

MASTER PLAN

WEST COUNTY TRAIL



ANNE ARUNDEL COUNTY, MARYLAND

MASTER PLAN
WEST COUNTY TRAIL

Prepared for:

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

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INTRODUCTION

The West County Trail, as proposed, would be a multi-use trail aligned along the abandoned mainline of the Washington, Baltimore & Annapolis Electric Railroad from central Odenton, in Anne Arundel County, to the Patuxent River where it would meet with a proposed trail in Prince Georges County. Trail spurs would also link the West County Trail to the Odenton Amtrak/Marc Station and the South Shore Trail.

The trail is intended to be a linear park that would be used by recreational and commuter cyclists as well as hikers. The West County Trail would connect the commercial area of central Odenton with residential areas, Arundel Middle and High Schools, Odenton Nature Center, Odenton Park, natural areas along the Little Patuxent and Patuxent Rivers, and a proposed trail system in Prince Georges County. The trail spur to the Amtrak station would provide commuters with an opportunity to ride bicycles to the train station, potentially alleviating some traffic and parking congestion.

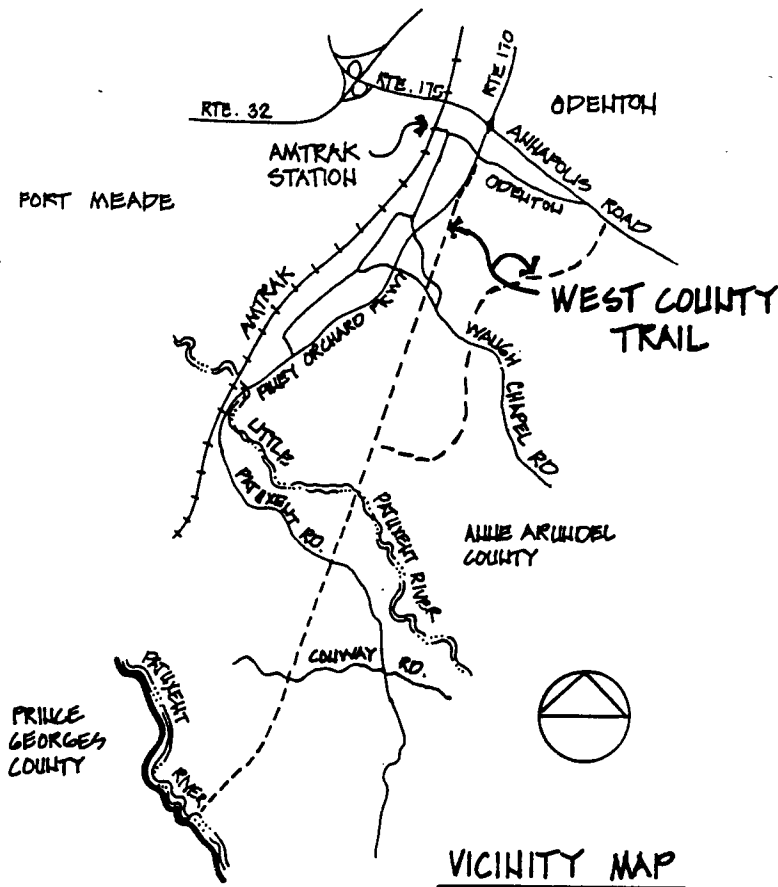
When the West County Trail is connected with the South Shore Trail, users would have the opportunity to travel from Odenton to Annapolis and eventually to the Baltimore & Annapolis Trail. An extension of the West Country Trail, north along WB&A Road, would connect with the BWI Trail. The Odenton Town Plan also calls for

a trail to follow the WB&A Railroad alignment west towards Annapolis Junction. As part of this Master Plan Report we considered some alternative alignments that would connect the West County Trail to the South Shore Trail.



LOCATION

The West County Trail is located in the western part of Anne Arundel County and including the spurs, would be approximately 9.6 miles long. The main trail would originate at Odenton Road and Piney Orchard Parkway in central Odenton and follow along the bed of the abandoned Baltimore, Washington & Annapolis Railway to the Patuxent River. The alignment would pass through the residential areas known as Stoney Hill, Kings Ransom, Breezewood, Riden, and Piney Orchard and would span the Little Patuxent River and the Patuxent River to Prince Georges County.



PROPOSED TRAIL ALIGNMENT

As previously stated, the West County Trail would follow the right of way of the WB&A Railroad. The trail would originate at the intersection of Odenton Road and Piney Orchard Parkway and parallel the parkway south along the east side. It would pass by the ends of Gill, Damascus, Darwin and Tab Streets. Between Tab and June Drive the old WB&A Railroad bed becomes apparent and angles away from Piney Orchard Parkway. The trail would cross June Road and continue along the railroad bed crossing Waugh Chapel and New Waugh Chapel Roads, and proceeding through





the Piney Orchard community. The next roadway intersection would be at the proposed Strawberry Lake Way. The trail would span the Little Patuxent River and continue along the railroad bed to Patuxent Road. South of Patuxent Road the railroad bed is known as Brager Road. The trail would utilize the roadway and continue to Conway Road.

South of Conway Road the railroad bed is in the middle of an ongoing sand and gravel operation. At this point the alignment would abandon the WB&A right of way and proceed west along Conway Road until reaching the edge of the mining operation. It would then turn south along the perimeter of the mining site, and connect back with the WB&A bed approximately one-half mile south

of Conway Road. The trail would utilize the railroad bed from there to the Patuxent River.

The most feasible trail alignment to connect with the Odenton Amtrak/Marc Station would be to cross Piney Orchard Parkway at the Odenton Road signal and utilize a utility easement between Piney Orchard Parkway and Becknel Road. The trail would follow Becknel Road to Patuxent Road, turn north along the east side of Patuxent Road to Odenton Road, cross, and then follow along the north side of Odenton Road to the Amtrak Station.

Three different alternatives were studied for the alignment of a spur to connect with the South Shore Trail. At this writing the preferred alignment would be to intersect the South Shore Trail at Watts Road, cross Route 175 at School Lane, and pass through the athletic complex behind Arundel High and Arundel Middle Schools. The trail would then pass through the Odenton Nature Area, cross Towsers Branch and follow along an existing dirt trail that runs along a stormwater management pond and stream to Greyswood Road. At Greyswood Road the alignment would parallel the road and turn south on Chapelgate Road to Waugh Chapel Road. The trail would cross Waugh Chapel Road at the intersection of the proposed extension of Strawberry Lake Way. At this point the trail would link to a previously planned trail paralleling Strawberry Lake Way, utilize the trail system in Odenton Park, and then continue along Strawberry Lake Way to the intersection with the main trail alignment.

HISTORY

What is known as the Washington, Baltimore & Annapolis Electric Railroad came into existence in 1908 and operated until 1935. This interurban railroad, with 73 of its 83 miles in Anne Arundel County, was made up of three segments: the Main line which ran between Washington & Baltimore; the South Shore line which ran from the B&O Railroad to Annapolis intersecting with the Main line at Academy Junction (Odenton); and the North Shore line which ran between Annapolis & Baltimore. Mr. George T. Bishop, a business tycoon from Cleveland, was responsible for consolidating the three segments into one system. The South and North Shore lines began as steam railroads in the 1800s and were converted to electric lines in 1907 and 1908 respectively, however the North Shore line (also known as the Short line) didn't merge with the WB&A until 1921.

The Main line opened for business on February 7, 1908 between Washington and Annapolis and the section from Academy Junction to Baltimore opened April 3, 1908. The histories of the WB&A railway and Camp George G. Meade (Fort Meade) are tied together. The opening of Camp Meade at the onset of World War I meant a boom to the WB&A Railroad. In 1918 ridership peaked at 5.9 million. Between Washington and Baltimore, Limiteds ran every half hour and Locals every hour. The trains travelled between 60 and 70 miles per hour through rural areas, taking only

65 minutes to travel between downtown Baltimore and the terminal in Washington. There were 90 stations on the WB&A system, six of them in the Odenton area: Academy Junction, Waugh Chapel, Francis, Brager, Conway and Meyers Stations.

By 1926 ridership started to decline due to the expanding highway system and the increased use of automobiles, trucks, and buses. The Depression brought the final blow, and the WB&A Railroad was forced into bankruptcy and ended service in 1935. Most of the Main line was sold for scrap metal at public auction. Today, the only reminders that the WB&A existed are streets bearing its name or a reference to the railroad; concrete footings where the stations were located; and the abandoned corridor itself.

EXISTING CONDITIONS

RIGHT OF WAY, PROPERTY OWNERSHIP

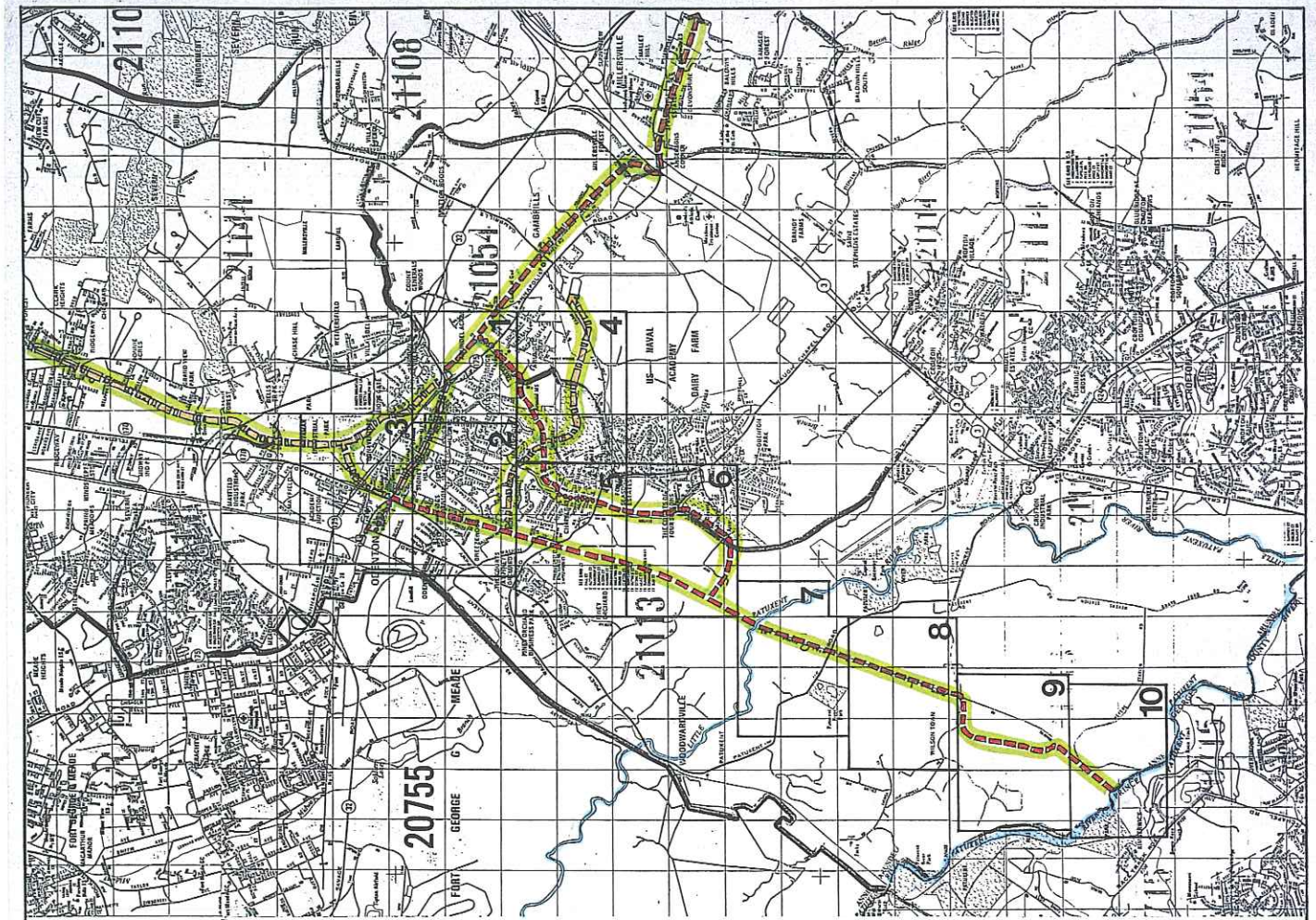
The main alignment of the West County Trail is on the abandoned Washington, Baltimore & Annapolis Railroad bed. The corridor is 66 feet wide and appears to be intact from Piney Orchard Parkway to the Patuxent River. The parkway may infringe on the railroad right of way at Odenton Road.

Right of way plats have to be prepared to determine ownership of the corridor. At this writing, Anne Arundel County owns the railroad right of way from Odenton Road to south of Patuxent Road, and will be negotiating with adjoining parties that may have an interest in the remaining corridor.

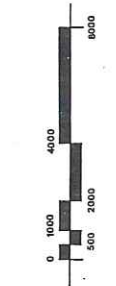
The trail spur connecting to the Amtrak/Marc Station has a lack of public right of way. The trail could follow the utility easement between Piney Orchard Parkway and the cul de sac at the end of Becknel Road. There are no sidewalks along Becknel, Patuxent and Odenton Roads and the public right of way appears to end at the edge of the roadways. Because of the relatively low volume of vehicular traffic, bicycles could share the roadway with vehicles (a Class III Bike trail), however it would be desirable to acquire enough right of way along these streets to provide a sidewalk for pedestrian traffic.

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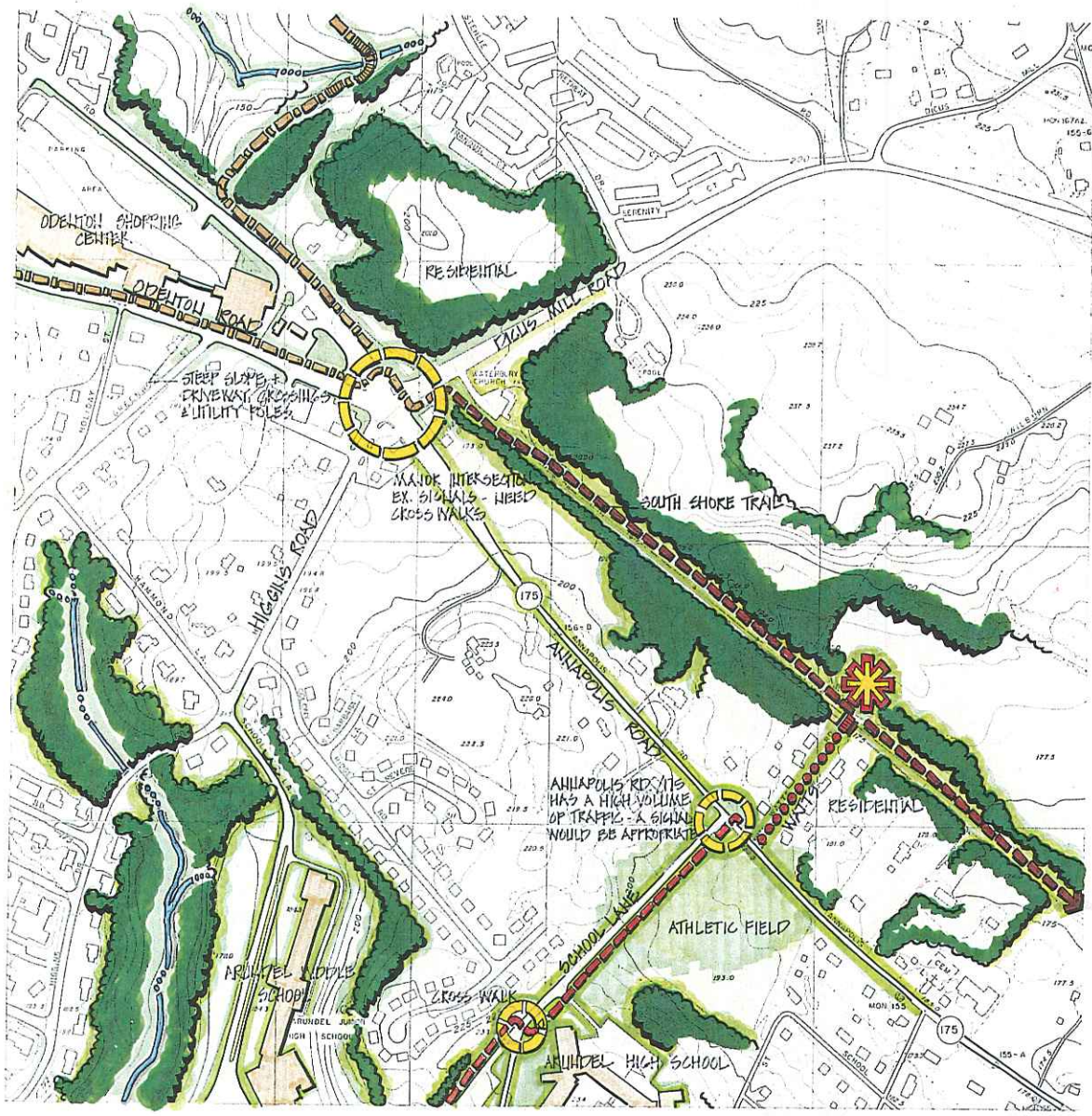
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KEY

- | | | | |
|--|-------------------------------|--|--|
| | TRAIL ALIGNMENT CLASS I | | RAILROAD LINE |
| | TRAIL ALIGNMENT CLASS III | | WB & A RAILROAD BED NOT USED FOR TRAIL |
| | TRAIL ALIGNMENT THRU WETLANDS | | WETLANDS |
| | ALTERNATIVE ALIGNMENT | | EXISTING WOODS |
| | EXISTING TRAIL | | STEEP SLOPES |
| | PROPOSED BRIDGE | | STREAMS |
| | ROAD CROSSING | | VIEWS |
| | PARKING POTENTIAL | | BUFFER/SCREEN |
| | TRAIL TERMINUS | | INTERPRETIVE SIGN |

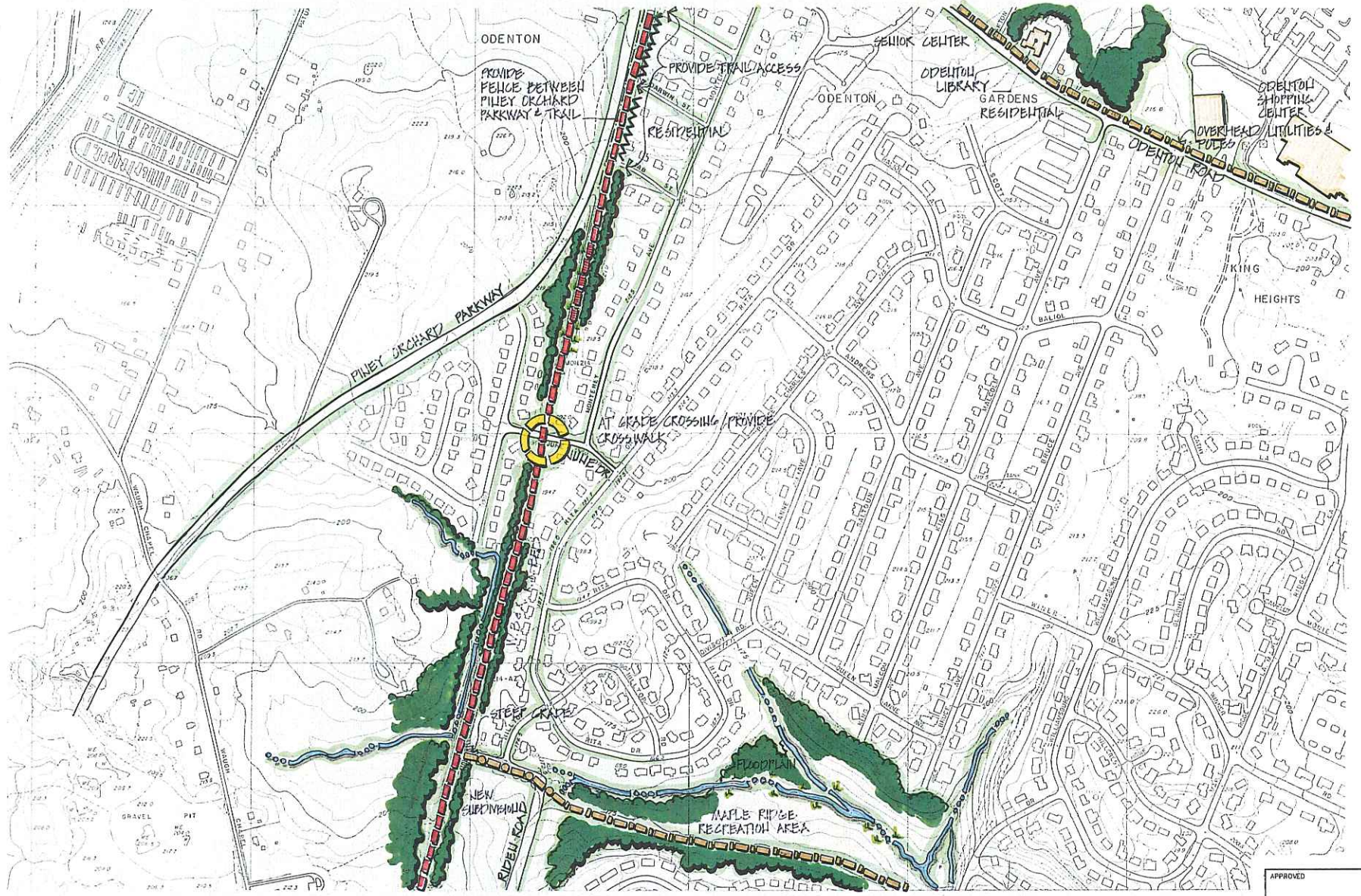
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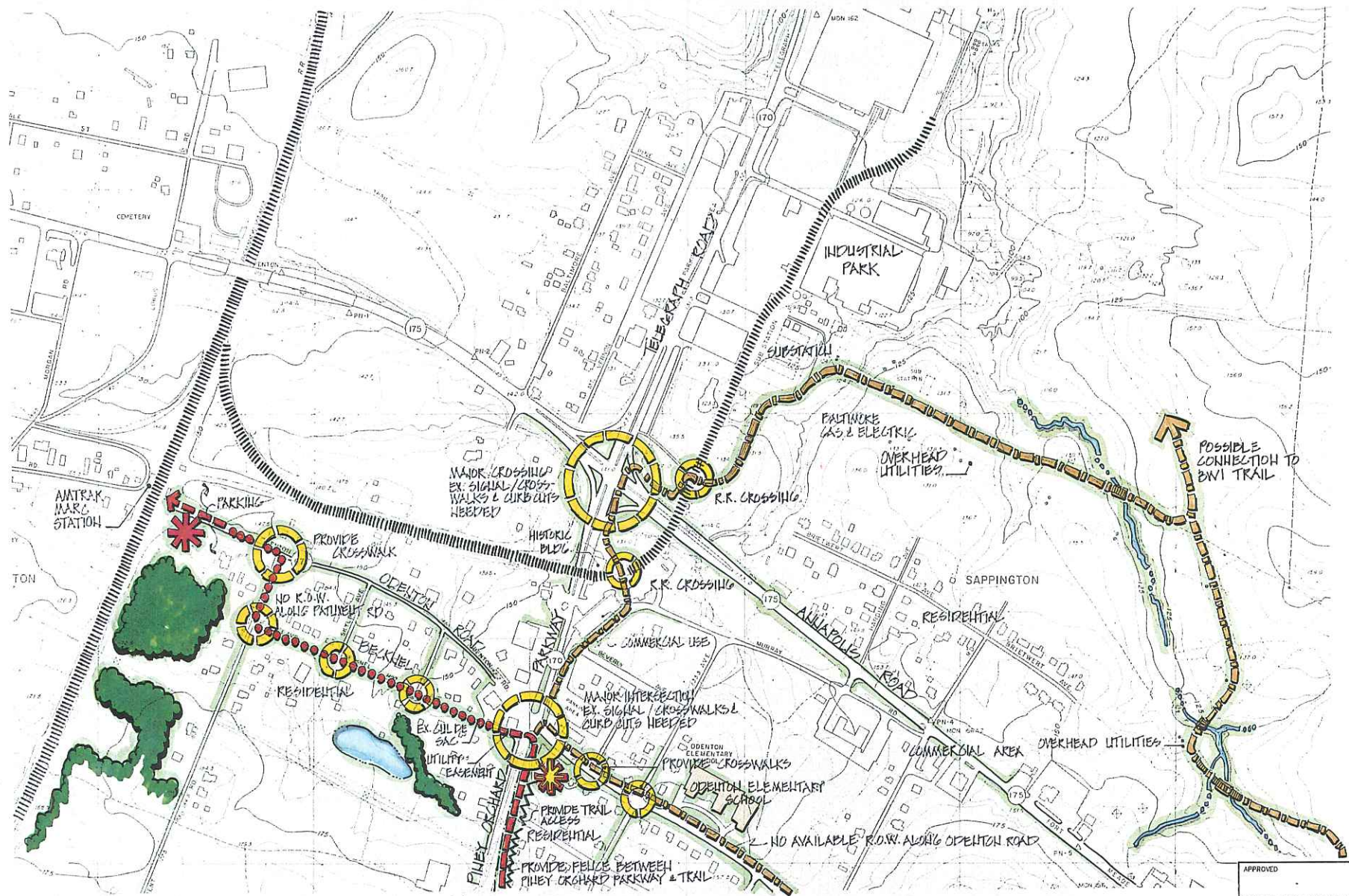
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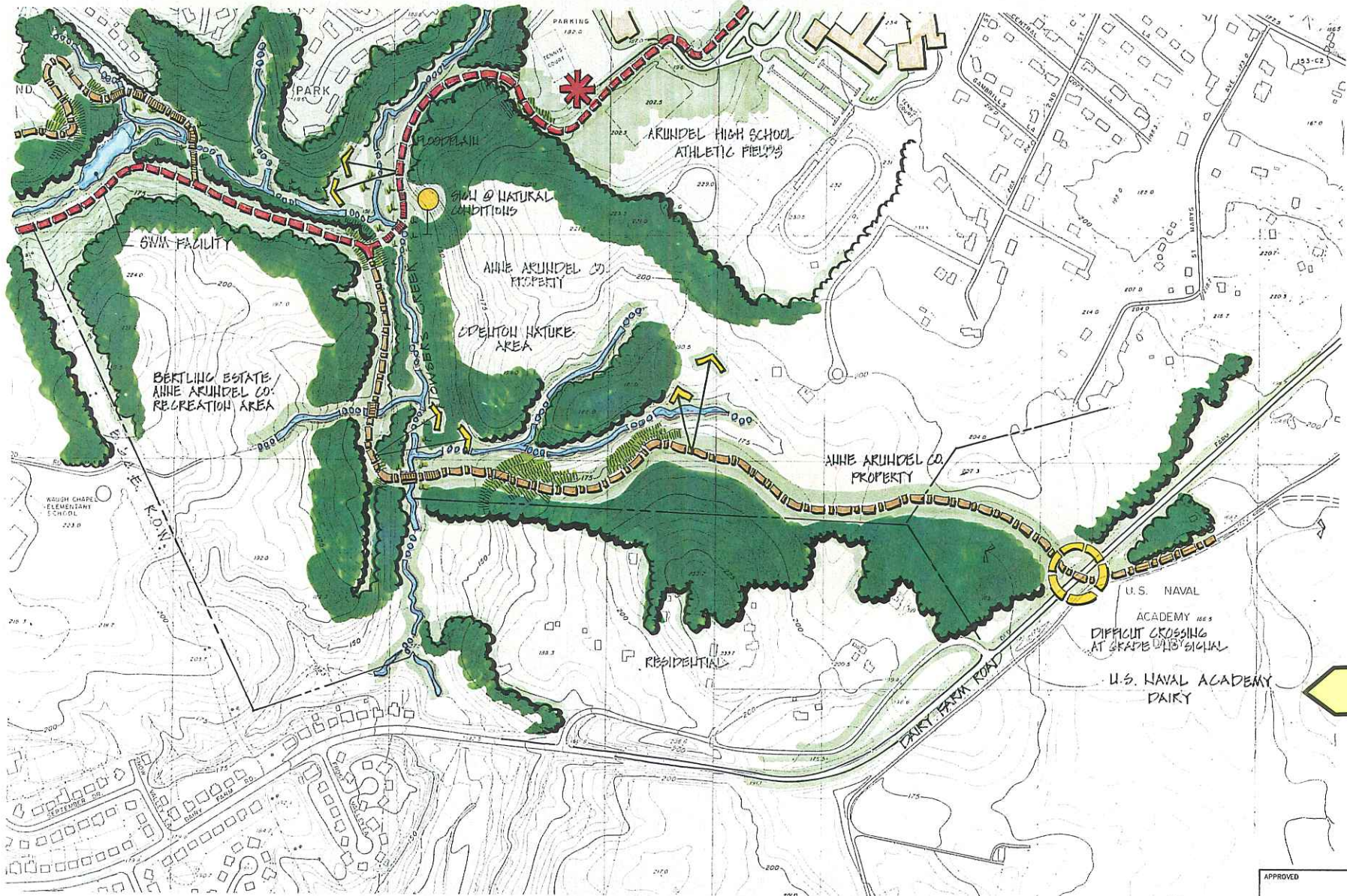


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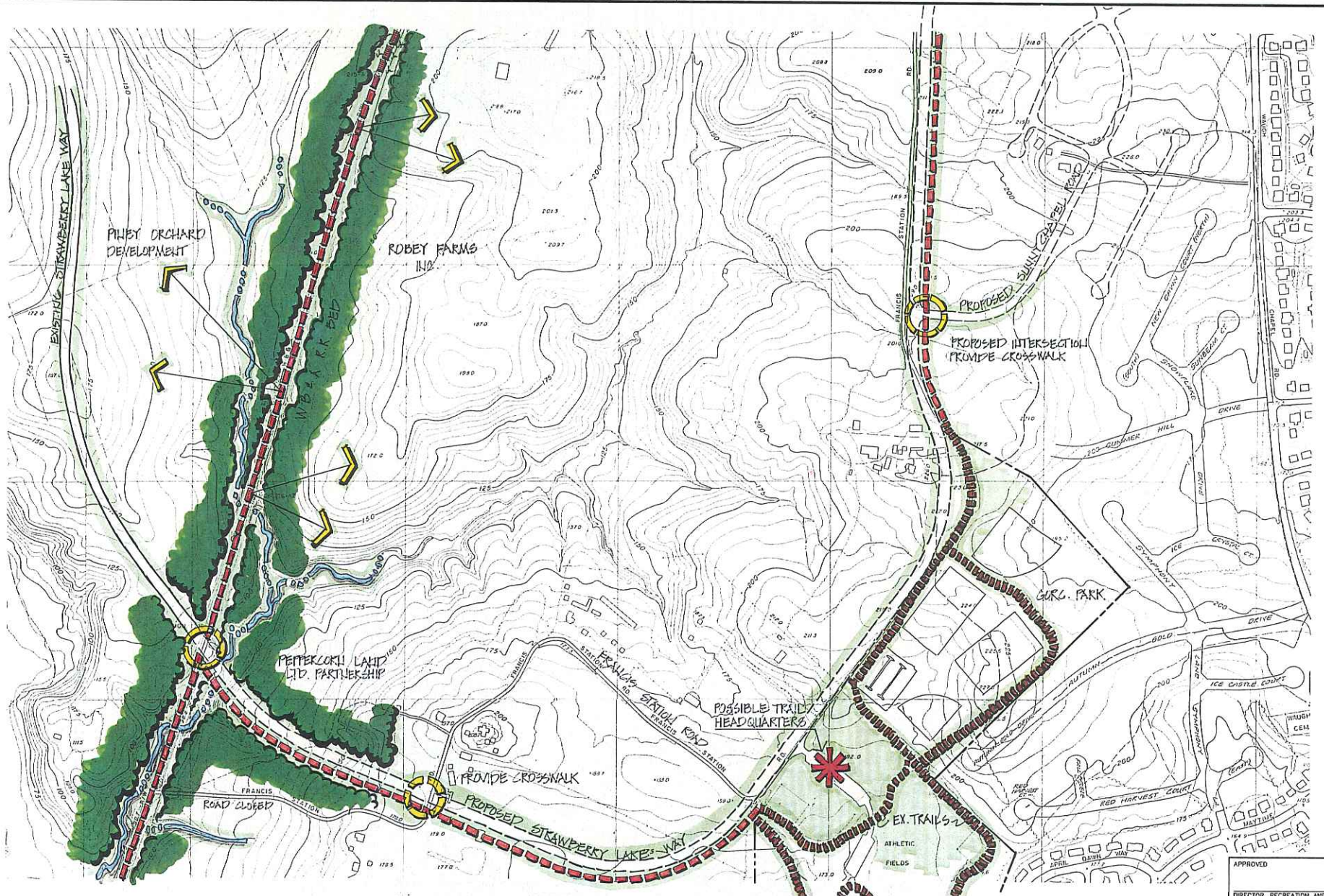


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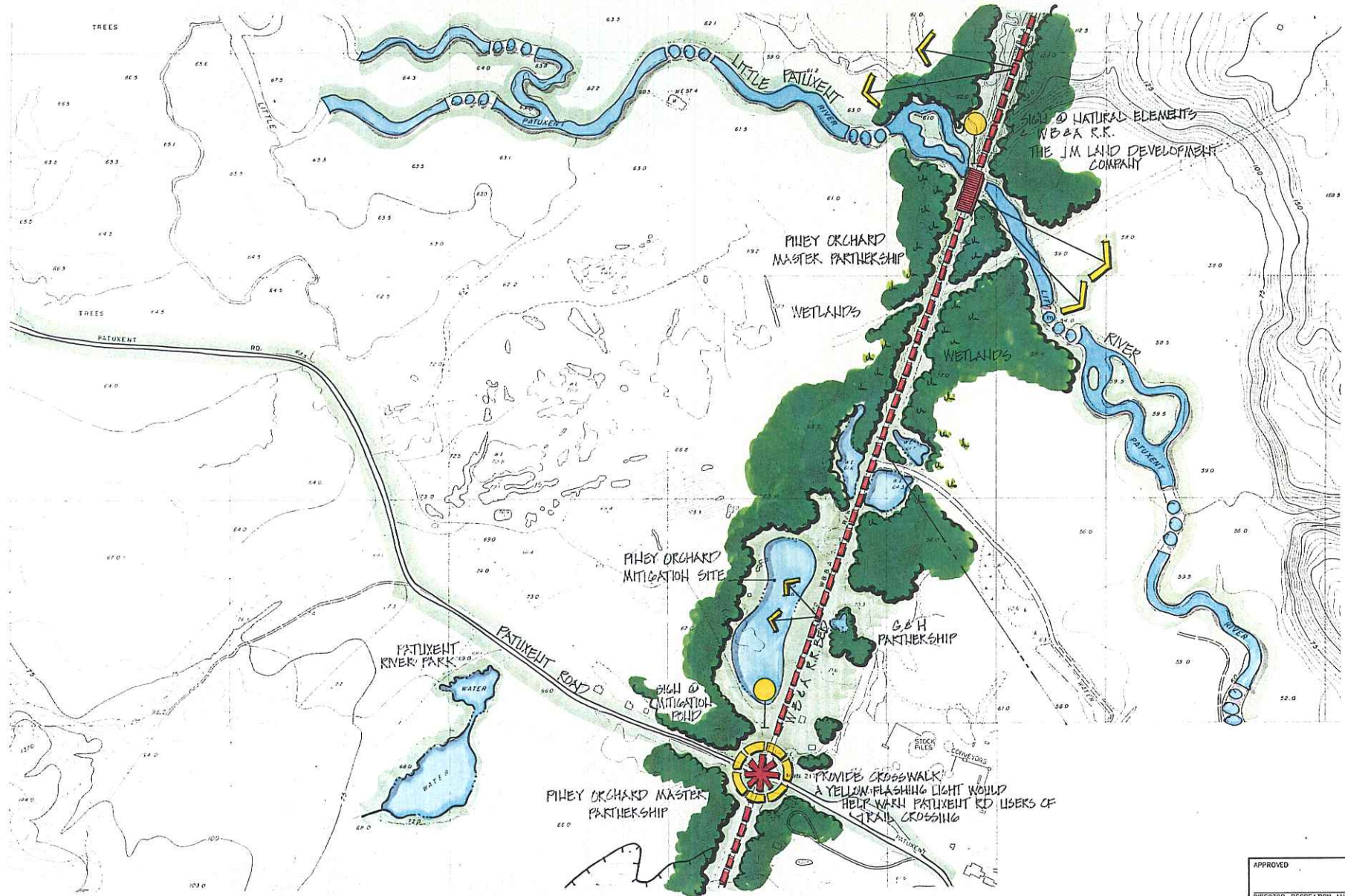


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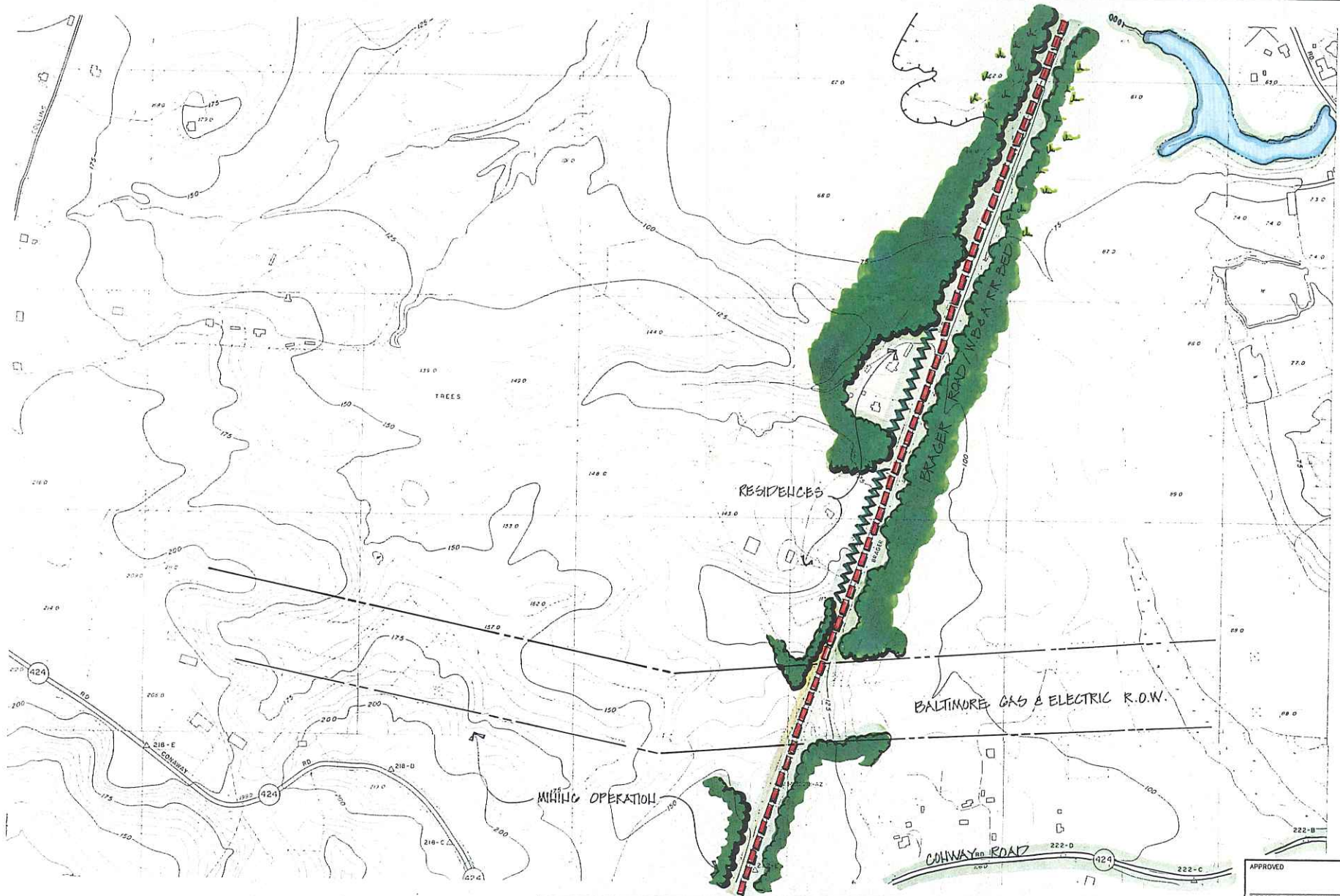
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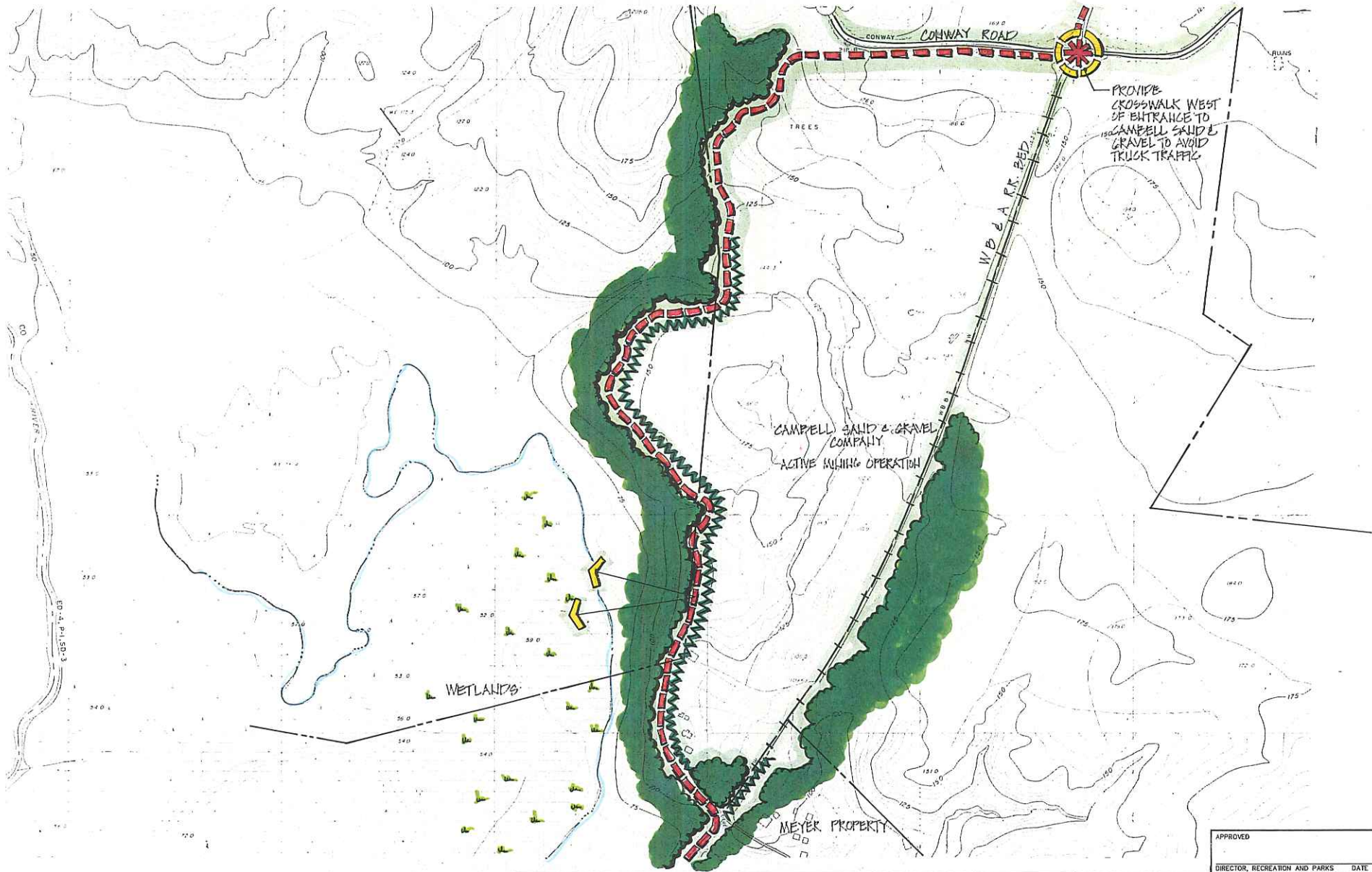
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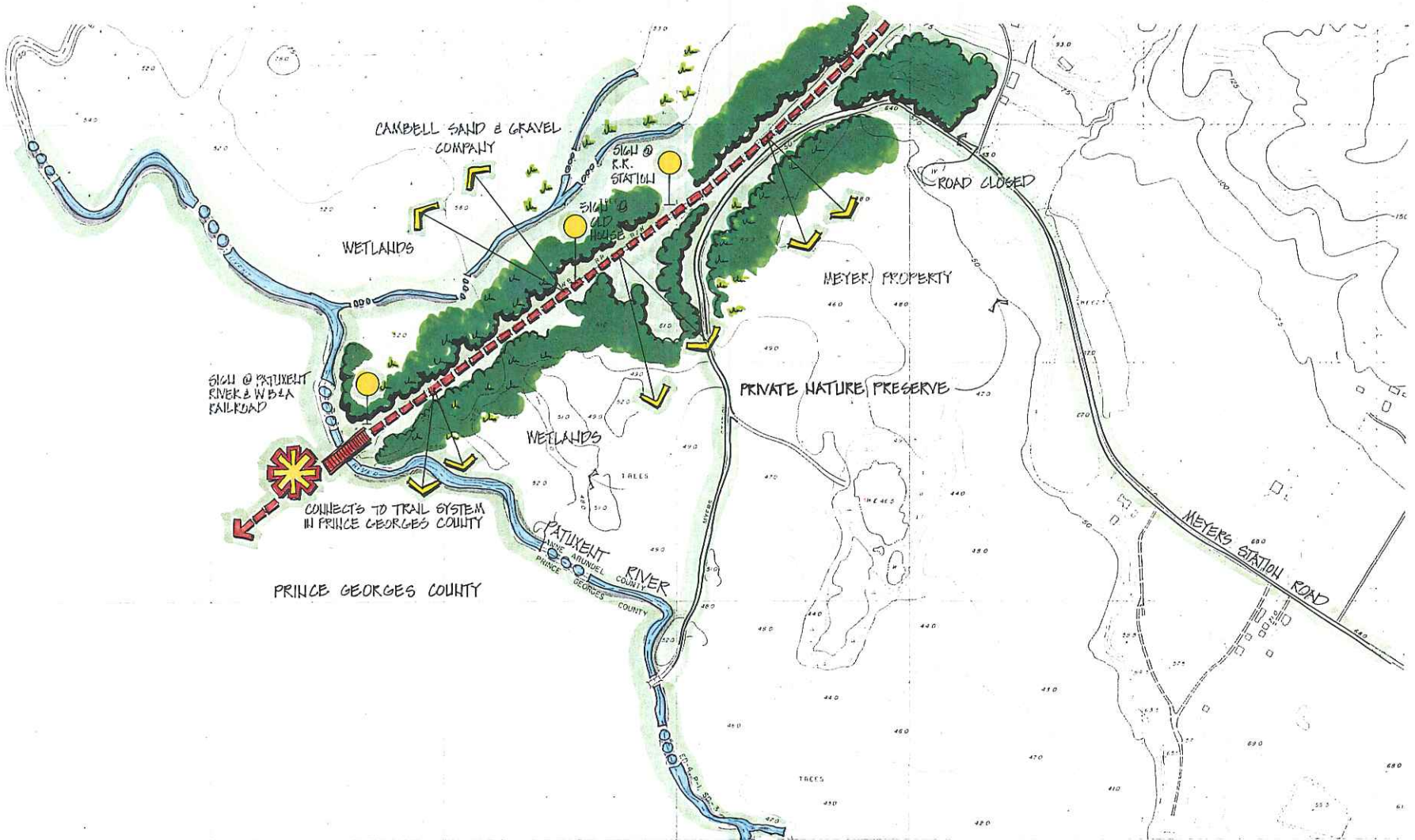
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Most of the spur that would connect the South Shore Trail with the main alignment of the West County Trail could be accommodated within public owned right of way. Watts Road is a dead end residential street with no sidewalks and parking on both sides. The right of way appears to end at the road edge. Bicyclists could share the roadway with vehicles, however it would be preferable to provide sidewalks for pedestrians. Between Annapolis Road (Route 175) and Greyswood Road the trail alignment is on property owned by the Anne Arundel County Board of Education and the Anne Arundel County Department of Recreation & Parks. From Greyswood Road to Waugh Chapel Road the trail would become a Class III trail, with cyclists sharing the roadway with vehicles and pedestrians utilizing the existing sidewalks. The trail would be accommodated within County right of way along the proposed Strawberry Lake Way and would utilize Odenton Park's existing trail system.

TOPOGRAPHY

Because the alignment for the West County Trail, excluding the spurs, is on an old railroad bed the grades along the trail probably do not exceed 3%. From Odenton Road to the Patuxent River the railroad bed alternates between cut and fill sections, thus some sections of the trail would be below the surrounding grade with slopes on each side and other sections of the trail would be on top of the embankments.

The topography of the spur that would connect the South Shore Trail with the main alignment of the West County Trail varies considerably. Where the trail parallels existing roadways the topography changes gradually and the grades range from 2% to 4%. The trail segment between the athletic complex adjacent to Arundel Middle School and Greyswood Road would traverse the Towsers Branch stream valley where the topography ranges from 225 feet above sea level to 138 feet at the creek. The trail could follow an existing dirt path from the school to the valley floor and out to Greyswood Road, however the gradient on the existing path exceeds 5% and would require regrading to make it accessible. The main trail alignment is in a valley where the spur would intersect with it at Strawberry Lake Way. The proposed gradient on Strawberry Lake Way exceeds 5% in this location which again exceeds the standards for accessibility.



SOILS

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

- . 30% loamy and clayey land
- . 12% Muirkirk soils
- . 12% Evesboro soils
- . 46% poorly drained soils of floodplain and other
minor soils

Loamy and clayey land is the predominate soil type; it is deep and well drained, but the under layer is unstable clay that moisture moves through slowly. The Muirkirk soils are well drained to excessively drained with a sandy surface layer and a clay subsoil. Evesboro soils are sandy and well to excessively drained.

The minor soils that compromise 46% of the soil association are important as they are poorly drained and are indications of environmentally sensitive land in the floodplains. These soils are in the Bibb, Christiana, Elkton, Keyport, Rumford and Sassafras series.

NON-TIDAL WETLANDS

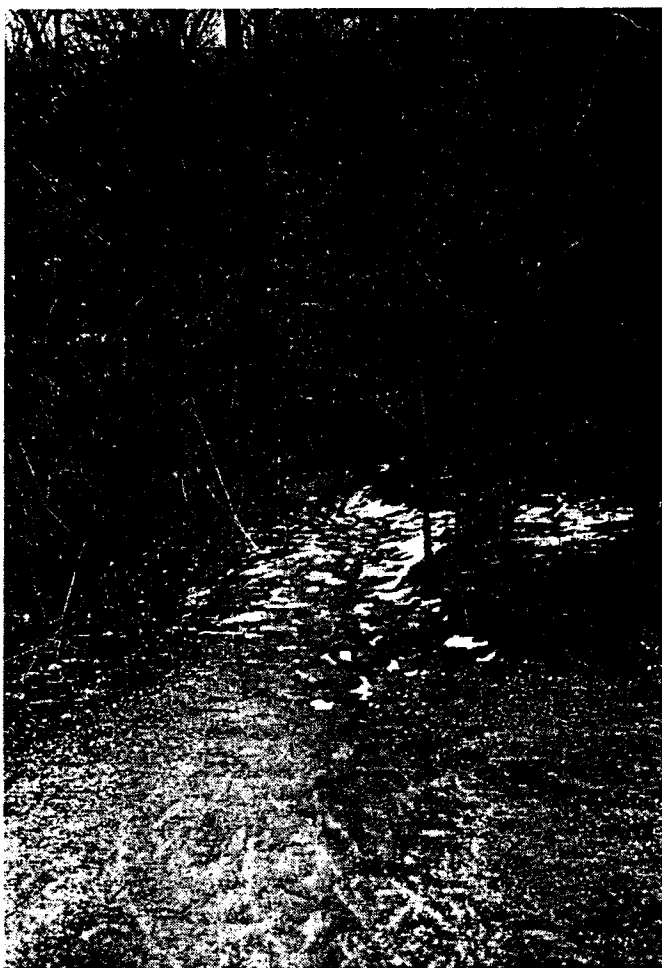
The West County Trail would cross the Little Patuxent River, the Patuxent River, and Towsers Branch, as well as their

associated wetlands. The wetlands adjacent to the Little Patuxent and Patuxent Rivers are extensive and unique and would offer trail users an opportunity to observe natural conditions that are otherwise unavailable. The Washington, Baltimore & Annapolis Railroad bed is on a fill area as it approaches both streams thus it should not be necessary to impact the wetlands. The bridges at both the Patuxent and Little Patuxent Rivers have been removed. The concrete abutments and pier at the Little Patuxent appear to be in usable condition, however those at the Patuxent River have been partially destroyed and are probably unusable. Further study would be needed to determine whether any of these structures could be utilized to support bridges for the trail.

Where the railroad bed is in a cut situation there are pockets of poor drainage. One such area is at Old Waugh Chapel Road. Water has been impounded and has created a large pond/wetland area which would need to be filled or the trail alignment moved to parallel the railroad bed. Front Street, a paper street, exists along the east side of the right of way from Riden Street to Old Waugh Chapel Road. It might be feasible to utilize that right of way for the trail.

Though not as extensive as the wetlands of the Little Patuxent and Patuxent Rivers, the floodplain and wetlands of Towsers Branch would present a challenge to trail construction.

The banks of Towsers Branch are eroded and the wetland/floodplain spreads approximately 100 feet on each side of the creek. Permits from the Corps of Engineers would be needed in order to cross the area with a bridge or a bridge and boardwalk.



VEGETATION

The proposed trail alignment would pass through developed areas, wooded upland areas, and the wetlands and wooded floodplains associated with the Patuxent River, Little Patuxent River, and Towsers Branch. This offers an opportunity to observe a variety of landscapes and their associated native plant species that are indigenous to western Anne Arundel County.

The following is a very brief list of the trees and shrubs species that are prevalent along the trail alignment.

Trees

Sweetgum	-	<i>Liquidambar styraciflua</i>
Tulip Poplar	-	<i>Liriodendron tulipifera</i>
American Holly	-	<i>Ilex opaca</i>
Beech	-	<i>Fagus grandifolia</i>
Pin Oak	-	<i>Quercus palustris</i>
Red Oak	-	<i>Quercus rubra</i>
White Oak	-	<i>Quercus alba</i>
Chestnut Oak	-	<i>Quercus prinus</i>
River Birch	-	<i>Betula nigra</i>
Red Maple	-	<i>Acer rubrum</i>
Silver Maple	-	<i>Acer saccharinum</i>
Ironwood	-	<i>Carpinus caroliniana</i>
Black Locust	-	<i>Robinia pseudoacacia</i>
Sassafras	-	<i>Sassafras albidum</i>
Virginia Pine	-	<i>Pinus virginiana</i>

Shrubs

Summersweet	-	<i>Clethra alnifolia</i>
Mountain Laurel	-	<i>Kalmia latifolia</i>
Sweetbay Magnolia	-	<i>Magnolia virginiana</i>
Sumac	-	<i>Rhus species</i>
Azalea	-	<i>Rhododendron species</i>
Blueberry	-	<i>Vaccinium corymbosum</i>
Sweetbells Leucothoe	-	<i>Leucothoe racemosa</i>
Greenbrier	-	<i>Smilax species</i>

ROAD CROSSINGS

The West County Trail would cross six roadways between Odenton Road and the Patuxent River, two between the main trail alignment and the Amtrak Station, and three between the South Shore Trail and main trail alignment. It is anticipated that all these crossings would be at grade. Safety on a trail is always a concern especially when trail users must interact with vehicular traffic. At the time of this report the intersection at Odenton Road and Piney Orchard Parkway is the only one signalized. Volume of traffic along the roadways and trail traffic would determine the need for additional signals. It would be necessary to adequately sign and mark the road crossings for both trail users and motorists. Following is a list of the road crossings along the proposed trail alignment.

<u>Crossing</u>	<u>Road Type</u>	<u>Comments</u>
<u>Odenton Road to the Patuxent River</u>		
June Drive	local	. residential street . low traffic volume
Old Waugh Chapel Road	local	. local and some through traffic (New Waugh Chapel has replaced it) . sight distance could be a problem
Waugh Chapel Road	arterial/ collector	. good sight distance . significant amount of traffic (connection between Route 3 and Piney Orchard Parkway)
Strawberry Lake Way	collector	. local traffic within Piney Orchard subdivision

<u>Crossing</u>	<u>Road Type</u>	<u>Comments</u>
Patuxent Road (Rte 424) (State road)	arterial	. links Route 3 with Piney Orchard Parkway . carries a large amount of industrial truck traffic . major crossing
Conway Road	local	. limited rural traffic if crossing to the west of the entrance to the sand and gravel operation
<u>Spur to Amtrak</u>		
Piney Orchard Parkway	arterial	. significant amount of traffic . links Route 170 with Route 3 . existing traffic signal
Waco Avenue	local	. residential street - low traffic volume
Skyline Avenue	local	. residential street - low traffic volume
Patuxent Road	collector	. connects Odenton Road to Waugh Chapel Road - industrial and local traffic
Odenton Road	collector	. mainly traffic to and from the Amtrak station and Patuxent Road

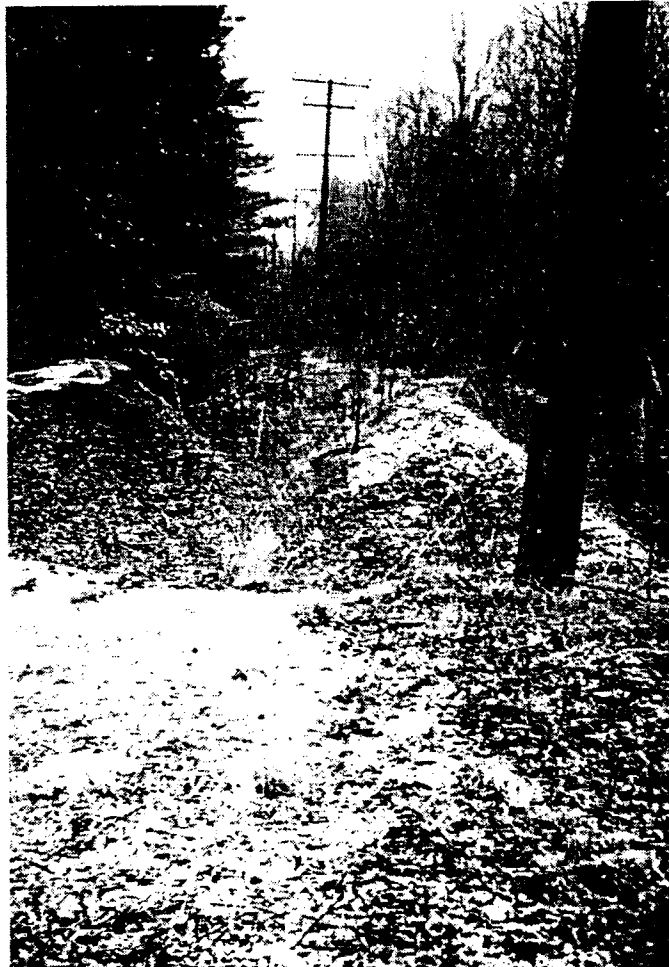
Due to a lack of County owned right of way along Becknel Road and Patuxent Road, bicyclists may need to share the roadway with vehicular traffic. Becknel is a cul de sac road with limited residential traffic and Patuxent is a collector road that does have a greater amount of traffic. Pedestrians would need to be accommodated on sidewalks.

<u>Crossing</u>	<u>Road Type</u>	<u>Comments</u>
<u>Spur to South Shore Trail</u>		
Annapolis Road (MD Rte 175)	arterial	. principal road/"main street" through Odenton . connects with regional highway system
School Lane	local	. school and athletic complex traffic only
Chapelgate Drive	collector	. residential traffic
Waugh Chapel Road	arterial	. links Route 3 and Piney Orchard Parkway . to receive traffic signal when Strawberry Lake Way is opened

As previously mentioned, bicyclists would be required to share the roadway with vehicles on Watts Road, Greyswood Road, and Chapelgate Drive. Watts Road is a dead end residential street and Greyswood Road is a local residential street which would have minimal traffic. Chapelgate Drive would be less desirable for cyclists. Chapelgate is a residential collector street with parking on both sides, driveway curb cuts, and duplex style housing.

UTILITIES

Baltimore Gas & Electric overhead service lines parallel the abandoned railroad bed within the WB&A right of way. Other than the storm drain structures that cross under the railroad bed, there doesn't appear to be any other utilities within the corridor except at the road crossings where one could expect to find water, sanitary and storm drain lines within the road right of ways. Between Patuxent Road and Conway Road the trail would cross under Baltimore Gas & Electric transmission lines. The proposed spur from the South Shore Trail would pass over storm drain and sanitary sewer lines between Towsers Branch and Greyswood Road.



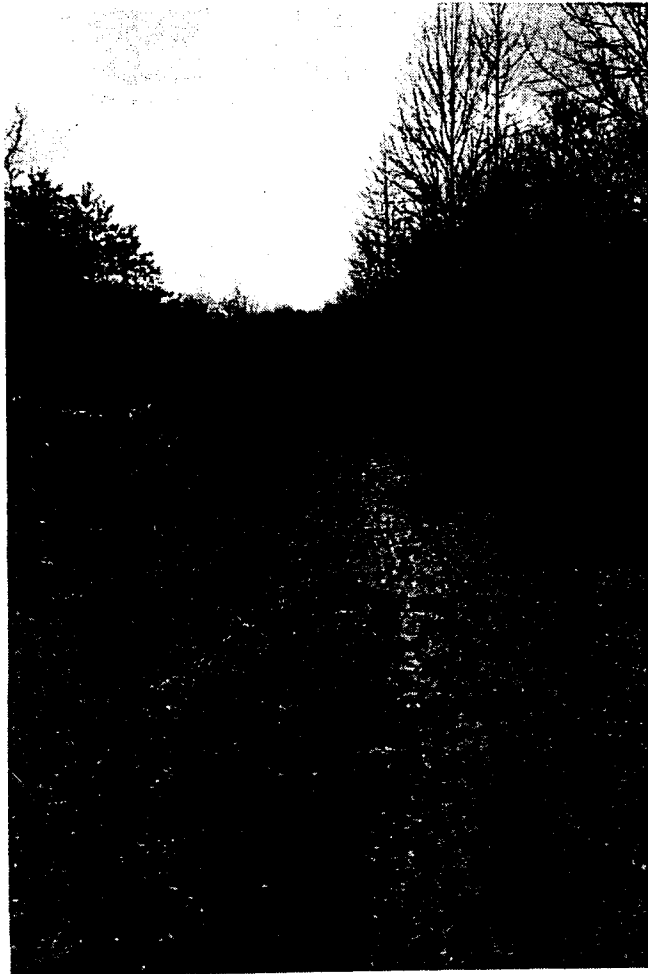
LAND USES

The main alignment of the West County Trail would pass through or near many different land uses between Odenton Road and the Patuxent River. The trail alignment would start in Academy Junction, an older section of Odenton that is a small retail/service center. Between Academy Junction and Waugh Chapel Road the trail would pass through single family neighborhoods such as Kings Ransom, Breezewood, and Riden.

Between Waugh Chapel Road and the Little Patuxent the trail alignment would pass through Piney Orchard, a planned unit development. Housing within Piney Orchard will consist of apartments, condominiums, townhouses, and single family homes. A shopping area and business park will also be located within Piney Orchard. South of the Little Patuxent River the land uses are more rural. The land adjacent to the Patuxent and Little Patuxent Rivers is zoned as open space as it is predominantly wetland and floodplains, and is for the most part unbuildable. The remaining land is rural residential, however it is also a mineral resource area and much of the land has been mined or is currently being mined for sand and gravel.

The proposed spur to the Amtrak Station would pass through an older residential area of Odenton. This area is proposed to be an historic preservation overlay zone in the Odenton Town Plan. The spur from the South Shore Trail would pass through Arundel High and Middle Schools and the adjoining athletic complex as well as the Odenton Nature Area. It also passes

through the residential communities of Chapelgate and Four Seasons Estates and the Odenton Park.



ALTERNATIVE LINKS WITH THE SOUTH SHORE TRAIL

As part of this study alternative alignments linking the West County to the South Shore Trail were identified. There are two routes that are feasible, both having desirable features as well as constraints.

One alignment would link the two trails together at the South Shore terminus near the intersection of Dicus Mill Road and Annapolis Road (Route 175). It would cross Annapolis Road at the existing signal and follow the north side of Odenton Road to the West County Trail at Odenton Road and Piney Orchard Parkway.

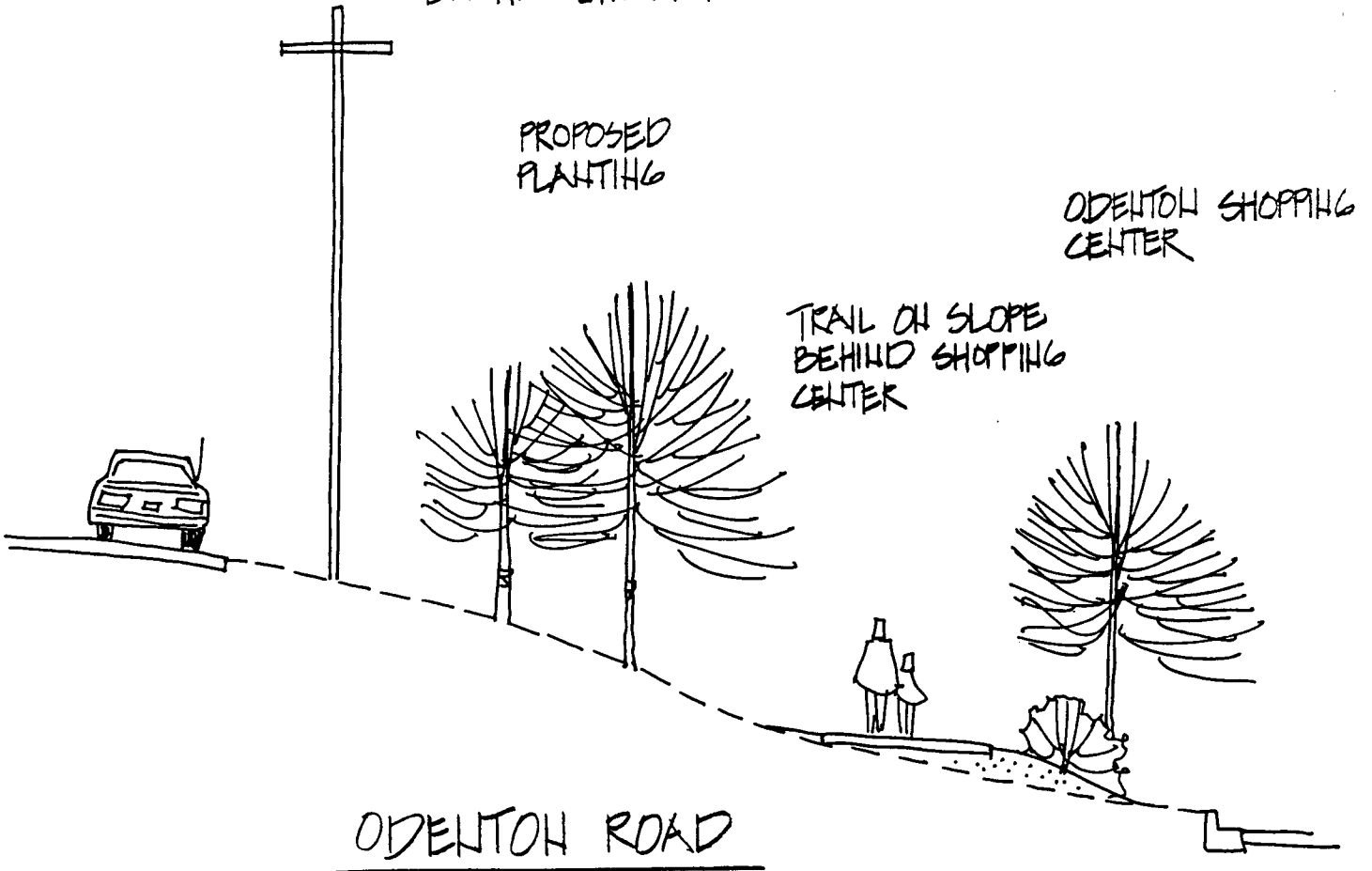


EXISTING UTILITY POLES

PROPOSED PLANTING

ODENTON SHOPPING CENTER

TRAIL ON SLOPE BEHIND SHOPPING CENTER

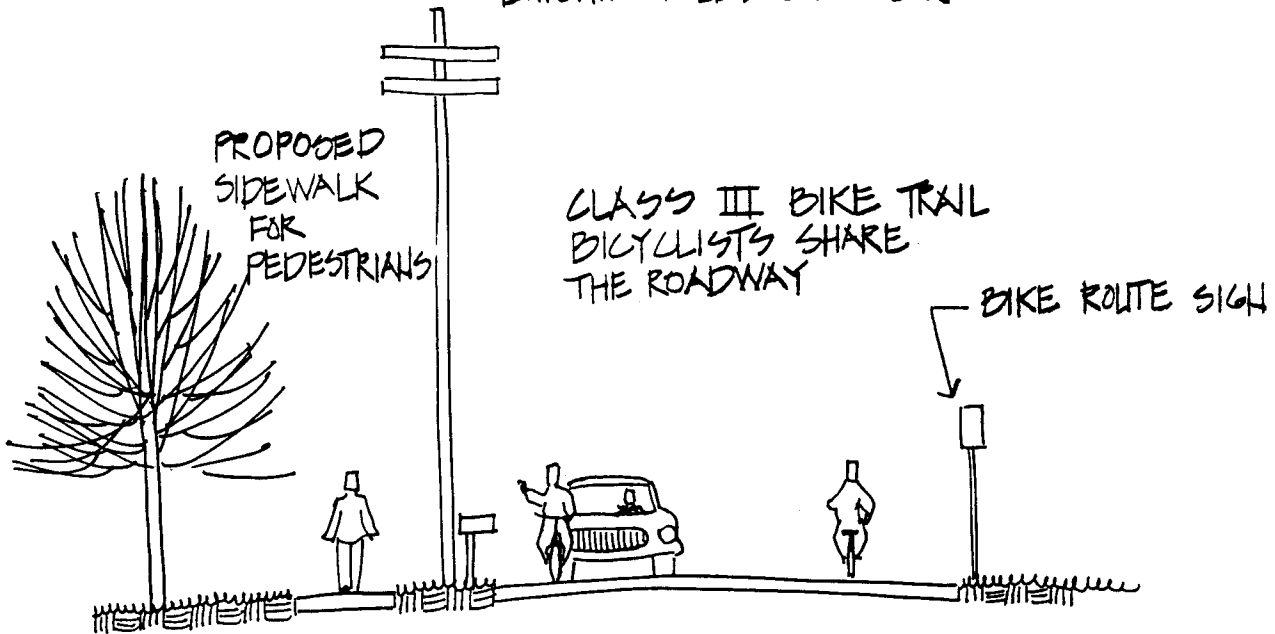


EXISTING POLES & MAILBOXES

PROPOSED SIDEWALK FOR PEDESTRIANS

CLASS III BIKE TRAIL BICYCLISTS SHARE THE ROADWAY

BIKE ROUTE SIGN



BECKHEL ROAD

This alignment would link the library, Odenton Elementary School, and the senior center with the trail system. The major constraints of this alignment are: the intersection at Dicus Mill Road and Route 175; the lack of County owned right of way along Odenton Road; driveway cuts; utility poles; and the slope conditions behind the Odenton Shopping Center.

The second possible alignment would link the South Shore Trail with the West County Trail through the Naval Academy Dairy Farm. The South Shore Trail parallels Maple Road. At the intersection of Maple and Gambrills Roads a spur could follow Gambrills Road, cross Annapolis Road at Dairy Farm Lane, and follow Dairy Farm Road to a point where Anne Arundel County Recreation & Parks land abuts the U.S. Naval Academy Dairy Farm. The alignment would then pass through the Odenton Nature Area, cross Towsers Branch, and link with the preferred alignment. This alternative would only be feasible if the U.S. Naval Academy Dairy Farm agreed to provide the necessary right of way or easement for the trail. This alignment would also require crossing Dairy Farm Road, an arterial road, at an uncontrolled location.

We briefly looked at other alignments that would connect the West County Trail to the BWI Trail - these alignments are shown on the master plan.

TECHNICAL AND DESIGN CONSIDERATIONS

To insure that the West County Trail would be as 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 West County Trail is constructed.

1. The width of the multipurpose trail in an urban/suburban area should be a minimum of 10 feet wide with 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. One hundred fifty feet is considered to be adequate sight/stopping distance for cyclists.
7. 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.
8. The trail should be designed to accommodate people with disabilities:
 - . barrier free
 - . 5' minimum width
 - . uniform hard surface
 - . gradients under 5%
9. Short, sharp curves should be avoided. AASHTO standards should be followed.

In addition, when site conditions permit, the paved trail should be constructed off-center in the right of way to provide a parallel, soft-surface trail for joggers and equestrians.

Trail Material & Construction Standards

It is anticipated that the West County Trail will be heavily used given its urban setting. The recommended trail surface should be machine laid hot mix bituminous concrete with a subbase of crushed stone. Bituminous concrete is preferred because it requires less maintenance, provides a smooth riding surface, and easily accommodates security and maintenance vehicles. Because Baltimore Gas & Electric shares the WB&A corridor it would be advantageous to have a thicker paving section than generally designed for trails to adequately support heavy trucks.

Four bridges would be necessary along the West County Trail; at the Little Patuxent and the Patuxent Rivers, at Towsers Branch, and at Watts Road and the South Shore Trail. It would be desirable to locate and reuse old metal railroad bridges at the Patuxent and Little Patuxent Rivers similar to the originals, however, prefabricated wooden or metal bridges may also be appropriate. The concrete abutments that once supported the bridges are still remaining. The abutments and pier in the Little Patuxent appear to be in usable condition, however a thorough study would have to be conducted to determine their usability. The abutments at the Patuxent are damaged and probably unusable, and no evidence of the piers remain. Because

people generally congregate on bridges to watch the stream below, it might be desirable to widen the bridges to allow for trail users to stop, yet still leave the travel lanes open.

Towers Branch and the drainage way at Watts Road could be spanned with prefabricated wood bridges and the wetlands at Towers Branch crossed with a boardwalk. The bridges should be designed to support maintenance or security vehicles and the railings should be 54" high to protect bikers. The approach to a bridge should extend a minimum of 15' with a fence on either side to safely funnel users onto the bridge.



DRAINAGE

There are a few areas along the main alignment where drainage problems will have to be addressed. The old Washington, Baltimore & Annapolis Railroad bed was built with a series of cut and fill sections to provide for a gradient no steeper than 3%. Where the alignment is in a cut situation water tends to sit on the bed and over the years has created small isolated wet areas. This condition occurs in three different areas: about 600 feet north of June Drive; between Old Waugh Chapel and New Waugh Chapel Roads; and approximately 2200 feet south of New Waugh Chapel Road. These three sites can probably be corrected by creating swales on either side of the bed and draining the water to a collection point.

Between Riden Road and Old Waugh Chapel Road the alignment is also in a cut situation. It appears that the drainage way was blocked when Old Waugh Chapel Road was constructed and a large pond has been created. It may be necessary to move the alignment off the railroad bed through this section. There are three areas where the railroad bed has been eroded away. One is located at Riden Street and the other two areas are between the Campbell sand and gravel site and the Patuxent River. These sites are in fill sections and will need to be stabilized.

There are 14 storm drain structures under the railroad bed. Two are non-functioning, two are under water, and several others are filled with sediment and need to be replaced or repaired. A

field investigation of the storm drain structures has been made and more detailed information can be found in a separate report. The spur from the South Shore Trail would cross over Towsers Branch. The creek banks are eroded in several spots and would need to be restored.

SUPPORT FACILITIES

The types and locations of support facilities along the West County Trail will depend on available land and the amount of use the trail receives. Typical support facilities would include parking areas, restrooms, drinking fountains, benches and picnic areas, information kiosks, and a trail headquarters/maintenance facility. Between the trail head at Odenton Road and the terminus at the Patuxent River, there are no public facilities (ie., parks, schools) adjacent to the trail to provide support for trail users. It would be advantageous to provide facilities near the trail head and at Waugh Chapel Road, Patuxent Road, or Conway Road, however, the County would need to acquire the land for these. Baltimore Gas & Electric Company owns the small site at Odenton Road and Piney Orchard Parkway at the trail head. It would be desirable to locate a small parking area with an information kiosk at that site.

Facilities would be available along the spur from the South Shore Trail at Arundel Middle and High Schools and at Odenton Park, which possibly could serve as the trail headquarters. The spur to the Amtrak Station would connect trail users with the

facilities there, however parking is available only on weekends and the station is open Monday through Friday only. The alternative alignment along Odenton Road would allow trail users to utilize the existing facilities at the Odenton Shopping Center, the library and the elementary school.

ACCESS POINTS

Residents in the neighborhoods adjacent to the West County Trail would probably be the primary users and should be able to access the trail easily and safely. Where possible it would be desirable to provide paved access ways onto the trail from the adjacent neighborhoods. Tab, Darwin, Gill and Damascus Streets dead end at the old railroad alignment and are separated by earth berms and guardrails. At these points it would be rather inexpensive to provide access to the trail and connect the communities of Stoney Hill and Kings Ransom with the trail. An access could be provided at Riden Street, however a steep slope separates the trail and the roadway and a ramp or stairway would be required. As Piney Orchard is developed pedestrian connections with the West County Trail should be provided.

SIGNAGE

Signage along the proposed West County Trail should be uniform and consistent. 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 six 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.
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 100-120 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.

6. Night Visibility Signs, reflecting strips and reflective paint on bollards, gates and other hazards should be used on the trail.

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 information signs, can be painted on the pavement.

SITE FURNISHINGS

The typical site furnishings along the proposed West County 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 - It is generally necessary to provide bollards at trail access points 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 - Site furnishings should be placed a minimum of three feet away from the edge of the trail to insure user safety. Benches should be located approximately every half mile along the trail with an asphalt or concrete pad under it for ease of maintenance and to prevent erosion.
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

and should be approximately four feet high to prevent a biker from falling over the fence.

DEVELOPMENT IMPACTS, APPROVALS AND PERMITS

The trail alignment on the existing railroad bed would create a minimal amount of development impact. Utility poles adjacent to Piney Orchard Parkway between Odenton Road and Tab Street may need to be relocated. In order to provide a Class III bike trail and sidewalks along Becknel, Patuxent and Odenton Roads for pedestrians, Anne Arundel County would be required to acquire right of way, perhaps relocate telephone poles and mailboxes. Additional grading would be involved if parking areas were developed adjacent to the trail. Considerably more impacts would occur with the construction of the spur to the South Shore Trail given the existing environmental constraints of steep slopes, wetland and stream conditions, and forest cover.

Construction of the trail will require a grading permit review from Anne Arundel County Office of Planning & Code Enforcement. In addition, all wetlands within the West County Trail right of way will need to be delineated and the delineations approved by the Baltimore District of the Corps of Engineers, the Maryland Department of Natural Resources, and the Anne Arundel County Office of Planning & Code Enforcement. If wetlands are disturbed, mitigation will be required.

ADMINISTRATION OF THE TRAIL

The West County Trail will be maintained and operated by the Anne Arundel County Department of Recreation & Parks.

A Park Superintendent and his staff will be responsible for the daily maintenance and operation of the trail. It is assumed that local service groups, such as hiking and biking clubs, local garden clubs, and scout troops, would 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, 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 Police Department.

PROJECT PHASING

The West County Trail could be implemented in three phases:

- | | | |
|------------|---|-------------------------|
| Phase I: | Odenton Road to Patuxent Road and Spur from
Odenton Road to Amtrak/Marc Station | approximately 3.6 miles |
| Phase II: | Spur from the South Shore Trail at
Watts Road to the intersection with
Phase I at Strawberry Lake Way | approximately 3.4 miles |
| Phase III: | Patuxent Road to the Patuxent River | approximately 2.6 miles |
| | | <hr/> 9.6 miles |

COST ESTIMATE - WEST COUNTY TRAIL

Phase I: Odenton Road to Patuxent Road and Spur to the
 Amtrak/Marc Station
 Approximately 3.6 miles

<u>CONSTRUCTION OFFICE:</u> Lump Sum	=	\$	5,000
<u>MOBILIZATION:</u> Lump Sum	=	\$	2,000
<u>SURVEY LAYOUT:</u> Lump Sum	=	\$	2,500
<u>MAINTENANCE AND PROTECTION OF TRAFFIC:</u> Lump Sum	=	\$	1,500

SEDIMENT CONTROL:

Stabilized Construction Entrance:			
8 @ \$1,500/each	=	\$	12,000
Silt Fence: 3,600 lf @ \$2.50/lf	=	\$	9,000
Sediment Trap:			
3 @ \$3,500/each	=	\$	10,500
Diversion Berms:			
180 lf @ \$10.00/lf	=	\$	1,800
Temporary Seeding:			
90,000 sf @ \$0.06/sf	=	\$	5,400
		Subtotal	\$ 38,700

STORMWATER MANAGEMENT:

<u>WATER QUALITY PROVISIONS:</u>	=	\$	30,000
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BIKE TRAIL: (16,330 lf - 3.09 miles)

Excavation			
4,550 cy @ \$8.00/cy	=	\$	36,400
Graded Aggregate (3025 cy)			
4,500 tons @ \$25.00/ton	=	\$	112,500
3" Bituminous Surface			
3,025 tons @ \$45.00/ton	=	\$	136,125
4" Topsoil			
1,200 cy @ \$30.00/cy	=	\$	36,000
		Subtotal	\$ 321,025

<u>PARKING AREA:</u>	=	\$	25,000
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DRAINAGE:

Cleaning			
14 culverts @ \$1,500/each	=	\$	21,000
Repair - Lump Sum	=	\$	20,000
Replacement			
(1) 19'x13'x50' culvert -			
Lump Sum	=	\$	25,000
New			
(1) 24"x30' culvert - Lump Sum	=	\$	5,000
		Subtotal	\$ 71,000

GUARDRAIL:

Removable Bollards			
10 @ \$500/each	=	\$	5,000
Wood Guardrail			
650 lf @ \$15.00/lf	=	\$	9,750
Metal Guardrail			
1,480 lf @ \$15.00/lf	=	\$	22,200
Split Rail Fence			
3,000 lf @ \$3.50/lf	=	\$	10,500
		Subtotal	\$ 47,450

BRIDGE - Replace Bridge over Little Patuxent:

Bridge: 12'x180'			
2,160 sf @ \$100.00/sf	=	\$	216,000
Abutment Repair: Lump Sum	=	\$	20,000
Rip Rap: Lump Sum	=	\$	15,000
		Subtotal	\$ 251,000

REFORESTATION: Exempt

SEEDING & SOD:

Seeding:			
326,600 sf @ \$0.06/sf	=	\$	19,596
Sod:			
250 sy @ \$4.00/sy	=	\$	1,000
		Subtotal	\$ 20,596

LANDSCAPING/SCREENING: Lump Sum = \$ 35,000

SIGNAGE:

Traffic Signs			
70 @ \$175.00/each	=	\$	12,250
Pavement Marking			
Lump Sum	=	\$	2,500
Interpretive Sign			

3 @ \$2,000.00/each	=	\$ 6,000	
Station Marker			
2 @ \$500.00/each	=	\$ 1,000	
			Subtotal \$ 21,750

SITE AMENITIES:

Picnic Tables			
3 @ \$600.00/each	=	\$ 1,800	
Benches			
10 @ \$700.00/each	=	\$ 7,000	
Bicycle Racks			
4 @ \$580.00/each	=	\$ 2,320	
			Subtotal \$ 11,120

Total		\$ 883,641
Contingencies (10%)		\$ 88,364
Inflation (1 yr @ 7%/yr)		\$ 61,854
Total Construction Cost		\$1,033,859
SAY		\$1,034,000
COST PER MILE		\$ 287,000

COST ESTIMATE - WEST COUNTY TRAIL

Phase II: Spur from the South Shore Trail at Watts Road
to the Intersection with Phase I at Strawberry
Lake Way

Approximately 3.4 miles

CONSTRUCTION OFFICE: Lump Sum = \$ 5,000

MOBILIZATION: Lump Sum = \$ 2,000

SURVEY LAYOUT: Lump Sum = \$ 2,500

MAINTENANCE AND PROTECTION OF TRAFFIC: Lump Sum = \$ 1,500

SEDIMENT CONTROL:

Stabilized Construction Entrance:
10 @ \$1,500/each = \$ 15,000
Silt Fence: 3,600 lf @ \$2.50/lf = \$ 9,000
Sediment Trap:
3 @ \$3,500/each = \$ 10,500
Diversion Berms:
180 lf @ \$10.00/lf = \$ 1,800
Temporary Seeding:
84,600 sf @ \$0.06/sf = \$ 5,076
Subtotal \$ 41,376

STORMWATER MANAGEMENT: Exempt

WATER QUALITY PROVISIONS: = \$ 30,000

BIKE TRAIL: (15,400 lf - 2.90 miles)

Excavation
4,275 cy @ \$8.00/cy = \$ 34,276
Graded Aggregate (3025 cy)
4,230 tons @ \$25.00/ton = \$105,750
3" Bituminous Surface
2,850 tons @ \$45.00/ton = \$128,250
4" Topsoil
1,125 cy @ \$30.00/cy = \$ 33,750
Subtotal \$302,476

PARKING AREA: = \$ 25,000

DRAINAGE:

Piping Swales: Lump Sum = \$ 20,000

GUARDRAIL:

Removable Bollards
4 @ \$500/each = \$ 2,000
Wood Guardrail
320 lf @ \$15.00/lf = \$ 4,800
Metal Guardrail
70 lf @ \$15.00/lf = \$ 1,050
Split Rail Fence
6,000 lf @ \$3.50/lf = \$ 21,000
Subtotal \$ 28,850

BRIDGE AT WATTS ROAD & SOUTH SHORE TRAIL:

Bridge: 12'x40'
480 sf @ \$50.00/sf = \$ 24,000

BRIDGE & BOARDWALK AT TOWSERS BRANCH: 250 lf

2,500 sf @ \$50.00/sf = \$125,000

REFORESTATION: Exempt

SEEDING & SOD:

Seeding:
308,000 sf @ \$0.06/sf = \$ 18,480
Sod:
250 sy @ \$4.00/sy = \$ 1,000
Subtotal \$ 19,480

LANDSCAPING/SCREENING: Lump Sum = \$ 35,000

SIGNAGE:

Traffic Signs
60 @ \$175.00/each = \$ 10,500
Pavement Marking
Lump Sum = \$ 1,200
Interpretive Sign
3 @ \$2,000.00/each = \$ 6,000
Subtotal \$ 17,700

SITE AMENITIES:

Picnic Tables			
3 @ \$600.00/each	=	\$ 1,800	
Benches			
10 @ \$700.00/each	=	\$ 7,000	
Bicycle Racks			
3 @ \$580.00/each	=	\$ 1,740	
		Subtotal	\$ 10,540
Total			\$690,422
Contingencies (10%)			\$ 69,042
Inflation (1 yr @ 7%/yr)			\$ 48,330
Total Construction Cost			\$807,794
SAY			\$808,000
COST PER MILE			\$237,647

COST ESTIMATE - WEST COUNTY TRAIL

Phase III: Patuxent Road to the Patuxent River
Approximately 2.6 miles

CONSTRUCTION OFFICE: Lump Sum = \$ 5,000

MOBILIZATION: Lump Sum = \$ 2,000

SURVEY LAYOUT: Lump Sum = \$ 2,500

MAINTENANCE AND PROTECTION OF TRAFFIC: Lump Sum = \$ 1,500

SEDIMENT CONTROL:

Stabilized Construction Entrance:

6 @ \$1,500/each = \$ 9,000

Silt Fence: 4,200 lf @ \$2.50/lf = \$ 10,500

Sediment Trap:

3 @ \$3,500/each = \$ 10,500

Diversion Berms:

180 lf @ \$10.00/lf = \$ 1,800

Temporary Seeding:

90,000 sf @ \$0.06/sf = \$ 5,400

Subtotal \$ 37,200

STORMWATER MANAGEMENT: Exempt

WATER QUALITY PROVISIONS: = \$ 30,000

BIKE TRAIL: (13,730 lf - 2.60 miles)

Excavation

3,822 cy @ \$8.00/cy = \$ 30,576

Graded Aggregate (3025 cy)

3,780 tons @ \$25.00/ton = \$ 94,500

3" Bituminous Surface

2,540 tons @ \$45.00/ton = \$114,300

4" Topsoil

1,010 cy @ \$30.00/cy = \$ 30,300

Subtotal \$269,676

PARKING AREA: = \$ 25,000

DRAINAGE:

Cleaning		
3 culverts @ \$1,500/each	=	\$ 4,500
Repair Erosion: Lump Sum	=	\$ 20,000
New 24" culverts		
5 @ \$2,500/each	=	\$ 12,500
		Subtotal \$ 37,000

GUARDRAIL:

Removable Bollards		
4 @ \$500/each	=	\$ 2,000
Wood Guardrail		
320 lf @ \$15.00/lf	=	\$ 4,800
Metal Guardrail		
100 lf @ \$15.00/lf	=	\$ 1,500
Split Rail Fence		
7,000 lf @ \$3.50/lf	=	\$ 24,500
		Subtotal \$ 32,800

BRIDGE - Replace Bridge over Patuxent:

Bridge: 12'x180'		
2160 sf @ \$100.00/sf	=	\$216,000
Rip Rap: Lump Sum	=	\$ 15,000
		Subtotal \$231,000

REFORESTATION: Exempt

SEEDING & SOD:

Seeding:		
326,600 sf @ \$0.06/sf	=	\$ 19,596
Sod:		
250 sy @ \$4.00/sy	=	\$ 1,000
		Subtotal \$ 20,596

LANDSCAPING/SCREENING: Lump Sum = \$ 35,000

SIGNAGE:

Traffic Signs		
20 @ \$175.00/each	=	\$ 3,500
Pavement Marking		
Lump Sum	=	\$ 1,200
Interpretive Sign		
2 @ \$2,000.00/each	=	\$ 4,000
Station Marker		
2 @ \$1,000.00/each	=	\$ 2,000
		Subtotal \$ 10,700

SITE AMENITIES:

Picnic Tables			
3 @ \$600.00/each	=	\$	1,800
Benches			
10 @ \$700.00/each	=	\$	7,000
Bicycle Racks			
2 @ \$580.00/each	=	\$	1,060
		Subtotal	\$ 9,960

Total		\$749,932
Contingencies (10%)		\$ 74,993
Inflation (1 yr @ 7%/yr)		\$ 52,495
Total Construction Cost		\$877,420
SAY		\$877,000
COST PER MILE		\$337,300

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