NHS CORRIDOR
BETWEEN I-68 AND CORRIDOR H

U.S. ROUTE 220 TIER ONE DRAFT
ENVIRONMENTAL IMPACT STATEMENT

CORRIDORS RETAINED FOR FURTHER ANALYSIS

PRELIMINARY DRAFT

APRIL 16, 2007

U.S. Department of Transportation
Federal Highway Administration

SHA State Highway Administration
Maryland Department of Transportation

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

1.0 Introduction

The purpose of this project is to develop an improved transportation corridor connecting Interstate 68 (I-68) and Appalachian Development Highway System Corridor H (Corridor H). Several preliminary needs for the region were identified in the *North South Appalachia Corridor Study* (July 2001), a multi-state transportation planning and economic development effort between West Virginia Division of Highways (WVDOH), Maryland State Highway Administration (MDSHA), the Pennsylvania Department of Transportation, and the Virginia Department of Transportation. The *North South Appalachia Corridor Study* analyzed the potential support of highway improvements for economic development in four north-south corridors bisecting the Appalachian regions of Maryland, Pennsylvania, West Virginia, and Virginia.

The study also evaluated the potential environmental impacts that would be associated with a major transportation improvement in the region. The study concluded that U.S. Route 220 south from I-68, via MD Route 53, to Corridor H and U.S. Route 219 north from I-68 to the Pennsylvania Turnpike (I-76) would provide the greatest potential for benefiting Appalachian economic development. The report concluded that the proposed National Highway System (NHS) corridor, generally paralleling existing U.S. Route 220, should be given a high priority for future highway upgrades and other transportation improvements.

One representative corridor was developed during the *North South Appalachia Corridor Study* to determine the relative social, economic, and environmental impacts between major, broad-brush corridors that bisect the multi-state region under investigation. For most of the environmental analyses associated with the *North South Appalachia Corridor Study,* the representative corridor was set at a 300-foot width to approximate the right-of-way needed for a major transportation improvement. The 300-foot width was expanded to one mile, however, to assess the potential noise and visual impact on historic resources.

Subsequent to the completion of the *North South Appalachia Corridor Study,* WVDOH and MDSHA entered into a *Memorandum of Understanding* (May 21, 2004). The purpose of that agreement was to develop other alternatives and a Tier One Draft Environmental Impact Statement (DEIS) for a study area surrounding the U.S. Route 220 corridor.

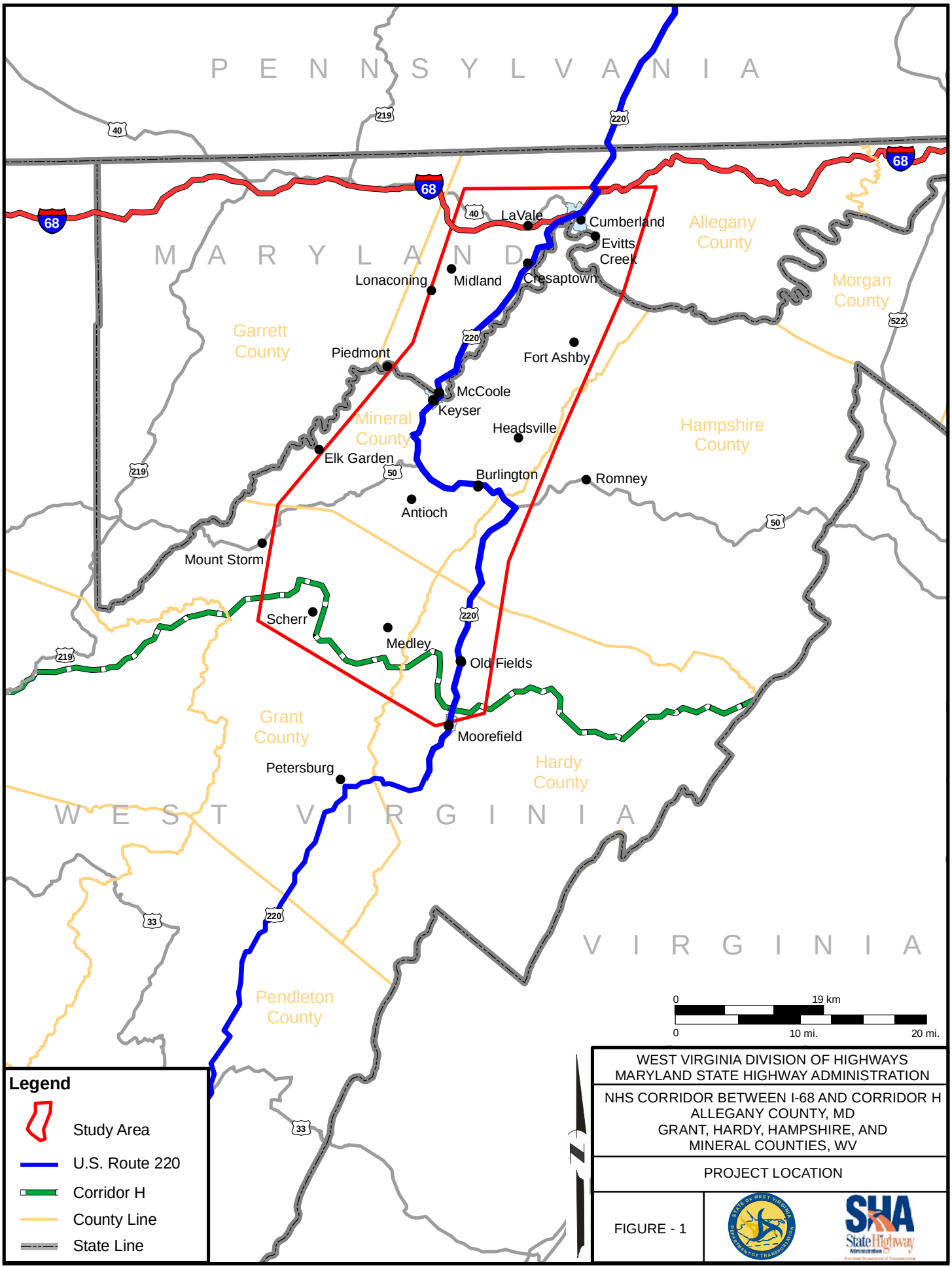
The project study area for the Tier One DEIS is shown in its regional context on Figure 1. The project area encompasses portions of Allegany County in Maryland and Grant, Hampshire, Hardy, and Mineral counties in West Virginia. Major communities on the Maryland side of the study area include Cumberland, LaVale, Cresaptown, and McCoole. Major communities on the West Virginia side of the study area include Keyser, Burlington, Fort Ashby, and Moorefield.

Preparation of a Tier One DEIS was formally initiated on April 14, 2006, with a notice in the *Federal Register*. Public and agency scoping for the project occurred shortly thereafter through a combination of meetings and field views held in early May 2006. Presentations on the project have also occurred at three resource agency coordination meetings, two in Maryland and one in West Virginia.

Utilizing the process established for the Tier One DEIS project, a full range of preliminary alternatives was developed and relevant environmental and engineering studies begun. Included in the first tier are a needs analysis, an environmental overview of five preliminary study corridors, and an alternatives analysis of those corridors. After the Tier One studies are completed, documented, and reported to the public and state and federal resource agencies, a recommendation will be made on the next phase of the project. The goal is for the Federal Highway Administration (FHWA) to issue a record of decision at the conclusion of Tier One that enables one of the corridors to be studied in more detail during Tier Two. This systematic approach allows for the preliminary alternatives analysis to occur in conjunction with development of the project's purpose and need. Alternative corridors can, thus, be developed, analyzed, and advanced or dismissed at key milestones throughout the process. Corridors retained for further analysis will be evaluated in more detail during subsequent studies.

1.1 Purpose and Need

The purpose of this project is to develop an improved transportation corridor connecting I-68 and Corridor H. Improvements within the U.S. Route 220 corridor will provide an upgraded north-south transportation system. The new corridor will support efforts to increase mobility and regional commerce for residents, businesses, and visitors. It will also serve north-south interstate travel movements and support economic development throughout the Appalachian regions of Maryland, West Virginia, Pennsylvania, and Virginia.


PENNSYLVANIA
MARYLAND
WEST VIRGINIA
VIRGINIA
LaVale
Cumberland
Evitts Creek
Cresaptown
Lonaconing
Midland
Allegany County
Morgan County
Garrett County
Piedmont
Fort Ashby
McCoole
Keyser
Mineral County
Headsville
Hampshire County
Elk Garden
Burlington
Romney
Antioch
Mount Storm
Scherr
Medley
Old Fields
Grant County
Moorefield
Petersburg
Hardy County
Pendleton County
0 19 km
0 10 mi. 20 mi.
Legend
Study Area
U.S. Route 220
Corridor H
County Line
State Line
WEST VIRGINIA DIVISION OF HIGHWAYS
MARYLAND STATE HIGHWAY ADMINISTRATION
NHS CORRIDOR BETWEEN I-68 AND CORRIDOR H
ALLEGANY COUNTY, MD
GRANT, HARDY, HAMPSHIRE, AND
MINERAL COUNTIES, WV
PROJECT LOCATION
FIGURE - 1

Specific project needs were developed through a collaborative process that included examination of past studies; review of existing regional plans; consultation with citizens, local planners, and elected officials within the project area; consultation with the federal and state agencies involved in the process; and an analysis of the environmental and socioeconomic conditions of the region. The following needs for the development of a Tier One DEIS have been identified:

- Current transportation deficiencies limit regional mobility.
- The project area has inadequate roadway capacity.
- There are safety deficiencies on some of the area's roadways.
- There is a need to support economic development efforts in the area.
- Additional system linkage is needed to complete the regional road network.

Additional in-depth information on the purpose and need for the U.S. Route 220 project is provided in a companion document, *Purpose and Need Statement.* Taken together, the *Purpose and Need Statement* and *Corridors to be Retained for Further Analysis* report provide sufficient background on the project for citizens, agency representatives, and elected officials to comment on the project at this stage and make informed decisions about its direction.

1.2 Design Criteria

Although the project could result in a program of individual transportation improvements throughout the U.S. Route 220 corridor, having independent utility and serving different logical termini, the design criteria for a four-lane, partially controlled roadway was used for the entire length of the project. This will allow environmental and engineering studies to proceed while assuming the maximum "project footprint" realistically possible. By analyzing the impact of a four-lane facility spanning the entire project area, a conservative, or worst-case, estimate of the potential impacts can be calculated. Because the proposed project would be located in two different states, slightly different design criteria were used for the ultimate development of transportation improvements in Maryland and West Virginia. The design criteria and typical sections for the Maryland portion of the project area were developed from information in the American Association of State and Highway Officials (AASHTO) publication, *A Geometric Design of Highways and Streets* (2004 edition). The design criteria and typical sections for the

West Virginia portion of the project area were developed from the same AASHTO publication as well as the *WVDOH Design Manual and Directives, DD-601, Geometric Design Criteria for Rural Highways*. The design criteria are shown in Table 1.

TABLE 1
Design Criteria

Criteria	West Virginia	Maryland
Functional Classification	Rural Divided Arterial	Rural Divided Arterial
Design Speed	65 MPH	65 MPH
Maximum Grade	6% (limited 7% permitted)	5% (mountainous terrain)
Minimum Grade	0.5%	0.5%
Access Control	At-grade intersections with public roads	At-grade intersections with public roads
Number of Lanes	4 (12' through lanes in each direction)	4 (12' through lanes in each direction)
Horizontal Radius	1,480 LF (min.) D =3°52'17"	1,485 LF (min.) D =3°51'30"
Cross Slope	2% minimum, 8% maximum	2% minimum, 8% maximum
Clear Width of Bridge	Clear roadway width of approach	Outside edge of paved shoulder to outside edge of paved shoulder

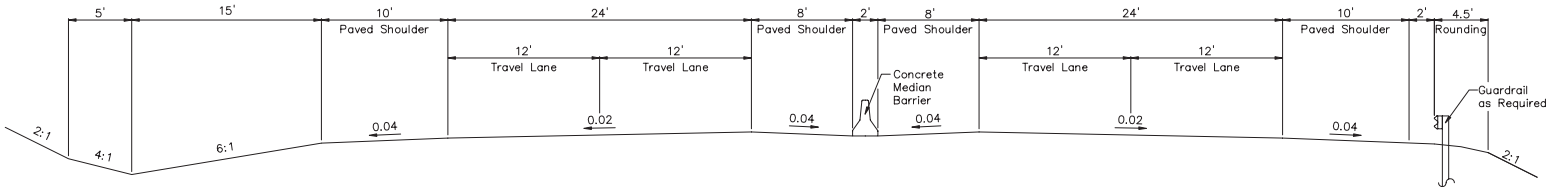
Typical sections for West Virginia and Maryland are shown on Figures 2 and 3, respectively.

2.0 Preliminary Corridors

Five preliminary corridors were identified in the *Memorandum of Understanding* prepared by the MDSHA and WVDOH. As noted in the accompanying *Purpose and Need Statement*, preliminary corridors were developed by the WVDOH utilizing sketch-planning techniques as a means of identifying the general location of future study corridors. Specific potential corridor widths were not developed as part of the *Memorandum of Understanding*. The process of determining how wide the study corridors should be was deferred until work on the Tier One DEIS began. As such, the development of preliminary corridors for the *Memorandum of Understanding* was highly dependent on previous analytical studies, secondary source data, and intuitive design judgment. A major concern at the time these corridors were developed, however, was that a full range of alternatives would be investigated, especially during the early stages of the project.

The preliminary corridors for the Tier One DEIS are shown on Figure 4. The development of the corridors began with an examination of both the *Memorandum of Understanding* and the

NORMAL SECTION



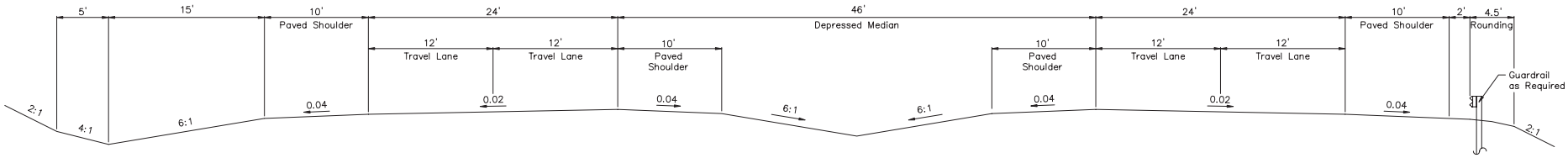
ALTERNATE SECTION

WEST VIRGINIA DIVISION OF HIGHWAYS
MARYLAND STATE HIGHWAY ADMINISTRATION

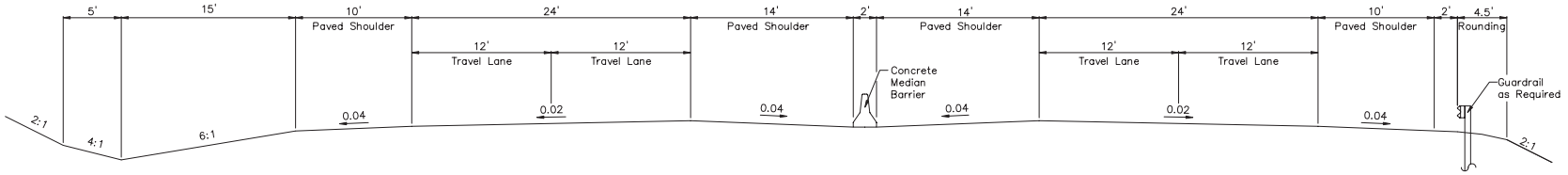
NHS CORRIDOR BETWEEN I-68 AND CORRIDOR H
ALLEGANY COUNTY, MD
GRANT, HARDY, HAMPSHIRE, AND
MINERAL COUNTIES, WV

WEST VIRGINIA DIVISION OF HIGHWAYS TYPICAL SECTION

FIGURE - 2



NORMAL SECTION



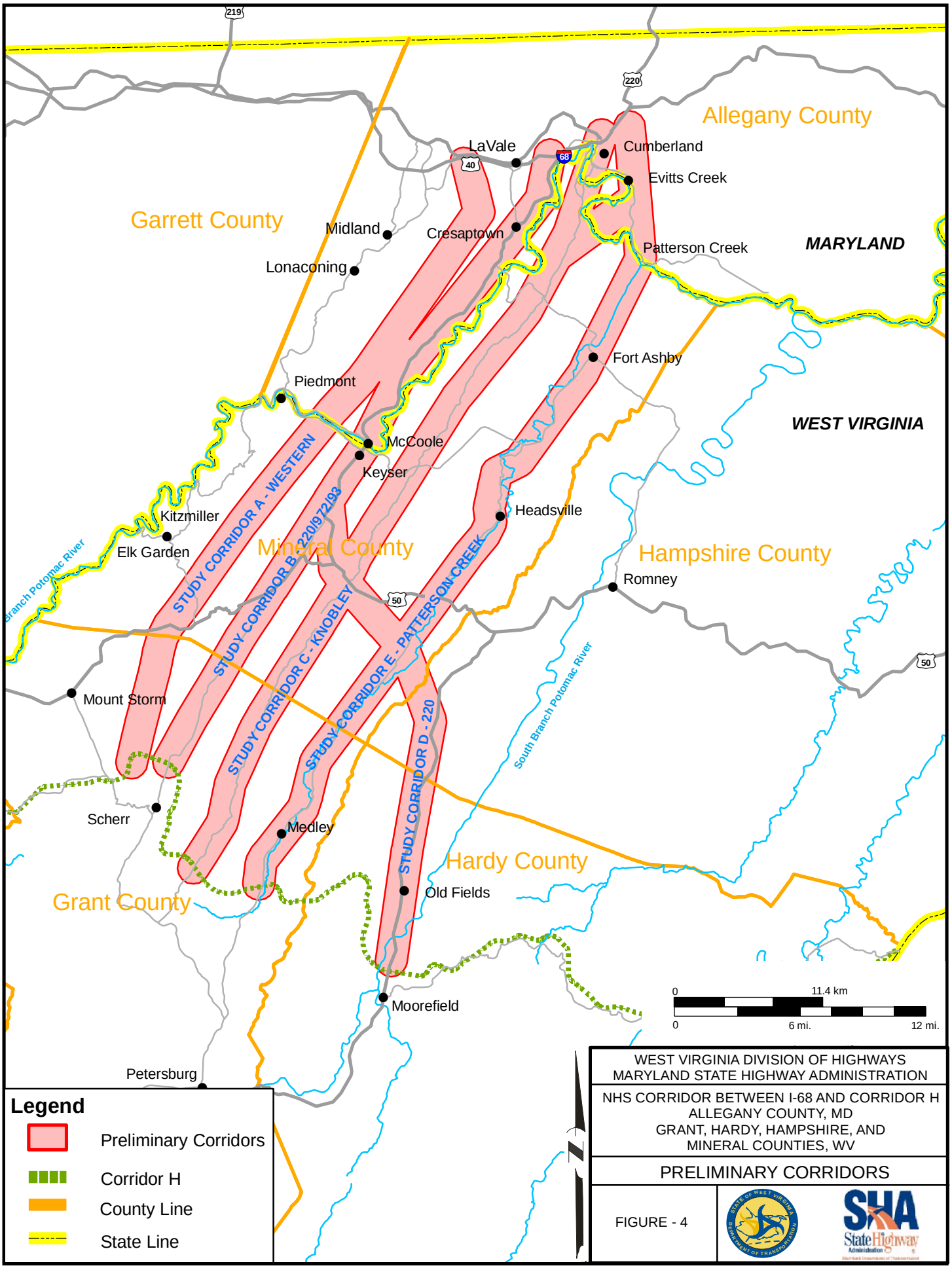
ALTERNATE SECTION

WEST VIRGINIA DIVISION OF HIGHWAYS
MARYLAND STATE HIGHWAY ADMINISTRATION

NHS CORRIDOR BETWEEN I-68 AND CORRIDOR H
ALLEGANY COUNTY, MD
GRANT, HARDY, HAMPSHIRE, AND
MINERAL COUNTIES, WV

MARYLAND STATE HIGHWAY ADMINISTRATION TYPICAL SECTION

FIGURE - 3


Allegany County
Garrett County
Mineral County
Hampshire County
Hardy County
Grant County
MARYLAND
WEST VIRGINIA
LaVale
Cumberland
Evitts Creek
Midland
Cresaptown
Patterson Creek
Lonaconing
Fort Ashby
Piedmont
McCoole
Keyser
Headsville
Kitzmiller
Elk Garden
Romney
Mount Storm
Scherr
Medley
Old Fields
Moorefield
Petersburg
STUDY CORRIDOR A - WESTERN
STUDY CORRIDOR B - 220/972/93
STUDY CORRIDOR C - KNOBLEY
STUDY CORRIDOR E - PATTERSON CREEK
STUDY CORRIDOR D - 220
South Branch Potomac River
Branch Potomac River
219
220
68
40
50
0
11.4 km
0
6 mi.
12 mi.
Legend
Preliminary Corridors
Corridor H
County Line
State Line
WEST VIRGINIA DIVISION OF HIGHWAYS
MARYLAND STATE HIGHWAY ADMINISTRATION
NHS CORRIDOR BETWEEN I-68 AND CORRIDOR H
ALLEGANY COUNTY, MD
GRANT, HARDY, HAMPSHIRE, AND
MINERAL COUNTIES, WV
PRELIMINARY CORRIDORS
FIGURE - 4
SHA
State Highway

existing transportation system in the area. In an effort to best meet traffic demand, four of the corridors were developed to parallel existing roadways to some extent. A fifth corridor was developed farther west than the other four to offer additional opportunities for regional economic development. Intuitively, this fifth corridor also provided potential alternatives in a less densely populated area than would be serviced by the other four corridors. At this point, a 4,000-foot buffer, 2,000 feet to either side, was attached to the corridors so that preliminary environmental information could be evaluated.

The first and westernmost of these corridors, called Corridor A, originated at I-68 near Frostburg, MD and extended southwest to Corridor H near Bismarck, WV. The corridor would traverse parts of Allegany, Mineral, and Grant counties. It could provide direct connections to MD Routes 36, 55, and 135; WV Routes 42, 46, and 93; and U.S. Route 50. By doing so, it would provide increased transportation opportunities to the communities of Frostburg, Midland, Lonaconing, and Westernport, all in Maryland, and Piedmont, Elk Garden, and Mount Storm, all in West Virginia. Traveling south from I-68, to the West Virginia – Maryland state line, the corridor roughly parallels existing MD Route 36 and Dans Mountain. After crossing the state line, the corridor was centered on County Route 4 and WV Route 42 in Mineral County and to the east of WV Route 42 in Grant County. As with all of the corridors, it terminated at Appalachian Development Highway System Corridor H. When first shown at a series of public meetings held in May 2006, Corridor A was also labeled as “the Western Corridor.”

The second corridor, called Corridor B, originated at I-68 near LaVale and extended southwest to Corridor H near Scherr, WV. The corridor would traverse parts of Allegany, Mineral, and Grant counties. Corridor B could provide direct connections to MD Routes 53 and 135; WV Routes 46, 93, and 972; and U.S. Routes 50 and 220. It would provide a major new transportation facility for the communities of LaVale, Cresaptown, and McCoole in Maryland, and Keyser and New Creek in West Virginia. Traveling south from I-68 to Keyser, the corridor was centered on existing U.S. Route 220. Just south of Keyser, the corridor continued to be centered on U.S Route 220 and WV Routes 972 and 93 to its termination at Corridor H. When first shown at public meetings held in May 2006, Corridor B was also labeled as “the 220/972/93 Corridor.”

The third corridor, Corridor C, originated at I-68 near Cumberland and extended southwest to Corridor H near Maysville, WV. The corridor would traverse parts of Allegany, Mineral, and

Grant counties. It could provide direct connections to MD Route 51, WV Routes 28 and 46, Mineral County Route 9 and Grant County Route 3, as well as U.S. Routes 50 and 220. It would provide improved transportation opportunities to the central part of Cumberland and its eastern side in Maryland, and the communities of Ridgely, Carpendale, Short Gap, the eastern side of Keyser, and Antioch in West Virginia. Paralleling the eastern face of Knobley Ridge, most of the corridor lies in West Virginia. It is centered on County Route 9 in Mineral County and County Route 3 in Grant County. When first shown at public meetings held in May 2006, Corridor C was also labeled as "the Knobley Corridor."

The fourth corridor, Corridor D, originated at I-68 near LaVale and extended south to Corridor H at Moorefield. It would traverse parts of Allegany, Mineral, Hampshire, and Hardy counties. It could provide direct connections to MD Routes 53 and 135, WV Route 46, County Routes 9 and 11 (Mineral County), and U.S. Routes 50 and 220. It would provide an improved transportation corridor to Cumberland, Cresaptown, and McCoole, Maryland. In West Virginia, it would service the communities of Keyser, New Creek, Old Fields, and Moorefield. For the most part, the corridor is centered on existing U.S. Route 220. When first shown at public meetings held in May 2006, Corridor D was also labeled as "the 220 Corridor."

The final corridor, Corridor E, originated at I-68 near Cumberland and extended southwest to Corridor H near Lahmansville, WV. It would traverse parts of Allegany, Mineral, and Grant counties. It could provide direct connections to MD Route 51, WV Routes 28 and 46, Mineral County Route 11, Grant County Route 5, and U.S. Routes 50 and 220. It would provide an improved transportation facility for the eastern side of Cumberland and the West Virginia communities of Patterson Creek, Fort Ashby, Burlington, and Medley. The corridor parallels the Patterson Creek valley for most of its length. When first shown at public meetings held in May 2006, Corridor E was also labeled as "the Patterson Creek Corridor."

3.0 Refinement of Preliminary Corridors

The five preliminary corridors were presented to several groups, including state and federal resource agencies, local planning officials, and the public, during early and mid-2006. Concurrent with these presentations, preliminary engineering studies and environmental analyses were begun to determine if reasonable highway alignments could be developed within each of the preliminary corridors.

Although the preliminary corridors were 4,000 feet wide, only about 300 to 500 feet would be needed for a highway alignment. Consequently, a best fit alignment (BFA) was developed for each corridor utilizing the engineering criteria of WVDOH and MDSHA. The BFAs within each of the preliminary corridors represented a possible line and grade for a new highway.

Although in theory many alignments and other possible transportation alternatives could be developed within the corridors that differ from the BFAs, the BFAs were developed to assure that at least one alignment was possible within each corridor. Other possible transportation alternatives could also include widening, turning lanes, signalization, transportation systems management, and spot improvements at a limited number of locations rather than a completely new highway stretching from I-68 to Corridor H.

Utilizing each BFA as a potential centerline, a 2,000-foot buffer was attached to each side to provide a refined 4,000-foot corridor. In order to differentiate these refined corridors from those that were already shown at public meetings and in an effort to avoid confusion between the preliminary corridors and the refined corridors, the refined corridors were called transportation scenarios.

Thus, five transportation scenarios, very similar to the preliminary corridors but with some modifications in their appearance, were developed at this point so that the environmental studies could continue. Likewise, the transportation scenarios were labeled A through E to retain their connection to the preliminary corridors. In this way, Transportation Scenario A is a refinement of Corridor A, Transportation Scenario B is a refinement of Corridor B, and so forth through Transportation Scenario E. Each of the transportation scenarios are discussed in detail later in this report.

Early in the process, concern was raised that a possible highway alignment could be found to have minimal environmental impacts, but might fail to connect properly with either of the termini points. To alleviate that concern, interchange configurations at I-68 and Corridor H were evaluated, again utilizing the line and grade of the BFAs. All five BFAs were found to have the ability to connect with the termini. The conceptual interchange configurations for the BFAs are described later in this report.

3.1 Public and Agency Involvement

Public and agency coordination has been a continuous process since the initiation of the project. To date, the following agency coordination and public involvement milestones have occurred:

- Maryland Interagency Project Review Meeting – February 15, 2006
- Federal Register Notice – April 14, 2006
- Region 8 Planning and Development Council – April 20, 2006
- Keyser Public Meeting – May 1, 2006
- Moorefield Public Meeting – May 2, 2006
- Field View with West Virginia Resource Agencies – May 3, 2006
- Field View with Maryland Resource Agencies – May 10, 2006
- Cumberland Public Meeting – May 10, 2006
- Meetings with Planners from Grant, Hardy, and Mineral Counties – August 2006
- Allegany County Planning Commission – September 20, 2006
- Maryland Interagency Project Review Meeting – January 17, 2007
- Field View with the Maryland Historical Trust – February 26, 2007
- West Virginia Agency Coordination Meeting – February 27, 2007
- Field View with the West Virginia Division of Culture and History – March 22 and March 23, 2007

Specific issues raised by the Maryland resources agencies included potential impacts to Dans Mountain, restoration activities in the North Branch Potomac River watershed, wild trout and long-term resident stocked trout, and historic resources in the area. Additional concerns include the numerous North Branch Potomac River tributaries flowing east from Dans Mountain, the North Branch Potomac River, and additional habitats of significance in the vicinity of Fort Hill and along the riparian corridor of the North Branch Potomac River.

Specific issues raised by the West Virginia resources agencies included bald eagle habitat, the Indiana bat, the Virginia big-eared bat, mussels, threatened and endangered plant species associated with shale barrens (especially the shale barrens rock cress), wetlands and streams, historic and archaeological resources in the area, and the relationship of this project to Corridor H and U.S. Route 50.

Subsequent to the initial agency coordination efforts, more formal consultation with the agencies began to identify rare, threatened, and endangered species in the proposed project area. That process is continuing and will be ongoing as the project progresses.

Issues raised by the public and local officials included concerns about existing and future traffic congestion, potential impacts to historic resources and farmlands, and avoidance of the Patterson Creek valley.

Most residents attending the public meetings expressed support for the project. Many residents, even those supporting the project, however, requested that the Patterson Creek valley be avoided.

3.2 Avoidance of Dans Mountain

With an approximate size of 9,200 acres, the Dans Mountain Wildlife Management Area is the largest tract of contiguous state owned forestland in Maryland. Located in the northwestern corner of the project area, it is one of the most important ecological and regional resources in western Maryland. Because of concern about potential impacts to Dans Mountain, a shift was considered for Corridor A to avoid Dans Mountain. Although only considered conceptually, it was determined that such a shift would not be a practical transportation scenario for the following reasons:

- Constructability – The terrain is steep with poor accessibility. A shorter construction season would be likely and most of the excavation could be into rock. The roadway profile would require major earthwork balancing. The Potomac River crossing would be approximately 2,500 feet long and 500-600 feet high. Other major structures would be required to cross streams and local roads.

- Traffic Diversion – It would not attract sufficient traffic volumes from U.S. Route 220 because of access locations and travel times from more populated areas. Although it could improve accessibility to areas along MD Route 36, it would not reduce travel time and accessibility from the U.S. Route 220 corridor.

- Economic Development and Smart Growth – Any western corridor, including the one through Dans Mountain, would become a true bypass of the most populated areas in the project area, including Cumberland, LaVale, and Keyser. Although new areas would become open for future development as a result of a western alternative, they would not be in Maryland's Priority Funding Areas (PFA), nor would they enhance existing economic development efforts in the project area's older, more established communities. This could limit future growth and result in sprawl by providing a major transportation improvement in an area without other public infrastructure.

- Access – Existing roads in the area are mostly narrow, local roads in steep terrain. Local roads would require considerable improvements to handle additional traffic and truck volumes. Access would be from the western side of Dans Mountain with no direct access from U.S. Route 220.

- Impacts to Historic Resources – The area on the western side of Dans Mountain is rich in cultural resources associated with the coal and iron industries. Several existing resources in the area are already on the National Register of Historic Places (NRHP), including the Lonaconing Historic District, the Lonaconing Furnace, and the Waverly Street Bridge in Westernport. A new transportation corridor through this area would require more detailed investigations to identify potential historic resources and identify the potential impact of the proposed transportation improvements. Any additional studies in an area with so many NRHP sites are likely to reveal more buildings and properties as potentially eligible for the National Register.

- Maintenance – Shifts further west could have future maintenance problems. A new roadway in the vicinity of Dans Mountain would be exposed to the high winds, heavy snow, and fog typical of Appalachian mountaintop areas. Maintaining the proposed mainline and access roads on the mountain would be difficult in the winter months. Severe weather conditions could also lead to accelerated wear on the roadway surface and require more frequent patching and resurfacing.

- Safety – Weather conditions on the exposed mountaintop could result in safety concerns pertaining to poor visibility and vehicle traction. Any mountaintop alternative will have frequent snow, snow drift, fog, and high winds, creating hazards for traffic.

3.3 No-Build Alternative

The No-Build Alternative would consist of taking no action to develop a new NHS corridor between I-68 and Corridor H. Current and future transportation deficiencies would need to be addressed by other transportation improvements as separate projects. These other potential projects would have independent utility and their own logical termini. They could include widening of existing roadways, the addition of turning lanes or signalized intersections, transportation systems management, and new facilities on new alignment, among other capital improvements.

Environmental impacts would occur as a result of these other projects, however. Additionally, they may not completely address future regional transportation needs in a timely manner or enhance development efforts and economic growth throughout the Appalachian regions of Maryland, West Virginia, Pennsylvania, and Virginia. The result of taking no action would, thus, be a continuation of conditions on the existing transportation facilities in the project area.

While the No-Build Alternative would not meet the identified purpose and need for the project, it could meet other transportation needs in the area. The No-Build Alternative is included for comparison with the other transportation scenarios. It will also be carried into detailed study as a baseline for establishing the environmental consequences of the build alternatives.

3.4 Transportation Scenario A (TS-A)

TS-A would be a four-lane, Rural Divided Arterial that begins with an interchange near existing Exit 34 along I-68 in Allegany County south of Frostburg and ends with a connection to Corridor H in Grant County east of Bismarck. Generally, TS-A's limits would exist in sparsely populated, low-density areas. TS-A would briefly parallel MD Route 36 (George's Creek Road) on the western side after which it would cross and then parallel the western slope of Dans Mountain in the vicinity of the Mountainview Landfill. Moving southwest and paralleling MD Route 36 on the

eastern side, TS-A would follow along the western extent of Dans Mountain. TS-A would be well east of Midland, Lonaconing, Barton, and Westernport.

TS-A would enter Mineral County east of Piedmont as it crosses over MD Route 135 (Westernport Road) and WV Route 46. It would also cross the North Branch of the Potomac River at this same location. TS-A would continue southwest, passing Jennings Randolph Lake and Elk Garden to the east. TS-A would cross U.S. Route 50/WV Route 42 at Hartmansville before entering Grant County. From there, TS-A would continue east of Mount Storm to WV Route 42 where it would turn southeast and parallel the existing road, terminating at the junction with WV Route 93 and Corridor H.

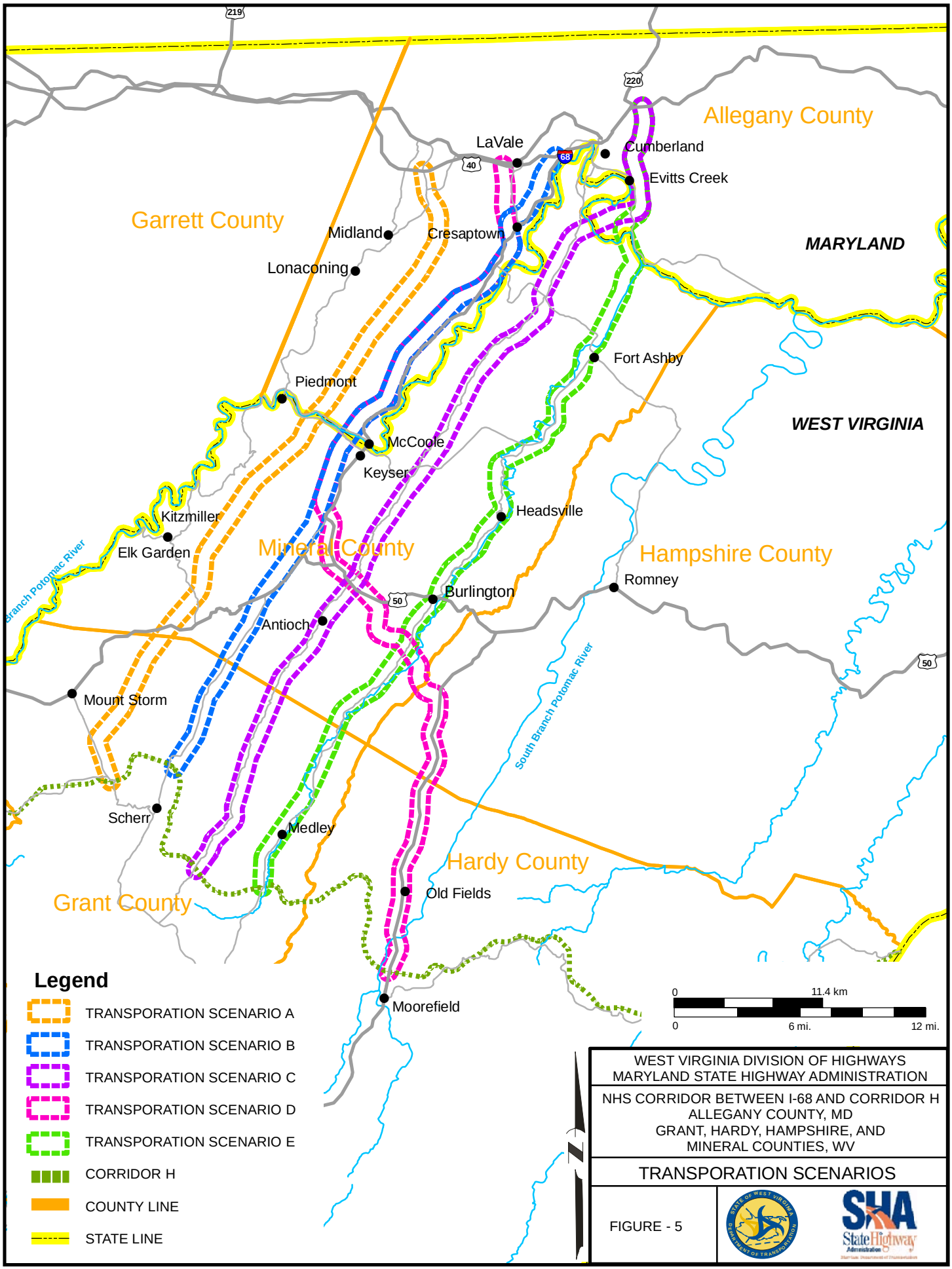
All five of the transportation scenarios (TS-A through TS-E) are shown on Figure 5.

3.5 Transportation Scenario B (TS-B)

TS-B would be a four-lane, Rural Divided Arterial that begins with an interchange near existing Exits 41 and 42 along I-68 in Allegany County between LaVale and Cumberland and ends with a connection to Corridor H in Grant County north of Scherr. Generally, TS-B's limits in the north would exist in congested areas, particularly in the vicinity of Cresaptown and Keyser while in the south TS-B would service mostly low-density rural areas.

TS-B would originate along Haystack Mountain at I-68 and extend southwest to Cresaptown crossing MD Route 53 (Winchester Road). At this point, it would parallel U.S. Route 220 to the west and Dans Mountain to the east. West of McCoole, TS-B crosses MD Route 135, the North Branch of the Potomac River, and WV Route 46.

Entering Mineral County, TS-B would be west of Keyser and continue to parallel U.S. Route 220 on the western side. At the junction with WV Route 972, TS-B continues southwest along U.S. Route 50. Near Claysville, TS-B would begin to parallel WV Route 93, entering Grant County and extending to a terminus at Corridor H.


Allegany County
Garrett County
Mineral County
Hampshire County
Hardy County
Grant County
MARYLAND
WEST VIRGINIA
LaVale
Cumberland
Evitts Creek
Midland
Cresaptown
Lonaconing
Fort Ashby
Piedmont
McCoole
Keyser
Headsville
Kitzmiller
Elk Garden
Burlington
Romney
Antioch
Mount Storm
Scherr
Medley
Old Fields
Moorefield
South Branch Potomac River
Legend
TRANSPORATION SCENARIO A
TRANSPORATION SCENARIO B
TRANSPORATION SCENARIO C
TRANSPORATION SCENARIO D
TRANSPORATION SCENARIO E
CORRIDOR H
COUNTY LINE
STATE LINE
0
11.4 km
0
6 mi.
12 mi.
WEST VIRGINIA DIVISION OF HIGHWAYS
MARYLAND STATE HIGHWAY ADMINISTRATION
NHS CORRIDOR BETWEEN I-68 AND CORRIDOR H
ALLEGANY COUNTY, MD
GRANT, HARDY, HAMPSHIRE, AND
MINERAL COUNTIES, WV
TRANSPORATION SCENARIOS
FIGURE - 5

3.6 Transportation Scenario C (TS-C)

TS-C would be a four-lane, Rural Divided Arterial that begins with an interchange near existing Exit 46 along I-68 in Allegany County east of Cumberland and ends with a connection to Corridor H in Grant County north of Maysville. Generally, TS-C's limits in the north would exist in congested areas, particularly in the vicinity of Cumberland, while in the south they would be in mostly low-density rural areas.

Originating near Nave's Crossroads, TS-C would extend south through the Willowbrook Road area near Allegany College of Maryland to Evitts Creek and briefly parallel MD Route 51. TS-C would then turn west through Mexico Farms and cross the North Branch of the Potomac River into Mineral County where it would parallel WV Route 28.

Continuing southwest, TS-C would parallel County Route 9 (Knobley Road) west of Short Gap and well east of Keyser. Crossing U.S. Route 50/220 at Ridgeville and continuing southwest, TS-C would enter Grant County paralleling County Route 3 (Knobley Road). It would connect with Corridor H just north of Maysville.

3.7 Transportation Scenario D (TS-D)

TS-D would be a four-lane, Rural Divided Arterial that begins with an interchange near existing Exit 39 along I-68 in Allegany County near LaVale and ends with a connection to Corridor H in Hardy County at Moorefield. TS-D closely follows TS-B between Cresaptown and the U.S. Route 50/U.S. Route 220 coupling just south of Keyser. Generally, TS-D's limits in the north would exist in congested areas, particularly in the vicinity of LaVale, Cresaptown, and Keyser, while within the south TS-D falls mostly within low-density rural areas.

TS-D would originate on the eastern slope of Dans Mountain and extend south for a short distance on the western side of MD Route 53. From Cresaptown, TS-D would run southwest paralleling U.S. Route 220 to the west and Dans Mountain to the east. West of McCoole, TS-D crosses MD Route 135, the North Branch of the Potomac River, and WV Route 46.

Entering Mineral County, TS-D would be west of Keyser and continue to parallel U.S. Route 220 on the western side. At the junction with WV Route 972, TS-D would turn southeast along U.S.

Route 220. TS-D would continue along U.S. Route 50/220, County Route 50/4 (Shirley Lane), and County Route 13 crossing into Hampshire County. Rejoining U.S. Route 220/WV Route 28, TS-D would turn southward and cross into Hardy County. TS-D would parallel U.S. Route 220 until its connection with Corridor H just north of Moorefield.

3.8 Transportation Scenario E (TS-E)

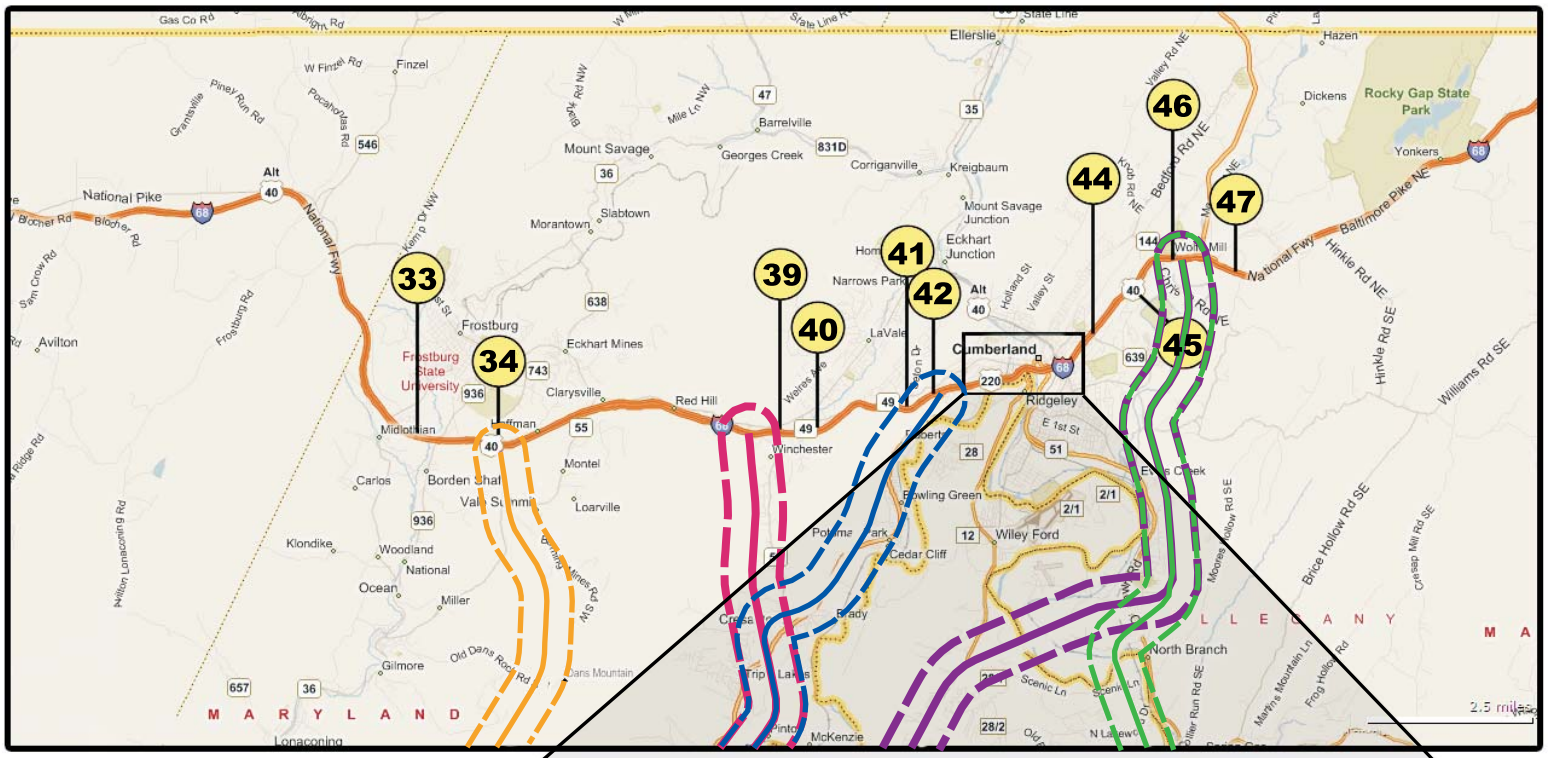
TS-E would be a four-lane, Rural Divided Arterial that begins with an interchange near existing Exit 46 along I-68 in Allegany County east of Cumberland and ends with a connection to Corridor H in Grant County near Lahmansville. Generally, TS-E's limits in the north would exist in congested areas, particularly in the vicinity of Cumberland, while in the south they fall mostly within low-density rural areas.

TS-E would originate in the vicinity of TS-C near Nave's Crossroads. TS-E would extend south through the Willowbrook Road area near Allegany College of Maryland to Evitts Creek and briefly parallel MD Route 51. TS-E would then cross the North Branch of the Potomac River into Mineral County near the town of Patterson Creek and parallel Patterson Creek itself to the west.

Continuing southwest, TS-E would cross WV Route 28 west of Fort Ashby and follow WV Route 46 to County Route 11 (Patterson Creek Road). It would then parallel County Route 11 and Patterson Creek passing nearby to Reese's Mill and Headsville. TS-E would cross Patterson Creek at numerous points along its projected path. TS-E would intersect U.S. Route 50/220 near Burlington and continue southwest into Grant County. It would then parallel County Route 5 (Patterson Creek Road) to its terminus with Corridor H near Lahmansville.

3.9 Potential Interchange Configurations

Potential interchange locations and configurations were examined for each transportation scenario at the northern terminus with I-68. I-68 has a series of closely spaced full and partial interchanges between mileposts 39 and 47. The roadway section consists of steep terrain and a number of physical barriers such as the Potomac River, CSX Railroad, and downtown Cumberland. Existing interchange locations are shown on Figure 6. Interchange alternatives were examined for each terminus location to ensure each scenario could physically be tied to



Legend

- TRANSPORTATION SCENARIO A
- TRANSPORTATION SCENARIO B
- TRANSPORTATION SCENARIO C
- TRANSPORTATION SCENARIO D
- TRANSPORTATION SCENARIO E
- 33 INTERCHANGE NUMBER

WEST VIRGINIA DIVISION OF HIGHWAYS
MARYLAND STATE HIGHWAY ADMINISTRATION

NHS CORRIDOR BETWEEN I-68 AND CORRIDOR H
ALLEGANY COUNTY, MD
GRANT, HARDY, HAMPSHIRE, AND
MINERAL COUNTIES, WV

INTERCHANGE LOCATIONS ON I-68

FIGURE - 6

I-68 while maintaining entrance and exit ramp spacing as per the AASHTO publication*, A Policy on Geometric Design of Highways and Streets (2004)* design criteria.

TS-A would tie into I-68 at the existing MD Route 36 (Exit 34) interchange. TS-A would tie to the existing MD Route 36 alignment and grade south of the I-68 interchange. The most practical option at this location would be to use the existing diamond interchange with some roadway widening and lane additions as needed. Preliminary traffic projections for the TS-A interchange, however, indicated that a full interchange may be necessary in place of the existing diamond interchange.

TS-B and TS-D have two possible interchange locations with I-68. Option 1 parallels MD Route 53 between Cresaptown and LaVale and ties into I-68 west of Exit 39. Full interchange alternatives were examined to connect Option 1 to I-68, MD Route 53, and/or U.S. Route Alt. 40. Option 2 parallels U.S. Route 220 between Cresaptown and Cumberland and ties into I-68 west of Exit 42. Full interchange alternatives connecting Option 2 to I-68 were examined while maintaining an existing ramp from I-68 to MD Route 49. A combination alternative was also examined providing a half interchange from TS-B and TS-D to I-68 westbound and a half interchange from Option 2 to I-68 eastbound.

TS-C and TS-E tie into I-68 at the interchange with U.S. Route 220 (North), MD Route 144, and Naves Cross Road (Exits 46 and 47) east of Cumberland. A full interchange between TS-C or TS-E and I-68 can be constructed. The future alignment would need to provide or maintain access from U.S. Route 220 (North) or MD Route 144 to both the transportation scenario and I-68.

4.0 Preliminary Alternatives Analysis

As the development of the transportation and interchange scenarios continued to progress, data were collected to prepare an environmental overview and an analysis of potential impacts. Concurrently with that effort, traffic and safety issues were examined.

4.1 Safety and Traffic Assessment

Concurrent with the refinement of the preliminary corridors into transportation scenarios, potential issues with safety and traffic were evaluated for the area. As noted in the *Purpose and Need Statement*, crash rates for the Maryland roadways in the study area were based on data from the years January 2001 through December 2005. For the West Virginia roadways, they were based on data from July 2002 through June 2005. The timeframes are consistent with typical study parameters in support of other projects in Maryland and West Virginia and are sufficient samples of data from steady state conditions. There were no major changes to project area roadways during the period that could affect the crash data analysis.

4.1.1 Safety

Crash rates on the major roadways of the project area's highway network are shown in Table 2. Only one of the segments, Mineral County Route 9, had a crash rate higher than the statewide average for similar highways. County Route 9 had a crash rate of 3.98 crashes per million vehicle miles traveled (VMT). The statewide average for similar roadways in West Virginia is 3.80. None of the roadways in Maryland had a crash rate higher than the statewide average. Nine segments in the West Virginia portion of the study area, however, had a crash rate higher than the statewide average for West Virginia expressways. The statewide average for expressways is 1.45. The segments with crash rates higher than the statewide average for West Virginia expressways include the following:

- WV Route 972 from U.S. Route 220 to U.S. Route 50
- Grant County Route 3 from the County Line to Oak Hill
- WV Route 28 from Romney to the MD/WV State Line
- WV Route 956 from WV Route 28 to the MD/WV State Line
- U.S. Route 220 from Moorefield to the MD/WV State Line
- WV Route 46 from Elk Garden to WV Route 28
- U.S. Route 50 from Mt. Storm to Romney
- Mineral County Route 11 from WV Route 28 to the County Line
- Mineral County Route 9 from WV Route 28 to the County Line

TABLE 2
Crash Rates for Project Area Roadways

Route	Segment	State	Crash Rate per Million VMT	Statewide Average
I-68	Exit 34 to Exit 47	MD	0.23	0.54
MD 135	Westernport to Keyser	MD	0.60	1.49
MD 36	Westernport to Frostburg	MD	0.63	1.32
US 220	MD/WV State Line to I-68	MD	0.66	1.59
MD 53	US 220 to I-68	MD	1.15	1.99
WV 28A	WV 28 to MD/WV State Line	WV	0.62	3.06
WV 42	Mt. Storm to WV 93	WV	1.01	3.06
Grant CR 5	County Line to Lahmansville	WV	1.14	3.80
WV 42	US 50 to MD/WV State Line	WV	1.36	3.06
WV 93	Scherr to New Creek	WV	1.39	3.06
WV 972	US 220 to US 50	WV	1.59	3.06
Grant CR 3	County Line to Oak Hill	WV	1.92	3.80
WV 28	Romney to MD/WV State Line	WV	2.11	3.80
WV 956	WV 28 to MD/WV State Line	WV	2.14	3.80
US 220	Moorefield to MD/WV State Line	WV	2.34	3.80
WV 46	Elk Garden to WV 28	WV	2.45	3.80
US 50	Mt. Storm to Romney	WV	2.50	3.80
Mineral CR 11	WV 28 to Grant County Line	WV	3.67	3.80
Mineral CR 9	WV 28 to Grant County Line	WV	3.98	3.80

CR = County Route

4.1.2 Traffic Analysis

Existing and future Levels of Service (LOS) were projected for roadway segments along U.S. Route 220; MD Routes 36, 53, and 135; and WV Routes 28, 46, 93, and 956. LOS describes the operation of a given highway by establishing a range of "A" to "F." LOS "A" represents the best operation of a roadway and LOS "F" represents the worst.

The primary data source for the required geometric information to determine LOS was a windshield survey conducted in the fall of 2005. At that time, it was determined that all roadway segments under study had one lane in each direction for through traffic, with left-turn lanes and center left-turn lanes in some instances. While there were some locations in Maryland with more than two lanes in each direction, these tended to be short relative to the two-lane highway sections. To represent the average condition of all of these highways, these roads were assumed to have free flow speeds of 45 mph, 90 percent no-passing zones, rolling terrain, and

10 percent truck traffic. Other traffic data and traffic growth rates were provided by the MDSHA and WVDOH.

Table 3 provides a summary of average annual daily traffic (AADT), growth rate, and existing and 20-year LOS. As shown in the table, none of the highway network roadways operate at a good level of service now. This is typical of what is generally predicted for similar roadways because even at volumes that are far from the capacity of the roadway, lower speeds prevail and the time spent following another vehicle tends to be high.

TABLE 3
Traffic and Level of Service Information for the Highway Network

Route	Segment	Current AADT	Current LOS	20-year Growth	2025 AADT	2025 LOS
US 220	Moorefield to Junction	3,800	E	1.4844	5,600	E
	Junction to New Creek	4,700	E	1.4844	7,000	E
	New Creek to MD/WV	4,400	E	1.4844	6,500	E
	MD/WV to MD 53	10,125	E	2.0	12,400	F
	MD 53 to I-68	14,125	E	2.0	20,200	F
MD 36	Westernport to Frostburg	8,150	E	2.0	11,650	F
MD 135	Westernport to Keyser	6,975	E	2.0	9,950	E
WV 46	Westernport to Keyser	2,000	E	1.6447	3,300	E
WV 93	Scherr to New Creek	2,200	E	1.5405	3,400	E
WV 28	Ft. Ashby to WV 956	9,300	E	1.5813	14,700	E
WV 956	WV 28 to US 220	5,200	E	1.5405	8,000	E
WV 28	WV 956 to Cumberland	9,900	E	1.5813	15,700	E
WV 46	Ft. Ashby to Keyser	3,200	E	1.6447	5,300	E
MD 53	US 220 to I-68	14,575	E	2.0	20,800	E

Potential future traffic for each transportation scenario was projected using a traffic assignment model and estimates of long-distance through traffic from intercity locations to the east and west of Cumberland on I-68. The traffic assignment model consisted of the following components:

- Trip Generation Productions – The number of households in the area was queried from the available census data at the block group level. There were 31,583 households in the area. It was estimated that each household produced 0.77 trips on the highway network.

- Trip Generation Attractions - Attractions were estimated using employment data queried at the place of work from the available census data. Data were queried and assigned to one of the eight major employment centers in the region: Cumberland, LaVale, Cresaptown, Frostburg, Westernport, Moorefield, Keyser, and Romney. Employment was grouped into retail and non-retail. Trip attraction rates were applied to each type of employment and the total number of attractions was balanced to match the trip productions.

- Trip Distribution – A gravity model was developed to perform the trip distribution. All of the attractions converged to within 8 percent.

- Traffic Assignment – For each of the segments, a matrix was prepared to estimate the percentage of trips between each origin and destination pair that would use the segment.

Some long-distance traffic flows through Cumberland on I-68 from I-79 and I-81. In the future, some of those trips could use the combination of Corridor H and an improved U.S. Route 220 corridor, if it provides a shorter and quicker route. After a detailed analysis of alternate travel paths through the area, a thousand vehicles per day were added to the forecasts, representing travelers that would shift from other long-distance through routes in the area to a new facility if one of the transportation scenarios were ultimately constructed.

At that point, the traffic model was complete and corridor level traffic was projected. In addition to the projections, the amount of regional residual traffic expected on U.S. Route 220 was calculated. Residual traffic would be those trips remaining on existing U.S. Route 220 if a new highway corridor were developed and traffic shifted to it. In effect, the less residual traffic on U.S. Route 220, the more successful the corridor would be. The amount of traffic each transportation scenario would carry, together with the residual traffic on U.S. Route 220, is shown in Table 4.

TABLE 4
Projected Residual Traffic on U.S. Route 220

Transportation Scenario	Traffic Projection for Each Scenario		Residual Traffic on U.S. Route 220	
	Year 2005	Year 2025	Year 2005	Year 2025
A	6,100-9,000	9,100-12,900	3,600-7,000	6,100-8,500
B	8,000-15,500	11,900-21,100	Primarily Local	Primarily Local
C	5,600-12,000	8,300-18,500	2,400-4,500	6,100-6,100
D	9,200-15,500	13,700-21,100	Primarily Local	Primarily Local
E	5,200-11,200	7,700-17,600	3,900-5,200	6,100-6,300

Across all five transportation scenarios, the lower range of traffic would occur between Corridor H and either Keyser or U.S. Route 50. Future traffic volumes would range from a low of 7,700 on the more rural parts of TS-E to a high of 21,100 on TS-B and TS-D in the vicinity of Cumberland and Cresaptown.

Of the five proposed transportation scenarios, TS-B and TS-D would divert the most traffic from existing U.S. Route 220, leaving primarily local traffic on the roadway. TS-A would divert the least traffic, leaving the most traffic on U.S. Route 220 in the year 2025. Though faring slightly better, TS-C and TS-E would leave about a third of the traffic on U.S. Route 220 that is expected there in the year 2025. Table 5 shows the upper limits of the five transportation scenarios ranked in order of their ability to divert future U.S. Route 220 traffic.

TABLE 5
Future Traffic on U.S. Route 220

Transportation Scenario	Maximum U.S. Route 220/MD Route 53 Traffic (AADT) Year 2025	Traffic (AADT) on each TS Year 2025	Residual Traffic (AADT) on U.S. Route 220 Year 2025
B	20,200	21,100	Primarily Local
D	20,200	21,100	Primarily Local
C	20,200	18,500	6,100
E	20,200	17,600	6,300
A	20,200	12,900	8,500

In terms of meeting future traffic demand, TS-B and TS-D offer the greatest promise, followed in order by TS-C, TS-E, and TS-A. Besides being diverted to a proposed corridor (if built), some of the growth in U.S. Route 220 traffic would shift to other roadways, compounding congestion and safety problems in the area. This shifting to other through routes would be greatest for the transportation scenarios that divert lesser amounts of future U.S. Route 220 traffic and lowest

for TS-B and TS-D. All of the other north-south routes, however, have less capacity than U.S. Route 220 for bearing increases in traffic.

4.2 Environmental Overview

The natural resources and important manmade features of the area were identified to aid in the development of environmentally sensitive transportation alternatives. The resources and features found within the project area were identified by reviewing secondary data (e.g., National Wetland Inventory data, county soil surveys, digital Flood Insurance Rate Maps, comprehensive plans, and other resource inventories) provided by local, state, and federal agencies. This data collection was followed by extensive field investigations to provide further insight into specific resources and environmental conditions.

The natural resources inventoried for the project included soils and geologic features, land cover, wetlands, streams, water quality, floodplains, threatened and endangered species, terrestrial habitat, parks and recreation areas, and farmlands. Secondary source information on all of the resources was collected by contacting local and state agencies with jurisdiction over, or interest in, the various landscape features. All information was incorporated into the project's geographic information system (GIS) and field verified. Updated data, based on the field verifications, were then incorporated into the GIS datasets and appropriate maps.

The manmade features included community facilities, urban/built-up areas, businesses, cultural resources (archaeological sites, historic structures, and historic districts), some potential Section 4(f) resources, and potentially contaminated sites. Locations with archaeological potential were assessed through a predictive model developed specifically for the project. Additionally, information on local planning initiatives, programs, and projects was gathered by contacting planning officials in the area. Similar to the natural resources, this information was field verified, where possible, and mapped in GIS.

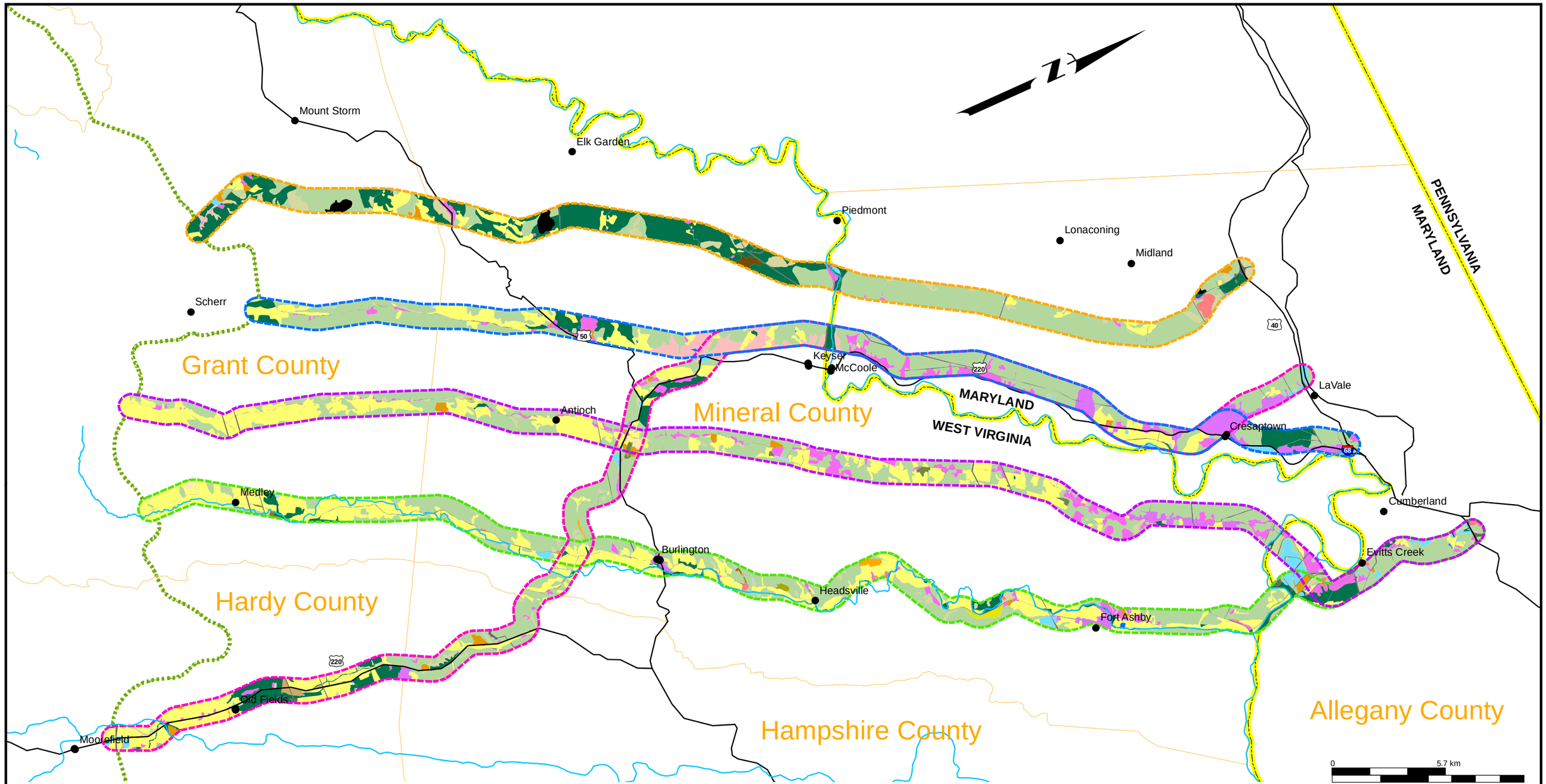
Located in West Virginia's Potomac Highlands region and one of Maryland's westernmost counties, the study area includes southwestern Allegany County in Maryland and all of Mineral County and portions of Grant, Hampshire, and Hardy counties in West Virginia. It encompasses an area over 835 square miles with a population of approximately 88,500. The major population and commercial centers of the area are located in Cumberland, Keyser, and Moorefield.

The landscape of the project area is primarily rugged terrain, characterized by a series of roughly parallel ridges and valleys. Although there are wider river valleys in the northwest and southeast centered around the North Branch Potomac River and Patterson Creek, respectively, narrower stream valleys and hollows are found throughout the remainder of the project area. Land utilization in this hilly project area can be divided into three major categories: urban and small town, agricultural, and forested. There are many small pockets throughout the area, however, where other uses are found.

The predominant land cover is forested and agricultural land. The rural valleys of the project area are dotted with many active farms while dense forests are found on the adjacent ridge tops. A generalized illustration of land cover in the area is shown on Figure 7.

Densely populated residential, commercial, and industrial development is found in three core areas around the City of Cumberland, the City of Keyser, and the City of Moorefield, all of which are their respective county seats. Heavy development in and around Cumberland extends from LaVale through Cumberland to the east and along MD Route 53 and U.S. Route 220 to the south through Cresaptown. Of importance are the neighborhoods of Cumberland for both their residential units and significance as historic resources. Also of importance in the Cumberland area are its commercial centers in downtown and along U.S Route 220 and MD Route 53. Large industrial and transportation complexes emanate from the center of Cumberland to the southeast along MD Route 51 (Industrial Boulevard). In Keyser, there are two primary commercial centers: the Keyser central business district (CBD) and suburban-type development along U.S. Route 220 extending from Keyser to WV Route 972. In Moorefield, commercial development is centered along U.S. Route 220 from Corridor H to WV Route 55. Further south on U.S. Route 220 are large processing plants associated with the poultry industry.

Although there are also a few small, more densely developed residential communities in the area, including Burlington, Fort Ashby, McCoole, and New Creek, among others, the remainder of the study area is mostly rural in nature, primarily used for agriculture or as forested land. Important farmland areas are found in the Patterson Creek valley, on the project's eastern edge, on the lower slopes of Knobley ridge, and along U.S. Route 220 in Allegany County south of Cresaptown. Vast tracts of forested land are found along the ridge tops, but, as noted previously, an area of special importance is Dans Mountain.



Legend

- TRANSPORATION SCENARIO A
- TRANSPORATION SCENARIO B
- TRANSPORATION SCENARIO C
- TRANSPORATION SCENARIO D
- TRANSPORATION SCENARIO E
- STATE LINE
- COUNTY LINE
- MAJOR ROADS
- CORRIDOR H

LANDCOVER

11	RESIDENTIAL
11/12	RESIDENTIAL/COMMERCIAL AND SERVICES
11/33	RESIDENTIAL/MIXED RANGELAND
12	COMMERCIAL AND SERVICES
14	TRANSPORTATION, COMMUNICATIONS, AND UTILITIES
16	MIXED URBAN OR BUILT-UP LAND
17	OTHER URBAN OR BUILT-UP LAND
21	CROPLAND AND PASTURES
21/11	CROPLAND AND PASTURES/RESIDENTIAL
21/33	CROPLAND AND PASTURES/MIXED RANGELAND
31	HERBACEOUS RANGELAND
31/11	HERBACEOUS RANGELAND/RESIDENTIAL
31/21	HERBACEOUS RANGELAND/CROPLAND AND PASTURE
31/33	HERBACEOUS RANGELAND/MIXED RANGELAND
31/43	HERBACEOUS RANGELAND/MIXED FOREST LAND
33	MIXED RANGELAND
33/41	MIXED RANGELAND/DECIDUOUS FOREST LAND
33/42	MIXED RANGELAND/EVERGREEN FOREST LAND
33/43	MIXED RANGELAND/MIXED FORESTLAND
41	DECIDUOUS FOREST LAND
41/31	DECIDUOUS FOREST LAND/HERBACEOUS RANGELAND
42	EVERGREEN FOREST LAND
42/31	EVERGREEN FOREST LAND/HERBACEOUS RANGELAND
43	MIXED FOREST LAND
51	STREAMS AND CANALS
52	LAKES
53	RESERVOIRS
75	STRIP MINES, QUARRIES, AND GRAVEL PITS
76	TRANSITIONAL AREAS

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NHS CORRIDOR BETWEEN I-68 AND CORRIDOR H
ALLEGANY COUNTY, MD
GRANT, HARDY, HAMPSHIRE, AND
MINERAL COUNTIES, WV

LAND COVER

FIGURE - 7

4.3 Potential Environmental Impacts

The potential impacts for each of the transportation scenarios are shown in Table 6, Figure 7, and Figure 8.

TABLE 6
Preliminary Environmental Impacts

Environmental Feature	Transportation Scenario				
	A	B	C	D	E
Aquatic Resources					
Wetlands					
Acreage	146.7	118.1	151.7	143.0	305.9
Number	123	117	255	211	277
Streams					
Perrenial					
--linear feet	198292	246322	269902	326380	564359
--number	74	150	199	198	362
Intermittant					
--linear feet	24065	53917	60932	122423	70793
--number	19	33	55	84	55
Floodplains					
Acreage	44	775	719	2244	5395
Potential Transverse Encroachments	1	3	3	9	9
Land Cover *(Acreage)*					
Built-Up Land	823	4427	3483	4439	2082
Agricultural Lands	1403	2953	6489	5487	8667
Forests	13016	9890	11130	11409	9921
Rangeland	1291	127	644	720	586
Mixed Forests and Rangeland	193	0	53	91	154
Potentially Hazardous Waste *(Sites)*	17	43	42	55	28
Community Facilities *(Sites)*					
Parks & Recreation					
Public Ownership	2	2	3	2	7
Private Ownership	0	4	4	2	4
Government Buildings	1	3	3	4	3
Cemeteries	1	9	18	14	12
Schools	0	8	2	7	4
Churches	2	18	19	20	13
Emergency Management	0	4	2	0	1
Major Health Care Facility	0	0	1	0	2
Prisons	0	2	1	0	0
Other Public Facilities	2	4	3	1	8

TABLE 6 (continued)
Preliminary Environmental Impacts

Environmental Feature	Transportation Scenario				
	A	B	C	D	E
Agricultural Resources					
Farmlands *(Acreage)*	1403	2953	6489	5486	8667
Agricultural Preservation Districts	0	0	1	0	0
Agricultural Preservation Easements	0	0	0	67	0
Cultural Resources					
Historic Resources					
NRHP Sites	0	0	5	9	10
NRHP Eligible Sites	0	4	5	14	16
Potential NRHP Eligible Sites	4	29	29	31	51
Archaeological Resources *(Acreage)*					
Post-Contact Features					
- -Very Low Potential	1598	1799	2675	2487	2373
- -Low Potential	435	2013	2116	2956	3236
- -Moderate Potential	1018	679	1114	1029	1080
- - High Potential	19	115	141	302	93
- - Very High Potential	0	98	300	316	489
Prehistoric Features					
- - Very Low Potential	8048	7000	7194	8727	8754
- - Low Potential	4786	1368	6767	5168	4066
- - Moderate Potential	3118	3968	1353	1229	417
- - High Potential	1090	4210	5490	4785	4280
- - Very High Potential	49	915	1043	2306	4314
Potential Section 4(f) Resources *(Sites)*					
Parks & Recreation	2	2	3	2	7
Wildlife Refuges	0	0	0	0	0
NRHP Sites	0	0	5	9	10
NRHP Eligible Sites	0	4	5	14	16
Potential-NRHP Eligible Sites	TBD	TBD	TBD	TBD	TBD
Socioeconomic Resources					
Residential *(Acreage)*	253	2591	2369	2623	1002
Mixed Built-up Land *(Acreage)*	243	1253	86	858	115
Commercial/Industrial *(Acreage)*	58	172	456	343	440
Industrial Parks *(Sites)*	0	1	0	0	1
Business Locations *(Sites)*	4	153	101	163	42
Employees	25	1215	1258	1813	355

Keyser

McCoole

LaVale

Cresaptown

Cumberland

Evitts Creek

Headsville

Fort Ashby

0 2880m

0 8000' 16000'

WEST VIRGINIA DIVISION OF HIGHWAYS
MARYLAND STATE HIGHWAY ADMINISTRATION

NHS CORRIDOR BETWEEN I-68 AND CORRIDOR H
ALLEGANY COUNTY, MD.
GRANT, HARDY, HAMPSHIRE, AND
MINERAL COUNTIES, WV.

POTENTIAL IMPACTS

FIGURE - 8
SHEET 1 OF 2

FIUGRE 8 SHEET 2 OF 2

FIUGRE 8 SHEET 1 OF 2

SHEET LAYOUT INDEX

Scherr

Antioch

Medley

Burlington

Old Fields

Moorefield

LEGEND:

- NATIONAL REGISTER OF HISTORIC PLACES LISTED (NRHP)
- NRHP ELIGIBLE
- NRHP POTENTIALY ELIGIBLE
- COMMUNITY FACILITY
- POTENTIALLY HAZARDOUS WASTE SITE
- INTERMITTENT STREAM
- MAJOR STREAM
- PERENNIAL STREAM
- TRIBUTARY STREAM
- CORRIDOR H
- NRHP POTENTIALLY ELIGIBLE
- NRHP ELIGIBLE
- NRHP LISTED
- POTENTIALLY HAZARDOUS WASTE SITE
- HISTORIC DISTRICT
- COMMUNITY FACILITY
- NWI WETLAND
- STRIP MINE
- PRIME FARMLAND
- STATEWIDE IMPORTANT FARMLAND
- LOCAL FARMLAND
- WVA PRESERVE FARMLAND
- FIELD SURVEYED FARMLAND
- FLOODPLAIN
- TRANSPORTATION SCENARIO C
- TRANSPORTATION SCENARIO D
- TRANSPORTATION SCENARIO E
- SEE FIGURE 8 SHEET 2 OF 2

Piedmont

Lonaconing

Midland

Keyser

McCoole

LaVale

Cresaptown

Cumberlan

0 2880m

0 8000' 16000'

WEST VIRGINIA DIVISION OF HIGHWAYS
MARYLAND STATE HIGHWAY ADMINISTRATION

NHS CORRIDOR BETWEEN I-68 AND CORRIDOR H
ALLEGANY COUNTY, MD.
GRANT, HARDY, HAMPSHIRE, AND
MINERAL COUNTIES, WV.

POTENTIAL IMPACTS

FIGURE - 8
SHEET 2 OF 2

FIGURE 8 SHEET 2 OF 2

FIGURE 8 SHEET 1 OF 2

SHEET LAYOUT INDEX

Mount Storm

Elk Garden

Scherr

Antioch

Burlington

LEGEND:

- NATIONAL REGISTER OF HISTORIC PLACES LISTED (NRHP)
- NRHP ELIGIBLE
- NRHP POTENTIALY ELIGIBLE
- COMMUNITY FACILITY
- POTENTIALLY HAZARDOUS WASTE SITE
- INTERMITTENT STREAM
- MAJOR STREAM
- PERENNIAL STREAM
- TRIBUTARY STREAM
- CORRIDOR H
- NRHP POTENTIALLY ELIGIBLE
- NRHP ELIGIBLE
- NRHP LISTED
- POTENTIALLY HAZARDOUS WASTE SITE
- HISTORIC DISTRICT
- COMMUNITY FACILITY
- NWI WETLAND
- STRIP MINE
- PRIME FARMLAND
- STATEWIDE IMPORTANT FARMLAND
- LOCAL FARMLAND
- WVA PRESERVE FARMLAND
- FIELD SURVEYED FARMLAND
- FLOODPLAIN
- TRANSPORTATION SCENARIO A
- TRANSPORTATION SCENARIO B
- SEE FIGURE 8 SHEET 1 OF 2

4.3.1 Wetlands

Each of the five transportation scenarios would require the crossing of wetlands, resulting in potential impacts to wetland resources. Potential wetlands within the five transportation scenarios were identified through the use of existing information and preliminary field investigations. Field investigations were conducted during August 2006.

Existing information utilized in the investigation included the U.S. Department of Agriculture – National Resources Conservation Service (USDA-NRCS), Allegany County, Maryland (1977); Hampshire, Mineral, and Morgan counties, West Virginia (1978); and Grant and Hardy counties, West Virginia (1989) Soil Surveys and USFWS National Wetland Inventory mapping. Potential wetland habitats were identified based on visual changes in vegetation and signs of hydrology. All potential wetlands within the project study area were classified in accordance with the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et al., 1979). None of the potential wetlands identified were delineated at that time.

Transportation Scenario A

TS-A could result in impacts to 123 wetlands, or 146.7 acres of wetlands. This would be the second fewest number of wetlands potentially impacted by any of the transportation scenarios, but the third largest in acreage.

Transportation Scenario B

TS-B would require the least amount of impacts to wetlands of the five transportation scenarios. Up to 117 wetlands and 118.1 acres could be impacted. This is both the fewest number of wetlands and least amount of wetland acreage that could be impacted by any of the transportation scenarios. Potential impacts to wetlands with this scenario would be considerably less, in both number and acreage, than any of the other transportation scenarios.

Transportation Scenario C

TS-C could result in 255 wetlands, or 151.7 acres of wetlands, being impacted. TS-C contains the second highest number of wetlands of the five transportation scenarios and the second largest amount of wetland acreage.

Transportation Scenario D

TS-D could result in 211 wetlands, or 143.0 acres of wetlands, being impacted. Although TS-D contains the third largest number of wetlands of the five transportation scenarios, it contains the second lowest amount of wetland acreage.

Transportation Scenario E

TS-E could result in 277 wetlands, or 305.9 acres of wetlands, being impacted. This would be both the highest number and greatest amount of impacts to wetlands of all five transportation scenarios.

4.3.2 Streams

Each of the five transportation scenarios would require the crossing of streams, resulting in potential impacts to stream (and water quality) resources. Streams were identified through the use of existing information and field investigations. Existing information utilized in the investigation included the USDA-NRCS, Allegany County, Maryland (1977); Hampshire, Mineral, and Morgan counties, West Virginia (1978); and Grant and Hardy Counties, West Virginia (1989) Soil Surveys and project area mapping. In August 2006, a field investigation revealed numerous perennial and intermittent streams within the five transportation scenarios.

Transportation Scenario A

TS-A would require the least amount of impacts to streams. TS-A contains 74 perennial streams (198,292 linear ft.) and 19 intermittent streams (24,065 linear ft.).

Transportation Scenario B

TS-B could result in 150 perennial streams (246,322 linear ft.) and 33 intermittent streams (53,917 linear ft.) being impacted.

Transportation Scenario C

TS-C could result in 199 perennial streams (269,902 linear ft.) and 55 intermittent streams (60,932 linear ft.) being impacted.

Transportation Scenario D

TS-D could result in 198 perennial streams (326,380 linear ft.) and 84 intermittent streams (122,423 linear ft.) being impacted. TS-D could impact the highest amount of intermittent streams of all five transportation scenarios.

Transportation Scenario E

TS-E could result in 362 perennial streams (564,359 linear ft.) and 55 intermittent streams (70,793 linear ft.) being impacted. TS-E could impact the highest amount of perennial streams of all five transportation scenarios.

4.3.3 Floodplains

The floodplain analysis was conducted in accordance with the requirements of Executive Order 11988, *Floodplain Management*, FHPM 6-7-3-2, *Location and Hydraulic Design of Encroachments on Floodplains,* and U.S. Department of Transportation 5650.2, *Floodplain Management and Protection*. Federal guidelines require the use of available National Flood Insurance Program (NFIP) maps to determine and evaluate the effect the proposed action may have on 100-year floodplains and the risk of flooding.

Three sets of data developed by FEMA for the NFIP were utilized to determine the project's potential impacts to 100-year floodplains and floodways: Flood Insurance Rate Maps (FIRMs), digital Q3 Flood Data, and the Digital Flood Insurance Rate Map (DFIRM) database. Depending on the level of study conducted for a stream, the FIRMs may include limits of 100-

year floodplains, floodways, and elevations of the base (100-year) flood. The digital Q3 Flood database, which FEMA developed by electronically scanning the paper FIRMs and vectorizing an overlay of the flood risks, includes special flood hazard areas; no floodways or elevations of the base flood are defined. The digital Q3 Flood database was utilized to determine potential impacts to special flood hazard areas within Allegany County. The DFIRM database includes the GIS information used to create new FIRMs. This database was utilized to determine potential impacts to 100-year floodplains and floodways for the four counties in West Virginia.

Transportation Scenario A

TS-A would require one transverse crossing of the North Branch Potomac River at the West Virginia/Maryland state line. TS-A would have the least amount of floodplain encroachment (44 acres) of the five transportation scenarios.

Transportation Scenario B

TS-B would require transverse crossings of New Creek in Mineral County, the North Branch Potomac River, and Warrior Run in Allegany County. In addition, TS-B could potentially result in longitudinal encroachments on New Creek and the North Branch Potomac River. TS-B could result in 775 acres of floodplain encroachment.

Transportation Scenario C

TS-C would require transverse crossings of Mikes Run in Mineral County, the North Branch Potomac River, and Evitts Creek in Allegany County. In addition, TS-C could potentially result in transverse crossings of several streams at the upper reaches of their identified floodplains and in a longitudinal encroachment of the North Branch Potomac River. TS-C could result in 719 acres of floodplain encroachment.

Transportation Scenario D

TS-D would require nine transverse crossings, including the South Branch Potomac River in Hardy County, Patterson Creek in Mineral County, and the North Branch Potomac River. In

addition, TS-D could potentially result in a longitudinal encroachment on the North Branch Potomac River. TS-D could result in 2,244 acres of floodplain encroachment.

Transportation Scenario E

TS-E would require a minimum of nine transverse crossings, including Patterson Creek in Grant and Mineral counties, the North Branch Potomac River, and Evitts Creek in Allegany County. In addition, TS-E would likely require numerous longitudinal encroachments along Patterson Creek in Grant and Mineral counties. At 5,395 acres, TS-E would have the greatest amount of floodplain encroachment of the five transportation scenarios.

4.3.4 Land Cover

Each of the five transportation scenarios would require the crossing of varied land cover and terrestrial habitat types, resulting in potential impacts to these resources. The habitat types found within the project area were identified by reviewing U.S. Geological Survey (USGS) topographic maps and through field investigation. The field investigation was performed in July 2006. Upland habitat types as well as land use types were classified to Level II in accordance with the *Anderson Land Use/Land Cover Classification System* (Anderson, et al., 1976).

Although all land cover is an important part of the landscape, and all components of land cover were evaluated, early coordination efforts with state resource agencies and the public indicated that impacts to forests and agricultural land could generate the most public controversy. As the project progresses, however, potential impacts to residential land are likely to rise to equal importance. The potential impacts to residential land are discussed in the socioeconomics section of this report.

Transportation Scenario A

TS-A would require the least amount of impacts to land resources. Of notable importance, TS-A would have the highest impact to forests (13,016 acres) of all five transportation scenarios.

Transportation Scenario B

TS-B could result in the second lowest amount of land disturbance of any transportation scenario. TS-B could impact 2,953 acres of agricultural land and 9,890 acres of forest land.

Transportation Scenario C

TS-C could result in the second highest amount of land disturbance of any transportation scenario. TS-C could impact 6,489 acres of agricultural land and 11,130 acres of forest land.

Transportation Scenario D

TS-D could result in the largest amount of land disturbance of any transportation scenario. TS-D could impact 5,487 acres of agricultural land and 11,409 acres of forest land.

Transportation Scenario E

TS-E could result in the third highest amount of land disturbance of any transportation scenario. TS-E could impact 8,667 acres of agricultural land and 9,921 acres of forest land.

4.3.5 Agricultural Resources

All land cover types were classified to Level II in accordance with the *Anderson Land Use/Land Cover Classification System* (Anderson, et al., 1976) to assist in determining the acreage of land cover types, including agricultural lands, within each of the transportation scenarios during the project site investigation in July 2006. As the project progresses, other indicators of farmlands will be investigated, including soil types listed under the *Federal Farmland Protection Policy Act of 1981* and land covered under the *Maryland Agricultural Land Preservation Program* and the *West Virginia Voluntary Farmland Protection Act*.

Transportation Scenario A

With a total of 1,403 acres in farmland, TS-A contains the least agricultural land of all the other transportation scenarios. This is the case because TS-A traverses a predominately forested

area including Dans Mountain and the highlands west of the Allegheny Front. This topography and the presence of numerous former strip mines minimize the presence of farmlands.

Transportation Scenario B

TS-B contains the second fewest acres of agricultural land with 2,953 acres. A concentrated cluster of farmlands exists along existing U.S. Route 220 between Cresaptown and Rawlings, MD. Just west of Keyser, TS-B also includes agricultural land that is part of Potomac State College and a concentrated cluster of agricultural land in the New Creek valley from U.S. Route 50 south to the Grant County line.

Transportation Scenario C

TS-C contains the second highest amount of agricultural land at 6,489 acres, more agricultural land than contained in TS-A and TS-B combined. This valley along the eastern face of Knobley Ridge contains many family-owned farms located along Mineral County Route 9 and Grant County Route 3.

TS-C would also impact one acre of land within an agricultural preservation district. The agricultural preservation district is located near the northern limits of the scenario in the Mexico Farms section of Allegany County. This district is the only one impacted by any of the transportation scenarios.

Transportation Scenario D

TS-D contains the third highest amount of agricultural land at 5,486 acres. Because it is generally coterminous with TS-B from Cresaptown to south of Keyser, it encompasses the same farmlands in Allegany County that TS-B does. At its southern end, TS-D could potentially impact some of the most productive farmland in the project area as it passes through Old Fields to Moorefield. This southern portion of TS-D also contains many poultry farms. The production of poultry products is a key sector of Hardy County's economy.

Additionally, TS-D would impact 67 acres of land with special agricultural preservation easements. It is the only transportation scenario within the project area that contains these easements.

Transportation Scenario E

Running through the Patterson Creek valley, TS-E contains the most farmland of all the transportation scenarios at 8,667 acres. The valley is considered the heart of the Mineral and Grant counties' agricultural industry. It contains many small and large family farms producing beef, dairy products, poultry, hay, and vegetable crops.

4.3.6 Historic Resources

The West Virginia Division of Culture and History (WVDCH) and the Maryland Historical Trust (MHT) provided GIS databases of previously surveyed historic resources. The historic resource survey files and Section 106 files at WVDCH and MHT were reviewed, cross-referenced against the GIS database, and photocopied for reference in the field. Previously surveyed resources were rated in four possible categories by the state agencies: NRHP listed, NRHP eligible, considered not NRHP eligible, or undetermined. Additional background research was carried out at the West Virginia Regional History Collection at West Virginia University and the library at Frostburg State University. Several histories, reference books, and historic maps were reviewed.

A windshield survey of every structure within an expanded study area of each transportation corridor (one-mile wide) was conducted. Every accessible structure was visually assessed for age and eligibility (integrity and possible significance). Structures deemed potentially eligible or worthy of further consideration were documented with digital photographs, UTM coordinates, and notes.

Transportation Scenario A

TS-A would have the least impact to historic resources, only impacting four potentially eligible NRHP sites. A summary of the historic resources found in TS-A and the other four transportation scenarios is found in Table 7.

TABLE 7
Historic Resources Found in Each Transportation Scenario

Eligibility	Transportation Scenario				
	A	B	C	D	E
National Register of Historic Places (Listed)	None		1. Stewart's Tavern 2. Vandiver-Trout-Clause House 3. Western Maryland Railway 4. Chesapeake and Ohio Canal 5. Inn of the National Road (Colonial Manor)	1. Vandiver-Trout-Clause House 2. LaVale Toll Gate House 3. Fairview/Peerce Home Place 4. Fort Hill Farm 5. Garrett VanMeter House (MSBVRHD) 6. Fort Pleasant (MSBVRHD) 7. Willow Wall (MSBVRHD) 8. Buena Vista Farms (MSBVRHD) 9. The Meadows (MSBVRHD)	1. Western Maryland Railway 2. Chesapeake and Ohio Canal 3. Inns of the National Road (Colonial Manor) 4. Fairview/Peerce Home Place 5. Fort Hill Farm 6. Fort Ashby 7. Burlington Historic District 8. Chesapeake and Ohio Canal Lockhouse 75 9. Chesapeake and Ohio Canal Lockhouse 72 10. Locust Grove (HHD)
National Register of Historic Places (Eligible)	None	1. Log House with Stone Chimneys 2. Luten Bridge/ Boseley Bridge 3. Log House 4. Claysville United Methodist Church	1. Frame House with Brick Chimney 2. Hillcrest Memorial Park 3. Concrete Block House 4. Carleton Farm 5. Hillcrest Memorial Park Funeral Chapel	1. Frame House with Brick Chimney 2. Julius Grabenstein Farmhouse 3. Grabenstein Bungalow 4. I-House 5. Old Fields Church/Fort Plesant Meetinghouse and Cemetery 6. Stone House Inn 7. Middle South Branch Valley Rural Historic District 8. Moorefield Battlefield 9. Abraham Inskeep House 10. Former Commercial Structure and part Tavern (PHD) 11. George Purgitt's House (PHD) 12. Former Commercial Structure (PHD) 13. Peter Casey Frame/Log House (MSBVRHD) 14. Large Frame House (MSBVRHD)	1. Hillcrest Memorial Park Funeral Chapel 2. Concrete Block house 3. Carleton Farm 4. Hillcrest Memorial Park 5. Lahman House 6. Eusebia Presbyterian Church and Cemetery 7. G. Carskadon House (HHD) 8. Thomas R. Carskadon House/Kingwood Farm (HHD) 9. Headsville One Room Schoolhouse (HHD) 10. Phillips House (HHD) 11. Headsville Bridge (HHD) 12. Borror House and Store (HHD) 13. McDonald Farm (HHD) 14. Headsville Methodist Church (HHD) 15. The Homestead 16. Williamsport Mill/Lyons Mill (WHD)

(HHD) Headsville Historic District (Potentially Eligible)
(MSBVRHD) Middle South Branch Valley Rural Historic District (Considered Eligible)
(PHD) Purgitsville Historic District (Considered Eligible)
(WHD) Williamsport Historic District (Potentially Eligible)

Transportation Scenario B

TS-B would impact the second fewest historic resources. TS-B could impact four NRHP-eligible sites and up to 29 potentially eligible sites, including five potentially eligible NRHP historic districts. Two of the potential historic districts are found in Bowling Green, located along U.S. Route 220 in a heavily developed residential area north of Cresaptown. The third potential district is just south of Cresaptown at Pinto, east of U.S. Route 220. The fourth potential district is also located along U.S. Route 220 slightly farther south. This resource, a potentially NRHP-eligible rural historic district centered around the Barton Dairy, spans the entire width of TS-B and could prove difficult to cross with future alternative alignments. Another potential district is the original Baltimore and Ohio Railway which spans parts of both Maryland and West Virginia and crosses every transportation scenario at some point.

Transportation Scenario C

TS-C would impact the third most historic sites. TS-C would impact five NRHP sites, five eligible NRHP sites, and up to 29 potentially eligible NRHP sites. One of the existing NRHP sites is the C&O Canal National Historic Park. This resource spans the entire width of TS-C as the transportation scenario crosses the Potomac River. One of the other NRHP sites, the Western Maryland Railway right-of-way, is located nearby and offers challenges similar to the Canal Park.

Transportation Scenario D

TS-D would impact the second most historic sites. TS-D would impact nine NRHP sites, fourteen eligible NRHP sites, and up to 31 potentially eligible NRHP sites, including four potentially NRHP-eligible historic districts.

One of the potentially eligible districts, the Middle South Branch Rural Historic District at the southern end of the transportation scenario just north of Moorefield spans the entire width of TS-D. Five of the existing NRHP sites found in TS-D are located within the suggested boundary of the potentially eligible South Branch Rural Historic District.

The second potentially eligible district is located in Purgitsville. It is centered on U.S. Route 220 in Hampshire County near its southwestern corner boundary with Hardy County.

The third potentially NRHP-eligible district is the rural historic district centered around the Barton Dairy. It spans the entire width of TS-D and could prove difficult to cross with future alternative alignments. The fourth potential district is just south of Cresaptown at Pinto, east of U.S. Route 220.

Transportation Scenario E

TS-E would impact the most historic sites. TS-E would impact ten NRHP sites, one NRHP historic district (Burlington), 16 eligible NRHP sites, and up to 51 potentially eligible NRHP site, including six potentially NRHP eligible historic districts. One of the existing NRHP sites is the C&O Canal National Historic Park.

The six potentially eligible historic districts are Patterson Creek, Lower Patterson Creek, Headsville, Williamsport, the Baltimore and Ohio's Patterson Creek Cutoff, and the original Baltimore and Ohio Railway. The Patterson Creek district is the northernmost near the Maryland state line. Lower Patterson Creek consists of a rural district with farm buildings and farmland. The Headsville district is north of Burlington and spans about half the width of TS-E. Williamsport is a relatively tight area with clusters of smaller properties near the southern end of the transportation scenario. The B&O's Patterson Creek Cutoff is near the town of Patterson Creek and contains an abandoned railroad tunnel. The B&O Railway which spans parts of both Maryland and West Virginia crosses TS-E near Patterson Creek.

4.3.7 Archaeological Resources

Archaeological predictive modeling and construction of predictive surfaces for pre-contact and historic period site locations has become an increasingly valuable tool, particularly within the applications of site/alternative selection and impact assessment in project planning (Allen, et al., 1990; Carr, 1985; Judge and Sebastian, 1988; Kohler and Parker, 1986; Kvamme 1983, 1986, 1990). In order to be effective, a predictive surface must be flexible and inexpensive to apply and be capable of projecting likely archaeological site distributions across an area based on a

sample of that region's known resources or on fundamental notions of human behavior (Kohler and Parker, 1986), while retaining a reliable degree of accuracy and validity.

In order to be effectively developed, tested, and applied, the predictive surface methodology must be flexible, allowing for refinements and reiterations to be quickly and inexpensively made as the process proceeds. Archaeological predictive surfaces were mapped for each transportation scenario by using the distribution and character of environmental variables in relation to patterns of archaeological site locations (Allen, et al., 1990; Calamia, 1986; Kvamme, 1986, 1989; Savage, 1989).

The basis for the construction of predictive surfaces is that people preferentially choose habitation and use locations from the array of choices made available by the natural environment (e.g., Paleoindian site locations associated with locations of high quality cryptocrystalline lithic raw materials; historic period mill locations associated with stream locations that provide sufficient fall for water power). If these environmental variables are considered in concert with what is known about previously identified archaeological resources and historic period features within a particular geographic area, mapping representative of the potential for the geographic area to contain additional archaeological resources can be constructed.

Employing GIS, data sets were compared, analyzed, and integrated, in order to assess the potential for occurrence and preservation of pre-contact and historic period archaeological resources within each transportation scenario. Predictions on archaeological potential were then developed.

Transportation Scenario A

TS-A would have the least impact on potential historic and prehistoric archaeological resources. There would be little impact to areas with high or very high potential to encounter prehistoric or post contact features, approximately 9 acres for post contact features and approximately 2,040 acres for prehistoric features.

Transportation Scenario B

TS-B would have the second lowest impact on potential historic and prehistoric archaeological resources. There would be little impact to areas with high or very high potential to encounter post contact features, approximately 215 acres. The possibility of encountering prehistoric features is greater, however, with approximately 5,125 acres of area with high or very high potential.

Transportation Scenario C

TS-C would have the third highest impact on potential historic and prehistoric archaeological resources. Approximately 440 acres of TS-C have high or very high potential to encounter post contact features and approximately 6,500 acres of TS-C have high or very high potential to encounter prehistoric features.

Transportation Scenario D

TS-D would have the second highest impact on potential historic and prehistoric archaeological resources. Approximately 620 acres of TS-D have high or very high potential to encounter post contact features (the highest of all the transportation scenarios) and approximately 7,100 acres of TS-D have high or very high potential to encounter prehistoric features.

Transportation Scenario E

TS-E would have the highest impact on potential historic and prehistoric archaeological resources. Approximately 580 acres of TS-E have high or very high potential to encounter post contact features and approximately 8,600 acres of TS-E have high or very high potential to encounter prehistoric features (the highest of all the transportation scenarios).

4.3.8 Potential Section 4(f) Resources

Section 4(f) requires that special efforts be made to protect publicly owned parks, recreation areas, wildlife and waterfowl refuges, and significant historic sites. Section 4(f) was enacted as Section 4(f) of the *U.S. Department of Transportation (USDOT) Act of 1966*, set forth in *Title 49*

United States Code (USC) §1653(f) and re-codified at *49 USC §303 (1983)*. Due to an effort to recode the *USDOT Act* in January of 1983, it was amended and codified in *49 USC §303.* Section 4(f) coordination was conducted with municipal officials throughout the project area as well as with WVDCH and MHT.

There are a number of public parks, recreation areas, and historic resources located within each transportation scenario that could potentially be impacted by the project. Historic resources identified as potential Section 4(f) resources during this preliminary alternatives analysis were limited to NRHP sites and NRHP-eligible sites. As the project progresses and potential NRHP sites are determined eligible, the number of Section 4(f) resources could increase.

Transportation Scenario A

Of all five transportation scenarios, TS-A would potentially impact the fewest Section 4(f) resources. TS-A would only impact two public parks. One of the two locations considered a public park, however, is the Dans Mountain Wildlife Management Area, the largest public parkland in the project area. The other public park is Dans Mountain State Park.

Although wildlife management areas are not necessarily parkland – that classification is dependent on a number of criteria still being evaluated – much of the Dans Mountain Wildlife Management Area is used for public recreational activities like hunting and hiking. As such, it is being considered a potential section 4(f) resource at this stage of the Tier One process. In any event, it would not be possible to build any new roadway alignment within TS-A without impacting this very important resource.

Transportation Scenario B

TS-B would potentially impact the second smallest number of Section 4(f) resources. TS-B would impact two public parks and four NRHP-eligible sites. Although Dans Mountain is one of two public parks falling within this transportation scenario, if advanced to Tier Two, it may be possible to develop roadway alignments within TS-B (on the eastern edge of Dans Mountain) that would avoid impacting this Section 4(f) resource. If the potential rural historic district centered on the Barton Dairy is determined to be NRHP eligible, it could result in an additional Section 4(f) impact.

Transportation Scenario C

TS-C would potentially impact the third most number of Section 4(f) resources. TS-C would impact three public parks, five NRHP sites, and five NRHP-eligible sites. One of the Section 4(f) resources within TS-C is the C&O Canal National Historic Park (both a historic resource and public park). As noted earlier, this park spans the entire width of TS-C as the transportation scenario crosses the Potomac River. It would be difficult to cross the C&O Canal National Historic Park without impacting it.

Transportation Scenario D

TS-D would potentially impact the second most Section 4(f) resources. TS-D would impact two public parks, nine NRHP sites, and fourteen NRHP-eligible sites. Five of the NRHP sites are located in a cluster of large farms near Old Fields that are part of the Middle South Branch Valley Rural Historic District. This historic district, determined eligible for the NRHP, spans the entire width of TS-D at its southern end. It would not be possible to build any new roadway alignment there without impacting this potential Section 4(f) resource. Also, if the potential rural historic district centered on the Barton Dairy is determined to be NRHP eligible, it could result in an additional Section 4(f) impact.

Transportation Scenario E

TS-E would potentially impact the most Section 4(f) resources. TS-E would impact seven public parks, ten NRHP sites, and 16 NRHP-eligible sites. One of the existing NRHP sites is the C&O Canal National Historic Park. As with TS-C, it would be difficult to cross the C&O Canal National Historic Park without impacting it.

4.3.9 Socioeconomic Resources

Information on socioeconomic resources was obtained through the U.S. Census, Dun and Bradstreet employment datasets, comprehensive plans, interviews with the project area's planning officials, and land cover (*Anderson* Level II classifications).

Transportation Scenario A

With only 252 acres in residential development, TS-A traverses some of the least populated land in Allegany and Mineral counties. Consequently, it would have the least impacts to residential and commercial land. It would also impact the fewest number of jobs and business locations.

Transportation Scenario B

With nearly 2,600 acres in residential development, TS-B traverses some of the most densely populated residential settlements within the project area, including LaVale, Cresaptown, and Keyser. As such, it would have the second highest impact on residential acreage and the second highest number of business locations. It would also have the highest impact on mixed built-up land (a combination of dense residential and commercial land) and the third highest number of jobs (1,215).

Transportation Scenario C

At its northern limits, TS-C is also densely populated, especially in Allegany County around the Mexico Farms area and in Mineral County along WV Route 28. With nearly 2,400 acres in residential development, TS-C is the third most densely populated transportation scenario in the project area. It has the highest amount of combined commercial/industrial acreage (455.9 acres) and the second highest number of jobs (1,258).

Transportation Scenario D

Similar to TS-B, TS-D traverses some of the most densely populated parts of the project area, including LaVale, Cresaptown, Keyser, and Moorefield. It would impact the greatest amount of residential acreage (2,623.1 acres), the highest number of business locations (163), and the highest number of jobs (1,813).

Transportation Scenario E

Although TS-E is heavily industrialized around the Mexico Farms area, it quickly becomes rural in nature as it crosses into West Virginia and continues south. It would impact the second

lowest amount of residential acreage (1,002.5 acres), the second lowest number of business locations (42), and the second fewest jobs (355). Although rural in nature overall, TS-E does impact the more densely settled areas of Fort Ashby and Burlington.

4.3.10 Community Facilities

Information on community facilities was collected from a variety of sources, including comprehensive plans, state and local agencies, and a windshield survey. Community facilities found in the project area include government buildings, post offices, emergency service buildings, parks and recreation areas, water and sewage treatment plants, schools and colleges, libraries, prisons, cemeteries, and churches.

Other than TS-A, which by far contains the fewest community facilities, the number of community facilities found within each transportation scenario is similar. Although TS-A contains only eight community facilities, the other transportation scenarios contain 50 to 56 each. Almost 60 percent of the community facilities are either churches or cemeteries scattered throughout the project area in no discernable pattern. The remaining community facilities tend to be clustered in the more populated areas.

Transportation Scenario A

Although TS-A would potentially impact only eight community facilities, it would have to cross the Dans Mountain Wildlife Management Area, the largest of all community facilities in the project area.

Transportation Scenario B

TS-B could potentially impact 54 community facilities. Major community facilities located within TS-B include a portion of Dans Mountain, Potomac State College, the Allegany County Detention Center, and the Western Correctional Institution.

As with all of the transportation scenarios, except TS-A, this transportation scenario would also impact numerous churches and cemeteries.

Transportation Scenario C

TS-C could potentially impact 56 community facilities, the most of all the transportation scenarios. Major community facilities located within TS-C include Allegany College of Maryland, the Federal Correctional Institution at Cumberland, and the C&O Canal National Historic Park. The C&O Canal National Historic Park spans the entire width of TS-C as the transportation scenario crosses the Potomac River. It will be difficult to cross this important historic and recreational resource without impacting it. As with all of the transportation scenarios, except TS-A, this transportation scenario would also impact numerous churches and cemeteries.

Transportation Scenario D

TS-D could potentially impact 50 community facilities. Major community facilities located within TS-D include the LaVale Toll House (an early nineteenth century toll house listed on the National Register of Historic Places that is also utilized as a park area), a portion of Dans Mountain, and Potomac State College. As with all of the transportation scenarios, except TS-A, this transportation scenario would also impact numerous churches and cemeteries.

Transportation Scenario E

TS-E could potentially impact 54 community facilities. Major community facilities located within TS-E include Allegany College of Maryland, the Mineral County Fairgrounds, Camp Minco, and Larenim Park. As with all of the transportation scenarios, except TS-A, this transportation scenario would also impact numerous churches and cemeteries.

4.3.11 Potentially Hazardous Waste Sites

A preliminary assessment of potentially hazardous waste sites was completed in the project area in August 2006. The assessment identified numerous sites with recognized environmental conditions (REC). Sites with REC were identified and categorized into one of three following levels of concern:

- Level 1 REC – These sites are classified as low risk. These sites include, but are not limited to, automotive and truck repair facilities, small quantity *Resource*

Conservation and Recovery Act (RCRA) generator facilities, facilities with aboveground storage tanks (ASTs) containing less than 10,000 gallons of product with no visible signs of contamination, electric power sub-stations, and auto sales and service facilities.

- Level 2 REC – These sites are classified as moderate risk and have potential to become high risk REC based on more detailed examination. These sites include, but are not limited to, facilities with ASTs containing greater than 10,000 gallons of product or ASTs with visible contamination, gasoline fueling facilities, potential former gasoline fueling facilities, metal fabrication facilities, facilities with underground storage tanks (USTs), facilities with junk automotive and truck parts storage, and storage trailers with unknown contents.

- Level 3 REC – These sites are classified as high risk, with the likelihood of soil and/or groundwater contamination. These sites include, but are not limited to, bulk petroleum storage facilities, properties with groundwater monitoring wells, properties with visible soil staining, industrial properties, surface mining facilities, landfills, and junkyards.

Hazardous waste investigations were completed through windshield surveys; no records review and/or interviews with agencies or knowledgeable persons were conducted. Additional sites may exist within each transportation scenario, but due to the modified nature of this investigation, they were not identified. Some sites with REC may exist on private property that was inaccessible to the investigators.

Transportation Scenario A

TS-A could impact 17 sites with REC. Five sites with Level 1 REC, eight sites with Level 2 REC, and four sites with Level 3 REC were identified in TS-A. TS-A would have the least amount of impact to sites with REC.

Transportation Scenario B

TS-B could impact 43 sites with REC. Ten sites with Level 1 REC, 30 sites with Level 2 REC, and three sites with Level 3 REC were identified in TS-B. TS-B would have the second highest amount of impact to sites with REC.

Transportation Scenario C

TS-C could impact 42 sites with REC. Thirteen sites with Level 1 REC, 18 sites with Level 2 REC, and 11 sites with Level 3 REC were identified in TS-C. TS-C would have the third highest amount of impact to sites with REC.

Transportation Scenario D

TS-D could impact 55 sites with REC. Fourteen sites with Level 1 REC, 36 sites with Level 2 REC, and five sites with Level 3 REC were identified in TS-D. TS-D would have the highest amount of impact to sites with REC.

Transportation Scenario E

TS-E could impact 28 sites with REC. Six sites with Level 1 REC, 15 sites with Level 2 REC, and seven sites with Level 3 REC were identified in TS-E. TS-E would have the second lowest amount of impact to sites with REC.

5.0 Corridors Recommended to be Carried Forward

In an effort to identify the most promising future roadway alignment alternative for the project, transportation scenarios were developed to the same level of engineering detail. A “best-fit” centerline alignment, or BFA, was developed for each transportation scenario and conceptual interchange configurations at the project’s termini were prepared. Subsequently, a 4,000-foot buffer (2,000 feet to each side of the centerline alignment) was attached to each BFA, allowing the potential environmental impacts to be calculated for five broad corridors at a Tier One level of detail. Existing traffic, future traffic, potential safety issues, and public and agency comments (to date) were also examined for each transportation scenario.

5.1 Ability to Meet Project Need

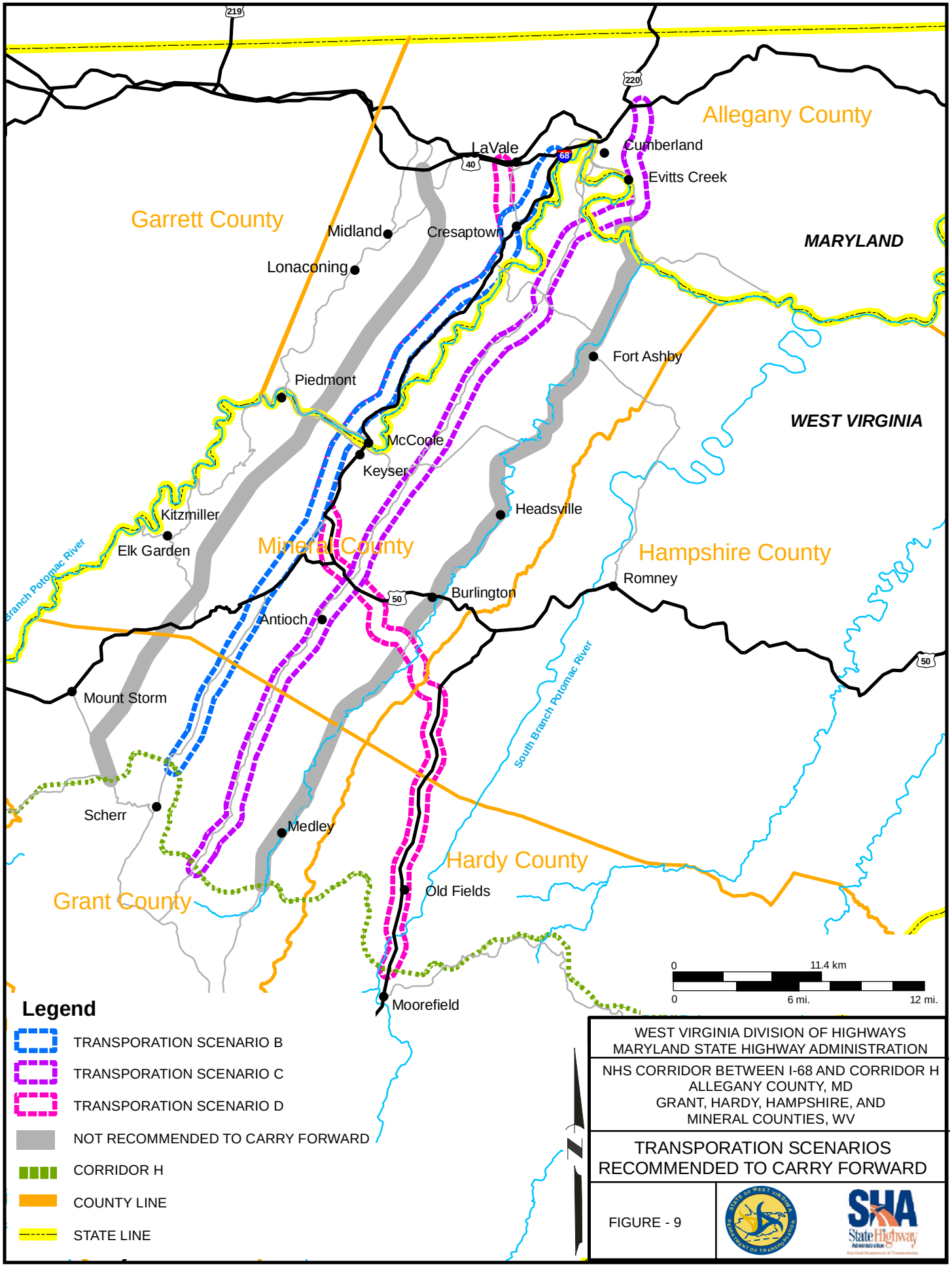
Each transportation scenario was evaluated on its ability to meet the project's purpose and need. For the most part, any of the proposed transportation scenarios could meet the purpose and need, but to varying degrees.

Each scenario would address the current transportation deficiencies that limit regional mobility by providing an improved north-south roadway through the region. Each would provide additional capacity while addressing safety deficiencies on existing roads. TS-B and TS-D, however, would pull the most traffic from U.S. Route 220, the area's busiest north-south road, and, as a result, correct current transportation deficiencies best.

Each scenario would also add additional system linkage to the regional road network and, consequently, support economic development efforts in the area. TS-B and TS-D would provide the greatest access to Cumberland, LaVale, Cresaptown, and Keyser, the major populated areas of the region and locations where economic development efforts are strongest. TS-D would also provide additional access to Moorefield, a growing community with many jobs and economic infrastructure currently in place. TS-C would provide access to Mexico Farms (a major employment location in Cumberland), the WV Route 28 area (a densely developed residential corridor in Mineral County that includes the Greater Cumberland Regional Airport), and the east side of Keyser via WV Route 46 (an area that includes Keyser Industrial Park, a 211-acre facility with nearly 60 acres available for future use). TS-E would also provide access to Mexico Farms as well as the Fort Ashby area (another densely populated residential area in Mineral County) and the Fort Ashby Business and Technology Park (a relatively new 70-acre facility located along Mineral County Route 11).

5.2 Recommendations for Further Study

As a result of the preliminary alternatives analysis, Transportation Scenarios B, C, and D are being recommended as corridors to be retained for further analysis. The corridors recommended to be retained for further analysis are shown on Figure 9. Although there could be significant impacts within all three of these corridors, some which could ultimately be proven insurmountable and require dismissal of a corridor at a later date, these transportation scenarios appear to meet the project's purpose and need better than TS-A or TS-E. They also would


Allegany County
Garrett County
Mineral County
Hampshire County
Hardy County
Grant County
MARYLAND
WEST VIRGINIA
LaVale
Cumberland
Evitts Creek
Midland
Cresaptown
Lonaconing
Fort Ashby
Piedmont
McCoole
Keyser
Headsville
Kitzmiller
Elk Garden
Romney
Burlington
Antioch
Mount Storm
Scherr
Medley
Old Fields
Moorefield
South Branch Potomac River
219
220
40
68
50
0
11.4 km
0
6 mi.
12 mi.
Legend
TRANSPORATION SCENARIO B
TRANSPORATION SCENARIO C
TRANSPORATION SCENARIO D
NOT RECOMMENDED TO CARRY FORWARD
CORRIDOR H
COUNTY LINE
STATE LINE
WEST VIRGINIA DIVISION OF HIGHWAYS
MARYLAND STATE HIGHWAY ADMINISTRATION
NHS CORRIDOR BETWEEN I-68 AND CORRIDOR H
ALLEGANY COUNTY, MD
GRANT, HARDY, HAMPSHIRE, AND
MINERAL COUNTIES, WV
TRANSPORATION SCENARIOS
RECOMMENDED TO CARRY FORWARD
FIGURE - 9

potentially result in fewer impacts than either of the other two scenarios. In some cases, the potential impact is considerably less.

Each analytical feature used in developing a recommendation is shown in ranked order in Table 8. Rank is ordered from one to five, with one being the least impact and five being the greatest. It is important to note, however, that this ranking system is based on the number of impacts, not the magnitude.

Socioeconomic resources are not included in Table 8 because impacts that appear to be negative can also be viewed as being positive. For example, TS-B, TS-C, and TS-D generally have the greatest impacts to residential land, commercial land, business locations, and jobs, signifying a high level of development. Because they are the most densely developed corridors in the project area, however, they also show greater need for transportation improvements.

Finally, there will be additional impacts with all of the scenarios as potential historic resources are determined eligible for the NRHP. Until the Section 106 review process is completed, it is impossible to predict how many of the potential historic resources will be determined eligible for the NRHP. That process is currently ongoing and is not expected to be completed until the project enters Tier Two.

TABLE 8
Potential Impact of Analytical Features in Ranked Order

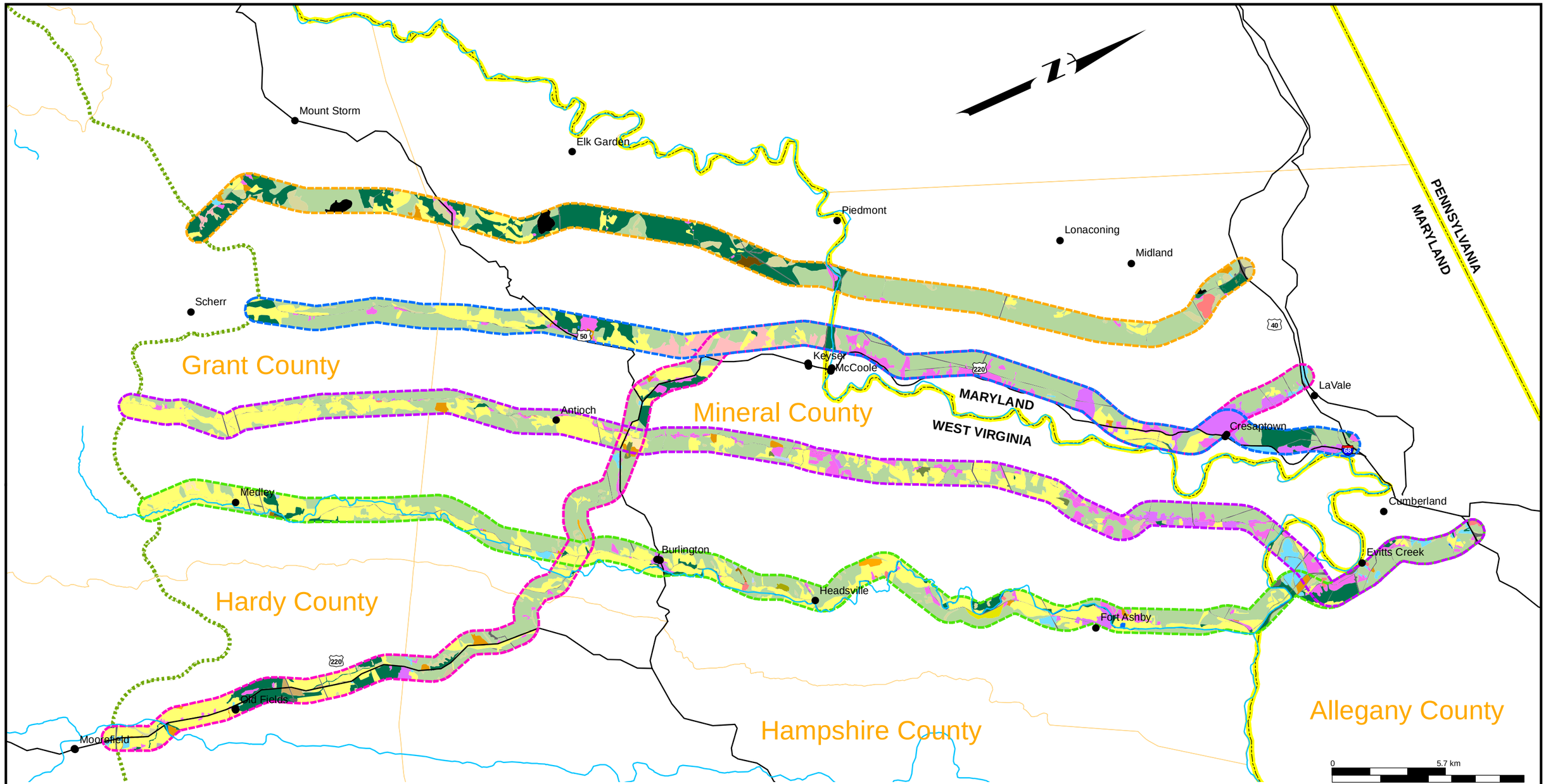
Trans. Scenario	Traffic Relief	Wet-lands	Streams	Flood-plains	Pot. Haz. Waste	Comm. Facilities	Agric. Land	Cultural and Sec. 4(f)
A	5	2	1	1	1	1	1	1
B	1	1	2	2	4	3	2	2
C	3	4	3	2	3	5	4	3
D	1	3	4	4	5	2	3	4
E	4	5	5	4	2	3	5	5

Order: 1 = Least Impact; 5 = Greatest Impact.

With further analysis, the proposed crossing of the C&O Canal National Historic Park by TS-C could be a fatal flaw for this corridor, but options to traversing the park may be available as more detailed investigations are undertaken later. Similarly, the rural historic landscapes found near the Barton Dairy and at the southern end of TS-D may prove to be fatal flaws for TS-B and TS-D. Nonetheless, the value of TS-B and TS-D in meeting the project's purpose and need is high and suggests that the scenarios should be retained for further study. Like the crossing of the C&O Canal National Historic Park, options for avoidance and minimization may be developed as the project progresses.

Although there would be fewer impacts to most resources within TS-A, it is not being recommended to be carried forward because of the potential impact to Dans Mountain. Dans Mountain contains the largest amount of state-owned contiguous forest in western Maryland and has been identified by the MDNR as having high habitat values associated with forest interior, wildlife corridors, and Green Infrastructure. TS-A is also not being recommended to be carried forward because it would divert the least amount of traffic from U.S. Route 220. A new highway alignment within TS-A would still leave as much as 8,500 AADT in the year 2025 on existing U.S. Route 220. TS-A is also not being recommended to be carried forward because it would likely have the least impact on improving economic development without other major public infrastructure improvements. With the least residential development and commercial facilities found in any of the transportation scenarios, the few communities located within the area of TS-A would require substantial investment in land development, utility extensions, and water and sewer improvements to attract economic growth.

TS-E is not being recommended to be carried forward because it would have the greatest impact on all natural resources. When the potential environmental impacts of each transportation scenario are compared against one another, TS-E consistently ranked at or near the bottom in terms of severity of the impacts. TS-E is also not being recommended to be carried forward because it would divert the second least amount of traffic from U.S. Route 220. A new highway alignment within TS-E would still leave as much as 6,300 AADT in the year 2025 on existing U.S. Route 220. TS-E is also not being recommended to be carried forward because it would likely create the most public controversy. About 120 people attended the first public meetings and although they were generally supportive of the project, potential impacts to the Patterson Creek valley located within TS-E were voiced as a major concern.



Legend

- TRANSPORATION SCENARIO A
- TRANSPORATION SCENARIO B
- TRANSPORATION SCENARIO C
- TRANSPORATION SCENARIO D
- TRANSPORATION SCENARIO E
- STATE LINE
- COUNTY LINE
- MAJOR ROADS
- CORRIDOR H

LANDCOVER

11	RESIDENTIAL
11/12	RESIDENTIAL/COMMERCIAL AND SERVICES
11/33	RESIDENTIAL/MIXED RANGELAND
12	COMMERCIAL AND SERVICES
14	TRANSPORTATION, COMMUNICATIONS, AND UTILITIES
16	MIXED URBAN OR BUILT-UP LAND
17	OTHER URBAN OR BUILT-UP LAND
21	CROPLAND AND PASTURES
21/11	CROPLAND AND PASTURES/RESIDENTIAL
21/33	CROPLAND AND PASTURES/MIXED RANGELAND
31	HERBACEOUS RANGELAND
31/11	HERBACEOUS RANGELAND/RESIDENTIAL
31/21	HERBACEOUS RANGELAND/CROPLAND AND PASTURE
31/33	HERBACEOUS RANGELAND/MIXED RANGELAND
31/43	HERBACEOUS RANGELAND/MIXED FOREST LAND
33	MIXED RANGELAND
33/41	MIXED RANGELAND/DECIDUOUS FOREST LAND
33/42	MIXED RANGELAND/EVERGREEN FOREST LAND
33/43	MIXED RANGELAND/MIXED FORESTLAND
41	DECIDUOUS FOREST LAND
41/31	DECIDUOUS FOREST LAND/HERBACEOUS RANGELAND
42	EVERGREEN FOREST LAND
42/31	EVERGREEN FOREST LAND/HERBACEOUS RANGELAND
43	MIXED FOREST LAND
51	STREAMS AND CANALS
52	LAKES
53	RESERVOIRS
75	STRIP MINES, QUARRIES, AND GRAVEL PITS
76	TRANSITIONAL AREAS

WEST VIRGINIA DIVISION OF HIGHWAYS
MARYLAND STATE HIGHWAY ADMINISTRATION

NHS CORRIDOR BETWEEN I-68 AND CORRIDOR H
ALLEGANY COUNTY, MD
GRANT, HARDY, HAMPSHIRE, AND
MINERAL COUNTIES, WV

LAND COVER

FIGURE - 7