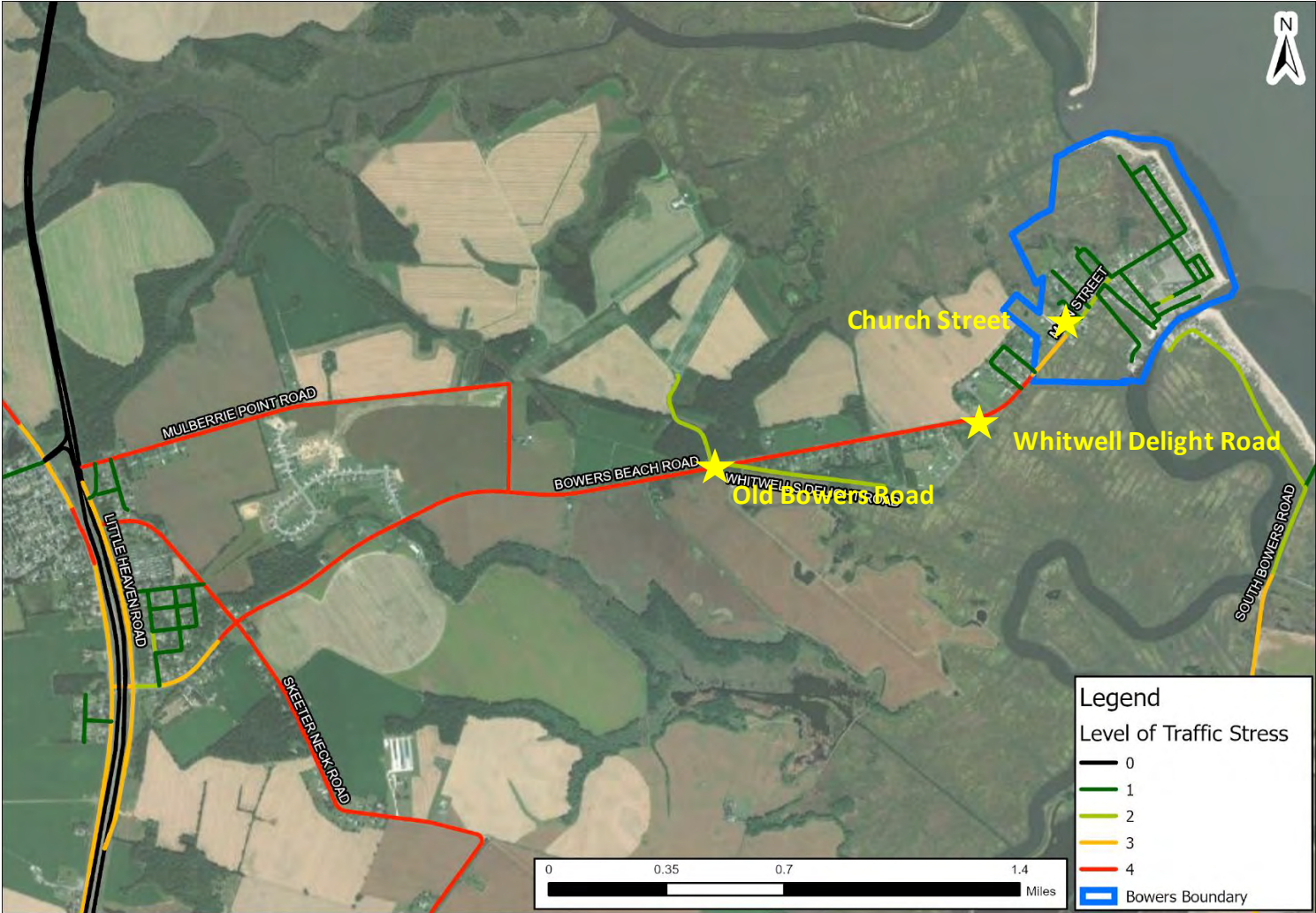


Speed Study on Bowers Beach Road

- To confirm Level of Traffic Stress mapping
- To better understand motor vehicle behavior along corridor
- Conducted Monday, November 22 midday
- Each location was counted for one hour
- Locations:
 - Bowers Beach Road@ Old Bowers Road
 - Bowers Beach Road@ Whitwell Delight Road (at curve)
 - Main Street@ Church Street (by Fire Company)



Speed Study



Speed Study

- Bowers Beach Road at Old Bowers Road

Bowers Beach Road	Eastbound (entering town)	Westbound (leaving town)
Posted speed limit	50 mph	50 mph
Average Speed	55 mph	55 mph
% more than 5 mph over speed limit	39%	40%
Pace	48-57 mph	50-59 mph
Vehicles observed	28	25
Highest speed observed	70 mph (1 car)	65 mph (1 car)



Speed Study

- Bowers Beach Road at Whitwell Delight Road (at curve)

Bowers Beach Road	Eastbound (entering town)	Westbound (leaving town)
Posted speed limit	35 mph	35 mph
Average Speed	42 mph	39 mph
% more than 5 mph over speed limit	60%	48%
Pace	38-47 mph	35-44 mph
Vehicles observed	25	27
Highest speed	49 mph (1 car)	47 mph (1 car)



Speed Study

- Main Street at Church Street (by the Fire Company)

Bowers Beach Road	Eastbound (entering town)	Westbound (leaving town)
Posted speed limit	25 mph	25 mph
Average Speed	27 mph	25 mph
% more than 5 mph over speed limit	20%	23%
Pace	23-32 mph	18-27 mph
Cars observed	30	26
Highest speed	38 mph (1 car)	36 mph (1 car)



Draft Recommendations



Draft Recommendations

- Bowers Beach Road/Main Street Recommendations
 - Includes alternatives for **bicycle and pedestrian facilities** for each segment of the street
 - Also includes **related infrastructure**, such as signage and street furniture like bike racks
 - Alternatives will be **assessed for feasibility**, and categorized as pragmatic or aspirational
- Recreational Access Plan
 - Includes ideas for cultivating **ecotourism** that are not directly related to transportation needs
 - Recommendations will be **assessed for feasibility**, and categorized as pragmatic or aspirational



Draft Recommendations- Bowers Beach Road/Main Street

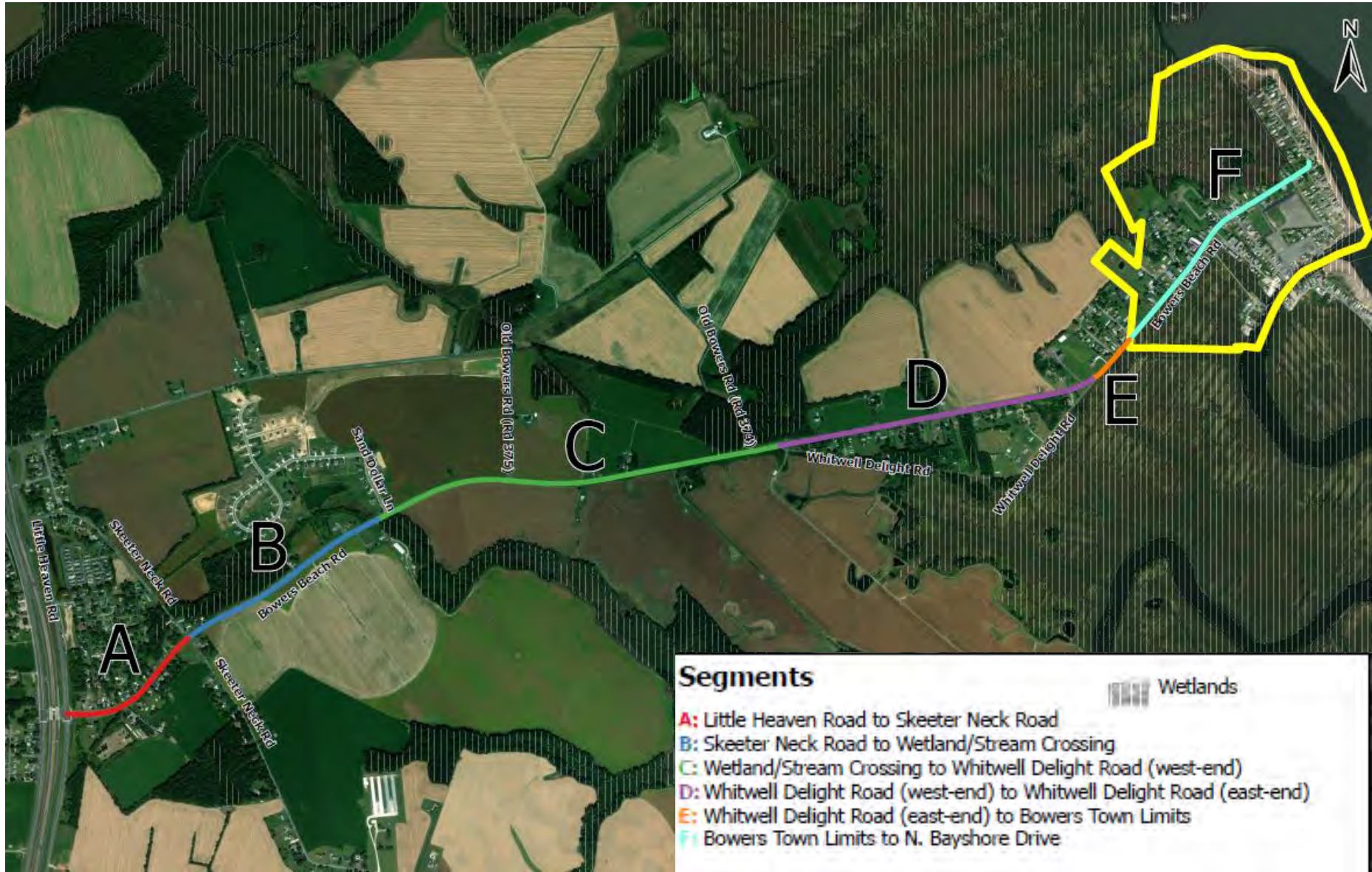


Recommendations – Bowers Beach Road

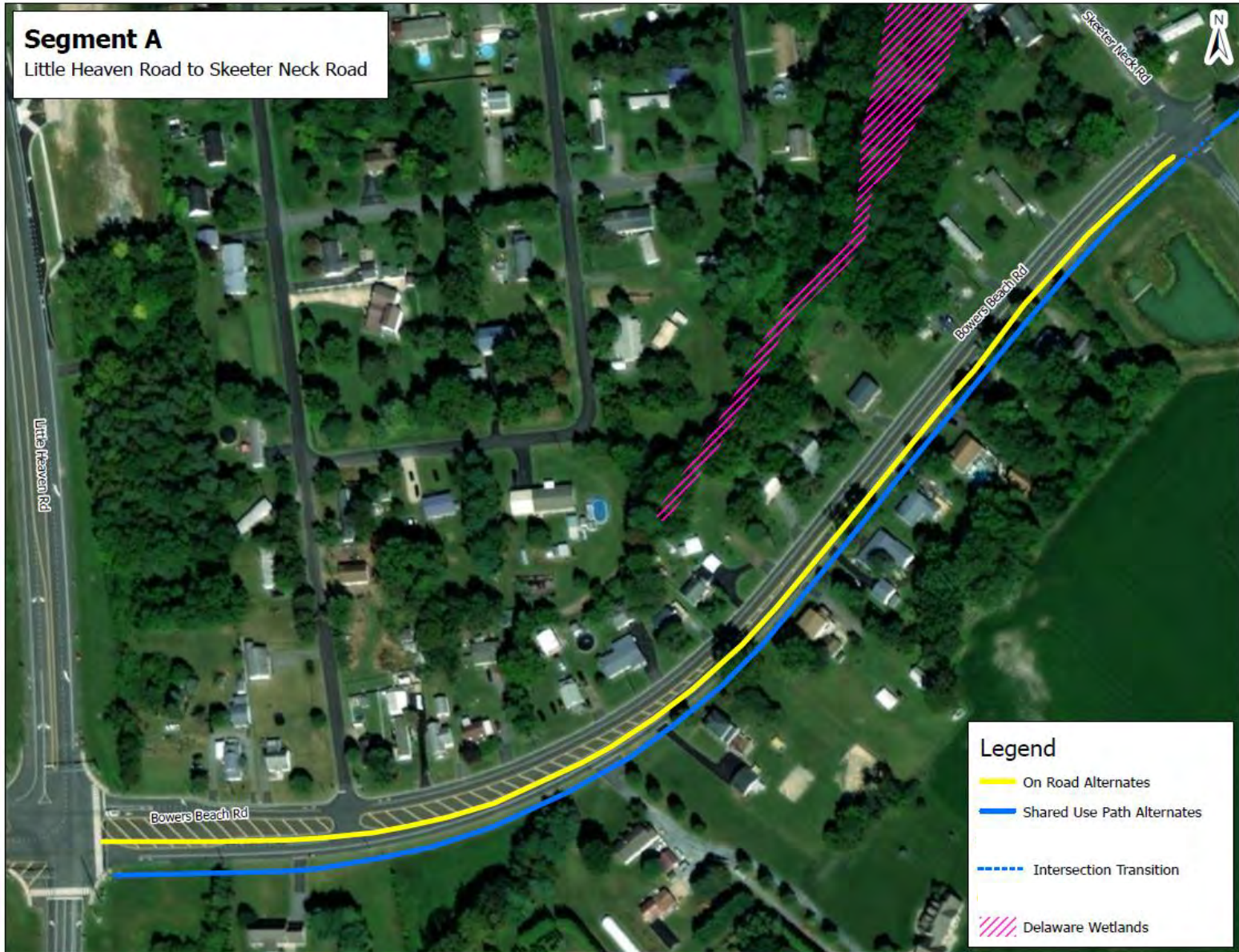
- Protected bicycle facilities along Bowers Beach Road between Little Heaven and town limits; facilities could include
 - Shared use path (both people walking and biking can use)
 - Separated two-way bike lanes with sidewalks
 - Separated one-way bike lanes with sidewalks
- Which side?
 - Site constraints inform this decision
 - Available Right-of-way
 - Potential private property impacts
 - Location of existing shoulders
 - Location of existing shared use path
 - Utilities
 - Wetlands
 - Flood Plain
 - Drainage
 - Opportunities for on-road facilities in locations instead of shared use path to decrease costs



Recommendations – Bowers Beach Road

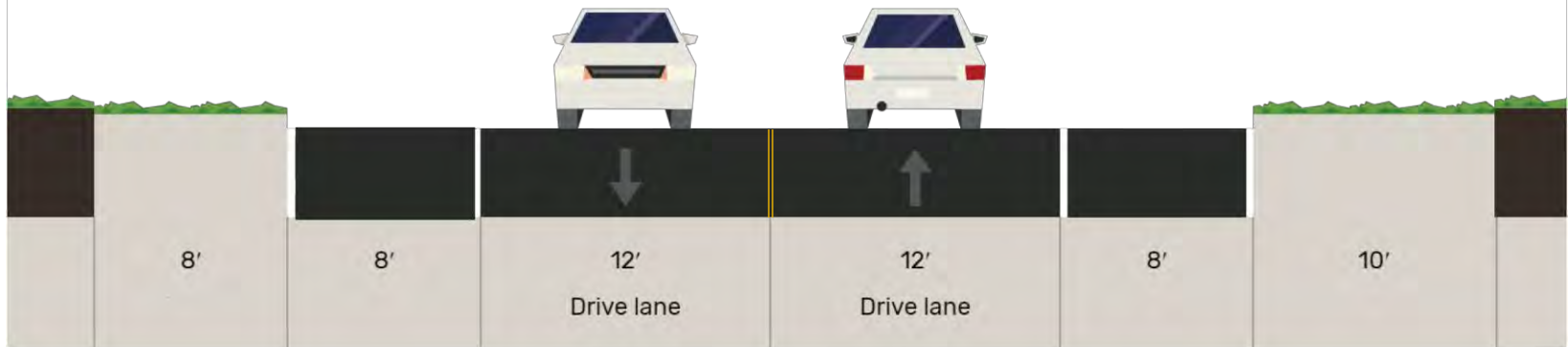


Recommendations – Segment A

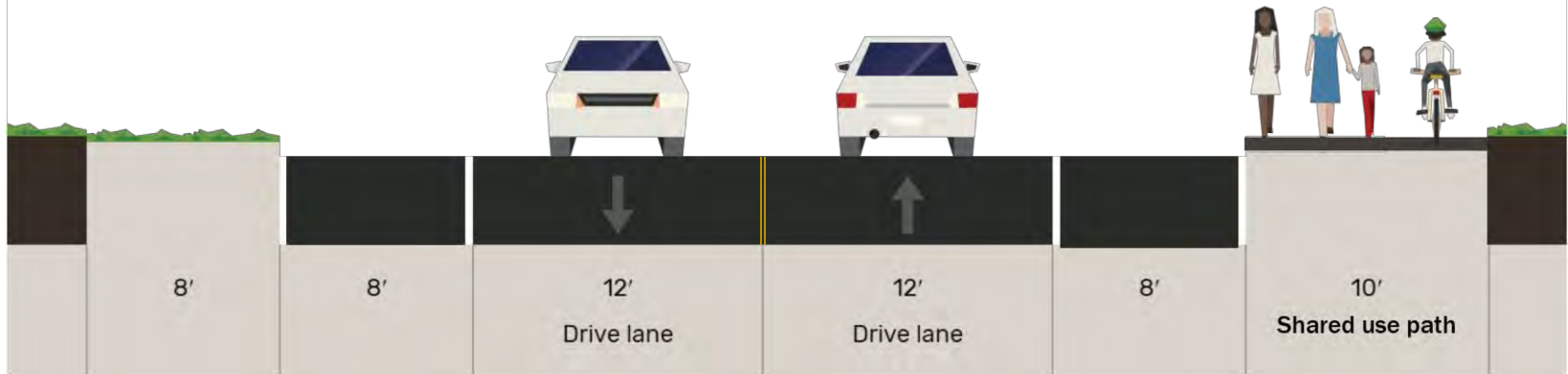


Recommendations – Segment A

Existing Conditions



Alt 1: Shared use path south side



All sections are shown looking towards Bowers Beach

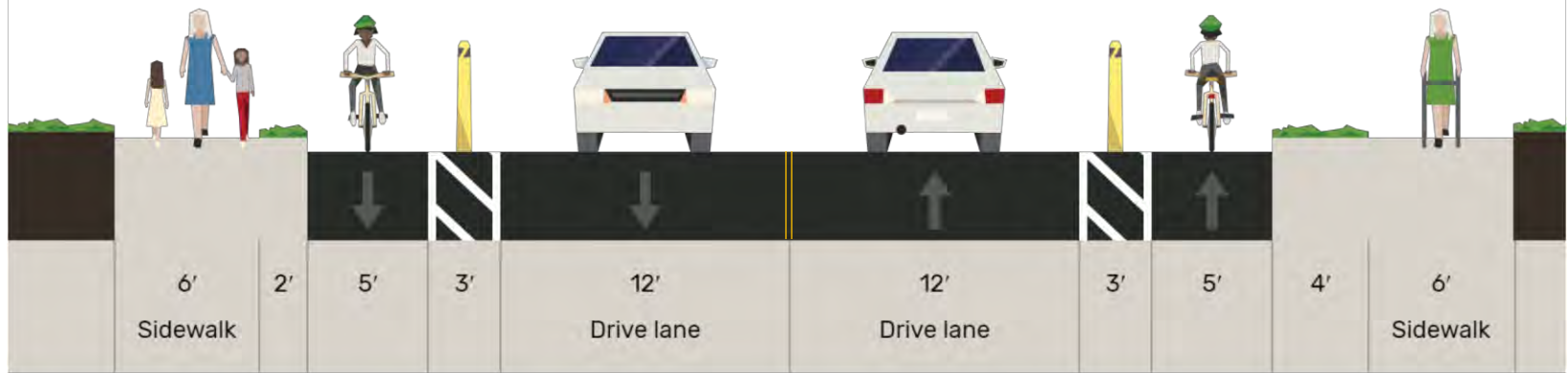


Recommendations – Segment A

Alt 2: Separated two-way bike lane on south side and sidewalks



Alt 3: Separated one-way bike lanes and sidewalks



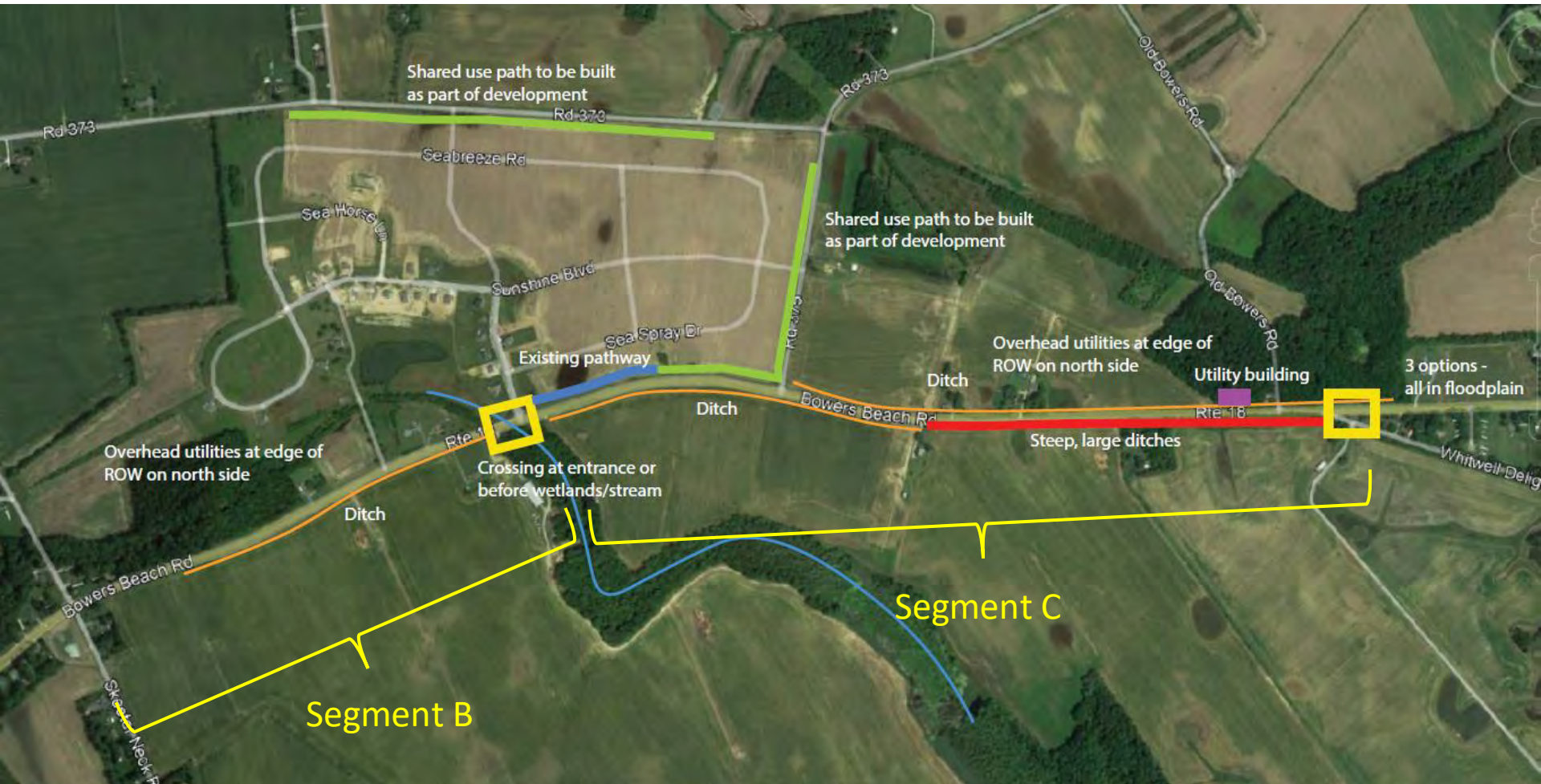
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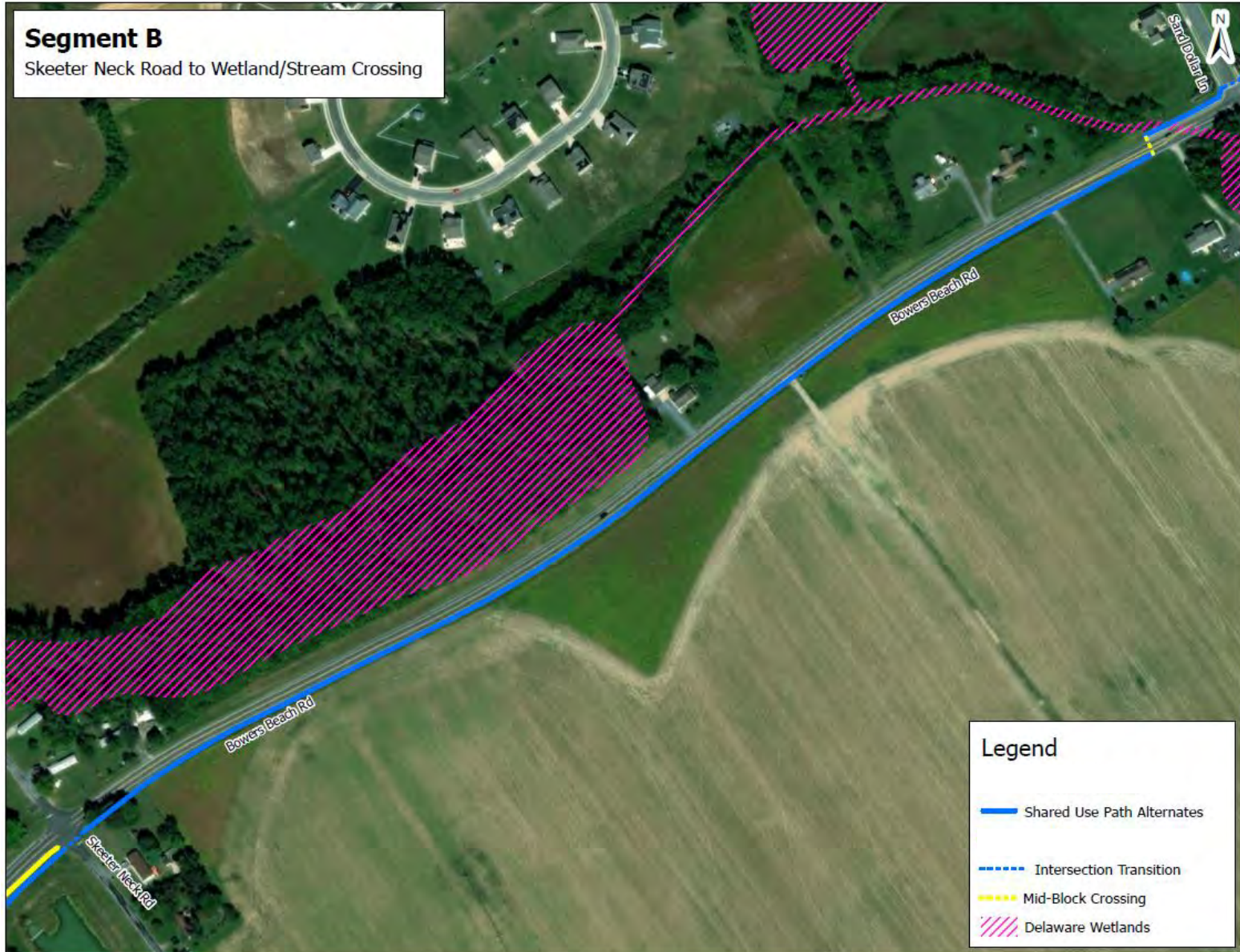
Recommendations – Segment A

	Pros	Cons
Option 1 Shared Use Path south side	<ul style="list-style-type: none">• Lowest stress facility• Can be used by people walking and biking• Aligns with proposed path to the east	<ul style="list-style-type: none">• Path would be constructed outside of the existing curb
Option 2 Separated 2-way bike lane	<ul style="list-style-type: none">• Low-stress facility• Aligns with proposed path to the east• Fits within existing curb to curb	<ul style="list-style-type: none">• Will require coordination for trash pick-up and mail delivery• Sidewalk would be constructed outside of the existing curb
Option 3 Separated 1-way bike lane	<ul style="list-style-type: none">• Low-stress facility• Works with existing striping	<ul style="list-style-type: none">• May impede trash pick-up and mail delivery• Would require a transition to path• Sidewalk would be constructed outside of the existing curb

Constraints – Skeeter Neck to Whitwell

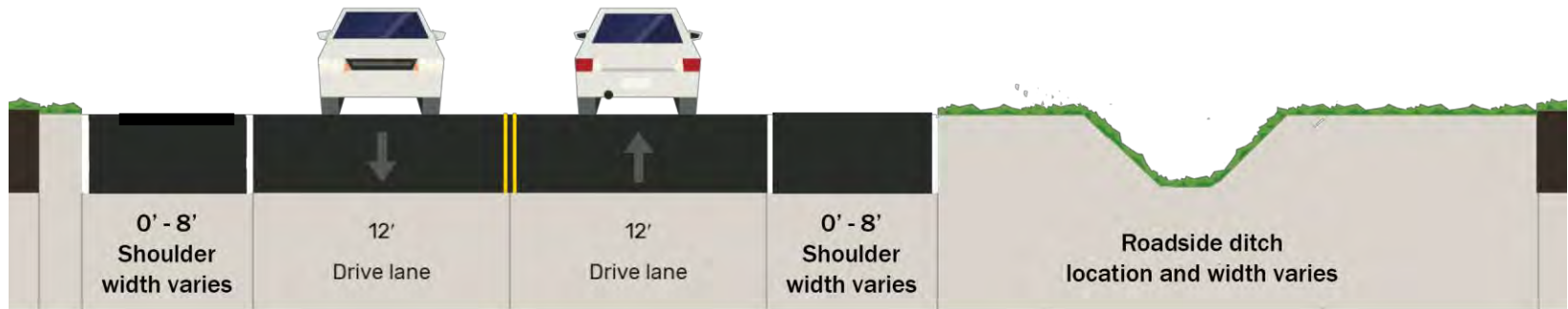


Recommendations – Segment B

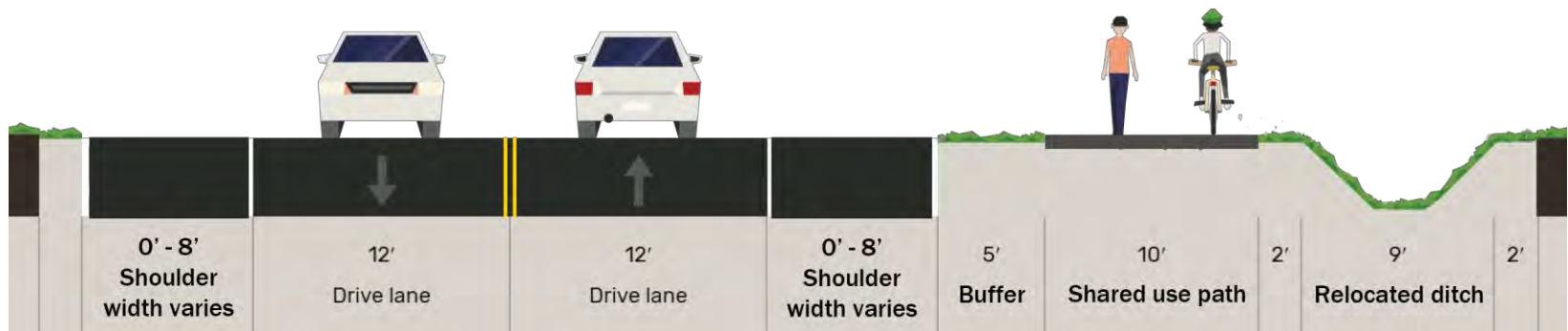


Recommendations – Segment B

Existing Conditions



Alt 1: Shared use path south side



All sections are shown looking towards Bowers Beach

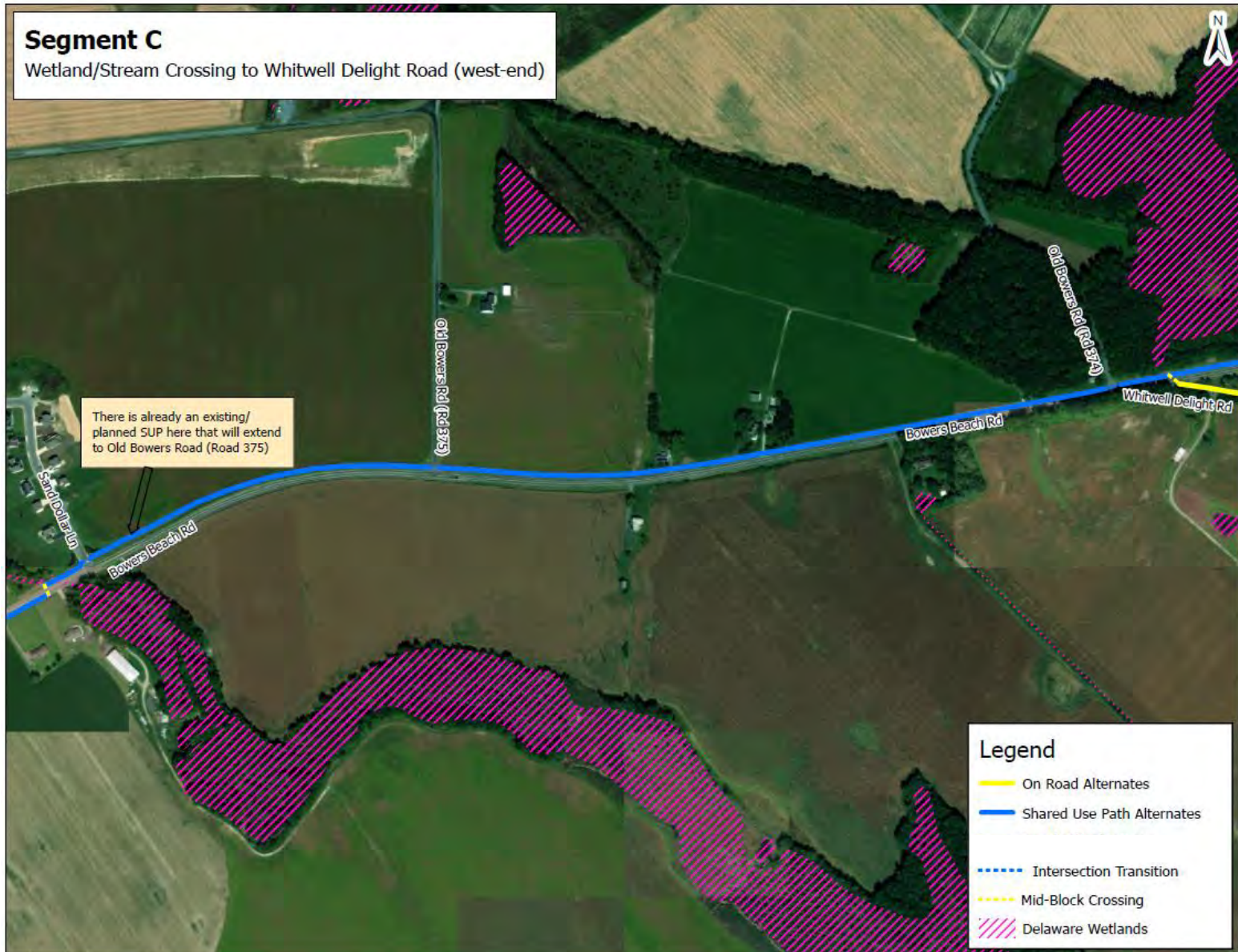


Recommendations – Segment B

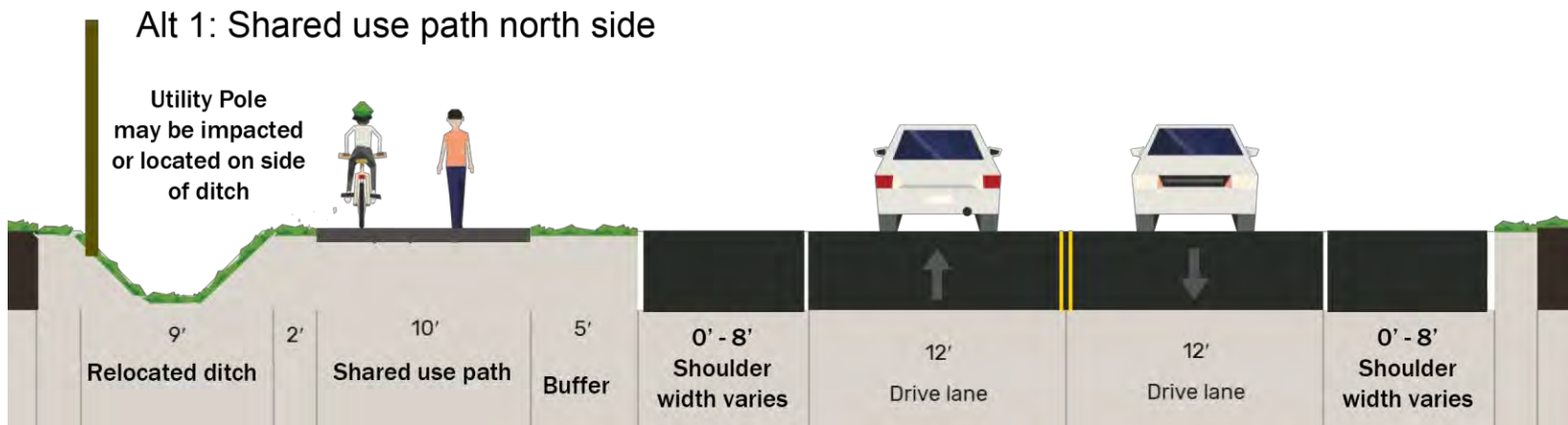
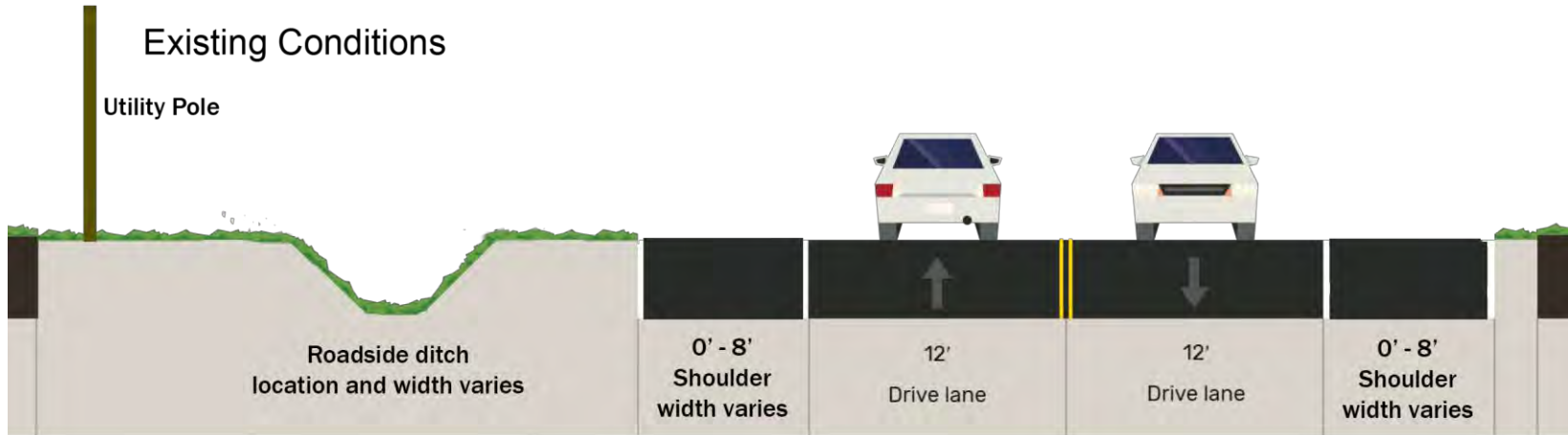
	Pros	Cons
Option 1 Shared Use Path south side	<ul style="list-style-type: none">• Lowest stress facility• Can be used by people walking and biking• Does not impact wetlands on north side of road• Fewer driveway crossings	<ul style="list-style-type: none">• Requires relocation of drainage ditch



Recommendations – Segment C



Recommendations – Segment C



All sections are shown looking towards Bowers Beach



Recommendations – Segment C

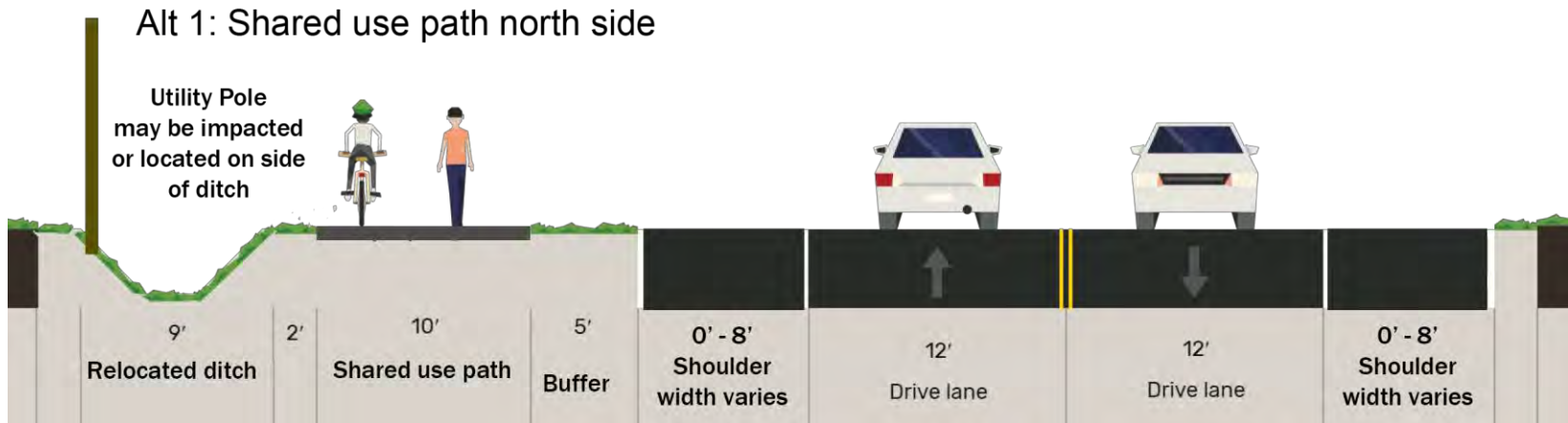
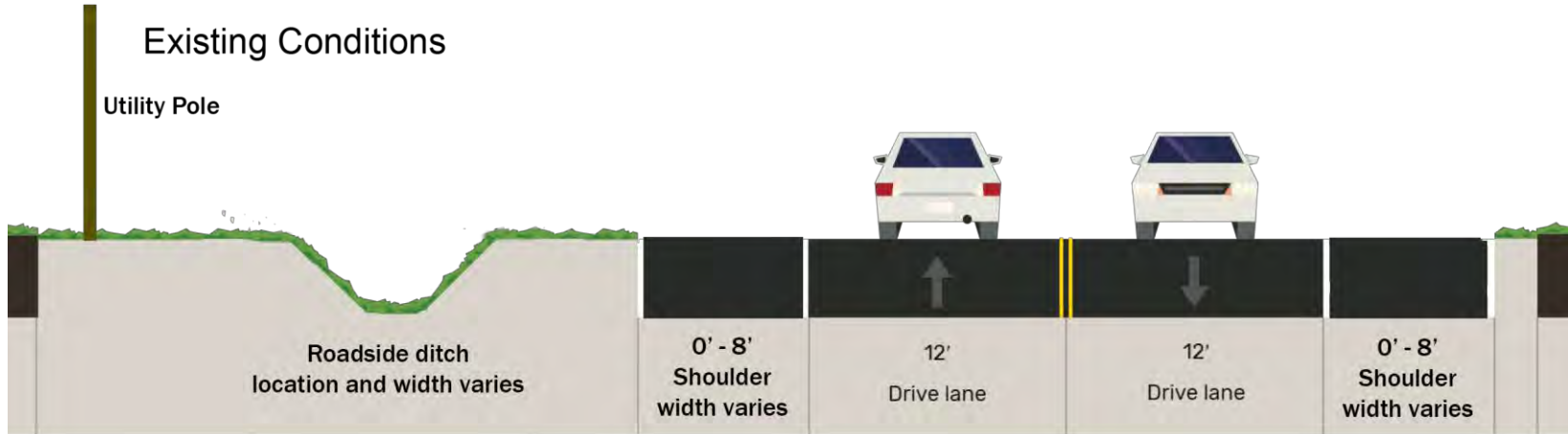
	Pros	Cons
Option 1 Shared Use Path north side	<ul style="list-style-type: none">• Lowest stress facility• Can be used by people walking and biking• Ties into existing path installed by private developer	<ul style="list-style-type: none">• Requires relocation of drainage ditch• May impact utility pole



Recommendations – Segment D



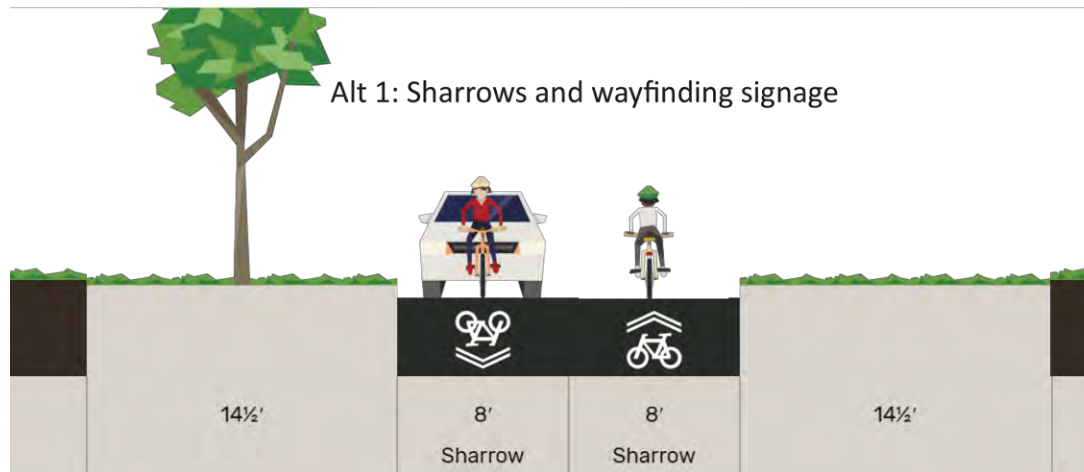
Recommendations – Segment D



All sections are shown looking towards Bowers Beach



Recommendations – Segment D



All sections are shown looking towards Bowers Beach



Recommendations – Segment D

	Pros	Cons
Option 1 Shared Use Path north side	<ul style="list-style-type: none">• Lowest stress facility• Ties into proposed path to the west	<ul style="list-style-type: none">• Requires relocation of drainage ditch• May impact utility poles
Option 2 Sharrows and wayfinding signage on Whitwell's Delight	<ul style="list-style-type: none">• Extremely low cost• No impacts• Low-stress due to low vehicle speeds and volumes	<ul style="list-style-type: none">• Not a separated facility; people walking and biking will share the road with people driving• Aggressive dog



Recommendations – Segment E

Segment E

Whitwell Delight Road (east-end) to Bowers Town Limits

This entire area is within the floodplain

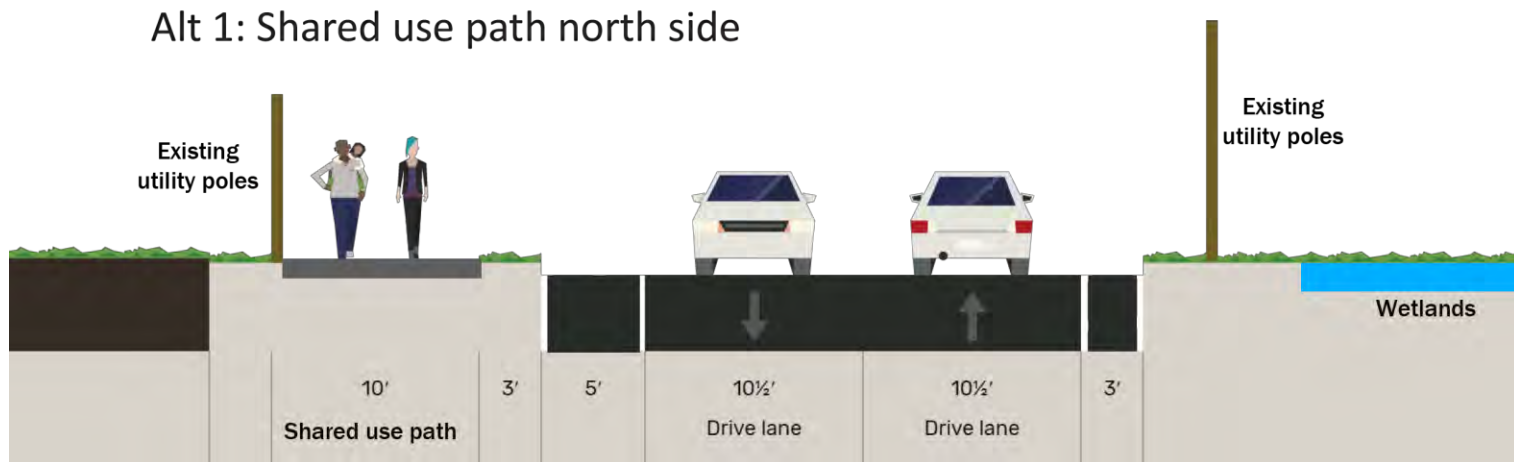
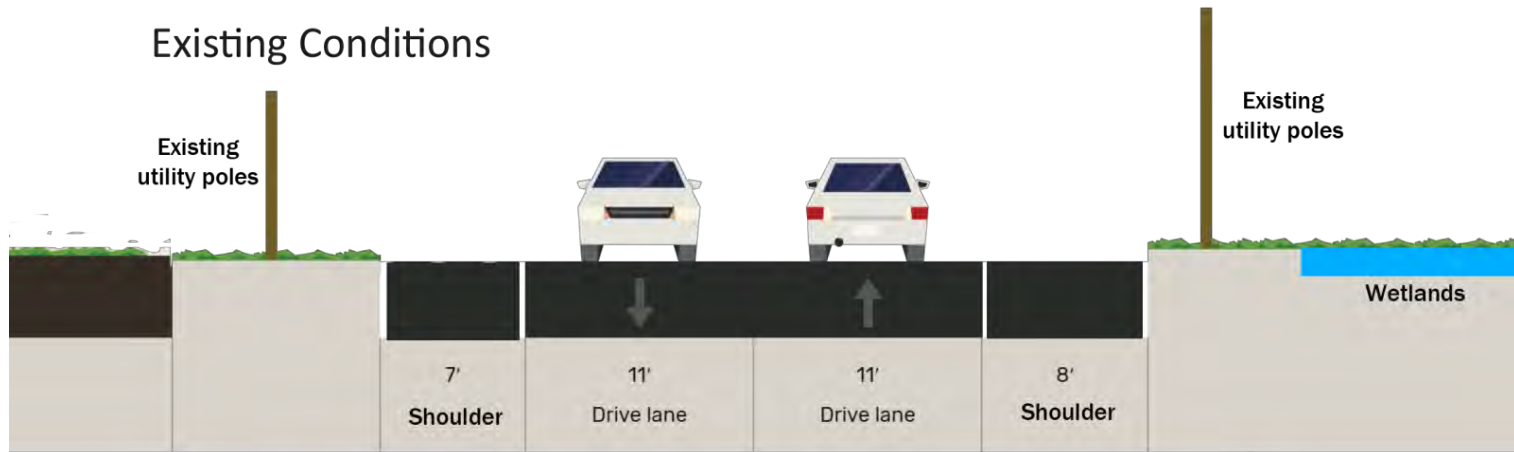
Bowers Town Limits is right around here

Legend

- On Road Alternates
- Shared Use Path Alternates
- Boardwalk Alternates
- Intersection Transition
- Mid-Block Crossing
- Delaware Wetlands



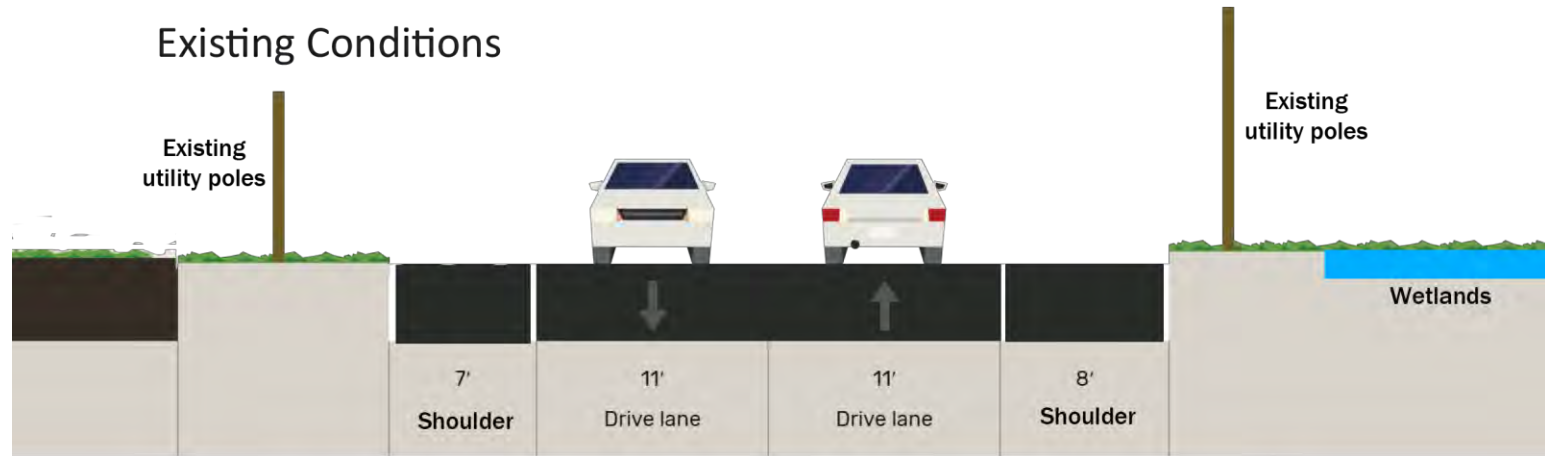
Recommendations – Segment E



All sections are shown looking towards Bowers Beach



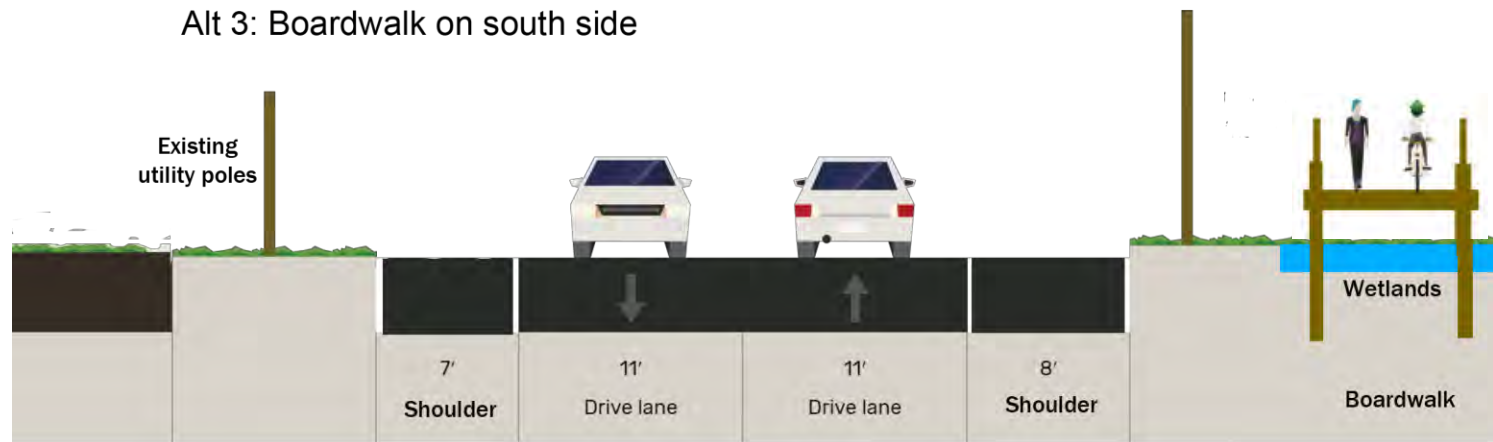
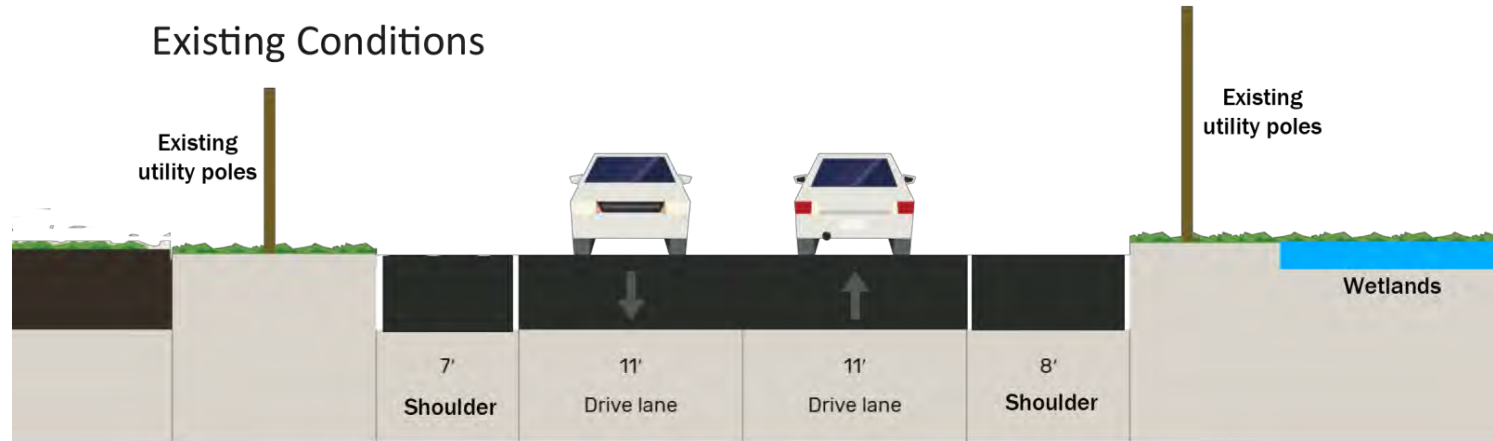
Recommendations – Segment E



All sections are shown looking towards Bowers Beach



Recommendations – Segment E



All sections are shown looking towards Bowers Beach



Recommendations – Segment E

	Pros	Cons
Option 1 Shared Use Path north side	<ul style="list-style-type: none"> • Lowest stress facility • Ties into proposed path to the west 	<ul style="list-style-type: none"> • Requires relocation of drainage ditch • May impact utility poles
Option 2 Bike lanes and north side sidewalk	<ul style="list-style-type: none"> • Extremely low cost • No impacts • Low-stress due to low vehicle speeds and volumes 	<ul style="list-style-type: none"> • High vehicular speeds and poor lines of sight • Better location to transition to on-road bike facilities may be further in town



Recommendations – Segment F



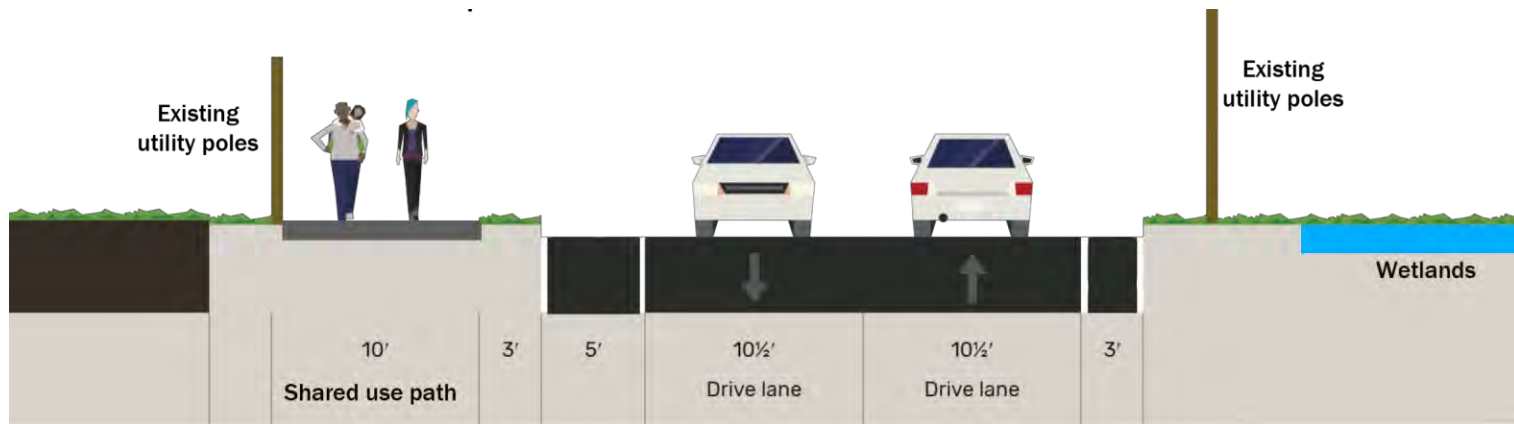
Level of Traffic Stress

LTS	Comfortable Enough	Characteristics
1	Most People	Lowest Stress Comfortable for most ages and abilities
2	Interested, but Concerned	Suitable for most adults Presenting little traffic stress
3	Enthused and Confident	Moderate traffic stress Comfortable for those already biking in American cities
4	Strong and Fearless	High traffic stress Multilane, fast moving traffic



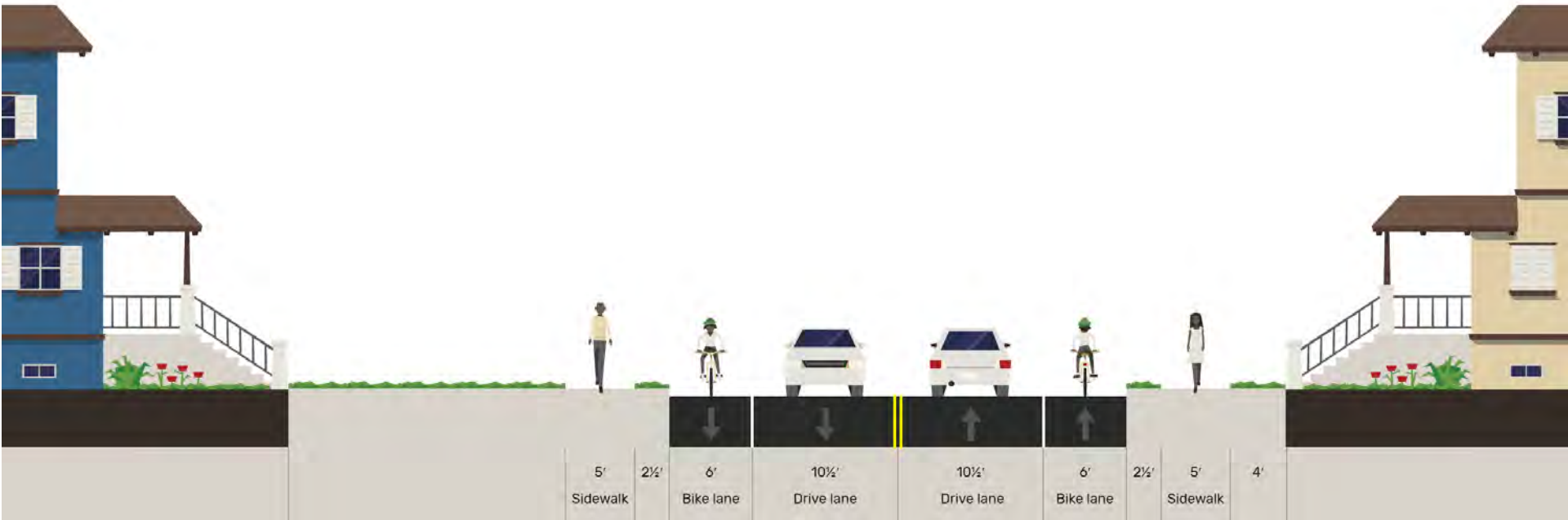
Recommendations – Segment F

Main Street Bike and Pedestrian Improvements Town Limits to Cedar Ave. (60-50 foot right of way)



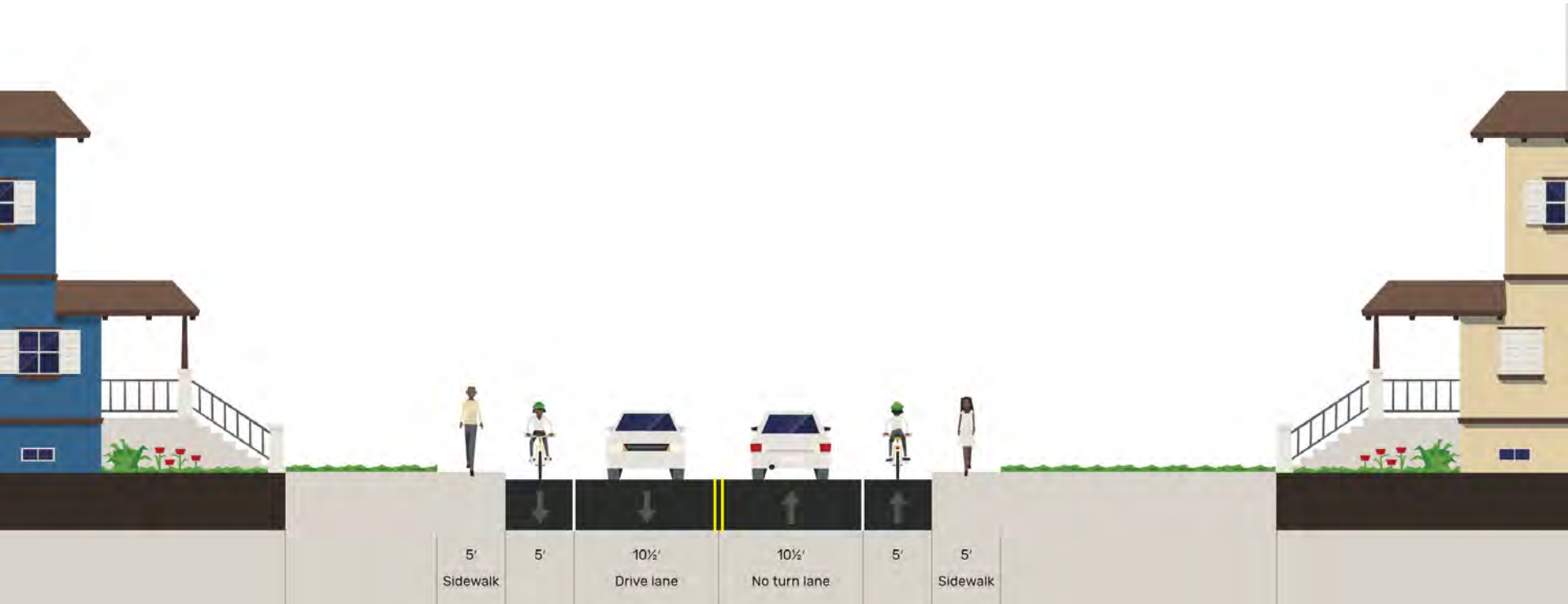
Recommendations – Segment F

Main Street Bike and Pedestrian Improvements Cedar Avenue to Hubbard Ave. (50 foot right of way)



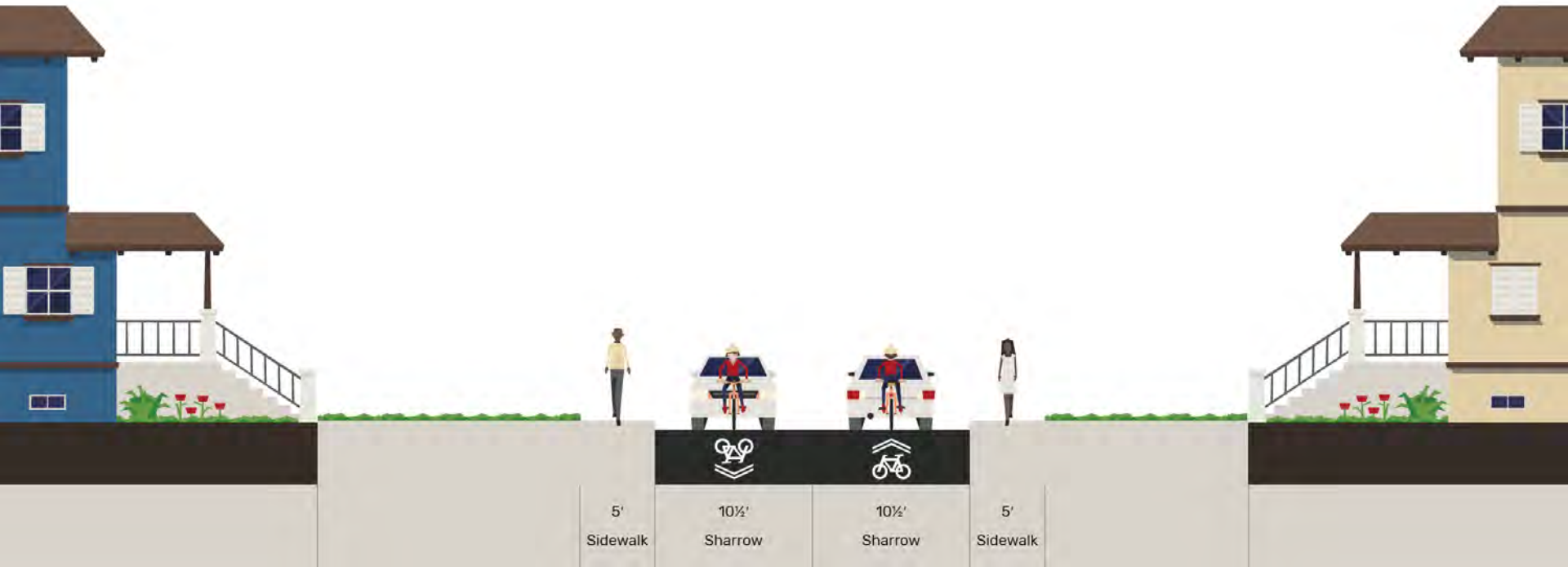
Recommendations – Segment F

Main Street Bike and Pedestrian Improvements Hubbard Ave. to S. Flack Ave. (40 foot right of way)



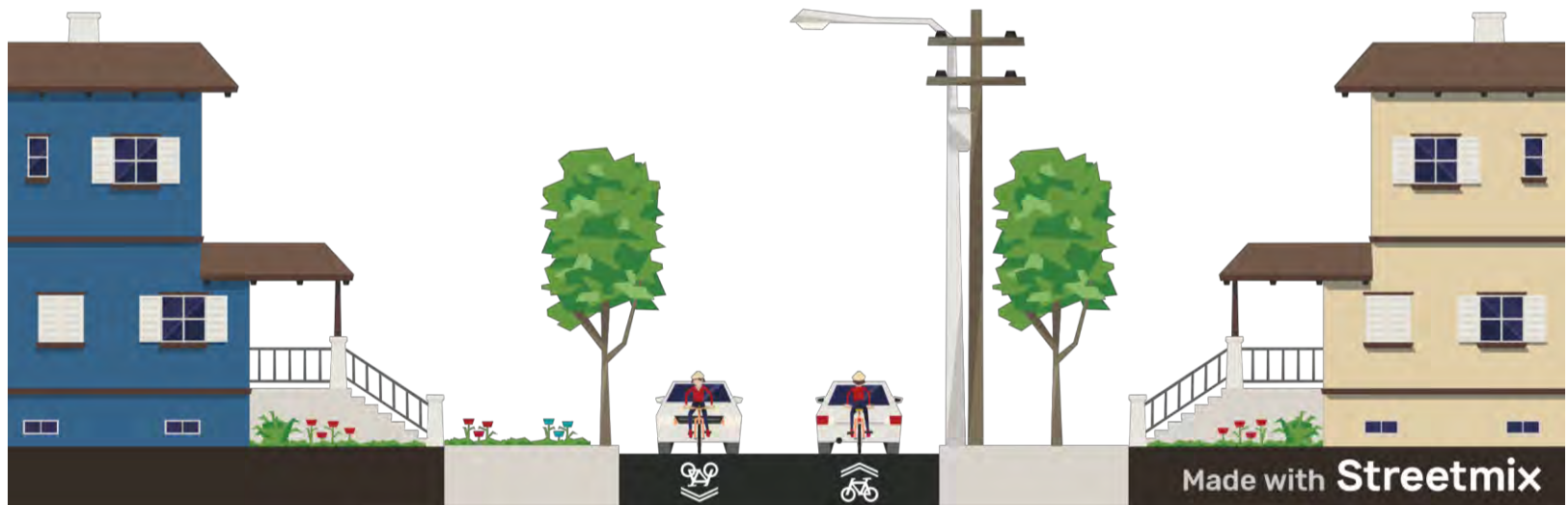
Recommendations – Segment F

Main Street Bike and Pedestrian Improvements S. Flack Ave. to N. Bayshore Dr. (30 foot right of way)



Recommendations – Town Streets

Local streets, including Hubbard Ave., Cooper Ave, S. Flack Ave., and N. Flack Ave.



Recommendations – Bike and Pedestrian Amenities

- Signage and markings designating on-street bike routes in town
- Sidewalks along Main Street



Draft Recommendations- Recreational Access



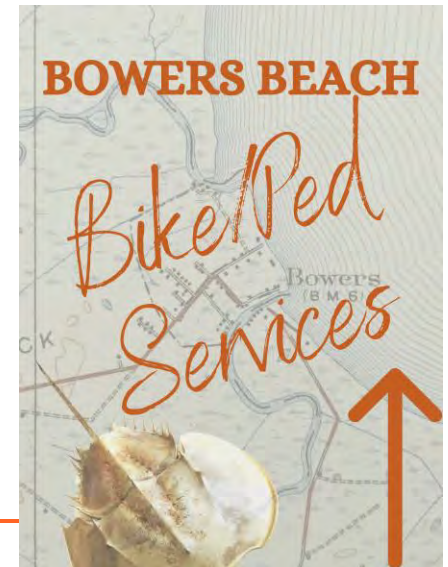
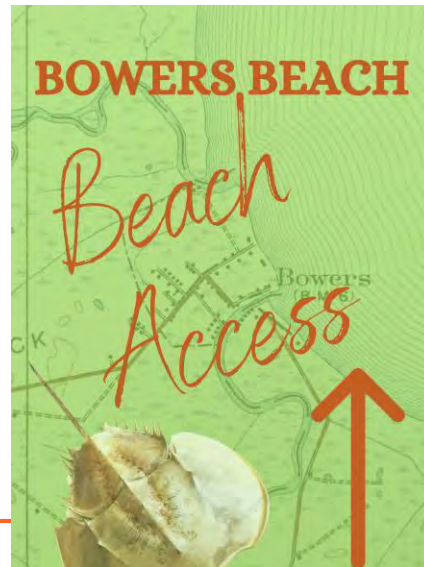
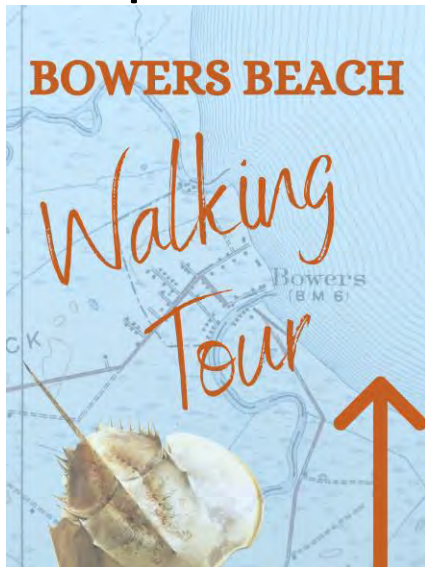
Recommendations – Recreational Access

- Capitalize on ecotourism opportunities by linking environmentally significant areas and local businesses with walking trails and bicycling routes
- Create signage and wayfinding to direct visitors to points of interest and designated routes
- Provide a service building with restrooms, a water station, and snack bar
- Provide a kayak launch/fishing pier on the St. Jones River
- Develop a wetland boardwalk and observation area off of N. Flack Avenue



Recommendations – Recreational Access

- Capitalize on ecotourism opportunities by linking environmentally significant areas and local businesses with walking trails and bicycling routes
- Create signage and wayfinding to direct visitors to points of interest and designated routes



Recommendations –Recreational Access

- Provide bike racks at key destinations in Town
- Provide a bike fix it station

Bike Racks





Example: Fish shaped decorative bike rack
Source: Streetscapes

Bike Fix It Station



Example: Gordon's Pond Trail
Source: Delaware Greenways

Proposed Bike Rack & Fix It Station Locations

-  Bike Fix-It Station
-  Bike Rack



Recommendations – Recreational Access

- Work with DNREC to develop an educational boardwalk area on state owned land off N. Flack Avenue
- Work with DNREC to provide a kayak launch and fishing pier on the St. Jones River

Wetland Boardwalk



Example: Slaughter Beach Boardwalk, DNREC
Source: Delaware Online

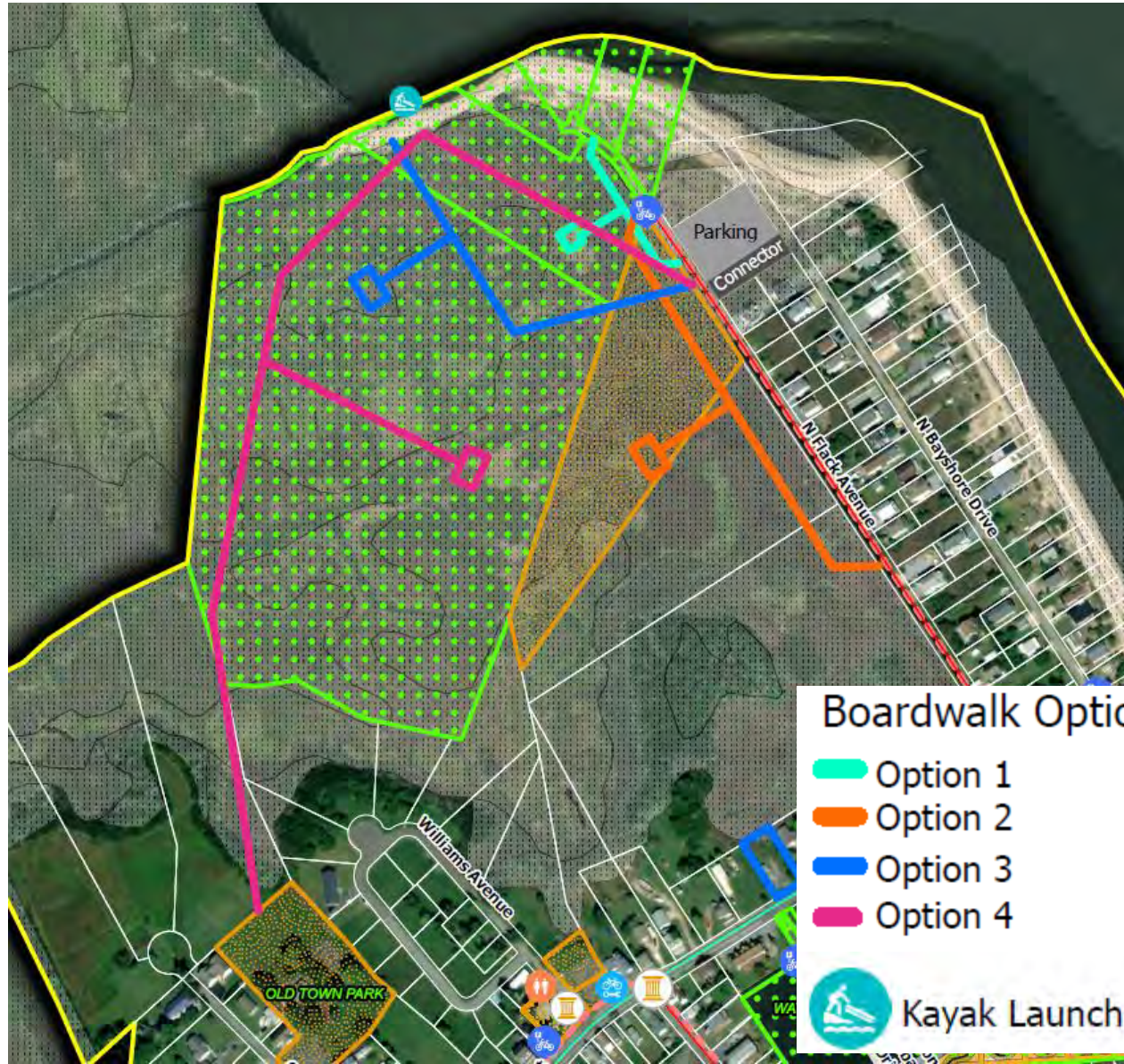
Tidal Kayak Launch/Fishing Pier



Example: Port Mahon Kayak Launch
Source: Delaware Surf Fishing



Boardwalk Alternatives & Proposed Kayak Launch/Fishing Pier Location



Open discussion

- Next steps
 - May 12: Spring Drop-in Public Workshop
 - May 12: Town Council Meeting presentation
 - May 28: Tabling at the Buccaneer Bash
 - June 9: MPO PAC Meeting
 - June 14: MPO TAC Meeting
 - June: Revisions based on public feedback
 - July 6: MPO Council Meeting
 - Briefing with Town Council/Final Recommendations



Thank you!

- Questions or comments?
- Please complete a survey in person or [online](#)

Bowers Beach Bicycle and
Pedestrian Study



SCAN HERE

Take a quick survey regarding all the options
presented at the public workshop.

CONTACT INFORMATION

We welcome your feedback!

If you have questions or comments
please contact Jim Galvin at

james.galvin@doverkentmpo.org or 302-387-6030

