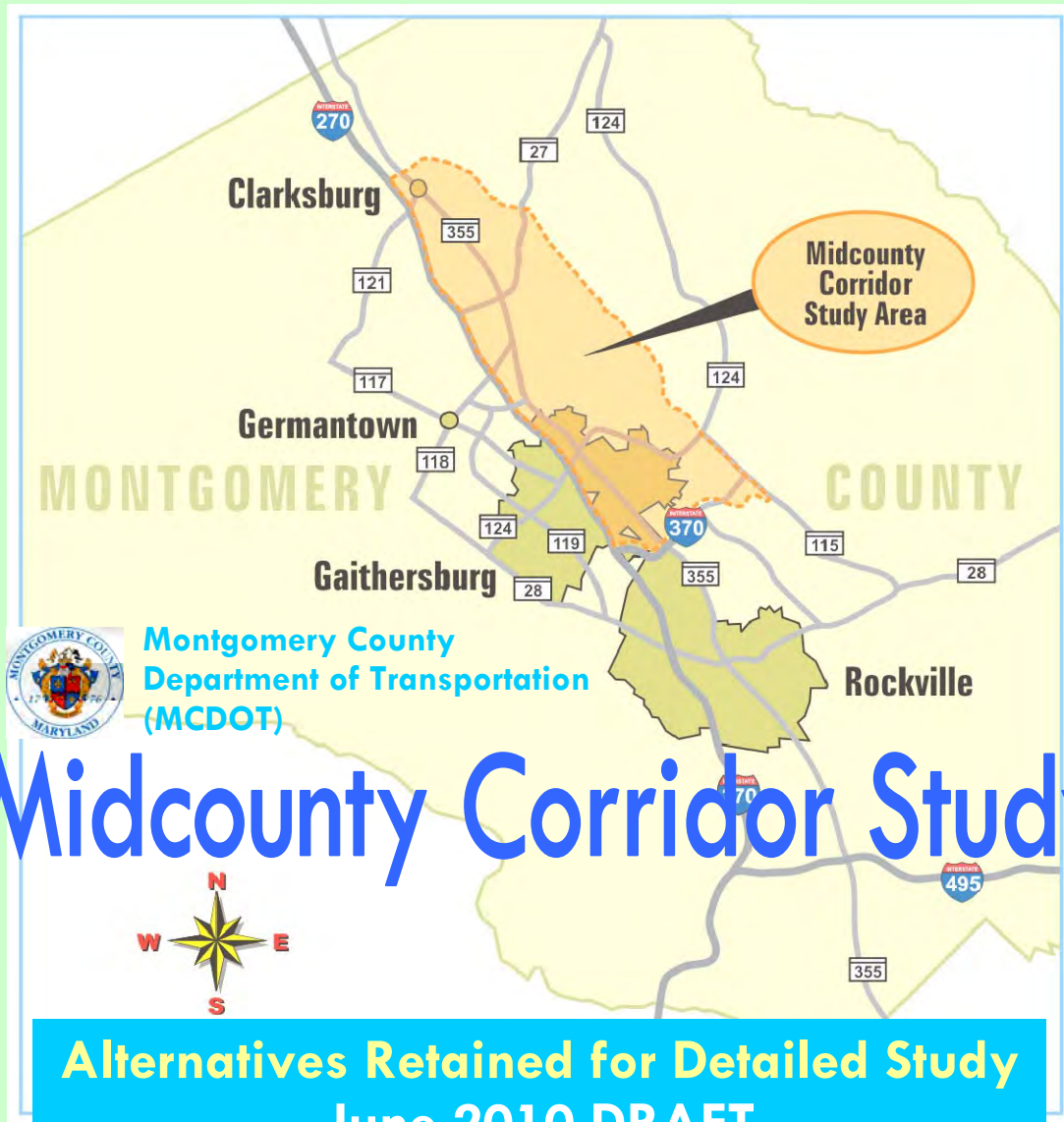




Division of Transportation Engineering

<http://www.montgomerycountymd.gov/midcountycorridorstudy>

## MidCounty Corridor Study



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## SUMMARY

### A. PURPOSE OF SUBMITTAL

The Montgomery County Department of Transportation (MCDOT) is hereby presenting this package to request concurrence on the Alternatives Retained for Detailed Study (ARDS) for the Midcounty Corridor Study (MCS).

### B. PROJECT PURPOSE

MCDOT is performing the Midcounty Corridor Study to relieve projected congestion on the roadways between Gaithersburg and Clarksburg; improve mobility east of I-270; improve traffic safety and efficiency; improve vehicular, pedestrian, and bicycle access to destinations within the study area; and to develop these improvements in an environmental sensitive manner.

### C. ALTERNATIVES RETAINED FOR DETAILED STUDY

The Alternatives Retained for Detailed Study, commonly referred to as ARDS, is a document to summarize and compare the initial alternatives and recommends those to be carried forward for detailed study. For the Midcounty Corridor Study (MCS), eleven (11) alternatives were evaluated that consisted of proposed improvements to existing roadways as well as new roadway alignment (with 3 different northern terminus options) as recommended in area master plans.

Of the eleven (11) alternatives, the following six (6) alternatives and two (2) Master Plan Alignment Northern Terminus options are recommended for detailed study:

- Alternative 1, No Build;
- Alternative 2, Transportation Systems Management/Transportation Demand Management;
- Alternative 4, Goshen-Wightman-Brink;
- Alternative 5, MD 355;
- Alternative 8, Master Plan Alignment from Watkins Mill Road;
- Alternative 9, Master Plan Alignment; and
- Master Plan Alignment Northern Terminus: Options A and C

### D. ALTERNATIVES NOT RECOMMENDED FOR DETAILED STUDY

Of the eleven (11) alternatives, the following five (5) alternatives and one (1) northern terminus option are not recommended:

- Alternative 3, Montgomery Village-Wightman-Brink;
- Alternative 6, MD 355-Lower & Upper Watkins Mill-Master Plan Alignment;
- Alternative 7, MD 355-Middlebrook-Master Plan Alignment;
- Alternative 10, Muncaster Mill-Snouffer School-Wightman-Brink (both Options A and B);
- Alternative 11, Montgomery Village-Stedwick-Upper Watkins Mill-Master Plan Alignment; and
- Northern Terminus of Master Plan Alignment: Option B.

These recommendations were based on a comparison of each alternative's transportation benefits; impacts to the natural, built, and social environment; and public and agency input.



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## I. INTRODUCTION

The Montgomery County Department of Transportation (MCDOT) has initiated the Midcounty Corridor Study (MCS) to evaluate transportation improvements that:

- Relieve projected roadway congestion between Gaithersburg and Clarksburg;
- Improve mobility east of I-270;
- Improve traffic safety and efficiency;
- Improve vehicular, pedestrian, and bicycle access to destinations within the study area; and
- Develop improvements in an environmentally sensitive manner.

The MCS seeks to evaluate the effects of the proposed alternatives and select the best alignment to achieve the project's purpose and need while minimizing impacts to the surrounding environment.

### A. PROJECT HISTORY

Since the 1960s, Midcounty Highway (M-83) from Ridge Road (MD 27) in Clarksburg to Redland Road in Derwood, an 8.7-mile controlled access, four to six-lane major highway, has been an element of the transportation master plan for Montgomery County. Over the years, the County has built the 3.0-mile section of Midcounty Highway from Shady Grove Road to Montgomery Village Avenue.

In the 1980s, the Maryland State Highway Administration (MSHA) conducted the *Maryland Route 355 Corridor Study*. This study concluded that improvements to MD 355 and Midcounty Highway (M-83) would be required in the next 10-15 years to provide access for existing and planned development east of I-270 in Germantown.

Accordingly, in 1986 MCDOT initiated the *Germantown-Montgomery Village Connector Study* (Montgomery County CIP #863116) which included preliminary engineering for the northern extension of Midcounty Highway from Montgomery Village Avenue to Ridge Road (MD 27). Due to the grim fiscal climate in the early 1990s, the *Germantown-Montgomery Village Connector Study* was put on hold in 1992 while developer and MSHA improvements to MD 355 proceeded. As a result of community developments along this section of Midcounty Highway through the years, portions of Midcounty Highway have been constructed or rights-of-way have been dedicated to date. By 2000, the 6-mile section of MD 355 between Montgomery Village Avenue and MD 27 (Ridge Road) had also been reconstructed as a 6-lane highway.

The Midcounty Highway (M-83) Facility Planning Study was reinitiated in 2004 to evaluate the master plan alignment from Montgomery Village Avenue to Ridge Road (MD 27). A Purpose and Need Statement was presented to the public in November 2004 and revised based on the community input and agency comments received. The revised Purpose and Need Statement was concurred upon by the environmental agencies in January 2007 and is summarized in Section II (page 5) of this document.



Due to the potential magnitude of environmental impacts associated with the project, and the likelihood that the project will need federal permits, the project is required to comply with the National Environmental Policy Act (NEPA). NEPA requires the development and study of appropriate alternatives to the recommended course of action in any proposal which involves unresolved conflicts concerning the use of available resources. Accordingly, MCDOT invested additional resources and expanded the Midcounty Highway (M-83) Facility Planning Study to the broader Midcounty Corridor Study (MCS) which evaluated eleven (11) different alternatives for the area east of I-270 between Clarksburg and Gaithersburg.

This document, referred to as *Alternatives Retained for Detailed Study*, presents a detailed summary of the alternatives considered throughout the alternatives development process of the MCS and recommends alternatives to be retained for detailed study (ARDS). A description of each alternative is presented in Section IV and a comparison of environmental impacts and transportation benefits associated with the alternatives is presented in Section V. A systematic environmental investigation was used, along with input from the public, environmental regulatory agencies, and other stakeholders to determine the ARDS. The MCDOT's recommendations and associated rationale are presented in Sections VI and VII.

## B. MASTER PLANS

The Midcounty Corridor Study (MCS) encompasses three master plans as listed below:

1. *Gaithersburg Vicinity Master Plan* (January 1985; Amended May 1988; Amended July 1990)
2. *Germantown Master Plan* (1989)
3. *Clarksburg Master Plan & Hyattstown Special Study Area* (1994)

All three master plans identify the extension of Midcounty Highway (roadway designation M-83) as a controlled access four- to six-lane major highway from Montgomery Village Avenue to Ridge Road (MD 27), approximately 6.1 miles, and also the widening of Middlebrook Road (M-85) as a six-lane highway from existing Midcounty Highway to MD 355, approximately 0.6 miles.

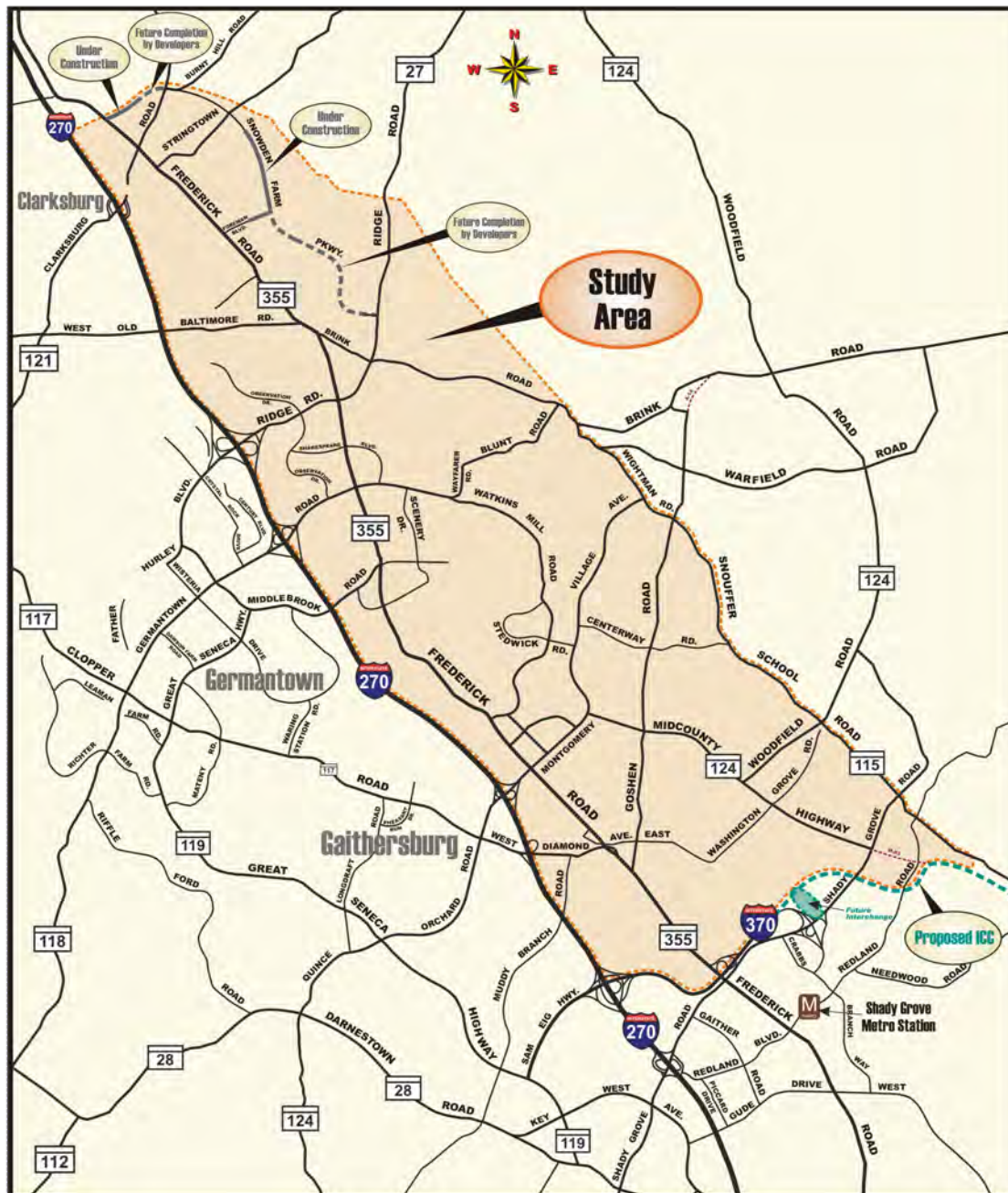
Beginning with the *Gaithersburg Vicinity Master Plan*, adopted in 1971, both Midcounty Highway (M-83) and Great Seneca Highway (MD 119, master plan designation M-90) were defined as having the same purpose: to provide a controlled access major highway parallel to I-270 that would serve regional traffic in the I-270 corridor and relieve I-270 of short and moderate length trips between the area's urban centers. Great Seneca Highway, from Middlebrook Road to Darnestown, was constructed between 1983 and 1989.

## C. STUDY AREA

The study area for the Midcounty Corridor Study was established as part of the Purpose and Need Statement and falls within the Derwood, Montgomery Village/Airpark, Gaithersburg City, Germantown East, Rural East and Clarksburg Policy Areas (see **Figure 1.1**). All alternatives were developed within this study area.



- I-270 to the west
- Wightman and Snouffer School Roads to the east
- Snowden Farm Parkway to the north, and
- I-370 and the proposed Intercounty Connector to the south.



### Figure 1.1 – Study Area

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## II. PURPOSE AND NEED

The Purpose and Need for the project was finalized and concurred upon by U.S. Army Corps of Engineers (USACE), U.S. Environmental Protection Agency and Maryland Department of the Environment in January 2007.

### A. PURPOSE

The purpose for transportation improvements in the Midcounty Corridor Study area is:

- to relieve projected congestion on roadway facilities between Clarksburg and Gaithersburg, east of I-270;
- to provide a north-south corridor which improves the safety and efficiency of short and moderate length trips in the study area;
- to improve vehicular, pedestrian and bicycle access to residential, commercial and employment destinations in Clarksburg and in the eastern areas of Gaithersburg and Germantown; and
- to develop all improvements in an environmentally sensitive manner using measures to avoid, minimize, and mitigate impacts.

### B. NEED

The need for this project is based on the following:

- *Reduce Existing and Future Congestion.* Several intersections along MD 355 and other major roadways in the study area were approaching unacceptable levels of service or were failing in the peak hours in 2005. Almost every signalized intersection will worsen over the existing condition, and in many cases, will deteriorate to LOS F by 2030. North-south travel times along the existing arterials will also significantly increase over the planning horizon.
- *Improve vehicular safety.* The accident history of MD 355 and MD 27 exceed the statewide average for similar roadways. Most of the accidents are clustered around the numerous intersections on MD 355.
- *Enhance the efficiency of the roadway network and improve the connections between economic centers.* Currently, localized north-south travel is provided by MD 355, which has little to no access control. In fact, between MD 124 and MD 27 there are almost 100 access points along MD 355 over a distance of 4.3 miles. Improved network efficiency and connections between economic and residential centers in the study area are necessary to facilitate the movement of goods and people in the region.
- *Accommodate planned land use and future growth.* This region of the county is among the fastest growing for both employment and housing, with a sizable portion of the county's remaining residential growth planned within the study area.
- *Provide bicycle and pedestrian connections.* The region lacks adequate north-south, off-street bike paths necessary to provide continuity and connections between existing and future bike facilities in the region.
- *Enhance homeland security.* Improved north-south access would enhance emergency response/evacuation and incident management by providing an efficient alternative to the existing congested north-south routes. Furthermore, less congestion on the existing routes would improve emergency response and incident management along these roadways.



- *Improve the Quality of Life.* Reducing commute times and offering a safer alternative to the already congested local roads and arterials for vehicles, bicycles, and pedestrians would enhance the overall quality of life of potential users.



### III. EXISTING AND FUTURE CONDITIONS EVALUATED DURING PRELIMINARY SCREENING

This section describes the environmental, cultural and community resources and transportation criteria that were utilized to develop and evaluate the preliminary alternatives. Accompanying this document is the “Composite of Preliminary Alternatives 2-11 and Environmental Resources” map, available both in print and digital format. This map depicts the alignments of alternatives 2 through 11 (BUILD alternatives) and most of the key environmental resources described in this section.

#### A. ENVIRONMENTAL, CULTURAL, AND COMMUNITY RESOURCES

The following environmental, cultural and community resources were identified in the study area:

##### 1. Natural Resources

###### a. Wetlands

Wetlands along the master plan alignment (Alternative 9) were field delineated and categorized by type (Palustrine emergent; Palustrine scrub shrub; and Palustrine forested). A jurisdiction determination has been received from the USACE for the master plan alignment. Wetland systems in the remainder of the study area were identified from National Wetland Inventory (NWI) and Maryland Department of Natural Resources (MDNR) mapping.

###### b. Wetlands of Special State Concern

The only Wetland of Special State Concern in the study area is the Germantown Bog, which is located west of MD 355 near Observation Drive. It supports the following State Threatened species: *Sphenopholis pennsylvanica* (Swamp-oats), *Sanguisorba Canadensis* (Canada Burnet), and *Carex buxbaumii* (Buxbaum’s Sedge).

###### c. Streams

The following five stream tributaries fall within the study area: (1) Great Seneca Creek; (2) Cabin Branch; (3) Dayspring Creek; (4) Whetstone Run; and (5) Wildcat Branch. Great Seneca Creek, Cabin Branch, Dayspring Creek, and Whetstone Run tributaries are designated as Use I-P waters, which are protected for water contact recreation, aquatic life, and public water supply. The Wildcat Branch tributary to Great Seneca Creek is designated as Use III-P waters (protected for natural trout and public water supply) and supports the only cold-water fish community (including naturally reproducing brown trout) currently found in the Great Seneca watershed.

###### d. Colonial Nesting Bird Habitat

Great blue heron and Black-crowned night heron colonies exist on the island within Lake Whetstone. The herons have been observed feeding along Whetstone Run, Brandermill Tributary, and Great Seneca Creek.

###### e. Federal and State Rare, Threatened and Endangered Species (RTE)

Based on a June 2006 study of the master plan alignment (Alternative 9), no State or Federally listed Threatened or Endangered species were identified. Surveys were conducted for *Iris cristata*

(Crested Iris), classified as State Endangered and previously documented near the master plan alignment. During April and May, 2006, a survey was conducted along the master plan alignment, with particular emphasis just upstream and downstream of the Great Seneca Creek crossing. There were no sightings of this species. According to MDNR (April 24, 2007 and June 10, 2004 correspondence), Crested Iris also occurs near Watkins Mill Road's existing Great Seneca Creek crossing in loamy floodplain soils.

The following State Rare species were identified along the master plan alignment: *Carex molesta*, *Carex striatula*, *Castanea dentate*, *Dichanthelium aciculare*, *Fraxinus nigra*, *Isoetes sp.*, *Juglans cinerea*, *Rorippa sessiliflora*, *Scirpus verecundus*, *Shortia galacifolia*. Several of these species are included on the *Flora Species List of Montgomery County Parks* (2002). In addition, two species that were formerly listed as State Watchlist species, *Arisaema dracontium* (Green dragon) and *Quercus imbricaria* (Shingle oak) were detected. However, these species are no longer listed as State Watchlist species because they have been found to be more common than was previously known. *Sanicula marilandica* (Maryland sanicle), a State Watchlist species that was documented in Great Seneca Park during surveys in 1993 and again in 1999, was not found during the 2006 survey. Also, *Castanea pumila* (Chinquapin), a species that is no longer listed as a State Watchlist species, was documented during earlier surveys, but was not found during the 2006 survey.

#### **f. Biodiversity Areas**

The Biodiversity Area designation by Maryland-National Capital Park and Planning Commission (M-NCPPC) is applied to portions of their park system that contain at least one of the following features: RTE plant or animal species, Watchlist species or species having high local importance, unique or unusual habitat area, or natural communities of high quality or significance. Portions of North Germantown Greenway Stream Valley Park and Great Seneca Creek Stream Valley Park have been designated as Biodiversity Areas.

The North Germantown Biodiversity Area boasts a very scenic streamside forest and several large seepage swamps among its many assets. This relatively undisturbed habitat is unusual for Montgomery County parklands. Forest interior dwelling birds such as the Wood thrush and Acadian flycatcher are known to be present in this area. The forest understory contains shrubs and an herb layer that, while not rare, are uncommon for the county.

The Great Seneca Creek Biodiversity Area contains *Arisaema dracontium* (Green dragon), *Castanea pumila* (Chinquapin), and *Quercus imbricaria* (Shingle oak) with Green dragon being especially well-developed along the floodplain south of Watkins Mill Road. This is one of only several occurrences of Green dragon in Montgomery County away from the Potomac River floodplain. Shingle oak is found in the bottomland woods and on north-facing slopes above the creek. This area is one of the best populations of this tree in the county. *Betula nigra* (Black birch), a tree usually found in the mountains in Western Maryland, is a dominant tree on the northwest-facing slope just north of Watkins Mill Road. This is the largest known Black birch population in the county.

#### **g. Special Protection Areas (SPAs)**

Special Protection Areas are Montgomery County-designated areas within a watershed that have high quality or unusually sensitive water resources or natural features, such as streams or wetlands, related to those water resources. In an SPA, special development requirements and land use controls

are imposed to ensure protection of water quality (e.g., limitations on the percentage of new impervious surface). The only SPA within the study area is the Clarksburg SPA. This SPA was established in the June 1994 Clarksburg Area master plan, and included portions of Little Seneca Creek, Ten Mile Creek, and Wildcat Branch, in recognition of added level of protection that would be needed to protect stream resources in the vicinity of the Town Center. A portion of Wildcat Branch, a Use III-P stream, is included in the Clarksburg SPA.

***h. Best Natural Areas***

The M-NCPPC's Best Natural Area designation is applied to portions of their park system that contain at least one of the following features: large tracts of high quality contiguous forest, RTE plant species, Biodiversity Areas, unique plant and wildlife habitat, high quality wetlands, good aquatic biological areas, or special trout management areas. The Black Hills Regional Park, which is west of I-270, and a portion of Little Bennett Regional Park, which is north of the study area, have received the Best Natural Area designation. Both are outside of the Midcounty Corridor study area.

***i. Greenways***

The Clarksburg Master Plan identifies the North Germantown Greenbelt, which consists of North Germantown Greenway Stream Valley Park, the Seneca Crossing Local Park, and the Ridge Road Recreational Park. These contiguous parks form a green corridor that is intended to provide a visual and physical border to the Germantown Community. This Greenbelt does not provide a continuous wildlife corridor, as the habitat is fragmented by roads and developed park facilities.

***j. Habitat for Forest Interior Dwelling Species (FIDS)***

FIDS habitat includes forests of at least 50 acres in size with ten acres or more of forest interior habitat ("interior" means 300 feet from the edge of the stand), and riparian forests of at least 50 acres in size that have an average width of 300 feet or greater along a perennial stream. The impact to FIDS habitat is based on an alternative's limit of disturbance (LOD) plus a 300-foot buffer on each side of the LOD, as recommended by M-NCPPC.

A high quality interior forest habitat is present within the North Germantown Greenway Stream Valley Park and the Great Seneca Creek Stream Valley Park. Interior species that were observed during field observations include the Acadian flycatcher, Blue jay, Downy woodpecker, Eastern wood peewee, Ovenbird, Parula warbler, and Pileated woodpecker. Cavity-nesting habitat is most prevalent in the larger climax forest stands of these two stream valley parks.

***k. Floodplains***

The 100-year floodplain limits were mapped based on MDNR data.

***l. Forest (upland)***

Forests were delineated based on Montgomery County Geographic Information System (GIS) data.

***m. Farmland***

Farmlands were delineated based on Montgomery County GIS data.



## **2. Cultural Resources**

### ***a. Historic Architecture***

A Phase I investigation was completed in 2007, that included a historic context of the study area, a discussion of the area of potential effects (APE), and a summary listing of historic architectural properties that are 50 years or older. Within the study area, 45 previously-recorded historic architectural properties were listed in the site files from the Maryland Historical Trust (MHT) and M-NCPPC. Of these, 16 have been demolished or removed, and seven were determined not eligible for the National Register. The remaining sites will need further study to evaluate their National Register eligibility.

A windshield survey identified 22 additional properties that had not been previously surveyed. They included predominantly small, 1920s to 1940s-era houses, and also include two late-19<sup>th</sup>/early 20<sup>th</sup> century houses, two churches, a bridge, and a 1920s-era service station. These properties will also require further research during the next investigation phase to determine National Register eligibility.

Two roads that may be contributors to a Rural Historic Landscape potentially eligible for the National Register are also located within the study area: (1) Wildcat Road parallels Wildcat Branch and has been recommended for classification as a “Rustic Road” and (2) Davis Mill Road located north of Brink Road has been designated as an “Exceptional Rural Rustic Road.” Both roads still contain much of their rural historic setting. Six previously surveyed historic farm-related properties are located along both roads and contribute to the rural setting.

### ***b. Archeological Sites***

An archeological Phase IA investigation was completed in 2007. An assessment of archeological sensitivity was conducted through background research of MHT and M-NCPPC site files, and previous surveys and studies. Sixty-six previously reported sites were identified in the expanded review area (the defined study area plus a one-mile buffer to the east and west). These sites represent 71 separate components consisting of 37 prehistoric and 34 historic components. Five reported sites have both prehistoric and historic components.

The extensive work of the Intercounty Connector (ICC) corridor passes into the study area, but does not intersect with any of the alternatives. Six previous surveys were identified that include portions of the alternatives. Nineteen previously conducted studies are located within the study area boundaries, with two located immediately adjacent to the study area. Of the pre-1994 studies, only three were identified as having archeological resources, while all but one of the post-1994 studies identified resources, likely due to improved survey methods.

A pedestrian reconnaissance survey, conducted as part of this study, revealed four features that had not been previously identified: two surface scatters of historic artifacts and two stone foundation remnants. In addition, the study area was classified as having 2,908 acres of high potential for prehistoric resources, 1,807 acres of moderate potential for prehistoric resources, and 1,616 acres with a high potential for historic period resources. However, large portions of the study area (10,864 acres) were assessed to have little potential for archeological resources since they are so densely developed.

### **3. Community Resources**

#### ***a. Parks & Recreational Facilities***

Over 40 public and private recreational facilities exist in the study area. Montgomery County stream valley parks are the predominant recreation properties in the study area, and include Great Seneca Creek Stream Valley Park, the North Germantown Greenway Stream Valley Park, and Cabin Branch Stream Valley Park. The Montgomery Village Foundation, a private nonprofit organization, manages eighteen recreation facilities for the 70 neighborhoods of Montgomery Village, including ball fields in South Valley Park adjacent to Whetstone Run. Blohm Park is owned and operated by the City of Gaithersburg.

The Seneca Creek Greenway Trail follows the Great Seneca Creek valley and extends from MD 355 to Huntmaster Road, north of Brink Road. This trail is part of a planned 25-mile greenway between the Potomac and Patuxent Rivers. Formal parking for trail access is provided at MD 355 and at Watkins Mill Road, with informal parking located just south of Middlebrook Road, where the previously-constructed two-lane Midcounty Highway terminates at the park.

#### ***b. Schools***

There are four schools located along Watkins Mill Road. Watkins Mill Elementary School and Montgomery Village Middle School have entrances on Watkins Mill Road while Stedwick Elementary School and Watkins Mill High School have entrances on side streets a short distance from Watkins Mill Road. Several schools are located along MD 355, including the Neelsville Middle School, the Neelsville Presbyterian Church Pre-School, and a Daycare Center near the Middlebrook Road intersection. The Covenant Life Church School is located along Snouffer School Road near Shady Grove Road.

#### ***c. Places of Worship***

Several churches are located along the roads that would be widened by the various alternatives. These include the Covenant Life Church, the New Life 7<sup>th</sup> Day Adventist, the Northgate Community Church, and the Covenant United Methodist Church on Snouffer School Road, the Jesus Christ Church of Latter Day Saints and Christ the Servant Lutheran on Montgomery Village Avenue, the Goshen United Methodist on Goshen Road, and the Neelsville Presbyterian Church on MD 355. The Dayspring Retreat Center is located in the northern portion of the study area, adjacent to the North Germantown Greenway Stream Valley Park. Dayspring Retreat Center is owned and operated by the Church of the Saviour, and its setting enables the Center to offer spiritual retreats with an emphasis on solitude, contemplation, and reflection.

### **4. Hazardous Material Sites**

A Preliminary Screening Assessment (PSA) was conducted using thirteen (13) federal and state databases to ascertain the locations of probable hazardous material sites within the study area. Several underground storage tanks (USTs) were identified within 1,500 feet of the proposed alternatives. The documented releases represent a slight risk that contamination may extend into the proposed right-of-way from properties to the north and northeast along Watkins Mill Road, and along Walkers Choice Road and Mills Choice Road (which are close to Montgomery Village Avenue).



## **5. Property**

Property lines were obtained from Montgomery County GIS data, and were used to determine the number of properties that are likely to be impacted. Residential properties were distinguished from commercial and industrial properties.



## B. TRANSPORTATION

Each alternative's transportation characteristics were based on its ability to meet the following key needs of the project:

1. Relieve projected roadway congestion in Year 2030
2. Improve safety and efficiency
3. Improve bicycle and pedestrian access

### 1. Relieve Projected Roadway Congestion in Year 2030

Traffic operations at 75 intersections were evaluated within the study area using the Critical Lane Volume (CLV) method and Synchro.

Future 2030 traffic volumes were projected using the Metropolitan Washington Council of Governments (MWCOC) regional travel demand model Version 2.1D, with Round 6.4a Cooperative Land Use Forecasts. The specific measures of effectiveness include:

1. The number of intersections exceeding acceptable CLV-based volume-to-capacity (V/C) ratios within the study area
2. Peak hour travel times along each alternative's alignment between specific starting and ending points at the northern and southern limits of the study area
3. Peak hour travel times along the other available travel paths between the northern and southern limits of the study area

The CLV is the sum of the highest lane volume for each direction, plus the volume of conflicting left turns, in the peak hour. The Montgomery County Annual Growth Policy establishes the level of service (LOS) standard for each policy area. These standards allow greater congestion in areas having access to transit service (Metro) since the transit facility is considered available for those who want to avoid congestion. MSHA measures intersection performance in terms of LOS whereas MCDOT and the County's Annual Growth Policy use the actual CLV value. The following table shows the correlation between LOS and CLV.

**Table 3.1 – Level of Service Parameters (Source: MSHA)**

LOS	CLV (veh/hr)	Expected Problems at Intersection
A	≤ 1000	Very low delay
B	>1000 and ≤ 1150	Short delay
C	>1150 and ≤ 1300	Number of vehicles stopping is significant
D	>1300 and ≤ 1450	Influence of congestion becomes more noticeable
E	>1450 and ≤ 1600	Highly congested with long queues
F	>1600	Oversaturated – Vehicles wait more than a signal cycle to proceed

At the time that the various alternatives were originally analyzed, a CLV greater than 1,450 vehicles was considered unacceptable in the policy areas covered by this study. Therefore, alternatives that result in fewer intersections with CLVs of 1,450 vehicles or more would be considered more effective in reducing traffic congestion. Similarly, alternatives that result in shorter travel times along the alternative's corridor as well as other adjacent corridors would also be considered more effective in reducing traffic congestion. It should be noted that since the time of the original traffic

analysis, the congestion threshold for the policy areas covered by this study was reduced to 1,425 vehicles per hour.

## **2. Improve Safety and Efficiency.**

A second key objective of the project is to improve traffic safety and efficiency. Presently, two major arterials within the project study area – MD 355 and MD 27 –have crash rates that exceed the statewide average for similar highways. The excessive rates can be largely attributed to the congestion levels and the large number of access points (including commercial and residential driveways) located along the corridors. Other north-south corridors within the study area such as Brink Road, Wightman Road and Watkins Mill Road are 2-lane undivided roadways with no access controls. These roadways were designed for low speed short length trips and are not intended to accommodate the projected traffic volumes and longer range trips between Clarksburg, Germantown, and Gaithersburg.

Research shows that accident rates tend to decrease as access controls are increased. Therefore safety and efficiency can be improved through additional access controls and can be measured using the following criteria:

1. Total number of signalized intersections
2. Total number of unsignalized intersections
3. Total number of driveways
4. Total number of intersecting roadways/driveways

Other potential safety improvements to be considered during the development of each alternative include geometric improvements, lane and shoulder widths, medians, and channelization,

## **3. Improve Bicycle and Pedestrian Access**

A third objective of the project is to improve bicycle and pedestrian access to encourage alternative modes of transportation. In Montgomery County, MCDOT considers the safe and efficient accommodation of pedestrians and cyclists along the roadway equally important as provisions for vehicles. MCDOT believes sidewalks, shared-use paths, and bike lanes enrich the livability of a community and serve as critical facilities in the transportation network by providing multi-modal access to neighborhoods, transit, commercial districts, schools, and recreation areas.

Currently, there are no continuous off-street bicycle and pedestrian facilities between the northern and southern limits of the study area. Existing facilities along the major roadways require bicyclists and pedestrians to compete with vehicular traffic at numerous intersections and driveways located along these corridors. Consequently, the build alternatives include off-road shared use paths and sidewalks to provide continuous bicyclist and pedestrian access. Potential improvements also include consolidation of driveways and entrances to minimize conflicts between pedestrians, bicyclists and vehicles.



## IV. DEVELOPMENT AND DESCRIPTION OF PRELIMINARY ALTERNATIVES

Alternatives were developed to meet the purpose and need of the Midcounty Corridor Study (MCS), which is to provide a north/south corridor that will enhance mobility east of I-270, and will relieve I-270 of short and moderate length trips in a similar manner to how existing Great Seneca Highway functions to the west of I-270. The southern limit of the study was set at the intersection of existing Midcounty Highway (MD 124) and Goshen Road and the northern limit of the study was set at the intersection of Ridge Road (MD 27) and future Snowden Farm Parkway (A-305).

### A. STUDY CORRIDORS

Six (6) north-south corridors were evaluated east of I-270 to provide a connection between Gaithersburg and Clarksburg and serve as the basis for the development of the preliminary alternatives. The corridors include:

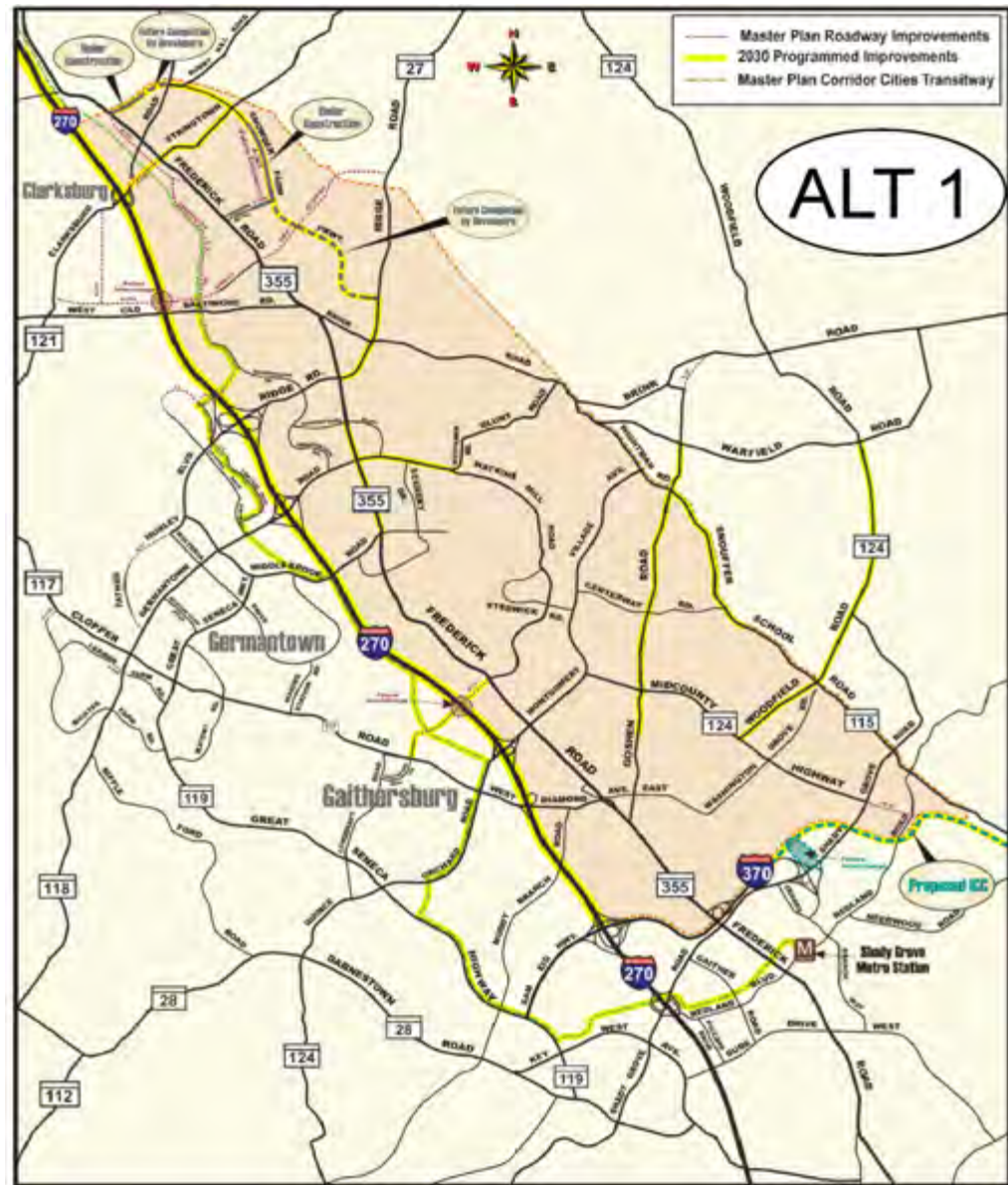
- **Midcounty Highway (M-83) Master Plan Alignment**
  - A Master Planned 8.7 mile, 4/6-lane, partial access controlled major arterial between Redland Road in Derwood and Ridge Road in Germantown
  - Shady Grove Road to Montgomery Village Avenue: An existing 3-mile, 6-lane (striped as 4-lane) divided major arterial
  - Middlebrook Road to 1200-feet South: A 2-lane “half-section” of the ultimate major arterial constructed to provide local access to the King Square residential community
- **Muncaster Mill Road (MD 115) - Snouffer School Road - Wightman Road - Brink Road**
  - Snouffer School Road from Woodfield Road (MD 124) to Flower Hill Way: An existing 1-mile, 4/5-lane undivided arterial
  - Snouffer School Road from Flower Hill Way to Centerway Road: An existing 1/3-mile, 3-lane undivided arterial
  - Snouffer School, Wightman and Brink Roads from Centerway Road to Ridge Road: An existing 5-mile, 2-lane open section roadway
  - The corridor has no access controls
- **Goshen Road - Wightman Road - Brink Road**
  - Goshen Road from Montgomery Village Avenue to Wightman Road: An existing 2-mile, 2-lane open section roadway with few driveways that is currently being designed under a separate county capital project to be reconstructed as a 4-lane divided arterial
  - Wightman Road and Brink Road from Goshen Road to Ridge Road: An existing 3.3 mile, 2-lane open section roadway

- The corridor has no access controls
- **Montgomery Village Avenue - Wightman Road - Brink Road**
  - Montgomery Village Avenue from Midcounty Highway to Wightman Road: An existing 2.4-mile, 4-lane divided arterial with few driveways
  - Wightman Road and Brink Road from Montgomery Village Avenue to Ridge Road: An existing 3-mile, 2-lane open section roadway with no access controls
- **Frederick Road (MD 355) - Ridge Road (MD 27)**
  - MD 355 from Montgomery Village Avenue to Ridge Road: An existing 4.2-mile 6/4-lane divided arterial with numerous driveways
  - Ridge Road from MD 355 to Brink Road: An existing ½-mile, 6-lane divided arterial from MD 355 to Brink Road, having few driveways
  - Ridge Road is an existing two-lane undivided section north of Brink Road, with no access controls
- **Watkins Mill Road**
  - MD 355 to Travis Avenue: An existing 1/3-mile, 4-lane divided arterial with few driveways
  - Travis Avenue to Great Seneca Creek Bridge: An existing 1.75-mile, 3-lane undivided arterial with few driveways
  - Great Seneca Creek Bridge to Wayfarer Road: An existing ½-mile, 2-lane open section roadway with few driveways
  - Wayfarer Road to MD 355: An existing 1-mile, 2/3-lane undivided “half-section” of the ultimate 6-lane partial access controlled divided arterial

## B. ALTERNATIVES

From the 6 primary corridors, eleven (11) alignment alternatives were developed and evaluated, in coordination with the concurring and reviewing agencies. The alternatives consisted of proposed improvements to existing roadways as well as a new roadway alignment (Midcounty Highway Master Plan Alignment with 3 different northern terminus options) as recommended in area master plans.

### 1. Alternative 1, No Build



**Figure 4.1**

The No-Build Alternative is the baseline condition which assumes that all proposed transportation improvements as defined in the 2004 Metropolitan Washington Council of Governments (MWCOG)

Constrained Long Range Plan (CLRP) and other approved planning documents are built for horizon year 2030 except for the extension of Midcounty Highway. The baseline condition also includes all transit system improvements including the Corridor Cities Transitway (CCT) and travel demand management measures applied to the entire Metropolitan Washington region.

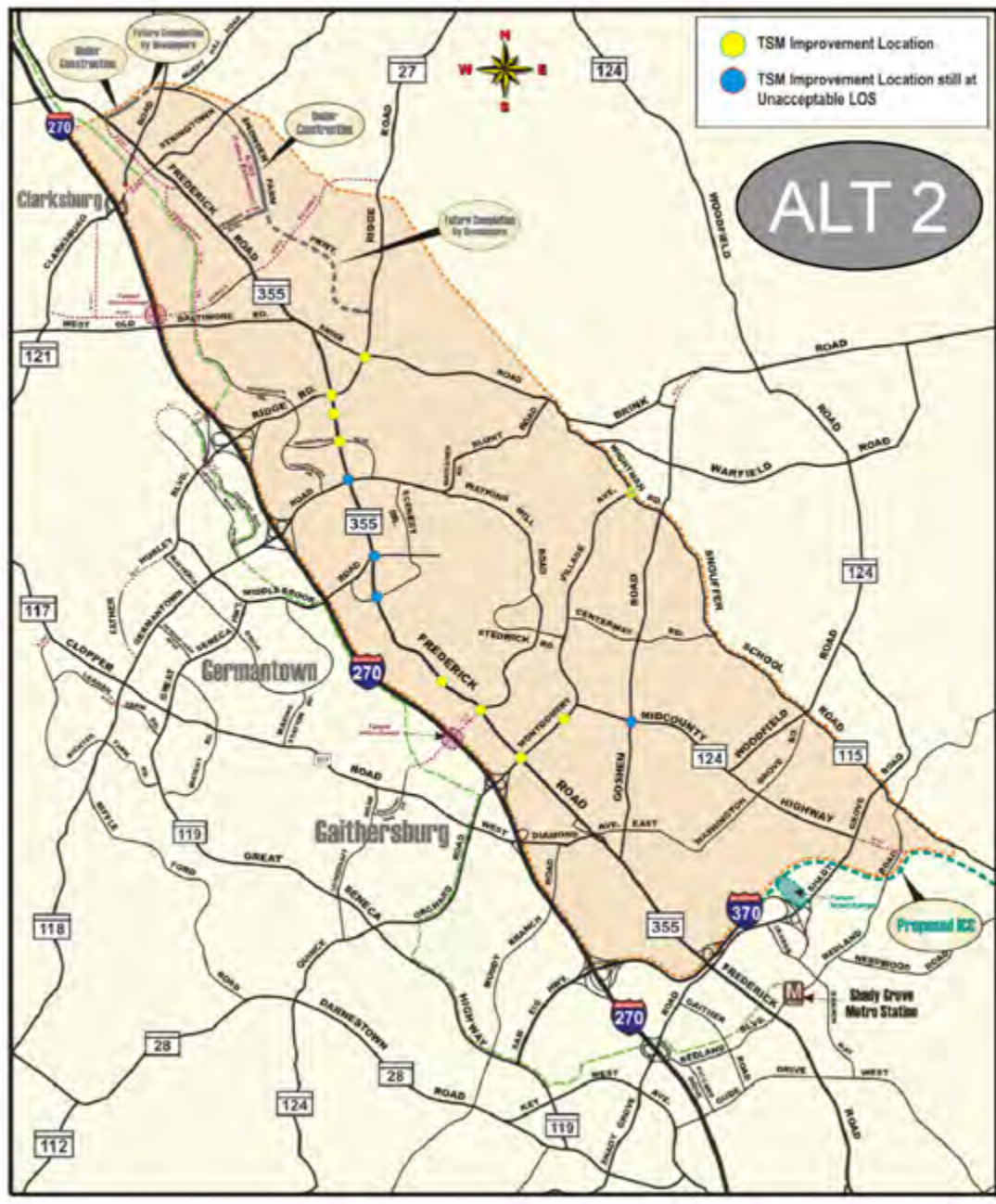
The No-Build Alternative includes the following proposed improvements that will be completed under separate projects by SHA, MCDOT and developers:

- **Goshen Road between Girard Street and Warfield Road** is proposed to be widened to a four-lane divided roadway with sidewalk and shared use path. (Montgomery County CIP #509337)
- **Snouffer School Road between Woodfield Road (MD 124) and Centerway Road** is proposed to be widened to a five-lane (four (4) through lanes and one (1) center turn lane) undivided roadway with sidewalk and shared use path. (Montgomery County CIP #509337)
- **Snouffer School Road between Centerway Road and Alliston Hollow Way** is proposed to be widened to a four-lane divided roadway with sidewalk and shared use path. (Montgomery County pending CIP #501118)
- **Snowden Farm Parkway between Clarksburg Town Center and Ridge Road (MD 27)** is proposed to be a four-lane divided roadway with sidewalk and shared use path.
- **Ridge Road (MD 27) between Snowden Farm Parkway and Brink Road** is proposed to be widened to a six-lane divided roadway with shared use path under a separate developer funded project.
- **Watkins Mill Road between Frederick Road (MD 355) and I-270** is proposed to be extended as a six-lane divided roadway with sidewalk and shared use path including Frederick Road (MD 355) intersection improvements and a new interchange at I-270. (Montgomery County CIP #500724) (SHA Contract No. MO351-21).
- **Woodfield Road (MD 124) between Midcounty Highway and Warfield Road** is proposed to be widened to a six-lane divided roadway with sidewalk and shared use path (SHA Contract No. MO632).

The No-Build Alternative's improvements are also the base for all other alternatives.



## 2. Alternative 2, Transportation System Management/Travel Demand Management



### Figure 4.2

Alternative 2 was developed to improve the existing transportation system with minimal capital improvements while reducing the demand for single-occupant vehicle travel on roadways. In the horizon year 2030, thirteen (13) intersections will exceed the acceptable Critical Lane Volumes (CLVs) as defined in the growth policy area. These intersections are proposed to be improved with addition of through and/or turning lanes to increase capacity. **Figure 4.2** at this page identifies the locations of these proposed intersection improvements. Five sections of MD 355 that are

characterized by closely-spaced intersections and/or driveways are proposed to be improved with the addition of auxiliary lanes to separate turning vehicle movements from the through traffic. Improvements to existing pedestrian and bicycle facilities are also proposed at three (3) locations to enhance alternative modes of transportation. All of the proposed improvements are summarized in **Table 4.1** below.

**Table 4.1 – Alternative 2 Improvements**

<b>Proposed Intersection Improvement Locations</b>	<b>Proposed Auxiliary Lane Locations</b>	<b>Proposed Sidewalks / Bicycle Facilities Locations</b>
1. Midcounty Hwy / Goshen Rd	1. NB MD 355 – Christopher Ave to Watkins Mill Rd	1. Midcounty Hwy - Montgomery Village Ave to Goshen Rd
2. Montgomery Village Ave / Wightman Rd	2. NB MD 355 – Travis Ave to Professional Dr	2. Montgomery Village Ave - Midcounty Hwy to MD 355
3. Montgomery Village Ave / Christopher Ave	3. NB MD 355 – Neelsville Church Rd to Shakespeare Blvd	3. NB MD 27 – From Brink Rd to future Snowden Farm Pkwy
4. Montgomery Village Ave / MD 355	4. NB MD 355 – at Henderson Corner Rd	
5. MD 355 / Watkins Mill Rd	5. SB MD 355 – MD 27 to Shakespeare Blvd	
6. MD 355 / Professional Dr		
7. MD 355 / Gunners Branch Rd		
8. MD 355 / Middlebrook Rd		
9. MD 355 / Germantown Rd		
10. MD 355 / Shakespeare Blvd		
11. MD 355 / Henderson Corner Rd		
12. MD 355 / Ridge Rd		
13. MD 27 / Brink Rd		

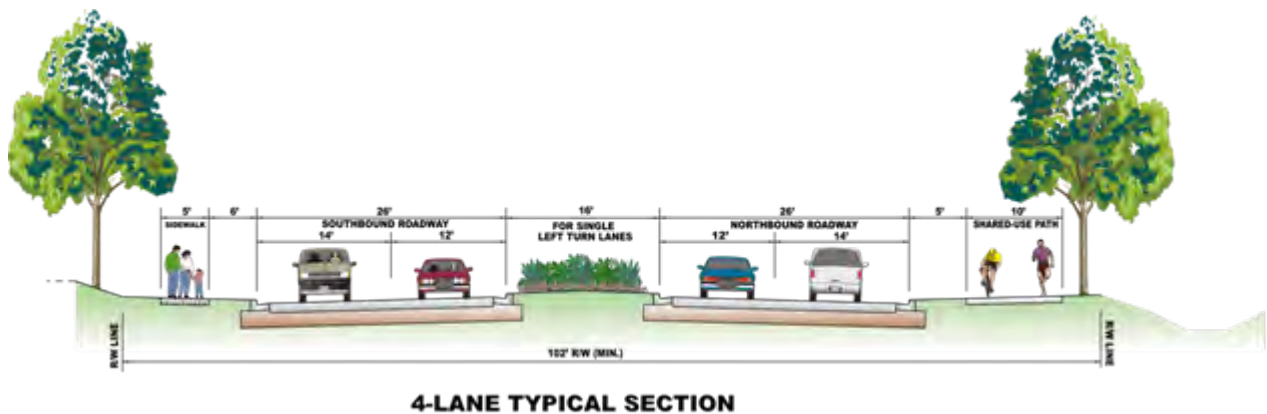
Improvements to transit travel were also explored for Alternative 2. Bus travel speeds were increased by 25% to simulate improved transit travel time and bus headways were reduced by 50% to simulate increased availability of transit service. Together these simulated travel demand management measures were found to have a negligible effect (less than one percent) in reducing automobile traffic, so neither was included in this alternative.

### 3. Alternatives 3 through 11

Alternatives 3-11 are roadway build alternatives developed along various alignments within the study area and assume the following common baseline conditions and elements:

- The future year (2030) improvements associated with Alternative 1, No Build.
- Alternatives 3-9 and 11 begin at the intersection of Midcounty Highway (MD 124) and Goshen Road and end at the intersection of Ridge Road (MD 27) and future Snowden Farm Parkway (A-305).
- Alternative 10 begins at the intersection of Muncaster Mill Road (MD 115) and Shady Grove Road (refer to Figure 4.11) and terminates at the future Ridge Road / Snowden Farm Parkway intersection.
- Proposed roadway features and elements include:
  - Closed section roadway with curbed median and green buffer
  - Design speed of 40 mph
  - Varies from four to six lanes
  - Five-foot sidewalk
  - Ten-foot shared use path
  - On-road bicycle facilities (wider outside lanes to accommodate commuter bicyclists)

**Figure 4.3** illustrates the four-lane typical section for Alternatives 3-11.



**Figure 4.3**



a. *Alternative 3, Montgomery Village – Wightman – Brink*



**Figure 4.4**

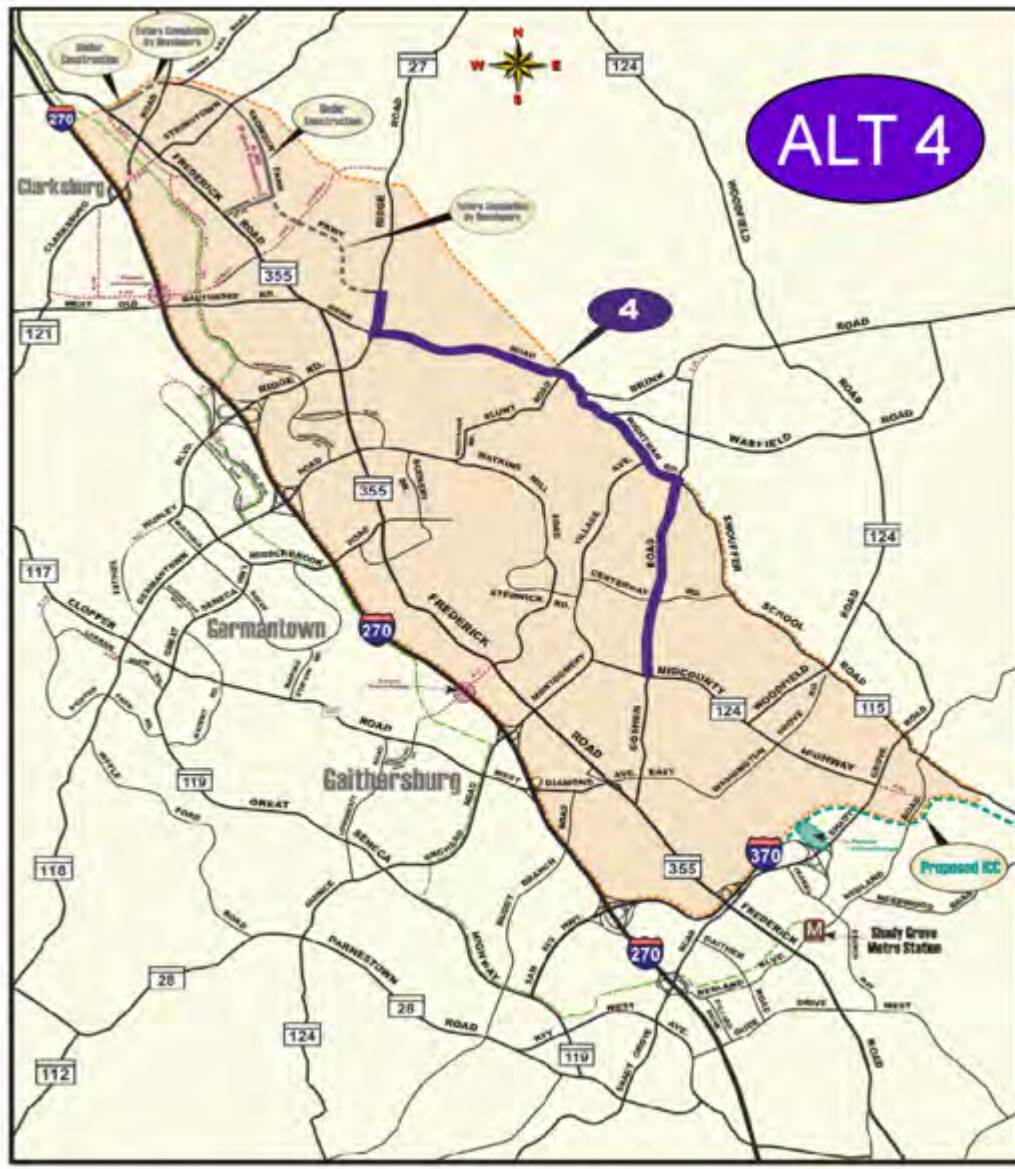
Alternative 3 is a 6.7 mile route that follows the Midcounty Highway (MD 124) - Montgomery Village Avenue - Wightman Road - Brink Road - Ridge Road (MD 27) corridor. The proposed improvements include:

- **Midcounty Highway (MD 124)** between Goshen Road and Montgomery Village Avenue is proposed to be widened from the existing four-lane divided roadway to a six-lane divided roadway with sidewalk and shared use path.



- **Montgomery Village Avenue** between Midcounty Highway (MD 124) and Wightman Road is proposed to be widened for on-road bicycle facilities. It is also proposed that the existing eastern sidewalk be replaced with a shared use path which ties into an existing shared use path adjacent to Lake Whetstone, between Walkers Choice Road and Stedwick Road.
- **Wightman Road and Brink Road** between Montgomery Village Ave. and Ridge Road (MD 27) are proposed to be widened from the existing two-lane undivided roadway to a four-lane divided roadway with sidewalk and shared use path. It is also proposed that the roadway alignment of portions of Wightman Road and Brink Road be improved to meet roadway design criteria.
- **Ridge Road (MD 27)** between Brink Road and Snowden Farm Parkway is proposed to be widen from the existing two-lane undivided roadway to a six-lane divided roadway with sidewalk and shared used path under a separate developer funded project.
- Major intersections that are proposed to be improved include:
  - Midcounty Highway (MD 124) / Montgomery Village Avenue
  - Montgomery Village Avenue / Wightman Road
  - Brink Road / Ridge Road (MD 27)

*b. Alternative 4, Goshen – Wightman – Brink*



**Figure 4.5**

Alternative 4 is a 6.2 mile route that follows the Goshen Road – Wightman Road – Brink Road – Ridge Road (MD 27) corridor. The proposed improvements include:

- **Midcounty Highway (MD 124)** between Goshen Road and Montgomery Village Avenue is proposed to be widened from the existing four-lane divided roadway to a six-lane divided roadway with sidewalk and shared use path.

- **Goshen Road** between Midcounty Highway and Wightman Road is proposed to be widened from the existing two-lane undivided roadway to a four-lane divided roadway with sidewalk and shared use path under a separate County project (Montgomery County CIP #509337).
- **Wightman Road and Brink Road** between Goshen Road and Ridge Road (MD 27) are proposed to be widened from the existing two-lane undivided roadway to a four-lane divided roadway with sidewalk and shared use path. It is also proposed that the roadway alignment of portions of Wightman Road and Brink Road be improved to meet roadway design criteria.
- **Ridge Road (MD 27)** between Brink Road and Snowden Farm Parkway is proposed to be widened from the existing two-lane undivided roadway to a six-lane roadway with sidewalk and shared used path under a separate developer funded project.
- Major intersections that are proposed to be improved include:
  - Midcounty Highway (MD 124) and Goshen Road
  - Goshen Road / Wightman Road
  - Wightman Road / Montgomery Village Avenue
  - Brink Road / Ridge Road (MD 27)

c. *Alternative 5, MD 355*



Figure 4.6

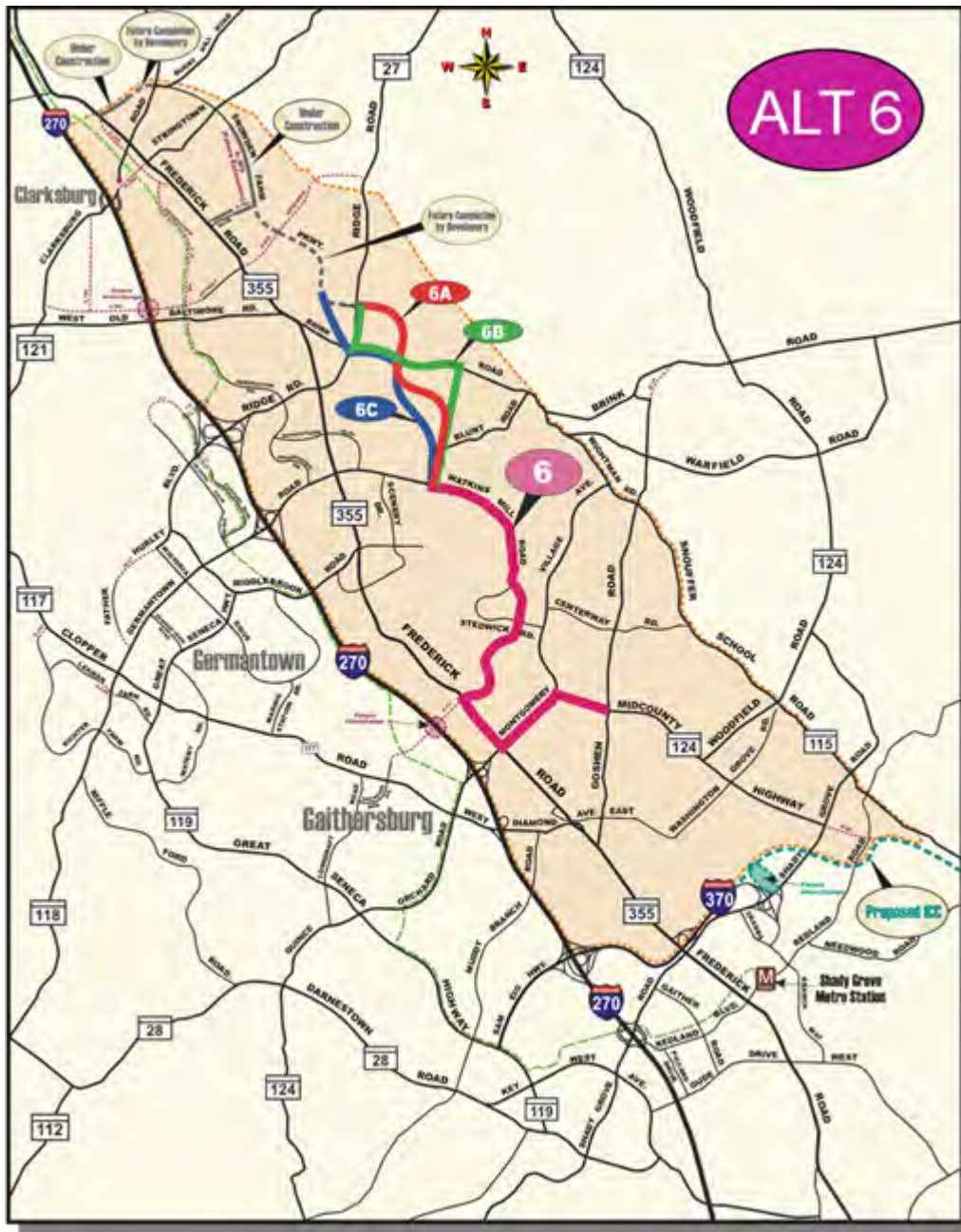
Alternative 5 is a 6.6 mile route that follows the Midcounty Highway (MD 124) – Montgomery Village Avenue (MD 124) - Frederick Road (MD 355) – Ridge Road (MD 27) corridor. The proposed improvements include:

- **Midcounty Highway (MD 124)** between Goshen Road and Montgomery Village Avenue is proposed to be widened for sidewalk, shared use path and on-road bicycle facilities.



- **Montgomery Village Avenue (MD 124)** between Midcounty Highway (MD 124) and Frederick Road (MD 355) is proposed to be modified by replacing the existing eastern sidewalk with a shared use path.
- **Frederick Road (MD 355)**
  - The segment between Montgomery Village Avenue (MD 124) and Middlebrook Road is proposed to be widened for auxiliary lanes at three (3) locations: 1) between Christopher Avenue and Watkins Mill Road, 2) between Travis Avenue and Professional Drive, and 3) between Scenery Drive and Middlebrook Road;
  - The segment between Middlebrook Road and Ridge Road is proposed to be widened from the existing four-lane divided roadway to a six-lane divided roadway with auxiliary lanes and shared use path.
- **Ridge Road (MD 27)** between Brink Road and Snowden Farm Parkway is proposed to be widened from the existing two-lane undivided roadway to a six-lane roadway with sidewalk and shared used path under a separate developer funded project.
- Major intersections that are proposed to be improved include:
  - Midcounty Highway (MD 124) / Goshen Road
  - Frederick Road (MD 355) / Montgomery Village Avenue (MD 124)
  - Frederick Road (MD 355) / Watkins Mill Road
  - Frederick Road (MD 355) / Middlebrook Road
  - Frederick Road (MD 355) / Germantown Road
  - Frederick Road (MD 355) / Ridge Road (MD 27)
  - Ridge Road (MD 27) / Brink Road
- Service roads are also proposed to be constructed along portions of MD 355 to consolidate access drives, entrances and side streets. A study evaluating the addition of service roads along MD 355 to consolidate access points is described in Section VI.D (page 69). The estimated impacts associated with Alternative 5 and presented in Section V do not include impacts associated with the proposed service roads.

d. *Alternative 6, MD 355 – Lower & Upper Watkins Mill – Master Plan Alignment*



**Figure 4.7**

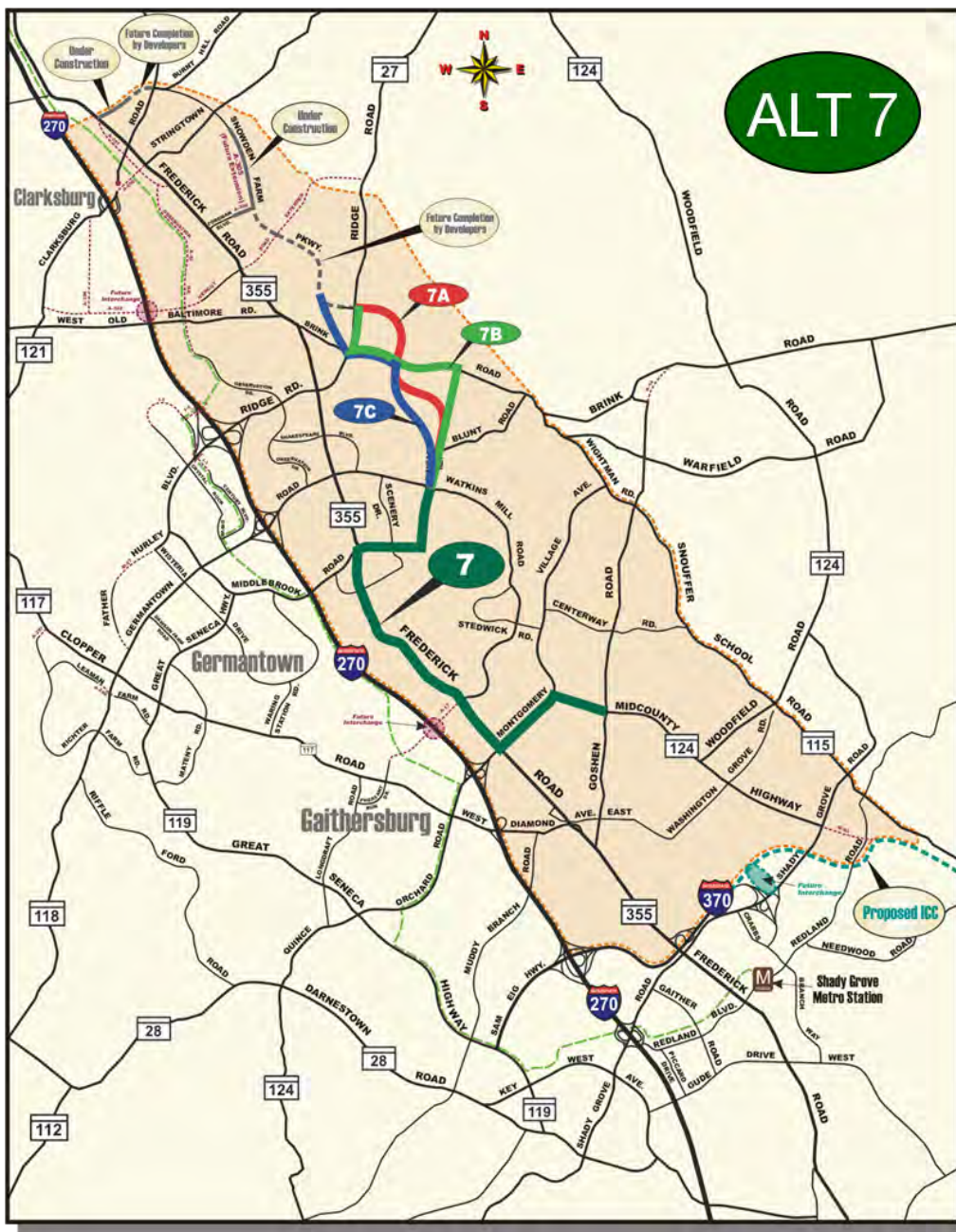
Alternative 6 is a 7.2 mile route that follows the Midcounty Highway (MD 124) – Montgomery Village Avenue (MD 124) – Frederick Road (MD 355) – Watkins Mill Road (lower & upper) – Midcounty Highway Master Plan Alignment (M-83) corridor. The proposed improvements include:

- **Midcounty Highway (MD 124)** between Goshen Road and Montgomery Village Avenue is proposed to be widened from the existing four-lane divided roadway to a five-lane divided roadway with sidewalk and shared use path.

- **Montgomery Village Avenue (MD 124)** between Midcounty Highway (MD 124) and Frederick Road (MD 355) is proposed to be widened for auxiliary lanes between Russell Avenue and MD 355. It is also proposed that the existing eastern sidewalk be replaced with a shared use path.
- **Frederick Road (MD 355)** between Christopher Avenue and Watkins Mill Road is proposed to be widened for auxiliary lanes.
- **Watkins Mill Road (upper & lower)**
  - The segment between Frederick Road (MD 355) and Watkins Mill Drive is proposed to be widened from the existing four-lane divided roadway (MD 355 to Travis Ave.) or two-lane divided roadway (Travis Ave. to Watkins Mill Drive) to a four-lane divided roadway with sidewalk and shared use path;
  - The segment between Watkins Mill Drive and Wayfarer Road is proposed to be widened from the existing three-lane undivided roadway (Watkins Mill Drive to Apple Ridge Road) or two-lane undivided roadway (Apple Ridge Road to Wayfarer Road) to a four-lane divided roadway with sidewalk and shared use path;
  - It is also proposed that the roadway alignment of portions of Watkins Mill Road be improved to meet roadway design criteria.
- **Midcounty Highway Master Plan Alignment (M-83)**
  - The segment between Watkins Mill Road (upper) and Blunt Road is proposed to be a four-lane divided roadway with sidewalk and shared use path.
  - The segment between Blunt Road and Ridge Road (MD 27) is proposed to be a four-lane divided roadway with sidewalk and shared use path. Three (3) alignment options, Option A, B, and C, were evaluated. The alignment options are described at page 40.
- Major intersections that are proposed to be improved include:
  - Midcounty Highway (MD 124) / Goshen Road
  - Midcounty Highway (MD 124) / Montgomery Village Avenue
  - Montgomery Village Avenue (MD 124) / Frederick Road (MD 355)
  - Frederick Road (MD 355) / Watkins Mill Road
  - Watkins Mill Road / Russell Avenue
  - Watkins Mill Road / Travis Avenue
  - Watkins Mill Road / Stedwick Road
  - Watkins Mill Road / Apple Ridge Road



*e. Alternative 7, MD 355 – Middlebrook – Master Plan Alignment*



**Figure 4.8**

Alternative 7 is a 7.5 mile route that follows the Midcounty Highway (MD 124) – Montgomery Village Avenue (MD 124) – Frederick Road (MD 355) – Middlebrook Road – Midcounty Highway Master Plan Alignment (M-83) corridor. The proposed improvements include:



- **Midcounty Highway (MD 124) between Goshen Road and Montgomery Village Avenue** is proposed to be widened from the existing four-lane divided roadway to a five-lane divided roadway with sidewalk and shared use path.
- **Montgomery Village Avenue (MD 124)** between Midcounty Highway (MD 124) and Frederick Road (MD 355) is proposed to be widened for auxiliary lanes between Russell Avenue and MD 355. It is also proposed that the existing eastern sidewalk be replaced with a shared use path.
- **Frederick Road (MD 355)**
  - The segment between Montgomery Village Avenue (MD 124) and Game Preserve Road is proposed to be widened from the existing six-lane divided roadway to an eight-lane divided roadway.
  - The segment between Plummer Drive and Middlebrook Road is proposed to be widened for auxiliary lanes.
- **Middlebrook Road** between Frederick Road (MD 355) and Midcounty Highway Master Plan Alignment (M-83) is proposed to be widened from the existing three-lane undivided roadway to a seven-lane divided roadway with sidewalk and shared use path.
- **Midcounty Highway Master Plan Alignment (M-83)**
  - The segment between Middlebrook Road and Watkins Mill Road (upper) is proposed for a four-lane divided roadway with sidewalk and shared use path.
  - The segment between Watkins Mill Road (upper) and Blunt Road is proposed for a six-lane divided roadway with sidewalk and shared use path.
  - The segment between Blunt Road and Ridge Road (MD 27) is proposed for a four-lane divided roadway with sidewalk and shared use path. Three (3) alignment options, Option A, B, and C, were evaluated. The alignment options are described at page 40.
- Major intersections that are proposed to be improved include:
  - Midcounty Highway (MD 124) / Goshen Road
  - Frederick Road (MD 355) / Montgomery Village Avenue (MD 124)
  - Frederick Road (MD 355) / Watkins Mill Road
  - Frederick Road (MD 355) / Middlebrook Road

***f. Alternative 8, MD 355 – Lower Watkins Mill – Master Plan Alignment***



### Figure 4.9

Alternative 8 is a 6.9 mile route that follows the Midcounty Highway (MD 124) – Montgomery Village Avenue (MD 124) – Frederick Road (MD 355) – Watkins Mill Road (lower) – Midcounty Highway Master Plan Alignment (M-83) corridor. The proposed improvements include:

- **Midcounty Highway (MD 124)** between Goshen Road and Montgomery Village Avenue is proposed to be widened from the existing four-lane divided roadway to a five-lane divided roadway with sidewalk and shared use path.

- **Montgomery Village Avenue (MD 124)** between Midcounty Highway (MD 124) and Frederick Road (MD 355) is proposed to be widened for auxiliary lanes between Russell Avenue and MD 355. It is also proposed that the existing eastern sidewalk be replaced with a shared use path.
- **Frederick Road (MD 355)** between Christopher Avenue and Watkins Mill Road is proposed to be widened for auxiliary lanes.
- **Watkins Mill Road (lower)** between Frederick Road (MD 355) and Midcounty Highway Master Plan Alignment (M-83) is proposed to be widened from the existing four-lane divided roadway (MD 355 to Travis Ave.) or two-lane divided roadway (Travis Ave. to M-83) to a four-lane divided roadway with sidewalk and shared use path. It is also proposed that the roadway alignment of portions of Watkins Mill Road be improved to meet roadway design criteria.
- **Midcounty Highway Master Plan Alignment (M-83)**
  - The segment between Watkins Mill Road (lower) and Watkins Mill Road (upper) is proposed for a four-lane divided roadway with sidewalk and shared use path.
  - The segment between Watkins Mill Road (upper) and Blunt Road is proposed for a six-lane divided roadway with sidewalk and shared use path.
  - The segment between Blunt Road and Ridge Road (MD 27) is proposed for a four-lane divided roadway with sidewalk and shared use path. Three (3) alignment options, Option A, B, and C, were evaluated. The alignment options are described at page 40.
- **Middlebrook Road** between Frederick Road (MD 355) and Midcounty Highway Master Plan Alignment (M-83) is proposed to be widened from the existing three-lane undivided roadway to a seven-lane divided roadway with sidewalk and shared use path.
- Major intersections that are proposed to be improved include:
  - Midcounty Highway (MD 124) / Goshen Road
  - Midcounty Highway (MD 124) / Montgomery Village Avenue
  - Montgomery Village Avenue (MD 124) / Frederick Road (MD 355)
  - Frederick Road (MD 355) / Watkins Mill Road
  - Middlebrook Road / Frederick Road (MD 355)



g. *Alternative 9, Master Plan Alignment*

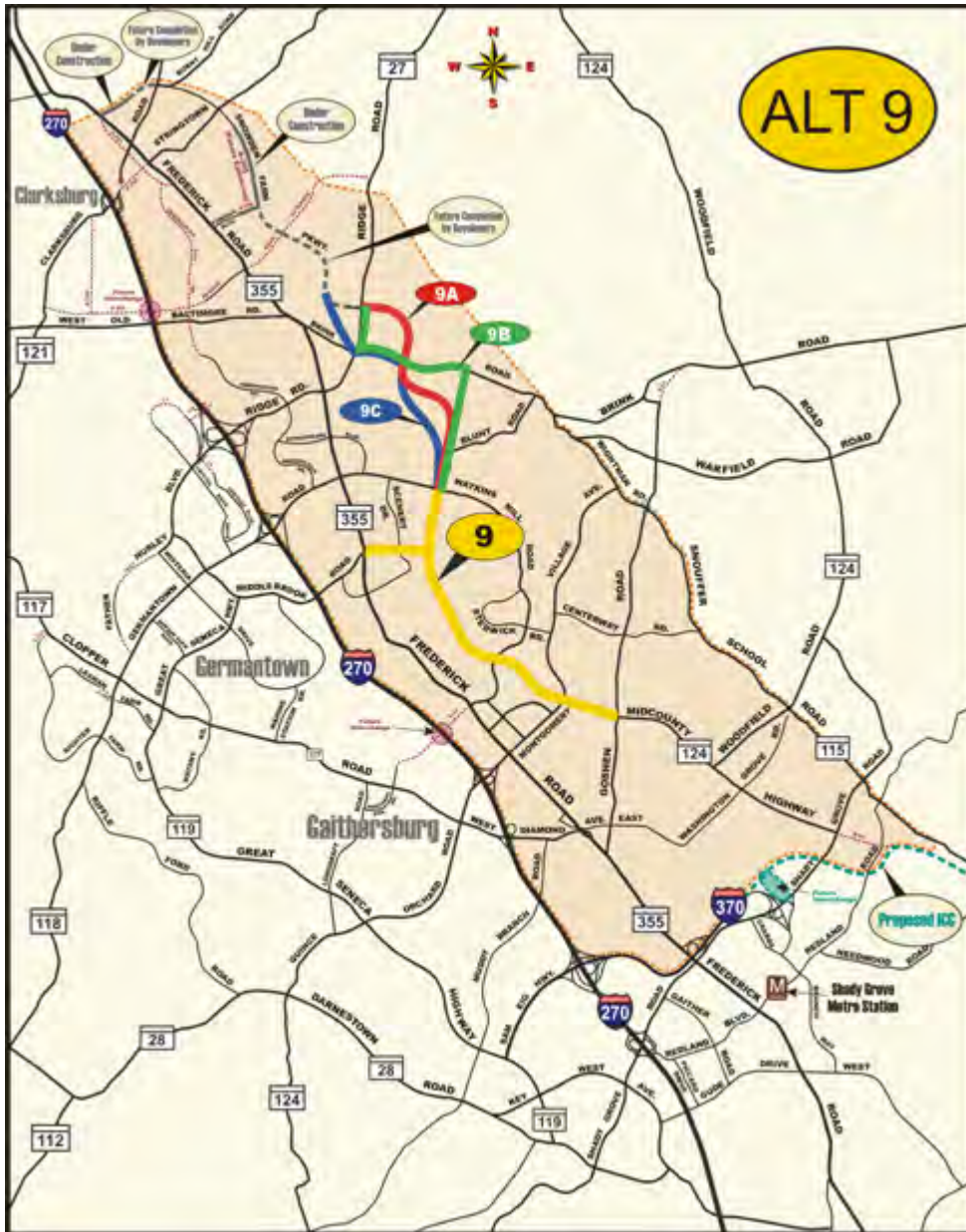


Figure 4.10

Alternative 9 is a 5.7-mile route that follows the Midcounty Highway (MD 124) - Midcounty Highway Master Plan Alignment (M-83) corridor. The proposed improvements include:

- **Midcounty Highway (MD 124)** between Goshen Road and Montgomery Village Avenue is proposed to be widened from the existing four-lane divided roadway to a five-lane divided roadway with sidewalk and shared use path.
- **Midcounty Highway Master Plan Alignment (M-83)**

- The segment between Montgomery Village Avenue and Watkins Mill Road (lower) is proposed for a six-lane divided roadway with sidewalk and shared use path.
- The segment between Watkins Mill Road (lower) and Watkins Mill Road (upper) is proposed for a four-lane divided roadway with sidewalk and shared use path.
- The segment between Watkins Mill Road (upper) and Blunt Road is proposed for a six-lane divided roadway with sidewalk and shared use path.
- The segment between Blunt Road and Ridge Road (MD 27) is proposed for a four-lane divided roadway with sidewalk and shared use path. Three (3) alignment options, Option A, B, and C, were evaluated. The alignment options are described at page 40.
- **Middlebrook Road** between Frederick Road (MD 355) and Midcounty Highway Master Plan Alignment (M-83) is proposed to be widened from the existing three-lane undivided roadway to a seven-lane divided roadway with sidewalk and shared use path.
- Major intersections that are proposed to be widened with this alternative include:
  - Midcounty Highway (MD 124) / Goshen Road
  - Midcounty Highway (MD 124) / Montgomery Village Avenue
  - Middlebrook Road / Frederick Road (MD 355)
- As part of the detailed study, an option also to be evaluated is a four-lane parkway with a narrow median, a 40 mph design speed, a prohibition on heavy trucks, eleven-foot lanes and other parkway features.

*h. Alternative 10 (A & B), Muncaster Mill – Snouffer School – Wightman – Brink*



**Figure 4.11**

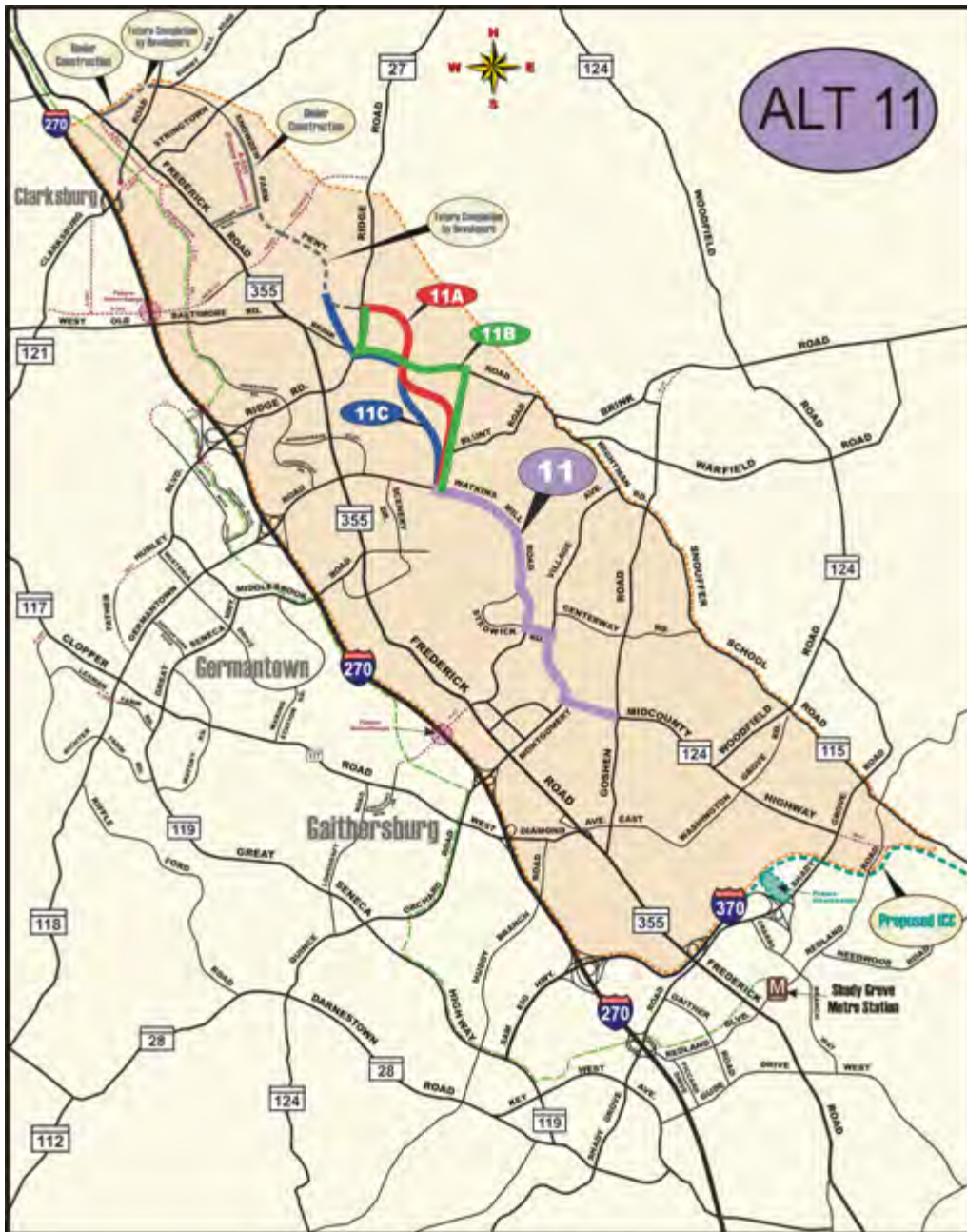
Alternative 10 is a 7.5-mile route that follows the Muncaster Mill Road (MD 115) – Snouffer School Road – Wightman Road – Brink Road – Ridge Road (MD 27) corridor. Two (2) options for the roadway cross section of Muncaster Mill Road and Snouffer School Road were evaluated: 1) Option 10A, four-lane divided section (to minimize access conflict points), and 2) Option 10B, five-lane undivided section (including a center turn lane to maintain existing access for adjacent businesses). The proposed improvements include:



- **Muncaster Mill Road** between Shady Grove Road and Woodfield Road (MD 124) is proposed to be widened from the existing two-lane undivided roadway to either the Option 10A or Option 10B roadway with sidewalk and shared use path. It is also proposed that the roadway alignment of portions of Muncaster Mill Road be improved to meet roadway design criteria.
- **Snouffer School Road**
  - The segment between Woodfield Road (MD 124) and Centerway Road is proposed to be widened from the existing five-lane undivided roadway (Woodfield Road to Flower Hill Way) or three-lane undivided roadway (Flower Hill Way to Centerway Road) to either the Option 10A or Option 10B roadway with sidewalk and shared use path. (Montgomery County CIP #509337)
  - The segment between Centerway Road and Goshen Road is proposed to be widened from the existing two-lane undivided roadway to either the Option 10A or Option 10B roadway with sidewalk and shared use path. (Montgomery County pending CIP #501118 for the section from Centerway Road to Alliston Hollow Way).
- **Wightman Road and Brink Road** between Goshen Road and Ridge Road (MD 27) are proposed to be widened from the existing two-lane undivided roadway to a four-lane divided roadway with sidewalk and shared use path. It is also proposed that the roadway alignments of portions of Wightman Road and Brink Road be improved to meet roadway design criteria.
- **Ridge Road (MD 27)** between Brink Road and Snowden Farm Parkway is proposed to be widened from the existing two-lane undivided roadway to a six-lane divided roadway with sidewalk and shared used path under a separate developer funded project.
- Major intersections that are proposed to be improved include:
  - Shady Grove Road / Muncaster Mill Road
  - Muncaster Mill Road / Woodfield Road (MD 124) / Snouffer School Road
  - Snouffer School Road / Centerway Road
  - Goshen Road / Wightman Road
  - Wightman Road / Montgomery Village Avenue
  - Brink Road / Ridge Road (MD 27)



i. *Alternative 11, Montgomery Village – Stedwick – Upper Watkins Mill – Master Plan Alignment*



**Figure 4.12**

Alternative 11 is a 5.7-mile route that follows the Midcounty Highway (MD 124) – Montgomery Village Avenue – Stedwick Road – Watkins Mill Road (upper) – Midcounty Highway Master Plan Alignment (M-83) corridor. The proposed improvements include:

- **Midcounty Highway (MD 124)** between Goshen Road and Montgomery Village Avenue is proposed to be widened from the existing four-lane divided roadway to a five-lane divided roadway with sidewalk and shared use path.
- **Montgomery Village Avenue** between Midcounty Highway (MD 124) and Stedwick Road is proposed to be improved at the MD 124, Lake Shore Drive and Stedwick Road intersections. It is also proposed that the existing eastern sidewalk be replaced with a shared use path which ties into an existing shared use path adjacent to Lake Whetstone, between Walkers Choice Road and Stedwick Road.
- **Stedwick Road** between Montgomery Village Avenue and Watkins Mill Road (upper) is proposed to be widened from the existing two-lane undivided roadway to a six-lane divided roadway with sidewalk and shared use path.
- **Watkins Mill Road (upper)** between Stedwick Road and Wayfarer Road is proposed to be widened from the existing three-lane undivided roadway (Stedwick Road to Apple Ridge Road) or two-lane undivided roadway (Apple Ridge Road to Wayfarer Road) to a four-lane divided roadway with sidewalk and shared use path. It is also proposed that the roadway alignment of portions of Watkins Mill Road be improved to meet roadway design criteria.
- **Midcounty Highway Master Plan Alignment (M-83)**
  - The segment between Watkins Mill Road (upper) and Blunt Road is proposed for a four-lane divided roadway with sidewalk and shared use path.
  - The segment between Blunt Road Ridge Road (MD 27) is proposed for a four-lane divided roadway with sidewalk and shared use path. Three (3) alignment options, Option A, B, and C, were evaluated. The alignment options are described at page 40.
- Major intersections that are proposed to be improved include:
  - Midcounty Highway (MD 124) / Goshen Road
  - Midcounty Highway (MD 124) / Montgomery Village Avenue
  - Montgomery Village Avenue / Stedwick Road
  - Watkins Mill Road / Stedwick Road
  - Watkins Mill Road / Apple Ridge Road

j. *Master Plan Alignment Northern Terminus Options A, B, and C (for Alternatives 6, 7, 8, 9, and 11)*



Figure 4.13

Three (3) horizontal alignment options, Option A (in red), B (in green) and C (in blue), were developed for the northern terminus of the Midcounty Highway Master Plan Alignment (M-83) between Blunt Road and Ridge Road (MD 27) to evaluate and weigh their impacts to North Germantown Greenway Stream Valley Park, Dayspring Creek (Use I-P waters), Wildcat Branch (Use III-P waters), Dayspring Farm Church of the Saviour, and All Souls Cemetery.

## V. EVALUATION OF PRELIMINARY ALTERNATIVES

The eleven preliminary alternatives were evaluated using the environmental and transportation criteria presented in Section III. A summary of the environmental and transportation analyses is presented in Sections V.A (this page 41) and V.B (page 49), respectively. Comments on the preliminary alternatives were subsequently solicited from the public and the concurring/review agencies. A summary of public and agency input is presented in Sections V.C (page 58) and V.D (page 61).

### A. ENVIRONMENTAL, CULTURAL AND COMMUNITY RESOURCES EVALUATION

For each alternative, a preliminary layout and limit of disturbance (LOD) was developed to estimate the impacts on adjacent natural resources, cultural resources, community resources, hazardous material sites and property. The results of the analysis are presented in **Table 5.1** (page 43) and are summarized below.

#### 1. Natural Resources

##### *a. Wetlands*

All wetlands that lie within the limits of disturbance (LOD) of each alternative were quantified as impacts, without regard to any structure that could be constructed to avoid impact. The impacts initially ranged from less than one acre for Alternate 2 and Alternate 5 to 13 acres for Alternate 9. In response to concerns expressed by the environmental agencies regarding the extent of wetland impacts on the Master Plan Alignments, additional avoidance and minimization analyses were evaluated for Alternative 9 to determine if impacts for the Master Plan Alternatives (6-9) could be reduced to the same range as the other alternatives.. By incorporating bridging, alignment shifts, narrower roadway sections and retaining walls, the impacts associated with the Master Plan alternatives could be substantially reduced to a range of 2-5 acres. (See Section VI.F (page 72) for further details.) During detailed studies, wetland avoidance and minimization techniques will be further developed for all retained alternatives.

##### *b. Streams*

Impacts to streams were categorized by type: *perennial* - having continuous flow in all parts of bed year round; *intermittent* - flowing only part of the year; and *ephemeral* - flowing only during or immediately after precipitation. The length of stream impact was determined by quantifying the length of stream that lies within the LOD of each alternative, including those streams which are already piped, culverted, or bridged. The number of stream crossings was quantified and assessed prior to the USACE's issuance in December 2008 of the Rapanos guidance on determining federal jurisdiction. As a result, some of the ephemeral streams that were previously considered to be jurisdictional waters may no longer be regulated. During the detailed study phase, ephemeral streams along the alternatives will be reevaluated to assess whether they would continue to be regulated under the Rapanos guidance.

Generally, the alternatives with new roadways have greater linear feet of stream impact and more stream crossings than the alternatives that only use existing roadways. During detailed study, the calculation of stream impacts will be further refined to include only the length of stream that is

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TABLE 5.1 - EVALUATION OF PRELIMINARY ALTERNATIVES - ENVIRONMENTAL CRITERIA																						
ENVIRONMENTAL CRITERIA	Alt. 1 No Build	Alt. 2 TSM/ TDM	Alt. 3 Mon. Vlg.- Wightman- Brink	Alt. 4 Goshen- Wightman- Brink	Alt. 5 MD 355	Alt. 6 MD 355- Lower & Upper Watkins Mill-Master Plan Alignment			Alt. 7 MD 355-Middlebrook-Master Plan Alignment			Alt. 8 MD 355-Lower Watkins Mill-Master Plan Alignment			Alt. 9 Master Plan Alignment			Alt. 10 Muncaster Mill- Snouffer Sch.- Wightman-Brink		Alt. 11 Montgomery Vlg-Stedwick- Upper Watkins Mill- Master Plan Alignment		
						A	B	C	A	B	C	A	B	C	A	B	C	A	B	A	B	A
Length (miles)		n/a	6.7	6.2	6.6	7.2	7.7	7.2	7.5	8	7.5	6.9	7.4	6.9	5.7	6.2	5.7	7.5	7.5	5.7	6.2	5.7
NATURAL RESOURCES <sup>1,2</sup>																						
Wetlands Total (acres) <sup>1</sup>	0	0.9	3.9	4.1	0.9	7.0	5.8	5.7	5.2	4.0	3.9	11.4	10.1	10.1	13.5	12.3	12.2	4.4	4.0	4.7	3.4	3.4
Palustrine, emergent (PEM)	0	0.0	3.0	3.0	0.0	1.3	1.3	1.2	0.1	0.1	<0.1	0.3	0.2	0.2	0.9	0.9	0.8	3.3	3.1	1.3	1.2	1.2
Palustrine, scrub shrub (PSS)	0	0.8	0.9	0.7	0.8	1.0	1.0	1.0	0.8	0.8	0.8	1.6	1.6	1.6	1.8	1.8	1.8	0.0	0.0	0.8	0.8	0.8
Palustrine, forested (PFO)	0	0.1	0.0	0.4	0.1	4.7	3.5	3.5	4.3	3.1	3.1	9.5	8.3	8.3	10.8	9.6	9.6	1.1	0.9	2.6	1.4	1.4
Stream Impact Total (LF) <sup>3</sup>	0	627.4	2241.2	2,296.0	1,966.7	6,092.5	5,286.7	5,779.8	3,043.1	2,223.3	2,716.4	6,159.0	5,353.2	5,846.2	6,685.0	5,879.1	6,372.2	1,509.2	1,022.3	4,018.0	3,212.2	3,705.3
Perennial (lf)	0	369.1	1,257.1	1,323.4	810.6	3,727.9	3,155.5	3,610.1	2,146.4	1,560.1	2,014.7	4,611.3	4,038.9	4,493.5	4,826.5	4,254.1	4,708.7	1,281.6	804.6	2,100.1	1,527.7	1,982.3
Intermittent (lf)	0	0.0	184.5	184.5	0.0	330.0	122.0	122.0	208.1	0.0	0.0	208.1	0.0	0.0	430.9	222.8	222.8	184.5	184.5	330.0	122.0	122.0
Ephemeral - including ditches (lf)	0	258.3	799.6	788.1	1156.1	2,034.6	2,009.2	2,047.7	688.6	663.2	701.7	1,339.6	1,314.3	1,352.7	1,427.6	1,402.2	1,440.7	43.1	33.2	1,587.9	1,562.5	1,601.0
Stream Crossing Totals	0	7	10	4	10	15	13	15	12	10	12	15	13	15	17	15	17	9	9	12	10	12
Crossings at Existing Roadways(#) <sup>3</sup>	0	7	10	4	10	12	12	12	7	7	7	7	7	7	5	5	5	9	9	9	9	9
New Crossings (#) <sup>3</sup>	0	0	0	0	0	3	1	3	5	3	5	8	6	8	12	10	12	0	0	3	1	3
Protected Habitat (Y/N)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heron Colony <sup>4</sup>	N	N	Y/Z3	N	N	Y/Z3	Y/Z3	Y/Z3	Y/Z3	Y/Z3	Y/Z3	Y/Z3	Y/Z3	Y/Z3	Y/Z3	Y/Z3	Y/Z3	N	N	Y/Z3	Y/Z3	Y/Z3
Unique and Sensitive Areas (acres)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biodiversity Areas	0	0	0	0	0	14.1	13.9	8.0	20.9	20.7	14.8	21.5	21.3	15.4	21.5	21.3	15.4	0	0	14.1	13.9	8.0
Forest Interior Dwelling Species (FIDS) <sup>5</sup>	-	0.0	0.0	0.0	0.0	50.0	31.6	18.1	67.0	48.6	35.1	67.2	48.8	35.3	67.2	48.8	35.3	0.0	0.0	50.0	31.6	18.1
Special Protection Areas (SPAs)	0	3.0	6.9	6.9	3.2	21.1	8.2	21.7	21.1	8.2	21.7	21.1	8.2	21.7	21.1	8.2	21.7	17.1	16.9	21.1	8.2	21.7
Floodplain, 100-year (acres)	0	5.3	9.0	7.8	6.2	15.3	15.3	15.3	8.6	8.6	8.6	20.6	20.6	20.6	22.8	22.8	22.8	7.3	4.3	9.6	9.6	9.6
Forest - Upland (acres)	0	1.2	17.9	18.2	2.6	37.6	41.8	30.2	47.8	51.5	40.2	59.1	63.3	51.6	74.8	78.9	67.6	20.0	19.2	35.6	39.8	28.2
Farmland (acres)	0	2.5	21.4	21.4	2.9	23.2	21.1	41.2	21.9	19.1	39.2	23.6	21.4	41.5	23.2	21.1	41.2	40.8	33.3	20.6	18.5	38.6
CULTURAL RESOURCES																						
Historic Properties (surveyed/unrecorded) <sup>7</sup>	0	7/9	9/7	9/7	5/9	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	10/10	10/10	5/6	5/6	5/6
Anticipated Archeology Sites (Prehistoric/Historic) <sup>7</sup>	0	0/12	1/13	1/13	0/12	2/12	2/12	2/12	4/15	4/15	4/15	5/18	5/18	5/18	5/15	5/15	5/15	2/19	2/19	4/9	4/9	4/9
COMMUNITY RESOURCES																						
Parks & Recreational Facilities (acres) <sup>2</sup>	0	0.1	10.3	10.3	0.4	35.5	26.7	27.2	40.3	31.1	31.5	43.8	35.0	35.4	43.8	35.0	35.4	16.0	14.6	35.5	26.7	27.2
Parks & Recreational Facilities (#) <sup>6</sup>	0	4	9	5	4	7	6	7	5	4	5	6	5	6	6	5	6	8	8	8	7	8
Schools (#) <sup>6</sup>	0	1	0	0	1	4	4	4	0	0	0	0	0	0	1	1	1	0	0	3	3	3
Churches & Cemeteries (#) <sup>6</sup>	0	1	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	5	5	1	1	1
POTENTIAL RISK FOR HAZARDOUS MATERIALS																						
High (#) <sup>6</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moderate (#) <sup>6</sup>	0	4	1	0	5	0	0	0	3	3	3	0	0	0	0	0	0	2	2	0	0	0
Low (#) <sup>6</sup>	0	2	12	9	10	8	9	8	6	7	6	2	3	2	2	3	2	15	15	5	6	5
PROPERTIES AFFECTED																						
Right-of-Way Total (acres) <sup>2</sup>	0	10.7	63.4	59.7	16.2	103.2	97.2	102.3	96.0	88.9	94.0	110.1	104.1	108.5	111.7	105.7	110.8	98.7	84.0	86.8	80.5	85.8
Residential Properties (#) <sup>6</sup>	0	47	235	209	66	240	268	243	114	140	116	219	247	220	184	212	188	383	370	171	195	174
Commercial/Industrial Properties (#) <sup>6</sup>	0	19	0	0	32	18	18	19	59	59	60	25	25	26	7	7	8	35	15	0	0	1
NOTES:																						
1 Natural Resources not impacted by any alternative have been removed including: Federal and State Rare, Threatened and Endangered Species (RTE); Wetlands of Special State Concern; Best Natural Areas; and Agricultural Preservation Parcels.																						
2 Totals indicate the cumulative (permanent and temporary) impacts.																						
3 Stream impact totals include impacts along existing roadways (including stream culverts and bridges) and impacts to new streams. Stream impacts along existing roadways include both the width of the existing roadway and roadway widening.																						
4 The heron colony is protected under the US Migratory Bird Treaty Act. Construction is prohibited in Zones 1 (Z1) and 2 (Z2). Within Zone 3 (Z3), construction is prohibited during the heron breeding season of February 15 to July 31.																						
5 Impacts to FIDS include areas within the proposed roadway LOD plus a 300-foot buffer on each side of the roadway, as recommended by M-NCPPC.																						
6 # reflects affected properties within the limits of disturbance; they are not property takes.																						
7 # reflects the anticipated properties within the Area of Potential Effect																						
<div><div></div> Most impact</div> <div><div></div> Least impact</div>																						

**NOTES:**

- Natural Resources not impacted by any alternative have been removed including: Federal and State Rare, Threatened and Endangered Species (RTE); Wetlands of Special State Concern; Best Natural Areas; and Agricultural Preservation Parcels.
- Totals indicate the cumulative (permanent and temporary) impacts.
- Stream impact totals include impacts along existing roadways (including stream culverts and bridges) and impacts to new streams. Stream impacts along existing roadways include both the width of the existing roadway and roadway widening.
- The heron colony is protected under the US Migratory Bird Treaty Act. Construction is prohibited in Zones 1 (Z1) and 2 (Z2). Within Zone 3 (Z3), construction is prohibited during the heron breeding season of February 15 to July 31.
- Impacts to FIDS include areas within the proposed roadway LOD plus a 300-foot buffer on each side of the roadway, as recommended by M-NCPPC.
- # reflects affected properties within the limits of disturbance; they are not property takes.
- # reflects the anticipated properties within the Area of Potential Effect

Most impact  
Least impact

Last updated 12/17/2009

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actually piped, armored, or relocated. Streams that are bridged will be considered to have been avoided.

**c. Colonial Nesting Bird Habitat**

MDNR provided conservation recommendations for the heron colony in Lake Whetstone. Alternative 6 would encroach into the 660-foot radius buffer within which MDNR recommends no clearing, grading, or construction at any time of year. Alternative 9 would not encroach into the 660-foot radius buffer, but would encroach into the 1,320-foot radius buffer, within which MDNR recommends no construction or timber harvesting during the breeding season (February 15<sup>th</sup> to July 31<sup>st</sup>). MDNR also indicated that these guidelines could potentially be modified, since the Lake Whetstone colony is in a highly urbanized area. During detailed studies, efforts will be made to minimize and mitigate impacts.

**d. Federal and State Rare, Threatened, and Endangered Species (RTEs)**

No Federal or State RTE species were identified along the Master Plan Alignment (Alternative 9) during the survey conducted in 2006. MDNR has also indicated that there are no previously recorded RTE occurrences within the LODs of the other studied alternatives.

**e. Biodiversity Areas**

Alternatives 6, 7, 8, 9, and 11 would potentially impact the southernmost edge of the Biodiversity Area within Great Seneca Creek Stream Valley Park, and Master Plan Alignment Northern Terminus Options A and B of these alternatives would potentially impact the Biodiversity Area in the North Germantown Greenway Stream Valley Park. During detailed studies, minimization measures will be analyzed and incorporated into the various retained alternatives.

**f. Special Protection Areas (SPAs)**

The Clarksburg SPA, located at the northern end of the study area, would potentially be affected by all build alternatives. Of the three Master Plan Alignment Northern Terminus options, Option B would potentially impact 8.2 acres within the SPA acreage, compared to 21.1 acres for Option A and 21.7 acres for Option C. Options B and C would avoid a crossing of tributaries and spring seeps of the Use III-P Wildcat Branch. During detailed studies, efforts will be made to minimize and/or mitigate impacts to Wildcat Branch.

**g. Best Natural Areas**

No alternative would impact the Black Hills Regional Park or the portion of Little Bennett Regional Park that has been designated a “Best Natural Area.”

**h. Greenways**

Master Plan Alignment Northern Terminus Option A and Option C would potentially bisect the Seneca Crossing Local Park. All three Master Plan Alignment Northern Terminus options would potentially bisect the North Germantown Greenway Stream Valley Park. Both parks are part of a series of contiguous parks forming the North Germantown Greenbelt. During detailed studies, measures will be taken to minimize and/or mitigate impacts.

**i. *Habitat for Forest Interior Dwelling Species (FIDS)***

Alternatives 6, 7, 8, 9, and 11 would potentially impact FIDS habitat in the North Germantown Greenway Stream Valley Park and the Great Seneca Creek Stream Valley Park. Of the three Master Plan Alignment Northern Terminus options, Option C would impact 18.1 acres, Option B would impact 31.6 acres, and Option A would impact 50.0 acres. Alternatives 7, 8, and 9 would potentially impact FIDS habitat in the Great Seneca Creek Stream Valley Park, with most of the impact occurring at the crossing of Great Seneca Creek. During detailed studies, measures will be taken to minimize and/or mitigate impacts.

**j. *Floodplains***

Based on the initial analysis which quantified all floodplains within the LOD as impacted, the alternatives with new roadways were projected to have greater floodplain impacts than the alternatives that only use existing roadways. However, some stream channel openings along the existing road network are undersized for the current volume of runoff generated during storm events, and merely extending these undersized stream channel openings would not address the current flooding problems. During detailed studies, measures will be considered to minimize and/or mitigate impacts to floodplains and flooding on all retained alternatives. Furthermore, impact calculations will be refined to include only the portion of the floodplain that is filled, since floodplains that are bridged will continue to provide the full range of floodplain functions. FEMA-designated floodplains will be mapped during the detailed study phase.

**k. *Forests***

All build alternatives would potentially impact forests, but the alternatives that only use existing roadways would have less impact. During detailed studies, efforts will be made to minimize and/or mitigate impacts.

**l. *Farmland***

All build alternatives would potentially impact farmlands. Alternatives 2 and 5 would potentially have less impacts to farmlands.

**2. *Cultural Resources***

**a. *Historic Architecture***

All alternatives would potentially impact historic architectural properties, but the alternatives that only use existing roadways would potentially impact a greater number of standing historic buildings and structures. Alternatives 3, 4, and 10 would potentially encroach on the numerous historic residences and farmsteads along Brink Road, Wightman Road, and Wildcat Road. Alternatives 3, 4, and 10 would also potentially encroach into the Davis Mill Road area which may qualify for the National Register as a Rural Historic Landscapethis resource. Numerous historic properties are also located along MD 355 north of Great Seneca Creek, which would potentially be impacted by Alternative 5. Alternatives 6, 7, 8, 9 and 11 would potentially impact numerous historic residences and farmsteads along Ridge Road and Wildcat Road. During the detailed study, additional research will be conducted to confirm National Register eligibility, and efforts will be made to minimize and/or mitigate impacts.

**b. Archeological Sites**

Based on the archeological Phase IA investigation completed in 2007, large portions of the study area were assessed as having little potential for archeological resources because they are densely developed and have experienced a great deal of previous soil disturbance. However, all of the build alternatives have potential impacts to archeological sites.

Alternatives 2, 3, 4, 5, 6 and 11 would each potentially impact 12-14 archeological sites. Alternatives 7, 8, 9 and 10 would potentially impact 19, 23, 20 and 21 archeological sites, respectively. While there are a larger number of anticipated historic sites, as compared to prehistoric sites within each of the alternatives, anticipated prehistoric sites in Alternatives 6, 7, 8, 9 and 11 encompass a larger acreage as compared to historic sites. An archeological Phase IB physical survey of previously identified sites, and high and moderate potential areas, would be conducted for the alternatives retained for detailed study. In addition, archeological Phase II work may be required to evaluate any associated sites. The results of these studies would help to further refine the alternatives and options being considered.

**3. Community Resources**

**a. Parks & Recreational Facilities**

Alternatives 3, 4, 5, and 10 would potentially impact 4-9 parks through widening of the existing roads. The parkland required for these road widenings is already affected by proximity to existing roads, and generally is not used for recreation activities. The impacts would range from 0.4 acres (Alternative 5) to 16 acres (Alternative 10A).

Alternatives 6 and 11 would impact Great Seneca Creek Stream Valley Park, but the impact would be limited to a widening of existing Watkins Mill Road. Alternatives 6 and 11 would also impact North Germantown Greenway Stream Valley Park and Seneca Crossing Local Park to various degrees, depending upon the incorporated Master Plan Alignment Northern Terminus option. Alternatives 6 and 11 would each potentially impact 35.5 acres of parkland with Option A, 26.7 acres of parkland with Options B, and 27.2 acres of parkland with Option C.

Alternatives 7, 8, and 9 would impact North Germantown Greenway Stream Valley Park, Seneca Crossing Local Park, and Great Seneca Creek Stream Valley Park at the crossing of Brandermill Tributary. Alternatives 8 and 9 would also impact Great Seneca Creek Stream Valley Park at the crossing of Great Seneca Creek, as well as the City of Gaithersburg's Blohm Park located on Watkins Mill Road. Alternative 9 could avoid impacts to the ballfields in South Valley Park and Watkins Mill Elementary School with compact cross section, alignment shift, and retaining walls (please refer to Section VI (page #) and the Appendix). Alternative 7 would potentially impact parkland ranging from 31.1 to 40.3 acres and each of Alternative 8 and 9 would potentially impact parkland ranging from 35.0 to 43.8 acres, depending upon the incorporated northern terminus option.

**b. Schools**

Alternatives 6 and 11 would widen Watkins Mill Road and direct regional traffic onto a road that primarily serves local traffic, including traffic that is oriented to four schools (Watkins Mill Elementary School, Montgomery Village Middle School, Stedwick Elementary School, and Watkins Mill High School). This would increase the potential for conflicts between through traffic and local

traffic as well as pedestrians and bicyclists. In addition, the turning movements by numerous school buses during the morning rush hour would significantly impede through traffic. Alternative 9 would pass in close proximity to, but behind, Watkins Mill Elementary School, and both Alternatives 8 and 9 would increase traffic volumes on Watkins Mill Road in front of Watkins Mill Elementary School. Alternative 5 would potentially impact a daycare facility and two schools (Neelsville Presbyterian Church Pre-School and Neelsville Middle School) on MD 355 with minor property acquisitions and increased traffic volumes. Alternative 10 would potentially impact the Covenant Life Church School.

**c. *Places of Worship***

Alternatives 3, 4, and 10 would potentially impact 4-5 churches with acquisition of a strip of unimproved property. Alternative 5 would potentially acquire a strip of unimproved property from one church. Alternatives 6, 7, 8, 9, and 11 would potentially impact the Dayspring Retreat Center with noise increases and disturb the solitude which is the primary focus of their retreat programs. Master Plan Alignment Option C would traverse the eastern portion of the Dayspring Retreat Center.

**4. *Hazardous Material Sites***

All of the hazardous material sites identified within proximity to a proposed alternative either have been remediated or the risk of contamination extending into the right-of-way is slight. These sites will continue to be evaluated during detailed studies to better assess the risk of encountering potential contamination.

**5. *Property***

**a. *Residential Property***

Alternatives 2 and 5 would potentially impact 47 and 66 properties, respectively. Alternative 10A and 10B would potentially impact 383 and 370 properties, respectively. Alternatives 3, 4, 6, 7, 8, 9, and 11 would potentially impact between 114 and 268 properties. Impacts along existing roadways would generally be strip takes along the property frontage while impacts from new roadways would involve acquisitions for the full width of roadway right-of-way from undeveloped parcels. Displacements of residential properties will be investigated during detailed studies.

**b. *Commercial/Industrial Property***

Because MD 355 and Snouffer School Road provide access to numerous businesses, Alternatives 5, 7, and 10 would potentially impact more commercial/industrial properties than the other alternatives. Alternative 5 will be further studied with a network of service roads that would consolidate the number of entrances along MD 355, thereby providing a level of access control that would be competitive with the other alternatives (please refer to Section VI.D (page 69). The service roads would potentially increase the impacts to commercial properties beyond the quantity shown in Table 5.1 and could potentially result in some business displacements.

## B. TRANSPORTATION EVALUATION

As discussed in Section III.B (page 13), each preliminary alternative was evaluated to determine its ability to achieve the following key needs of the project:

1. Relieve projected roadway congestion in Year 2030
2. Improve safety and efficiency
3. Improve bicycle and pedestrian access

The results of the preliminary transportation analyses are summarized in **Table 5.2** (page 51) and are summarized below.

### 1. Intersections Exceeding Acceptable Critical Lane Volumes in Year 2030

Roadway congestion was analyzed by evaluating traffic operations at 75 intersections within the study area using the Critical Lane Volume (CLV) method and Synchro. One of the key measures of effectiveness was the number of intersections exceeding an acceptable CLV of 1,450 vehicles.

- The number of intersections with unacceptable congestion is 29 for Alternative 1, No-Build Alternative.
- Of the build alternatives 2 through 11, Alternative 6 had the lowest number of congested intersections at 17 and Alternatives 3 and 4 had the highest number of congested intersections at 24. The congested intersections for the other alternatives varied from 18 to 21 intersections.

### 2. Reduction in Peak Hour Travel Times

A second measure used to evaluate effectiveness at improving traffic congestion was each alternative's ability to reduce round trip peak hour travel times along the primary travel corridors within the study area. Using Synchro traffic analysis software, morning and evening peak hour travel times were computed along four existing corridors (Alternatives 3, 4, 5 and 10) and five new corridors (Alternatives 6, 7, 8, 9, and 11) that are proposed under the respective build alternatives. The travel time starting and stopping points for all corridors, except Alternative 10, are the future MD 27/Snowden Farm Parkway intersection to the north and the Midcounty Highway/Goshen Road intersection to the south. For Alternative 10, the northern terminus is the future MD 27/Snowden Farm Parkway intersection and the southern terminus is the Snouffer School Road/Shady Grove Road intersection. The combined AM and PM peak hour travel times for each alternative are presented in **Table 5.2** (page 51). **Table 5.3** (page 53) ranks the alternatives in descending order from lowest travel time to greatest travel time.



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**Table 5.2 – Evaluation of Preliminary Alternatives - Purpose and Need Criteria**

PURPOSE AND NEED CRITERIA	Alt. 1 No Build	Alt. 2 TSM/TDM	Alt. 3 Montgomery Vlg- Wightman- Brink	Alt. 4 Goshen- Wightman- Brink	Alt. 5 MD 355	Alt. 6 MD 355-Lower & Upper Watkins Mill- Master Plan Alignment			Alt. 7 MD 355-Middlebrook- Master Plan Alignment			Alt. 8 MD 355-Lower Watkins Mill-Master Plan Alignment			Alt. 9 Master Plan Alignment			Alt. 10 Muncaster Mill- Snouffer Sch.- Wightman-Brink		Alt. 11 Montgomery Vlg- Stedwick- Master Plan Alignment		
						A*	B*	C*	A*	B*	C	A*	B*	C*	A*	B*	C*	A*	B*	A*	B*	C*
Length of <b>Bold</b> Route (miles)	n/a	n/a	6.7	6.2	6.6	7.2	7.7	7.2	7.5	8.0	7.5	6.9	7.4	6.9	5.7	6.2	5.7	7.5	7.5	5.7	6.2	5.7
RELIEVES PROJECTED ROADWAY CONGESTION (YEAR 2030)																						
Number of Intersections Exceeding Acceptable CLV within Study Area	29	21	24	24	18	17			19			20			19			21		21		
Peak Travel Time (minutes) – AM + PM																						
MD 27-MD 355-Mont. Vlg- Midcounty	42.0	35.8	37.8	38.3	34.8	41.1			40.9			35.1			34.7			38.4		39.2		
MD 27-Brink-Wightman- Mont. Vlg.-Midcounty	31.5	28.0	27.2	27.1	28.6	30.5			31.8			30.0			29.1			30.0		31.9		
MD 27-Brink-Wightman- Goshen-Midcounty	29.9	27.6	27.4	27.3	27.1	30.1			30.8			27.9			28.5			29.0		30.1		
MD 27-Brink-Wightman- Snouffer Sch.-Muncaster Mill	32.4	31.1	30.4	30.4	31.7	31.6			32.4			31.7			31.9			31.8		31.8		
New Alignment	N/A	N/A	N/A	N/A	N/A	38.2			40.7			33.0			23.7			N/A		30.2		
PROVIDES N-S CORRIDOR WHICH IMPROVES SAFETY & EFFICIENCY																						
# of Signalized Intersections (existing/proposed)	22	22/22	9/9	6/7	22/22	13/16	14/17	14/17	15/19	16/20	16/20	10/15	11/16	11/16	3/5	4/6	4/6	7/10	7/10	7/10	8/11	8/11
# of Unsignalized Intersections (existing/proposed)	18	18/18	23/23	26/26	18/17	17/17	21/21	18/18	15/15	19/19	16/16	8/10	12/14	9/11	3/5	7/9	4/5	33/33	33/33	13/13	17/17	14/14
# of Driveways (existing/proposed)	66	67/58	48/44	52/48	67/42	36/28	54/44	39/31	50/38	68/51	53/41	19/15	36/26	21/16	0/0	17/11	2/1	99/86	99/80	16/13	33/24	18/13
Total (existing/proposed)	106	108/99	80/76	84/81	107/81	66/61	89/82	71/66	80/72	103/90	85/77	37/40	59/56	41/43	6/10	28/26	10/12	139/129	139/123	36/36	58/52	40/38
IMPROVES ACCESS																						
Vehicular (Y/N)	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bicycle & Pedestrian (Y/N)	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
RECOMMEDED IN CLRP / TIP / MASTER PLAN																						
CLRP (Y/N)	Y	N	N	Y	N	N			Y			Y			Y			N		N		
TIP (Y/N)	Y	N	N	N	N	N			N			N			N			N		N		
Master Plan (Y/N)	Y	Y	N	N	Y	N			N			N			Y			N		N		
	2030 transportation improvements except for the Master Plan Alignment	Alt 2 only includes intersection improvements to Master Plan roads	Brink Rd master planned as 2-lane roadway from M-83 to Wightman Rd (Alt 3 proposes 4-lane divided)	Brink Rd master planned as 2-lane roadway from M-83 to Wightman Rd (Alt 4 proposes 4- lane divided)		Watkins Mills Rd master planned as a 4- lane, undivided arterial (Alt 6 proposes 4-lane divided)			MD 355 master planned as 6 lanes at Middlebrook Rd and south of Game Preserve Rd (Alt 7 proposes 8 lanes)			Watkins Mills Rd master planned as a 4-lane, undivided arterial (Alt 8 proposes 4-lane divided)						Roadways master planned as 2- or 4- lane, undivided arterials (Alt 10 proposes 4-lane divided)		Stedwick and Watkins Mill Rds master planned as 4-lane undivided arterials (Alt 11 proposes 4-lane divided)		

- ❖ Options A, B, and C for Alternatives 6, 7, 8, 9, and 11 refer to the Master Plan Alignment Northern Terminus Options between Germantown Road and MD 27
- ❖ Options A and B for Alternative 10 refer to 4-lane divided and 5-lane undivided typical section options between Goshen Road and Shady Grove Road
- ❖ The number of intersections shown for Alternative 5, 6, and 7 do not reflect the implementation of service roads along MD 355. The addition of service roads would reduce the numbers presented in the table.

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**Table 5.3 – Ranking of Alternatives in Terms of Travel Time (in Minutes)**

Travel Time Along the Build Alternative	Travel Time Along MD 355-Mont. Village-Midcounty Corridor	Travel Time Along Brink-Wightman-Snouffer School-Muncaster Corridor	Travel Time Along Brink-Wightman-Mont. Village-Midcounty Corridor	Travel Time Along Brink-Wightman-Goshen-Midcounty Corridor
Alt 9 (23.7)	Alt 9 (34.7)	Alt 4 (30.4)	Alt 4 (27.1)	Alt 5 (27.1)
Alt 3 (27.2)	Alt 5 (34.8)	Alt 3 (30.4)	Alt 3 (27.2)	Alt 4 (27.3)
Alt 4 (27.3)	Alt 8 (35.1)	Alt 2 (31.1)	Alt 2 (28.0)	Alt 3 (27.4)
Alt 11 (30.2)	Alt 2 (35.8)	Alt 6 (31.6)	Alt 5 (28.6)	Alt 2 (27.6)
Alt 10 (31.8)	Alt 3 (37.8)	Alt 5 (31.7)	Alt 9 (29.1)	Alt 8 (27.9)
Alt 8 (33.0)	Alt 4 (38.3)	Alt 8 (31.7)	Alt 8 (30.0)	Alt 9 (28.5)
Alt 5 (34.8)	Alt 10 (38.4)	Alt 10 (31.8)	Alt 10 (30.0)	Alt 10 (29.0)
Alt 6 (38.2)	Alt 11 (39.2)	Alt 11 (31.8)	Alt 6 (30.5)	Alt 1 (29.9)
Alt 7 (40.7)	Alt 7 (40.9)	Alt 9 (31.9)	Alt 1 (31.5)	Alt 6 (30.1)
Alt 2 (N/A)	Alt 6 (41.1)	Alt 7 (32.4)	Alt 7 (31.8)	Alt 11 (30.1)
Alt 1 (N/A)	Alt 1 (42.0)	Alt 1 (32.4)	Alt 11 (31.9)	Alt 7 (30.8)

Based on the above tables, the following conclusions can be made:

- Among the build alternatives, the travel times ranged from a low of 23.7 minutes along the Alternative 9 corridor to a high of 40.7 minutes along the Alternative 7 corridor.
- Alternative 9's travel time (23.7 minutes) is substantially less than the next lowest alternative (Alternative 3 @ 27.2 minutes).
- In the MD 355-Montgomery Village Avenue-Midcounty Highway Corridor, travel times were lowest with Alternatives 9, 5, 8, and 2 (34.7-35.8 minutes) and result in a substantial improvement over the No Build alternative (42 minutes).
- There is little difference between the alternatives in travel time in the Brink-Wightman-Snouffer School-Muncaster Road Corridor (only 2 minutes separate the best and the worst alternative).
- Alternatives 6, 7, 10, and 11 are consistently among the lowest ranked alternatives with respect to travel time.
- The travel time along Alternative 8 (33.0 minutes) was significantly longer than Alternative 9 (23.7 minutes) as a result of terminating the Master Plan Alignment at Watkins Mill Road.

### 3. Improvement in Safety and Efficiency

A key objective of the project is to safely accommodate the growing number of mid to long range trips between Clarksburg and Gaithersburg and locations further north and south of the study area. Potential safety improvements include medians, channelization, access controls, and geometric improvements that would:

- Separate opposing traffic streams;
- Channelize and separate turning traffic from through traffic;
- Provide separate turning bays/lanes for traffic traveling at different speeds;
- Reduce the number of intersecting streets/driveways and, thereby, reduce the conflict points between through traffic and turning traffic; and
- Safely accommodate the higher speed mid and long range trips through the study area, minimizing conflicts between local and through traffic.

All alternatives, except Alternatives 1 and 2, would involve either construction of a new divided 4-6 lane roadway or widening of existing roadways with increased medians, channelization and/or geometric improvements to further enhance traffic capacity, safety, operations and efficiency.

Many of the alternatives would also enhance safety through the provision of increased access controls and limited access to driveways, entrances, and local roadways. The effectiveness of each alternative to provide a partial access-controlled corridor was measured by tallying the total number of signalized intersections, unsignalized intersections, and driveways along each alternative (see **Table 5.2**). **Table 5.4** ranks the alternatives in descending order from fewest number of access points (fewer potential conflicts) to greatest number of access points (greater potential conflicts).

**Table 5.4 – Ranking of Alternatives in Terms of Access Control**

Number of Signalized Intersections	Number of Unsignalized Intersections	Number of Driveways	Total Number of Access Points
Alt 9 (5-6)	Alt 9 (5-9)	Alt 9 (1-11)	Alt 9 (10-26)
Alt 4 (7)	Alt 8 (10-14)	Alt 11 (13-24)	Alt 11 (36-52)
Alt 3 (9)	Alt 11(13-17)	Alt 8 (15-26)	Alt 8 (40-56)
Alt 10 (10)	Alt 7 (15-19)	Alt 6 (28-44)	Alt 6 (61-82)
Alt 11 (10-11)	Alt 5 (17)	Alt 5 (42)	Alt 3 (76)
Alt 8 (15-16)	Alt 2 (18)	Alt 3 (44)	Alt 7 (72-90)
Alt 6 (16-17)	Alt 1 (18)	Alt 7 (38-51)	Alt 4 (81)
Alt 7 (19-20)	Alt 6 (17-21)	Alt 4 (48)	Alt 5 (81)
Alt 5 (22)	Alt 3 (23)	Alt 2 (58)	Alt 2 (99)
Alt 2 (22)	Alt 4 (26)	Alt 1 (66)	Alt 1 (106)
Alt 1 (22)	Alt 10 (33)	Alt 10 (80-86)	Alt 10 (123-129)



Based on the two tables, Alternatives 8, 9, and 11 rank among the best in terms of potential conflict points. Alternatives 1, 2, and 10 rank among the worst in terms of potential conflict points. Other conclusions, based on the information in the above tables, include the following:

- The total number of proposed access points (including all roads, driveways and entrances) ranged from 10 along Alternative 9A to 129 along Alternative 10A.
- The total number of proposed signalized intersections ranged from 5 along Alternative 9A to 22 along Alternative 5 and 23 along Alternative 2.
- Alternatives 1, 2 and 10 would contain between 99-129 access points.
- Alternatives 3 and 4 would contain approximately 76-81 access points.
- Based on the current level of design, Alternatives 5, 6, and 7 would contain between 61-90 access points. However, the implementation of service roads along MD 355 would reduce the number of access points below these current values (to be determined in detailed studies).
- Alternatives 8 and 11 would contain between 36-56 access points.
- Alternative 9 with 10-26 access points, depending upon the choice of option, offers more access control improvement as compared to the other alternatives.
- The total number of access points along Alternative 8 (40-56) would be much greater than Alternative 9 (10-26) as a result of terminating the Master Plan Alignment at Watkins Mill Road and utilizing other existing corridors.

#### **4. Bicycle and Pedestrian Access**

Another significant objective of the project is to improve bicycle and pedestrian access within the study area. Currently, the region lacks a continuous off-street bicycle and pedestrian pathway between the northern and southern limits of the study area. Furthermore, existing sidewalks and pathways located along MD 355, MD 27, existing Midcounty Highway and other roadways within the study area have the potential to result in conflicts with motorists, particularly at intersections and driveways.

Each of the build alternatives generally includes a new off-street bike path along one side of the corridor and a new sidewalk along the other side of the corridor. In addition, new connections will be made to existing pedestrian and bicycle facilities where feasible.

Potential improvements for pedestrians and bicyclists also include consolidation of driveways and entrances to reduce the number of conflict points between pedestrians/bicyclists and motorists. Each alternative's ability to reduce conflicts between pedestrians/bicyclists and motorists is best illustrated by the total number of access points along the roadway as presented in the previous section. Fewer access points would generally result in fewer conflicts.

- Alternatives 1, 2, and 5 would not offer substantial improvements to pedestrian and bicycle facilities within the study area. However, the addition of service roads to Alternative 5 could improve the safety and operations of the existing facilities along MD 355.



- Alternatives 3, 4, 6, 7, 8, 9, 10 and 11 would provide substantial pedestrian and bicycle improvements through the construction of new pedestrian and bicycle facilities.
- Further study of vehicular, pedestrian and bicycle networks between Watkins Mill Road and Montgomery Village Avenue would be conducted for Alternative 8 during the detailed study.

## 5. Transportation Evaluation Summary

- **Alternative 1 - No Build** is the baseline for comparison for the other alternatives. As demonstrated in the Purpose and Need, Alternative 1 would not adequately improve congestion, travel time, safety, efficiency or pedestrian/bicycle access.
- **Alternative 2 - Transportation System Management/Travel Demand Management** would moderately improve congestion and travel time through the improvement of several intersections within the study area but would not substantially improve safety, efficiency or pedestrian/bicycle access.
- **Alternative 3 - Montgomery Village–Wightman-Brink, and Alternative 4 - Goshen-Wightman-Brink** would moderately improve congestion, travel times, safety, efficiency, and pedestrian/bicycle access. Further study of conflicts between vehicular, pedestrian, and bicycle traffic would be conducted during the detailed study.
- **Alternative 5 - MD 355** would moderately improve congestion, travel times; safety, and efficiency; and provide minor improvements for pedestrian/bicycle access. Further study of service roads to reduce conflicts between vehicular, pedestrian, and bicycle traffic would be conducted during the detailed study.
- **Alternative 6 - MD 355-Lower & Upper Watkins Mill-Master Plan Alignment and Alternative 7 - MD 355-Middlebrook-Master Plan Alignment** would moderately improve congestion but provide the highest travel times and moderately improve safety, efficiency and pedestrian/bicycle access.
- **Alternative 8 - MD 355-Lower Watkins Mill-Master Plan Alignment** would moderately improve congestion, travel times, safety, efficiency, and pedestrian/bicycle access. Further study of vehicular, pedestrian and bicycle networks between Watkins Mill Road and Montgomery Village Avenue would be conducted during the detailed study.
- **Alternative 9 - Master Plan Alignment** would reduce congestion, minimize travel times and significantly improve safety, efficiency and pedestrian/bicycle access.
- **Alternative 10 - Muncaster Mill-Snouffer School-Wightman-Brink** would moderately improve congestion, travel times, safety, efficiency, and pedestrian/bicycle access. Transportation benefits are less than Alternatives 3 and 4, which also use the Wightman-Brink alignment. Alternative 10 would offer substantial conflicts between vehicular, pedestrian and bicycle traffic at many commercial entrances and intersections along the southern portion of the corridor.

- **Alternative 11 - Montgomery Village-Stedwick-Upper Watkins Mill-Master Plan Alignment** would moderately improve congestion, travel times, safety, efficiency, and pedestrian/bicycle access.



## C. PUBLIC INVOLVEMENT

Public participation is an indispensable component of the transportation planning process. MCDOT believes public involvement is the keystone to building and maintaining a successful transportation system and is committed to providing collaborative processes, and thus encourages the public to participate in project planning early and often. The Department always welcomes constructive input and any concerns the public may have, as this allows MCDOT to better understand the needs of the community. To date, the following efforts have been made to integrate the community on the project:

- Two public workshops, on November 15, 2004 and December 12, 2007, have been held for this project to date.
- MCDOT attended two community meetings, with Montgomery Village Foundation on January 15, 2008 and Greater Goshen Civic Association on October 26, 2009, to present the preliminary alternatives and receive community input.
- Three project newsletters, May 2004, October 2004 and October 2007, have been distributed to date to residential and business property owners as well as area civic and homeowner associations located along the study corridors.
- Comment forms with prepaid postage were provided with the newsletters and were also made available at the public workshops and community meetings.
- <http://www.montgomerycountymd.gov/midcountycorridorstudy>, the Midcounty Corridor Study (MCS) project webpage, was developed to provide the public with additional access for project information, documents, status updates, public notices, and input.
- Traffic simulations for the existing and future conditions were rendered and presented at the December 12, 2007 public workshop to illustrate existing and future traffic conditions.
- Responses were promptly provided by MCDOT to each public inquiry and question that was received.
- Meetings between the MCDOT's representatives and individual property owners were held upon request.
- The December 12, 2007 public workshop handout and *Composite of Alternative 2-9 and Environmental Resources* map were made available to the public at local libraries/government centers during the comment period following the December 12, 2007 workshop.

### 1. Public Meetings/Workshops

#### a. Public Workshop – November 15, 2004

The first public workshop was held on November 15, 2004 at the Neelsville Middle School in Germantown to present the project's Purpose and Need and the Environmental Site Assessment solely for the Midcounty Highway/Middlebrook Road Facility Planning Study. One hundred eighty eight (188) people attended the workshop. The majority of comments focused on concerns with

potential environmental, property and traffic impacts associated with the proposed extension of Midcounty Highway.

***b. Public Workshop – December 12, 2007***

A second public workshop was held on December 12, 2007 at the Seneca Valley High School in Germantown to present the project's Purpose and Need and eleven preliminary alternatives for the Midcounty Corridor Study. Additional information included: an overview of the environmental features; the advantages/disadvantages of the alternatives; potential impacts of the alternatives; and the initial recommendation that Alternatives 1, 4, 7, 9, and 11 be retained for detailed study. One hundred fifteen (115) people attended the workshop, including three council members' representatives and one representative from M-NCPPC. Eighteen written comments were received at the workshop and a total of 445 comments were received during the subsequent comment period which ended on March 8, 2008. A summary of the public comments received from this workshop are presented below in Section V.C.5.

**2. Community Meetings**

***a. Montgomery Village Foundation - January 15, 2008***

With the invitation from Montgomery Village Foundation (MVF), MCDOT gave a presentation on the Midcounty Corridor Study at the MVF's January 15, 2008 community meeting. 145 people attended the meeting and several of them provided verbal comments and eight persons provided written comments.

***b. Community Meeting – Greater Goshen Civic Association- October 26, 2009***

With the invitation from Greater Goshen Community Association (GGCA), MCDOT gave a presentation on the Midcounty Corridor Study at the GGCA's October 26, 2009 Association meeting. Approximately 20 people attended the meeting and several of them provided oral and written comments.

**3. Website - Launched December 2007**

The project website, [www.montgomerycountymd.gov/midcountycorridorstudy](http://www.montgomerycountymd.gov/midcountycorridorstudy), was launched in December 2007 to provide the public with additional access for the project information, documents, status updates, public notices, and input on the following subjects:

- Project Overview
  - Project Background
  - Project Team
  - Project Area Map
  - Schedule and Process
  - Purpose and Need
- Environmental
  - Environmental Process
  - Environmental Inventory





- Alternatives
  - Alternatives maps
  - Impacts Summary
- Public Involvement
  - Frequently Asked Questions
  - Comment Form
- Public Outreach
  - Public Workshops/Meetings/Hearings
  - Newsletter

The website was also being periodically revised to provide the public with up-to-date project information.

#### **4. Newsletters -- May 2004, October 2004, and October 2007**

Three newsletters and one update have been distributed to date to residential and business property owners as well as area civic and homeowner associations located along the study corridors:

- May 2004 Newsletter: *Announcement of the Midcounty Highway/Middlebrook Road Facility Planning Study* – This newsletter provided a project overview, a location map to identify the project limits, and the MCDOT’s project contact information.
- October 2004 Newsletter: *Invitation to attend the Midcounty Highway/Middlebrook Road Facility Planning Study Public Workshop on November 15, 2004.*
- October 2007 Newsletter: *Invitation to attend the Midcounty Corridor Study Public Workshop on October 25, 2007.*
- October 2007 Update: Announcement of the cancellation of the October 25, 2007 Midcounty Corridor Study Public Workshop and the rescheduled December 12, 2007 Midcounty Corridor Study Public Workshop at the request of the community due to scheduling conflicts.

The announcement of each public workshop and associated update was also posted on the MCDOT Event Calendar which is publicly accessible.

#### **5. Public and Community Comments**

- A total of 465 public comments from individuals and communities have been received to date for the Midcounty Corridor Study. **Table 5.5** provides a summary of the major topics of the public comments received.

**Table 5.5 – Summary of Comments by Major Topic**

<b>Comment</b>	<b>Number</b>	<b>Percent</b>
Favors the No-Build Alternative	63	14 %
Favors Alternative 9 – Master Plan Alignment	75	16 %
Opposed to Alternative 9 – Master Plan Alignment	111	24 %
Favors Alternative 4 or 10 – Widening of Brink/Wightman Roads	24	5 %
Opposed to Widening Wightman/Goshen/Brink Roads	45	10 %
Prevent any adverse effects to Dayspring	80	17 %
Other (Requests only)	116 (51)	25 % (44 % of 116)

*Note: Some comments contained more than one opinion; hence, the total is greater than 100 %.*

## D. AGENCY COORDINATION AND COMMENTS

### 1. Agency Meetings

The following regulatory and resource agencies have been involved throughout the Midcounty Corridor Study planning process:

- Concurring Agencies include:
  - US Army Corps of Engineers (USACE), lead agency
  - US Environmental Protection Agency (EPA)
  - Maryland Department of the Environment (MDE)
- Reviewing Agencies include:
  - US Fish and Wildlife Service (USFWS)
  - Maryland Historical Trust (MHT)
  - Maryland Department of Natural Resources (MDNR)
  - Maryland State Highway Administration (MSHA)
  - Maryland-National Capitol Park and Planning Commission (M-NCPPC)
  - City of Gaithersburg

### **December 8, 2006**

The project team met with the USACE, EPA and MDE for a field walk to review the project's alternatives currently being evaluated. The following topics were discussed in detail and have been subsequently considered in the project:

- addition of a TSM/TDM alternative (including transit and efforts to minimize SOV use);
- further description of the quality of the resources impacted;
- inclusion of an alternative that follows Watkins Mill Road across Great Seneca Creek;
- inclusion of an option to the Master Plan alternative to minimize impacts to the North Germantown Greenway Stream Valley Park;
- inclusion of options to the Master Plan alternative to avoid Wildcat Branch;
- evaluation of bridging the entire floodplain at the Master Plan alternative crossing of Great Seneca Creek.

The USACE also noted the following:

- Because crossings of Walkers Run, Whetstone Run and Great Seneca Creek could be highly impactive, the County should evaluate building only the northern portion of the Master Plan alternative between MD 27 and Middlebrook Road. (Note that subsequent to these comments, additional studies were performed on the Master Plan Alignment to reduce impacts. These studies are further discussed in Section VI and the Appendix.)

### **March 2, 2007**

MCDOT and the USACE communicated with EPA (by phone) to provide the Concurring Agencies (MDE was not in attendance) an opportunity to comment on the preliminary alternatives.

- USACE noted that other options at the northern terminus would be appropriate if they did not result in additional stream crossings.
- USACE and EPA requested that the number and type of streams crossed (perennial, intermittent, and ephemeral) and linear feet of impacts be identified.
- The ARDS submittal should include known archeological sites and both temporary and permanent impacts. (Note: These items were addressed and are reflected in **Table 5.1**, page 43).
- The agencies recommended that new impervious surface should be calculated but it was agreed that these will be calculated during detailed studies.
- MCDOT should present a draft of the ARDS to the public prior to agency concurrence on the ARDS.

### **March 28, 2007**

The project team met with USACE, MDE, and EPA to present the preliminary impacts for Alternatives 3 through 11 and Master Plan Alignment Northern Terminus Options A through C.

- For Alternatives 7 and 8, USACE asked to extend them to I-270 and review the respective I-270 interchanges for capacity. (Note: Following the meeting, Alternatives 7 or 8 were found not to have a traffic impact on the I-270 interchanges at MD 124, Watkins Mill Road, and Middlebrook Road.)

- M-NCPPC requested that potential impacts include those to County FIDS and County RTE species. (Note: **Table 5.1** (page 43) includes impacts to FIDS, and County RTE species coincide with the state list. No RTE species have been recorded in the project area.)
- MCDOT stated that the public workshop would present the range of alternatives and that the County's recommendations for ARDS would be postponed until Fall 2007.

### **July 20, 2007**

The project team again met with the agencies to preview the revised preliminary recommendations for ARDS. EPA was unable to attend.

- The alternatives recommended by MCDOT for ARDS would include Alternatives 1, 2, 4, 8, 9, and 11 and Master Plan Alignment Northern Terminus Options A and C.
- M-NCPPC recommended Alternatives 1, 2, 4, 5, 9, 10 (with Master Plan Alignment Northern Terminus Option A), and 11 be retained for detailed study.
- The USACE recommended that Alternatives 1, 2, 5, 7, and 8 be retained and to drop Alternative 9 from further consideration; they would wait for public comments before stating an opinion about Alternative 4. Optional alignments should also be provided for Alternative 9 in the Whetstone Run stream valley if it is retained.

### **April 10, 2008**

The project team met with the agencies to review the County's revised ARDS recommendations.

- MCDOT's recommended ARDS included Alternatives 1, 4, 5, 8 and 9 and Master Plan Alignment Northern Terminus Options A and C.
- MCDOT presented two new concepts for Alternative 5: 1) Alternative 5 with Service Roads that would reduce access points within the project area from 82 to 42 and travel time by 1.0 minute; and 2) Alternative 5 with Interchanges at Montgomery Village Avenue, Watkins Mill Road, Middlebrook Road and MD 27 and a grade-separated movement at the Midcounty Highway/ Montgomery Village Avenue intersection that would reduce the number of access points from 82 to 54 and travel time by 5.6 minutes. Alternative 5 with Service Roads was agreed to be included as recommended for ARDS.
- USACE recommended that Alternative 2 (TSM/TDM) and Alternative 7 be retained.
- MDE stated that they do not favor Alternatives 8 or 9 because of the magnitude of impacts.
- MCDOT agreed to distribute a draft ARDS concurrence package for agency review and comment.

### **November 17, 2009**

The project team met with the agencies to review the Alternative 9 studies that MCDOT conducted since the April 2008 meeting and the revised recommendations for ARDS.



- MCDOT presented an analysis of seven alternative bridges at the Alternative 9 crossing of Great Seneca Creek and three alternatives for the crossing of Whetstone Run.
- USACE and EPA requested further study of a bridge at Great Seneca Creek that requires no stream armoring or relocation, spans both the primary and secondary channels, and whose cost is compared to the total project cost in determining practicability.
- MDE agreed with USACE and EPA recommendations but would like a field review of the crossing site; MDE would prefer stream bank armoring instead of stream relocation.
- USACE and MDE generally agreed to pursue the Alternative 3 alignment shift for the alternatives for the Whetstone Run crossing of Alternative 9 USACE would require justification for not pursuing Alternatives 1 and 2 and would like to see additional minimization in design.
- MCDOT's recommendation for ARDS included Alternatives 1, 2, 4, 5, 8 and 9 with Master Plan Alignment Northern Terminus Options A and C.

## **2. Agency Comments**

### **June 2008 Draft ARDS Document**

USACE and EPA performed an informal review of a preliminary draft ARDS package submitted by MCDOT in June, 2008.

- USACE suggested that Alternative 10 should be carried forward for further consideration because of low impacts to aquatic resources, noting their opinion that the safety issues with Alternative 10 could be solved.
- USACE raised concerns that Alternatives 8 and 9 have extensive environmental impacts when compared to the other build alternatives, making them individually ineligible to qualify as a "least environmentally damaging practicable alternative" (LEDPA).
- EPA requested further information be provided to support that Alternatives 3, 6, 10, and 11 be removed from ARDS.

### **November 2009 Briefing of MCDOT's Recommended ARDS**

Subsequent to the November 17, 2009 team meeting, USACE, EPA and M-NCPPC provided the following comments:

- USACE raised concerns about the ability to obtain permits for the stream relocations at Great Seneca Creek and Whetstone Run and the potential impacts to Watkins Mill Elementary School.
- EPA raised concerns about Alternative 10 being removed from ARDS, since half of the alignment is identical to Alternative 4. If Goshen Road widening has extensive takings, it would severely limit the options for upgrading existing roads, leaving only MD 355.



- EPA emphasized that streams such as Whetstone Run or Great Seneca Creek, even if avoided by bridging, would be adversely impacted by clearing, impervious surface, and other construction activities.
- M-NCPPC supported the ARDS as recommended.
- MNCPPC suggested that specific details of Alternatives 2 and 5 should both be revisited in the future to reflect changes in the CLRP that could result from the County's Bus Rapid Transit (BRT) study.

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## VI. RECOMMENDATION FOR ALTERNATIVES RETAINED FOR DETAILED STUDY

Eleven (11) alternatives and three (3) master plan alignment northern terminus options, consisting of improvements to existing roadways and/or new roadway alignment, were evaluated based on their transportation benefits and environmental impacts. Of the eleven (11) alternatives and three (3) northern terminus options, the following six (6) alternatives and two (2) northern terminus options **are recommended** for detailed study:

- Alternative 1, No Build
- Alternative 2, Transportation Systems Management/Transportation Demand Management
- Alternative 4, Goshen-Wightman-Brink
- Alternative 5, MD 355
- Alternative 8, Master Plan Alignment from Watkins Mill Road
- Alternative 9, Master Plan Alignment
- Options A and C, Northern Terminus of Master Plan Alignment

The following five (5) alternatives and one (1) northern terminus option **are not recommended** for detailed study:

- Alternative 3, Montgomery Village-Wightman-Brink
- Alternative 6, MD 355-Lower & Upper Watkins Mill-Master Plan Alignment
- Alternative 7, MD 355-Middlebrook-Master Plan Alignment
- Alternative 10, Muncaster Mill-Snouffer School-Wightman-Brink
- Alternative 11, Montgomery Village-Stedwick-Upper Watkins Mill-Master Plan Alignment
- Option B, Northern Terminus of Master Plan Alignment

The ARDS recommendations were developed based on the environmental analysis, transportation evaluation, agency input, and public comments presented in Section V. Summaries of the key environmental and transportation characteristics that formed the basis for the recommended ARDS are presented below for each alternative. The alternative summaries also include descriptions of additional studies completed subsequent to the preliminary evaluations presented in Section V and recommendations for additional studies to be completed during the detailed study phase of the project.

### A. ALTERNATIVE 1, NO BUILD

Alternative 1, No Build, is recommended to be retained for comparison to the build alternatives because it serves as a baseline if no action is taken.

#### *Elements for Further Study*

During detailed studies, the definition of Alternative 1, No Build, will be updated to reflect the most currently adopted Metropolitan Washington Council of Governments (MWCOG) constrained long-range plan (CLRP) and associated travel demand model with the most recently adopted land use forecast (households and employment) for the region. The alternative will also be updated to reflect changes to planned and programmed projects that have occurred since 2006.

B. ALTERNATIVE 2, TRANSPORTATION SYSTEM MANAGEMENT (TSM)/TRAVEL DEMAND MANAGEMENT (TDM)

Alternative 2 was developed to determine the impact that minor transit service enhancements and intersection improvements would have on reducing congestion. Although Alternative 2 would not significantly address the need for traffic safety, mobility, and pedestrian/bicycle improvements, Alternative 2 is proposed to be carried forward for detailed study for the following reasons:

- Provides improvements by utilizing existing infrastructure;
- Has the least impact to natural resources, parks, and property;
- Provides moderate relief to over-congested intersections in the study area;
- Improves peak-hour travel times;
- Can be combined with other alternatives for more widespread study area congestion relief.

*Elements for Further Study*

Other TSM measures may be considered (in addition to spot intersection improvements and signal timing) and/or TDM measures that could be applied to only the study area. M-NCPPC is performing a bus study for the MD 355 corridor and the findings of that study may be incorporated into the future definition of Alternative 2.

C. ALTERNATIVE 4, GOSHEN-WIGHTMAN-BRINK

Alternative 4 is one of three alternatives (3, 4 and 10) that were developed along the Muncaster Mill Road-Snouffer School Road-Wightman Road-Brink Road corridor on the eastern side of the study area. The alternative offers improvements to traffic congestion, travel times, safety, efficiency, and pedestrian/bicycle access with relatively low environmental impacts.

*Additional Studies Completed*

Alternative 4, when originally evaluated in 2007 had moderately high ephemeral stream impacts that primarily occur at the intersection of Goshen Road and Midcounty Highway. Since the preliminary impact evaluation, further studies indicate that the majority of the estimated stream impact can be reduced by 1) not considering existing piped lengths of stream, and 2) avoiding impacts through roadway shifts, steeper fill slopes, and retaining walls.

*Recommendation*

While Alternative 4 would improve the fewest number (24) of intersections of all the build alternatives, the difference between the other alternatives is not considered excessive. Alternative 4 is being retained for the following reasons:

- Reduces the number of over-congested intersections;
- Substantially improves peak-hour travel times;
- Improves safety of existing roads through geometric and median improvements;
- Significantly improves pedestrian and bicycle access through the construction of new sidewalk and bike facilities;
- Utilizes existing roadway infrastructure;

- Utilizes planned improvements to Goshen Road which is being completed by MCDOT under a separate contract;
- Requires relatively low natural resource, park, and property impacts.

#### *Elements for Further Study*

Alternative 4 will require improvements to the horizontal and vertical geometry of Brink Road and Wightman Road to satisfy a design speed that is appropriate for a regional arterial. In addition, other geometric improvements may be required to eliminate skewed intersections, ensure safe access to a high number of adjacent driveways, raise the road elevation and improve bridge hydraulics to reduce flooding, and address any special transportation needs of the adjacent residential and agricultural communities.

#### D. ALTERNATIVE 5, MD 355 WITH SERVICE ROADS

Alternative 5 was developed to determine if improvements within the heavily-traveled MD 355 corridor would be sufficient to satisfy the project purpose and need. Since the majority of MD 355 is built out to its Master Planned 6-lane section, the required improvements primarily consist of additional turning lanes and auxiliary lanes along the corridor. Consequently, Alternative 5 has the lowest environmental impacts among the alternatives. The transportation evaluation determined that Alternative 5 would effectively improve congestion, travel times and pedestrian/bicycle access. However, there are concerns that Alternative 5 cannot achieve the safety needs of the study since it already has historical crash rates that are higher than the statewide average for similar type roadways. It is believed that the high crash rates can be largely attributed to the high number of at-grade intersections and driveways (over 100) and high traffic volumes in the corridor.

#### *Additional Studies Completed*

Because of concerns with adding additional traffic to a corridor possessing a large number of driveways and a high crash rate history, it was originally recommended that Alternative 5 not be retained for detailed study. As described in Section IV, Alternative 5 was originally developed with a 4/6-lane divided arterial roadway section, similar to the other preliminary alternatives. During the December 2007 public meeting comment period, M-NCPPC suggested that Alternative 5 be further evaluated with additional access control measures such as service roads and interchanges that would reduce the number of entrances and presumably reduce crash rates in the corridor. A subsequent study of service roads along MD 355 indicates that service roads could be implemented to substantially consolidate the service entrances along the corridor. The environmental and transportation impacts for a modified Alternative 5 with service roads need to be studied in greater detail to fully determine the impacts and effectiveness of service road improvements along the corridor. (Note: the impacts presented in **Table 5.1** (page 43) and **Table 5.2** (page 51) are for Alternative 5 without service roads. With service roads, businesses could potentially be impacted by changes in access, loss of property/parking, or displacement.)

#### *Recommendation*

Alternative 5 with Service Roads is proposed to be carried forward for detailed study for the following reasons:

- Reduces the number of over-congested intersections;



- Provides moderate improvement in travel time along the MD 355 corridor and other adjacent corridors;
- Consolidates entrances and improves the safety of the corridor;
- Improves pedestrian and bicycle access;
- Provides improvements by utilizing existing infrastructure;
- Results in low natural resource, park, and property impacts.

#### *Elements for Further Study*

Alternative 5 will be further refined to achieve balance between the scale/extent of transportation improvements and the residential/commercial impacts. Any changes in access which could indirectly affect businesses (e.g., increased circuitry of access, limitations on left turns, and changes in visibility of entrances) will be assessed in detail. Traffic analyses will be completed to determine the effects of consolidating traffic at fewer intersections along the corridor.

#### E. ALTERNATIVE 8, MASTER PLAN ALIGNMENT FROM WATKINS MILL ROAD

Alternative 8 is a truncated version of the Master Plan Alignment (Alternative 9) that terminates on the south at Watkins Mill Road. In lieu of extending Midcounty Highway along the master plan alignment to merge with the existing Midcounty Highway at Montgomery Village Avenue, traffic would be required to divert to Watkins Mill Road, MD 355, and Montgomery Village Avenue. This alternative was proposed to eliminate the environmental impacts to Whetstone Run between Watkins Mill Road and Montgomery Village Avenue while maintaining the high level of transportation benefits associated with the Master Plan Alignment.

Truncating the Master Plan Alignment at Watkins Mill Road would eliminate impacts to more than 2 acres of wetland and floodplain, four new stream crossings, and more than 15 acres of forest as compared to Alternative 9. (Note: With additional refinements to be studied for Alternative 9 at Whetstone Run, as discussed in Section VI.F, (page 72), the difference in impacts between Alternatives 8 and 9 are likely to be less).

#### *Additional Studies Completed*

The additional studies described in Section VI.F (page 72) for Alternative 9 at the Great Seneca Creek crossing also apply to Alternative 8.

#### *Recommendation*

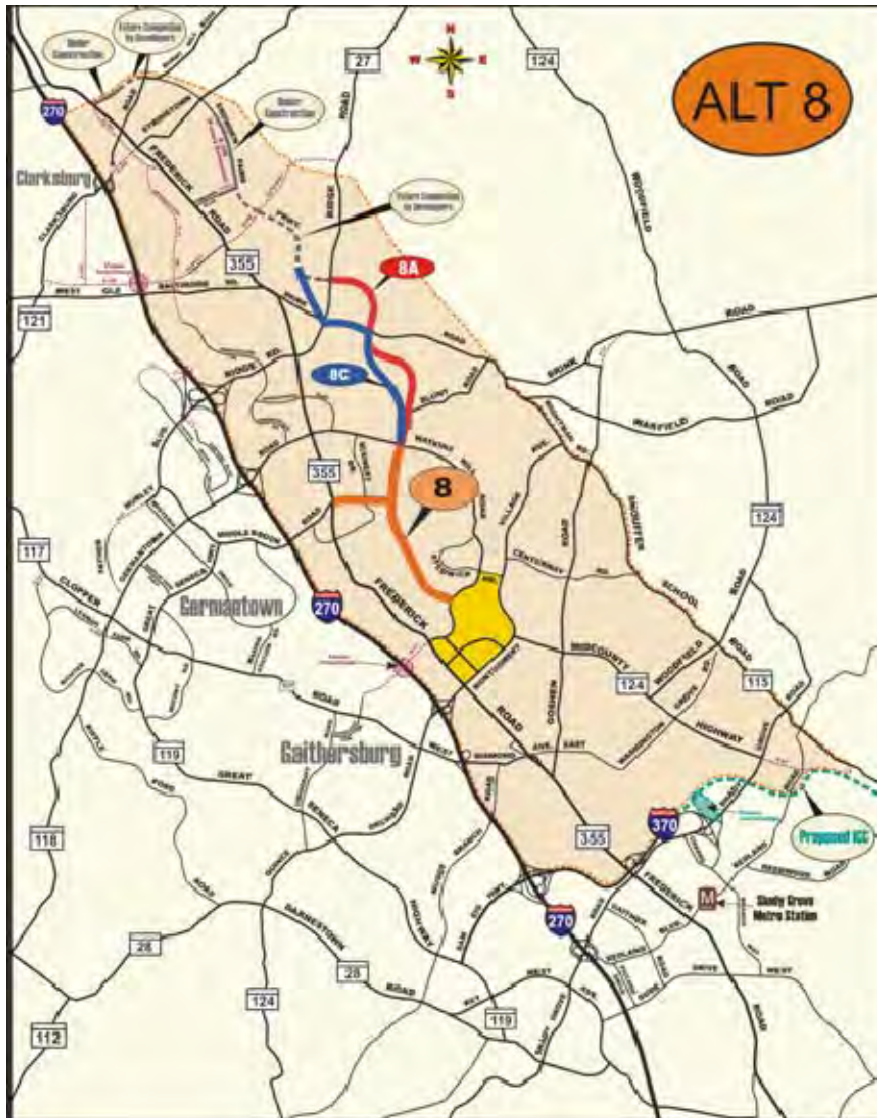
While Alternative 8 has higher environmental impacts relative to other alternatives, it is believed that the impacts can be significantly reduced through the implementation of avoidance, minimization and mitigation measures. Alternative 8 is proposed to be carried forward for the following reasons:

- Reduces the number of over-congested intersections;
- Improves travel times along the alternative and other adjacent corridors;
- Significantly improves safety by providing a partially access controlled corridor with significantly fewer entrances and intersections than other adjacent corridors;
- Provides for the separation of regional and local traffic;
- Increases capacity and mobility by adding an additional north-south corridor;

- Provides an alternative route for emergency vehicles and incident management on I-270 and MD 355;
- Significantly improves pedestrian and bicycle access through the construction of new sidewalk and bike facilities;
- Avoids Whetstone Run south of Watkins Mill Road.

### *Elements for Further Study*

South of Watkins Mill Road, spot intersection improvements will be evaluated within an area bounded by MD 355 on the southwest, Watkins Mill Road on the northwest, Stedwick Road on the northeast, and Montgomery Village Avenue on the southeast, as shown in Figure 6.1 below. These spot improvements would facilitate north-south through movements between existing Midcounty Highway and Watkins Mill Road.



**Figure 6.1 – Alternative 8, Master Plan Alignment from Watkins Mill Road**

Additional items for further study include:

- Minimization of wetland and stream impacts through bridging, retaining walls, alignment shifts and roadway narrowing at Great Seneca Creek and other stream crossings;
- Minimization studies for other natural resources;
- Avoidance and minimization options at Dayspring Retreat Center;
- Alternative connections to Watkins Mill Road.

#### F. ALTERNATIVE 9, MASTER PLAN ALIGNMENT

Alternative 9, Master Plan Alignment, has been proposed in the County's Master Plan since the 1960s as an extension of Midcounty Highway (M-83). Alternative 9 would complete the master planned link between existing Midcounty Highway on the south and Snowden Farm Parkway on the north and would reduce congestion, minimize travel times and significantly improve capacity, mobility, safety, efficiency and pedestrian/bicycle access. While Alternative 9 would provide a very high level of transportation benefits, the alternative also has some of the highest potential environmental impacts of all the alternatives.

##### *Additional Studies Completed*

Because of the high environmental impacts associated with the preliminary evaluation of Alternative 9, the concurring agencies expressed concern with carrying Alternative 9 forward into detailed studies. A study of potential avoidance and minimization measures was subsequently completed to further define the potential environmental impacts of Alternative 9. The study included:

- Bridges at 8 stream crossings along the corridor;
- Seven bridge crossing alternatives at Great Seneca Creek;
- Three alternatives at Whetstone Run, south of Watkins Mill Road;
- Potential bridges, retaining walls, roadway section modifications, and alignment shifts that would reduce total wetland impacts in the range of 2-5 acres;
- Stream, wetland, and floodplain impacts that are at a level that is commensurate with other alternatives. (Note: These impact reductions are not reflected in the impact summary table, **Table 5.1** (page 43, in Section V.A.)

In the November 17, 2009 meeting to review the study results, the Concurring Agencies recommended:

- Further study of a Seneca Creek bridge alternative that avoids armoring, piping, or relocation of Great Seneca Creek and minimizes wetland impacts;
- Further study of a Whetstone Run alternative that incorporates retaining walls, reductions in the cross section, and a western alignment shift to minimize impacts to the stream, wetland, and floodplain; and the ballfields at Watkins Mill Elementary School and South Valley Park. A portion of Whetstone Run would be realigned and restored to a stable geometry with a wooded riparian buffer.

### *Recommendation*

Alternative 9 is proposed to be carried forward for detailed study for the following reasons:

- Reduces the number of over-congested intersections;
- Has the lowest travel time among the alternatives and improves travel times on other adjacent routes;
- Significantly improves safety by providing a new partially access controlled corridor with significantly fewer entrances and intersections than other adjacent corridors;
- Provides for the separation of regional and local traffic;
- Increases capacity and mobility by adding an additional north-south corridor;
- Provides an alternative route for emergency vehicles and incident management on I-270 and MD 355;
- Provides the highest improvements for pedestrian and bicycle access through the construction of new sidewalk and bike facilities;
- Supports the planned growth in the County's Master Plan.

### *Elements for Further Study*

The following measures would be evaluated as Alternative 9 is developed in further detail:

- Minimization of wetland and stream impacts through bridging, retaining walls, alignment shifts and roadway narrowing at Great Seneca Creek, Whetstone Run and other stream crossings;
- Minimization studies for other natural resources;
- Avoidance and minimization options at Dayspring Retreat Center;
- Alternative connections to Watkins Mill Road.

## G. MASTER PLAN ALIGNMENT NORTHERN TERMINUS OPTION A

Northern Terminus Option A for Alternatives 8 and 9 represents the Master Plan Alignment from Blunt Road to its northern terminus at MD 27/Snowden Farm Parkway. This option is recommended to be carried forward for the following reasons:

- Provides a perpendicular crossing of Dayspring Creek;
- Minimizes impacts to the Dayspring Retreat;
- Avoids residential properties along Brink Road;
- Provides a direct connection with future Snowden Farm Parkway;
- Represents the alignment for Midcounty Highway established in the County Master Plan.

### *Elements for Further Study*

Wildcat Road and Davis Mill Road are designated as Rustic Roads, and are associated with several historic structures that may support this area's designation as a Rural Historic Landscape. Avoidance and minimization studies will be performed to preserve the rural historic characteristics of this area.



## H. MASTER PLAN ALIGNMENT NORTHERN TERMINUS OPTION C

Northern Terminus Option C for Alternatives 8 and 9 reduces impacts to the North Germantown Greenway Stream Valley Park and avoids Wildcat Branch north of Brink Road. This option is recommended to be carried forward for the following reasons:

- Avoids Wildcat Branch;
- Reduces impacts to North Germantown Stream Valley Park;
- Avoids residential properties along Brink Road.

### *Elements for Further Study*

Northern Terminus Option C increases the impacts to the Dayspring property (see Section V.A.). Additional studies must be performed to evaluate the impacts to the Dayspring Retreat Center. Wetland and stream resources at the proposed crossing of Dayspring Creek must also be further defined and evaluated.



## VII. ALTERNATIVES RECOMMENDED FOR NO FURTHER STUDY

Eleven (11) alternatives and three (3) master plan alignment northern terminus options consisting of improvements to existing roadways and/or new roadway alignment were evaluated based on their transportation benefits, environmental impacts and community input. Six alternatives and two northern terminus options are recommended to be carried forward for detailed study and are presented in Section VI. The following five (5) alternatives and one (1) northern terminus option **are not recommended** for further study:

- Alternative 3, Montgomery Village-Wightman-Brink
- Alternative 6, MD 355-Lower & Upper Watkins Mill-Master Plan Alignment
- Alternative 7, MD 355-Middlebrook-Master Plan Alignment
- Alternative 10, Muncaster Mill-Snouffer School-Wightman-Brink
- Alternative 11, Montgomery Village-Stedwick-Upper Watkins Mill-Master Plan Alignment
- Option B, Northern Terminus of Master Plan Alignment

The ARDS recommendations were developed based on environmental analysis, transportation evaluation, agency input and public comment as presented in Section V. Summaries of each alternative's key environmental and transportation characteristics that formed the recommendations for no further study are presented below. The alternative summaries also include descriptions of additional studies completed subsequent to the preliminary evaluations presented in Section V.

### A. ALTERNATIVE 3, MONTGOMERY VILLAGE -WIGHTMAN-BRINK

Alternative 3 is one of three alternatives (3, 4 and 10) that were developed along the Muncaster Mill Road-Snouffer School Road-Wightman Road-Brink Road corridor on the eastern side of the study area. Similar to Alternative 4, Alternative 3 would offer moderate improvements to traffic congestion, travel times, safety, efficiency, and pedestrian/bicycle access with relatively low environmental impacts.

#### *Recommendation*

Alternative 3 is not recommended for further study for the following reasons:

- Alternative 4 would extend the proposed 4-lane widening of Wightman Road between Montgomery Village Avenue and Goshen Road, a distance of approximately 2,000 feet. The additional widening of Wightman Road proposed under Alternative 4 would make both Goshen Road and Montgomery Village Avenue fully accessible to users of the Brink-Wightman corridor, essentially providing users in the corridor the option of using Goshen Road or Montgomery Village Avenue. The environmental impacts associated with the additional Wightman Road widening would be minor.
- Alternative 3 would include widening along Montgomery Village Avenue to accommodate bike lanes and shared use path. Under Alternative 4, similar bicycle improvements would already be included in a planned improvement along Goshen Road which is being completed by MCDOT under a separate capital improvement project.

B. ALTERNATIVE 6, MD 355-LOWER & UPPER WATKINS MILL-MASTER PLAN ALIGNMENT

Alternative 6 would utilize the master plan alignment north of Watkins Mill Road/Wafarer Road and would improve portions of Montgomery Village Avenue, MD 355, and Watkins Mill Road south of Watkins Mill Road /Wafarer Road. While the alternative would result in the greatest number of intersections that meet County congestion standards, its effect on reducing travel times, and improving safety, efficiency, and pedestrian/bicycle access would be relatively low compared to other alternatives. Alternative 6 would result in relatively high environmental impacts.

*Recommendation*

Alternative 6 is not recommended for further study for the following reasons.

- The travel times along the path of Alternative 6 and most of the other primary travel corridors in the study area would be relatively high.
- Alternative 6 would result in significant community impacts. Four schools are located along Watkins Mill Road. Two have entrances on Watkins Mill Road, and two have entrances on side streets a short distance from Watkins Mill Road. School buses must enter and exit the schools without the benefit of traffic signals, thus adding to the potential for traffic conflicts. Directing commuter traffic to this corridor would increase the likelihood of traffic conflicts between higher speed through traffic and lower speed local /school traffic.
- Alternative 6 would potentially impact pedestrian and bicycle safety. The corridor has a high potential for significant pedestrian and bicycle traffic due to the high number of neighborhoods, schools and other community facilities located along the corridor. Alternative 6 would increase vehicular through traffic volumes and increase the potential for conflicts between higher speed commuter traffic and local pedestrian/bicycle traffic.
- Residential property impacts would be very high - 243 properties - second highest among the build alternatives.
- Alternative 6 would traverse North Germantown Greenway Stream Valley Park on new alignment and would result in relatively high impacts to natural resources, parks and special protection areas without providing significant transportation improvements.

C. ALTERNATIVE 7, MD 355-MIDDLEBROOK-MASTER PLAN ALIGNMENT

Alternative 7 would follow existing roadways south of Middlebrook Road and one of the Master Plan Alignment Northern Terminus Options north of Middlebrook Road. Alternative 7 would significantly improve the number of intersections that meet County congestion standards but its effect on reducing travel times, and improving safety, efficiency, and pedestrian/bicycle access would be relatively low compared to other alternatives. Alternative 7 would avoid new crossings of Great Seneca Creek and Whetstone Run and would result in moderate environmental impacts.

### *Recommendation*

Alternative 7 is not recommended for further study for the following reasons:

- Alternative 7 would result in the highest travel times of any build alternative.
- The travel distance from the MD 27/Snowden Farm Parkway intersection to the MD 355/Middlebrook Road intersection would be longer along Alternative 7 than it would be along MD 355 (Alternative 5), with no advantage in travel time. Therefore, Alternative 7 would not effectively induce Snowden Farm Parkway and MD 27 traffic to use Alternative 7 instead of MD 355 (Alternative 5).
- Alternative 7 would add additional traffic to an already-congested MD 355/Middlebrook Road intersection.
- Alternative 7 would traverse North Germantown Greenway Stream Valley Park on new alignment and would result in relatively high impacts to parks and special protection areas, without a correspondingly high savings in travel time.
- Alternative 7 would provide a lower level of transportation service with significantly higher environmental impacts than Alternative 5.

### D. ALTERNATIVE 10, MUNCASTER MILL-SNOUFFER SCHOOL-WIGHTMAN-BRINK

Alternative 10 is also one of the three alternatives (3, 4 and 10) that were developed along the Muncaster Mill Road-Snouffer School Road-Wightman Road-Brink Road corridor on the eastern side of the study area. Alternative 10A would widen Snouffer School, Wightman, and Brink Roads to 4 lanes with a 16-foot raised median. Alternative 10B would provide the same 4-lane divided section along Wightman and Brink Roads but would utilize a 5-lane undivided section on Snouffer School Road that is consistent with improvements programmed by the County between Woodfield and Goshen Roads under a separate capital improvement project. Alternative 10B also includes additional auxiliary lanes along portions of Snouffer School Road that are beyond the programmed improvements.

Alternative 10A and 10B would both offer moderate improvements to traffic congestion but their improvements on travel times, safety, efficiency, and pedestrian/bicycle access are relatively low compared to the other build alternatives. On the other hand, Alternative 10A and 10B impacts on wetlands, streams, forest and parks would be relatively low compared to the other build alternatives. However their impacts to farmland are high and their impacts to total properties are significantly higher than the other build alternatives.

A significant disadvantage of Alternative 10 (A or B) is that the corridor possesses approximately 139 streets, entrances and driveways that provide access to adjacent residential communities, industrial parks and businesses. The large number of intersections creates numerous points of conflict between through traffic and local traffic accessing the various properties. Improving Alternative 10 to accommodate additional regional traffic within the study area would increase the potential for conflicts between local and regional traffic. Consequently, Alternative 10 would not

likely meet the purpose and need criterion of improving vehicular and pedestrian safety unless the number of access points along the corridor could be reduced.

The section of roadway with the greatest density of intersections is the segment fronting Montgomery County Airpark Industrial Park between Centerway Road and Woodfield Road. Within this 1-mile stretch of Snouffer School Road, there are currently 25 driveways and two local streets providing access to several businesses on the east side of the road, as well as six local streets providing access to residential communities on the west side of the road. Managing the potential conflicts between through traffic and the turning traffic, including significant truck traffic, would be very challenging under either Option A (4-lane divided) or B (5-lane undivided).

Option 10A, 4-Lane Divided would limit the number of left turn locations by constructing a raised median with left turn storage bays. However, there are too many business entrances to provide a median break at every driveway, so some businesses could only be accessed from the north by making a U-turn at designated median breaks and doubling back to the business entrance. The number of left turns at these median breaks would not likely warrant a signal, meaning that left-turning vehicles would have to wait for a gap in the two lanes of on-coming northbound traffic to safely make the U-turn. Likewise, vehicles desiring to go south after exiting a business would be required to travel north to the next available median break or intersection, and make a U-turn. Requiring a large number of vehicles (many of which are trucks) to perform left turning movements and U-turns at un-signalized median breaks would not be conducive to improving safety. Similarly, eliminating the unsignalized median breaks and requiring all U-turns to be made at signalized intersections would overload the intersection operations.

Option 10B, 5-Lane Undivided would continue to allow left turns for ingress/egress to all of the driveways and streets along the corridor. This would result in a significant volume of left turns being completed from the center turn lane to the business entrances on the east side of the road and to the local streets such as Autumn Drive, Mallory Place, and Carriage Walk Circle on the west side of the road. While this situation currently exists along this segment, traffic operations and safety would decline with the addition of more commuter traffic that would result from the implementation of Alternative 10B. The inability to control these conflict points would be a major detriment to the operations and safety of Option B, 5-Lane Undivided.

#### *Additional Studies Completed*

To reduce the number of entrances and streets and improve the operations and safety along Snouffer School Road, consideration was given to closing some of the driveways of some businesses along Snouffer School Road. Closing these driveways would restrict access to these businesses from Beechcraft Avenue via Bonanza Way and Mooney Drive and would impact other businesses by requiring an easement acquisition through an adjacent property. Furthermore, rear entrance driveways would displace their already-limited parking spaces.

Consideration was also given to constructing a parallel frontage road along northbound Snouffer School Road to consolidate the number of driveways. However, many of the businesses are not set back sufficiently from Snouffer School Road to accommodate construction of a frontage road and/or would lose parking spaces that could not be replaced elsewhere in their properties.

Finally, consideration was given to providing an alternative exit from Woodfield Road in order to reduce the number of left turn vehicles exiting the industrial park via Snouffer School Road. This would require improvement of the existing emergency exit driveway from the Beechcraft Avenue cul-de-sac and would result in substantial volumes of traffic, including truck traffic, traversing the parking lot of a small shopping center. Also, constructing a driveway behind the industrial park would encroach into the aviation clear zone for the Montgomery Airpark.

One of the advantages of Alternative 10 during the preliminary analysis was its low stream impacts, particularly when compared to Alternative 4. The preliminary analysis provided that the potential stream impacts by Alternatives 4 would be approximately 800 linear feet more than Alternative 10. However, this difference in stream impacts is attributable almost entirely to ephemeral stream impacts. The study team reexamined the ephemeral stream impacts of Alternative 4, which occur primarily at the intersection of Goshen Road and Midcounty Highway, and determined that 336 linear feet of the quantified impact is already piped under Midcounty Highway and another 283 linear feet of the quantified impact can potentially be avoided by widening Midcounty Highway on the opposite side of the road. Consequently, the difference in stream impacts between Alternative 4 and Alternative 10 is now only approximately 200 feet.

### *Recommendation*

Alternative 10 is not recommended for further study for the following reasons:

- The transportation improvements to travel times, safety and efficiency are relatively low compared to the other build alternatives.
- Alternative 10 would result in the largest number of potential traffic conflict points (139 intersections and driveways) among the build alternatives.
- Alternative 10 would result in potential conflicts between through traffic and turning traffic, including significant truck traffic, at the Montgomery County Airpark Industrial Park.
- Alternative 10 would result in higher impacts to community and cultural resources than Alternative 4.
- Alternative 10 impacts to properties (383) would be significantly higher than all of the other build alternatives.

### E. ALTERNATIVE 11, MONTGOMERY VILLAGE-STEDWICK-UPPER WATKINS MILL-MASTER PLAN ALIGNMENT

Alternative 11 follows the same alignment as Alternative 6 from the northern project limits at MD 27 to the Watkins Mill Road/Stedwick Road intersection. The circuitous southern portion of the Alternative 6 route along Watkins Mill Road-MD 355-Montgomery Village Avenue-Midcounty Highway would be replaced with a more direct route incorporating Stedwick Road, Montgomery Village Avenue, and Midcounty Highway. Consequently, Alternative 11 would have a more significant impact on travel time reduction along the alternative and would provide a corridor with



fewer intersecting streets and entrances and reduced impacts to adjacent properties and natural resources.

#### *Recommendation*

While Alternative 11 improves upon the transportation performance and environmental impacts of Alternative 6, Alternative 11 is not recommended for further study for the following reasons:

- Alternative 11's travel times along the primary study area travel corridors are relatively high compared to Build Alternatives 4, 5, 8 and 9.
- Alternative 11 would potentially impact pedestrian and bicycle safety. The corridor has a high potential for significant pedestrian and bicycle traffic due to the high number of neighborhoods, schools and other community facilities located along the Watkins Mill Road corridor. Alternative 11 would increase vehicular traffic volumes and increase the potential for conflicts between higher speed commuter traffic and local pedestrian/bicycle traffic.
- Alternative 11 would result in significant community impacts. Three schools are located along Watkins Mill Road north of Stedwick Road, creating potential conflicts between higher speed through traffic and lower speed local /school traffic.
- Alternative 11 would traverse the North Germantown Greenway Stream Valley Park on new alignment and would result in relatively high impacts to natural resources, parks and special protection areas without providing significant transportation improvements.

#### F. MASTER PLAN ALIGNMENT NORTHERN TERMINUS OPTION B

Option B is one of three options developed for the northern portion of Alternatives 6, 7, 8, 9, and 11. Of Master Plan Alignment Northern Terminus Options A, B and C, Option B would utilize existing roads to the greatest extent and would reduce impacts to streams and special protection areas. However, Option B would also increase the length of the roadway by one-half mile and would bisect a residential community located along Brink Road.

#### *Recommendation*

Option B is not recommended for further study for the following reasons:

- Option B would be the least desirable from a transportation perspective because:
  - Option B would result in a more circuitous alignment that is one-half mile longer than Options A and C
  - Option B would result in the addition of several residential driveways along the corridor; no residential driveways are located along Options A and C.
  - Option B would more than double the number of access points along the Alternative 9 corridor.
  - Option B would not result in a direct connection to Snowden Farm Parkway.

- Option B would bisect a residential community along Brink Road and impact approximately 24 properties.

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## APPENDIX

### STREAM CROSSINGS ALTERNATIVES ANALYSES AT GREAT SENECA CREEK AND WHETSTONE RUN

Alternatives analyses were conducted to identify and evaluate potential options for reducing the wetland, waterway and floodplain impacts of the Alternative 8 and 9 crossings of Great Seneca Creek and the Alternative 9 crossing of Whetstone Run.

#### GREAT SENECA CREEK CROSSING

A simplified hydraulic analysis was performed to develop seven bridge alternatives for the Alternative 8/9 crossing of Great Seneca Creek (see attached figures). The alternatives assumed an allowable one-foot increase in the 100-year flood elevation since no developed property would be affected and a revision to FEMA's floodplain mapping would not be required. At the proposed crossing location, Great Seneca Creek is conveyed in two channels, a primary channel to the south and a smaller secondary-flow channel to the north. The primary channel is approximately 32-feet wide, with 5-6 foot high unvegetated near-vertical banks. The secondary channel is approximately 20 feet wide, with 4-5 foot high unvegetated nearly-vertical banks. A stormwater management (SWM) facility discharges into the secondary channel. The secondary channel appears to be intermittent, only carrying flow during storm events and SWM pond discharges.

The first two alternatives, **Alternatives 1A and 1B**, consist of the minimum length bridge opening with floodplain culverts that would accommodate the 100-year storm event. A benefit of floodplain culverts is the preservation of flows over the entire floodplain rather than forcing the convergence of flow through a single bridge opening. Alternatives 1A and 1B propose a bridge length of 280 feet (220 feet between the toes of abutment fill slopes) and twin 9-ft diameter pipe culverts. The relatively small spacing between piers would require realignment of the stream channel to overcome the existing poor meander pattern and channel instability. Furthermore, it would be advantageous to restore the channel to the center of the valley with an orientation that would allow for non-skewed bridge piers. Bridge hydraulics would be more efficient if the piers are aligned in the direction of channel flow.

Accordingly, Alternative 1A includes the proposed realignment of approximately 1,530 linear feet of channel. In-stream structures to provide grade control, reduce near-bank shear stresses, and maintain the channel geometry would also be proposed to accommodate the realignment and associated increased channel slope. The abandoned stream channels could be converted into oxbow lakes, vernal pools, or shallow emergent wetlands. Alternative 1B proposes the same bridge and culvert structures as Alternative 1A but utilizes approximately 435 feet of the secondary channel and reduces the proposed stream realignment to approximately 760 linear feet. The 435 feet of secondary channel would require expansion to accommodate the increased flows. Alternative 1B would also require in-stream structures to provide grade control, reduce near-bank shear stresses, and maintain the channel geometry.

**Alternatives 4A and 4B** eliminate the proposed pipe culverts and propose a 295-foot bridge that would pass the 100-year storm event. These alternatives also propose stream realignments similar to Alternatives 1A and 1B that would centralize the stream within the stream valley to avoid interference with the proposed bridge piers and discourage erosion of the roadway embankment.

**Alternative 5** proposes a 355-foot bridge to span the primary channel and a single 9-foot diameter pipe culvert at the northern approach to convey the secondary channel under the proposed highway fill. Alternative 5 would reduce the proposed stream realignment to approximately 300 feet by limiting the proposed stream realignment to the bridge crossing and the upstream approach. The stream realignment is needed because the primary channel currently runs parallel to the proposed structure and would interfere with the proposed bridge piers. The proposed realignment would also eliminate two sharp meander bends that have potential to migrate in the future and impact the bridge piers. Upstream of the bridge, stream bank control structures (e.g., either rock veins or riprap, depending upon shear stress calculations) would be provided to prevent further stream migration that could ultimately undermine the roadway embankment.

**Alternative 6** eliminates the 9-foot diameter culvert proposed under Alternative 5 and proposes a 475-foot bridge that will span both the primary and secondary channels. Like Alternative 5, Alternative 6 would propose approximately 300 feet of stream realignment to accommodate the placement of the proposed bridge piers and provide a more stable stream system in the vicinity of the proposed crossing.

**Alternative 7** proposes a 750-foot bridge that would span the entire floodplain. Approximately 300 feet of stream would be realigned at the bridge crossing to accommodate the proposed piers and to provide a more stable stream system in the vicinity of the proposed crossing. Impacts and costs for each bridge alternative are presented in Table 1 below.



**Table 1 – Impact Summary of Bridge Alternatives for Great Seneca Creek**

	Bridge Alternatives						
	1A	1B	4A	4B	5	6	7
Bridge Span Length (LF)	280	280	295	295	355	475	750
Culvert/Arch	2 - 9' RCP	2 - 9' RCP	N/A	N/A	9' RCP	N/A	N/A
Length between toe of sloped abutments (LF)	220	220	235	235	295	415	720
Floodplain Fill (Ac)	2.58	2.58	2.45	2.45	1.90	1.33	0.46
Forest Impact of Highway (Acre)	3.09	3.09	2.99	2.99	2.55	2.20	1.83
Stream Piped, Filled, or Armored (LF) <sup>1</sup>	413	413	413	413	437	309	309
Stream Restoration (LF)	1,530	1,195	1,530	1,195	300 <sup>2</sup>	300 <sup>2</sup>	300 <sup>2</sup>
Wetland Impact of Highway (Ac)	2.08	2.08	1.97	1.97	1.53	0.96	0.17
Wet./Forest Impact of Stream Restoration (Ac)	2.20	1.65	2.20	1.65	0.41	0.41	0.41
Total Wetland Impact (Ac)	4.28	3.73	4.17	3.62	1.94	1.37	0.58
Bridge and Roadway Cost (\$M) <sup>3</sup>	\$9.0	\$9.0	\$9.0	\$9.0	\$11.0 <sup>4</sup>	\$13.0 <sup>4</sup>	\$16.0
Stream Restoration Cost (\$M)	\$1.5	\$1.0	\$1.5	\$1.0	\$0.5	\$0.5	\$0.5
Total Cost (\$M)	\$10.5	\$10.0	\$10.5	\$10.0	\$11.5	\$13.5	\$16.5

**Notes:**

<sup>1</sup> Abandoned segments of stream channel were not counted as impacted except where they would be piped or filled.

<sup>2</sup> Does not include channel armoring that would likely be required to further stabilize the stream channel through the bridge piers.

<sup>3</sup> Cost estimate includes roadway costs and wetland mitigation costs.

<sup>4</sup> Assumes a retaining wall would be constructed along southeast abutment to reduce stream/floodplain impacts

The bridge alternatives were presented to the concurring agencies during a November 17, 2009 meeting. The USACE expressed their preference for a bridge that achieves the following:

- avoids pipe culverts
- avoids stream realignment and armoring of the streams
- spans both the primary and secondary channels
- minimizes impacts to wetlands as deemed practicable in consideration of overall project cost.

MDE concurred with the USACE's comments but indicated that they would prefer stream bank stabilization over stream realignment.

## WHETSTONE RUN

Three alternatives were developed and analyzed for reducing the stream, wetland, floodplain and forest impacts at Whetstone Run, south of Watkins Mill Road (see attached figures).

**Alternative 1** proposes a 750-foot long bridge spanning Whetstone Run and the floodplain. Approximately 503 feet of the existing stream channel would be filled and replaced with

approximately 330 feet of relocated channel. While the bridge was considered as a means of avoiding impacts to the stream and floodplain, the channel instability and the inability to sustain vegetative growth along the banks under the bridge would require all 1,053 linear feet of the stream beneath the bridge to be armored. This alternative has an extremely high cost and fails to minimize stream impacts.

**Alternative 2** proposes a retained fill. Approximately 2,574 linear feet of stream would be filled and replaced with 2,460 feet of relocated channel. The fill would directly impact 1.7 acres of wetlands and approximately 3.65 acres of forest (of which 2.8 acres is wetland) would be excavated to replace the lost flood storage capacity of the floodplain. At least one ball field would also be impacted at Watkins Mill Elementary School. The school considers this ball field to be essential to meeting the physical education needs of the students and the ball field is also used by the County Parks and Recreation Program. This alternative has a reasonable cost but results in the greatest impact to streams, wetlands, floodplain, forest, and the adjacent ball fields.

**Alternative 3** proposes a retained fill, but also includes a western shift of the proposed alignment and a reduction in the proposed median width. This alternative would enable the wetland fill, stream relocation, and forest clearing to be significantly reduced and would preserve the ball fields on the Watkins Elementary School property. The alternative would also provide sufficient room to plant a riparian buffer on both sides of the relocated stream and would minimize the loss of flood storage. Alternative 3 would require a very minor encroachment into the adjacent Windbrooke community. Alternative 3 appears to be the best solution for balancing transportation needs, environmental and community impacts and costs at the Whetstone Run crossing. Impacts and costs for each alternative are presented in Table 2.

**Table 2 – Impact Summary for Alternatives at Whetstone Run**

	Alternatives		
	1 – Bridge	2 - Retaining Wall	3 – Alignment Shift
Bridge Length (LF)	750 <sup>1</sup>	N/A	NA
Floodplain Fill (Ac)	0.16	1.83	0.77
Forest Impact of Highway (Ac)	4.04	5.02	4.06
Stream Filled or Armored (LF)	1,053 <sup>2</sup>	2,574 <sup>3</sup>	1,173 <sup>3</sup>
Stream Relocation (LF)	503	2,460	1,103
Wetland Impact of Highway (Ac)	0.3 <sup>4</sup>	1.7	0.55
Wetland/Forest Impact of Stream Relocation (Ac) <sup>4</sup>	0.57	2.80 / 3.65 <sup>5</sup>	1.26
Cost (\$M) <sup>6</sup>	\$30.5	\$10.5	\$10.0

**Notes:**

<sup>1</sup> Bridge span assumed between Sta 154+00 to 161+50 with a retaining wall along northbound lane between Sta. 150+00 to 154+00.

<sup>2</sup> Impacts due to hardening of the channel under the bridge and realignment around bridge piers, and filling abandoned channel for stream relocation between Sta 162+50 to 165+00.

<sup>3</sup> Impacts due to filling of the abandoned stream channel.

<sup>4</sup> Wetland impacts do not include conversion impacts.

<sup>5</sup> For Alternative 2, wetland impact also includes excavation of wetlands required to re-establish a floodplain.

<sup>6</sup> Cost includes retaining walls shown on mapping, stream relocation costs, and any excavation needed to re-establish a floodplain.

The Whetstone Run alternatives were presented to the concurring agencies at the November 17, 2009 meeting. The USACE expressed their preference for Alternative 3 but requested that additional design modifications be evaluated during detailed studies to further reduce impacts (i.e., reducing the lane widths). MDE concurred with USACE's recommendations.





2008-08122-mcboaltask 1 - midcounty corridor study/cadd/display/wetland-display 1a-alt1.dgn

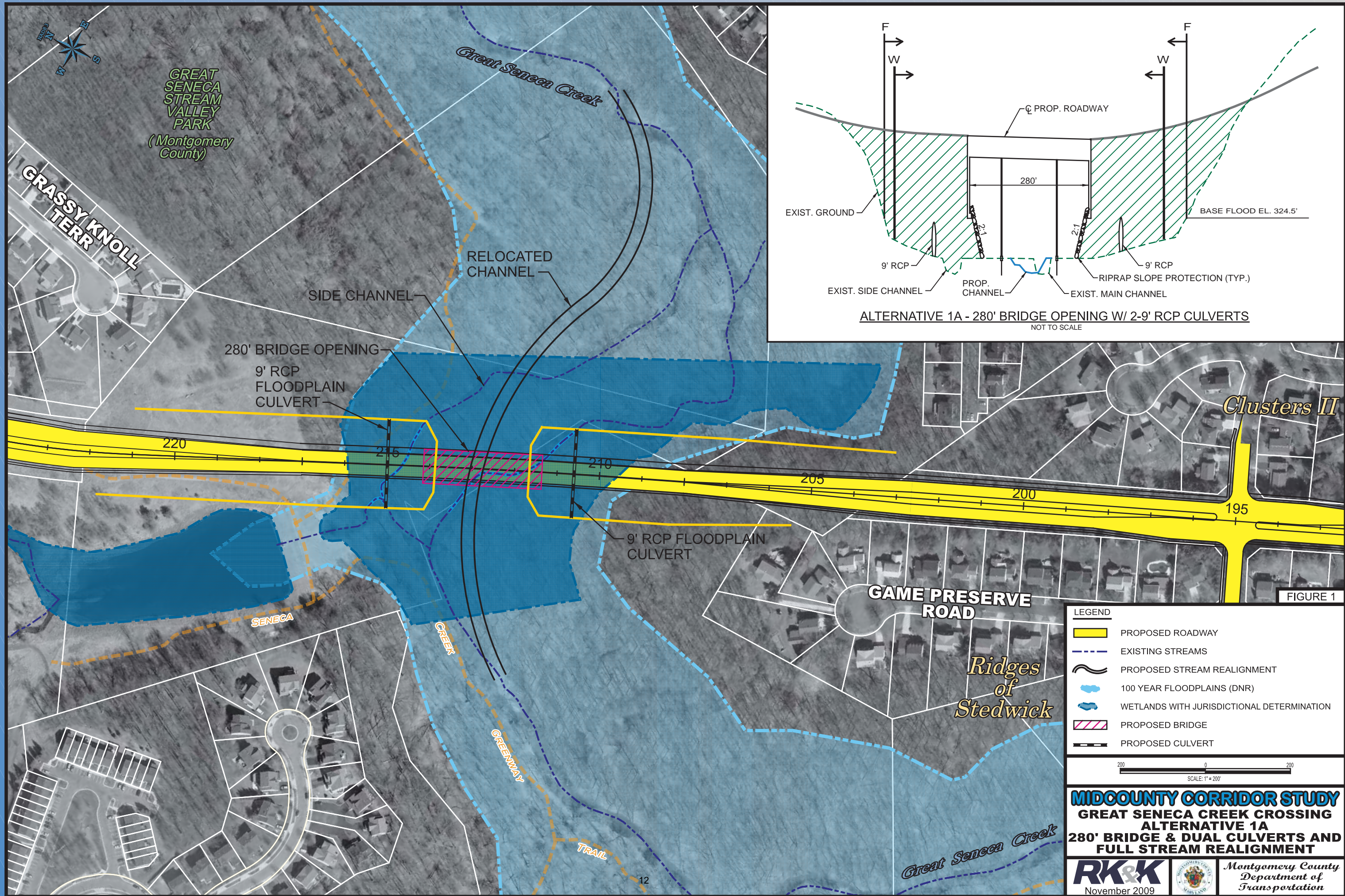


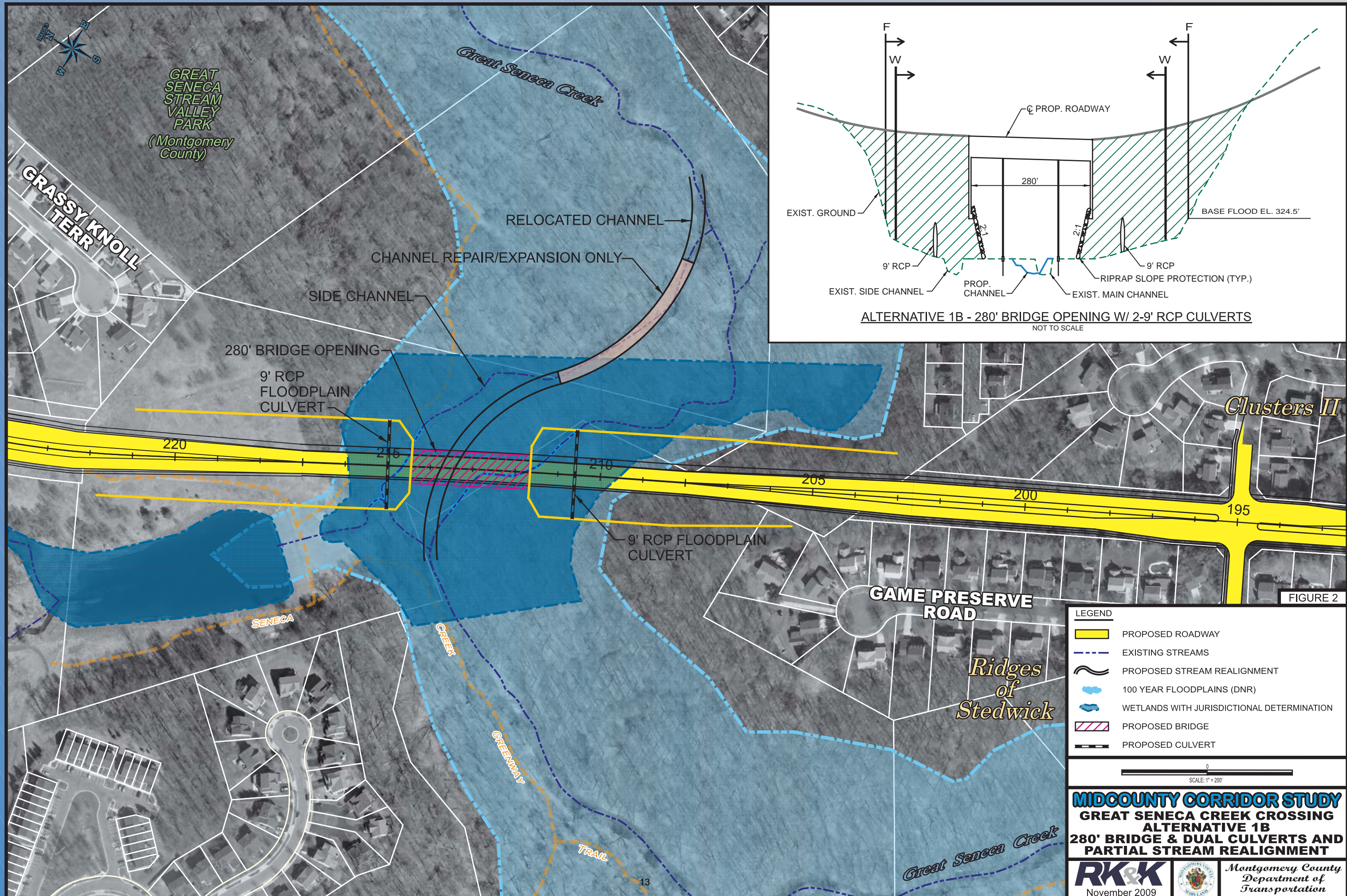
FIGURE 1







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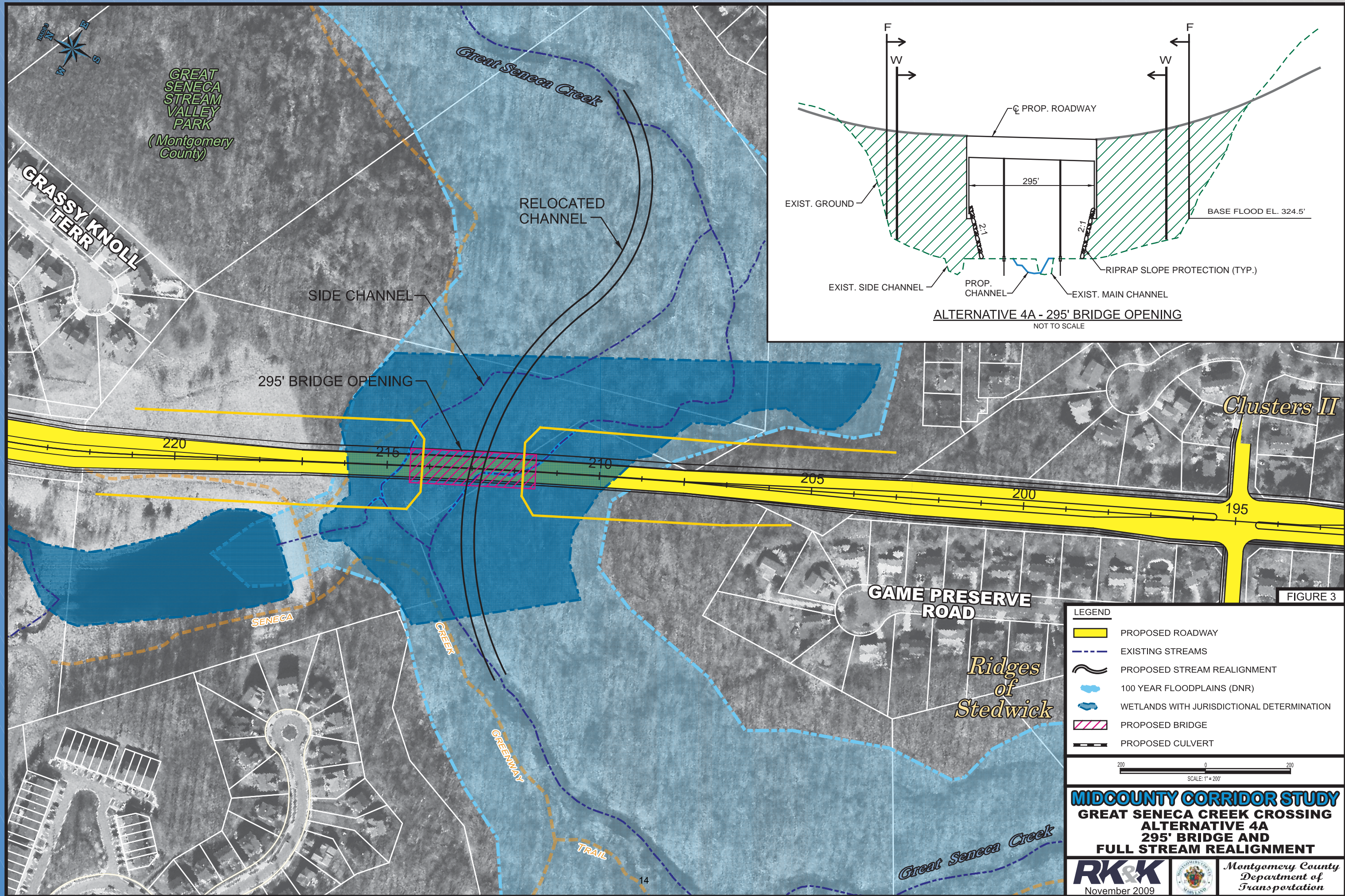








2008-08122-mcboaltask 1 - midcounty corridor study/cadd/display/wetland-display 1b-alt4A.dgn

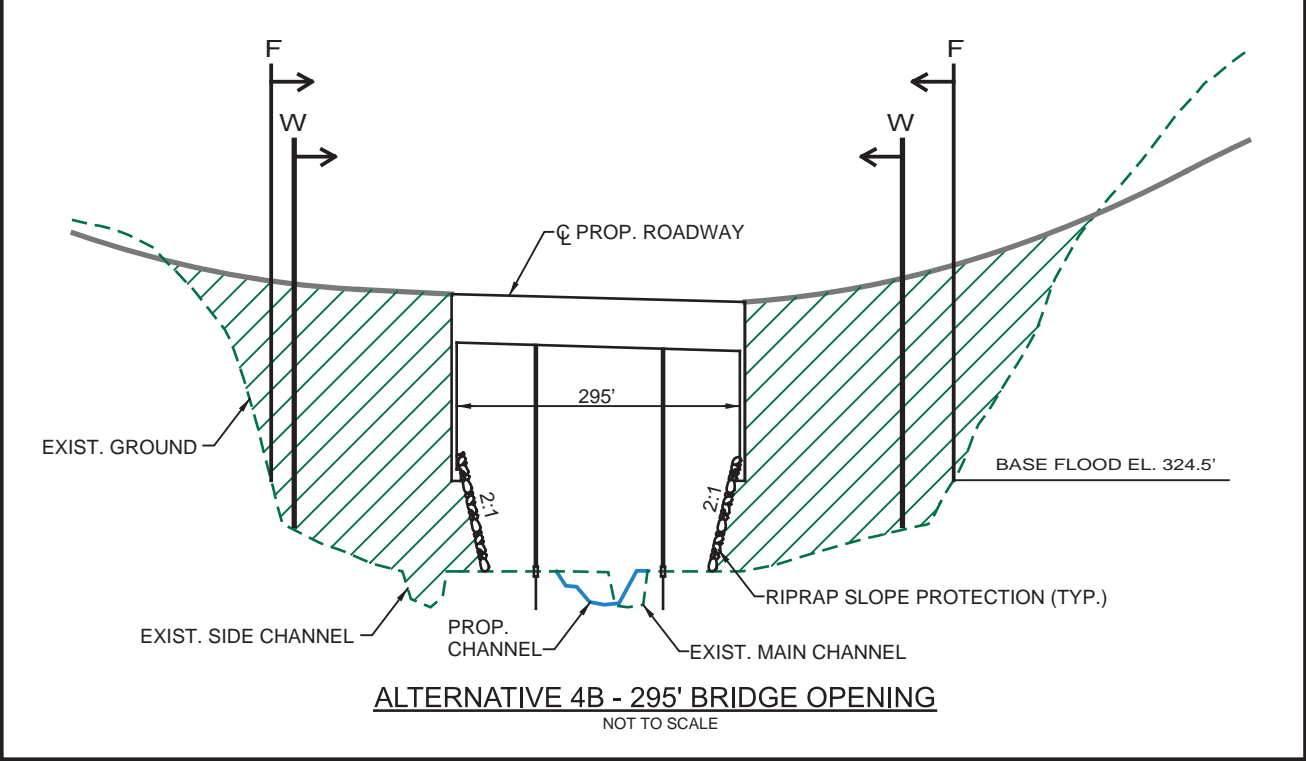
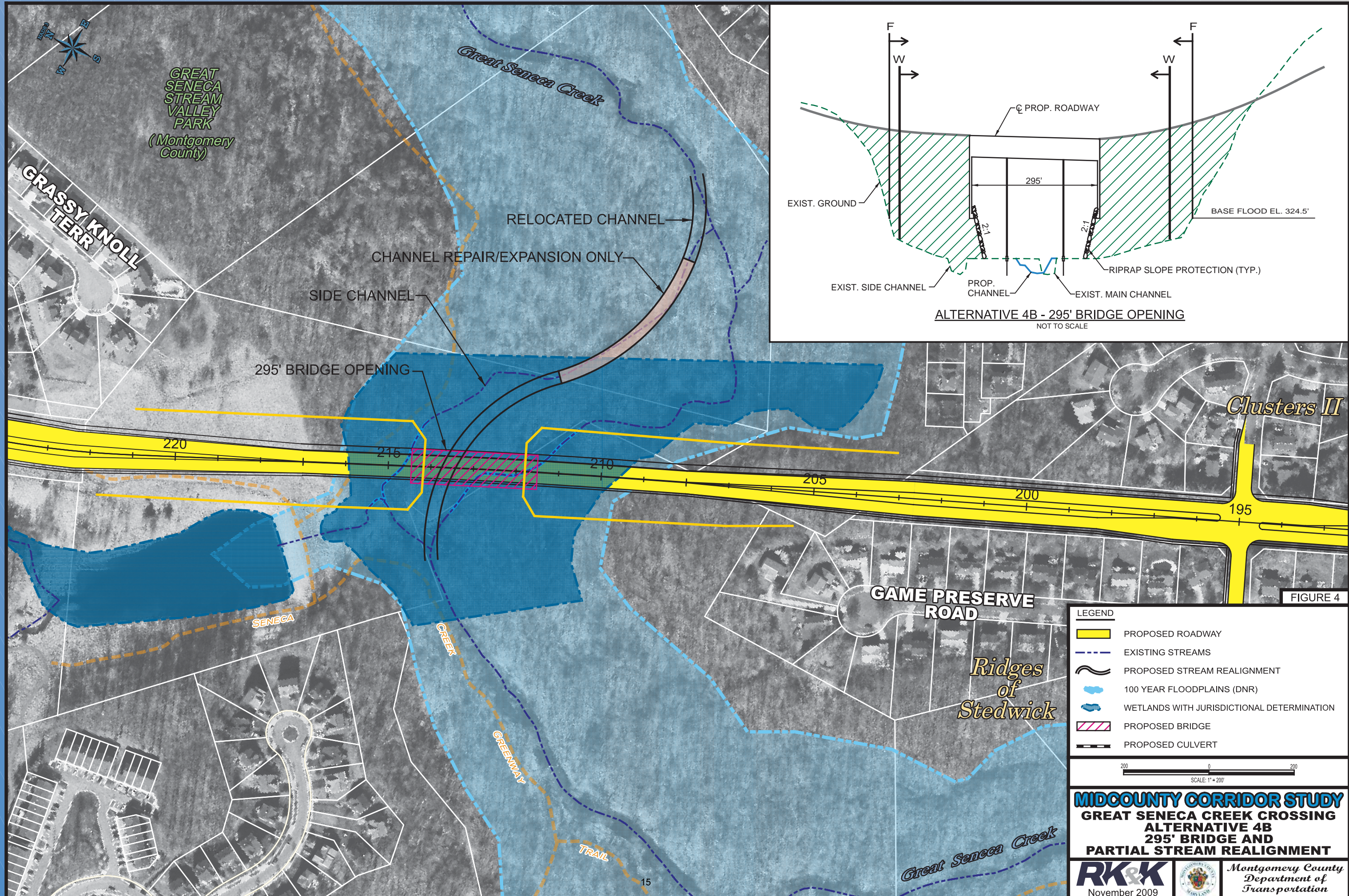




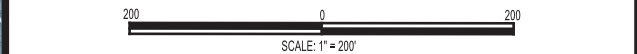




2008-08122-mcboaltask 1 - midcounty corridor study/cadd/display/wetland-display 1b-alt4B.dgn



- LEGEND**
- PROPOSED ROADWAY
  - EXISTING STREAMS
  - PROPOSED STREAM REALIGNMENT
  - 100 YEAR FLOODPLAINS (DNR)
  - WETLANDS WITH JURISDICTIONAL DETERMINATION
  - PROPOSED BRIDGE
  - PROPOSED CULVERT



**MIDCOUNTY CORRIDOR STUDY**  
**GREAT SENECA CREEK CROSSING**  
**ALTERNATIVE 4B**  
**295' BRIDGE AND**  
**PARTIAL STREAM REALIGNMENT**

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November 2009

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Department of  
Transportation

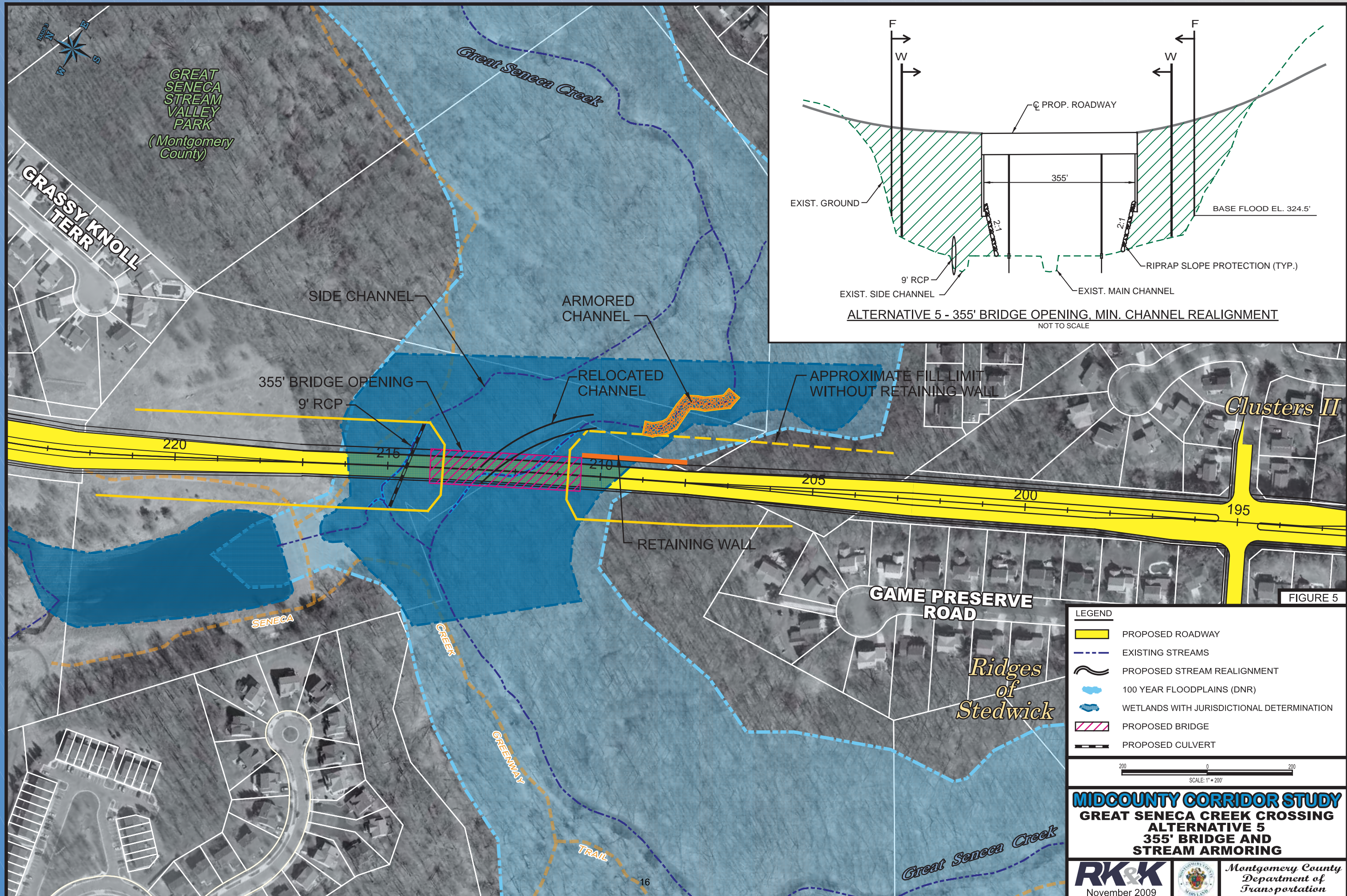
FIGURE 4







2008-08122-mcboaltask 1 - midcounty corridor study/cadd/display/wetland-display 1b-alt5.dgn



**MIDCOUNTY CORRIDOR STUDY**  
**GREAT SENECA CREEK CROSSING**  
**ALTERNATIVE 5**  
**355' BRIDGE AND**  
**STREAM ARMORING**

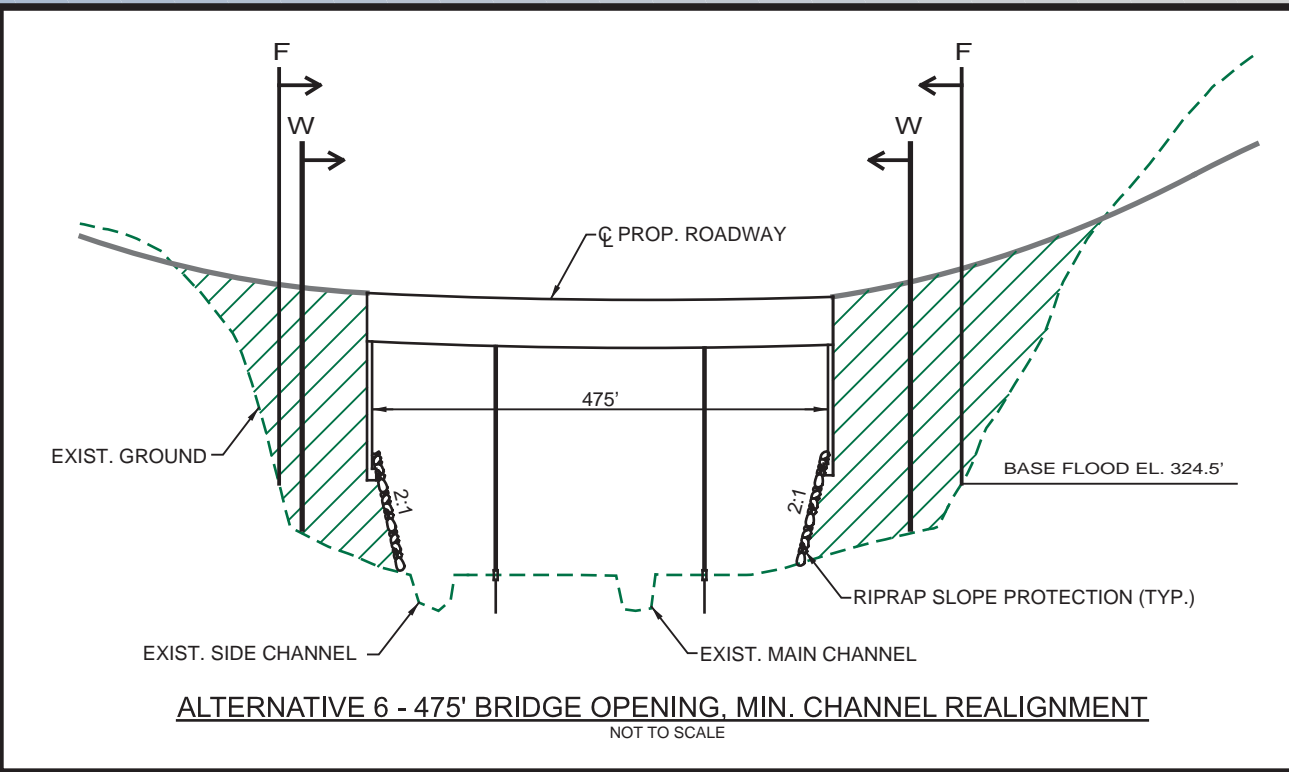
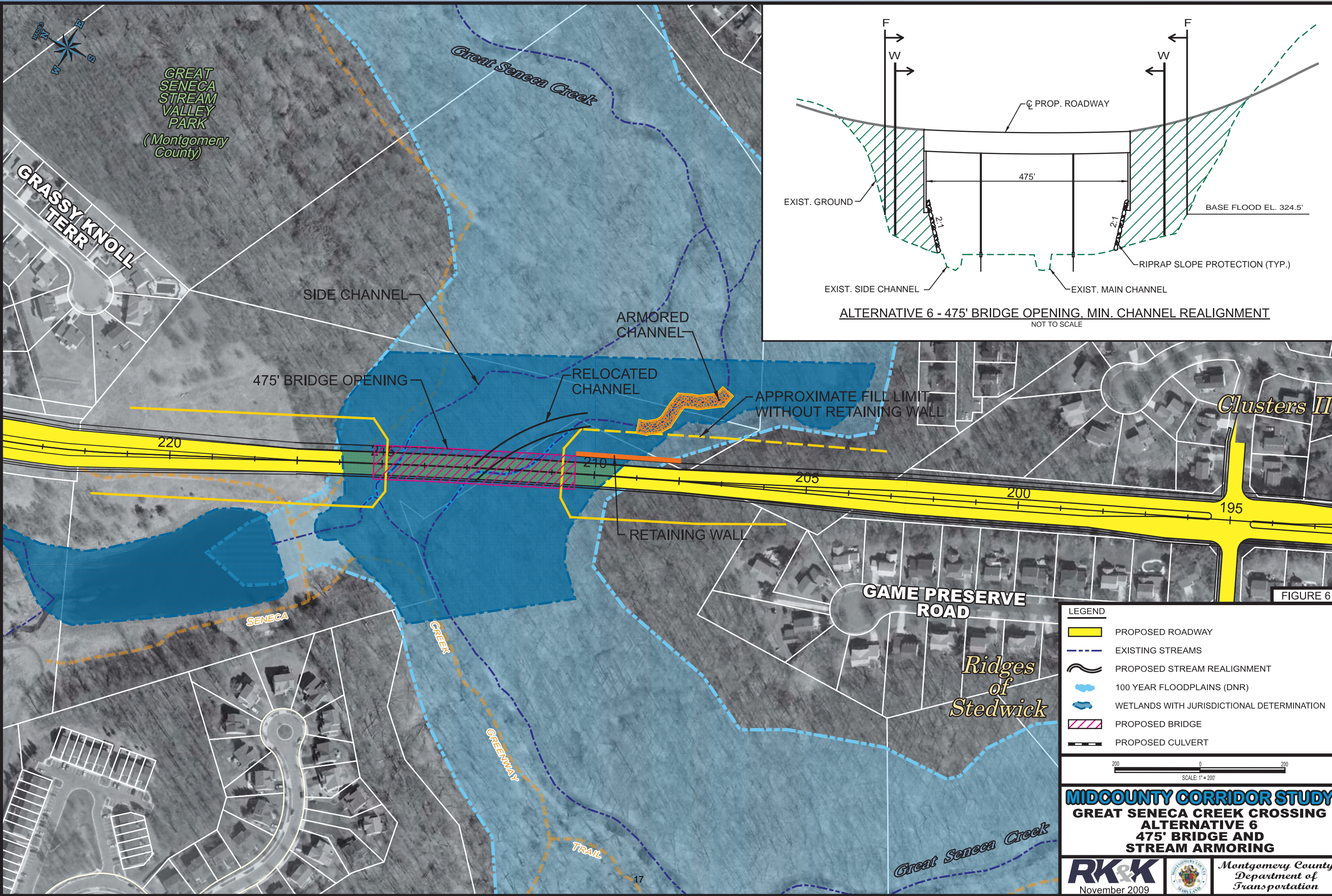
**RK&K**  
November 2009

Montgomery County  
Department of  
Transportation

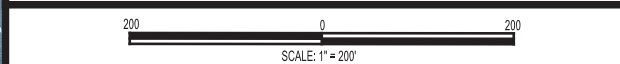








- LEGEND**
- PROPOSED ROADWAY
  - EXISTING STREAMS
  - PROPOSED STREAM REALIGNMENT
  - 100 YEAR FLOODPLAINS (DNR)
  - WETLANDS WITH JURISDICTIONAL DETERMINATION
  - PROPOSED BRIDGE
  - PROPOSED CULVERT



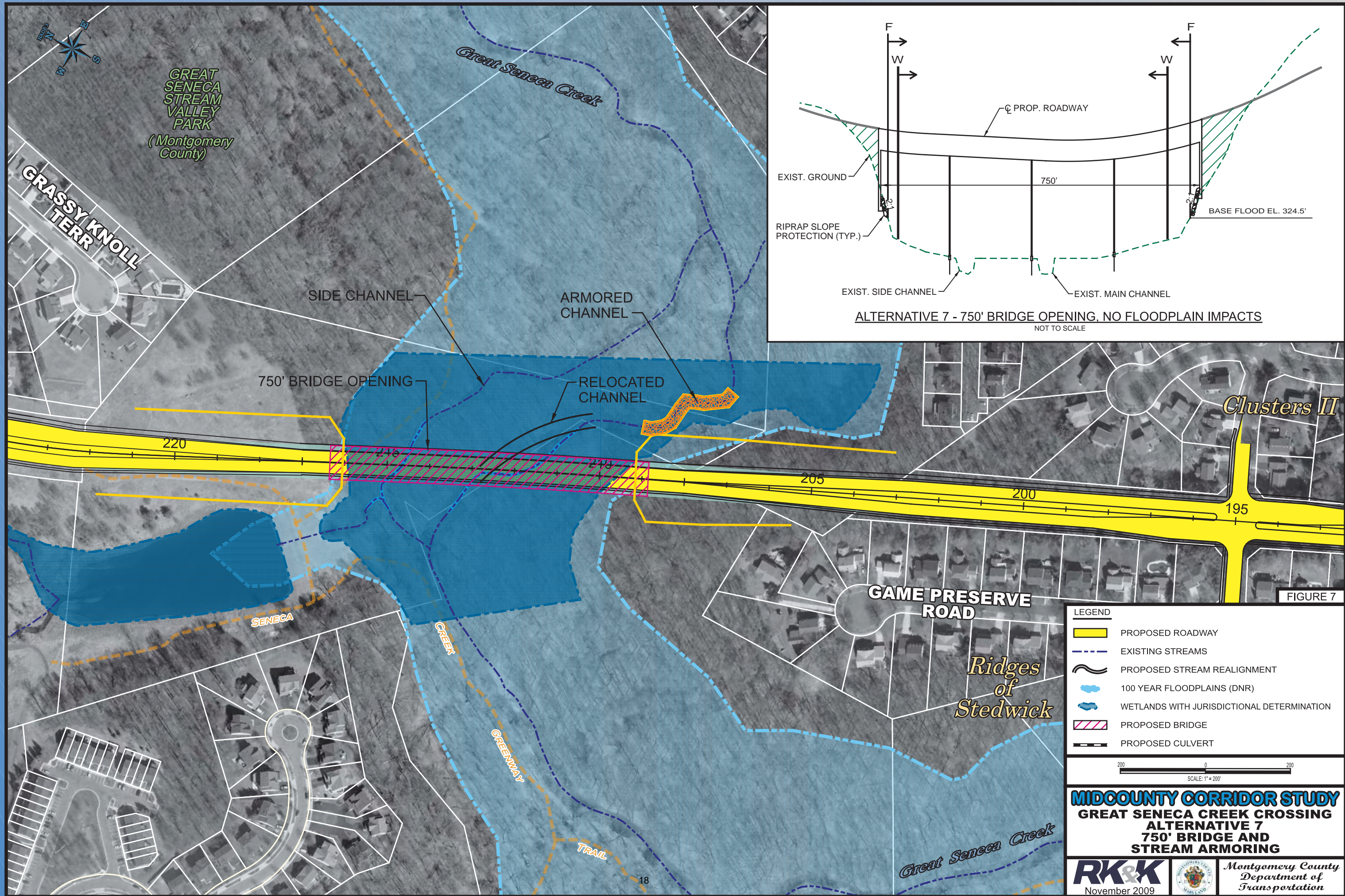
**MIDCOUNTY CORRIDOR STUDY**  
**GREAT SENECA CREEK CROSSING**  
**ALTERNATIVE 6**  
**475' BRIDGE AND**  
**STREAM ARMORING**







2008-08122-mcboaltask 1 - midcounty corridor study/cadd/display/wetland-display-1b-alt7.dgn









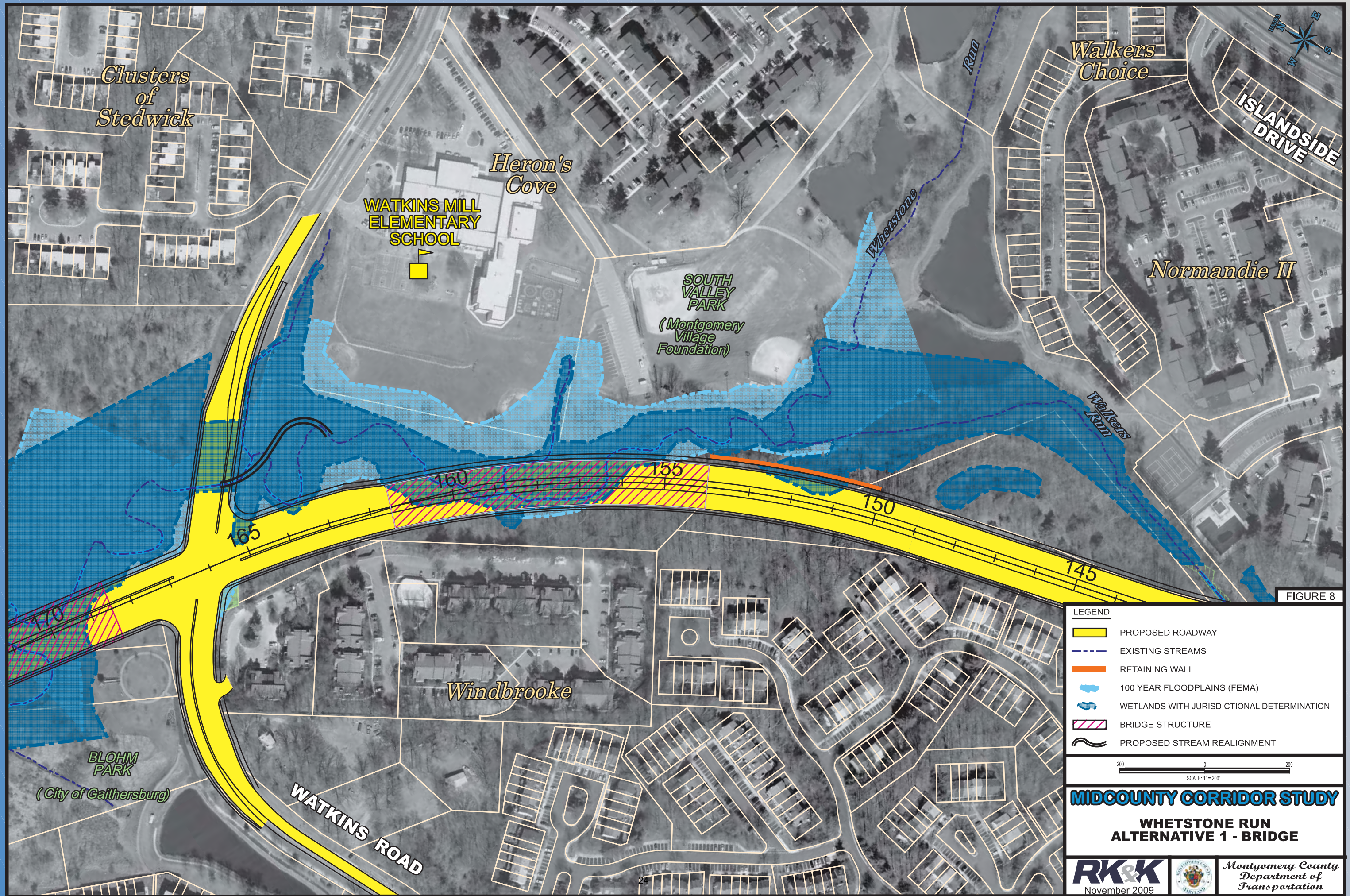


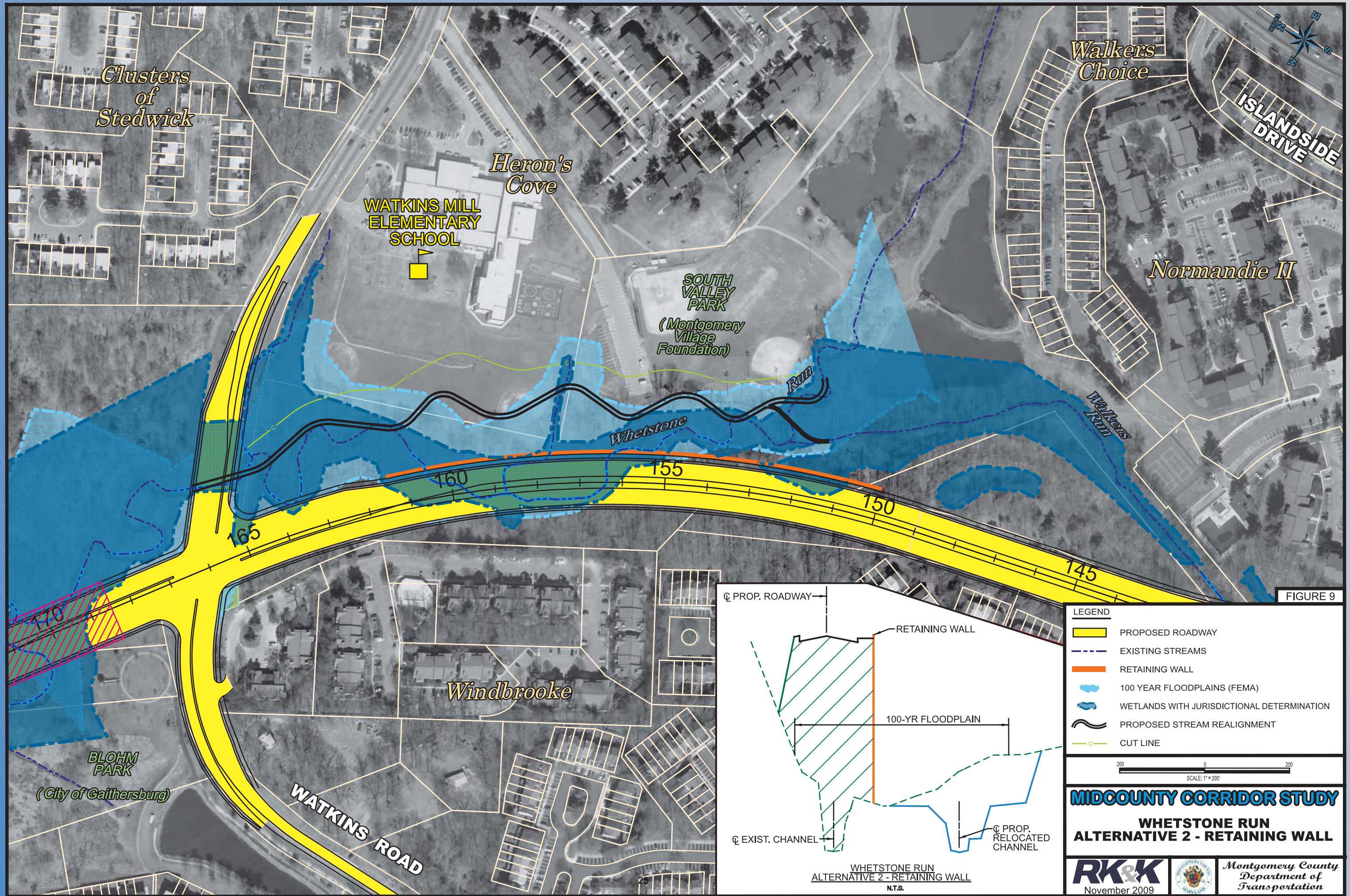
FIGURE 8







2008-08122-mcboaltask 1 - midcounty corridor study/cadd/display/wetland-display/a-stream-fig8.dgn









2008-03122-mcboaltask 1 - midcounty corridor study/cadd/display/wetland-display/a-stream.dgn

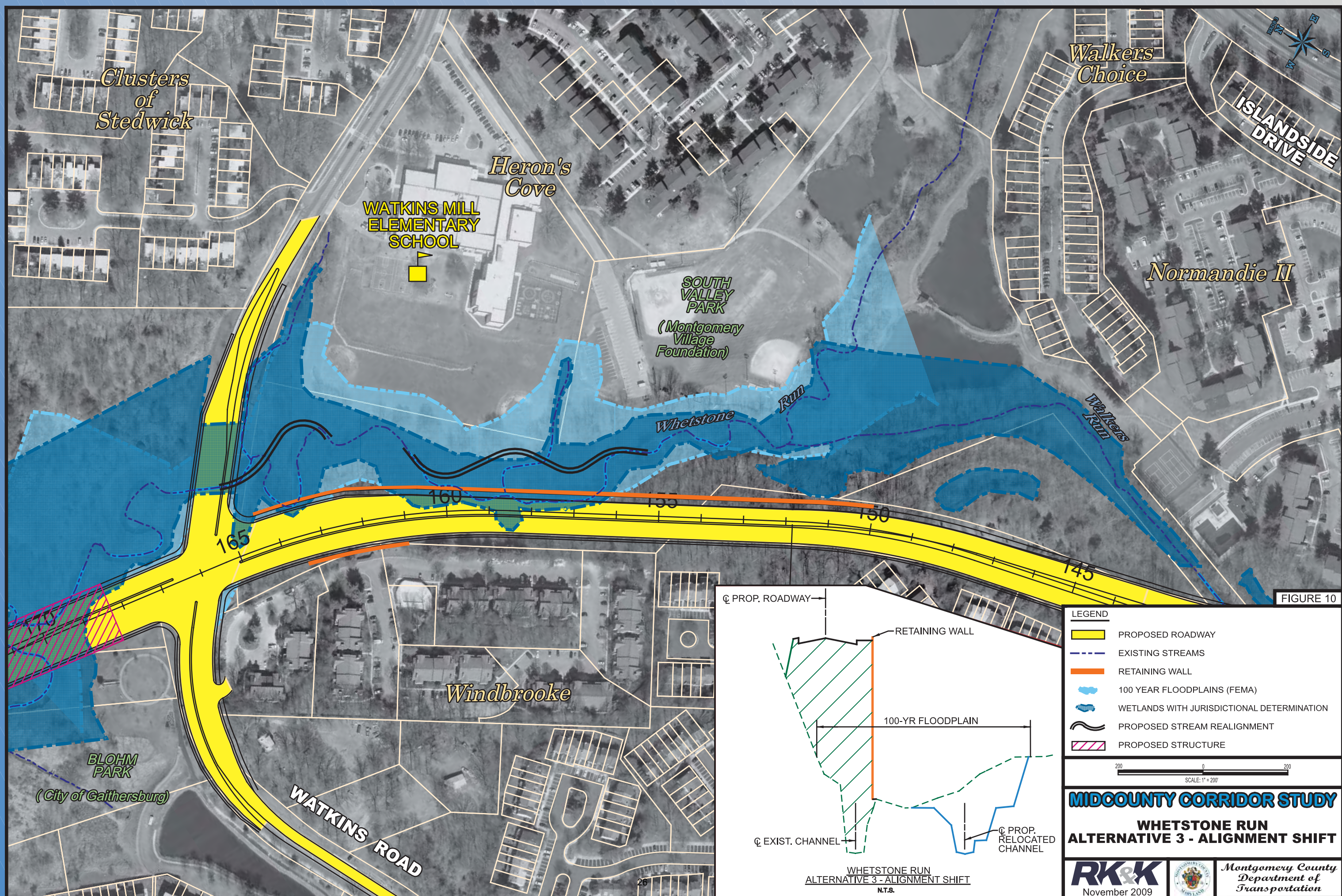
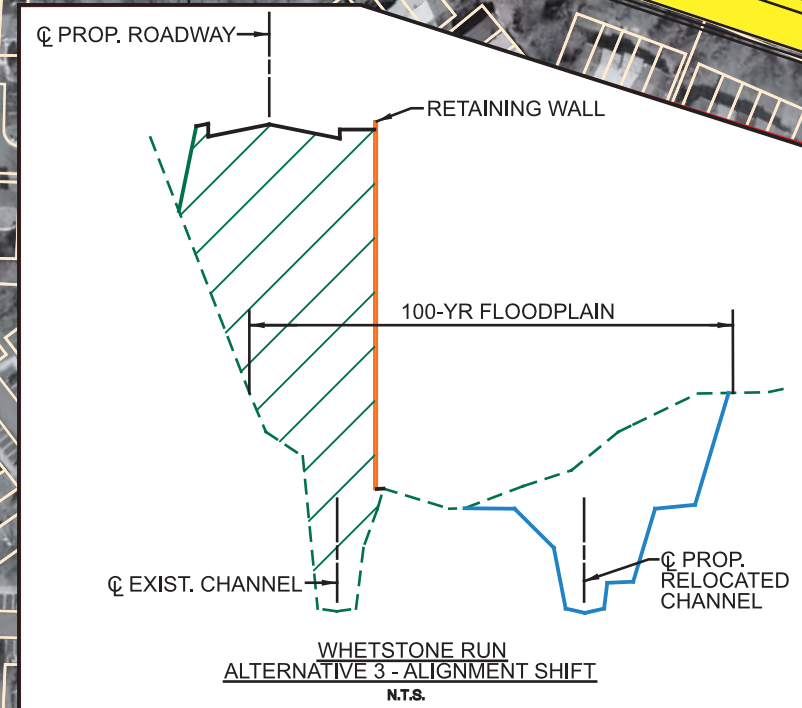


FIGURE 10



**LEGEND**

- PROPOSED ROADWAY
- EXISTING STREAMS
- RETAINING WALL
- 100 YEAR FLOODPLAINS (FEMA)
- WETLANDS WITH JURISDICTIONAL DETERMINATION
- PROPOSED STREAM REALIGNMENT
- PROPOSED STRUCTURE

200 0 200  
SCALE: 1" = 200'

**MIDCOUNTY CORRIDOR STUDY**

**WHETSTONE RUN  
ALTERNATIVE 3 - ALIGNMENT SHIFT**

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November 2009

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Transportation



