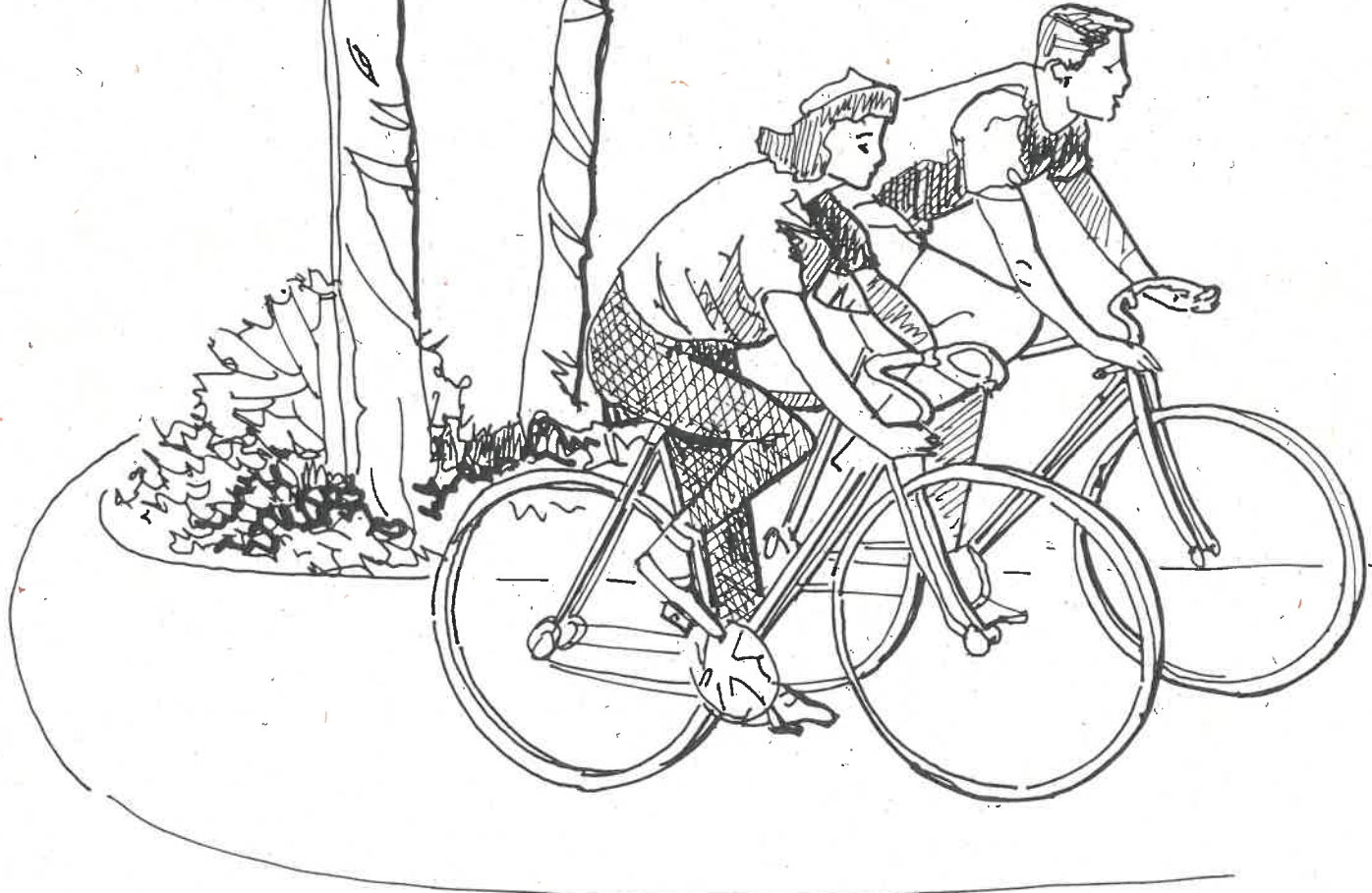




**MASTER PLAN**  
**SOUTH SHORE TRAIL**  
**PHASE V**



**ANNE ARUNDEL COUNTY, MARYLAND**



# MASTER PLAN

South Shore Trail  
Phase V

Prepared for:

Anne Arundel County  
Department of Recreation & Parks  
and  
Department of Public Works

John Gary, County Executive  
M. Joseph Cannon, Director, Department of Recreation & Parks  
John Brusnighan, Director, Department of Public Works

Prepared by:

Human & Rohde, Inc.  
110 E. Pennsylvania Avenue  
Towson, MD 21286  
(410) 825-3885

August 1995



## TABLE OF CONTENTS

---

---

	Page
. Acknowledgements . . . . .	1
. Introduction . . . . .	2
. Location . . . . .	5
. Proposed Alignment . . . . .	6
. Master Plan Drawings . . . . .	10
. Existing Conditions . . . . .	17
Right of Way, Property Ownership	
Topography	
Soils	
Vegetation	
Traffic/Road Crossings	
Utilities	
Land Uses	
. Alternative Alignments . . . . .	27
. Technical and Design Considerations . . . . .	30
Trail Material and Construction Standards	
Drainage	
Support Facilities	
Signage	
Site Furnishings	
. Development Impacts, Approvals and Permits . . .	36
. Administration of the Trail . . . . .	38
. Project Phasing . . . . .	39
. Cost Estimates . . . . .	40
. Bibliography . . . . .	53



## ACKNOWLEDGEMENTS

---

---

The South Shore Trail, Phase V Plan was prepared for Anne Arundel County Departments of Recreation and Parks and Public Works with the assistance of staff members and the City of Annapollis Planning Department.

We would like to acknowledge and thank those individuals who contributed time and thought to the planning of this community facility.

### Anne Arundel County

- Sancho Contreras - Project Manager  
Department of Public Works
- John Keene - Chief, Planning & Construction  
Department of Recreation and Parks
- Vijay Kulkarni - Project Supervisor  
Department of Public Works

### City of Annapolis

- Teresa Dowd - Chief of Community Development  
Planning Department





## INTRODUCTION

---

---

Over the past ten years Anne Arundel County has been active in planning three County-wide trails. These are the Baltimore and Annapolis Trail, from Glen Burnie to the Severn River Bridge; the South Shore Trail, from the Bestgate substation in Parole to Odenton; and the West County Trail, from Odenton to the Patuxent River. The Baltimore and Annapolis Trail was completed and opened to the public in 1989. All three trails will offer a variety of recreational and transportation opportunities to the citizens of Anne Arundel County. These trails have all utilized abandoned railroad right of ways for most of their alignments. The old railroads, which once connected all of Anne Arundel County, now are providing pedestrian and bicycle linkages on the existing and proposed trails. The purpose of Phase V of the South Shore Trail is to connect the Baltimore and Annapolis Trail, from its terminus at the Severn River Bridge, to the terminus of the proposed South Shore Trail at the Bestgate substation.

Phase V of the South Shore Trail will be different from Anne Arundel County's previously planned trails since it would be located within densely developed residential and commercial areas of the County and the City of Annapolis. This trail would not be able to utilize a railroad right of way for its alignment. It was difficult determining the final alignment for the Phase V

trail because of existing development and the associated traffic in the area. Most of the alignment would be located on public roads and right of ways, and would utilize existing and proposed hiker/biker trails through the Annapolis Mall, the Anne Arundel County Hospital Medical Center, the Harborgate subdivision, the DiSalvatore property, and the Windgate subdivision. A portion of the trail would pass through U.S. Naval Academy property.

The Phase V trail's function as a connector between the Baltimore and Annapolis Trail and the South Shore Trail, will primarily benefit long distance, dedicated adult cyclists. Portions of the trail however, will most likely also be used by local residents for access to neighborhood facilities located along the trail. For example, the trail will provide a linkage between residential developments, such as Harborgate and Windgate and commercial areas, such as the Annapolis Mall. It will also provide a linkage between families living in Naval Academy housing and the elementary school and commercial center in West Annapolis which serves them. The specific location of the trail alignment will determine which class of trail would be used.

Bicycle trail classifications are based on their separation from vehicular traffic. A Class I trail is located off the road and is dedicated exclusively or semi-exclusively to bicycle usage. It is wide enough to accommodate two way bicycle traffic. A Class II trail is located on the street with a specific bike lane designated by road striping or a physical barrier. In most cases

this class of trail provides bike lanes on both sides of the road, with bicycles traveling in the same direction as automobile traffic. A Class III trail is also on the road, but is designated by signage alone. Bicycles in this situation must share the road with motorists. Roughly half of the Phase V Trail would be classified as Class II or Class III. These sections of the trail would be potentially more dangerous for users than the Class I segments. In general the Phase V trail will be slower paced than other trails due to traffic and safety constraints.



Corner of Jennifer Road and Medical Parkway

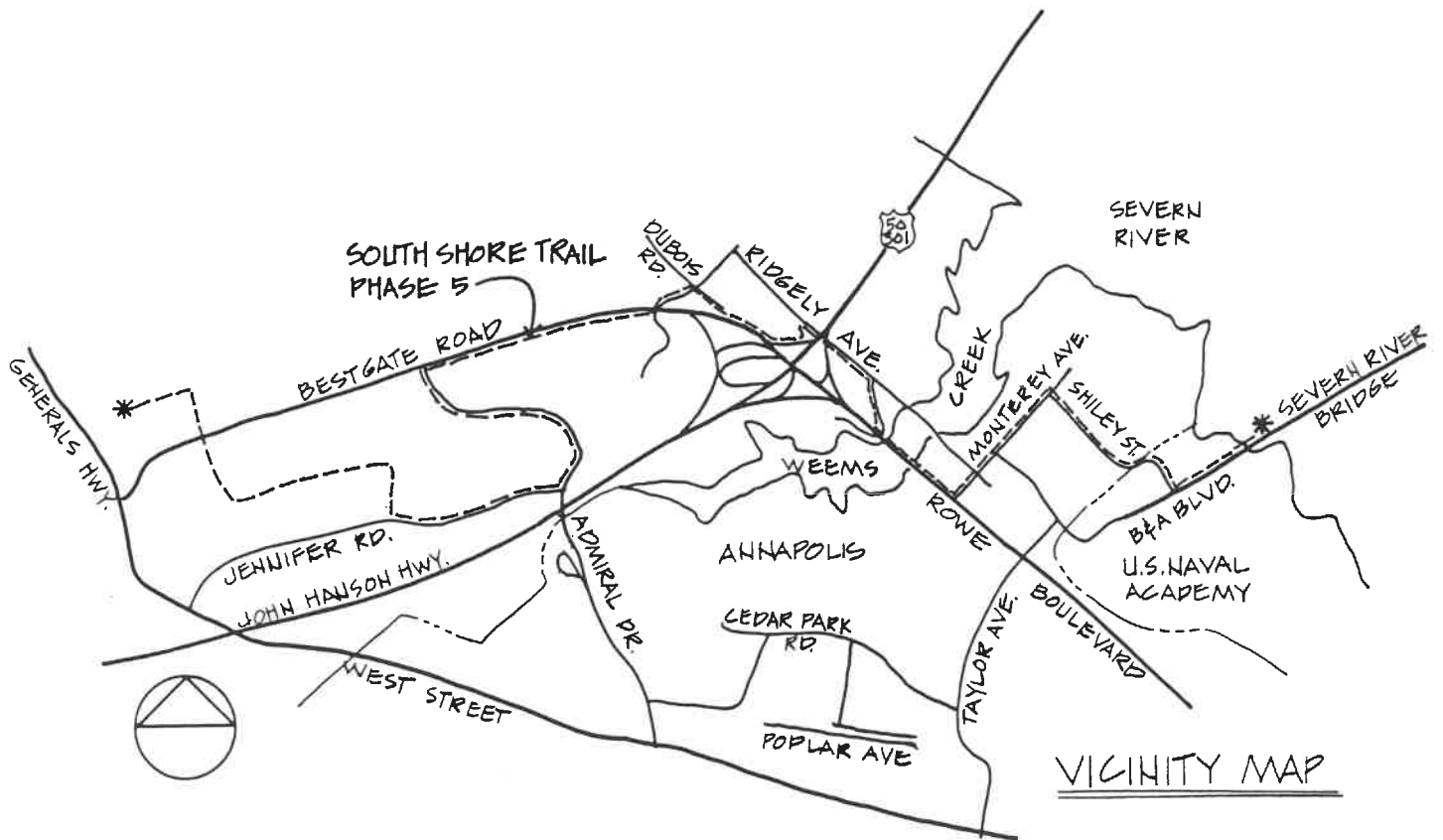


# LOCATION

---

---

The South Shore Trail, Phase V, is located in the eastern part of Anne Arundel County and in West Annapolis. The trail would originate at the terminus of the South Shore Trail, at the Bestgate substation, and travel east, crossing Route 50/301 at Ridgely Avenue. It would then cross Weems Creek at Rowe Boulevard and continue into West Annapolis. The trail would pass through West Annapolis and the United States Naval Academy before reaching its terminus at the Severn River Bridge.





## PROPOSED TRAIL ALIGNMENT

---

---

This section of the report describes the proposed trail alignment of Phase V of the South Shore Trail. Further details appear on the master plan drawings included in this report. All trail alignments mentioned in this narrative are Class I unless otherwise specified.

The trail would begin at the terminus of the South Shore Trail at Bestgate Road. It would pass behind the power substation and proceed east through the Annapolis Commerce Park, utilizing an existing 25' median. The trail would turn south on Industrial Drive and cross Bestgate Road to connect with an existing trail on the Annapolis Mall property.



Annapolis Mall Trail at Bestgate Road

At the end of the Mall trail, the Phase V alignment would turn east behind the Annapolis Plaza. The trail would be located on the slope above an existing stormwater management pond. The alignment would then pass through Anne Arundel Medical Center property, and follow Medical Parkway out to Jennifer Road. The Medical Center has provided a trail along their frontage on Jennifer Road.

The alignment would remain on the north side of Jennifer Road, passing in front of the Anne Arundel County gas station, until reaching Admiral Drive. From Admiral Drive, it would proceed north to Bestgate Road, utilizing an existing 8' wide trail through the Harborgate development. The alignment would then turn east and continue on the south side of Bestgate Road. After passing Boardley Road, the alignment would utilize trails provided by the DiSalvatore and Windgate subdivisions.

At Lawrence Road, the alignment would cross Rowe Boulevard and continue as a Class I trail on the north side of Bestgate Road for a short distance before turning southeast on DuBois Road as a Class III trail. At the end of DuBois Road, the trail would become Class I and follow along the north side of the 50/301 highway ramp until reaching Willow Road. The alignment would utilize Willow Road as a Class III alignment, turning east on Ridgely Avenue. From this point on, into West Annapolis and up to the Severn River Bridge, the trail would be primarily Class II or III.

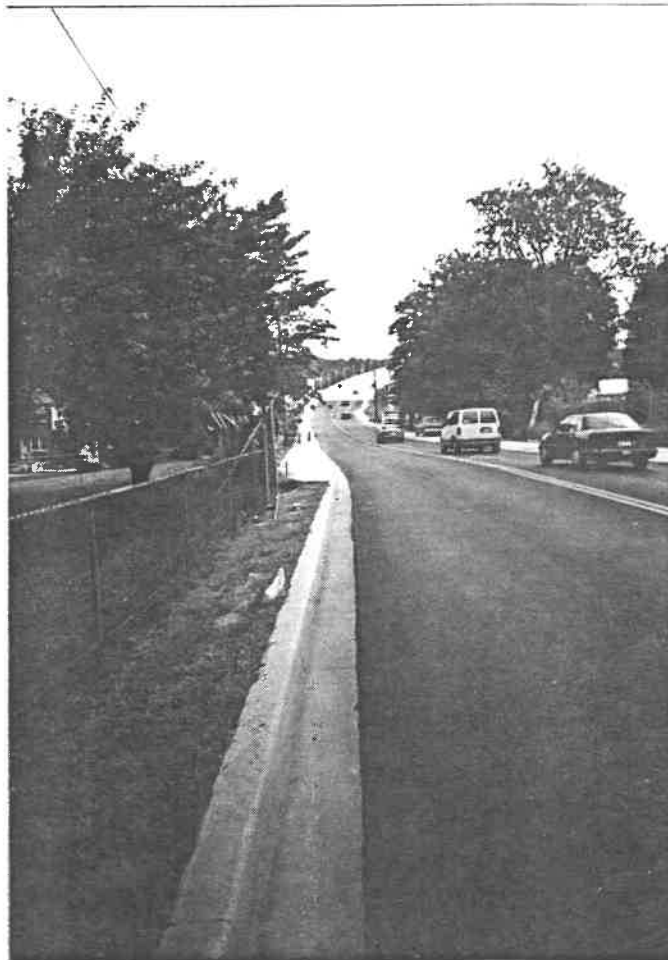




Intersection of Kirkley and Ridgely Roads, Facing West

After crossing the Route 50/301 bridge, the alignment turns south on Kirkley Road. This move detours the trail off Ridgely Road in order to avoid a narrow roadway situation on both sides of the Ridgely Avenue bridge over Weems Creek. The trail would leave Kirkley Road and cut across Maryland State Highway Administration property to the east side of Rowe Boulevard. The trail would then cross Weems Creek on the Rowe Boulevard bridge. The existing bridge is not wide enough to accommodate bicycle traffic; however, a new bridge, planned for the future, could include a two-way bike lane on the east side.

The alignment would continue on the east shoulder of Rowe Boulevard and connect into the end of Monterey Road at Forbes Street in West Annapolis. The trail would utilize Monterey Road and then turn east on Shiley Street and follow it until it ends at the old B&A Railroad right of way. The alignment would cross the right of way at grade and stay on Badger Road, passing through the enlisted men's housing area of the United States Naval Academy, until it reaches Baltimore and Annapolis Boulevard. The trail would then turn east towards the Severn River Bridge, with eastbound bicycle traffic crossing to the south side of Baltimore and Annapolis Boulevard.



Baltimore & Annapolis Boulevard (Route 450)  
Approaching the Severn River Bridge



21401

3

2

5

6

1

GOVERNOR RITCHIE HIGHWAY  
BALTIMORE  
ANNAPOLIS  
648  
450

RIVER BRIDGE  
FERRY FARMS  
Point  
Dewey Field

SEVERN RIVER  
BRIDGE  
Coul Spring Cove  
WIDCHSTER  
SEVERN  
Creek  
636

WEEMS 70  
HIGHWAY  
Exit-24  
LAWRENCE AVE

ANNAPOLIS  
COMMERCIAL  
PK  
BESTGATE TERR  
Annapolis Medical Plaza  
Annapolis Mail

USP  
HIGHWAY  
Exit-22  
Exit-23

ANNAPOLIS  
666  
ANNAPOLIS  
HARBOR  
CITY

ANNAPOLIS  
CITY  
ANNAPOLIS  
CITY

ANNAPOLIS  
CITY  
ANNAPOLIS  
CITY

ANNAPOLIS  
CITY  
ANNAPOLIS  
CITY

ANNAPOLIS  
CITY  
ANNAPOLIS  
CITY

Crouchs Pond

Whitehurst Lake

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY

ANNAPOLIS  
CITY



**KEY**

	TRAIL ALIGNMENT CLASS I		EXISTING TRAFFIC SIGNAL
	TRAIL ALIGNMENT CLASS II OR III		STEEP SLOPES
	ALTERNATIVE ALIGNMENT-CLASS I		EXISTING WOODS
	ALTERNATIVE ALIGNMENT-CLASS III		STREAM - BODY OF WATER
	EXISTING TRAIL		VIEWS
	FUTURE TRAIL		BUFFER - SCREEN
	MAJOR ROAD CROSSING		
	MINOR ROAD/DRIVEWAY CROSSING		
	PARKING POTENTIAL		

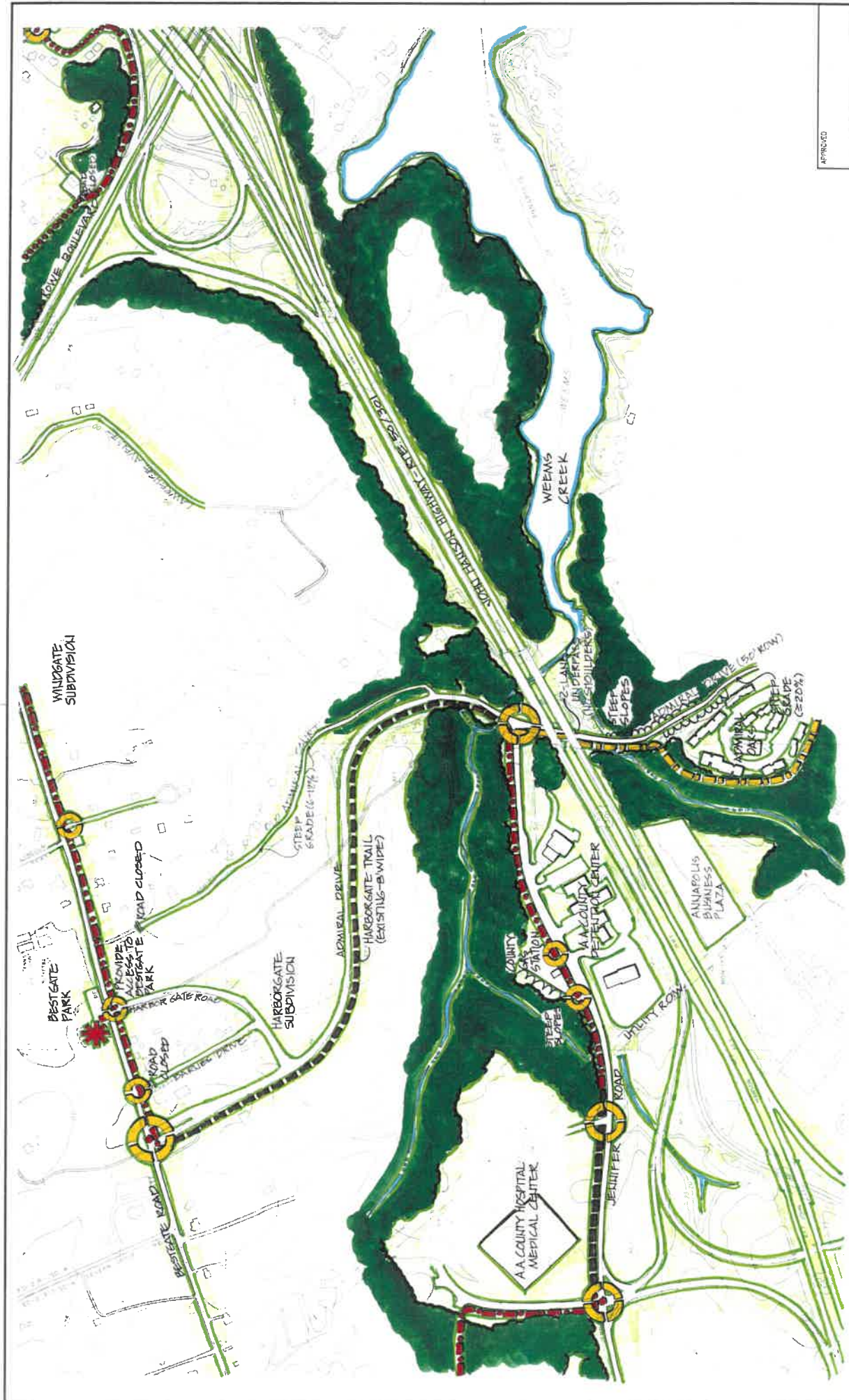


APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER	DATE	PROJECT MANAGER	DATE
ASSISTANT CHIEF ENGINEER	DATE	CHIEF, RIGHT-OF-WAY	DATE
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS BUREAU OF ENGINEERING SOUTH SHORE TRAIL MASTER PLAN			

**HUMAN & ROHDE, INC.**  
 Landscape Architects  
 110 E. Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 825-3885







APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 DIRECTOR, RECREATION AND PARKS

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHIEF ENGINEER

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 ASSISTANT CHIEF ENGINEER

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 PROJECT MANAGER

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 SUPERVISOR

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 PROJECT NO. 2 OF 6

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 SHEET NO. 2 OF 6

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 PROPOSAL NO.

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 ANNE ARUNDEL COUNTY  
 DEPARTMENT OF PUBLIC WORKS

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 BUREAU OF ENGINEERING

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 SOUTH SYKE TRAIL  
 MASTER PLAN

HUMAN & ROHDE, INC.  
 Landscape Architects  
 110 E. Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 825-3885







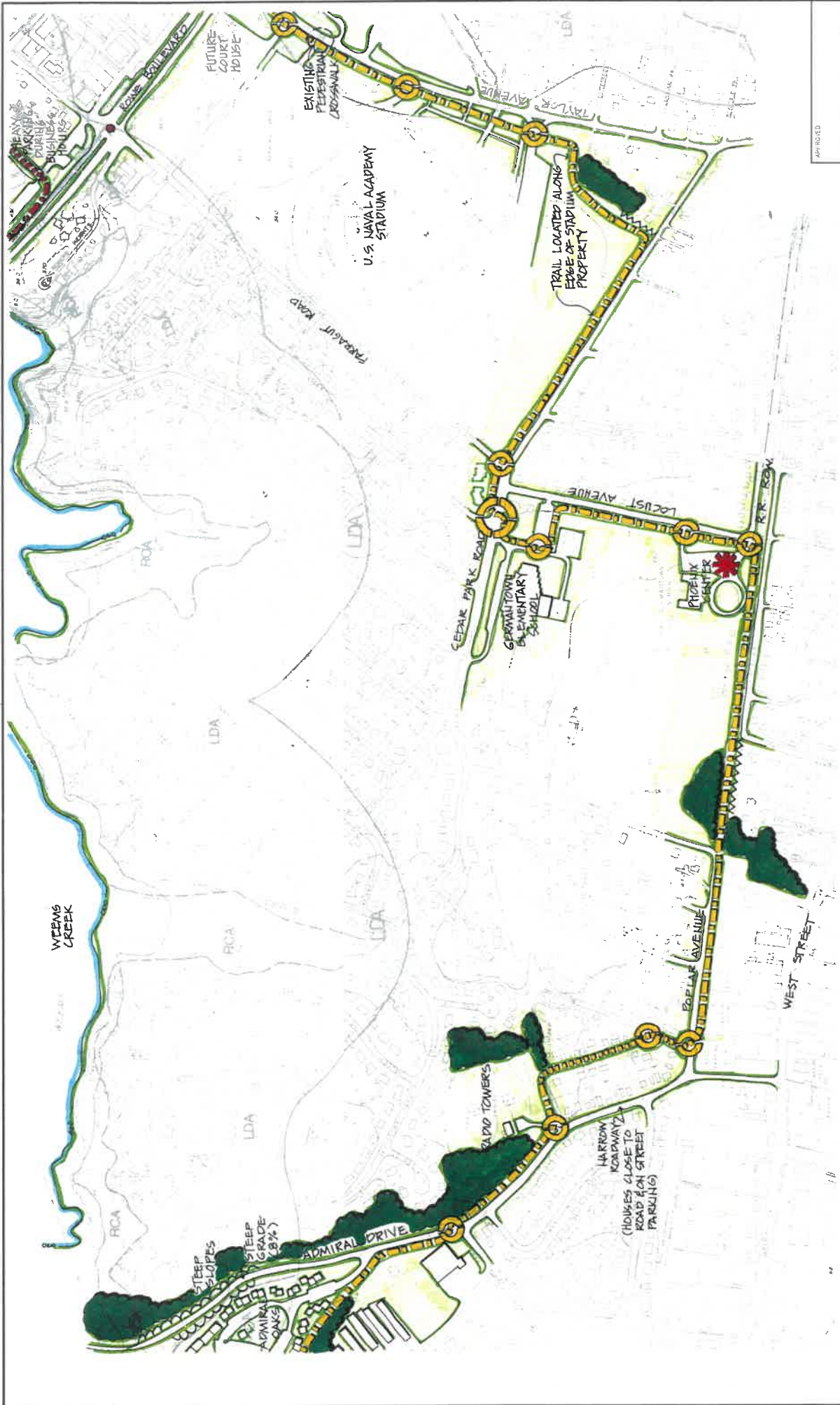
APPROVED	DATE	APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER		PROJECT NO.	
ASSISTANT CHIEF ENGINEER		DATE APPROVAL		CHIEF, RIGHT-OF-WAY	



**HUMAN & ROHDE, INC.**  
 Landscape Architects  
 110 E. Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 925-3885

ANNE ARUNDEL COUNTY  
 DEPARTMENT OF PUBLIC WORKS  
 SCALE: 1" = 20'-0"  
 DRAWN BY: J.H.S.  
 CHECKED BY: J.H.S.  
 SHEET NO. 5 OF 6  
 PROJECT NO. 1000000000  
 CHIEF, RIGHT-OF-WAY  
 APPROVAL  
 BUREAU OF ENGINEERING  
 SOUTH-FH RE: T KAL  
 MASTER PLAN





APPROVED: \_\_\_\_\_  
 DATE: \_\_\_\_\_  
 SCALE: 1" = 200'  
 DRAWN BY: J.H.S.  
 CHECKED BY: \_\_\_\_\_  
 PROJECT MANAGER: \_\_\_\_\_  
 DATE APPROVED: \_\_\_\_\_  
 SHEET NO.: 4 of 6  
 PROJECT NO.: \_\_\_\_\_  
 PROPOSAL NO.: \_\_\_\_\_

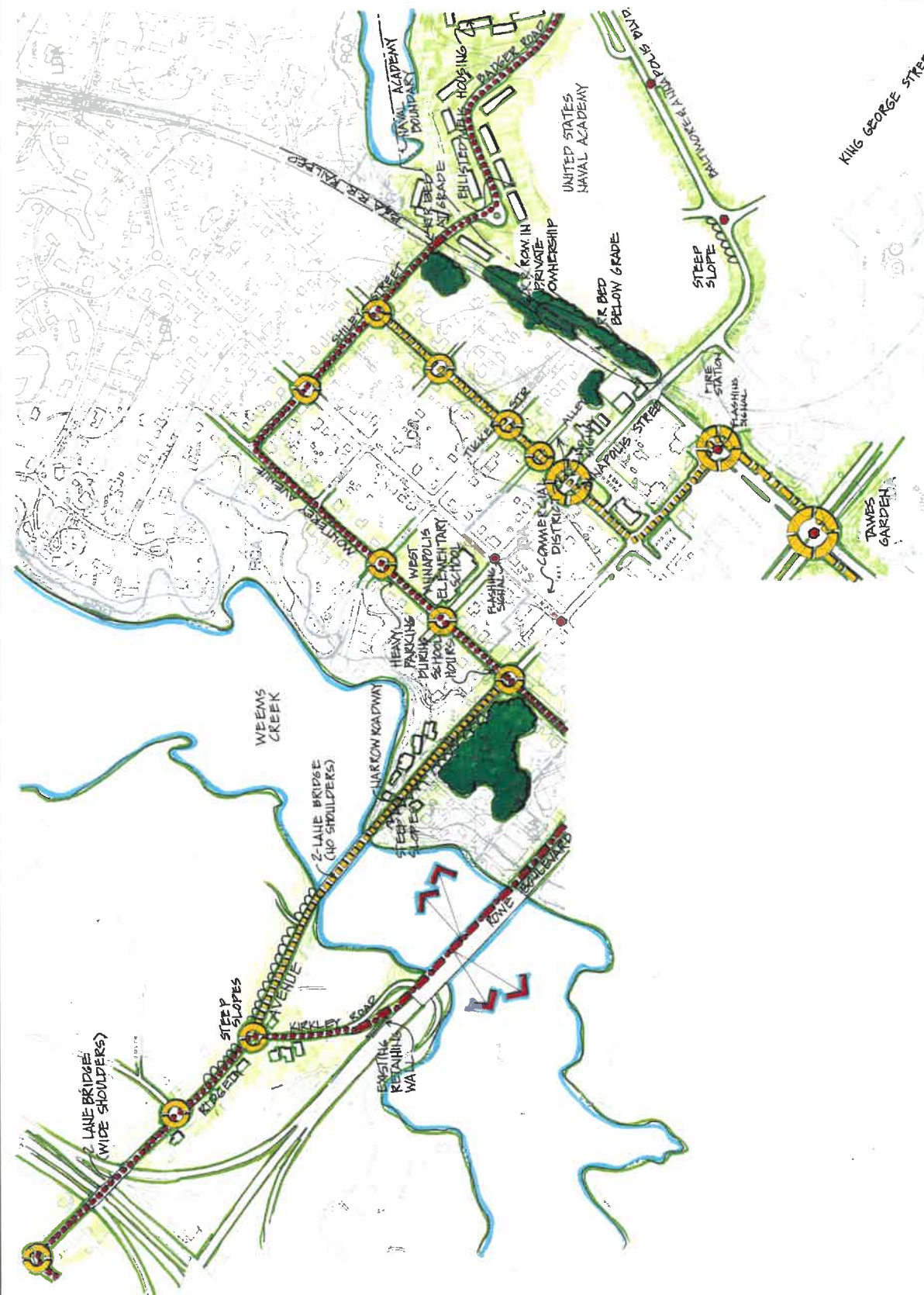
APPROVED: \_\_\_\_\_  
 DATE: \_\_\_\_\_  
 SCALE: 1" = 200'  
 DRAWN BY: J.H.S.  
 CHECKED BY: \_\_\_\_\_  
 PROJECT MANAGER: \_\_\_\_\_  
 DATE APPROVED: \_\_\_\_\_  
 SHEET NO.: 4 of 6  
 PROJECT NO.: \_\_\_\_\_  
 PROPOSAL NO.: \_\_\_\_\_



**HUMAN & ROHDE, INC.**  
 Landscape Architects  
 110 E. Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 825-3885

APPROVED: \_\_\_\_\_  
 DATE: \_\_\_\_\_  
 SCALE: 1" = 200'  
 DRAWN BY: J.H.S.  
 CHECKED BY: \_\_\_\_\_  
 PROJECT MANAGER: \_\_\_\_\_  
 DATE APPROVED: \_\_\_\_\_  
 SHEET NO.: 4 of 6  
 PROJECT NO.: \_\_\_\_\_  
 PROPOSAL NO.: \_\_\_\_\_





APPROVED  
SECTION, REVISION AND DRAWING NO.

ANNE ARUNDEL COUNTY  
DEPARTMENT OF PUBLIC WORKS  
BUREAU OF ENGINEERING  
SOUTH SHORE TRAIL  
MASTER PLAN

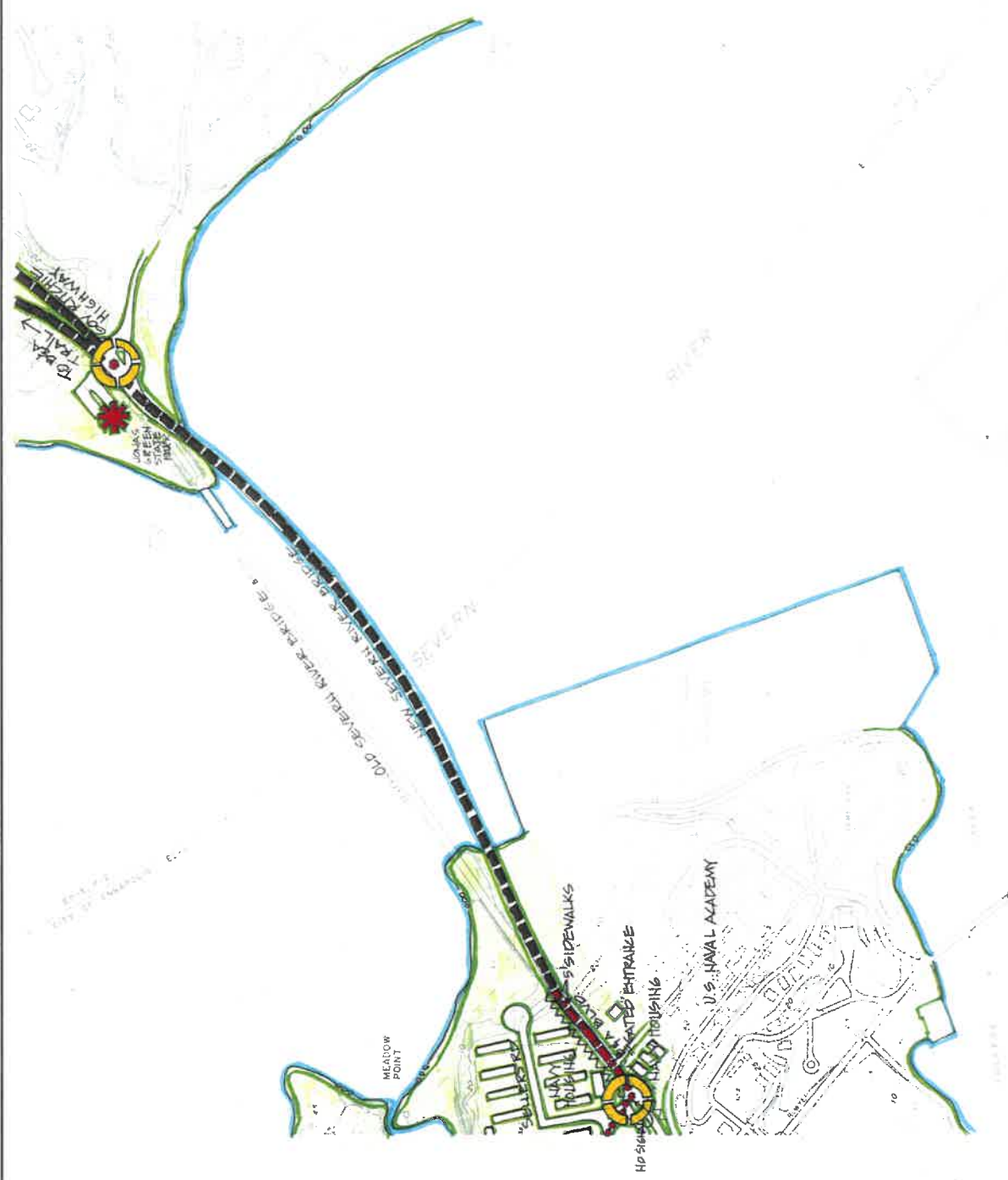
APPROVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
SCALE: 1" = 200'  
DRAWN BY: J.H.S.  
CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
PROJECT NO. 5 OF 6  
PROJECT NO. \_\_\_\_\_  
PHYSICAL NO. \_\_\_\_\_

APPROVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
PROJECT MANAGER: \_\_\_\_\_ DATE: \_\_\_\_\_  
APPROVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ASSISTANT CHIEF ENGINEER: \_\_\_\_\_  
CHIEF, RIGHT-OF-WAY: \_\_\_\_\_



HUMAN & ROHDE, INC.  
Landscape Architects  
110 E. Pennsylvania Avenue  
Towson, Maryland 21286  
(410) 825-3885





ANNAPOLIS		ANN ARUNDEL COUNTY	
DEPARTMENT OF PUBLIC WORKS		BUREAU OF ENGINEERING	
DATE	SCALE	DATE	SCALE
APPROVED	1" = 20'	DATE	1" = 20'
PROJECT MANAGER	DESIGNED BY	PROJECT MANAGER	DESIGNED BY
APPROVAL	DATE	APPROVAL	DATE
PROJECT NO.	SHEET NO.	PROJECT NO.	SHEET NO.
1000000000	1 OF 1	1000000000	1 OF 1
PROJECT TITLE		PROJECT TITLE	
SOUTH SHORE TRAIL		SOUTH SHORE TRAIL	
MASTER PLAN		MASTER PLAN	



**HUMAN & ROHDE, INC.**  
 Landscape Architects  
 110 E. Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 825-3885





## EXISTING CONDITIONS

---

---

### RIGHT OF WAY, PROPERTY OWNERSHIP

There are a variety of conditions relative to right of way and property ownership along the proposed alignment of Phase V of the South Shore Trail. A preliminary evaluation is as follows:

<u>Trail Alignment</u>	<u>Ownership/ROW</u>
Bestgate substation to Annapolis Mall	. ROW easements must be negotiated with Baltimore Gas & Electric Co. and the Annapolis Commerce Park
Annapolis Mall	. Existing trail and easement have been provided by Annapolis Mall
Annapolis Plaza	. Future easement has been agreed upon by Annapolis Plaza
Anne Arundel Medical Center Medical Park	. Future easement and existing trail along Jennifer Road is provided by Anne Arundel Medical Center
Medical Park to Admiral Drive	. Anne Arundel County has ownership of this stretch
Admiral Drive, from Jennifer Road to Bestgate Road	. Existing trail and easement is provided by Harborgate Development
Bestgate Road, from Admiral Drive to Boardley Road	. Bestgate Road was recently widened; there may be remaining right of way, but in spots additional right of way may need to be purchased
Bestgate Road, Boardley Road to Lawrence Avenue	. Trail easement and trail will be provided by DiSalvatore and Windgate Developments
Bestgate Road, Lawrence Avenue to DuBois Road	. Trail would be located within road right of way, if possible

Trail Alignment

Ownership/ROW

DuBois Road	. Class III trail on road
DuBois Road to Willow Road	. Easement would be needed from MD State Highway Administration along 50-301 ramp
Willow Road	. Class III trail on road
Ridgely Avenue, Willow Road to Kirkley Road	. Class II trail on road
Kirkley Road	. Class III trail on road
Kirkley Road to Rowe Boulevard	. Easement would be needed from MD State Highway Administration
Rowe Boulevard over Weems Creek	. Easement would be needed from MD State Highway Administration
Rowe Boulevard to Monterey Avenue	. Median strip in private ownership - easement needed
Monterey Avenue	. Class III trail on road
Shiley Street	. Class III trail on road
Pass Through to Naval Academy	. Old WB&A Railroad right of way now in private ownership - easement needed
Badger Road	. Class III trail on road - access through U.S. Naval Academy must be approved
Baltimore & Annapolis Boulevard to Severn River Bridge	. U.S. Naval Academy property - easement needed

TOPOGRAPHY

The proposed trail alignment would follow existing roadways. The grades range from 2 to 5%. There is a short distance of steeper grades (8-10%) on Willow Road at the intersection of Ridgely Avenue. There is also a problem with steep grades where the

trail connects from Kirkley Road to Rowe Boulevard. There is a retaining wall there at present and the trail should be able to negotiate the slope at a grade of 8% or less.



Rowe Boulevard Shoulder; Kirkley Road on Hill Behind Trees

### SOILS

The soils in this part of Anne Arundel County are in the Monmouth-Collington Association. This association is characterized as having:

- 34% Monmouth soils
- 25% Collington soils
- 41% Minor soils

Monmouth and Collington soils are well drained sandy loams, often with sandy clay loam to clay subsoils. The Monmouth soils are

erodible. Almost all of the soils along the proposed trail alignment are Monmouth or Collington soils.

#### VEGETATION

The proposed alignment would pass adjacent to a wooded stream valley which is located behind the Anne Arundel Medical Center Medical Park, the County gas station, and the lower portion of the Harborgate trail. This area provides a sample of a native bottomland forest community. It features trees such as Red and White Oaks, Tulip Tree, Red Maple, Ironwood, White Pine, and Black Cherry. There is little direct contact with the forest; however, it does provide a visual contrast to the surrounding development.

Most other vegetation along the trail would be of an urban character, such as street trees, small woodlots, and residential and commercial landscape plantings.

#### TRAFFIC/ROAD CROSSINGS

Phase V of the South Shore Trail, as previously mentioned, would be located in developed commercial and residential areas. The proposed alignment twists and turns its way from one end to the other. This has meant many road and driveway crossings, some occurring in high traffic areas.

It is anticipated that all these crossings would be at grade. Safety is a major concern when trail users must interact with



Median Through Annapolis Commerce Park

vehicular traffic. There are existing signals at several of the major road crossings which will provide safe crossings for bicyclists. It would be necessary to adequately sign and/or mark the paving at other road or driveway crossings. Because of the number of crossings involved, a hierarchy should be used in developing a system of signage and road marking. In general, however, bicyclists should be aware that motorists will have the right of way unless signage indicates otherwise. Following is a list of the road/driveway crossings along the proposed trail alignment.

<u>Crossing Location</u>	<u>Road Type</u>	<u>Comments</u>
<u>Anne Arundel County</u>		
Research Drive	local	<ul style="list-style-type: none"> <li>. access into Annapolis Commerce Park</li> <li>. traffic mostly limited to business hours</li> </ul>

<u>Crossing Location</u>	<u>Road Type</u>	<u>Comments</u>
Driveways (3)	parking access	. access into Annapolis Commerce Park parking lots . traffic mostly limited to business hours
Industrial Drive	local	. existing traffic signal . access to business park . traffic limited to business hours
Bestgate Road	arterial	. existing traffic signal . significant amount of traffic (connects General Highway and Rowe Boulevard)
Medical Parkway	parking access	. access into Anne Arundel Medical Center . existing traffic signal . higher traffic volumes during business hours
Driveway (1)	parking access	. access into Anne Arundel Medical Center . no signal . emergency vehicle access
Driveways (2)	parking access	. access to Anne Arundel County gas station/ parking lot for Detention Center . low traffic volume
Admiral Road at Bestgate Road	collector	. existing traffic signal . median in road . local traffic into Harborgate subdivision and connection to Bestgate Road
Barnes Drive	parking access	. access to commercial strip shopping area . dead end - no access to residential area
Driveway	parking access	. commercial parking lot . light use

<u>Crossing Location</u>	<u>Road Type</u>	<u>Comments</u>
Harbor Gate Road	local	. access to Harborgate subdivision . residential - low traffic volumes
Boardley Road	local	. future access for DiSalvatore subdivision . residential - low traffic volumes
Entrance Roads (2)	local	. access into Windgate subdivision . residential - low traffic volumes
Bestgate Road/ Rowe Boulevard	arterial	. existing traffic signal . high traffic volume
Driveways (2)	parking access	. one residential and one church parking access
Bestgate Road at DuBois Road	collector/ local	. access to Ridgely Avenue commercial and residential areas . low to medium traffic volume
Riverview Avenue at Ridgely Road	local	. access to residential and commercial areas . low to medium traffic volume
<u>City of Annapolis</u>		
Forbes Street	local	. residential - low traffic volumes
Ridgely Avenue	local/ collector	. access to Weems Creek bridge - connecting Anne Arundel County with West Annapolis . medium traffic volume
Annapolis Street	local	. adjacent to West Annapolis Elementary School . heavy traffic volume before/after school - low traffic volume when school is out

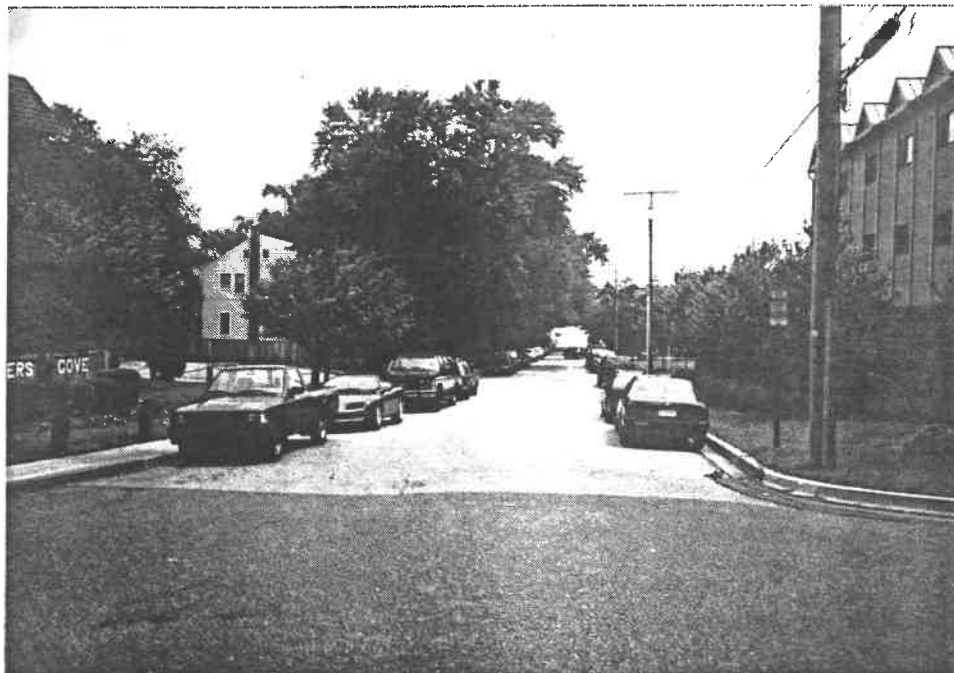
<u>Crossing Location</u>	<u>Road Type</u>	<u>Comments</u>
Tucker Street	local	. adjacent to West Annapolis Elementary School . heavy traffic volume before/after school - low traffic volume when school is out
Melvin Avenue	local/ collector	. access to Wardour Bluffs community . moderate traffic volumes
Giddings Avenue	local	. residential - low traffic volume
Baltimore and Annapolis Boulevard	arterial	. high speeds and high volumes of traffic . difficult crossing - would need signal

In addition to the road crossings, there would be a number of Class II and III trails where bicyclists would need to share the roadway with vehicular traffic. Other issues of concern on Class II and III trails are parked cars and driveways. Following is a list of the location of the proposed Class II or III trails and significant factors affecting bicycle usage.

<u>Road Name</u>	<u>Road Width</u>	<u>Comments</u>
DuBois Road	15'	. residential - very low traffic volume . dead end street . no curbs or sidewalks . no parking on street
Willow Road	15'	. residential - very low traffic volume . dead end street . no sidewalks . steep grade at intersection with Ridgely Avenue . no parking on street



<u>Road Name</u>	<u>Road Width</u>	<u>Comments</u>
Ridgely Avenue	30'	<ul style="list-style-type: none"> <li>. connector road - providing access to Ridgely Avenue businesses</li> <li>. moderate traffic volume</li> <li>. no parking</li> <li>. residential driveways exit onto roadway</li> <li>. 8' shoulders on bridge</li> </ul>
Monterey Avenue	30'	<ul style="list-style-type: none"> <li>. residential - low traffic volume</li> <li>. adjacent to West Annapolis Elementary School</li> <li>. on-street parking on both sides is heavy during school and business hours</li> <li>. existing sidewalks</li> </ul>
Shiley Avenue	40'	<ul style="list-style-type: none"> <li>. residential - low traffic volume</li> <li>. dead end street</li> <li>. existing sidewalks</li> <li>. light volume of on street parking - both sides of road</li> </ul>
Badger Road	30'	<ul style="list-style-type: none"> <li>. residential - low traffic volume</li> <li>. dead end street</li> <li>. restricted entry street - Naval Academy property</li> <li>. existing sidewalks</li> <li>. moderate to heavy volume of on street parking - both sides of road</li> </ul>



Monterey Avenue at Intersection of Forbes Street

## UTILITIES

The urban location of the Phase V trail makes it probable that there will be utilities, both surface and underground, in proximity to the proposed trail alignment. In instances of surface utilities, such as poles, transformer boxes or phone boxes, it would be necessary either to move the trail location or the utility. Underground utilities for the most part will have little effect on the placement of the trail. Utilities would be located and dealt with on a case by case basis when specific construction drawings are executed.

## LAND USE

The urban setting of the Phase V trail provides a wide diversity of land uses along the length of the trail. The Bestgate/Parole area is a highly developed commercial and retail center. A wide variety of stores and restaurants are adjacent or nearby the trail. The alignment also would pass next to the new Anne Arundel Medical Center Medical Park on Jennifer Road, as well as across from the County Detention Center, an interesting, if not inviting, landmark.

There are a wide variety of residential housing types represented along the proposed trail. New subdivisions, such as Harborgate, Windgate, and Severn Crossing, represent modern styles of townhome development. The Ridgely Avenue area and West Annapolis provide examples of older urban residential neighborhoods. The Naval Academy housing along Badger Road is an example of yet another residential housing type.

## ALTERNATIVE ALIGNMENTS

---

---

### Ridgely Avenue to West Annapolis

The proposed trail was diverted from Ridgely Avenue to Rowe Boulevard in order to avoid the narrow roadways and the narrow bridge over Weems Creek. A new bridge is already planned for Ridgely Avenue over Weems Creek and it will provide one 5' sidewalk, but no bike lane.



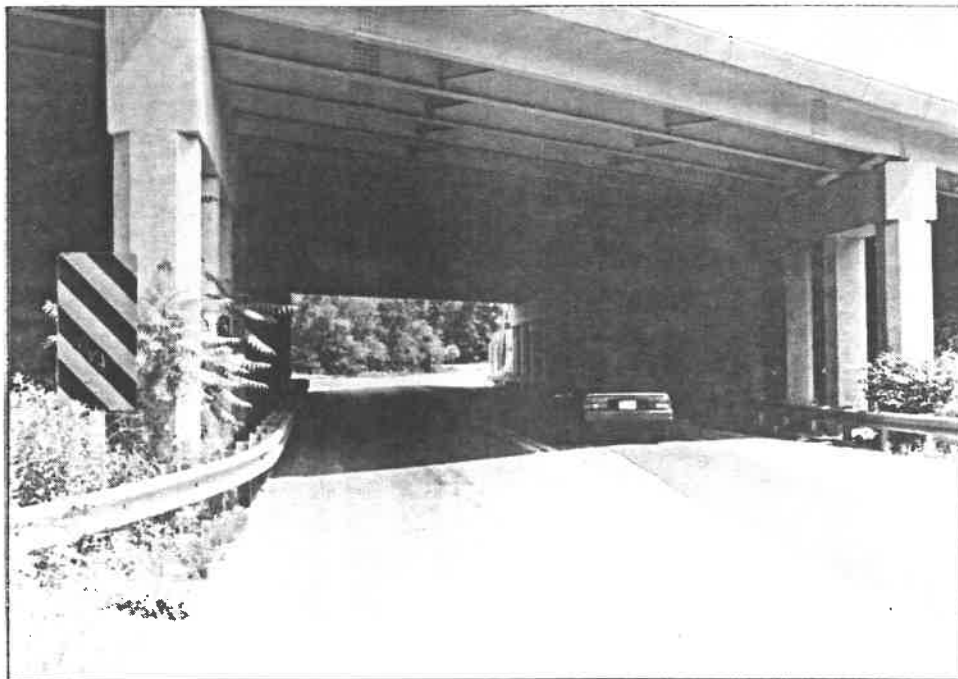
Ridgely Road Bridge Over Weems Creek

There is a possibility that once experienced bike riders become familiar with this trail they may choose to ride on Ridgely Avenue, despite the narrow roadway, because it is a more direct route. In recognizing this, it may be preferable to choose the

direct Ridgely Avenue route initially, and designate that as a Class III trail into West Annapolis. This would avoid building the connection from Kirkley Road to Rowe Boulevard. In either case, it is still recommended that bike lanes be provided on the new Rowe Boulevard bridge over Weems Creek.

Admiral Drive South Into Annapolis

A southern route to the Severn River Bridge from the intersection of Jennifer Road and Annapolis Drive was investigated and appears on the master plan as an alternative. It has, however, many difficulties including steep grades, wetlands, traffic, and right of way problems. This alignment would utilize the Poplar Avenue railroad right-of-way which is a pathway the City of Annapolis has included in its Parks & Paths for People Plan. It would also provide a local linkage to the Germantown Elementary School from surrounding residential neighborhoods.



Admiral Drive Under Route 50/301

Housely Road to Annapolis Waterworks Park

A future spur trail would connect the South Shore Trail and the City of Annapolis Waterworks Park. This connection would follow Bestgate Road west across Generals Highway, onto Housely Road, and then onto the Waterworks Park property. Waterworks Park is approximately 30 acres and will provide limited passive recreation, such as hiking and nature study. Permits will be required for access to this park.



## TECHNICAL AND DESIGN CONSIDERATIONS

---

---

To insure that Phase V of the South Shore Trail would be a safe as well as an attractive recreational facility, certain technical and design standards must be considered. Below are some general trail guidelines recommended by the American Association of State Highway & Transportation Officials (AASHTO) that should be followed when the Phase V trail is constructed.

1. The width of the Class I trail in an urban area should be a minimum of 8 feet wide with 10 or 12 feet being the preferred width.
2. The desired grade on the trail is 3% or less with 5% being the maximum.
3. There should be a minimum of 2 feet clear on each side of the trail.
4. Vertical clearance should be a minimum of 8 feet.
5. The minimum design speed should be 20 miles per hour on level terrain and 30 miles per hour on slopes of 5%±.
6. Bike lanes (Class II trails) should always be one way with bicycles riding in the same direction as motor vehicle traffic.
7. Minimum width for a bike lane is 4 feet, with 5 feet being preferable.
8. Drainage grates in bicycle paths should be made "bicycle-safe" in order to prevent accidents.

9. One hundred fifty feet is considered to be adequate sight/stopping distance for cyclists.
10. Traffic signs should follow the standards specified in the Manual on Uniform Traffic Control Devices published by the U.S. Department of Transportation, Federal Highway Administration.
11. The trail should be designed to accommodate people with disabilities:
  - . barrier free
  - . 5' minimum width
  - . uniform hard surface
  - . gradients under 5%
12. Short, sharp curves should be avoided. AASHTO standards should be followed.

#### TRAIL MATERIAL AND CONSTRUCTION STANDARDS

The recommended trail surface is machine laid hot mix bituminous concrete with a subbase of crushed stone. Bituminous concrete is preferred because it requires little maintenance and provides a smooth riding surface. In some situations concrete sidewalks may be widened to 8' and used for one way bike traffic.

#### DRAINAGE

It is not anticipated that drainage will be a problem on the Phase V trail. Since the trail is located in previously developed areas, there is an adequate storm drainage system which would be able to handle any increased runoff caused by the 1.9



miles of new paved trail. The remaining 2.8 miles of the Phase V trail will be on existing roads or trails and will cause no change in runoff amounts.

#### SUPPORT FACILITIES

Typical support facilities would include parking areas, restrooms, drinking fountains, benches, and picnic tables. There will be parking available at the South Shore Trail terminus to the Phase V trail. This is supplemented by plenty of parking on the Annapolis Mall and Annapolis Plaza lots. Restrooms and food would also be available at the Annapolis Mall where bike racks and a picnic table should be made available.

Parking and recreational facilities would be available at Bestgate Park on Bestgate Road. To access this park from the trail, the user must cross Bestgate Road. This would mean providing a crossing at the park or directing users to cross at the existing light at Admiral Drive.

Limited parking would be available on the residential streets in West Annapolis; however, trail users should be considerate of local residents. Food, drinks and restrooms would be available in the West Annapolis commercial area along Annapolis Road. A bike rack should be provided to encourage trail users to utilize the commercial area.

There would be no parking on the west side of the Severn River Bridge or on Naval Academy property, however parking would be available on the east side of the Severn River Bridge at the Jonas Green State Park.

### SIGNAGE

Signage along the proposed Phase V of the South Shore Trail should be uniform and consistent with signage on the South Shore and Baltimore and Annapolis Trails. The traffic signs should follow the standards specified in the Manual on Uniform Traffic Control Devices published by the U.S. Department of Transportation, Federal Highway Administration. Following is a list of the five types of signs that would be required:

1. Trail Information Signs should be located at major trail access points. The name of the trail, location map, destinations, distances, and trail rules should be included. These signs could indicate alternative routes for experienced cyclists and family cyclists based on safety concerns.
2. Direction Signs should be used where paths can be confused, i.e., road intersections. Directional and distance signs may also show destinations adjacent to the trail.
3. Warning Signs must be placed on the trail to indicate hazardous conditions, such as a road intersection. Warning signs should be placed approximately 100-200 feet in front of any hazard.

4. Regulatory Signs are STOP or YIELD signs. The State standards for colors should be followed. These signs should be smaller than roadway signs. Regulatory signs, i.e., NO DOGS, NO MOTORCYCLES, may need to be installed at trail entrances.
5. Information Signs should be used to indicate mileage markers, emergency services, rest areas, food stops, etc.

The following aesthetic characteristics should be considered:

1. Sign Material should be metal. Metal sign faces on wood posts are less prone to vandalism.
2. Sign Sizes should be standardized.
3. Sign Design should be consistent throughout the trail, including colors and letter style.
4. Sign Location should take into account the existing vegetation and grades. Safe sight distances should always be maintained. Height of a sign is generally 40 inches from grade to the bottom of a sign. For safety, signs should be located so that the inside edge of the sign face is two feet from the trail edge.
5. Sign Consolidation is recommended whenever possible. Use signs sparingly. However, warning and regulatory signs should not be mixed with any other type of sign.
6. Pavement Signs should be considered. STOP signs, as well as directional and informational signs, can be painted on the pavement.

## SITE FURNISHINGS

The typical site furnishings along the proposed Phase V of the South Shore Trail would include bollards, guardrails, fences, bike racks, trash receptacles, and benches. A consistent theme for all the site amenities should be carried out along the trail.

1. Bollards - There would be a need for bollards at several points along the trail to prevent unauthorized vehicles from entering. The bollards centered on a trail should be removable with a locking system to allow access to maintenance and service vehicles.
2. Benches, Bike Racks, and Trash Receptacles - Bike racks should be provided at the commercial/retail areas along the trail, as well as at Bestgate Park. Benches should be located approximately every half mile as feasible to provide rest stops for limited mobility trail users. If possible, benches should be located adjacent to commercial areas where food and drinks may be purchased. Trash receptacles should be made available next to such benches where food may be consumed. Site furnishings should be placed a minimum of three feet away from the edge of the trail to insure user safety.
3. Guardrails and Fences are necessary along sections of the trail and should be constructed of wood. Fences along the bike trail should be designed for the safety of the cyclists.

## DEVELOPMENT IMPACTS, APPROVALS AND PERMITS

---

---

The urban location of this trail would create a significant amount of development impact. In a number of cases, utility poles and boxes will need to be avoided or moved. Right of way must be acquired in several situations. Several sections of the trail would be built on slopes and would require fences. Because this trail is utilizing several segments of existing trail, all construction areas are not adjacent, but are spread along the length of the trail. Construction along this trail will also be impacted by surrounding land use and traffic. Class II and III sections of trail would have fewer development impacts since little or no construction is required.

Anne Arundel County will be responsible for building the portion of the trail located in the County, from the Bestgate Substation to the Rowe Boulevard bridge over Weems Creek. The trail over the bridge will be provided by the Maryland State Highway Administration when the bridge is rebuilt. The City of Annapolis will be responsible for the trail from Weems Creek to the Severn River Bridge.

There will be no need for wetland permits on Phase V of the South Shore Trail as there are no wetlands being impacted. Grading permits will be required from Anne Arundel County Office of

Planning & Zoning and the City of Annapolis Office of Planning & Zoning.



DuBois Road Facing North

## ADMINISTRATION OF THE TRAIL

---

---

Phase V of the South Shore Trail will be maintained and operated by the Anne Arundel County Department of Recreation and Parks and the City of Annapolis Department of Recreation and Parks.

A County Park Superintendent and his staff will be responsible for the daily maintenance and operation of the County trail segments. It is assumed that neighborhood community associations, businesses, and local service groups, such as hiking and biking clubs, garden clubs, and scout troops, might volunteer to help in the ongoing maintenance of the trail. Typical maintenance tasks would include grass cutting, tree and shrub trimming, trash collection, pavement repairs, repairing signs and fences, repainting pavement signage, etc.

Besides maintenance, the park staff is responsible for trail supervision to insure the safety of trail users, to prevent unauthorized vehicles from using the trail, and to prevent trail users from spilling over onto private property adjacent to the trail. The Park Superintendent and rangers are not law enforcement officers, but are equipped to call Anne Arundel County Police for assistance if necessary. The trail will be open for use between dawn and dusk. Any after hours use of the trail will be addressed by the Anne Arundel County and/or Annapolis City Police Departments.





## PROJECT PHASING

---

---

The South Shore Trail Phase V, could be implemented in sections. There are four sections in Anne Arundel County and two sections in the City of Annapolis.

### Anne Arundel County

Section I:	BG&E Substation to the end of the existing Annapolis Mall Trail.	Approximately 0.5 miles
Section II:	Annapolis Plaza, through Anne Arundel Hospital Medical Center property, along Jennifer Road to Admiral Drive.	Approximately 0.9 miles
Section III:	Existing Harborgate trail to intersection of Bestgate Road and DuBois Road.	Approximately 1.4 miles
Section IV:	DuBois Road to Ridgely Road, to Kirkley Road to the Rowe Boulevard bridge.	Approximately 0.7 miles
	Subtotal	3.5 miles

### City of Annapolis

Section I:	Rowe Boulevard bridge to Monterey Street to end of Shiley Street.	Approximately 0.8 miles
Section II:	End of Shiley Street to Severn River bridge.	Approximately 0.4 miles
	Subtotal	1.2 miles
	Total Trail	4.7 miles



COST ESTIMATE - SOUTH SHORE TRAIL, PHASE V

---

---

Anne Arundel County

Section I: BG&E Substation to the end of the  
existing Annapolis Mall Trail

Approximately 0.5 miles

MOBILIZATION: Lump Sum = \$ 5,000

SURVEY LAYOUT: Lump Sum = \$ 3,500

MAINTENANCE AND PROTECTION OF TRAFFIC: Lump Sum = \$ 2,500

SEDIMENT CONTROL:

Stabilized Construction Entrance:

2 @ \$1,500/each = \$ 3,000

Silt Fence: 2,240 lf @ \$2.50/lf = \$ 5,600

Temporary Seeding:

22,400 sf @ \$0.06/sf = \$ 1,350

Subtotal \$ 9,950

STORMWATER MANAGEMENT: Waiver

WATER QUALITY PROVISIONS: = \$ 5,000

BIKE TRAIL: (1,120 lf - 0.2 miles)

Excavation

450 cy @ \$8.00/cy = \$ 3,600

Graded Aggregate (335 cy)

500 tons @ \$25.00/ton = \$12,500

3" Bituminous Surface

220 tons @ \$45.00/ton = \$ 9,900

4" Topsoil

150 cy @ \$30.00/cy = \$ 4,500

Subtotal \$30,500

UTILITY RELOCATION: Lump Sum = \$10,000

GUARDRAIL:

Removable Bollards			
2 @ \$500/each	=	\$ 1,000	
Split Rail Fence			
350 lf @ \$3.50/lf	=	\$ 1,225	
Wood Guardrail			
40 lf @ \$15.00/lf	=	\$ 600	
		Subtotal	\$ 2,825

SEEDING & SOD:

Seeding:			
22,400 sf @ \$0.06/sf	=	\$ 1,350	
Sod:			
375 sy @ \$4.00/sy	=	\$ 1,500	
		Subtotal	\$ 2,850

<u>LANDSCAPING/SCREENING:</u>	Lump Sum	=	\$10,000
-------------------------------	----------	---	----------

SIGNAGE:

Traffic Signs			
14 @ \$175.00/each	=	\$ 2,450	
Pavement Marking			
Lump Sum	=	\$ 1,000	
		Subtotal	\$ 3,450

SITE AMENITIES:

Picnic Tables			
1 @ \$600.00/each	=	\$ 600	
Trash Receptacle			
1 @ \$500.00/each	=	\$ 500	
Bicycle Racks			
1 @ \$750.00/each	=	\$ 750	
		Subtotal	\$ 1,850

Total		\$87,425
Contingencies (10%)		\$ 8,740
Total Construction Cost		\$96,165

**COST ESTIMATE - SOUTH SHORE TRAIL, PHASE V**

---

---

Anne Arundel County

Section II: Annapolis Plaza, through Anne Arundel  
Hospital Medical Center property,  
along Jennifer Road to Admiral Drive

Approximately 0.9 miles

MOBILIZATION: Lump Sum = \$ 5,000  
SURVEY LAYOUT: Lump Sum = \$ 3,500  
MAINTENANCE AND PROTECTION OF TRAFFIC: Lump Sum = \$ 2,500

SEDIMENT CONTROL:

Stabilized Construction Entrance:  
5 @ \$1,500/each = \$ 7,500  
Silt Fence: 7,820 lf @ \$2.50/lf = \$19,550  
Temporary Seeding:  
77,200 sf @ \$0.06/sf = \$ 4,650  
Subtotal \$31,700

STORMWATER MANAGEMENT: Waiver

WATER QUALITY PROVISIONS: = \$15,000

BIKE TRAIL: (3,860 lf - 0.7 miles)

Excavation  
2,000 cy @ \$8.00/cy = \$16,000  
Graded Aggregate (1150 cy)  
1,700 tons @ \$25.00/ton = \$42,500  
3" Bituminous Surface  
720 tons @ \$45.00/ton = \$32,400  
4" Topsoil  
300 cy @ \$30.00/cy = \$ 9,000  
Subtotal \$99,900

UTILITY RELOCATION: Lump Sum = \$15,000

GUARDRAIL:

Split Rail Fence		
1,000 lf @ \$3.50/lf	=	\$ 3,500
		Subtotal \$ 3,500

SEEDING & SOD:

Seeding:		
77,200 sf @ \$0.06/sf	=	\$ 4,650
Sod:		
1,290 sy @ \$4.00/sy	=	\$ 5,160
		Subtotal \$ 9,810

<u>LANDSCAPING/SCREENING:</u> Lump Sum	=	\$12,000
--	---	----------

SIGNAGE:

Traffic Signs		
12 @ \$175.00/each	=	\$ 2,100
Pavement Marking (200 lf)		
Lump Sum	=	\$ 750
		Subtotal \$ 2,850

SITE AMENITIES:

Trash Receptacle		
1 @ \$500.00/each	=	\$ 500
Benches		
1 @ \$700.00/each	=	\$ 700
		Subtotal \$ 1,200

Total		\$201,960
Contingencies (10%)		\$ 20,196
Total Construction Cost		\$222,156

**COST ESTIMATE - SOUTH SHORE TRAIL, PHASE V**

---

---

Anne Arundel County

Section III: Existing Harborgate trail to  
intersection of Bestgate Road and  
DuBois Road

Approximately 1.4 miles

MOBILIZATION: Lump Sum = \$ 5,000  
SURVEY LAYOUT: Lump Sum = \$ 3,500  
MAINTENANCE AND PROTECTION OF TRAFFIC: Lump Sum = \$ 2,500

SEDIMENT CONTROL:

Stabilized Construction Entrance:  
4 @ \$1,500/each = \$ 6,000  
Silt Fence: 4,800 lf @ \$2.50/lf = \$12,000  
Temporary Seeding:  
48,000 sf @ \$0.06/sf = \$ 2,880  
Subtotal \$20,880

STORMWATER MANAGEMENT: Waiver

WATER QUALITY PROVISIONS: = \$10,000

BIKE TRAIL: (2,400 lf - 0.45 miles)

Excavation  
900 cy @ \$8.00/cy = \$ 7,200  
Graded Aggregate (750 cy)  
1,110 tons @ \$25.00/ton = \$27,750  
3" Bituminous Surface  
500 tons @ \$45.00/ton = \$22,500  
4" Topsoil  
200 cy @ \$30.00/cy = \$ 6,000  
Subtotal \$63,450

UTILITY RELOCATION: Lump Sum = \$ 5,000

GUARDRAIL:

Split Rail Fence		
400 lf @ \$3.50/lf	=	\$ 1,400
		Subtotal \$ 1,400

SEEDING & SOD:

Seeding:		
48,000 sf @ \$0.06/sf	=	\$ 2,880
Sod:		
800 sy @ \$4.00/sy	=	\$ 3,200
		Subtotal \$ 6,080

<u>LANDSCAPING/SCREENING:</u> Lump Sum	=	\$10,000
--	---	----------

SIGNAGE:

Traffic Signs		
24 @ \$175.00/each	=	\$ 4,200
Pavement Marking		
Lump Sum	=	\$ 750
		Subtotal \$ 4,950

SITE AMENITIES:

Trash Receptacle		
1 @ \$500.00/each	=	\$ 500
Benches		
2 @ \$700.00/each	=	\$ 1,400
Bicycle Racks		
1 @ \$750.00/each	=	\$ 750
		Subtotal \$ 2,650

Total		\$135,410
Contingencies (10%)		\$ 13,541
Total Construction Cost		\$148,951



**COST ESTIMATE - SOUTH SHORE TRAIL, PHASE V**

---



---

Anne Arundel County

Section IV: DuBois Road to Ridgely Road, to  
Kirkley Road to the Rowe Boulevard  
bridge

Approximately 0.7 miles

MOBILIZATION: Lump Sum = \$ 5,000

SURVEY LAYOUT: Lump Sum = \$ 3,500

MAINTENANCE AND PROTECTION OF TRAFFIC: Lump Sum = \$ 2,500

SEDIMENT CONTROL:

Stabilized Construction Entrance:		
4 @ \$1,500/each	=	\$ 6,000
Silt Fence: 2,800 lf @ \$2.50/lf	=	\$ 7,000
Temporary Seeding:		
28,000 sf @ \$0.06/sf	=	\$ 1,680
		Subtotal \$14,680

STORMWATER MANAGEMENT: Waiver

WATER QUALITY PROVISIONS: = \$ 7,500

BIKE TRAIL: (1,400 lf - 0.3 miles)

Excavation		
1,050 cy @ \$8.00/cy	=	\$ 8,400
Graded Aggregate (425 cy)		
630 tons @ \$25.00/ton	=	\$15,750
3" Bituminous Surface		
260 tons @ \$45.00/ton	=	\$11,700
4" Topsoil		
110 cy @ \$30.00/cy	=	\$ 3,300
		Subtotal \$39,150

UTILITY RELOCATION: Lump Sum = \$12,000

GUARDRAIL:

Wood Guardrail			
40 lf @ \$15.00/lf	=	\$ 600	
Removable Bollards			
2 @ \$500/each	=	\$ 1,000	
Split Rail Fence			
1,200 lf @ \$3.50/lf	=	\$ 4,200	
Jersey Barrier			
200 lf @ \$45.00/lf	=	\$ 9,000	
		Subtotal	\$14,800

SEEDING & SOD:

Seeding:			
28,000 sf @ \$0.06/sf	=	\$ 1,680	
Sod:			
470 sy @ \$4.00/sy	=	\$ 1,880	
		Subtotal	\$ 3,560

LANDSCAPING/SCREENING: Lump Sum = \$15,000

SIGNAGE:

Traffic Signs			
18 @ \$175.00/each	=	\$ 3,150	
Pavement Marking			
Lump Sum	=	\$ 2,500	
		Subtotal	\$ 5,650

SITE AMENITIES:

Trash Receptacle			
1 @ \$500.00/each	=	\$ 500	
Benches			
1 @ \$700.00/each	=	\$ 700	
		Subtotal	\$ 1,200

Total		\$124,540
Contingencies (10%)		\$ 12,454
Total Construction Cost		\$136,994

COST ESTIMATE - SOUTH SHORE TRAIL, PHASE V

---

---

City of Annapolis

Section I: Rowe Boulevard bridge to Monterey  
Street to end of Shiley Street

Approximately 0.8 miles

MOBILIZATION: Lump Sum = \$ 3,000

SURVEY LAYOUT: Lump Sum = \$ 1,750

MAINTENANCE AND PROTECTION OF TRAFFIC: Lump Sum = \$ 1,250

SEDIMENT CONTROL:

Silt Fence: 150 lf @ \$2.50/lf = \$ 375

Temporary Seeding:  
3,000 sf @ \$0.06/sf = \$ 180

Subtotal \$ 555

STORMWATER MANAGEMENT: Waiver

WATER QUALITY PROVISIONS: Waiver

BIKE TRAIL: (75 lf - 0.01 miles)

Excavation  
30 cy @ \$8.00/cy = \$ 240

Graded Aggregate (25 cy)  
37 tons @ \$25.00/ton = \$ 925

3" Bituminous Surface  
14 tons @ \$45.00/ton = \$ 630

4" Topsoil  
6 cy @ \$30.00/cy = \$ 180

Subtotal \$ 1,975

UTILITY RELOCATION: Lump Sum = \$ 2,500

GUARDRAIL:

Wood Guardrail			
40 lf @ \$15.00/lf	=	\$ 600	
Removable Bollards			
2 @ \$500/each	=	\$ 1,000	
Jersey Barrier			
650 lf @ \$45.00/lf	=	\$29,250	
		Subtotal	\$29,950

SEEDING & SOD:

Seeding:			
3,000 sf @ \$0.06/sf	=	\$ 180	
Sod:			
50 sy @ \$4.00/sy	=	\$ 200	
		Subtotal	\$ 380

LANDSCAPING/SCREENING: Lump Sum = \$ 5,000

SIGNAGE:

Traffic Signs			
22 @ \$175.00/each	=	\$ 3,850	
Pavement Marking			
Lump Sum	=	\$ 750	
		Subtotal	\$ 4,600

SITE AMENITIES:

Bicycle Racks			
1 @ \$750.00/each	=	\$ 750	
		Subtotal	\$ 750

Total	\$51,710
Contingencies (10%)	\$ 5,171
Total Construction Cost	\$56,881

**COST ESTIMATE - SOUTH SHORE TRAIL, PHASE V**

---



---

City of Annapolis

Section II: End of Shiley Street to Severn River  
Bridge

Approximately 0.4 miles

MOBILIZATION: Lump Sum = \$ 3,000

SURVEY LAYOUT: Lump Sum = \$ 1,750

MAINTENANCE AND PROTECTION OF TRAFFIC: Lump Sum = \$ 1,250

SEDIMENT CONTROL:

Stabilized Construction Entrance:		
1 @ \$1,500/each	=	\$ 1,500
Silt Fence: 3,110 lf @ \$2.50/lf	=	\$ 7,775
Temporary Seeding:		
26,680 sf @ \$0.06/sf	=	\$ 1,600
		Subtotal \$10,875

STORMWATER MANAGEMENT: Waiver

WATER QUALITY PROVISIONS: = \$ 5,000

BIKE TRAIL: (75 lf - 0.01 miles)

Excavation		
30 cy @ \$8.00/cy	=	\$ 240
Graded Aggregate (25 cy)		
37 tons @ \$25.00/ton	=	\$ 925
3" Bituminous Surface		
14 tons @ \$45.00/ton	=	\$ 630
4" Topsoil		
6 cy @ \$30.00/cy	=	\$ 180
		Subtotal \$ 1,975

SIDEWALK: (1480 lf - 0.2 miles)  
5,840 sf @ \$3.50/sf = \$20,440

UTILITY RELOCATION: Lump Sum = \$ 2,500

GUARDRAIL:

Wood Guardrail			
40 lf @ \$15.00/lf	=	\$ 600	
Removable Bollards			
2 @ \$500/each	=	\$ 1,000	
		Subtotal	\$ 1,600

SEEDING & SOD:

Seeding:			
26,680 sf @ \$0.06/sf	=	\$ 1,600	
Sod:			
450 sy @ \$4.00/sy	=	\$ 1,800	
		Subtotal	\$ 3,400

<u>LANDSCAPING/SCREENING:</u> Lump Sum	=		\$10,000
--	---	--	----------

SIGNAGE:

Traffic Signs			
10 @ \$175.00/each	=	\$ 1,750	
Pavement Marking			
Lump Sum	=	\$ 1,000	
		Subtotal	\$ 2,750

PEDESTRIAN ACTIVATED FLASHING SIGNAL:

Lump Sum	=		\$20,000
----------	---	--	----------

Total		\$84,540	
Contingencies (10%)		\$ 8,454	
Total Construction Cost		\$92,994	

COST ESTIMATE - SOUTH SHORE TRAIL, PHASE V

---

---

SUMMARY:

Anne Arundel County

Section I	\$ 96,165.00
Section II	\$222,156.00
Section III	\$148,951.00
Section IV	<u>\$136,994.00</u>
TOTAL	\$604,266.00

City of Annapolis

Section I	\$ 56,881.00
Section II	<u>\$ 92,994.00</u>
TOTAL	\$149,875.00





## BIBLIOGRAPHY

---

---

- American Association of State Highway and Transportation Officials. Guide for Development of New Bicycle Facilities, a report. Washington, D.C., 1981.
- Harris, Charles W., Dines, Nicholas T. Time Saver Standards for Landscape Architecture. McGraw-Hill, 1988.
- Jarrell, Temple R. Bikeways: Design, Construction, Programs. National Recreation and Parks Association. Special Publications Series No. 10022, 1974.
- Human & Rohde, Inc. Master Plan WB&A Trail from Bestgate Road to Dicus Mill Road. Department of Recreation & Parks, Anne Arundel County, Maryland, June, 1989.
- Human & Rohde, Inc. Master Plan West County Trail. Department of Recreation and Parks, Anne Arundel County, Maryland. January, 1995.
- National Park Service - National Capital Region. Bikeway Planning and Design Manual. U.S. Department of the Interior.
- Ryan, Karen-Lee, Editor. Trails for the Twenty-First Century: Planning, Design and Management Manual for Multi-Use Trails. Rails-to-Trails Conservancy. Washington, D.C. and Covelo, California. Island Press, 1993.

