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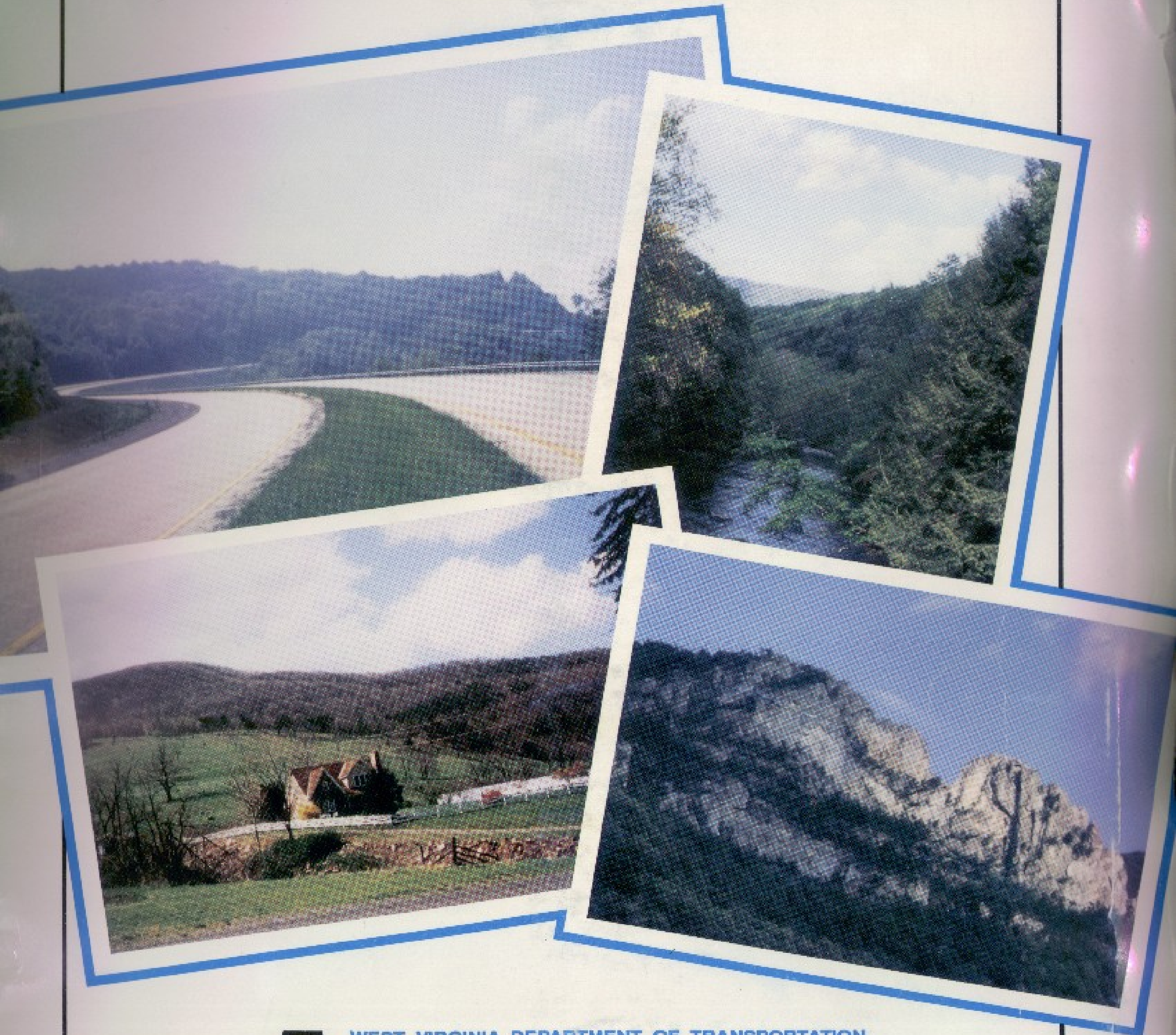
CORRIDOR SELECTION
SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

APPALACHIAN CORRIDOR H

Elkins to Interstate 81

State Project: X142-H38.99 C-2
Federal Project: APD-484 (59)

WVDOT
DIVISION OF HIGHWAYS

FHWA-WV-EIS-92-01-SD
State Project: X142-H-38.99 C-2
Federal Project: APD-484 (59)

APPALACHIAN CORRIDOR H
Elkins, West Virginia to Interstate 81, Virginia

Corridor Selection Supplemental Draft Environmental Impact Statement/Section 4(f)/6(f) Evaluation

Submitted Pursuant to : 42 U.S.C. 4332(2)(c), 23 U.S.C. 128(a),
49 U.S.C. 303(c), and 16 U.S.C. 470(f)
80 Stat. 931, Public Law 89-670

U. S. Department of Transportation - Federal Highway Administration
and
West Virginia Department of Transportation - Division of Highways

Cooperating Agencies:
U.S. Fish and Wildlife Service, U.S. Forest Service, U.S. Army Corps of Engineers, U.S. Park Service, U.S. Soil Conservation Service, Environmental Protection Agency, Virginia Department of Transportation, Virginia Council on the Environment

10/21/92 Fred VanKirk
Date of Approval — For West Virginia Department of Transportation

10-21-92 Billy R. Higginbotham
Date of Approval — For Federal Highway Administration

The following persons may be contacted for additional information concerning this document:

Mr. Ben Hark
WVDOT - Division of Highways
State Capitol Complex
Building Five, Room A-830
Charleston, WV 25305
(304) 558-3236

Mr. Billy R. Higginbotham
FHWA Division Administrator
550 Eagan Street, Suite 300
Charleston, WV 25301
(304) 558-3093

This project consists of a proposal to construct an approximately 110 to 130 mile highway; completing Corridor H of the Appalachian Development Highway System in northeastern West Virginia to Interstate 81 in Virginia. The proposed Corridor H facility would provide a four-lane highway with partial control of access on new and existing location between the towns of Elkins, West Virginia and either Strasburg or Winchester, Virginia. This corridor-level study evaluates the engineering, economic, social, and environmental impacts associated with the construction of the proposed project.

Comments on this SDEIS are due by JAN 25 1993 and should be sent to:

Mr. Randolph T. Epperly, Jr.
Director, Roadway Design Division
WVDOT - Division of Highways
State Capitol Complex, Building Five
Charleston, West Virginia 25305

PREFACE

As noted in FHWA Technical Advisory T 6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents,* there is no required format for a Supplemental EIS. Therefore, the format of this corridor SDEIS has been modified such that Section III presents both the Affected Environment and the Environmental Consequences. This was done to present a more concise and unified discussion of the various existing resources and the project's potential for impacting them. Traditionally, Sections III and IV of an EIS present the Affected Environment and the Environmental Consequences, respectively. Aside from this format modification, the remainder of this corridor SDEIS follows the traditional EIS format.

APPALACHIAN CORRIDOR H SDEIS

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SUMMARY

SUMMARY

This portion of the Appalachian Corridor H project has a long history. Since its inception in 1965 as part of the Appalachian Regional Highway System, numerous studies have been conducted to evaluate the potential impacts of the proposed project. These studies include the *1981 Appalachian Corridor H Draft Environmental Impact Statement* (DEIS) and associated Technical Reports, the 1990 DEIS Reevaluation efforts, and this *Corridor Selection Supplemental Draft Environmental Impact Statement* (SDEIS) and its associated Technical Reports.

A. PROPOSED ACTION

The West Virginia Department of Transportation, Division of Highways (WVDOT), in conjunction with the Federal Highway Administration (FHWA), is proposing to construct an approximately 110 to 130 mile highway through northeastern West Virginia and northwestern Virginia. The proposed Corridor H facility would provide a divided, four-lane highway with partial control of access on new and existing location from Elkins, West Virginia to Interstate 81 in either Strasburg or Winchester, Virginia. The project area includes portions of the West Virginia Counties of Grant, Hampshire, Hardy, Mineral, Pendleton, Randolph, and Tucker, as well as the Virginia Counties of Frederick and Shenandoah. Exhibit S-1 shows the regional location of the study area.

The proposed facility would complete Corridor H of the Appalachian Development Highway System (APD System). The primary purpose of and need for the APD System is to stimulate economic growth and development in Appalachia by enhancing access and mobility. (A detailed discussion of the purpose and need for action is included in Section I.) The APD System is largely complete in West Virginia, except for Corridor H. As an element of the APD System, Corridor H will improve east/west access, as well as connect several of the existing north/south highway systems. In addition to the economic growth and development needs for the proposed facility, project need is based on six other factors: system linkage; capacity and level of service; current and future transportation demands (from the standpoint of both local and regional planning officials); legislation; safety considerations; and roadway deficiencies.

CORRIDOR H
Elkins to I-81

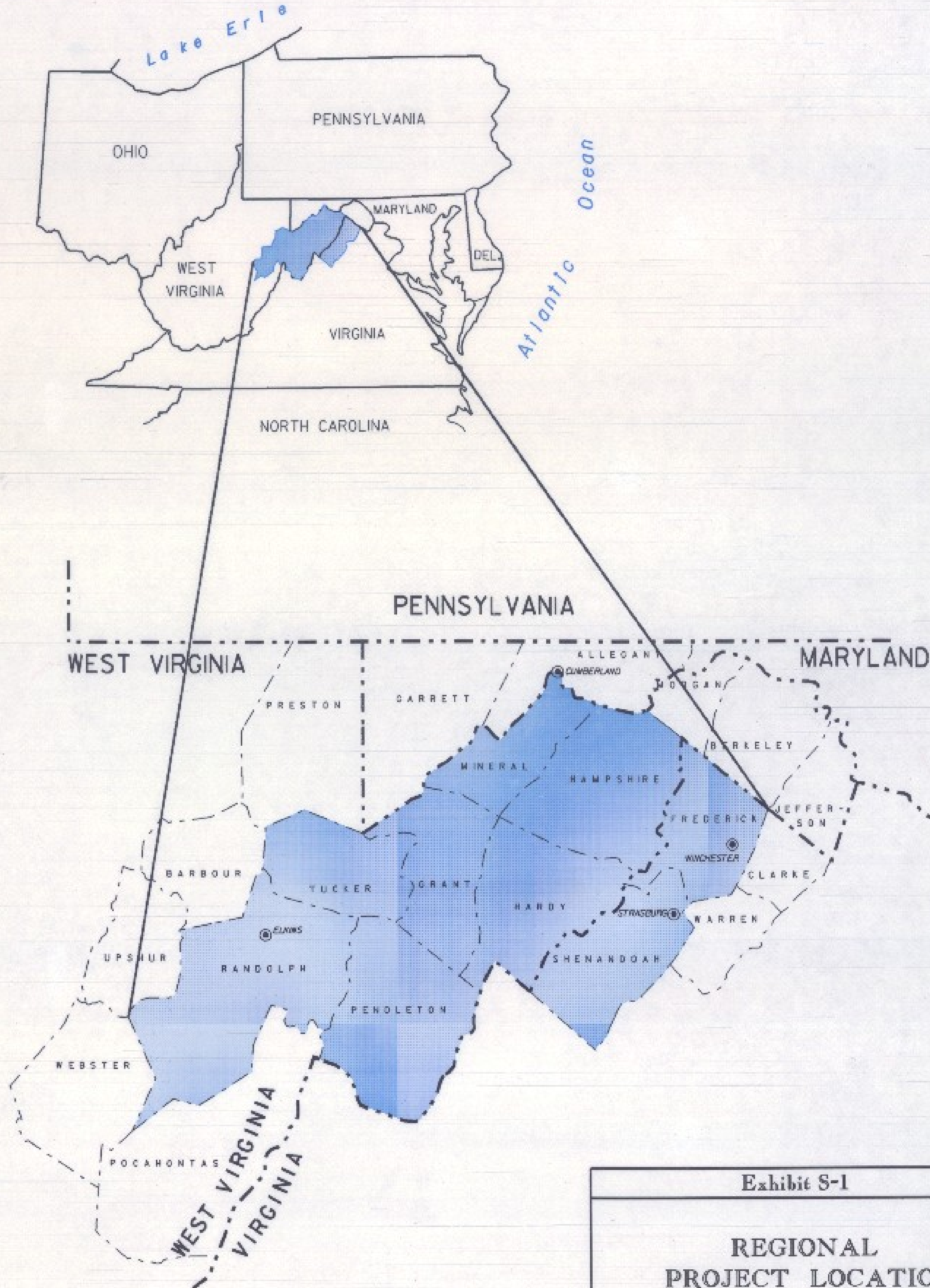


Exhibit S-1

REGIONAL PROJECT LOCATION

Not to Scale

1. PREVIOUS STUDIES

In 1981, the *Appalachian Corridor H: Elkins WV to Interstate 81, Virginia Draft Environmental Impact Statement* (DEIS) was circulated for public review and comment. (Copies.of the DEIS are available from WVDOT.) Following public input, WVDOT selected Scheme A as the preferred Scheme. Since then, there have been numerous studies and field reviews, as well as resource agency and public input, focusing on the potential impacts of Scheme A. In 1984 the project was put on hold and a Final EIS (FEIS) and the subsequent Record of Decision (ROD) were never prepared.

In June of 1990, WVDOT and FHWA resumed the project. FHWA regulation 23 CFR 771.129(a) states that a written reevaluation of a DEIS is required if FHWA has not received an acceptable FEIS within three years from the date of the DEIS circulation. In accordance with this, the Appalachian Corridor H DEIS Reevaluation effort was initiated. The 1990 DEIS Reevaluation identified legislative and procedural changes, as well as changes in the project's surroundings and impacts that have occurred since the circulation of the 1981 DEIS.

The purpose of the Reevaluation was to determine whether there have been changes in the project or its surroundings or new information which would either require a supplement to the DEIS or the preparation of a new EIS. The results of the Reevaluation indicated that over 65 percent of the issues in the 1981 DEIS would need in-depth reevaluation on the basis of significant regulatory and procedural changes and/or on the basis of agency and public comment. (Copies of the 1990 Reevaluation *Task 1* and *Task 2* Reports are available from WVDOT.)

In August of 1990, WVDOT and FHWA agreed that further Reevaluation efforts should cease and the Corridor H project should be elevated to a Supplemental DEIS (SDEIS). It was also agreed that 1) the Schemes and SubSchemes identified in the 1981 DEIS and those developed during the course of the SDEIS would be equally evaluated based on 2,000 foot-wide corridors and that 2) the evaluation would be prepared under the assumption that a preferred corridor would not be identified until after the SDEIS has been completed (i.e., Scheme A would no longer be considered WVDOT's preferred Scheme).

2. CORRIDOR H STUDY PROCESS

Appalachian Corridor H is a large, complex transportation project. Because WVDOT returned to a location planning stage for Corridor H, an effective method of assessing potential environmental effects had to be developed to adequately address environmental issues at an appropriate level of detail for each step in the process.

The two-step process that was developed is shown on Exhibit S-2 and relies heavily upon guidance taken from the Council on Environmental Quality's "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act" and the U.S. Department of Transportation's environmental impact procedural regulations.

The first step of this process (the Corridor Selection SDEIS) focuses on a broad comparison of key environmental factors which may have a bearing on the selection of a preferred 2,000 foot-wide corridor. During Step 2, an Alignment Selection SDEIS will be prepared to examine in detail site-specific environmental impacts that affect the selection of a preferred alignment for the ultimate construction of Appalachian Corridor H.

a. <u>Corridor Selection SDEIS (Step 1)</u>

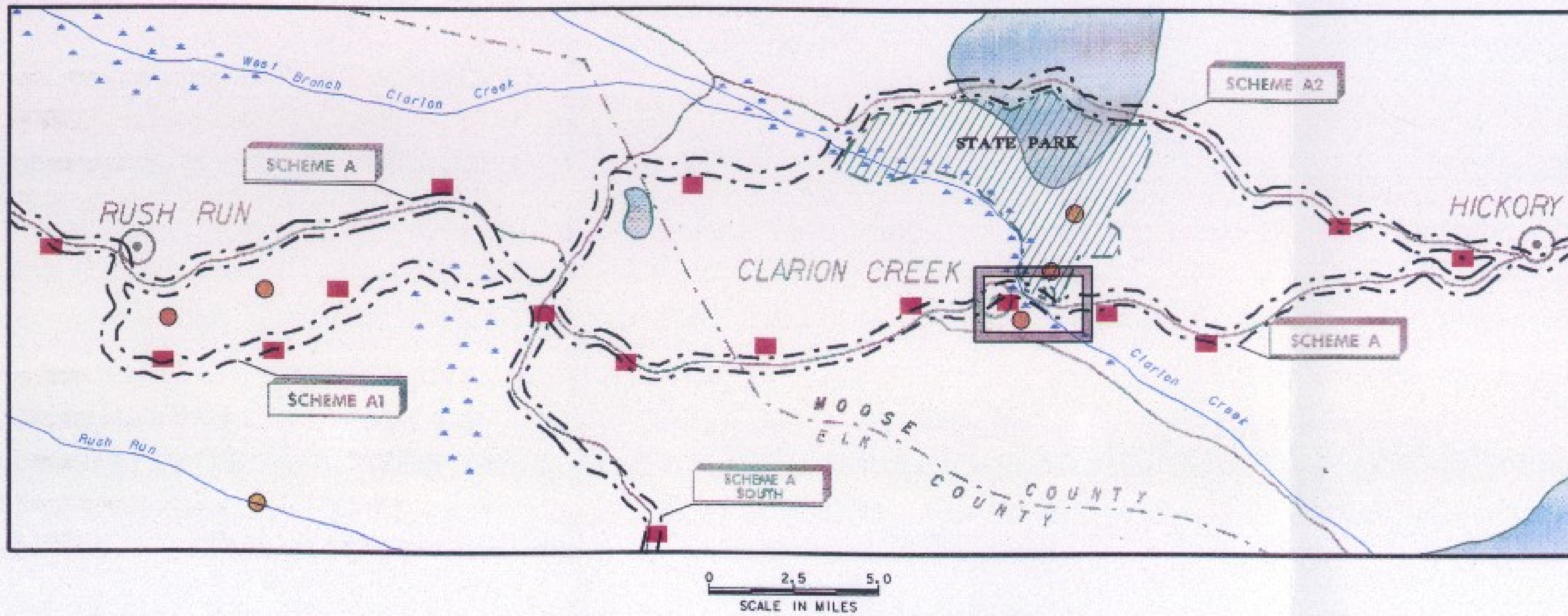
The purpose of this Corridor Selection SDEIS is to provide a corridor-level evaluation in which sensitive resources within 2,000 foot-wide corridors are inventoried and the potential project-related involvements with these resources are identified. By identifying sensitive resources within these 2,000 foot-wide corridors before specific alignments are developed, roadway designers can more easily avoid such resources during the project design stage. As shown on Exhibit S-2, this corridor-level study is the first step in a two-step study process.

An inventory of resources within the 2,000 foot-wide corridors (Step 1) allows for flexibility during the preliminary and final design efforts (Step 2). Exhibit S-2 illustrates the alignment design flexibility when going from a Corridor Selection SDEIS (Step 1) to an Alignment Selection SDEIS (Step 2). At the Alignment Selection stage, actual right-of-way limits (approximately 150 to 300 feet in width) would be much less than the originally inventoried 2,000 foot corridor width. Anywhere from one to six possible roadway alignments could be located within a 2,000 foot-wide corridor, depending on topographic and sensitive resource constraints. The purpose of this Corridor Selection SDEIS is to identify the most prudent and feasible *<u>corridor</u>* which best meets the project need with the least degree of sensitive resource involvement.

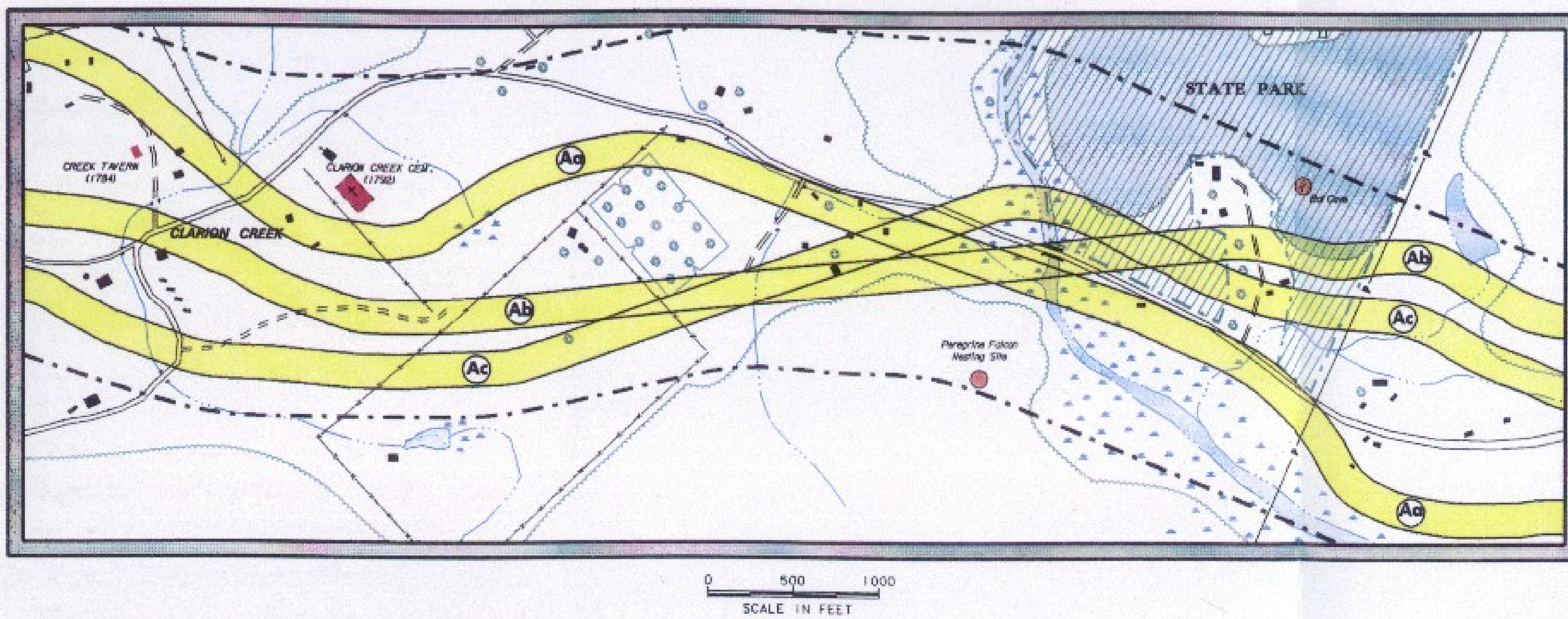
Once a preferred corridor is identified and approved, WVDOT will begin to identify prudent and feasible alignments within the preferred corridor. In this second step of the project, specific alignments will be developed, taking into account the sensitive resources identified in the Corridor Selection SDEIS. Once specific alignments within the preferred corridor have been established, detailed socioeconomic, environmental, and engineering studies will follow. It will not be until this second step of the Appalachian Corridor H project that a preferred alignment will be selected.

CORRIDOR H STUDY PROCESS

Corridor Selection (Step 1)



Alignment Selection (Step 2)



LEGEND

- 2000' Corridor Boundary
- Alternative Alignments (Aa)
- Wetlands
- Historic/Archaeological Resources
- Section 4f Resources
- Special Botanical Areas
- Threatened/Endangered Species
- Orchard

Approach

A. 2000' Wide Corridors
B. Resource Inventory within each Corridor
C. Broad Corridor Comparisons of Resources
D. Preferred Corridor Selection

A. 200'-250' Wide Alignments
B. Site Specific Resource Analyses (HEP, WET 2.0, STAMINA)
C. Alignment Impact Comparisons
D. Preferred Alignment Selection

Documents

SDEIS 1

Corridor Selection Decision Document

SDEIS 2

FEIS

Record of Decision (ROD)

Exhibit S-2

b. Decision Document

A Decision Document specifically detailing information in support of the preferred corridor will be prepared prior to the formal initiation of the Alignment Selection SDEIS. The Decision Document will include a review of comments received on the Corridor Selection SDEIS, as well as a summary of the results of the location public meetings and hearings. Before the Decision Document is finalized, it will be presented in draft form to the agencies cooperating in the preparation of the Corridor Selection SDEIS and will be available to the public from WVDOT.

Should additional studies be required to assure the selection of the most environmentally responsible corridor that meets the purpose of and need for the project, the results of those studies will be documented in the Decision Document. If necessary, these additional studies may involve an intermediate level of analysis beyond the 2,000 foot-wide corridor inventory presented in the Corridor Selection SDEIS, but a less detailed level of analysis than will be performed for the Alignment Selection SDEIS.

If, after circulation of the Corridor Selection SDEIS and the public meetings and hearings, the selection of a preferred corridor cannot be narrowed down to one clear choice, the Decision Document will contain the results of additional studies performed to support the selection of a final corridor.

c. Alignment Selection SDEIS (Step 2)

After a preferred corridor is selected and the Decision Document is prepared, WVDOT will begin to develop prudent and feasible highway alignments within the limits of the preferred corridor, taking into account the sensitive environmental resources identified in the Corridor Selection SDEIS. Once the preliminary right-of-way and construction limits of several alternative alignments have been established, detailed environmental impact studies will commence based on new aerial photography and mapping prepared to a scale of 1" = 200' (10 times more detailed than the available mapping for the Corridor Selection SDEIS).

The Alignment Selection SDEIS will be prepared and circulated to the public in the same manner as the Corridor Selection SDEIS. That is, the cooperating agencies will have an opportunity to review preliminary drafts of the Alignment Selection SDEIS in order to assure that it adequately addresses all appropriate environmental concerns. The Alignment Selection SDEIS will also be made available to the public at a series of design public meetings and hearings.

Based on the length of this project, it is anticipated that, after selection of a preferred corridor, approximately 18 months will be required to complete all of the studies necessary for the Alignment Selection SDEIS.

A preferred highway alignment for design purposes will not be selected until the Alignment Selection SDEIS is complete and officially circulated for public agency and general public review.

d. Final EIS

After the completion and circulation of the Alignment Selection SDEIS, and after all required public meetings and hearings have been held, a Final EIS will be prepared to formally respond to comments on both the Corridor Selection SDEIS (Step 1) and the Alignment SDEIS (Step 2).

Upon acceptance of the Final EIS, a Record of Decision (ROD) will be prepared to officially document the decisions reached throughout the Corridor Selection SDEIS and the Alignment Selection SDEIS study process.

B. OTHER MAJOR GOVERNMENT ACTIONS

1. PROPOSED CANAAN VALLEY WILDLIFE REFUGE

The U.S. Department of Interior, Fish and Wildlife Service has proposed to establish a National Wildlife Refuge in Canaan Valley, West Virginia. The wildlife refuge would encompass 28,000 acres, extending from the existing Canaan Valley State Park to the northeast, a distance of approximately nine miles. Schemes B and C would traverse a portion of this proposed area.

The refuge would be located in the northern end of the valley in the wetland area that was once targeted for the Davis Power Pump Storage Plant. The power project would have consisted of a 7,000 acre valley reservoir created by a 65-foot dam on the Blackwater River between Canaan and Brown Mountains. The various power companies involved no longer believe the proposed Davis Power Project is viable due to their inability to obtain a Section 404 permit for the dam and have petitioned (unsuccessfully) the Federal Energy Regulatory Commission to have their license fees ($5 million) returned. The Fish and Wildlife Service will start purchasing land in Canaan Valley when Congress approves the funds.

2. NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLANS

Both the Monongahela National Forest (MNF) and the George Washington National Forest (GWNF) are located within the study area and would be traversed by the project. Adopted in 1986, the *Monongahela National Forest Land and Resource Management Plan* was developed with a high level of public involvement and input. As a result, the MNF management direction specifically designates, with clear guidelines, that 75 percent of MNF lands emphasize remote wildlife habitat and semi-primitive, non-motorized recreation in a natural setting. This Forest Plan guides all natural resource management activities on the MNF until 1995, at which time the Plan will be revised. All of the Schemes would traverse MNF lands.

In December of 1991, a draft *Environmental Impact Statement for the Revised Land and Resource Management Plan* was completed for the George Washington National Forest. In this draft plan, the Forest Service identified Alternative 8 as their preferred management plan. Alternative 8 "places emphasis on biological values - proposed, threatened, endangered, and sensitive species; large areas of unfragmented habitat for area-sensitive species; wildlife viewing and nature studies - while providing multiple use". Based on the comments received during the public review process, the draft plan is being finalized. While Scheme A, B, and D would traverse GWNF lands, the proposed corridors would follow existing SR 55 through these lands.

3. AMERICAN DISCOVERY TRAIL

Still in the initial stages of development, the American Discovery Trail is the nation's first coast-to-coast trail. Approximately 4,820 miles in length, the trail passes through 12 states and connects five National Scenic Trails, turning the current national trail system into a network. The route follows existing trails whenever possible. Where no trails exist, the smallest roads are used. Congress is currently considering designating the American Discovery Trail as part of the National Scenic Trail System. The House has approved and the Senate is now considering approving a study bill (H.R. 3011 and S. 1537, respectively) authorizing a feasibility study on whether the American Discovery Trail should be a National Scenic Trail.

Within the study area, heading west to east, the trail enters the Monongahela National Forest on back roads to Parsons. From Parsons, it follows Forest Service trails and roads through Blackwater Falls State Park, Canaan Valley State Park, and Dolly Sods Wilderness. At this time, it is uncertain the degree of involvement the proposed project would have on the trail.

C. ALTERNATIVES CONSIDERED

Five broad-ranged alternatives were established for consideration at the initiation of the Appalachian Corridor H project. In this SDEIS, "alternatives" refers to the general means available to address the purpose of and need for the project. The range of alternatives evaluated in this SDEIS includes:

- A Transportation Systems Management Alternative;
- A Mass Transit Alternative;
- An Improved Roadway Alternative;
- A No-Build Alternative involving maintaining the existing roadway system; and
- A Build Alternative, involving constructing Corridor H.

Of the five alternatives considered for this project, only the Build Alternative meets the project purpose and need and, therefore, was retained for further consideration. While the No-Build Alternative would not meet the needs of the project, it was retained for consideration as a basis of comparison with the Build Alternative and remains a viable alternative of the Appalachian Corridor H project. A detailed discussion of the alternatives is included in Section II.

1. NO-BUILD ALTERNATIVE

The No-Build Alternative consists of a continuation of the existing routes between Elkins and I-81. This alternative would include such short-term, minor restoration activities as maintenance improvements, resurfacing, bridge repairs, minor widening, and intersection improvements. These improvements are already a part of WVDOT's ongoing plan for the continued safe operation of the existing roadway system.

2. BUILD ALTERNATIVE

The Build Alternative refers to constructing Corridor H. Several corridors have been evaluated as potential locations for construction. All corridors are 2,000 feet wide between termini and range from 110 to 130 miles in length. The western logical terminus is approximately two miles west of Elkins in the unincorporated area of Aggregates. This location is the easternmost terminus of the 3.2 mile section of Corridor H currently under construction. For ease of reference and given its proximity, this western terminus is referred to as Elkins. The eastern logical terminus is I-81, at either Winchester or Strasburg, Virginia.

a. Schemes and SubSchemes

"Schemes" refer to individual, 2,000 foot-wide corridors. "SubSchemes" are location modifications of the Schemes. The 1981 DEIS evaluated five Schemes and their SubSchemes which were determined to be feasible and practicable and met the project need. At the initiation of the Corridor H SDEIS, several additional SubSchemes were developed for evaluation. The various DEIS and SDEIS Schemes and SubSchemes are presented below.

1981 DEIS SCHEMES	***1992 SDEIS SCHEMES***
Scheme A	***All 1981 DEIS Schemes***
Scheme B	
Scheme C	
Scheme D	
Scheme E	

1981 DEIS SUBSCHEMES	***1992 SDEIS SUBSCHEMES***
SubScheme K	***All 1981 DEIS SubSchemes, plus***
SubScheme KP	***SubScheme AE-1***
SubScheme L	***SubScheme AE-2***
SubScheme L2	***SubScheme AE-3***
SubScheme HR	***SubScheme AD-1***

In keeping with the terminology established in the 1981 DEIS, the various corridors remain labeled "Schemes" and "SubSchemes" in the 1992 SDEIS. Exhibit S-3 shows the location of the Schemes and SubSchemes under consideration for this SDEIS.

b. Scheme Options

Scheme Options are corridors formed by the combination of various Schemes and SubSchemes. There are 24 continuous, 2,000 foot-wide Scheme Options between the western and eastern termini. Many of the Schemes are coincidental; that is, they are the same corridor for a portion of their respective routes. For example, Schemes D and E are the same from Elkins to Bismarck, at which point Scheme E continues along the northern route and becomes coincidental with Scheme C, and Scheme D turns to the southeast and becomes coincidental with Scheme B. Table S-1 presents the development and components of each Scheme Option. The routes of these Scheme Options are discussed in detail in Section II of this document. All 24 Scheme Options have been evaluated at a comparable level of detail.

CORRIDOR H

ELKINS to I-81

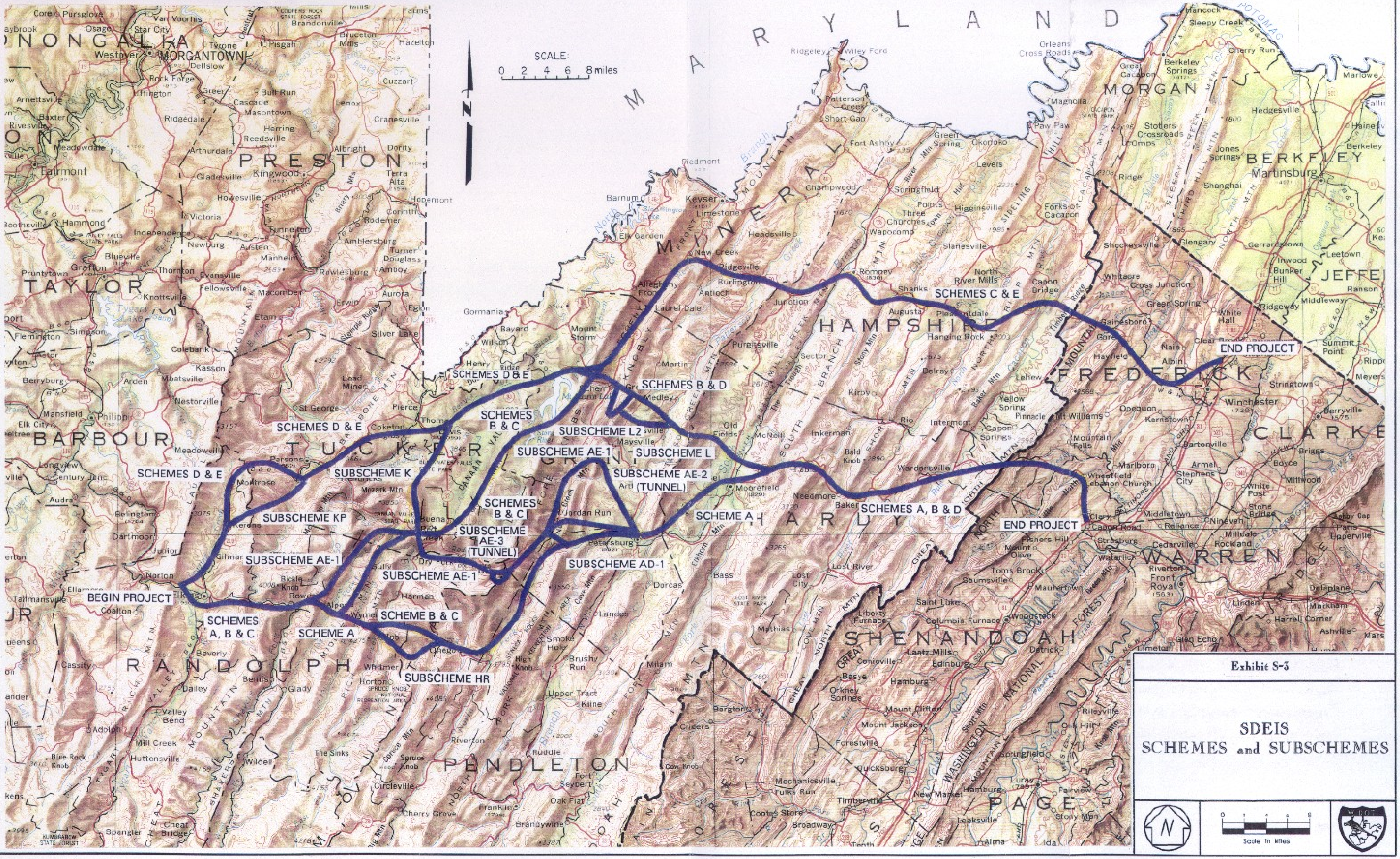


Exhibit S-3

SDEIS
SCHEMES and SUBSCHEMES

Scale in Miles

81092

TABLE S-1
SCHEMATIC: FROM THE BUILD ALTERNATIVE TO SCHEME OPTIONS

ALTERNATIVES
No-Build Alternative
Build Alternative

BUILD ALTERNATIVE (1)	
SCHEMES	**SUBSCHEMES**
A	**HR, AE-1, AE-2, AE-3, AD-1**
B	**K, L, L2**
C	**K**
D	**KP, L, L2**
E	**KP**

(1) Corridor Schemes, SubSchemes, and Scheme Options are 2,000' wide.

SCHEME OPTIONS	*Descriptions*
A1	Scheme A
A2	Scheme A via SubScheme AE-1
A3	Scheme A via SubScheme AE-1, AE-2
A4	Scheme A via SubScheme AE-1, AD-1
A5	Scheme A via SubScheme AE-1, AE-3, AE-1
A6	Scheme A via SubScheme AE-1, AE-3, AE-2
A7	Scheme A via SubScheme AE-1, AE-3, AD-1
A8	Scheme A via SubScheme HR
B1	Scheme B
B2	Scheme B via SubScheme L2
B3	Scheme B via SubScheme L2, L
B4	Scheme B via SubScheme K
B5	Scheme B via SubScheme K, L2
B6	Scheme B via SubScheme K, L2, L
C1	Scheme C
C2	Scheme C via SubScheme K
D1	Scheme D
D2	Scheme D via SubScheme L2
D3	Scheme D via SubScheme L2, L
D4	Scheme D via SubScheme KP, L2
D5	Scheme D via SubScheme KP, L2, L
D6	Scheme D via SubScheme KP
E1	Scheme E
E2	Scheme E via SubScheme KP

c. **Scheme Descriptions**

Scheme A construction costs are estimated to range from \$994 million to \$1,649 million. Scheme Options under Scheme A which call for the construction of tunnels to cross the Allegheny Front and New Creek Mountain account for the higher construction cost estimates. Scheme B construction costs are estimated to range from \$945 million to \$1,071 million. Scheme C construction costs are estimated to range from \$1,053 million to \$1,080 million. Scheme D construction costs are estimated to range from \$839 million to \$931 million. Scheme E construction costs are estimated to range from \$943 million to \$1,039 million.

d. **SubScheme Descriptions**

There are four SubScheme options under Scheme A that serve to avoid or minimize involvement with the Spruce Knob/Seneca Rocks National Recreation Area (NRA) (Exhibit S-3). SubScheme AE-1 (Scheme Option A2 or A5) would completely avoid the NRA. SubScheme AE-2 (Scheme Option A3 or A6), SubScheme AE-3 (Scheme Option A5), and SubScheme AD-1 (Scheme Option A4 or A7) would minimize Scheme A's involvement with the Seneca Rocks Unit of the NRA. SubSchemes AE-2 and AE-3 would involve the construction of tunnels through the Allegheny Front. SubScheme HR (Scheme Option A8) was developed as an option to avoid Whites Run and Seneca Creek in the Spruce Knob Unit of the NRA.

SubScheme KP (Scheme Option D4, D5, D6, or E2) would serve as a short-cut for Scheme D or E between Kerens and Porterwood. SubScheme K (Scheme Option B4, B5, B6, or C2) would avoid the Canaan Valley area (a Natural National Landmark) and any involvement with Canaan Valley State Park. SubSchemes L (Scheme Option B3, B6, D3, or D5) and L2 (Scheme Option B2, B5, D2 or D4) would avoid Greenland Gap (a Natural National Landmark).

e. **Design Criteria**

The proposed facility would consist of a four-lane, divided highway with partial control of access and a standard operating speed of 50 miles per hour. The maximum gradient would be 7 percent (in rugged terrain), the maximum degree of curvature would be 7^{o} 30', and median width would be 40 feet. Access would be partially controlled, consisting of no more than two at-grade intersections per side, per mile.

D. MAJOR ENVIRONMENTAL INVOLVEMENTS

Details of the Scheme Options and their specific social, economic, and natural environment involvements are included in Section III. The studies prepared for this assessment are based on 2,000 foot-wide corridors to evaluate potential involvements within the Scheme Options. This width of corridor, much larger than the expected width of the actual right-of-way, was used to evaluate the relative effects of each Scheme Option. Therefore, the resource involvements discussed in this document are not the actual impacts expected from the project, but are estimates to be used for comparison purposes. Table S-2 illustrates potential Scheme Option involvements with sensitive resources.

1. BENEFICIAL INVOLVEMENTS

Implementation of the Build Alternative would improve the future economic competitiveness of the area by improving access and network linkage between central West Virginia and the markets of the East Coast and Midwest. This would create opportunities for new investment and economic development in the commercial, industrial, residential, and tourism sectors. In light of the region's reputation for providing extensive, high quality, outdoor recreation opportunities, economic development would most easily occur in the region's growing tourism industry. In addition, the study region is highly suitable for second home/vacation cabin development to serve the increasing numbers of people choosing to recreate in the area. It must be noted that, while highway development is an important foundation to providing economic development, other factors such as water supply, sewage treatment, labor availability, relative position to markets, and developable land must also be present to promote economic competitiveness.

Construction of the Build Alternative would reduce east/west travel time up to 40 percent for automobiles and up to 48 percent for trucks. Safety would be improved by providing a 36 percent reduction in the accident rate and a 50 percent reduction in annual fatalities. Public safety responsiveness and community services access would be improved in the long-term, although access and mobility would be disrupted during construction.

Schemes D and E would reach the greatest number of population centers and they would intersect more regions identified for growth. Scheme E, and to a lesser extent, Scheme D, would provide the greatest benefit to the social environment by serving the greatest number of West Virginia residents, the most incorporated residents, the greatest number of employed workers, the most potential employees, and the counties with the highest unemployment. These two Schemes would enhance medical care and access to those West Virginia counties which collectively have the largest elderly populations. Scheme Options E1 and E2 would provide improved linkage to the most (five)

TABLE S-2
CORRIDOR H SUMMARY MATRIX

ISSUE	SCHEME OPTION																						
	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	C1	C2	D1	D2	D3	D4	D5	D6	E1	E2
COST ($ Millions)	$994	$1,533	$1,586	$1,523	$1,596	$1,649	$1,586	$1,007	$1,015	$1,054	$1,052	$1,048	$1,087	$1,085	$1,053	$1,084	$907	$912	$840	$913	$841	$908	$943	$944
LENGTH (Miles)	111	118	110	110	117	108	109	110	118	120	120	120	123	122	128	130	115	117	116	114	113	111	125	121
TRAVEL TIME (Hours-Automobile)	2.2	2.4	2.2	2.2	2.3	2.2	2.2	2.2	2.4	2.4	2.4	2.4	2.5	2.4	2.6	2.6	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.5
FARMLANDS: Sum of Total Corridor (# acres)	4,074	4,101	3,768	4,025	4,101	3,768	4,026	4,062	4,476	4,491	4,531	4,009	4,025	4,064	4,936	4,467	5,653	5,668	5,708	5,077	5,117	5,062	4,318	3,939
DISPLACEMENTS: Residential/Commercial (#)	901	662	669	779	662	669	779	886	552	548	529	575	572	553	1,263	1,289	625	621	601	581	561	585	1,336	1,296
DISPLACEMENTS: Facilities/Services (#)	35	23	22	24	25	22	24	32	16	16	15	22	21	20	34	39	24	25	24	23	22	24	41	41
OEDP CONSISTENCY (#Yes : #No : #N/A)	9:5:4	9:5:4	9:5:4	9:5:4	9:5:4	9:5:4	9:5:4	9:5:4	9:2:7	9:2:7	9:2:7	9:2:7	9:2:7	9:2:7	8:3:7	8:2:8	10:2:6	10:2:6	10:2:6	10:2:6	10:2:6	10:2:6	9:2:7	9:2:7
NOISE: Critical Distance to Receptor (feet)	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	750	750	750	750	750	750	750	750
AIR: Worst Case 1-Hour CO (ppm)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4
AIR: Worst Case 8-Hour CO (ppm)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1	1	1	1	1	1	1.1	1.1
HISTORIC SITES: # NRHP Listed and Eligible	17	15	13	14	15	13	14	17	10	10	10	10	10	10	5	5	9	9	9	9	9	9	4	4
MNF MP 6.1: Major Involvement (# acres)	266	2,400	2,242	1,902	1,902	1,902	1,902	267	267	267	267	654	654	654	267	1,309	0	0	0	0	0	0	0	0
MNF MP 6.1: Minor Involvement (# acres)	484	242	242	242	242	242	242	775	922	992	992	922	922	922	922	267	1,309	1,309	1,309	897	1,018	1,018	1,309	1,018
MNF MP 6.2: Major Involvement (# acres)	424	97	97	97	97	97	97	424	0	0	0	1,350	1,350	1,350	0	1,350	0	0	0	0	0	0	0	0
MNF MP 6.2: Minor Involvement (# acres)	970	0	0	970	0	0	970	970	921	921	921	921	921	921	921	921	0	0	0	0	0	0	0	0
NATIONAL RECREATION AREAS (# of units)	2	0	1	1	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CANAAN VALLEY STATE PARK: Involvement	No	No	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	No
BIG BLUE TRAIL : Corridor crossing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No
COMMUNITY PARKS: (# parks)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WETLANDS: Corridor Total (# acres)	209	156	131	142	156	131	142	208	586	586	594	656	656	663	610	677	765	765	772	733	741	733	786	755
ERV WETLANDS: Corridor Total (# acres)	121	41	41	53	41	53	53	120	388	388	388	157	157	157	388	157	133	133	133	133	133	133	133	133
WILD & SCENIC RIVERS: Eligibility Impacts (#)	2	1	1	2	1	1	2	2	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0
E/T SPECIES: Confirmed Involvements (#)	3	6	5	7	5	5	6	5	4	4	4	4	4	4	4	4	2	2	2	2	2	2	2	2
E/T SPECIES: Confirmed Species (#)	2	3	3	4	3	3	4	4	2	2	2	3	3	3	2	3	2	2	2	2	2	2	2	2
100-YEAR FLOODPLAIN: (# acres)	566	523	513	566	523	513	566	566	119	119	119	119	119	119	344	344	119	119	119	119	119	119	344	344
FOREST FRAGMENTATION: Tracts (#)	24	23	20	20	23	21	20	23	29	29	29	31	31	31	31	33	27	28	25	27	27	28	30	29
REMOTE HABITAT: Major Involvement (# acres)	690	2,497	2,339	1,999	1,999	1,999	1,999	691	267	267	267	2,036	2,036	2,036	267	2,691	0	0	0	0	0	0	0	0
SPECIAL BOTANICAL SITES: (# sites)	1	0	1	1	0	1	1	1	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
STREAMS (total #)	63	53	48	49	53	48	49	60	44	43	42	45	44	45	44	46	46	44	44	43	41	44	47	45
NATIONAL RESOURCE WATERS: Involvement (#)	39	25	24	26	25	24	26	39	20	20	20	21	21	21	11	12	22	22	22	21	21	21	13	12

medical complexes and would serve the greatest number of educational facilities. Options under Scheme E would provide a better LOS over the entire proposed route than would other Scheme Options.

None of the Scheme Options would be expected to disproportionately or adversely affect the elderly or minority populations of the project area. All Scheme Options would be expected to avoid schools, major industrial complexes, hospitals, and power plants.

2. ADVERSE INVOLVEMENTS

Construction of any of the Scheme Options would result in adverse impacts to the environment. The magnitude and type of adverse impact would vary among the Scheme Options and the resource in question. For instance, in the worst-case analysis for air quality, Schemes A, B, and C would have only a very minor difference than predicted for Scheme D or E. On the other hand, there would be major differences among the Scheme Options in potential major involvements with Monongahela National Forest Management Prescription 6.1 areas, ranging from 2,400 acres for Scheme Option A2 to none for Schemes D and E.

a. Scheme A

Scheme A corridors would involve the least number of fragmented forest tracts (20 to 24), and the smallest wetland acreage (131 to 209 acres), including wetlands of exceptional resource value (41 to 121 acres). However, certain Scheme A Options would potentially affect the largest number of Endangered and Threatened species (7), one Critical Habitat, and one Special Botanical Area (Powers Hollow); the greatest floodplain acreage (566 acres); and the largest number of streams (63), including National Resource Waters (39). Options under Scheme A would involve the Spruce Knob/Seneca Rocks National Recreation Area, one community park, and the most historic sites (13-17) eligible for or listed on the National Register of Historic Places. Scheme A Options would be the most expensive to construct, ranging from $ 994 to $ 1,649 million, which would include tunnels on several of the Scheme Options.

b. Scheme B

Scheme B would potentially involve the least number of residential/commercial establishments (529 to 575) and the least number of facilities and services (15 to 22). Scheme B Options would involve few Endangered and Threatened species (2 to 3), or floodplains (119 acres). However, some of the Scheme B Options would involve the greatest acreage of exceptional resource value wetlands (388 acres); the greatest number of river segments eligible for Wild and Scenic status (2); the largest major involvements with Managment Prescription Area 6.2 (1,350 acres) and one

Special Botanical Area (Greenland Gap). Options under Scheme B would also involve the proposed Canaan Valley National Wildlife Refuge and Canaan Valley State Park. The cost for construction of the Scheme B Options would range from $ 1,015 to $ 1,085 million.

c. **Scheme C**

Scheme C corridors would involve the fewest National Resource Waters (11 to 12), Endangered and Threatened species (2 to 3), or river segments eligible for Wild and Scenic status (0 to 1). Scheme C would involve the greatest acreage of exceptional resource value wetlands (388 acres), forests senstive to fragmentation (31 to 33) and major involvements with remote habitat (2,691 acres). Scheme C Options would involve the proposed Canaan Valley Wildlife Refuge and Canaan Valley State Park. The cost for construction of the Scheme C Options would range from $ 1,053 to $ 1,085 million, less than Scheme A, even though it is the longest of the corridors (128 to 130 miles).

d. **Scheme D**

Scheme D corridors would involve the greatest amount of farmland (5,062 to 5,708 acres). Options under Scheme D would not have major involvements with Monongahela National Forest MP 6.1 and 6.2 areas, but all Options would have minor involvements with Management Prescription Area 6.1 (897 to 1,309 acres). Scheme D would involve the least number of Threatened and Endangered species (2 confirmed involvements and 2 confirmed species), the fewest streams (41) but Scheme Option D1 would involve Greenland Gap. Scheme D Options would not involve the proposed Canaan Valley Wildlife Refuge or Canaan Valley State Park. Options under Scheme D would be the least costly to construct ($ 840 to $ 913 million).

e. **Scheme E**

This Scheme would involve the greatest number of residences and commercial establishments (1,296 to 1,336) and community facilities and services (41). Scheme E would potentially involve the greatest number of wetlands (786 acres). Scheme E corridors would have no major involvement with remote habitat, but would have minor involvements with Management Prescription Area 6.1 (1,018 to 1,309 acres). Scheme E Options would involve the least historic sites (4) eligible for or listed on the National Register of Historic Places. Scheme E Options would not involve Special Botanical Areas, river segments potentially eligible for Wild and Scenic status, the proposed Canaan Valley Wildlife Refuge, or Canaan Valley State Park. Options under Scheme E would cost from $943 to $ 944 million to construct.

E. AREAS OF CONTROVERSY

Coordination with various governmental agencies, property owners, and local groups has elicited numerous areas of potential controversy. The major issues are: purpose of and need for the project; Section 4(f)/6(f) and 106 resources; Threatened and Endangered species; wetlands; Wild and Scenic Rivers; water quality; recreation resources; economic development; and the source of project construction funds.

F. OTHER GOVERNMENT ACTIONS REQUIRED

A section 404 permit may be required from the U.S. Army Corps of Engineers for construction activities in waters of the United States. Associated with this would be the need to obtain Section 401 Water Quality Certifications from West Virginia and Virginia. In addition, a Subaqueous Bed Permit may be required from Virginia for any work in, on, or over State waters.

Although there are no rivers presently listed as navigable in the study area, such designations may be made on a case by case basis. Therefore, a Section 10 permit from the U.S. Army Corps of Engineers and/or a Section 9 permit from the U.S. Coast Guard for construction activities in navigable waters may be required.

Right-of-way acquisition from various federal and state agencies may be required, depending on the Scheme Option. These agencies include the Monongahela National Forest, the George Washington National Forest, and Canaan Valley State Park. In addition, approval by the Department of the Interior would be required for any Section 6(f) land exchange. A Biological Assessment in response to Section 7 of the Endangered Species Act of 1973 may be required if there are involvements with Threatened or Endangered Species.

A more detailed discussion of the types of environmental permits which may be required during the development of this project is provided in the *Natural Resources Technical Report* (available from WVDOT). The actual number of each of the various permits required will be determined following the selection of a preferred corridor and the completion of alignment design. The ultimate number of permits required by the project will be a function of:

- The final location and design of the facility;
- The number of sections into which the project is divided, in order to complete final design and construction; and
- Input from the resource agencies.

SECTION I:
Purpose of and Need for Action

SECTION I: PURPOSE OF AND NEED FOR ACTION

The West Virginia Department of Transportation-Division of Highways (WVDOT), in conjunction with the Federal Highway Administration (FHWA), is proposing to construct an approximately 110 to 130 mile highway through northeastern West Virginia and northwestern Virgini . This would complete Corridor H of the Appalachian Development Highway System (APD System); a highway system established by the Appalachian Regional Development Act of 1965.

The proposed Corridor H facility would provide a divided, four-lane highway with partial control of access on new and existing location from Elkins, West Virginia to Interstate 81 in either Strasburg or Winchester, Virginia. The project area includes portions of the West Virginia Counties of Grant, Hampshire, Hardy, Mineral, Pendleton, Randolph, and Tucker, as well as the Virginia Counties of Frederick and Shenandoah (Exhibit I-1).

As an element of the APD System, Corridor H's purpose is to improve east/west access and thereby stimulate economic growth within the rugged, mountainous terrain of rural, northeastern West Virginia. This development could be in the form of commercial, industrial, residential, service-oriented, and tourism-related enterprises. As stated in the Act:

> "This system would be designed to provide access to the presently almost inaccessible subregions of Appalachia. These highways, while they would ease the traffic congestion in some parts of Appalachia, will not be constructed with that particular objective in mind. They will rather be built as instruments of economic development. They will be built to generate traffic where none presently exists. They will do so because they will open up areas to development which, because of their present remoteness and isolation, cannot be developed."

A Transportation Needs Analysis for this proposed facility has been prepared in accordance with FHWA's Technical Advisory T6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents*, and their 1990 policy statement, *Purpose and Needs in Environmental Documents*. (Copies of the *Transportation Needs Study* are available from WVDOT.) Based on FHWA's guidelines, the purpose and need for a project is generally based on one or a combination of the following seven factors:

CORRIDOR H
Elkins to I-81

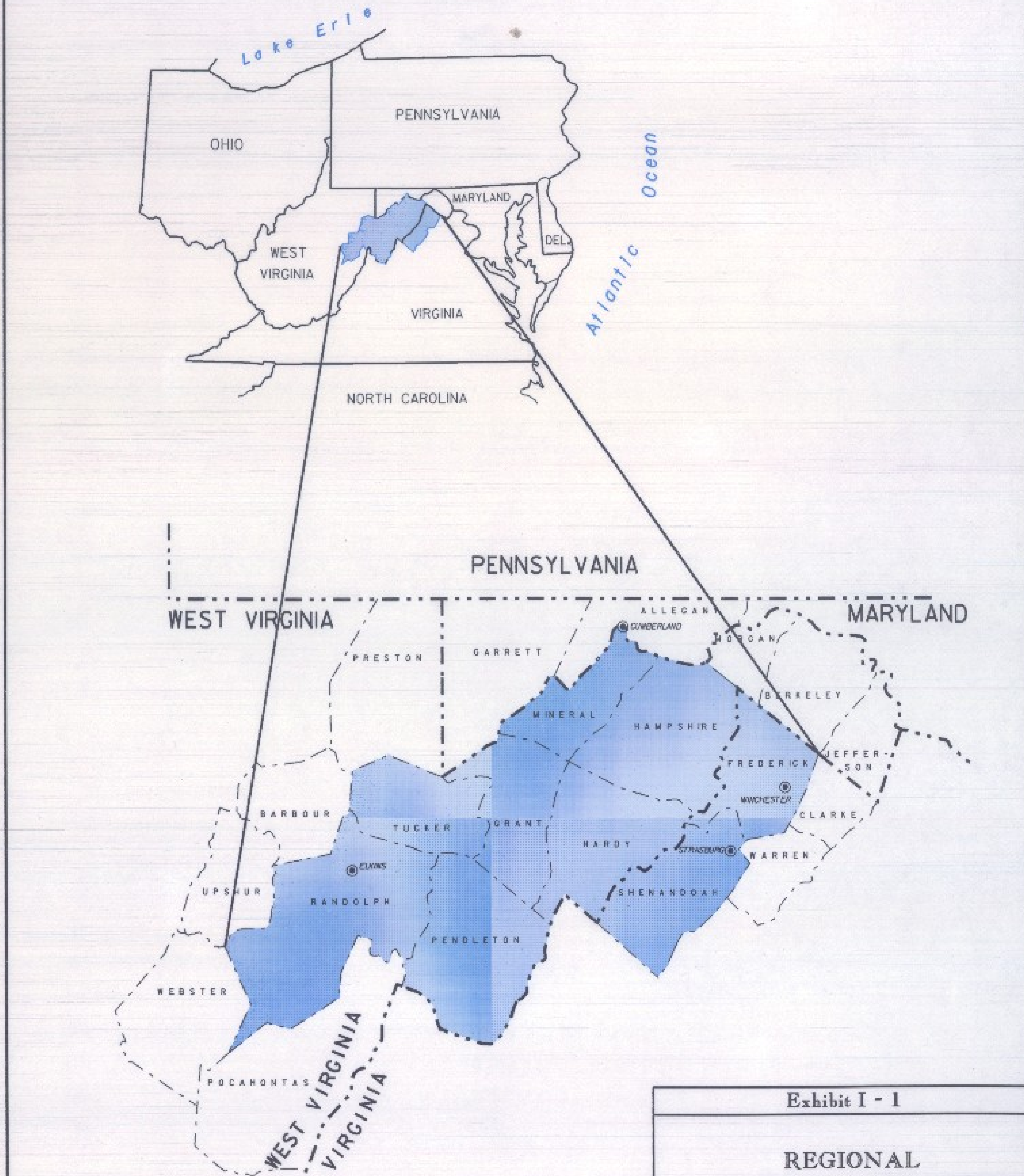


Exhibit I - 1

REGIONAL PROJECT LOCATION

Not to Scale

1) Legislation;
2) Social demands and economic development considerations;
3) The importance of the project in the local and regional transportation system (System Linkage);
4) The current and future capacities and levels of service of the existing transportation network;
5) Current and future transportation demands (from a local and regional planning authority perspective);
6) Safety considerations; and
7) Roadway deficiencies.

While the principal need for the project is based on legislation, socioeconomic demands, and system linkage, the cumulative effect of the above seven factors provides strong support for the proposed facility. Following a discussion of the project's history and status, these factors will be discussed in detail in the remaining portion of this Section.

A. PROJECT HISTORY AND STATUS

This portion of the Appalachian Corridor H project has a long history. Since its inception in 1965 as part of the APD System, numerous studies have been conducted to evaluate the potential impacts of the proposed project. These studies include the *1981 Appalachian Corridor H Draft Environmental Impact Statement* (DEIS) and associated Technical Reports, the 1990 DEIS Reevaluation efforts, and this Corridor Selection Supplemental Draft Environmental Impact Statement (SDEIS) and its associated Technical Reports (all of which are available from WVDOT).

1. APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM

In 1965, in an effort to stimulate economic growth and development in rural Appalachia, the United States Congress passed the Appalachian Regional Development Act. (The Appalachian Region encompasses portions of 13 states, of which, only West Virginia is included in its entirety.) The Act made provisions for funding and development of an APD System. The System is administered by the Appalachian Regional Commission (ARC), whose responsibilities include designating Appalachian Corridor termini, setting priorities for the construction of Appalachian Corridor segments, and distributing funds received from Congress for the construction of those segments. The funds ARC receives from Congress for APD System construction are turned over to FHWA, which then administers the actual construction of the APD System. Since its inception, substantial progress has been made toward completing the APD System. The completion status of the APD System in West Virginia (Corridors D, E, G, H, L, and Q) and the remaining Corridors within the Appalachian Region are shown on Exhibit I-2.

The primary goal behind the APD System is economic: it is intended to stimulate economic growth and development in Appalachia by enhancing access and mobility. According to ARC, one of the major deterrents to economic growth in Appalachia has been the lack of an adequate transportation network through the rugged Appalachian terrain. Because of this inadequate network, it was presumed that many communities in Appalachia were unable to attract the investment and corporate interest needed to experience their full development potential.

To attain the goal of economic development in Appalachia, the purpose of the APD System has been to assist the region in establishing a framework of basic transportation facilities. These facilities serve as a means for the transportation network to efficiently connect to the Interstate System and other Federal Aid Highways in the region. While ARC has not had the opportunity to survey the "before and after" economic effects of a particular area once an Appalachian Corridor has been completed, it has been able to conduct an overall impact assessment of the System's success in improving economic development within Appalachia. ARC's *Fiscal 1993 Program* states that:

> "During 1981, ARC surveyed the 13 Appalachian States and the 68 local development districts in Appalachia to assess the impact of the highway system. The surveys provided the most accurate count ever taken of the industries located on or near the Appalachian Development Highway System corridors. The surveys showed that since 1965, when the corridor system was first announced, 182,700 jobs had been created in 801 manufacturing plants with 50 or more employees within 30 minutes of the corridors. Added to this is an estimated 32,300 jobs in smaller plants for a total of 215,000 jobs. Standard projections of one service job created for each manufacturing job suggest that 215,000 jobs in retail trade, commercial establishments and various services have been opened up along the corridors, for a total of over 430,000 jobs. A 1987 survey, using a different approach showed that between 1980 and 1986, 560,000 jobs *{81 percent}* were created in the Appalachian counties with a major highway compared with 134,000 jobs *{19 percent}* created in counties without a major highway. The number of expanding firms was also greatest (9,800) *{77 percent}* in counties with a major highway compared with the number (3,000) *{23 percent}* in counties without a major highway."

West Virginia

CORRIDOR H

Elkins to I-81

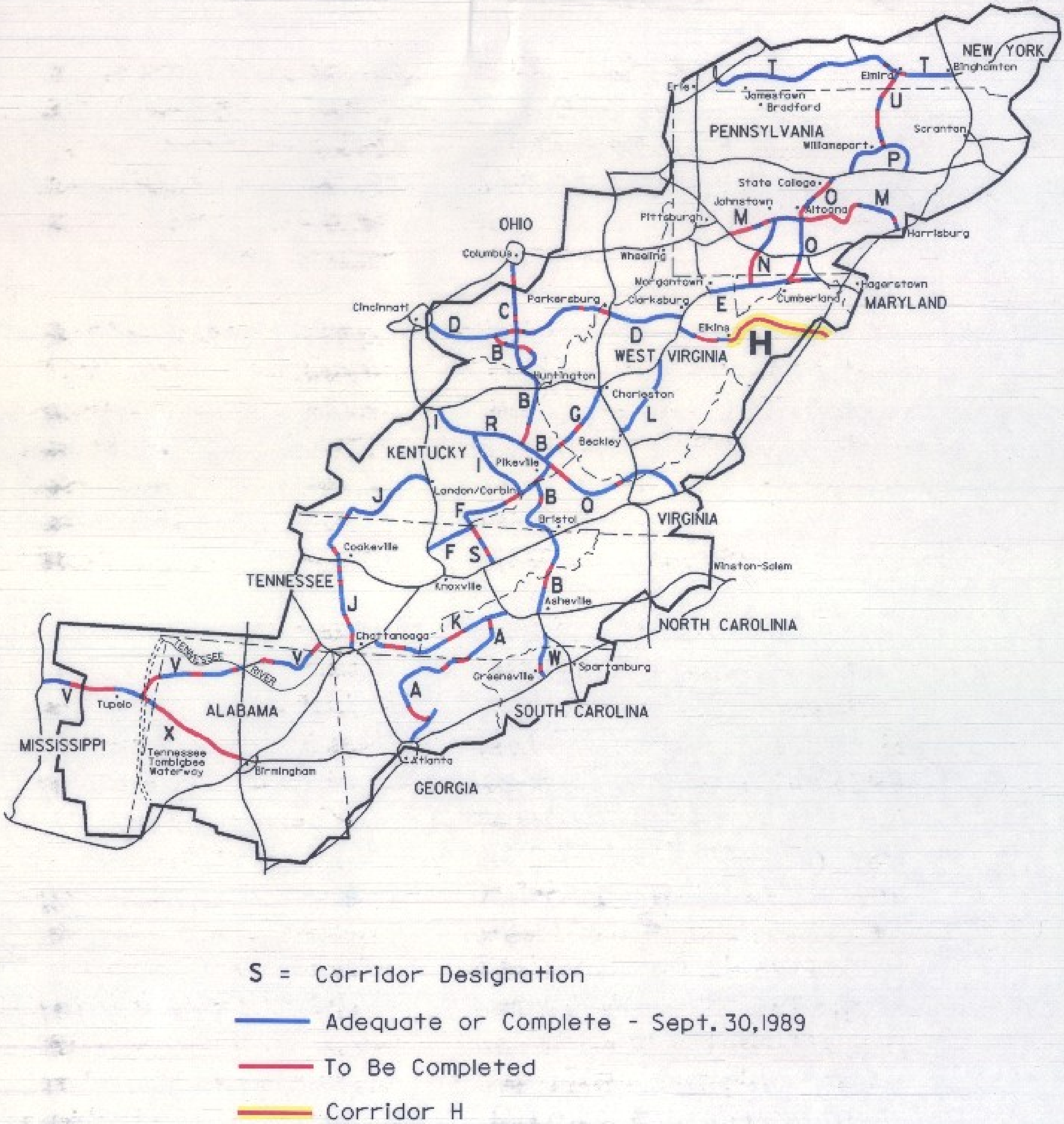


Exhibit I - 2

APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM STATUS

0 125
Scale in Miles

SOURCE: Appalachian Regional Commission, 1990

APH961.050 091092

2. APPALACHIAN CORRIDOR H

The Appalachian Corridor H transportation corridor was proposed by ARC in 1965 as one of 23 transportation corridors to be developed in Appalachia. ARC established the location of Corridor H to be between I-79 near Weston, West Virginia and I-81 in Strasburg, Virginia. It was anticipated that such a transportation corridor would enhance access and mobility to major urban markets of the East Coast, such as Washington, D.C.; Baltimore, Maryland; and Norfolk, Virginia; as well as to those markets to the west, such as Charleston, West Virginia; Columbus and Cincinnati, Ohio; and Lexington, Kentucky. It was also recognized that Corridor H would connect several of the existing north/south highway systems which parallel the Appalachian Ridge and Valley System.

3. CURRENT STATUS OF CORRIDOR H

In its entirety, Appalachian Corridor H has been divided into several segments for study and construction purposes. Completed construction of Corridor H is mainly west of Elkins. A ten mile segment of Corridor H was completed from I-79 near Weston, WV to Buckhannon, WV. Segments of Corridor H extending east from Buckhannon to west of Elkins, including the Buckhannon Bypass, are currently under various stages of construction. A 6.6 mile segment of US 33, extending east of Elkins from Canfield, WV to Bowden, WV was improved to a four-lane, divided highway in 1986 (WVDOT - West Virginia Appalachian Construction Status, December, 1990). This 6.6 mile improvement would only remain a component of the Appalachian Corridor System if a southern alignment were selected as the preferred alternative for the continuation of Corridor H from Elkins to I-81. Given the length of time that has passed since its construction and WVDOT's desire to reevaluate corridors on an equal basis, FHWA has stated that a payback for construction costs ***would not*** be required should the preferred corridor ***not*** include this four-lane segment of US 33.

Previous study efforts included a series of environmental and engineering investigations; coordination activities with federal, state, and local agencies and organizations; and various local public involvement efforts. Following these efforts, WVDOT and FHWA issued the results of the study findings in the *Draft Environmental Impact Statement: Appalachian Corridor H - Elkins, West Virginia to Interstate 81, Virginia*, dated March 1981. The Draft Environmental Impact Statement (DEIS) presented detailed engineering, socioeconomic, and environmental assessments of the Build Alternative versus the No-Build Alternative. Under the Build Alternative, five Schemes and their corresponding SubSchemes were determined to merit additional evaluation. The five Schemes were identified as Schemes A, B, C, D, and E. The SubSchemes were identified as SubSchemes HR, K, KP, L, and L2. These Schemes and SubSchemes are shown on Exhibit I-3.

SYGL1N2.DGN 091092

CORRIDOR H
ELKINS to I-81

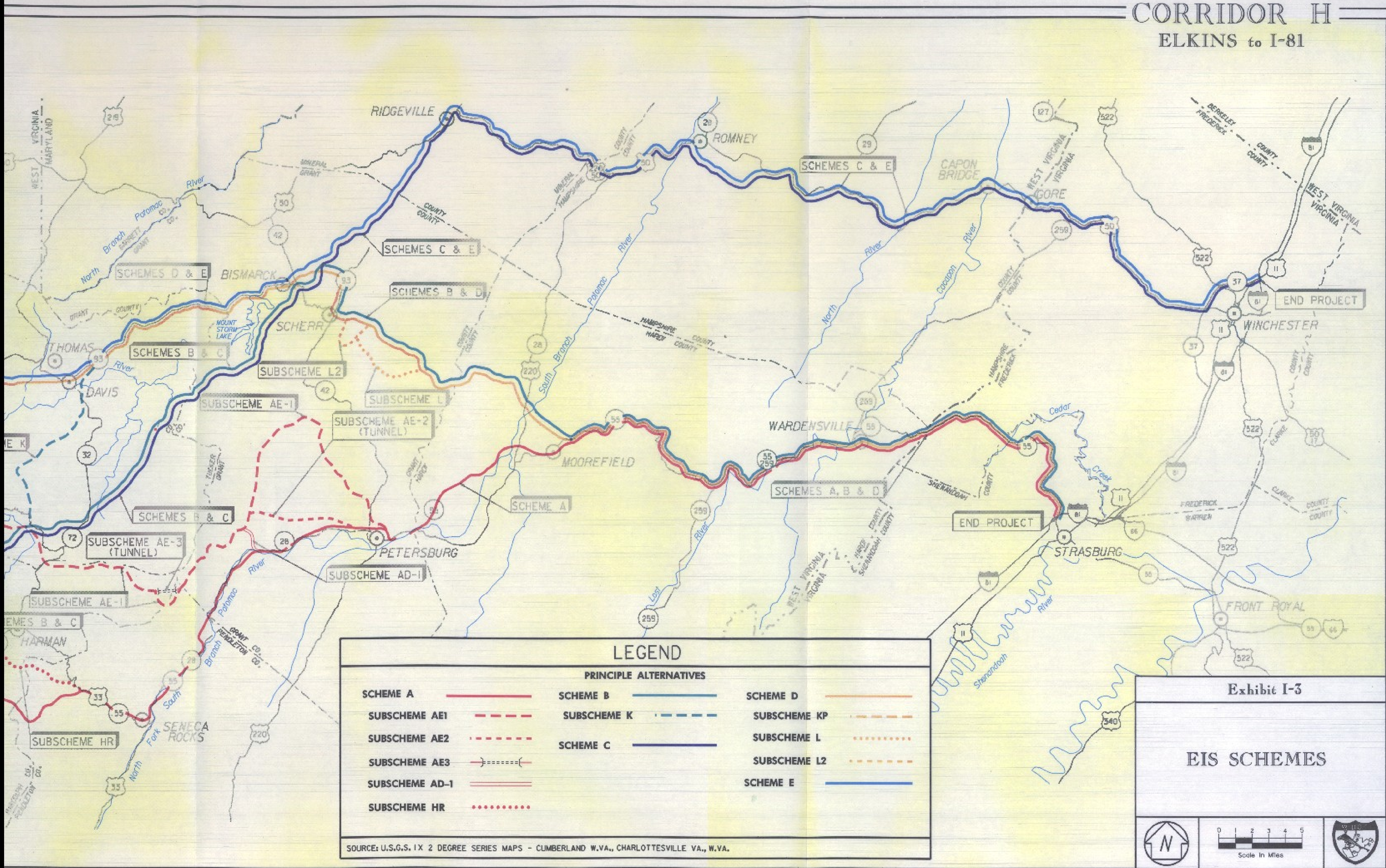


Exhibit I-3

EIS SCHEMES

In June and July of 1981, following the circulation of the DEIS, six Public Hearings were held throughout the study area. Federal, state, and local agencies, officials and interested groups and individuals were requested by WVDOT to provide comments on the DEIS. Based on the comments received through the circulation of the DEIS and the Public Hearing process, WVDOT selected Scheme A as the preferred alignment.

Since then, there have been several additional studies focusing on the potential impacts of Scheme A, including the Environmental Protection Agency's 1984 *Cooperating Agency Study: Stream and Wildlife Impacts Associated with Corridor H in West Virginia*; WVDOT's 1984 *Archaeological Survey and Testing Operations within Portions of the Proposed Appalachian Corridor H, West Virginia*; WVDOT's 1984 *Environmental Review: Location Phase Reevaluation for Appalachian Corridor H*; and WVDOT's 1990 *Appalachian Corridor H DEIS Reevaluation: Task 1 Project Update Report*. There have also been numerous field reviews and comments received from resource agencies and the public concerning sensitive resources within the corridor of Scheme A.

In August of 1990, based on the findings of the DEIS Reevaluation efforts, WVDOT and FHWA agreed to prepare a Corridor Selection Supplemental Draft Environmental Impact Statement (SDEIS) for the project. It was agreed that the SDEIS and its supporting studies would be prepared under the assumption that a preferred Scheme Option would ***not*** be identified until ***after*** the SDEIS and the public review process had been completed (i.e., Scheme A would no longer be considered WVDOT's preferred Scheme). The SDEIS was initiated based on:

- WVDOT's desire to evaluate the possibility of a new SubScheme along Scheme A that would avoid the Section 4(f) resources of the Monongahela National Forest's Spruce Knob/Seneca Rocks National Recreation Area;
- The need to reassess engineering, socioeconomic, and environmental issues in light of current regulations, directives, and Executive Orders; and
- WVDOT's desire to respond to the 1981 DEIS comments and update the study.

B. FEDERAL, STATE, OR LOCAL GOVERNMENTAL AUTHORITY

Project need based on governmental authority refers to the history of those local, state, and/or federal governmental units which support the proposed project. Historically, one of the major deterrents to economic growth in Appalachia has been the lack of an adequate transportation network. Highways have replaced water and rail as the dominant mode of transportation, but the rugged Appalachian terrain has continued to restrain travel in the area. In recognition of this situation, Congress made provisions for the Appalachian Development Highway System (APD) under the Appalachian Regional Development Act of 1965. The intent of the system is to provide, in conjunction with the Interstate System and other Federal-Aid Highways in the region, a highway system which would open up an area(s) with development potential where commerce has been inhibited by lack of adequate access.

Since 1965, much progress has been made toward the completion of the Appalachian Development Highway System. The Appalachian Regional Commission's *1989 Annual Report*, states that:

> "Among all programs of the Appalachian Regional Commission, the Appalachian Development Highway System remains the most dramatic symbol of commitment to and achievement of the Commission's objectives. (T)he Appalachian states have continued to place completion of the most critical sections of highway at the top of their program agendas. Development of an adequate transportation network is still deemed of first priority to develop the Region's economy."

C. SOCIAL DEMAND AND ECONOMIC DEVELOPMENT

Social Demand and Economic Development refer to the types of social and economic traffic generators, both existing and future, which exert travel demands on the proposed facility. This includes businesses, neighborhoods, land use plans (existing and future), recreational facilities, shopping centers, new developments (economically-oriented or residentially-based), and any other type of social or economic anomaly which could increase travel demand on the proposed facility and, as a consequence, increase capacity demands and safety demands.

A principal function of Corridor H is to improve linkage and access between the primary traffic generators. On a local level, the incorporated communities make up the primary traffic generators because they contain the highest concentrations of population, employers, and public facilities and services. On a regional level, industry and tourism are the primary traffic generators. (These generators are discussed in detail in Sections III-E and III-G).

The primary industries are directly related to the abundance of natural resources. Leading industries include manufacturing, coal, lumber, maple syrup, and livestock. The mineral extraction industry encompassing coal, limestone, and gravel, has historically been the principal employer. These industries rely on the transportation network to get raw and finished materials to ports along the East Coast, as well as to major market centers of the Northeast, Mid-Atlantic, and Midwest regions.

A large portion of the study area's economy is in transition from industrial to service and trade-oriented businesses. Major growth in the tourism industry has increasingly influenced the regions' economic character and vitality. Recreation attractions are one of the primary traffic generators since the mountain counties of eastern West Virginia comprise one of the largest natural scenic recreation areas in the eastern United States. Within the confines of the study area, major attractions include the Spruce Knob/Seneca Rocks National Recreation Area, the George Washington and the Monongahela National Forests, Canaan Valley and Blackwater Falls State Parks, Dolly Sods Wilderness and Otter Creek Wilderness, Nathaniel Mountain and Short Mountain Public Hunting Areas, as well as numerous trout and whitewater streams. Just outside the study area are such attractions as Cass Scenic Railroad State Park, Cranberry Glades and Laurel Fork Wilderness Areas, Lost River State Park, and Snowshoe and Silver Creek ski resorts.

Within the study area, outdoor recreation opportunities are diverse, including whitewater rafting, canoeing, kayaking, rock climbing, caving, downhill and cross-country skiing, golfing, hunting, fishing, camping, hiking, backpacking, on and off-road bicycling, horseback riding, bird watching, and swimming. Downhill and cross-country skiing are main attractions in the region, with five ski resorts in the study area and nearby. The northern portion of the Monongahela National Forest also provides numerous cross-country ski trails. Since almost the entire study area is wooded, viewing the autumn colors is a major attraction. Access to these recreation areas is dependent upon an adequate transportation system.

Throughout the history of the Appalachian Corridor H project, many diverse economic development authorities, citizen and industry action groups, and governmental agencies have expressed concern over the deficient transportation network and its effect on the economic vitality of the study area. Economic development specialists with the West Virginia Region VII and VIII Planning and Development Councils agree that improving east/west access and mobility through the study area would substantially open the markets of the East Coast and the Midwest to businesses and tourism opportunities throughout central West Virginia. The effect would be to reverse the current trend of increasing economic isolation (Region VII Planning and Development Council, 1990; Region VIII Planning and Development Council, 1990; and the Associated Press, 1990).

D. SYSTEM LINKAGE

System Linkage refers to how the proposed project fits into the existing and future transportation system or network. This includes the contribution of the proposed action to developing a sound transportation network in relation to existing roadways and proposed improvements contained within the appropriate state transportation agencies' adopted Transportation Improvement Plans.

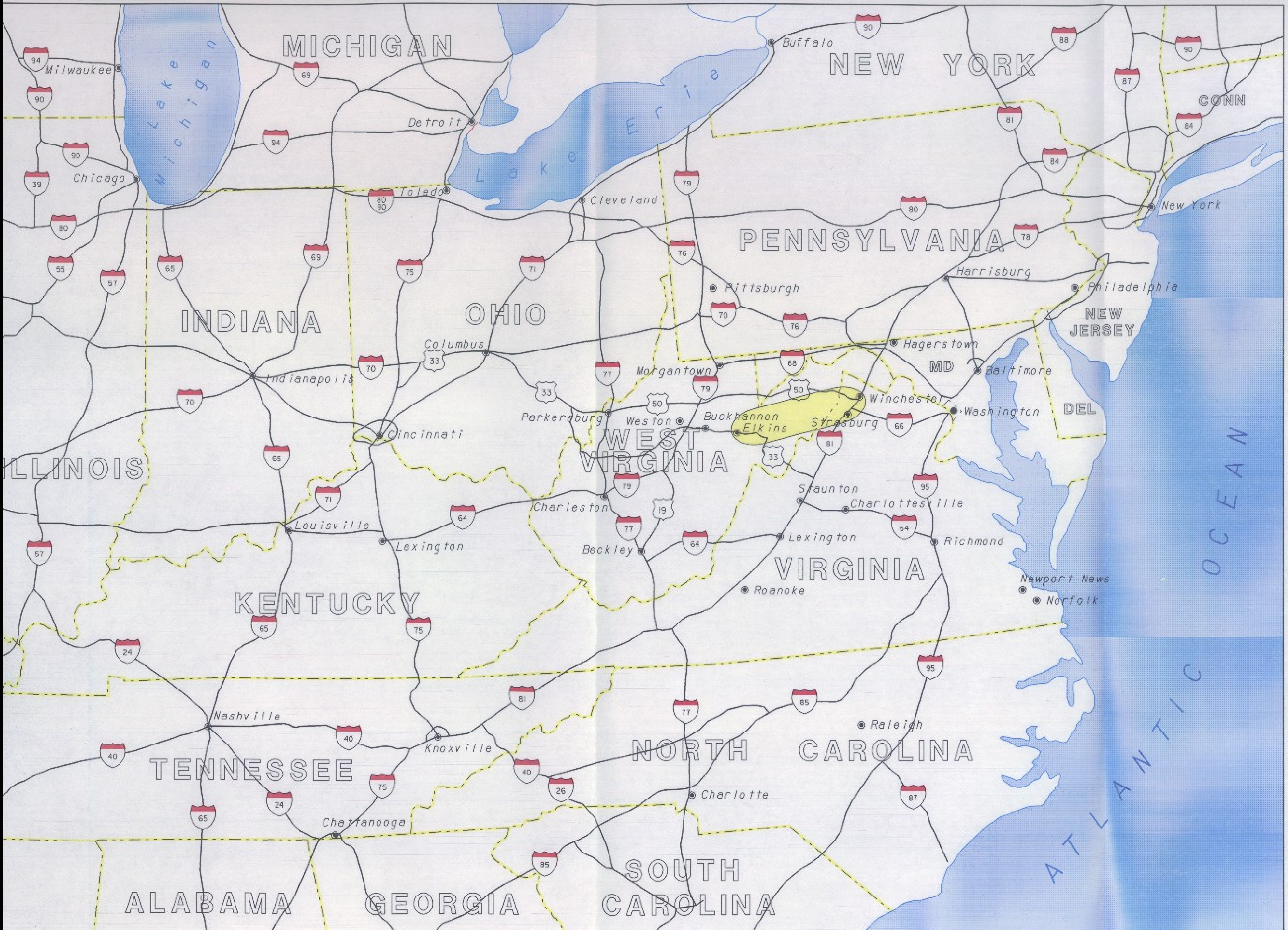
1. REGIONAL SYSTEM LINKAGE

The study area is situated between the Northeast, Midwest, and Mid-Atlantic regions of the United States. The Interstates (I) and significant United States (US) routes serving these regions are shown on Exhibit I-4. Based on available traffic data, it is estimated that approximately 14 percent of the existing traffic within the study area is "through" traffic or traffic whose specific origin and destination are not within the study area (WVDOH - Division of Statewide Planning, February 28, 1984). Traffic volumes have been projected using WVDOT growth rates to represent 1990 volumes. The percentage of through traffic is assumed to have been maintained since the roadway network has not changed since the 1984 projections. However, the volume of through traffic has increased since 1984 based on WVDOT's growth projections. Current projections by WVDOT indicate that implementation of the project would increase through traffic to 26 percent of total traffic volume in the area.

Within the study area, the closest limited-access, east/west facility is I-66, beginning in Washington, D.C., and terminating at I-81 in Strasburg, VA. Outside the study area, from Hagerstown, MD, to Morgantown, WV, the closest east/west, limited-access facility is I-68, between 54 and 84 miles to the north of the study area. Interstate 64 is West Virginia and Virginia's only common east/west, limited-access facility. This facility ranges between 60 and 106 miles to the south of the study area. Located in the Maryland Panhandle and southern Pennsylvania are two limited-access, four-lane facilities. In southern Pennsylvania, the Pennsylvania Turnpike (I-76 and I-70) runs from southern New Jersey to Ohio.

United States 50 (Appalachian Corridor D) is a four-lane, limited-access, east/west facility from I-79 in Clarksburg, WV to I-77 in Parkersburg, WV. This route is the main roadway between these two points. This facility is between 52 and 173 miles northwest of the study area. The only other four-lane, limited-access facility in northeast West Virginia is US 33, which runs east from its interchange with I-79 near Weston to Buckhannon. The widening of US 33 from a two to a four-lane facility is currently underway from Buckhannon to Elkins (this segment is a western section of Corridor H). To the east of Elkins, a series of two-lane, winding mountain roads extend from Elkins to I-81 and I-66, as well as to I-64 and I-95.

CORRIDOR H
ELKINS to I-81



LEGEND

- INTERSTATE HIGHWAY
- U.S. ROUTE
- STUDY REGION

Exhibit I-4

REGIONAL SYSTEM LINKAGE

0 75
Scale In Miles

There are four principal north/south, limited-access highways located in the West Virginia and Virginia area. The first is I-81 in Virginia which parallels the West Virginia and Virginia border. The second is I-79 which runs through the center of West Virginia approximately 45 to 166 miles west of the study area. The intersection of I-79 and US 33 at Weston is the westernmost terminus of Appalachian Corridor H. Further to the west, the third north/south route is I-77. This route runs through Ohio into West Virginia near Parkersburg, extends south to Charleston, and then south through Beckley to Virginia, where it intersects I-81 and continues south. The fourth north/south route is I-95 in Virginia. Although this route is somewhat removed from the study area, it is intersected by the east/west facilities of I-68, I-66, and I-64. Interstate 95 is the most heavily traveled of all roadways within the Interstate System and serves as a vital link along the East Coast.

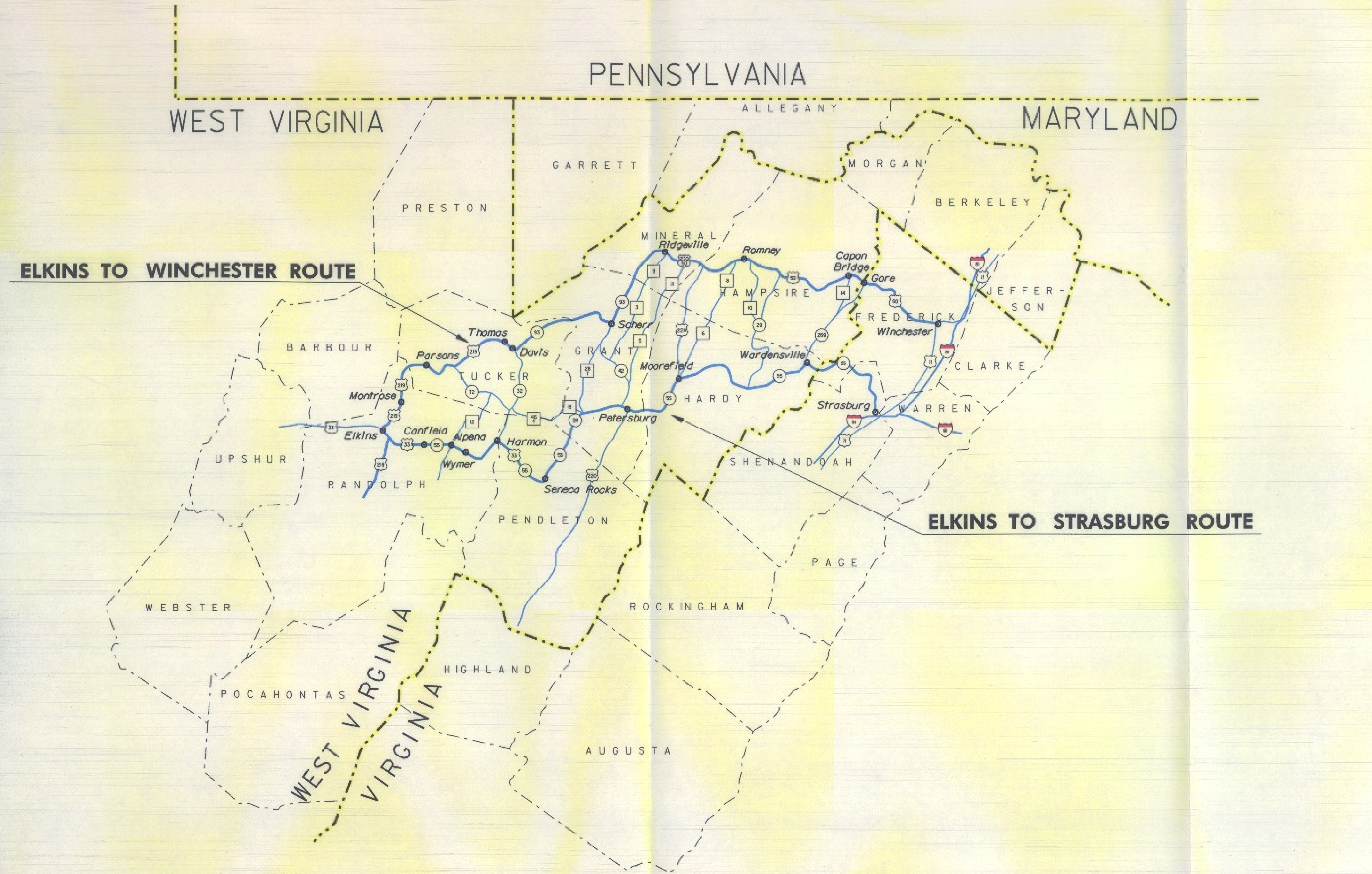
2. LOCAL SYSTEM LINKAGE

As shown on Exhibit I-5, there are two main routes which serve east/west travel within the study region. One route extends from Elkins to I-81 in Winchester, VA and the other route extends from Elkins to I-81 in Strasburg, VA. These two existing routes are primarily made up of two-lane, winding mountain roadways linking small towns and communities. WVDOT's Functional Classification Map indicates that the roadways on the Elkins to Winchester route are classified as feeder routes between Elkins and Scherr and as a trunkline route between Scherr and the West Virginia/Virginia state line. The Elkins to Strasburg route is classified as an expressway, although it is not constructed to expressway standards. These two routes serve as the existing or No-Build condition for the SDEIS. Table I-1 identifies the various US and State Routes (SR) which make up these two east/west routes. Approximately 86 percent of all existing traffic within the study area is local traffic or traffic whose origin and destination are within the study area. Implementation of the proposed facility would increase through traffic to 26 percent of total traffic volume on the facility.

3. CORRIDOR H AS A CONNECTING LINK

While the Interstate System and its supporting network of primary highways are essential for travel between the East Coast and the Midwest regions, they offer no direct access to the study region. The purpose of the Appalachian Corridor System is to develop a connected highway system in conjunction with the Interstate System and other Federal-Aid Highways in the region. The most direct route from I-95 and the East Coast to the Midwest is through West Virginia. Presently, high speed roads carry traffic to the northwestern limits of West Virginia from both regions but do not continue through the midsection of West Virginia.

CORRIDOR H
ELKINS to I-81



LEGEND

- INTERSTATE HIGHWAY
- U.S. ROUTE
- STATE ROUTE
- COUNTY ROUTE

Exhibit 1-5

LOCAL SYSTEM LINKAGE

Scale in Miles

TABLE I-1

EXISTING EAST/WEST ROUTES: ELKINS TO I-81

ELKINS TO WINCHESTER
US 33 in Aggregates, WV to US 250 in Elkins, WV
US 250 in Elkins to US 219 in Elkins
US 219 in Elkins to SR 32 in Thomas, WV
SR 32 in Thomas to SR 93 in Davis, WV
SR 93 in Davis to US 50/220 south of New Creek, WV
US 50/220 south of New Creek to US 50/SR 28 in Junction, WV
US 50/SR 28 in Junction to US 50 in Romney, WV
US 50 in Romney to I-81 in Winchester, VA
ELKINS TO STRASBURG
US 33 to Aggregates to Elkins, WV
US 33 in Elkins to SR 55/28 in Seneca Rocks, WV
SR 55/28 in Seneca Rocks to I-81 in Strasburg, WV

As previously noted, the types of existing roadways found in the region are winding, two-lane facilities with unlimited access. Corridor H, in particular, was established to improve east/west access across the Appalachian Region of northeastern West Virginia. Since almost all of the existing highway facilities in the region run north/south, a major east/west facility would serve to tie these north/south facilities into a functional network.

4. ONGOING AND PLANNED IMPROVEMENTS

The need for the project has been formally recognized in the transportation plans and programs of WVDOT, FHWA, and ARC. As shown in Table I-2, corridor location studies for Appalachian Corridor H are among those listed in the Department's 1991 Transportation Improvement Program. While the Virginia Department of Transportation's (VDOT) *Six Year Improvement Program - Fiscal Years 1992-93 thru 1997-98*, does not include Corridor H as a part of their transportation improvement plan, they are actively involved in the project as a cooperating agency and have stated they will abide by WVDOT's corridor selection.

E. CAPACITY AND LEVEL OF SERVICE

Capacity and Level of Service refer to the capacity of the existing facility, its present level of service, and any deficiencies of the system in serving the motoring public. In general, Level of Service "*C*" or better is the standard acceptable by FHWA for future improvements.

The most recent traffic counts for the project were obtained from WVDOT and VDOT. WVDOT provided truck percentages and growth factors for each county and roadway type, as well as the roadway widths of each route and the planned roadway improvements within West Virginia. VDOT provided 1989 daily traffic volumes and 2010 forecasted daily volumes. While APD System facilities are not specifically intended to alleviate traffic congestion or reduce accident rates, the following information provides another aspect to the need for the proposed facility.

1. 1990 CAPACITY AND LEVEL OF SERVICE

Level of Service (LOS) is a qualitative measure which describes operational conditions of a traffic stream along a roadway. Levels of Service are defined from *A* to *F*, with LOS *A* being the best (e.g.:little, if any, traffic delays) and LOS *F* being the worst (e.g.: traffic at a standstill). In general, highways are designed to provide the highest LOS which is both feasible and consistent with the expected operating performance (taking into account acceptable degrees of congestion, turning lanes,

TABLE I-2
WVDOT ONGOING AND PLANNED ROADWAY IMPROVEMENTS

COUNTY	ROUTE	SECTION	TRANSPORTATION IMPROVEMENT
Randolph, Hardy, Grant, Pendleton	US 33	Corridor H	Corridor Location Studies - Wymer to Virginia State Line
Hampshire	US 50	Romney to VA	Guardrail Installation
Hampshire	US 50	Shanks to Augusta Rd.	Guardrail Installation
Hampshire	US 50	Hanging Rock to Capon Bridge	Resurface/Widen/Realign/Shoulder Work
Hardy	SR 55	Moorefield to Baker	Guardrail Installation
Hardy	SR 55	Moorefield to Needmore Rd.	Resurface/Widen
Hardy	SR 55	Bridge over Lost Sinks River	Bridge Renovation
Hardy	US 220	Petersburg Gap Bridge, South Branch Potomac River	Removal of Old Petersburg Gap Bridge
Randolph	US 33	Elkins By-Pass	Design Reports for Elkins By-Pass, from Aggregates to Canfield
Randolph	US 33	Elkins to Harman Rd.	Slide Correction
Randolph	US 33	Harman to Allegheny Mountain Rd.	Resurface and Shoulder Treatment
Randolph	US 33	Corridor H	Update Plans and Archaeological Survey, from US 33 to Aggregates
Randolph	US 219	Elkins to Parsons	Resurface/Widen/Shoulder/Guardrail Installation
Tucker	US 219	Backbone Mountain	RPM
Tucker	US 219	Roaring Run	Replace Bridge over Roaring Run
Tucker	US 219	Thomas Bridge	Renovate Bridge over North Fork of Blackwater River and Railroad
Tucker	SR 32	Canaan Valley to Thomas	Guardrail Installation
Tucker	SR 93	Beaver Creek Bridge	LMC O/L over Beaver Creek

Source: "1991 Transportation Improvement Program". Report No. 3100A-P1, State of West Virginia, Department of Highways, Division of Project Control. (Includes all projects not "completed" as of 1/01/91.)

passing sections, weaving sections, intersections, and interchanges). The designed LOS should generally be at or better than LOS *B*. The exception to this is in mountainous areas where LOS *C* is often considered acceptable.

As shown on Exhibit I-6 and Table I-3, the 1990 average daily traffic (ADT) volumes ranged from 1,600 to 8,800 vehicles along the existing Elkins to Winchester route. Based on these traffic volumes and the existing roadway conditions (grades up to 10 percent and below standard lane widths), over 57 percent of the Elkins to Winchester route is operating at LOS *D* or *E*. Along the existing two-lane roads of the Elkins to Winchester route (Elkins to Gore, VA), the LOS ranges from *C* to *E*. The sections which operate at LOS *E* are situated in mountainous terrain (grades over 8 percent) and have truck traffic usage of 12 to 13 percent. While the terrain from Thomas to Davis is more rolling than mountainous, truck traffic volume of 15 percent accounts for a LOS *E* on this section of the Elkins to Winchester route. In the vicinity of Gore, VA, where US 50 becomes a four-lane facility, LOS *A* is maintained to its connection with I-81. (Existing roadway conditions are discussed in detail in this section under "Safety and Roadway Deficiencies".

Along the Elkins to Strasburg route, ADT volumes range from 1,500 to 6,000 vehicles with a LOS of *D* or *E* along 82 percent of the route. The four-lane section from Elkins to Canfield currently operates at LOS *A*. The two-lane sections from Canfield to Seneca Rocks and from Petersburg to Wardensville currently operate at LOS *D*. From Seneca Rocks to Petersburg, truck traffic of 13 percent and rolling terrain account for a LOS *E*.

2. PROJECTED TRAFFIC GROWTH AND LEVEL OF SERVICE

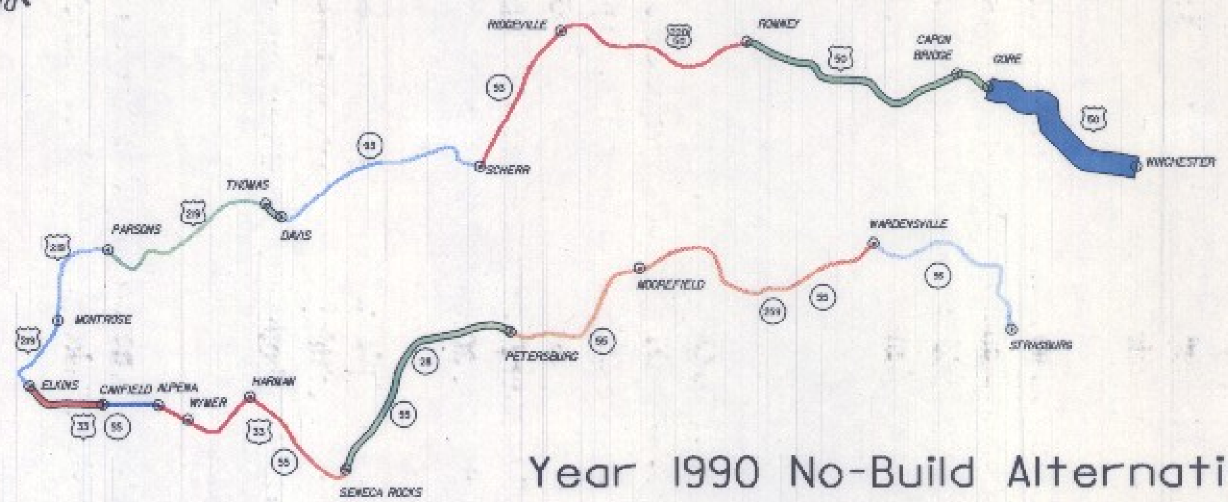
Along the Elkins to Winchester route, the year 2010 ADT volumes are projected to range from 2,600 to 10,000 vehicles (Exhibit I-6 and Table I-3). The Elkins to Strasburg route is projected to have ADT volumes ranging from 2,700 to 14,100 vehicles. Based on these projections, 93 percent of the Elkins to Winchester route would operate at LOS *D*, *E*, or *F*, and 92 percent of the Elkins to Strasburg route would operate at LOS *D* or *E* in the design year 2010.

These projections are based on the assumption that all planned roadway improvements within the study area have been completed with the exception of this project. As the projected traffic volumes indicate, even with the planned improvements in place, both existing east/west routes would be operating well below an acceptable Level of Service.

The two-lane facilities in the study area do not and will not accommodate the existing and future growth in traffic at an acceptable LOS. As a four-lane, limited-access facility, Appalachian

CORRIDOR H

Elkins to I-81

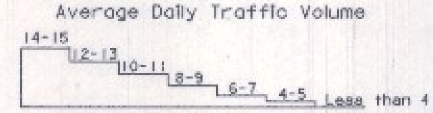


Year 1990 No-Build Alternative

Level of Service

A
B
C
D
E
F

Average Daily Traffic Volume



(Thousands of Vehicles Per Day)

Year 2010 No-Build Alternative

Exhibit I-6

EXISTING ROUTES
1990 & 2010 TRAFFIC VOLUMES
and
LEVELS of SERVICE

0 15
Scale in Miles

TABLE I-3
EXISTING AND FUTURE AVERAGE DAILY TRAFFIC VOLUMES AND LOS UNDER THE NO-BUILD ALTERNATIVE

ROADWAY LINK	1990 AVERAGE DAILY TRAFFIC VOLUMES	1990 LEVEL OF SERVICE (LOS)	2010 AVERAGE DAILY TRAFFIC VOLUMES	2010 LEVEL OF SERVICE (LOS)
ELKINS TO WINCHESTER				
Elkins/Montrose	3,200	C	6,600	E
Montrose/Parsons	2,500	C	4,600	D
Parsons/Thomas	2,700	E	5,000	E
Thomas/Davis	4,000	E	7,000	E
Davis/Scherr	1,600	C	2,600	D
Scherr/Ridgeville	1,700	D	3,400	E
Ridgeville/Romney	3,300	D	6,800	E
Romney/Capon Bridge	5,100	E	7,400	F
Capon Bridge/State Line	4,900	E	7,200	F
State Line/Winchester	8,800	A	10,000	A
ELKINS TO STRASBURG				
Elkins/Canfield	5,800	D	13,700	F
Canfield/Alpena	3,000	A	4,100	A
Alpena/Harman	1,900	D	3,900	E
Harman/Seneca Rocks	1,500	D	2,900	E
Seneca Rocks/Petersburg	5,800	E	9,500	E
Petersburg/Moorefield	3,700	D	6,100	E
Moorefield/Wardensville	1,900	D	2,700	E
Wardensville/Strasburg	1,800	C	2,800	D

Source: "Transportation Needs Study: Appalachian Highlands Region", WVDOT 1991.

Corridor H would operate at LOS *A* and *B* throughout the study area in design year 2010. If the Corridor H project were implemented, demands on the existing transportation facilities would be reduced and improved traffic operations would result.

F. TRANSPORTATION DEMAND

Transportation Demand refers to the relationship of the project to the local transportation plan and the local comprehensive plan. The appropriate State Planning Regions of West Virginia, the U.S. Forest Service, the West Virginia County Commission of Grant County, and the Frederick (Virginia) County Department of Planning and Development have adopted comprehensive development plans for portions of the study area, taking into account Corridor H in the planning process.

The West Virginia portion of the study area is within State Planning Regions VII and VIII. The respective Planning and Development Councils for those regions have published *Overall Economic Development Plans* (OEDP) which outline goals and strategies to develop the region in an efficient and desirable manner. The *1991-1993 Region VII Development Plan* serves as the OEDP for a seven county region and includes the West Virginia counties of Tucker and Randolph. The *Region VIII Fiscal Year 1991 OEDP Update* covers the West Virginia counties of Grant, Hampshire, Hardy, Mineral, and Pendleton. Both OEDP's identify Corridor H as a program element in their plans.

The *Economic Adjustment Strategy for Grant County* and the *Economic Adjustment Strategy for Hampshire County* identify Corridor H as an element in each county's overall economic development plan. In the Virginia county of Frederick, the *Frederick County 1990 Comprehensive Plan* designates Corridor H as a planned transportation improvement.

The *Shenandoah County Comprehensive Plan: 2010* (December 1991) does not specifically mention Appalachian Corridor H as a part of their future transportation plan.

G. MODAL INTERRELATIONSHIPS

Modal Interrelationships refers to the different types of transportation modes which would interface with the proposed project and establish how the proposed action will complement these modes (i.e., airports, rail, port facilities, mass transit services, ride sharing, HOV, etc.)

The transportation of goods and services can incorporate the use of more than one mode of transportation. In northern West Virginia, the coal industry utilizes a network of railroads to transport coal to the East Coast (West Virginia Governor's Office of Community and Industrial Development, 1990) The counties that participate in the extraction of coal have railroad lines and terminals to use for transportation purposes. However, existing rail lines do not provide direct access to the widespread communities and industries in the study area. While the existing rail system could be used as a means of freight distribution, use would be limited due to the limited mileage of track and limited system termini within the region. Industries not located near rail system termini are unable to utilize the railroad system because existing roads are not designed to accommodate truck traffic to the terminal facilities.

The basic air traffic system in the United States links states, regions, and countries. However, within the study area, there is a lack of adequate airports capable of handling commercial airplanes. The airports located within the study area are small and classified for general aviation. Three airports are in close proximity to the study area; the Elkins-Randolph County Airport; the Petersburg-Grant County Airport, and the Cumberland Maryland-Wiley Ford Airport. Larger airports outside the study region must be reached by other modes before the nation's air traffic system can be utilized for air freight purposes. Goods bound for or receiving air freight distribution must be transferred to trucks and then hauled over deficient roadways within the study region. Similarly, the inadequate roadways make it more difficult for residents of the region to access the nation's air traffic system. Exhibit I-7 identifies the intermodal relationships within the study area.

Completion of this link of Corridor H would improve the transport of goods within and across the region. This would be accomplished by improving access to existing rail and air freight facilities within the region, as well as improve the means by which vehicular transport connects with other modes of transportation outside of the study area.

H. SAFETY AND ROADWAY DEFICIENCIES

Safety and Roadway Deficiencies refer to accidents which have occurred in the study area. This includes the types, frequency, percentage increase or decrease over a period of time, and the rate of accidents when compared with the statewide average for similar facilities.

1. ACCIDENT RATES

West Virginia's state rural primary routes experienced an average accident rate of 2.62 accidents per million vehicle miles traveled. Along completed portions of Appalachian Corridor

CORRIDOR H

Elkins to I-81

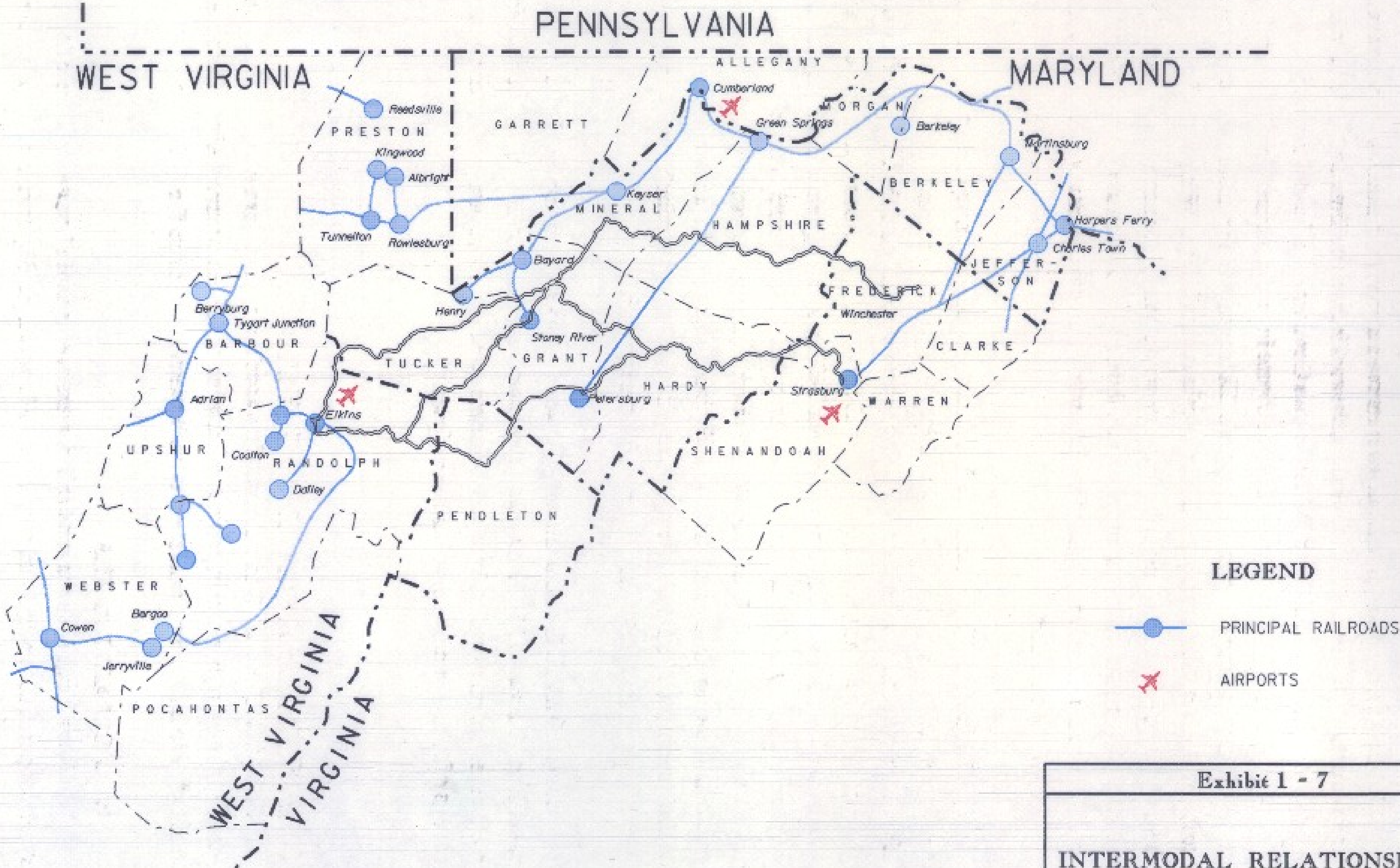


Exhibit 1 - 7

INTERMODAL RELATIONSHIPS

0 20
Scale In Miles

highways, average accident rates are approximately 1.10 per million vehicle miles traveled. This represents a 58 percent accident rate reduction with the implementation of APD System, expressway type facilities. A similar reduction in accident rates would be expected along the proposed Elkins to I-81 Appalachian Corridor H facility.

One of the most substantial gains of Corridor H would be the reduction in the annual number of fatalities. It is estimated that annual fatalities on the proposed facility would be between 23 and 26, whereas estimated fatalities along either of the existing routes would number 46. Statistics compiled by the National Safety Council and by independent researchers have shown that freeway travel reduces the frequency of vehicular accidents. Accident data show that the death rate for freeway travel is less than one half that for all highways and that the accident rate per million vehicle miles traveled is much less for freeway travel.

Table I-4 identifies the rate of accidents for each section of the Elkins to Winchester and Elkins to Strasburg routes over a 3-year period (1987 to 1990). The Elkins to Winchester route's average accident rate was 2.63 accidents per million vehicle miles traveled (^{a}/VMT) with a high of 4.02 between Capon Bridge and the Virginia state line, and a low of 0.79 ^{a}/VMT between the Virginia state line and Winchester. Along the Elkins to Strasburg route, the average accident rate was 3.24 ^{a}/VMT, with a high of 3.94 between Petersburg and Moorefield, and a low of 1.62 between Strasburg and the Virginia state line. Completion of Corridor H can be expected to provide a reduction in social and economic losses due to highway accidents incurred.

2. EXISTING AND PROPOSED ROADWAY CHARACTERISTICS

Appalachian Corridor H would provide not only a link across the Appalachian Mountains by means of an efficient transportation facility, but also a much safer highway for local and through motorists. Major portions of the existing Elkins to Winchester and the existing Elkins to Strasburg routes are considered inadequate to meet both the current and future transportation demands. As previously discussed, between 57 and 82 percent of the existing routes are currently operating at LOS *D* or *E*. In the design year 2010, approximately 92 percent of either of these routes would be operating at LOS *D*, *E*, and *F* under the No-Build condition.

The inadequate LOS is due, in part, to the geometric deficiencies of these existing roadways. Typically composed of two, 11-foot lanes with no control of access, these roads are characterized by safety defects such as restricted sight distance, poor intersection design, poor horizontal alignment, variable shoulder width (0 to 8 feet), and obstructions close to the pavement edge.

TABLE I-4
INTERSECTIONS AND ACCIDENT RATES: 1987 TO 1990

ROUTE AND ROADWAY SEGMENT	NUMBER OF INTERSECTIONS PER MILE (Number)	ACCIDENTS PER MILLION VEHICLE MILES TRAVELED (Number)
ELKINS TO WINCHESTER		
Elkins to Montrose	1.43	2.90
Montrose to Parsons	0.52	2.43
Parsons to Thomas	0.78	2.82
Thomas to Davis	N/A	2.45
Davis to Scherr	0.21	2.31
Scherr to Ridgeville	0.71	3.41
Ridgeville to Romney	0.55	2.98
Romney to Capon Bridge	1.07	2.15
Capon Bridge to VA State Line	1.61	4.02
State Line to I-81	N/A	0.79
ELKINS TO STRASBURG		
Elkins to Canfield	3.00	N/A
Canfield to Alpena	0.29	2.10
Alpena to Harman	0.91	2.22
Harman to Seneca Rocks	0.73	3.65
Seneca Rocks to Petersburg	0.68	2.63
Petersburg to Moorefield	0.65	3.94
Moorefield to Wardensville	0.67	3.44
Wardensville to VA State Line	1.52	3.09
State Line to I-81	N/A	1.62

Source: WVDOT-Division of Highways. "Traffic and Transportation Technical Report: Appalachian Corridor H-Elkins to I-81". 1991.

N/A = Not Applicable

Average travel speeds are also a function of the level of service provided by a facility. Automobile travel time and speed are restrained on the existing two-lane roads primarily by truck traffic for two main reasons. First, there is a general lack of adequate passing sight distance and, second, approaching traffic can be in the passing lane when passing sight distance is available. Under these conditions, driver frustration leads to attempts to pass without assured clear distance, resulting in hazardous and unsafe operation. The existing roadway characteristics of the Elkins to Winchester and Elkins to Strasburg routes are identified in Tables I-5 and I-6. (While the source of the existing and proposed roadway characteristics is dated 1978, the data is still valid since the existing and the proposed facility characteristics have not changed.)

One result of the designation of Corridor H as part of the APD System, with its attendant expressway-type standards, was classification of the Corridor as part of the Expressway System in the statewide highway functional classification system. Expressway-type standards require a four-lane, divided, limited-access facility. As shown in Table I-5, Corridor H would be designed based on these standards. When completed, the design features of Corridor H would incorporate greater safety measures. Some of these safety features are listed below.

- Better horizontal alignment, with corresponding increased sight distance (7° 30' maximum degree of curvature).
- Partially controlled access to minimize and restrict points of traffic conflict at predetermined intersections to reduce turning conflicts at private and/or commercial driveways, and to substantially improve capacity for projected future traffic loads.
- Divided lanes to eliminate passing in opposing lanes and to substantially reduce the potential for head-on collisions.
- Wide shoulders, with guardrails (where necessary) and open medians (up to 40 feet, where feasible) to provide space for temporarily disabled vehicles and a recovery zone for out-of-control vehicles.
- Hazardous obstructions controlled or eliminated close to the roadway.
- Adequate signing and other traffic control devices to properly direct traffic.
- Provisions for shielded left-turn storage lanes at major intersections.

TABLE I-5
EXISTING AND PROPOSED ROADWAY CHARACTERISTICS

CHARACTERISTIC	EXISTING ROUTES		PROPOSED ROUTE
	Elkins to Strasburg	Elkins to Winchester	Elkins to I-81: (Strasburg or Winchester)
DISTANCE			
Elkins to I-81 (Miles)	121	139	111 to 129
AVERAGE TRAVEL TIME			
Autos (Hours)	3.44	3.65	1.86 to 2.18
Trucks (Hours)	5.02	5.23	2.95 to 3.44
AVERAGE TRAVEL SPEED			
Autos (Miles per Hour)	35	38	59
Trucks (Miles per Hour)	24	26	36 to 40
VERTICAL ALIGNMENT			
Maximum Grades	7% to 10%	7% to 10%	7%
Longest Maximum Grade (Feet)	18,500	18,400	9,000 to 15,700
Sum Total Length of Maximum Grades (Miles)	29	12	11 to 20
Accumulative Ascension (Feet)	9,410.00	8,497.00	7675 to 7855
Total Length of Grades Over 4% (Miles)	48	38	25 to 42
Percent of Length Over 4%	40%	27%	20% to 36%
HORIZONTAL ALIGNMENT			
Maximum Degree of Curve	100 +	100 +	6 -30' to 7 -30'
Number of Curves Exceeding 5 - 30'	188	155	3 to 8
Number of Curves Exceeding 3 - 30'	284	321	56 to 78
Percent of Length with Curves Over 3 - 30'	34%	38%	13% to 15%
Number of Curves 3 - 30' and Over	290	332	69 to 103
Percent of Length with 3 - 30' and Over	35%	40%	15% to 19%

Source: WVDOH and E.S. Preston Associates, Inc. "Premiminary Engineering Study: Corridor H". 1978.
American Association of State Highway Transportation Officials. "Geometric Design of Highways and Streets". 1990.

TABLE I-6

TYPICAL LANE & SHOULDER WIDTH

ROADWAY SECTION	TYPICAL LANE WIDTH	TYPICAL SHOULDER WIDTH
ELKINS TO WINCHESTER		
Elkins to Montrose	10 & 11 ft.	4 & 5 ft.
To Parsons	10 & 11 ft.	4 ft.
To Thomas	10 & 11 ft.	4 & 6 ft.
To Davis	N/A	N/A
To Scherr	9 & 10 ft.	4, 5 & 6 ft.
To Ridgeville	11 ft.	8 ft.
To Romney	10, 11 & 12 ft.	3, 6 & 8 ft.
To Capon Bridge	12 & 13 ft.	5 & 6 ft.
To Virginia State Line	10 ft.	5 ft.
To Winchester	N/A	N/A
ELKINS TO STRASBURG		
Elkins to Canfield	10 ft.	
To Alpena	12 ft.	5 & 8 ft.
To Harman	9 & 10 ft.	5 ft.
To Seneca Rocks	9 & 10 ft.	5 & 6 ft.
To Petersburg	9, 10 & 11 ft.	4 & 8 ft.
To Moorefield	9 & 10 ft.	4, 5 & 8 ft.
To Wardensville	N/A	4, 5 & 6 ft.

The design and construction of Appalachian Corridor H would generally parallel the design requirements specified for the Interstate Highway System. The primary difference between the two is that Corridor H would have partial access-control whereas Interstates have full access-control. All design features of the proposed facility would contribute greatly to the safety and efficiency of traffic movement throughout the completed project. Following selection of a preferred corridor and initiation of preliminary design, certain design standard modifications may be examined to better fit the roadway into the surrounding environment and to eliminate or minimize encroachments on sensitive environmental resources such as wetlands and streams. Any design modifications would be addressed and documented in the alignment SDEIS and its supporting Technical Reports.

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SECTION II:
Alternatives Considered

SECTION II: ALTERNATIVES CONSIDERED

This section presents the alternatives considered for the proposed Appalachian Corridor H project. First, the process through which the alternatives were developed is presented. This is followed by a description of alternatives that have been eliminated from further consideration. Finally, the alternatives retained for detailed evaluation and comparison are identified. At this stage in the study process, a preferred alternative has not yet been determined. This decision will be made based on the results of the circulation of this document and the information received through the Location Public Hearing process.

A. <u>DEVELOPMENT OF ALTERNATIVES</u>

In accordance with 23 CFR 771.123 and FHWA Technical Advisory T 6640.8A, five broad-ranged alternatives were established for development and consideration at the initiation of the Appalachian Corridor H project, between Elkins and I-81. The alternatives included:

- A Transportation Systems Management Alternative;
- A Mass Transit Alternative;
- An Improved Roadway Alternative;
- A No-Build Alternative of maintaining the existing roadway system; and
- A Build Alternative involving the construction of Appalachian Corridor H.

Prior to developing specifics for any of the alternatives, existing data and previously completed studies were reviewed. Because of the continuous evaluation of Appalachian Corridor H over the past 20 years, an extensive collection of data existed for this project. The data were reviewed and pertinent information was extracted for use is this study. This information provided the basis for development of the alternatives and the identification of additional data requirements needed to fully evaluate the various possibilities being studied.

B. ALTERNATIVES CONSIDERED BUT ELIMINATED

Several alternatives have been considered but eliminated from further consideration because they do not serve the purpose of and need for the project. Alternatives eliminated from further consideration include the Transportation Systems Management, Mass Transit, and Improved Roadway Alternatives.

1. TRANSPORTATION SYSTEMS MANAGEMENT ALTERNATIVE

The purpose of the Transportation Systems Management (TSM) Alternative is to make the existing system as efficient as possible. Typically, the TSM approach includes low-cost roadway improvements such as adding widened shoulders and warning signs in areas where they are needed; constructing minor realignments of sharp horizontal curves; installing traffic signals at intersections experiencing substantial delays; and establishing flexible work schedules and promoting carpooling at the major employers within the area. TSM measures are generally considered appropriate in urban areas where the existing facilities operate beyond the designed capacity limits. However, capacity constraints along the existing routes are not caused by a large volume of traffic, but rather by the relationship between traffic volumes and the physical constraints of the mountainous terrain and the sharp curves of the switchbacks required to traverse the steep mountains.

Implementation of TSM measures within the rural study area would not adequately address the purpose of and need for the proposed project. That is, TSM measures would not provide improved access within and through the northeastern portion of West Virginia, would not substantially improve the level of service provided by the existing Elkins to I-81 routes, and would not substantially improve the overall highway system network. Although many of the TSM measures would result in traffic safety and operational improvements, the practical need lies with an alternative which would provide a limited access, long-term solution to the identified project need. Based on all of these factors, the TSM Alternative is not a viable alternative to meet the needs of the project and has, therefore, been eliminated from further study.

2. MASS TRANSIT ALTERNATIVE

The Mass Transit Alternative includes such options as providing either bus or rail service within the area to alleviate congestion. Typically, mass transit is considered a viable alternative to roadway construction in urban areas with populations over 200,000 and requires a fairly large user level to support such a service. Bus-based mass transit depends on an adequate highway system already in place. Existing rail lines do not provide direct access to the widespread communities and industries in the study area. In addition, access to the existing rail lines/terminal facilities is difficult due to the documented deficiencies of the roadway system.

Given the relatively low population density, rural character, and overall size of the study area; the tourist and truck traffic which would not likely use mass transit; the prohibitive costs associated with implementing an efficient bus or rail mass transit system within the study area; and the operation and maintenance costs associated with maintaining such a system, it has been determined that the Mass Transit Alternative would not adequately serve the purpose of and need for the project. Therefore, the Mass Transit Alternative has been eliminated from further study.

3. IMPROVED ROADWAY ALTERNATIVE

The Improved Roadway Alternative would require performing significant geometric changes to one of the existing Elkins to I-81 routes. Examples of such improvements would include adding truck climbing lanes, widening roadways and shoulders, regrading where slopes are steep, and realigning where sight distance is poor. While implementation of the Improved Roadway Alternative would address localized problems, it still would not address the need for the project. This alternative would not address the issues of roadway deficiencies, safety considerations, and regional system linkage.

In accordance with the Transportation Research Board's *Highway Capacity Manual* (1985), on two-lane highways experiencing operational problems, three-lane roadways are considered a rational, intermediate solution to four-lane expansions. Because of funding, terrain, environmental resources, or other constraints, three-lane roadways are options for spot and segment improvements.

The construction of three-lane highways was common during the 1940's and 1950's. During that period, the center lane of three-lane roadways was typically used as a passing lane by vehicles in either direction. However, this practice was found to be especially hazardous (due to the increased number of head-on collisions and subsequent fatalities) and the practice has been generally discontinued since the 1960's.

In the mid 1980's, the use of three-lane roadways has once again become more common as safer designs have been incorporated into their operation. Some safer uses of three-lane roadways that were considered in this study but eliminated from further consideration include:

- Use of the third (center) lane as a passing lane. Several options are available, including alternating the travel direction of the center lane (approximately 1-mile segments), thereby providing exclusive passing lanes for each direction of travel at periodic intervals.

- Use of the third lane as a climbing lane. This is generally applied as a spot improvement, most often on steep, sustained grades which cause heavy vehicles to travel at slow speeds.

- Use of a long segment of three-lane highway. This three-lane facility operates with two lanes in one direction and one lane in the other direction (*Highway Capacity Manual*, 1985).

The use of three-lane roadways was eliminated from further consideration for several reasons. As noted in the *Highway Capacity Manual*:

- Where the second lane in the preferred direction on a three-lane highway exists for short segments, it is generally used less efficiently than the second lane on a full, four-lane facility. The added lane is typically used to pass slower moving vehicles and execute left turns. While the extra lane adds to the capacity of the highway by providing more efficient passing and reducing left-turn conflicts, it still does not approach the capacity levels of a four-lane highway, even in the preferred (two-lane) direction of travel.

- Where the third lane of a three-lane highway is permanently assigned to one direction for a distance of several miles, the operation of the preferred direction can approach that of a four-lane highway. However, capacity levels of the two-lane section are reduced 10 to 15 percent to reflect the somewhat reduced efficiency compared to the full, four-lane case.

- Three-lane highways (even safely designed ones) are not considered to be the ultimate development of a roadway facility. Rather, they are described by the *Highway Capacity Manual* as "intermittent" solutions. Therefore, in considering the impact of the proposed project, it is necessary to evaluate the ultimate facility development throughout the planning period.

The following provides specific data to substantiate the basis for eliminating the Improved Roadway Alternative (including the use of three-lane roadways) from further consideration.

a. **<u>Roadway Deficiencies</u>**

Implementation of the Improved Roadway Alternative would require that any improvements implemented meet current highway design standards for the specific roadway classifications along the route. The roadways on the Elkins to Winchester route are currently classified as feeder routes between Elkins and Scherr and as trunkline routes between Scherr and the Virginia state line. The Elkins to Strasburg route is classified as an expressway even though it is not designed to expressway standards.

The existing conditions on the Elkins to Winchester and Elkins to Strasburg routes are typical of roadways constructed through mountainous terrain; roadways follow the terrain, grades are steep, curves are sharp, lanes and shoulders are narrow, straight portions are limited, and homes and businesses are usually built in close proximity to the roads. (Depending on the route, from 27 to 40 percent of roadway grades are over 4 percent; between 34 and 38 percent of all curves are greater than 3° -30'; and over 50 percent of the lanes are between 9 and 11 feet wide.) When these conditions are blended with steep hillsides that come down to narrow shoulders, the end result is a roadway with many areas of inadequate sight distance, blind spots, and potentially dangerous intersections.

To reconstruct the existing routes to current design standards would likely result in the following impacts:

- A considerable number of relocations would be required in order for the horizontal alignment to conform to the 50 mph design speed.

- The widening of the roadway from two to four lanes with adequate shoulder width would require the removal of almost all of the residences and businesses immediately adjacent to the existing routes.

- Homes and businesses not directly adjacent the roadway improvement would be affected by the earthwork cut or fill slopes.

- The profile grade of some of the intersecting side roads could be made steeper because of the widening, and regrading of these could further impact adjacent properties.

- Reconstruction and reconfiguration of all existing intersecting roadways along the improved roadway would be needed due to the widened roadway.

- Traffic control would be required during construction to maintain traffic flow. Due to unlimited access points along the existing roadways, extensive traffic control devices would be needed, adding to the cost of the Improved Roadway Alternative.

b. Safety Considerations

The Improved Roadway Alternative would include maintaining the existing two-lane facilities and constructing truck climbing lanes or passing lanes in locations of steep grades. WVDOT's historical experience with two-lane, controlled-access facilities, or facilities with similar operating experience, has not been favorable. Examples of such facilities include Tolsia Highway, Appalachian Corridor L (US 19), and the original West Virginia Turnpike. On all three, the overall accident and injury rates are similar to four-lane highways and the Interstate System. However, the fatality rate exceeds the Statewide Rural Primary Highway Average (WVDOT - Division of Traffic Engineering, 12/26/90).

The high fatality rate seems to occur for two reasons. The first is that two-lane roadways do not separate traffic and thus fail to prevent the most severe type of rural collision; head-on crashes. In 1990, the percentage of fatalities resulting from head-on collisions on the Tolsia Highway and US 19 were 60 and 78 percent, respectively. The high speeds typical of modern rural highways make such crashes severe and more likely to result in death or serious injury (WVDOT 12/26/90).

The second reason for the high fatality rate involves problems that occur at certain intersections on two-lane, rural highways. Drivers find it difficult to estimate the speed of fast-moving vehicles, particularly when trying to cross the through highway or to make a left turn onto it. In addition, once threshold traffic volumes are reached, at-angle accident problems begin to occur. (At-angle accidents are collisions between vehicles moving in different directions, not opposing directions, usually at a right angle.) Construction of a four-lane facility with medians wide enough to protect most turning vehicles would reduce or eliminate these problems, allowing drivers to be concerned with one through-traffic stream at a time (WVDOT 12/26/90).

In mountainous terrain, two-lane roadways generally function at less than acceptable levels of service and, as a result, have higher than average accident rates. Two-lane expressways typically do not meet motorist expectations for an expressway-type facility. These drivers can be intolerant of delays caused by trucks and other slower moving vehicles and end up engaging in risky passing maneuvers. While truck-climbing lanes can be added to accommodate passing needs, they are only partially successful in reducing the above average accident rates. With the addition of passing lanes comes other accident-related problems. These accident problems are associated with the ending of these passing lanes at the top of a grade, especially where climbing lanes may be provided in opposing directions on either side of a mountain (WVDOT 12/26/90).

c. **System Linkage**

Spot improvements would not address the system linkage deficiency. Only a consistent, four-lane highway would directly link the East Coast to central Ohio and the Midwest; as well as provide a consistent four-lane highway link to Appalachian Corridors E, D, and L (Exhibit I-2). The purpose of the APD System is to develop a primary highway system network in conjunction with the Interstate System. The Interstate System and its supporting system of primary highways are essential for travel between the East Coast and the Midwest regions. However, these systems do not currently offer the shortest direct access which is through West Virginia. Spot improvements would not complete the APD System identified as necessary to promote the economic well-being of the region.

Since the Improved Roadway Alternative would require large numbers of relocations and would not eliminate the safety problems nor the system linkage problems indicative of the study area, it has been eliminated from further study.

C. ALTERNATIVES CONSIDERED FOR ADDITIONAL STUDY

Of the five alternatives considered for this project, two have been retained for further study and evaluation: the No-Build Alternative and the Build Alternative. In accordance with 40 CFR 1502.14, these two alternatives have been developed to a comparable level of detail to evaluate their merits.

1. NO-BUILD ALTERNATIVE

The No-Build Alternative consists of a continuation of the existing routes between Elkins and I-81. This alternative would include such short-term, minor restoration activities as safety and maintenance improvements, resurfacing, bridge repairs, minor widening, and intersection improvements. These improvements are already a part of WVDOT's on-going plan for the continued safe operation of the existing roadway system.

As shown on Exhibit I-6, over 57 percent of the Elkins to Winchester route is currently operating at LOS *D* or *E* and over 82 percent of the Elkins to Strasburg route is currently operating at LOS *D* or *E*. By the design year 2010, over 93 percent of the Elkins to Winchester route would operate at LOS *D*, *E*, or *F* and over 92 percent of the Elkins to Strasburg route would operate at LOS *D* or *E*. These levels indicate that a majority of the existing routes are currently operating below acceptable standards. These levels are expected to substantially deteriorate on both routes by the year 2010, even with WVDOT's planned improvements taken into consideration.

The No-Build Alternative would not improve the efficiency and safety of the transportation facility, it would perpetuate a gap in the Corridor H system, and it would hamper the intent of the Appalachian Regional Development Act of 1965: to aid the Appalachian region in promoting economic development and to provide basic facilities for its growth. While the No-Build Alternative would not meet the needs of the project, it has been retained for further consideration as a basis of comparison with the Build Alternative. In addition, it will remain a viable alternative of the Appalachian Corridor H project should the impacts associated with the Build Alternative be determined to be too great.

2. BUILD ALTERNATIVE

To solve the identified system linkage and transportation problems and to meet the associated purpose and needs of the project, numerous 2,000 foot-wide corridors have been studied. The *Draft Environmental Impact Statement: Appalachian Corridor H - Elkins, West Virginia to Interstate 81, Virginia*, dated March 1981, documents those corridors within the Build Alternative which were studied but eliminated from further consideration and the basis upon which they were eliminated. The DEIS also identified five corridors which were determined to be feasible and practicable. (These corridors were labeled Schemes and SubSchemes.) As such, these warranted further investigation and were evaluated in detail for their potential social, economic, and environmental impacts. These five Schemes (Schemes A, B, C, D, and E) and their corresponding SubSchemes (HR, K, KP, L, and L2) are identified on Exhibit I-3.

Following the circulation of the DEIS and the public review process, WVDOT unofficially selected Scheme A as their preferred corridor. Several in-depth investigations were conducted along Scheme A following WVDOT's unofficial selection, however, a Final EIS was never prepared and detailed design and construction efforts were never initiated. A major environmental concern over constructing Scheme A was its involvement with the Spruce Knob/Seneca Rocks National Recreation Area; a Section 4(f) property.

In August 1990, at the initiation of the Corridor H SDEIS process, the possibility of a SubScheme branching from Scheme A, avoiding or minimizing any involvement with these Section 4(f) properties, was investigated. The result of this investigation has been the development of SubSchemes AE-1, AE-2, AE-3, and AD-1. With the exception of these new Section 4(f) avoidance SubSchemes along Scheme A, the remaining five Schemes and their SubSchemes are those that were evaluated in the 1981 DEIS. Schemes and SubSchemes under the Build Alternative which have been retained for further evaluation are identified on Exhibit II-1.

The western terminus of all five Schemes is US 33 in Aggregates, approximately one-half mile west of Elkins. However, given its proximity to Elkins, and for ease of reference, this western terminus is referred to as the Elkins terminus. The eastern terminus for Schemes A, B, and D is I-81 in Strasburg. The eastern terminus for Schemes C and E is I-81 in Winchester. Throughout the study area, portions of the Schemes have common alignments: Schemes A, B, and C are common from Elkins to Wymer; Schemes B and C are common from Wymer to Bismarck; Schemes B and D are common from Bismarck to east of Moorefield; Schemes A, B, and D common from east of Moorefield to Strasburg; Schemes D and E are common from Elkins to Bismarck; and Schemes C and E are common from Bismarck to Winchester. The approximate corridor routes and the concurrent segments of each Scheme and SubScheme are identified in Table II-1. Location descriptions of the 1981 DEIS Schemes A, B, C, D, and E and SubSchemes HR, K, KP, L, and L2, as well as SubSchemes AE-1, AE-2, AE-3, and AD-1 are provided in the latter portion of this section.

D. BUILD ALTERNATIVE AND CORRIDOR SCHEME OPTIONS

Under the Build Alternative, the various Schemes and SubSchemes can be combined to create 24 unique 2,000 foot-wide corridor Scheme Options extending between the project termini. Table II-2 identifies the various Scheme Options and their approximate length in miles. Each of these 24 unique 2,000 foot-wide corridor Scheme Options has been evaluated for potential impacts in Section III of this SDEIS.

1. SCHEME A

From its western terminus in Elkins, Scheme A would follow US 33/250 east for approximately one mile, through the valley south of Laurel Mountain. Scheme A would then head southeast on new location through the Tygart Valley, bypassing Elkins. East of Elkins, Scheme A would rejoin existing US 33/SR 55 and basically follow this route, passing Alpena and crossing

CORRIDOR H
ELKINS to I-81

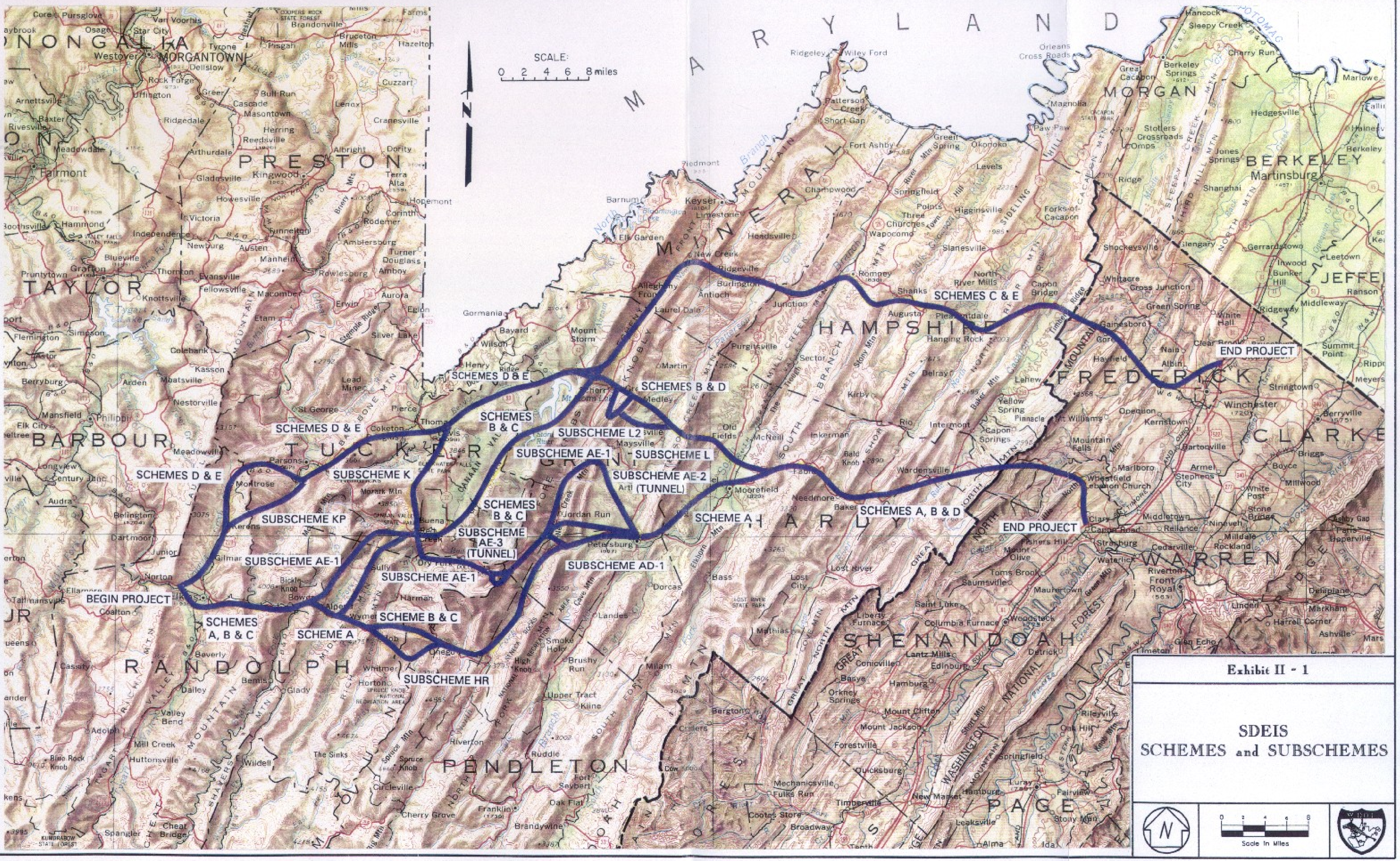


Exhibit II - 1

SDEIS
SCHEMES and SUBSCHEMES

81092

TABLE II-I
APPROXIMATE ROUTES: CORRIDOR H SCHEMES AND SUBSCHEMES

CORRIDOR ROUTE	SCHEMES AND SUBSCHEMES													
	A	AE-1	AE-2	AE-3*	AD-1	HR	B	C	K	L	L2	D	E	KP
Elkins to Wymer	■						■	■						
Wymer to Job	■													
Job to Onego	■													
Job to Onego (via SR 55 & US 33)						■								
Onego to US 220 & SR 55/28 east of Moorefield	■													
US 220 & SR 55/28 to Strasburg	■						■					■		
Alpena to Red Creek		■												
Red Creek to Big Run & CR 28/7 **		■		■										
Big Run to Smoke Hole Cavern					■									
Big Run to south of Jordan Run		■												
South of Jordan Run to Petersburg			■											
Jordan Run to Hoglan Run & SR 55/28		■												
Wymer to Bismarck							■	■						
Red Creek to east of Davis									■					
Bismarck to US 220/SR 55/28 east of Moorefield							■					■		
Scherr to Knobly Mountain											■			
Knobly Mountain to CR 3/3											■			
Knobly Mountain to Forman										■				
Elkins to Bismarck												■	■	
Kerens to Parsons														■
Bismarck to Winchester								■					■	

* Includes Tunnel Option along Scheme AE-1
** CR is County Route

TABLE II-2
CORRIDOR H SCHEMES AND SCHEME OPTIONS

SCHEME	SCHEME OPTION	LENGTH (Miles)	SCHEME OPTION DESCRIPTION
A	A1	111	Scheme A
	A2	118	Scheme A via SubScheme AE-1
	A3	110	Scheme A via SubScheme AE-1, AE-2
	A4	110	Scheme A via SubScheme AE-1, AD-1
	A5	117	Scheme A via SubScheme AE-1, AE-3, AE-1
	A6	108	Scheme A via SubScheme AE-1, AE-3, AE-2
	A7	109	Scheme A via SubScheme AE-1, AE-3, AD-1
	A8	110	Scheme A via SubScheme HR
B	B1	118	Scheme B
	B2	120	Scheme B via SubScheme L2
	B3	120	Scheme B via SubScheme L2, L
	B4	120	Scheme B via SubScheme K
	B5	123	Scheme B via SubScheme K, L2
	B6	122	Scheme B via SubScheme K, L2, L
C	C1	128	Scheme C
	C2	130	Scheme C via SubScheme K
D	D1	115	Scheme D
	D2	117	Scheme D via SubScheme L2
	D3	116	Scheme D via SubScheme L2, L
	D4	114	Scheme D via SubScheme KP, L2
	D5	113	Scheme D via SubScheme KP, L2, L
	D6	111	Scheme D via SubScheme KP
E	E1	125	Scheme E
	E2	121	Scheme E via SubScheme KP

Shavers and Middle Mountains, to approximately 3.5 miles east of Wymer. Between Canfield and Bowden, US 33/SR 55 is already a four-lane facility.

Scheme A would follow County Road (CR) 31 over Rich Mountain to its intersection with US 33/SR 55. Along CR 31, it would cross through the Monongahela National Forest's Spruce Knob Unit of the National Recreation Area (NRA) and parallel Whites Run. Scheme A would tie into US 33/SR 55 at its intersection with CR 3. In a southeast direction, it would then cross the Allegheny Front and somewhat parallel Seneca Creek to approximately one mile west of the Mouth of Seneca near Fore Knobs. At this point, Scheme A would turn to the northeast, enter the Monongahela National Forest's Seneca Rocks Unit of the NRA, and bypass Mouth of Seneca on new location. Scheme A would then tie in to SR 55/28. It would closely follow the existing roadway and parallel the North Fork of the South Branch of the Potomac River through the NRA to its intersection with SR 42, just west of Petersburg. Along this route, Scheme A would be on new location to the west of Skidmore Mountain and from Cabins to SR 42. This portion of Scheme A would be in the valley between the Allegheny Front and North Fork Mountain.

At the intersection of SR 42 and SR 55/28, Scheme A would begin its northern bypass of Petersburg on new location and tie in to US 220/SR 55/28. At its intersection with CR 10, it would then follow the existing route to Fisher, where it would then be on new location, for a northern bypass of Moorefield. To the east of Moorefield, Scheme A would return to SR 55 and follow it on both new and existing location to I-81, its eastern terminus in Strasburg. Along this section, Scheme A would cross Short Mountain, pass through the George Washington National Forest, parallel the Cacapon/Lost River for approximately three miles, and then cross Great North Mountain and Little North Mountain.

2. SCHEME B

From its western terminus in Elkins eastward, Scheme B follows the same corridor of Scheme A to approximately one-half mile west of Wymer. Here, at the intersection of CR 10 and US 33/SR 55, Scheme B would diverge to the northeast. It would ascend and follow the crest of Middle Mountain, then descend the mountain and cross SR 45, the Dry Fork, and SR 35/15. Primarily on new location, Scheme B would ascend parallel to Big Run in an eastward direction, past the town of Red Creek, and then parallel CR 45 along the southern side of Canaan Valley State Park. Through the southernmost portion of the Park, Scheme B would parallel SR 32 and go through the saddle between Canaan Mountain and Cabin Mountain into the Canaan Valley.

Taking off to the northeast on new location, Scheme B would cross Cabin Mountain. On the eastern slope of Cabin Mountain, it would continue ascending the slope and pass northwest of the now defunct Stony River Reservoir. Ascending the Allegheny Front, it would then pass Mount Storm Lake to the west, and continue northeast to the intersection of SR 93 and SR 42. As it descends the Allegheny Front, Scheme B would turn to the southeast to a connection with SR 93. Here, Scheme B would follow SR 93 to the south until its intersection with SR 42 in Scherr. It would then turn to the southeast through Greenland Gap, along CR 3/3 on both new and existing location.

At the town of Falls, Scheme B would turn southeast and go through the ridge between Middle Fork and Patterson Creek before turning south along CR 5 in the Patterson Creek Valley. As it ascends Patterson Creek Mountain, Scheme B would turn east through a saddle divide in the mountain and begin its eastern descent in Toombs Hollow. Here, it would turn north, descend Patterson Creek Mountain and cross Walnut Bottom Run to its connection with Scheme A at SR 55. At this point, Scheme B would follow the same corridor as Scheme A to its eastern terminus at I-81 in Strasburg.

3. SCHEME C

The corridor of Scheme C is common with that of Schemes A and B from Elkins to approximately one-half mile west of Wymer. It is also common with the corridor of Scheme B from Wymer to the top of the Allegheny Front near the intersection of SR 93 and SR 42. At this point, Scheme C would diverge from Scheme B. Continuing northeast on new location, Scheme C would descend the Allegheny Front and then rejoin SR 93 in the New Creek Valley at the base of the eastern slope of the Allegheny Front.

Scheme C would cross New Creek Mountain and remain on SR 93 to its intersection with US 50 near Claysville. From this point to its eastern terminus at I-81 in Winchester, Scheme C would remain in close proximity to US 50. Through this section, Scheme C would cross Knobly Mountain, Patterson Creek and Patterson Mountain, Mill Creek Mountain, the South Branch of the Potomac River, South Branch Mountain, Short Mountain, North River Mountain, Cooper Mountain, Schaffenaker Mountain, and the Cacapon River. From Gore, Virginia to I-81, the existing roadway is already a divided, four-lane facility.

4. SCHEME D

From its western terminus in Elkins, Scheme D would follow US 33/250 east for approximately one mile. Scheme D would then head northeast, on new location to the intersection of US 219 and CR 11. From this point, Scheme D would follow US 219 to Porterwood. Along this route, Scheme D would cross Leading Creek and Shavers Fork. After crossing Shavers Fork, it would continue east, remaining south of Parsons, crossing the Black Fork River, and connecting to SR 72 near Hambleton. From this point, Scheme D would turn to the northeast, paralleling CR 219/4 and crossing Backbone Mountain, to its intersection with US 219. It would then follow US 219 north of its intersection with Forest Service (FS) road 18. Here, Scheme D would head east on new location. It would intersect SR 32, pass north of Davis and parallel SR 93. Crossing Beaver Creak, which it then parallels, the route would continue east across Cabin Mountain, over the Mount Storm Lake Dam, and begin to ascend the western slope of the Allegheny Front to the intersection of SR 93 and SR 42.

Continuing past Bismarck approximately one mile east of the intersection of SR 93 and SR 42, Scheme D would then join the proposed corridor of Scheme B. From this point to its eastern terminus at I-81 in Strasburg, Scheme D would follow the same corridor as would Scheme B.

5. SCHEME E

From its western terminus in Elkins to the vicinity of Bismarck, Scheme E would be the same as the corridor of Scheme D. In the vicinity of the intersection of SR 42 and SR 93, Scheme E would continue in a northeasterly direction, joining the proposed corridor of Scheme C. From this point to its eastern terminus at I-81 in Winchester, Scheme E follows the same corridor as Scheme C.

6. SUBSCHEMES

a. SubSchemes AE-1, AE-2, AE-3, and AD-1

These SubSchemes are alternate corridors under Scheme A. They serve to avoid or minimize Scheme A's involvement with the NRA. Overall, SubSchemes AE-1, AE-2, and AE-3 would completely avoid the Spruce Knob and Seneca Rocks Units of the NRA; SubSchemes AE-2 and AE-3 would involve the construction of a tunnel through the Allegheny Front; and SubScheme AD-1would serve as an option to minimize involvement with the Seneca Rocks Unit of the NRA.

SubScheme AE-1, almost completely on new location, would diverge from Scheme A in the vicinity of Alpena Gap to the northeast. Traversing the eastern slope of Shavers Mountain, it would follow a ridge midway between the summit of the mountain and Glady Fork. As it reaches the northern terminus of Shavers Mountain, SubScheme AE-1would turn to the east and descend into the Dry Fork Valley in the vicinity of Gladwin. Continuing eastward toward Red Creek, it would turn south and cross Red Creek near the existing SR 32 crossing of Red Creek. Here, it would resume its eastward route, climbing toward the Allegheny Front along the southern slope of the Red Creek Valley. Crossing the South Fork of Red Creek, SubScheme AE-1 would then cross the summit of the Allegheny Front. The SubScheme would then turn to the northeast to descend the Allegheny Front along its eastern slope.

Remaining behind the Fore Knobs for much of the descent, it would cross the steep streams draining the eastern slope near their headwaters, avoiding the deep ravines they form as they pass between the individual Fore Knobs. Continuing north, SubScheme AE-1 would follow the western slope of Jordan Run to its headwaters and then follow the western slope of Big Star Run. The SubScheme would then turn eastward to cross New Creek Mountain and Knobly Mountain through unnamed saddles. Here, SubScheme AE-1 would turn to the southeast through low, rolling terrain and would cross SR 42 and Lunice Creek to the point where it would rejoin Scheme A just north of Petersburg.

SubScheme AE-2 would diverge from SubScheme AE-1 in the vicinity of the western slope of Jordan Run. At this point, SubScheme AE-2 would turn eastward and cross CR 28/7 and Jordan Run. Shortening the distance of the complete NRA avoidance alignment (SubScheme AE-1), SubScheme AE-2 would pass through New Creek Mountain by means of a tunnel approximately 7,500 feet in length. Beyond the eastern portal, it would cross Powers Hollow and Knobly Mountain before descending to low, rolling terrain and rejoining Scheme A, approximately two miles west of Petersburg.

SubScheme AE-3 would serve as a means to shorten the route over the Allegheny Front. This SubScheme would have two options; one involving cutting through and the other involving tunneling through the Allegheny Front. The tunnel would be approximately 5,500 feet in length and, in addition to avoiding an open cut across the Front, would reduce the length of climb necessary to cross the Front.

Regardless of the SubScheme option, the general location would be the same. SubScheme AE-3, would diverge from SubScheme AE-1 at the base of the ascent along the western slope of the Allegheny Front and rejoin SubScheme AE-1 along the descent of the eastern slope of the Allegheny Front.

SubScheme AD-1 would serve to minimize Scheme A's involvement with the Seneca Rocks Unit of the NRA. On the eastern slope of the Allegheny Front, SubScheme AD-1 would diverge from SubScheme AE-1 in the vicinity of Big Run. From this point, SubScheme AE-1 would turn south, crossing Jordan Run and CR 28/7, to its connection with Scheme A near Smoke Hole Caverns.

b. <u>SubScheme HR</u>

SubScheme HR was developed to avoid Whites Run and Seneca Creek in the Spruce Knob Unit of the NRA. SubScheme HR diverges to the northeast of Scheme A at the intersection of SR 55 and CR 31. At this point, SubScheme HR would continue on SR 55 and then turn to the southeast, climbing the Tory Camp Run Valley. On new location, SubScheme HR would turn east along Tory Camp Run, through the saddle between Brierpatch Mountain and Job Knob. To the southeast, the route would descend parallel to and then cross Horsecamp Run and McIntosh Run before it would rejoin Scheme A at the intersection of US 33/SR 55 and CR 31.

c. <u>SubScheme KP</u>

SubScheme KP would serve as a short-cut for Scheme D or E between Kerens and Porterwood. This SubScheme would diverge from Scheme D or Scheme E at the intersection of US 219 and CR 7 in Kerens. In a northeasterly direction, SubScheme KP would cross Leading Creek and parallel Lazy Run through rough terrain. Crossing over Cheat Mountain it would then cross Shavers Fork and turn northeast, along the steep western slope of Fork Mountain. SubScheme KP would tie back in to Scheme D or E immediately after the crossing of Shavers Fork.

d. <u>SubScheme K</u>

SubScheme K would avoid the Canaan Valley area (a National Natural Landmark), as well as any involvement with Canaan Valley State Park. SubScheme K diverges from Scheme B or Scheme C just west of the town of Red Creek. Here, SubScheme K would turn north, cross Big Run, and ascend Canaan Mountain. It would then cross SR 72 and Mozark Mountain and parallel the northwest side of Forest Service (FS) road 13. The route would then cross the Blackwater River and tie in to Scheme D or Scheme E northeast of Davis.

e. <u>SubSchemes L and L2</u>

SubSchemes L and L2 would avoid Greenland Gap, a National Natural Landmark. South of Scherr, near the intersection of CR 1 and CR 42/3, these two SubSchemes diverge from Scheme B or D, turn south, and follow CR 42/3 to climb the ridge of New Creek Mountain. SubScheme L2 would turn back sharply to descend the mountain and rejoin Scheme B or D.

SubScheme L would continue southward, descending New Creek Mountain, crossing Knobly Mountain, and then join Scheme B or D near CR 5 in Forman.

E. BUILD ALTERNATIVE AND DESIGN LIMITATIONS

This SDEIS involves evaluating potential corridors for Appalachian Corridor H and determining, in light of the social, economic, engineering, and environmental constraints, which of the corridors best meets the purpose of and need for the project. At the initiation of this project in 1990, WVDOT and FHWA agreed that the original 1981 DEIS Schemes and SubSchemes and the SDEIS SubSchemes would be evaluated based on the level of engineering detail appropriate for a corridor-level study. As such, a 2,000-foot corridor width was established for each Scheme Option, within which sensitive resources would be inventoried.

Given the size of the study area, evaluating the potential impacts of each Scheme and SubScheme at a corridor-level serves many purposes. First, at this stage of study, it is not practical or fiscally responsible to prepare detailed design plans for over 380 miles of unique corridor. Second, a corridor-level study involves the identification of sensitive resources before design work has been prepared. At the next stage of study, roadway designers will be aware of these resources and will be able to incorporate avoidance or impact minimization measures into design plans. If design work is prepared before sensitive resources are identified, opportunities to avoid these areas tend to be preempted. Third, the intent of this study is to identify a corridor which best meets the needs of the project. Once a preferred corridor is selected, the next step would be to develop detailed alignments within the 2,000-foot wide corridor and to evaluate the potential impacts to the same level of detail in an alignment SDEIS. It is at this second stage of study that an actual roadway alignment would be developed.

F. DESIGN CRITERIA

Basic design criteria for the Appalachian Development Highway System are established within the framework of Section 201A-1 of the Appalachian Regional Commission Code. This section states that "the design of the development highway system shall be compatible with prevailing Federal-Aid highway standards, specifications, policies, and guides applicable to the projected type and volume of traffic". The recognized source for this information, as well as the basis upon which design criteria for Corridor H have been established, is the American Association of State Highway and Transportation Official's (AASHTO) *A Policy on Geometric Design of Highways and Streets* (1990).

Under the Build Alternative, any corridor would be constructed utilizing the same design criteria. The Build Alternative would consist of a four-lane, divided highway with partial control of access and a standard operating speed of 50 miles per hour. The maximum gradient would be 7 percent (in rugged terrain), the maximum degree of curvature would be 7°-30', and median width would be 40 feet. Access would be partially controlled, consisting of no more than two at-grade intersections per side per mile. The following provides the rationale for not incorporating grade-separated interchanges into the project design.

The American Association of State Highway and Transportation Officials (AASHTO) *Green Book* specifies that grade-separated interchanges are warranted only under specific conditions, none of which would be the case under the proposed Build Alternative.

- If the route is a designated freeway. (The proposed facility would be designated an expressway facility, not a freeway).

- If there is significant spot congestion or if intersection hazards could be eliminated. (Existing or potential areas were not identified within the study area during the traffic analysis.)

- If an interchange design is economically beneficial to an intersection. (This is not likely the case given the rugged, mountainous terrain of the area.)

- If the cost to a roadway user is significantly lowered by reducing delay. (This is more applicable to facilities which experience large volumes of traffic, unlike the proposed project.)

Table II-3 provides the minimum and desirable limits for key design elements under the proposed Build Alternative. Proposed typical roadway and structure sections are shown on Exhibit II-2. In general, the typical section would consist of two 24-foot directional roadways separated by a median 40 feet in width. Shoulder width on the inside would be approximately six feet and the outside shoulder would be 12 feet. Traffic volumes crossing any of the proposed alignments are not expected to warrant grade-separated intersections. The various typical sections shown on Exhibit II-2, are defined below:

TABLE II-3
DESIGN CRITERIA OF THE BUILD ALTERNATIVE

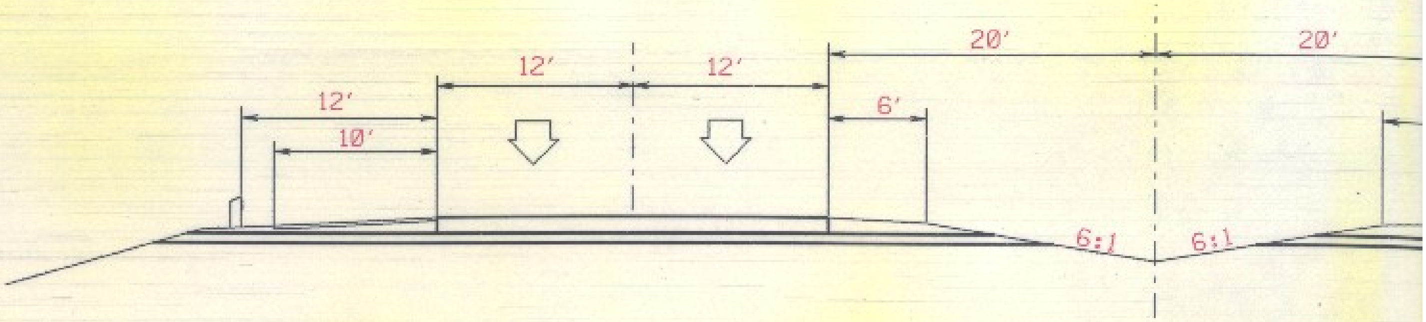
DESIGN ELEMENT	OPTIMAL	ACCEPTABLE
Operating Speed	50 - 55 mph	45 - 50 mph
Design Speed	70 mph	50 mph
Maximum Degree of Curvature	3 -00'	7 -30'
Minimum Stopping Sight Distance	625-850 ft.	400-475 ft.
Maximum Gradient (Rolling Terrain)	4%	5%
Maximum Gradient (Mountainous Terrain)	5%	7%
Control of Access	Full	Partial
Maximum Superelevation	0.08 ft/ft	0.08 ft/ft

Source: American Association of State Highway and Transportation Officials. "A Policy on Geometric Design of Highways and Streets". Washington, D.C., 1990.

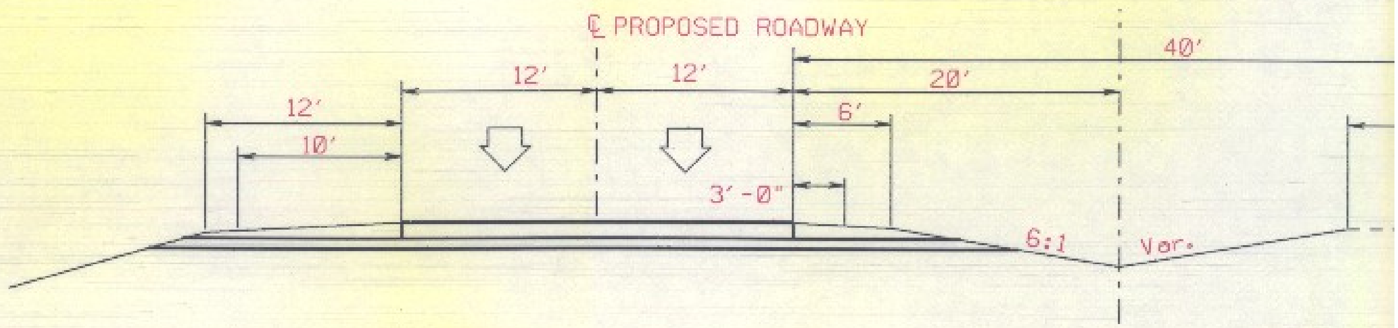
Where terrain and right of way expenditures are not excessive, "Optimal" standards for design criteria would be utilized. In certain locations, lesser standards could be utilized to accommodate otherwise excessive design costs, terrain extremes, or impacts. These "Acceptable" standards would not be lowered below a minimum design criteria.

West Virginia

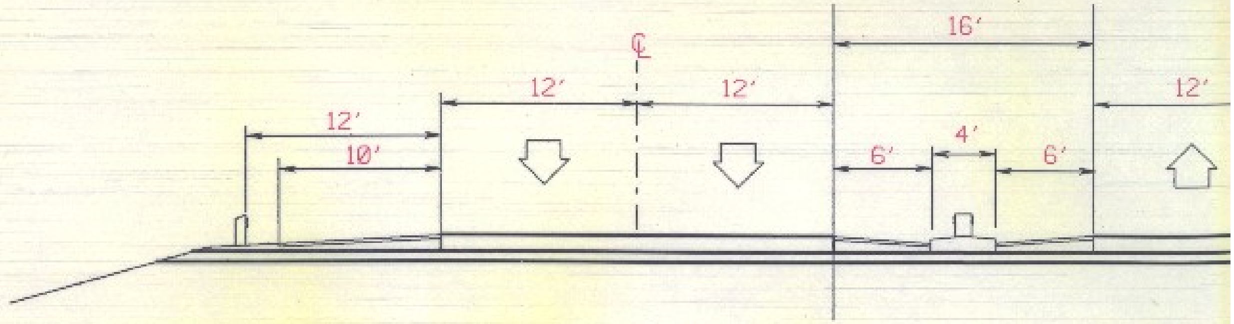
TYPICAL ROADWAY SE



NORMAL SECTION



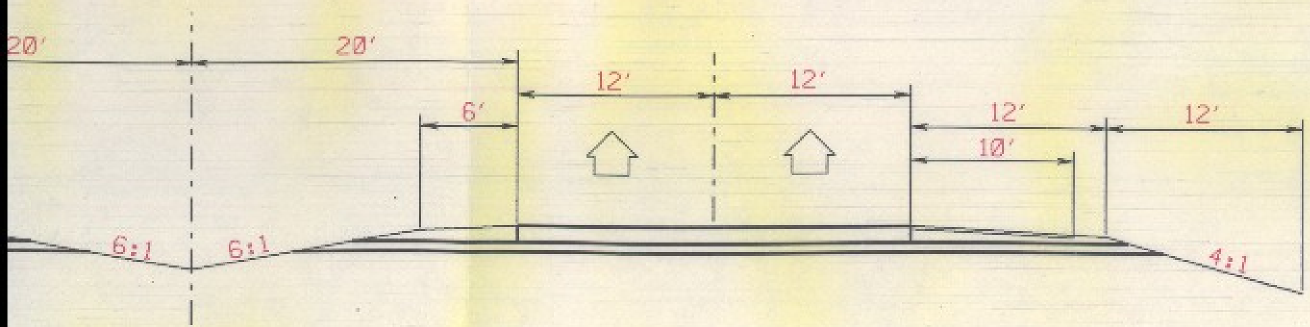
SALVAGE SECTION



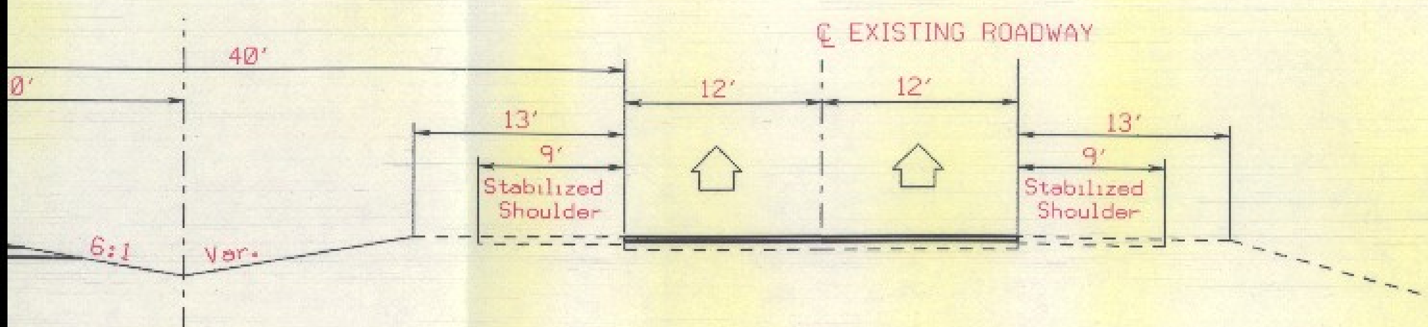
RESTRICTED SECTION

X56C.DGN 091092

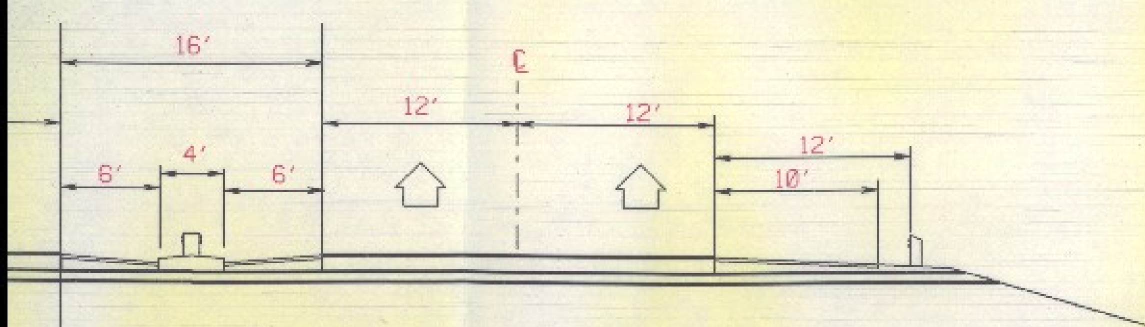
ROADWAY SECTIONS



ORMAL SECTION

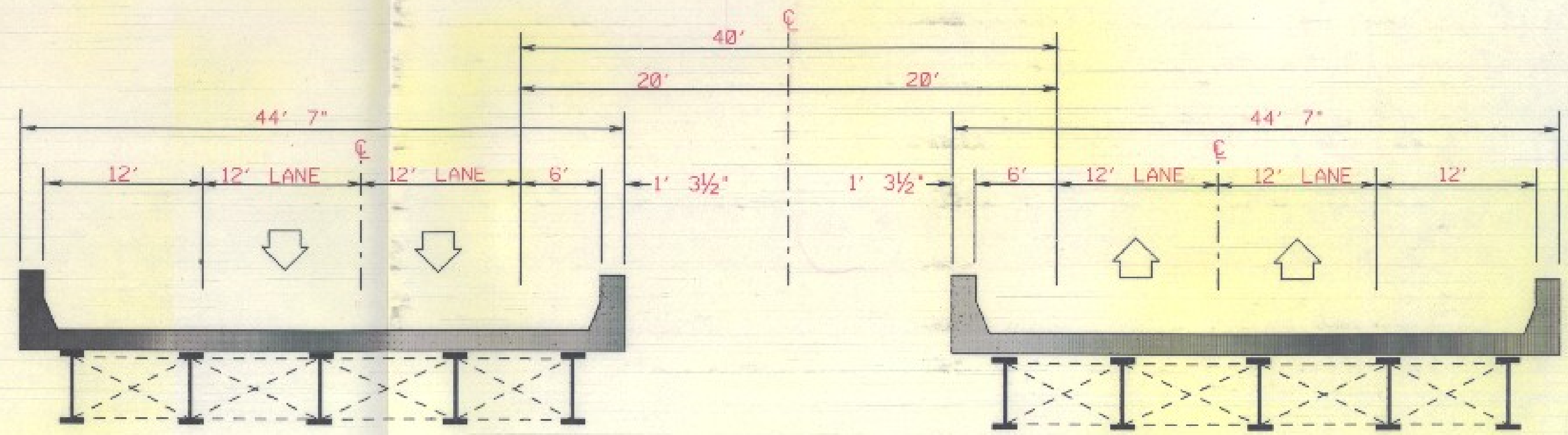


LVAGE SECTION



TRICTED SECTION

TYPICAL STRUCTURAL SECTIONS



NOTE: IN FINAL DESIGN, ALL ELEMENTS WILL BE IN ACCORDANCE WITH CURRENT POLICIES OF THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE GIRDER TYPE AND SUBSTRUCTURE TYPE SHOWN FOR ILLUSTRATION PURPOSES ONLY. SUPERSTRUCTURE AND SUBSTRUCTURE TYPE WILL BE DETERMINED DURING PRELIMINARY DESIGN.

Exhibit II - 2

PROPOSED TYPICAL SECTIONS

Not to Scale

- ***Normal Section:*** Typical section based on 4-lane facility on all new location.

- ***Salvage Section:*** Typical section based on 4-lane facility which incorporates existing (but upgraded) roadway.

- ***Restricted Section:*** Typical section based on 4-lane facility in an area where median width is constrained by topography or surrounding sensitive resources.

Structures would be required to bridge major streams and rivers. As with the proposed roadway typical section, the structure typical section would consist of a separate, 2-lane roadway for each direction of travel with an inside shoulder width of six feet and an outside shoulder width of 12 feet. A determination of bridge types and locations would be made during the final design stage of the project.

SubSchemes AE-2 and/or AE-3 (Scheme Options A1, A5, A6, and A7) would involve the construction of a tunnel through the Allegheny Front. An approximate tunnel length of 5,500 feet would reduce the amount of climbing necessary to cross the Allegheny Front and would reduce winter maintenance requirements common at higher elevations. In addition, a tunnel would not disturb the summit area of the Allegheny Front as would an open cut bisecting the summit ridge running from Dolly Sods in the north to the Spruce Knob Unit in the south.

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SECTION III:
Affected Environmental and the Environmental Consequences

SECTION III: AFFECTED ENVIRONMENT AND THE ENVIRONMENTAL CONSEQUENCES

This section combines the description of the affected environment with the discussion of the potential environmental consequences of the proposed project. The purpose of this format is twofold. First, it serves to eliminate the repetition of information which is common when these sections are separate. Second, in describing the existing conditions of each issue and immediately following with a discussion of the associated corridor involvements, a more comprehensive understanding of the environmental consequences can be obtained. The general format for this section includes a description of the impact assessment methodology, a description of the affected environment, a discussion of the corridor involvements, and a presentation of possible measures to avoid, minimize, or mitigate potential impacts that would result from implementation of the proposed project.

The purpose of this study is to provide an overall assessment of the proposed corridors and to identify design constraints in light of the engineering, social, economic, and natural environments. Following the selection of a preferred corridor, preliminary design of potential alignments will be initiated. This will include establishing various alignments within the 2,000 foot-wide preferred corridor. With design constraints identified prior to alignment design, the avoidance, minimization, or mitigation of resource impacts will be simplified.

Because detailed engineering data (such as right of way limits, location and type of structures, cut and fill estimates, roadway elevations, etc.) are not available, it is not appropriate to assess the potential environmental consequences with a great level of detail. Therefore, this initial, preliminary impact assessment examines the resources within the 2,000 foot-wide corridors and the extent to which these resources could be affected. Descriptions of the affected engineering, social, economic, and natural environments are general in nature, addressing the entire project area rather than providing separate descriptions of areas as they relate to each proposed Scheme Option combination. This inventory of sensitive resources within each corridor will facilitate the selection process by presenting the tradeoffs of corridors versus the consequences of construction.

A. TRAFFIC AND TRANSPORTATION

The Build Alternative would impact the study area mainly by serving the needs identified in Section I. These needs include increased roadway capacity, improved roadway safety, better system linkage, and more efficient intermodal relationships. A discussion of these impacts has been presented in Section II. In general, the traffic and transportation impacts were so similar among all Scheme Options that the impacts were compared at the Build Alternative/No-Build Alternative level. In analyses where there were differences between Scheme Options, the results were reported as such.

1. VOLUME AND CAPACITY COMPARISONS

As noted in Section I, both the existing Elkins to Winchester route and the Elkins to Strasburg route exhibit capacity deficiencies and substandard Levels of Service (LOS) for both existing (1990) and future (2010) No-Build conditions. Under the No-Build Alternative, the 1990 average daily traffic (ADT) volumes ranged from 1,600 to 8,800 vehicles along the existing Elkins to Winchester route. Based on these traffic volumes and the existing roadway conditions, over 57 percent of this route operates at LOS *D* or *E*. In the year 2010, ADT volumes are projected to range from 2,600 to 10,000 vehicles, indicating that 93 percent of the Elkins to Winchester route would operate at LOS *D*, *E*, or *F*.

Along the Elkins to Strasburg route, 1990 ADT volumes ranged from 1,500 to 6,000 vehicles with a LOS of *D* or *E* along 82 percent of the route. This route is projected to have ADT volumes ranging from 2,700 to 14,100 vehicles, indicating that 92 percent of the Elkins to Strasburg route would operate at LOS *D* or *E* in the design year 2010.

Traffic volumes for the corridors were developed using WVDOT's 20-year growth factors for each type of roadway in each West Virginia county. Since the study area includes a portion of Virginia, a 20-year growth factor was determined for Virginia roadways using traffic volumes predicted by the New York State Department of Transportation Rural Forecast Model. The 20-year growth factor represents a straight line growth rate: year 2000 traffic volumes were determined by adding half of the difference between the 2010 and the 1990 volumes to the 1990 volumes.

It was assumed that traffic volumes for the different SubSchemes would be relatively the same within each Scheme. Therefore, generalized volumes were determined only for Schemes A, B, C, D, and E. To represent through-traffic diverted to the Build Alternative from other routes in the area, 50 percent of the lowest link traffic volume on the existing routes in the year 2000 were assumed to be diverted to the Build Alternative. Each Scheme was adjusted for the appropriate diversion.

Capacity analyses were performed in accordance with the Transportation Research Board's *Highway Capacity Manual, 1985* for multi-lane, divided rural highways. The results of the capacity analyses yielded LOS determinations. According to the American Association of State Highway and Transportation Official's 1990 guidelines, a rural arterial highway should be designed for LOS *B*. The exception to this design standard is in mountainous terrain, in which case LOS *C* is acceptable.

A comparison of the anticipated 2010 ADT volumes and corresponding LOS for the No-Build and the Build Alternatives is illustrated on Exhibit III-1. The LOS shown for the Build Alternative would be well within the acceptable limit. Under the No-Build Alternative, the LOS would be below the acceptable limits, except along those sections that are already four-lane, divided facilities.

As presented on Table III-1, construction of any one of the corridors would also result in an improved LOS along the existing routes not reconstructed. For example, Schemes A, B, and C follow the existing roadway section from Elkins to Canfield. If the No-Build Alternative were selected and none of the Schemes constructed, a LOS of *F* would be expected on the roadway section from Elkins to Canfield. However, if Scheme D or E were constructed, the LOS would be expected to improve to LOS *E*, even though neither Scheme would utilize this section of roadway. This improvement would be due to the diversion of traffic from the existing (unimproved) facilities to the new, four-lane facility. However, due to prevalent steep grades, the majority of the roadway links would still experience a LOS below the desired limit, despite the reduced traffic volumes and reduced percentage of truck traffic.

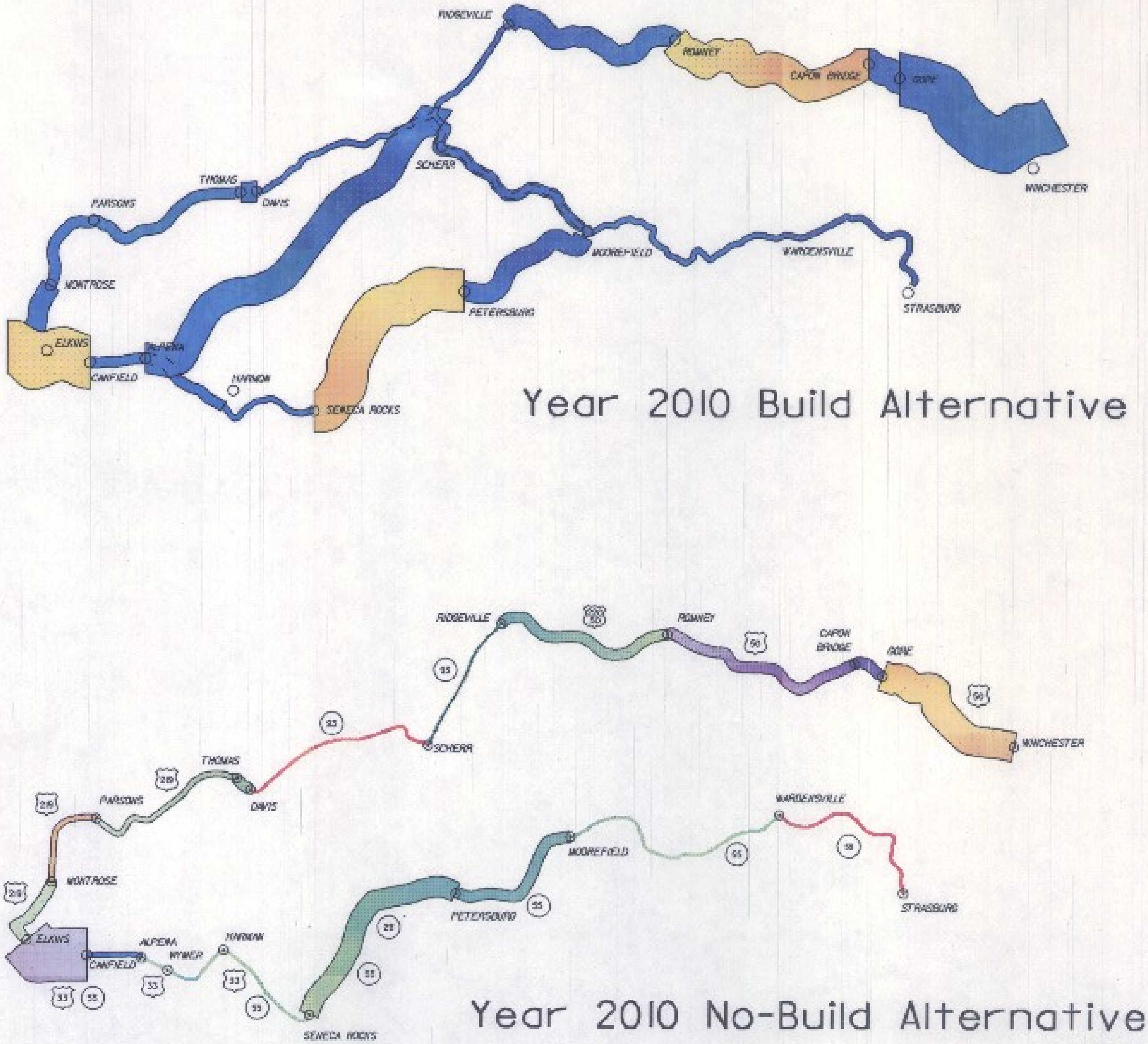
2. TRAVEL DISTANCE AND TRAVEL TIME

As presented on Table III-2, a comparison of travel distance and travel time of the No-Build Alternative and the Build Alternative with its various Scheme Options has been completed. For the No-Build Alternative, the existing travel time between Elkins and Winchester is 3.7 hours for a distance of 139 miles. Under the Build Alternative, the travel time and distance on this route would range from 2.5 to 2.6 hours over a distance of 124 to 130 miles. A northern corridor of the Build Alternative would result in a distance savings of 6 to 11 percent and a travel time savings of 29 to 32 percent.

The existing travel time between Elkins and Strasburg is 3.4 hours for a distance of 121 miles. Under the Build Alternative, the travel time and distance on this route would range from 2.2 to 2.5 hours over a distance of 109 to 123 miles. A southern corridor of the Build Alternative would result in a distance savings of -1.7 to 10 percent and a travel time savings of 27 to 36 percent.

CORRIDOR H

Elkins to I-81



Level of Service

A
B
C
D
E
F

Average Daily Traffic Volume

14-15 | 12-13 | 10-11 | 8-9 | 6-7 | 4-5 | Less than 4

(Thousands of Vehicles Per Day)

Exhibit III-1

BUILD vs. NO-BUILD ALTERNATIVE
Traffic Volumes and Levels of Service

0 15
Scale In Miles

TABLE III-1
EFFECTS OF THE NO-BUILD AND BUILD ALTERNATIVES ON SCHEMES NOT SELECTED AS THE PREFERRED CORRIDOR

FOR ROADWAY NOT PART OF SCHEME A OR B

ROADWAY SECTION	NO-BUILD CONDITION		BUILD CONDITION	
	ADT	LOS	ADT	LOS
Elkins to Montrose	6,600	E	5,800	E
To Parsons	4,600	D	3,600	D
To Thomas	5,000	E	3,800	D
To Davis	7,000	E	5,800	D
To Scherr	2,600	D	1,300	C
To Ridgeville	3,400	E	2,100	D
To Romney	6,800	E	6,100	E
To Capon Bridge	7,400	F	6,400	E
To VA State Line	7,200	F	6,000	E
To Winchester	10,000	B	8,900	A

FOR ROADWAY NOT PART OF SCHEME C

ROADWAY SECTION	NO-BUILD CONDITION		BUILD CONDITION	
	ADT	LOS	ADT	LOS
Elkins to Montrose	6,600	E	5,800	E
To Parsons	4,600	D	3,600	D
To Thomas	5,000	E	3,800	D
To Davis	7,000	E	5,800	D
To Scherr	2,600	D	1,300	C
Alpena to Harman	3,900	E	2,800	D
To Seneca Rocks	2,900	E	1,600	D
To Petersburg	9,500	E	8,500	E
To Moorefield	6,100	E	500	E
To Wardensville	2,700	E	1,400	C
To Strasburg	2,800	D	1,500	C

FOR ROADWAY NOT PART OF SCHEME D

ROADWAY SECTION	NO-BUILD CONDITION		BUILD CONDITION	
	ADT	LOS	ADT	LOS
Elkins to Canfield	13,700	F	12,100	E
To Alpena	5,300	A	4,100	A
To Harman	3,900	E	2,800	D
To Seneca Rocks	2,900	E	1,600	D
To Petersburg	9,500	E	8,500	E
To Moorefield	6,100	E	500	E
Scherr to Ridgeville	3,400	E	2,100	D
To Romney	6,800	E	6,100	E
To Capon Bridge	7,400	F	6,400	E
To VA State Line	7,200	F	6,000	E
To Winchester	10,000	B	8,900	A

FOR ROADWAY NOT PART OF SCHEME E

ROADWAY SECTION	NO-BUILD CONDITION		BUILD CONDITION	
	ADT	LOS	ADT	LOS
Elkins to Canfield	13,700	F	12,100	E
To Alpena	5,300	A	4,100	A
To Harman	3,900	E	2,800	D
To Seneca Rocks	2,900	E	1,600	D
To Petersburg	9,500	E	8,500	E
To Moorefield	6,100	E	500	E
To Wardensville	2,700	E	1,400	C
To Strasburg	2,800	D	1,500	C

TABLE III-2
DISTANCE AND TRAVEL TIME COMPARISON: NO-BUILD VS. BUILD ALTERNATIVE

ALTS.	ELKINS TO WINCHESTER ROUTE			ELKINS TO STRASBURG ROUTE		
	DISTANCE (Miles)	TRAVEL TIME (Hours)		DISTANCE (Miles)	TRAVEL TIME (Hours)	
		Autos	Trucks		Autos	Trucks
NO-BUILD	**139**	**3.65**	**5.23**	**121**	**3.44**	**5.02**
BUILD	**124 to 130**	**2.5 to 2.6**	**3.1 to 3.2**	**109 to 123**	**2.2 to 2.5**	**2.7 to 3.1**
Option A1	N/A	N/A	N/A	111	2.20	2.80
Option A2	N/A	N/A	N/A	118	2.40	2.90
Option A3	N/A	N/A	N/A	110	2.20	2.70
Option A4	N/A	N/A	N/A	110	2.20	2.80
Option A5	N/A	N/A	N/A	117	2.30	2.90
Option A6	N/A	N/A	N/A	109	2.20	2.70
Option A7	N/A	N/A	N/A	109	2.20	2.70
Option A8	N/A	N/A	N/A	110	2.20	2.70
Option B1	N/A	N/A	N/A	118	2.40	2.90
Option B2	N/A	N/A	N/A	120	2.40	3.00
Option B3	N/A	N/A	N/A	120	2.40	3.00
Option B4	N/A	N/A	N/A	120	2.40	3.00
Option B5	N/A	N/A	N/A	123	2.50	3.10
Option B6	N/A	N/A	N/A	122	2.40	3.00
Option C1	128	2.6	3.2	N/A	N/A	N/A
Option C2	130	2.6	3.2	N/A	N/A	N/A
Option D1	N/A	N/A	N/A	115	2.30	2.90
Option D2	N/A	N/A	N/A	117	2.30	2.90
Option D3	N/A	N/A	N/A	116	2.30	2.90
Option D4	N/A	N/A	N/A	114	2.30	2.80
Option D5	N/A	N/A	N/A	116	2.30	2.90
Option D6	N/A	N/A	N/A	115	2.30	2.90
Option E1	125	2.5	3.1	N/A	N/A	N/A
Option E2	124	2.5	3.1	N/A	N/A	N/A

Travel time savings to truck traffic would be even greater with a 39 to 41 percent savings along the northern corridor and a 38 to 46 percent savings along the southern corridor.

Regardless of the corridor, the Build Alternative would substantially reduce vehicle travel time and (excluding Scheme Options B5 and B6) would reduce travel distance. The travel speed of automobiles and trucks would increase with the reduction of vertical grades. The addition of a second lane in each direction along the Build Alternative would allow for safer passing of slower moving vehicles.

3. USER COSTS

The Build Alternative would reduce the cost of vehicle operation for the users of the proposed facility. The efficient performance of a vehicle is influenced by various factors including weather, vehicle type and condition, and roadway geometry. Roadway geometric features that effect the performance of a vehicle include vertical and horizontal curves. Travel speed consistency is not a geometric condition, but it is affected by the roadway's geometric features, including grade and intersection frequency.

The following tables were derived from user costs presented in *Vehicle Operating Costs, Fuel Consumption, and Pavement Type and Condition Factors*, prepared by Texas Research and Development Foundation for the Federal Highway Administration. These tables represent unit costs for geometric features representing the No-Build and the Build Alternative. There would be little, if any, variance in user costs among the Scheme Options. However, there would be a substantial user cost difference between the No-Build and Build Alternative. Therefore, for the user cost comparisons shown on the following tables, the Build Alternative represents all Scheme Options.

Table III-3 presents the cost of a vertical grade on various types of vehicles for running speeds and grades representing the No-Build Alternative and the Build Alternative. It is clear that the savings for larger trucks is substantial and while the passenger car savings does occur, it is not as dramatic.

Table III-4 presents the vehicle operating cost on horizontal curves for the No-Build and the Build Alternative. It can be noted that a savings due to more gentle curves is beneficial for passenger cars and single unit trucks, however semi tractor trailer trucks do not benefit from gentler horizontal

TABLE III-3
EXCESS USER COSTS FOR VERTICAL CURVES
($/1,000 miles)

VEHICLE CLASSIFICATION	NO-BUILD ALTERNATIVE SI=2.0 RS= 30MPH		BUILD ALTERNATIVE SI=4.5 RS = 50MPH	
	G= +8%	G= -8%	G= +5%	G= -5%
SMALL AUTO	$235	$250	$162	$108
MEDIUM AUTO	$299	$281	$213	$123
LARGE AUTO	$322	$289	$235	$141
PICK-UP	$302	$274	$244	$105
2-AXLE SU TRUCK	$707	$417	$514	$203
3-AXLE SU TRUCK	$1,355	$802	$961	$352
2-S2 SEMI TRUCK	$1,440	$744	$736	$213
3-S2 SEMI TRUCK	$1,992	$1,000	$1,037	$299

Vehicle operating costs, fuel consumption and pavement type and condition factors prepared by Texas Research and Development Foundation for SHWA, March 1982. All costs have been adjusted to 1990 $ using the Consumer Price Index average with 1982-1984 equal to zero.

SI = SERVICEABILITY INDEX
RS= RUNNING SPEED
G= GRADE

TABLE III-4
EXCESS USER COSTS FOR HORIZONAL CURVES
($/1,000 miles)

VEHICLE CLASSIFICATION	RUNNING SPEED	NO-BUILD CURVE = 5%	BUILD CURVE = 3%
SMALL AUTO	50 MPH	$14	$3
MEDIUM AUTO	50 MPH	$26	$5
LARGE AUTO	50 MPH	$31	$7
PICK-UP	50 MPH	$29	$7
2-AXLE SU TRUCK	45 MPH	$39	$3
3-AXLE SU TRUCK	45 MPH	$114	$8
2-S2 SEMI TRUCK	40 MPH	$14	$22
3-S2 SEMI TRUCK	40 MPH	$21	$34

Vehicle operating costs, fuel consumption and pavement type and condition factors prepared by Texas Research and Development Foundation for FHWA, March 1982.

All costs have been adjusted to 1990 $ using the Consumer Price Index with 1982-1984 equal to zero.

curves. Overall, the combination of less severe maximum grades and curves associated with the Build Alternative would result in substantial savings in operating costs for users of the proposed facility.

When a vehicle enters or exits the existing route it can interrupt the through traffic speed by forcing mainline vehicles to decelerate. With the No-Build Alternative, these interruptions are not restricted. For the Build Alternative, the number of intersections has been limited to two per mile. The Build Alternative will also be designed to separate traffic movement and to provide ample acceleration and deceleration lanes in order to separate the different speeds. Table III-5 presents the additional costs resulting from slowing a vehicle and then accelerating it to its original speed. A cycle is considered complete when a vehicle has regained its original speed.

4. SYSTEM LINKAGE COMPARISON

From a regional standpoint, all Scheme Options would complete the east/west expressway link between I-79 (Weston, WV) and I-81 (Strasburg or Winchester, VA). Since a continuing east/west link is not located at the intersection of US 50 and I-81, Schemes with a terminus in Winchester (Scheme C or E) would require a 6 to 14 mile north/south diversion in order to continue east/west travel. However, Schemes which would terminate in Strasburg (Schemes A, B, and D) would provide a direct, continuous, east/west expressway link with I-66. From a regional system linkage standpoint, Schemes which terminate in Strasburg would provide better east/west expressway access.

The ability of the Schemes to effectively address the local system linkage deficiencies varies. The year 2010 Build Alternative traffic volumes (Exhibit III-1) indicate local system linkage differences between the various Schemes. Under the various Schemes, higher traffic volumes are anticipated between the following roadway sections:

Scheme A: Elkins and Alpena, Seneca Rocks and Petersburg, Petersburg and Moorefield

Scheme B: Elkins and Alpena, Alpena and Scherr

Scheme C: Elkins and Alpena, Alpena and Scherr, Ridgeville and Romney, Romney and Capon Bridge, Capon Bridge and Gore, Gore and Winchester

Scheme D: Elkins and Montrose

TABLE III-5
EXCESS USER COSTS FOR TEMPORARY CHANGES IN SPEED
($/1,000 Cycles)

TEMPORARY CHANGE IN SPEED	VEHICLE TYPE	EXCESS USER COST
50 MPH to 30 MPH to 50 MPH	Small Automobile	$12
	Medium Automobile	$18
	Large Automobile	$22
	Pick-Up Truck	$20
45 MPH to 30 MPH to 45 MPH	2-Axle SU Truck	$69
	3-Axle SU Truck	$104
	2-S2 Semi Truck	$68
	3-S2 Semi Truck	$101

Vehicle operating costs, fuel consumption, pavement type, and condition factors prepared by Texas Research and Development Foundation for FHWA, March 1982.

All costs have been adjusted to the 1990 $ using the Consumer Price Index average with 1982-1984 equal to zero.

Scheme E: Elkins and Montrose, Ridgeville and Romney, Romney and Capon Bridge, Capon Bridge and Gore, Gore and Winchester

With the exception of the Elkins to Montrose and Seneca Rocks to Moorefield sections, the majority of roadway sections experiencing high traffic volumes in the year 2010 would be located within Scheme C.

B. DESIGN ELEMENTS AND COSTS

The Build Alternative would be developed in accordance with WVDOT's design standards and the American Association of State Highway and Transportation Officials (AASHTO) design standards. The major design criteria used for developing the Build Alternative is presented on Table II-3.

Cost estimates are based on the original construction costs documented in the *1978 Preliminary Engineering Report: Appalachian Corridor H - Elkins to I-81*, prepared by E.S. Preston Associates, Inc. for WVDOT. These costs have been adjusted to 1991 dollars.

Construction cost estimates for each Scheme Option are presented on Table III-6. These preliminary construction cost estimates are based on the design criteria established in Section II and do not include the cost of mitigation. As the table indicates, the estimated cost of any of the Scheme Options would range from $840 million (Scheme Option D3) to $1,649 million (Scheme Option A6). The two proposed tunnel crossings (SubSchemes AE-2 and AE-3) of the Allegheny Front and New Creek Mountain account for the expense of Scheme Option A6. Details of how the construction cost estimates were derived are documented in the *Traffic and Transportation Technical Report: Appalachian Corridor H - Elkins to I-81*, available from WVDOT.

The Build Alternative would be the most costly alternative, requiring funding for engineering and environmental impact studies, roadway and structure design, construction, mitigation measures, and maintenance. The No-Build Alternative would only require funding for necessary spot improvements and maintenance. The costs of such spot or planned improvements would be minor compared to the costs associated with the Build Alternative.

TABLE III-6
BUILD ALTERNATIVE CONSTRUCTION COSTS

SCHEME OPTION	SCHEME CONSTRUCTION COSTS ($ Millions)				
	A	B	C	D	E
1	$994	$1,015	$1,053	$907	$943
2	$1,533	$1,054	$1,084	$912	$944
3	$1,586	$1,052	N/A	$840	N/A
4	$1,523	$1,048	N/A	$913	N/A
5	$1,596	$1,087	N/A	$841	N/A
6	$1,649	$1,085	N/A	$908	N/A
7	$1,586	N/A	N/A	N/A	N/A
8	$1,007	N/A	N/A	N/A	N/A

Source: West Virginia Department of Transportation, Division of Highways. "Traffic and Transportation Technical Report - Appalachian Corridor H: Elkins to I-81." 1992.

N/A = Not Applicable

Based on the highway costs found in the 1978 Preliminary Engineering Study performed by E.S. Preston Associates, Inc. for the West Virginia Department of Highways. The costs were adjusted to 1991 dollars using the following assumptions:

- Escalation of 12% from 1978 to 1991
- 1991 Costs = 1987 Cost x 1.12
- 1991 Costs = 1975 Cost x 3.02
- Compare 1991 APD Cost to 1978 Preston Cost
  - Bowden to Petersburg: 210% Cost Escalation
  - Bowden to VA Line: 194% Cost Escalation
  - Average: 202% Cost Escalation

C. LAND USE

Corridor involvements with land uses have been determined by assessing the consistency of the proposed action with the various comprehensive development plans adopted for the area.

1. METHODOLOGY

The United States Geological Survey's (USGS) most current digital land use and land cover data were used to determine existing conditions within the study area. This information is based on the Anderson Level II Land Use and Land Cover Classification System. A Geographic Information System (GIS) computed and plotted the land use distributions and patterns within the corridor Scheme Options from this data. In addition, comprehensive development plans in effect within the project area have been reviewed to evaluate Scheme Option consistency. Conflicts between Scheme Options and specified land use plans, policies, and controls have also been identified.

2. EXISTING LAND USE PATTERNS

Table III-7 presents the acreage of land use and land cover located within the 2,000 foot-wide corridor Scheme Options. The categories for which acreages are provided are based on the categories provided under the Anderson Level II System. Exhibit III-2 shows the existing land use patterns within the corridor Scheme Options. The land use/land cover categories presented in Table III-7 have been combined to create the following categories:

- ***Urban or Built-Up Land:*** Consists of Anderson Level II categories of Residential, Commercial, Industrial, Transportation/Communication/Utilities, and Other Urban Land.

- ***Agricultural Land:*** Consists of Anderson Level II categories of Cropland/Pasture, Other Agricultural Land, and Rangeland.

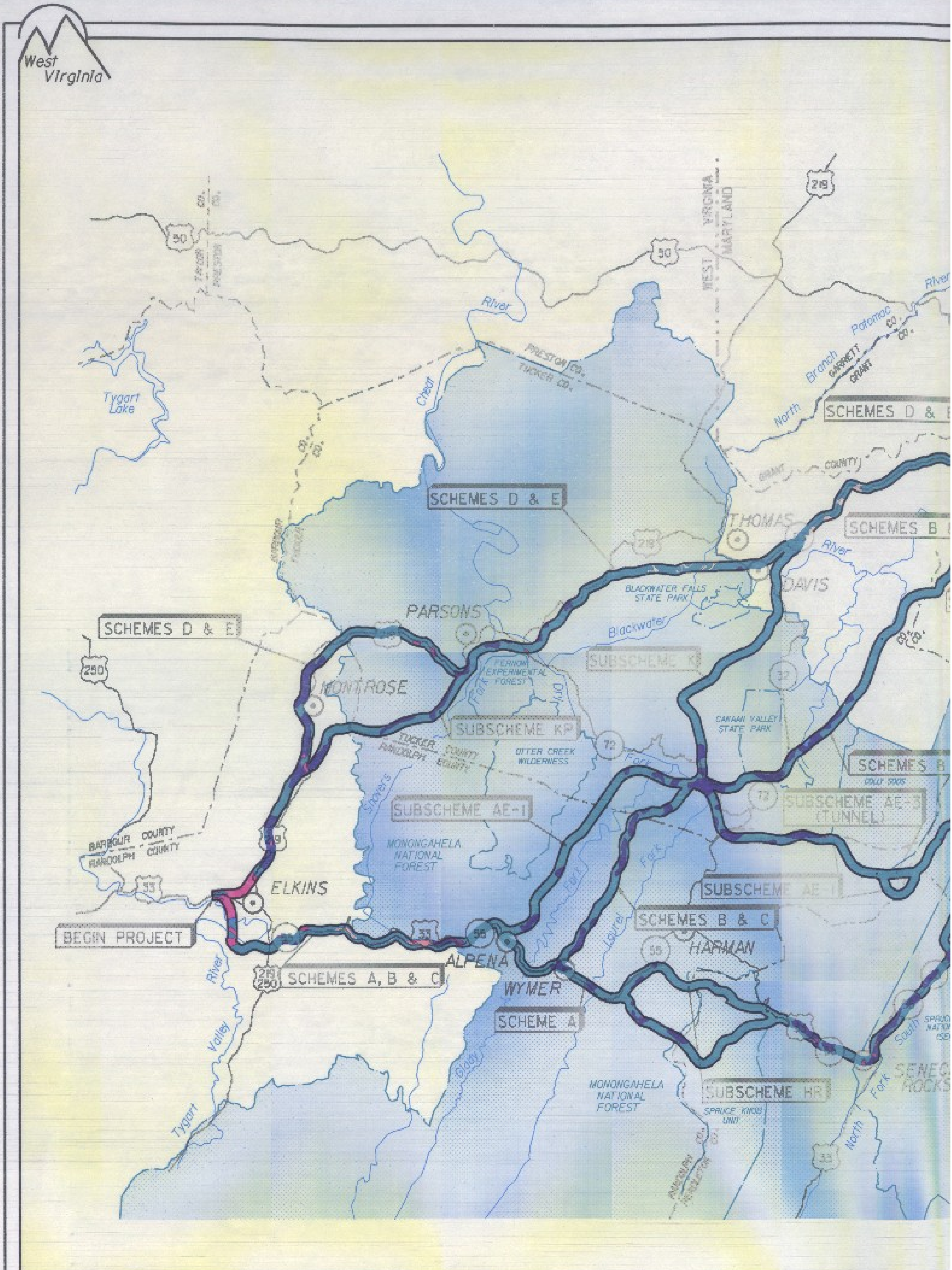
- ***Forested Land:*** Consists of Anderson Level II category of Forest Land.

- ***Water:*** Consists of Anderson Level II category of Water Resources.

- ***Wetlands:*** Consists of those resources identified as wetlands on the U.S. Fish and Wildlife Service's *National Wetlands Inventory*. Wetlands acreages within corridors are reported in Section III-L "Wetlands".

TABLE III-7
PERCENTAGE LAND USE AND LAND COVER BY SCHEME OPTION

LAND USE & LAND COVER (Anderson Level II)	TOTAL PROJECT AREA (Acres)	PERCENTAGE LAND USE AND LAND COVER BY SCHEME OPTION																							
		A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	C1	C2	D1	D2	D3	D4	D5	D6	E1	E2
Residential	8,347	1.90	0.82	0.97	1.62	0.83	0.99	1.64	1.87	0.75	0.74	0.77	0.74	0.72	0.76	1.69	1.66	1.24	1.22	1.26	1.01	1.05	1.03	2.17	2.00
Commercial	914	0.16	0.08	0.10	0.10	0.08	0.10	0.10	0.17	0.02	0.02	0.20	0.02	0.02	0.02	0.29	0.29	0.15	0.15	0.15	0.10	0.10	0.11	0.42	0.38
Industrial	1,620	0.13	0.13	0.14	0.14	0.13	0.14	0.14	0.14	0.36	0.35	0.36	0.40	0.39	0.39	0.09	0.13	0.34	0.33	0.33	0.34	0.34	0.35	0.07	0.07
Trans/Comm/Util.	821	0.22	0.21	0.23	0.23	0.21	0.23	0.23	0.23	0.09	0.09	0.14	0.09	0.09	0.09	0.09	0.09	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Other Urban Land	9,478	1.85	1.59	1.71	1.73	1.61	1.73	1.75	1.86	1.33	1.30	1.31	1.30	1.28	1.28	1.39	1.36	1.14	1.11	1.12	1.15	1.15	1.17	1.21	1.25
Cropland/Pasture	185,329	30.99	30.48	28.75	28.99	30.75	29.03	29.27	30.52	25.31	24.95	24.16	22.65	22.35	22.02	29.83	27.35	26.65	26.16	25.83	25.83	25.50	26.23	31.41	30.98
Other Agr. Land	560	0.13	0.12	0.13	0.13	0.12	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rangeland	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forest Land	459,528	63.30	65.35	66.65	65.74	65.04	66.33	65.42	63.78	69.67	70.13	70.34	72.42	72.82	73.09	64.15	66.75	68.79	69.28	69.55	69.77	70.05	69.27	63.14	63.42
Water Resources	1,680	0.20	0.18	0.20	0.20	0.18	0.20	0.20	0.20	0.50	0.49	0.48	0.29	0.28	0.29	0.54	0.35	0.12	0.11	0.11	0.12	0.12	0.12	0.19	0.19
Mines/Quarries/Pits	6,428	0.33	0.31	0.33	0.33	0.31	0.33	0.33	0.32	1.12	1.10	1.10	1.05	1.03	1.04	1.11	1.05	1.41	1.38	1.39	1.42	1.43	1.45	1.38	1.42
Other Barren Land	4,090	0.79	0.73	0.79	0.79	0.74	0.79	0.79	0.78	0.73	0.71	0.75	0.92	0.90	0.90	0.71	0.86	0.21	0.21	0.21	0.21	0.21	0.22	0.23	0.24
TOTAL	678,795	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100



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CORRIDOR H
ELKINS to I-81

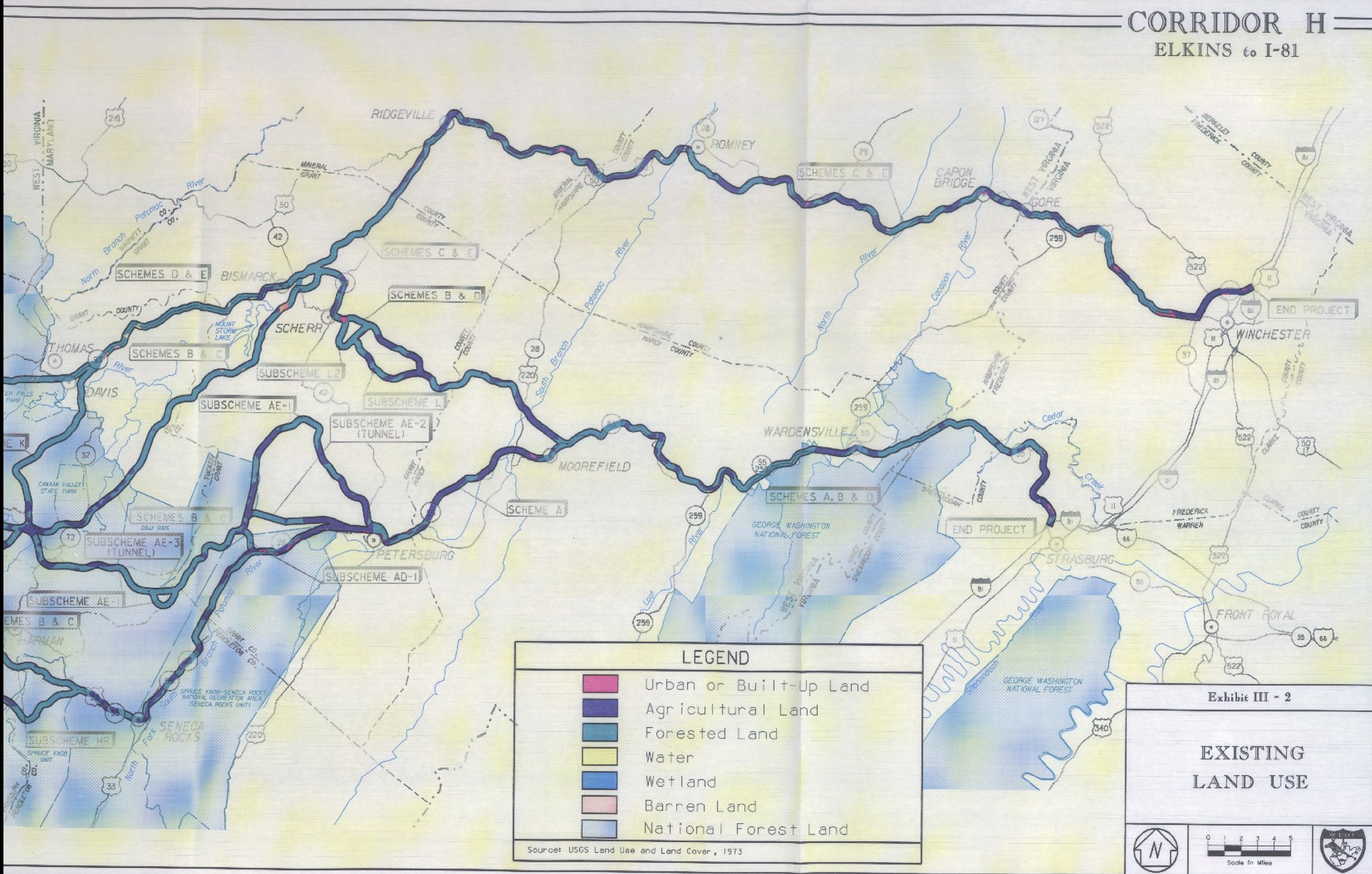

Exhibit III - 2

EXISTING LAND USE

- ***Barren Land:*** Consists of Anderson Level II categories of Mines/Quarries/Pits and Other Barren Land.

- ***National Forest Land:*** Consists of those forest resources identified by the U.S. Forest Service.

Collectively, the Scheme Options encompass roughly 678,795 acres, 70 percent of which is forested. This land use category includes portions of several recreational and natural areas (e.g. Monongahela and George Washington National Forests, Spruce Knob/Seneca Rocks National Recreation Area, Canaan Valley State Park, and Dolly Sods Wilderness). Cropland/pasture is the second most prominent land use, occupying just over 25 percent of the area. The remaining land use categories (residential, commercial, industrial, other types of urbanized land, and mining operations) comprise approximately five percent of the area.

3. POTENTIAL LAND USE INVOLVEMENTS

The various land use/land cover acreages involvements were based on an inventory of 2,000 foot-wide corridors. Actual acreage involvements would be substantially less since actual right-of-way limits for a specific alignment would range between 150 and 300 feet in width and, in some instances, would use existing roadway and right-of-way. The land use/land cover information provided at the corridor level provides a basis of comparison between all 2,000 foot-wide corridors, as well as an order of magnitude from which to make corridor-level comparisons. The existing land use/land cover which could potentially be affected by the project is also broken down by Scheme Option in Table III-7. As the table indicates:

- ***Residential*** Corridor involvement would range from a low of 0.72 percent (Scheme Option B5) to a high of 2.17 percent (Scheme Option E1).

- ***Commercial*** Corridor involvement would range from a low of 0.02 percent (Scheme Options B1 thru B6) to a high of 0.42 percent (Scheme Option E1).

- ***Industrial*** Corridor involvement would range from a low of 0.07 percent (Scheme Options E1 and E2) to a high of 0.40 percent (Scheme Option B4).

- ***Cropland/ Pasture*** Corridor involvement would range from a low of 22.02 percent (Scheme Option B6) to a high of 31.41 percent (Scheme Option E1).

- ***Forest*** Corridor involvement would range from a low of 63.14 percent (Scheme Option E1) to a high of 73.09 percent (Scheme Option B6). However, options under Schemes A, B, and C would have the greatest involvement with Monongahela National Forest lands. In addition, Scheme Options A1 and A8 would traverse both units of the Spruce Knob/Seneca Rocks National Recreation Area.

- ***Water*** Corridor involvement would range from a low of 0.11 percent (Scheme Options D2 and D3) to a high of 0.54 percent (Scheme Option C1).

- ***Mines/ Quarries*** Corridor involvement would range from a low of 0.31 percent (Scheme Option A2) to a high of 1.45 percent (Scheme Option D6). (Mineral resources are discussed in-depth in Section III-V, "Mineral Resources".)

Overall, Scheme Option E1 would have the greatest involvement with existing residential and commercial land uses and Scheme Option B4 would have the greatest corridor involvement with existing industrial land uses. Because these land uses typically generate the most demand for transportation access and facilities, Scheme Option involvement would be considered a positive component of the project.

4. POTENTIAL GROWTH AREAS

The growth potential of an area is likely the best available indicator to determine where development is most likely to occur along improved or new transportation facilities. It reflects an area's capacity to support and absorb increased economic activity. The growth potential of an area is dependent upon a variety of factors, the most important of which are Water Supply Capacity, Sewage Treatment Availability, Land Use Plans and Controls, Land Suitability, and Transportation Access. The following describes these factors for the study region, as well as the potential involvement of the Scheme Options.

a. Water and Sewage Service Capacities

A majority of the utility providers have excess service capacities to accommodate new development. Those systems having combined excess water supply and sewage treatment capacity are listed below. The Schemes which would most improve access to these areas are also identified below. Of the eleven areas identified as having excess water and sewer capacities, Options under Scheme:D would provide better access to eight, whereas Options under Schemes A, B, C, and E would provide better access to six of the eleven.

- ***The City of Elkins and the Town of Beverly, Randolph County:***
  - All Schemes would provide access to these two areas.

- ***The City of Parsons and the Town of Davis, Tucker County:***
  - Schemes D and E would provide the most direct access to Parsons and Davis.
  - Scheme Options B4, B5, B6, and C2 would improve access to Davis.

- ***The Town of Petersburg, Grant County:***
  - Scheme A would provide the most direct access to Petersburg.
  - Schemes B and D would improve access to Petersburg.

- ***The Town of Moorefield and the Town of Wardensville, Hardy County:***
  - Scheme A would provide the most direct access to Moorefield.
  - Schemes B and D would improve access to Moorefield.
  - Schemes A, B, and D would provide the most direct access to Wardensville

- ***The City of Romney, Hampshire County:***
  - Schemes C and E would provide the most direct access to Romney.

- ***The City of Keyser and the Fort Ashby PSD, Mineral County:***
  - Schemes C and E would provide the most direct access to Keyser and Fort Ashby.

- ***The City of Franklin, Pendleton County:***
  - Scheme A would improve access to Franklin.

b. Land Use Plans and Controls

The West Virginia portion of the project area is within State Planning Regions VII and VIII. The respective Planning and Development Councils for these regions have published *Overall Economic Development Plans* (OEDP) which outline goals and strategies to develop the region in an efficient and desirable manner. The OEDP's indicate that six areas within the project were accorded status as growth centers. These growth centers and the Schemes which would provide the best access are identified below. Of the seven areas identified as growth centers, Schemes B, C, D, and E would provide overall improved access to five of the seven areas, whereas Scheme A would provide improved access to three.

- ***The City of Keyser, Mineral County:***
    - Scheme C and E would provide the most direct access to Keyser.

- ***The Town of Moorefield, Hardy County:***
    - Scheme A would provide the most direct access to Moorefield.
    - Schemes B and D would improve access to Moorefield.

- ***The City of Petersburg, Grant County:***
    - Scheme A would provide the most direct access to Petersburg.
    - Schemes B and D would improve access to Petersburg.

- ***The City of Romney, Hampshire County:***
    - Schemes C and E would provide the most direct access to Romney.

- ***The City of Elkins, Randolph County:***
    - All Schemes would provide direct access to Elkins.

- ***The Canaan Valley/Town of Davis area, Tucker County:***
    - Schemes D and E would provide the most direct access to Davis.
    - Scheme Options B4, B5, B6, and C2 would improve access to Davis.
    - Schemes B and C would provide the most direct access to Canaan Valley.
    - Schemes D and E would improve access to Canaan Valley.

c. **Land Suitability**

Both the Region VII and Region VIII OEDP's indicate that the rugged terrain of the study region has been a major impediment to economic growth. As a result, the project area as a whole suffers from a shortage of readily developable space from an industrial standpoint. Those areas most conducive to industrial development are likely to be located within or in proximity to the service boundaries of existing regional water and sewerage utility providers (Region VII Planning and Development Council, 1990; and Region VIII Planning and Development Council, 1990). As noted above, Scheme D would provide the most direct access to areas with excess water and sewer capacities and the areas identified as growth centers.

While industrial development typically requires level land, this is not necessarily the case for recreation and tourism development. Rough mountainous terrain can be "developed" for the outdoor recreation and tourism market, as has been the case in the study area. In addition, such areas are attractive for second home/vacation cabin development. All Schemes would provide improved access to the area's vast potential recreation and tourism-related developable lands.

d. Transportation Access

Primary east/west transportation access within and through the project area is deficient (Section I). These deficiencies have precluded safe and efficient access. All Schemes would improve east/west access within the study area. However, Schemes A, B, and D would provide better regional and national east/west access because of their direct connection to I-66 in Strasburg.

5. CONSISTENCY WITH COMPREHENSIVE DEVELOPMENT PLANS

The West Virginia Region VII and Region VIII Planning and Development Councils, the U.S. Forest Service, the County Commission of Grant County, the Frederick County Department of Planning and Development, and the Shenandoah County Planning Commission have adopted comprehensive development plans for their respective portions of the project area. Table III-8 provides an overview of these plans. Corridor H is specifically identified as a transportation element in the comprehensive development plans of Region VII and Region VIII Planning and Development Councils, and the economic development plans of Grant, Hampshire, and Frederick Counties. Because Corridor H has been identified in these various plans, it can be inferred that project implementation within the plan-approved areas would be consistent with their comprehensive development plans.

Several of the larger incorporated municipalities, including the Canaan Valley area, have enacted zoning ordinances to regulate population densities, infrastructure requirements, building codes, and development patterns. With the exception of Canaan Valley's ordinance prohibiting industrial development and manufacturing, these municipal zoning ordinances would not likely directly affect Corridor H (Friddle, 1991). As a part of the APD System, Corridor H would not likely be compatible with the Canaan Valley ordinance.

As presented in Table III-9, Scheme Options were evaluated in light of the provisions of 18 specified plans. This consists of nine adopted comprehensive development plans. Within the Monongahela National Forest's (MNF) plan are ten MNF Management Prescriptions in which the Scheme Options were evaluated for consistency with MNF's management objectives.

- All Schemes would be consistent with the comprehensive plans of Regions VII and VIII, as well as Grant, Hampshire, and Frederick Counties.

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TABLE III-8
COMPREHENSIVE DEVELOPMENT PLANS

PLANNING AUTHORITY	PLANNING TOOL	DEVELOPMENT PLANS IN RELATION TO CORRIDOR H
WV Region VII Planning and Development Council	1991 - 1993 Region VII Development Plan (Adopted 1990)	• Seven county region, including Tucker and Randolph. Sets forth policies and objectives for orderly development and identifies capital improvement programs and needs. • Corridor H is identified as a program element in plan.
WV Region VIII Planning and Development Council	1990 Overall Economic Development Plan Update (Adopted 1990)	• Covers Grant, Hampshire, Hardy, Mineral, and Pendleton Counties. Similar to Region VII in format and content. • Corridor H is identified as a program element in plan.
U.S.D.A., Forest Service - Monongahela National Forest	Monongahela National Forest Land and Resource Management Plan (Adopted 1986)	• Plan guides the natural resource management activities within the forest to attain multiple uses along with other goals and objectives • Plan divides forest into zones or Management Prescription (MP) areas to promote or restrict resource usage. • MP 1.1: Emphasizes mineral resource development. • MP 2: Emphasizes shade-tolerant hardwoods, uneven-aged silverculture, continuous forested scene, wildlife associated with shade-tolerant vegetation, motorized recreation. • MP 3: Emphasizes large, high-quality hardwoods, intolerant hardwoods, visual variety, motorized recreation. • MP 4: Emphasizes softwoods, wildlife associated with conifers, visual variety, motorized recreation. • MP 5: Emphasizes management of Congressionally designated wilderness. • MP 6.1: Emphasizes remote wildlife habitat, wildlife intolerant of disturbance, mix of forest products. • MP 6.2: Emphasizes semi-primitive, non-motorized recreation, no timber management, no road construction. • MP 7: Emphasizes high-density recreation. • MP 8: Emphasizes preservation of unique ecosystems, areas of national significance, research areas. • MP 9: Emphasizes minimum management, protection of environmental values and health and safety of public.
U.S.D.A., Forest Service - George Washington National Forest	George Washington National Forest Land and Resource Management Plan (Preliminary - 1992)	• Plan provides management program similar in scope to Monongahela National Forest Plan. • While management areas are defined, Scheme Options do not traverse any of the specially designated areas.
Lazar Management Group for the County Commission of Grant County	1991 Economic Adjustment Strategy for Grant County (Adopted 1991)	• Plan assesses the economic problems and potential of Grant County and presents strategy to respond to economic needs. • Corridor H is identified as a planning element in this plan.
Region VIII Planning and Development Council	1990 Economic Adjustment Strategy for Hampshire County (Adopted 1990)	• Plan enumerates County's economic strengths and weaknesses and discusses methods of stimulating economic activity. • Corridor H is identified as a planning element.
Frederick County Department of Planning and Development	Frederick County 1990 Comprehensive Plan (Adopted 1990)	• Similar to an OEPD in format and content. • Plan designates Corridor H as a planned transportation improvement.
Shenandoah County Planning Commission	Shenandoah County Comprehensive Plan: 2010 (Adopted 1991)	• Plan does not refer to Corridor H.

* Comprehensive Development Plans for Tucker and Hampshire Counties are in the process of being completed.

* Several larger incorporaterd municipalities, including Canaan Valley, have enacted zoning ordinances. With the exception of Canaan Valley, these zoning ordinances would not directly effect Corridor H.

TABLE III-9
SCHEME OPTION CONSISTENCY WITH ENACTED COMPREHENSIVE DEVELOPMENT PLANS

SCHEME OPTION	REGION VII OEDP	REGION VIII OEDP	MONONGAHELA NATIONAL FOREST PLAN Management Prescription Area										G.W. N.F. PLAN	GRANT COUNTY STRATEGY	HAMPSHIRE COUNTY STRATEGY	CANAAN VALLEY ZONING	FREDERICK COUNTY PLAN	SHENANDOAH COUNTY PLAN
			1.1	2	3	4	5	6.1	6.2	7	8	9						
A1 and A8	👍	👍	N	N	👍	N	👎	👎	👎	👍	👎	👍	👍	👍	👍	N	👍	👎
A2 thru A7	👍	👍	N	N	👍	N	👎	👎	👎	👍	👎	👍	👍	👍	👍	N	👍	👎
B1 thru B3	👍	👍	N	N	👍	N	N	👎	N	👍	N	👍	👍	👍	👍	👎	👍	N
B4 thru B6	👍	👍	N	N	👍	N	N	👎	👎	👍	N	👍	👍	👍	👍	N	👍	N
C1	👍	👍	N	N	👍	N	N	👎	👎	👍	N	👍	N	👍	👍	👎	👍	N
C2	👍	👍	N	N	👍	N	N	👎	👎	👍	N	👍	N	👍	👍	N	👍	N
D1 thru D6	👍	👍	N	👍	👍	N	N	👎	N	👍	👎	👍	👍	👍	👍	N	👍	N
E1 and E2	👍	👍	N	👍	👍	N	N	👎	N	👍	👎	👍	N	👍	👍	N	👍	N

Source:
U.S. Department of Agriculture, Forest Service, 1986a
U.S. Department of Agriculture, Forest Service, 1986b
Region VII Planning & Development Council, 1990
Region VIII Planning & Development Council, 1990
Lazar Management Group, 1991
Region VIII Planning & Development Council et al., 1990
Frederick County Department of Planning and Development, 1990
Shenandoah County Planning Commission, 1991

LEGEND
👍 - Consistent with plan
👎 - Conflict with plan
N - Not Applicable

- Options under Scheme D would be consistent with the greatest number of plans (10), whereas Options under Scheme C would be consistent with the least (8).

- Options under Schemes B, D, and E, as well as Scheme Option C2 would be inconsistent with the least number of plans (2), whereas Options under Scheme A would be inconsistent with the greatest number (5).

- Scheme Options A1 through A8, B4 through B6, and C2 would pose the greatest potential for conflict with the MNF plan, traversing several zones assigned Management Prescriptions of 6.1 (remote wildlife habitat and wildlife intolerant of disturbance) and 6.2 (semi-primitive, non-motorized recreation). In addition, Scheme Options A2 through A7 would conflict with areas designated as Management Prescription areas 5 (Congressionally designated wilderness) and 8 (unique ecosystems, areas of national significance, and research areas). Development of a four-lane, divided highway through zones with either of these Management Prescriptions may inhibit the intended use of these areas.

- Scheme Options B1 through B3, and C1 may also indirectly conflict with the goals of the Canaan Valley Zoning Ordinance.

- Scheme Options D1 through D6, E1, and E2 exhibit the highest compatibility potential. These options are consistent with all county and community plans. Conflicts with the Monongahela National Forest Plan would be limited to encroachments which occur on the outer fringes of zones having Management Prescription of 6.1 and 6.2. The degree of conflict may, however, be less for Scheme Options D1 through D3, and E1, as only a single encroachment would occur along an existing highway corridor (US 219) bordering such a zone.

- The No-Build Alternative would conflict with almost all adopted regional and county comprehensive plans. With the exception of Shenandoah County, the various local and regional economic development plans have been based, in part, on the assumption that Corridor H would be constructed. The No-Build Alternative would not be consistent with these plans in that failure to construct Corridor H would eliminate an essential factor used in developing the various economic development plans.

- The No-Build Alternative would be consistent with those Management Prescriptions which encourage semi-primitive recreation, protect Congressionally designated wilderness, and discourage the use of motorized vehicles and/or habitat disturbance.

6. POTENTIAL MITIGATION MEASURES

Complete avoidance of those zones in the Monongahela National Forest having Management Prescriptions of 5, 6.1, 6.2, and 8 would serve as the first line of mitigation. Scheme Options readily conducive to such a measure may be limited to D1 through D3, and E1. Alignments could possibly be positioned within the corridor Scheme Options to further minimize involvement or potentially avoid the zone bordering US 219. Such a determination will be made when a preferred corridor is selected and preliminary alignments and intersection locations are studied.

If, during the study of the preferred corridor, it is determined that an involvement is unavoidable, selective design measures and other mitigative options would be extensively examined and pursued with the appropriate resource agencies.

D. FARMLANDS

In accordance with the Farmland Protection Policy Act (FPPA) of 1984, the potential project-related farmland involvements has been assessed. Coordination with the U.S. Department of Agriculture - Soil Conservation Service's (SCS) district offices has been initiated in an effort to complete the required Farmland Conversion Impact Rating Form (Form AD-1006).

Typically, this process is not initiated during a corridor-level study since Form AD-1006 can only be completed when right-of-way requirements have been defined. However, a modified farmlands involvement assessment has been undertaken in consultation with the various SCS District Conservationists. The purpose of the modified farmlands evaluation is to ensure that potential involvements with farmlands have been taken into consideration during the corridor selection process.

1. METHODOLOGY

In accordance with the FPPA, the criteria for determining prime, unique, and statewide important farmlands are based on soil type and slope, regardless of whether or not the land in question is used for agricultural purposes. Within each state, District Conservationists are responsible for determining which soils should be classified as prime, unique, and statewide important and, therefore, are afforded protection under the Farmland Protection Policy Act. In general, the steep terrain of the area reduces the occurrence of prime, unique, and statewide important farmland soil types which must be within suitable slope limits to be determined as such.

In February of 1991, coordination was initiated with the West Virginia SCS District Offices for Area 3 (Randolph, Tucker, and Upshur Counties) and Area 4 (Grant, Hampshire, Hardy, Mineral, Morgan, and Pendleton Counties), as well as the Virginia SCS District Office responsible for Frederick and Shenandoah Counties. Requests for appropriate SCS *Soil Surveys* and county-wide listings of prime, unique, and statewide important soils were made to the District Conservationists in these offices. In West Virginia, the District Conservationists concurred that their statewide soil classification "locally important" is essentially the same as the nationwide soil classification "statewide important".

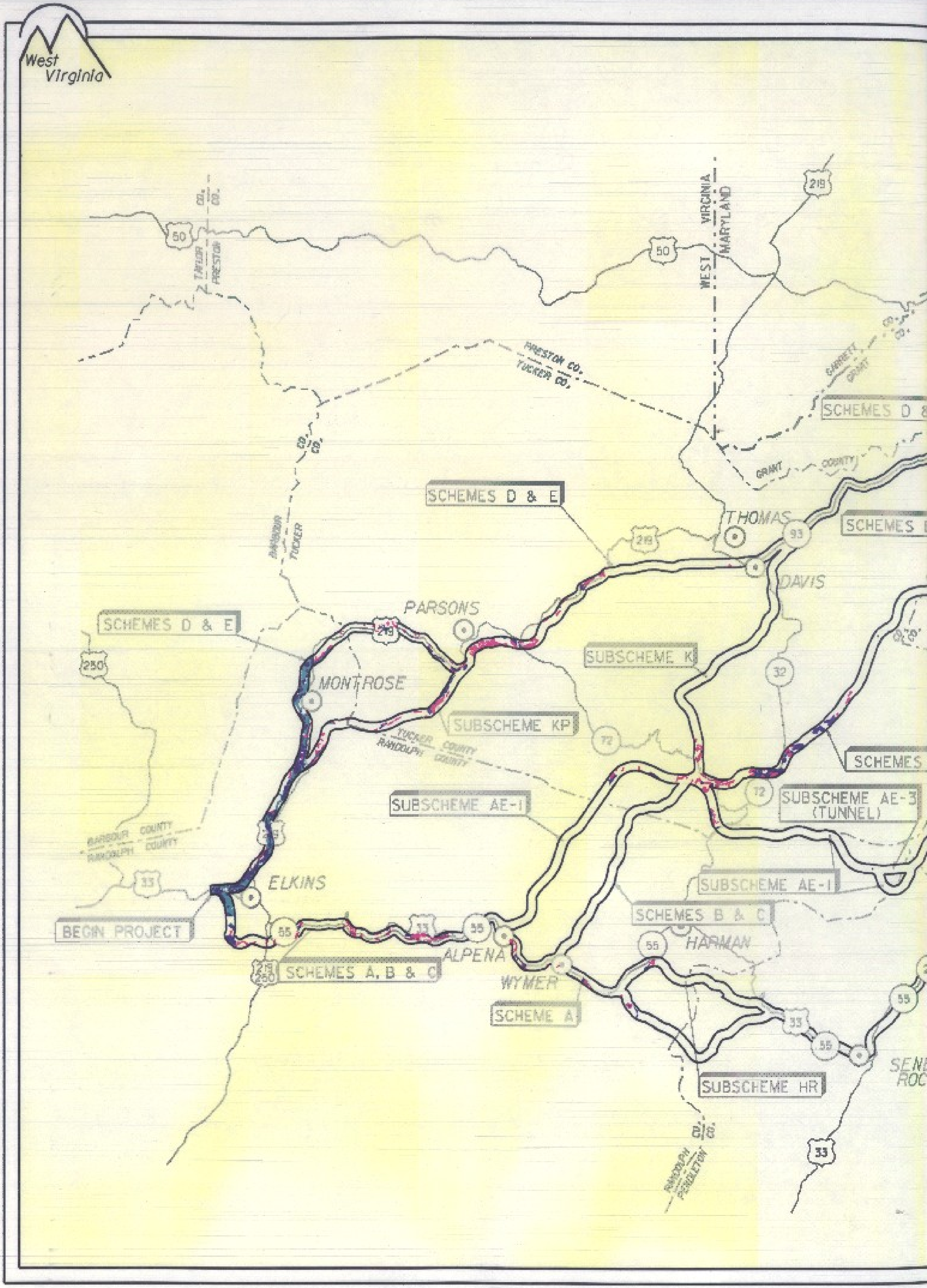
Once the prime, unique, statewide important, and locally important soils were identified on the various *Soil Surveys* mapping, they were electronically copied onto the project base mapping. The total area of each soil type (prime, unique, statewide, and locally important) within the corridor Scheme Options was then electronically calculated. The acreage results were submitted to each District Conservationist for review and comment. Given the size of the study area and the lack of right-of-way limits necessary to complete Form AD 1006, the District Conservationists are waiting until a preferred corridor is selected and right-of-way limits established before commenting on the extent of the project-related impacts. While the SCS has not commented officially via Form AD 1006, it is still possible to present the overall farmland involvements within each Scheme Option. (Documentation of coordination with the SCS is included in the Appendix.)

2. POTENTIAL INVOLVEMENTS

The farmland assessment indicates there are no farmland soils classified as unique within the study area. Exhibit III-3 shows the distribution of farmland soil types within each corridor. Table III-10 lists the acreage of farmland involvements for the soil types by Scheme Option.

- Relative to the total corridor area, options under Scheme E would have the least farmland involvement (between 14 and 15 percent) and options under Scheme D would have the most (between 18 and 20 percent).

- Regardless of the Scheme Option, there would be more prime farmland involvements (8 to 11 percent of each Scheme Option's total corridor area) than statewide important (3 to 6 percent) and locally important (1 to 3 percent) farmlands combined.



West Virginia
TAYLOR CO.
PRESTON CO.
50
WEST VIRGINIA
MARYLAND
219
PRESTON CO.
TUCKER CO.
GARRETT CO.
GRANT CO.
SCHEMES D &
GRANT COUNTY
BARBOUR CO.
TUCKER CO.
SCHEMES D & E
THOMAS
93
SCHEMES
DAVIS
SCHEMES D & E
PARSONS
250
219
MONTROSE
SUBSCHEME K
32
SUBSCHEME KP
72
TUCKER COUNTY
RANDOLPH COUNTY
SCHEMES
SUBSCHEME AE-1
SUBSCHEME AE-3
(TUNNEL)
BARBOUR COUNTY
RANDOLPH COUNTY
33
ELKINS
SUBSCHEME AE-1
BEGIN PROJECT
55
SCHEMES B & C
HARMAN
ALPENA
219
250
SCHEMES A, B & C
WYMER
SCHEME A
SUBSCHEME HR
RANDOLPH
PENDLETON

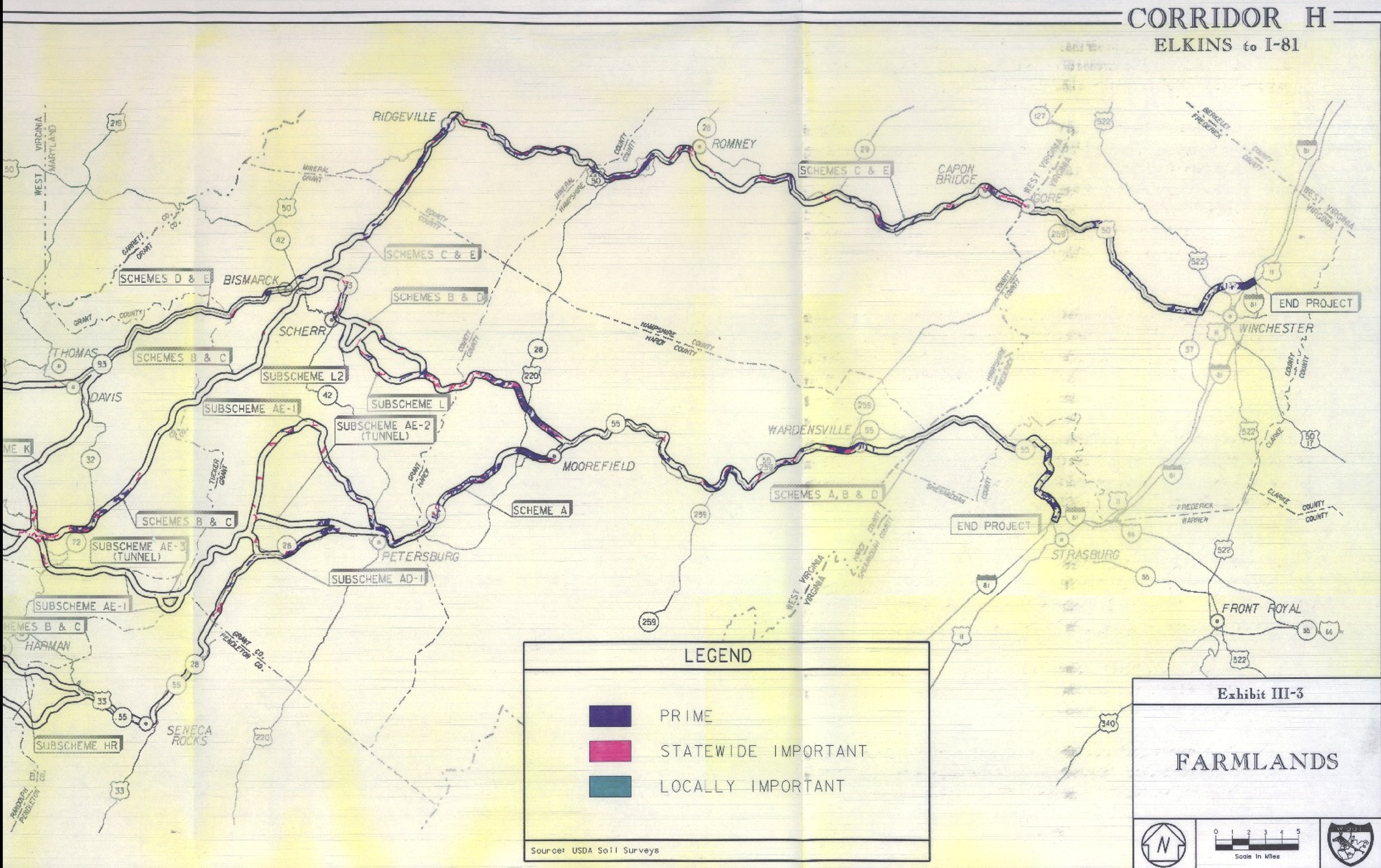


Exhibit III-3

FARMLANDS

TABLE III-10
FARMLAND INVOLVEMENT BY SCHEME OPTION

SCHEME OPTION	PRIME		STATEWIDE IMPORTANT		LOCALLY IMPORTANT		TOTAL AREA WITHIN SCHEME OPTION	SUM OF FARMLAND INVOLVEMENT	
	Acres	%	Acres	%	Acres	%	Acres	Acres	%
A1	2,793	10%	1,024	4%	257	1%	26,793	4,074	15%
A2	2,721	10%	1,146	4%	234	1%	28,555	4,101	15%
A3	2,559	10%	975	4%	234	1%	26,550	3,768	15%
A4	2,783	10%	1,008	4%	234	1%	26,669	4,025	15%
A5	2,721	10%	1,146	4%	234	1%	28,305	4,101	15%
A6	2,559	10%	975	4%	234	1%	26,299	3,768	15%
A7	2,784	11%	1,008	4%	234	1%	26,419	4,026	16%
A8	2,790	10%	1,015	4%	257	1%	26,648	4,062	15%
B1	2,593	9%	1,628	6%	255	1%	28,582	4,476	16%
B2	2,608	9%	1,628	6%	255	1%	29,124	4,491	16%
B3	2,633	9%	1,643	6%	255	1%	28,972	4,531	16%
B4	2,340	8%	1,414	5%	255	1%	29,155	4,009	14%
B5	2,356	8%	1,414	5%	255	1%	29,697	4,025	14%
B6	2,380	8%	1,429	5%	255	1%	29,546	4,064	14%
C1	3,120	10%	1,561	5%	255	1%	31,059	4,936	16%
C2	2,864	9%	1,348	4%	255	1%	31,619	4,467	14%
D1	3,095	11%	1,639	6%	919	3%	27,790	5,653	20%
D2	3,111	11%	1,638	6%	919	3%	28,331	5,668	20%
D3	3,135	11%	1,654	6%	919	3%	28,180	5,708	20%
D4	2,856	10%	1,681	6%	540	2%	27,518	5,077	18%
D5	2,881	11%	1,696	6%	540	2%	27,366	5,117	19%
D6	2,841	11%	1,681	6%	540	2%	26,976	5,062	19%
E1	2,597	9%	802	3%	919	3%	30,253	4,318	15%
E2	2,597	9%	802	3%	540	2%	29,439	3,939	14%

- There would be no farmland involvements under the No-Build Alternative.

3. POTENTIAL MITIGATION MEASURES

When a preferred corridor is selected and right-of-way limits defined, the SCS District Conservationists will make a determination of impact and recommended mitigation measures. With right-of-way limits defined, the actual farmland involvement would be less than what has been reported in Table III-10.

E. SOCIAL ENVIRONMENT

This project has been developed in accordance with Title VI of the 1964 Civil Rights Act and Title VIII of the 1968 Civil Rights Act. Title VI provides that no person shall on the grounds of handicap, age, race, color, sex, or national origin, be excluded from participation in, or be denied the benefits of, or be otherwise subject to discrimination under any program of the federal, state, or local government.

1. METHODOLOGY

The initial study efforts defined the baseline conditions of the project region. Various social characteristics were inventoried, including county and community population trends, out-migration rates, age and racial distributions, community service resources, and public safety capabilities. Information and statistics on these characteristics were obtained primarily from the U.S. Department of Commerce, Bureau of the Census; the University of West Virginia, Office of Health Services Research; the University of Virginia, Center for Public Service; and through consultation with the economic development authorities and the community service providers of the region (e.g. police, fire, emergency medical services, education, and health care).

Upon completion of the baseline inventory, the potential social effects of each Scheme Option were projected and evaluated. Both direct and secondary affects were distinguished and are discussed separately under this section. Direct affects include those resource involvements which are attributed to the location of the Scheme Option and/or to the construction and operation of a four-lane, divided highway somewhere within the corridor Scheme Option.

Determinations of these effects were based on the proximity of the Scheme Options to resident populations, involvement with local communities, and the opportunities to improve east-west access and linkage relative to public safety response times and public service accessibility (e.g. education and health care). Secondary project effects relate to those impacts which Corridor H may indirectly stimulate, such as induced population growth and development.

2. POPULATION CHARACTERISTICS

a. Current Trends and Characteristics

Selected population statistics for the various municipalities within the nine county region are presented in Table III-11. As shown in Exhibit III-4, over 35 percent of the total project area population, approximately 65,154 persons, reside in one of 32 incorporated municipalities. Estimated 1990 populations within these municipalities ranged from 21,947 in the City of Winchester to 140 in the Towns of Montrose and Wardensville. Just over half of the municipalities had populations under 1,000 persons. Table III-12 depicts the 1980 and 1990 populations, the annual growth rates, and the racial and age characteristics of each county. Over 75 percent of the West Virginia municipalities in the project area experienced a decline in population during the 1980's. No population decline was registered by the Virginia municipalities in the project area.

Population statistics show that a majority of project area residents live in rural areas. The project area is predominantly rural, with population densities under 30 persons per square mile in six of the seven West Virginia counties. For comparison, the average population density in the State of Virginia was 80.8 persons per square mile and averaged nearly 70 persons per square mile in Frederick and Shenandoah Counties (U.S. Bureau of the Census, 1983). The perception that higher or lower population densities are preferable varies, depending upon the individual. For those living in or visiting a rural area, lower population densities could be considered a positive attribute; i.e. one of the primary reasons for living in or visiting the area. Others, however, may perceive low population densities as a reflection of limited employment and/or educational opportunities.

An undetermined percentage of rural residents are concentrated in small, unincorporated towns and villages interspersed throughout the project area. These towns are often composed of scattered, single-family residences, small entrepreneurial or family businesses, and sometimes farming or industrial operations surrounded by undeveloped expanses of mountainous terrain. With such rugged terrain, many of the communities, particularly in West Virginia, are isolated and not easily accessible. The population of these communities rarely exceeds 100 persons. Well over 100 of these communities (e.g., Kerens, Sully, Job, Onego, Cabins, and Shanks), are located in the project area. Current demographic statistics for these communities were unavailable at the time of this study (Friddle, 1991, Dyche, 1991, and Jordan, 1991).

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TABLE III-11
COUNTY POPULATION CHARACTERISTICS

COUNTY	POPULATION		% 1980-90 AVERAGE ANNUAL CHANGE	1990 RACE COMPOSITION (% Total Pop.)			1990 AGE DISTRIBUTION (% Total Pop.)			1980-90 NET MIGRATION	
	1980	1990		White	Black	Other	0-18	19-64	65&Up	Number	%
Grant	10,210	10,428	0%	99%	1%	0%	27%	58%	15%	-700	-7%
Hampshire	14,867	16,498	1%	99%	1%	0%	28%	58%	14%	900	6%
Hardy	10,030	10,977	1%	98%	2%	0%	25%	60%	15%	-100	-1%
Mineral	27,234	26,697	0%	97%	3%	0%	27%	58%	15%	-300	-1%
Pendleton	7,910	8,054	0%	98%	2%	0%	25%	58%	17%	-200	-3%
Randolph	28,734	27,803	0%	99%	1%	0%	26%	58%	16%	-1,200	-4%
Tucker	8,675	7,728	-1%	100%	0%	0%	25%	58%	17%	-100	-1%
*Frederick	34,150	45,723	3%	97%	2%	1%	28%	63%	9%	1,200	4%
Shenandoah	27,559	31,636	1%	98%	1%	1%	23%	60%	17%	600	2%

* Frederick County totals do not include statistics for the City of Winchester

Source:
U.S. Bureau of the Census, 1982
U.S. Bureau of the Census, 1983
U.S. Bureau of the Census, 1988
U.S. Bureau of the Census, 1991
University of Virginia, 1991
West Virginia University, 1991

CORRIDOR H
Elkins to I-81

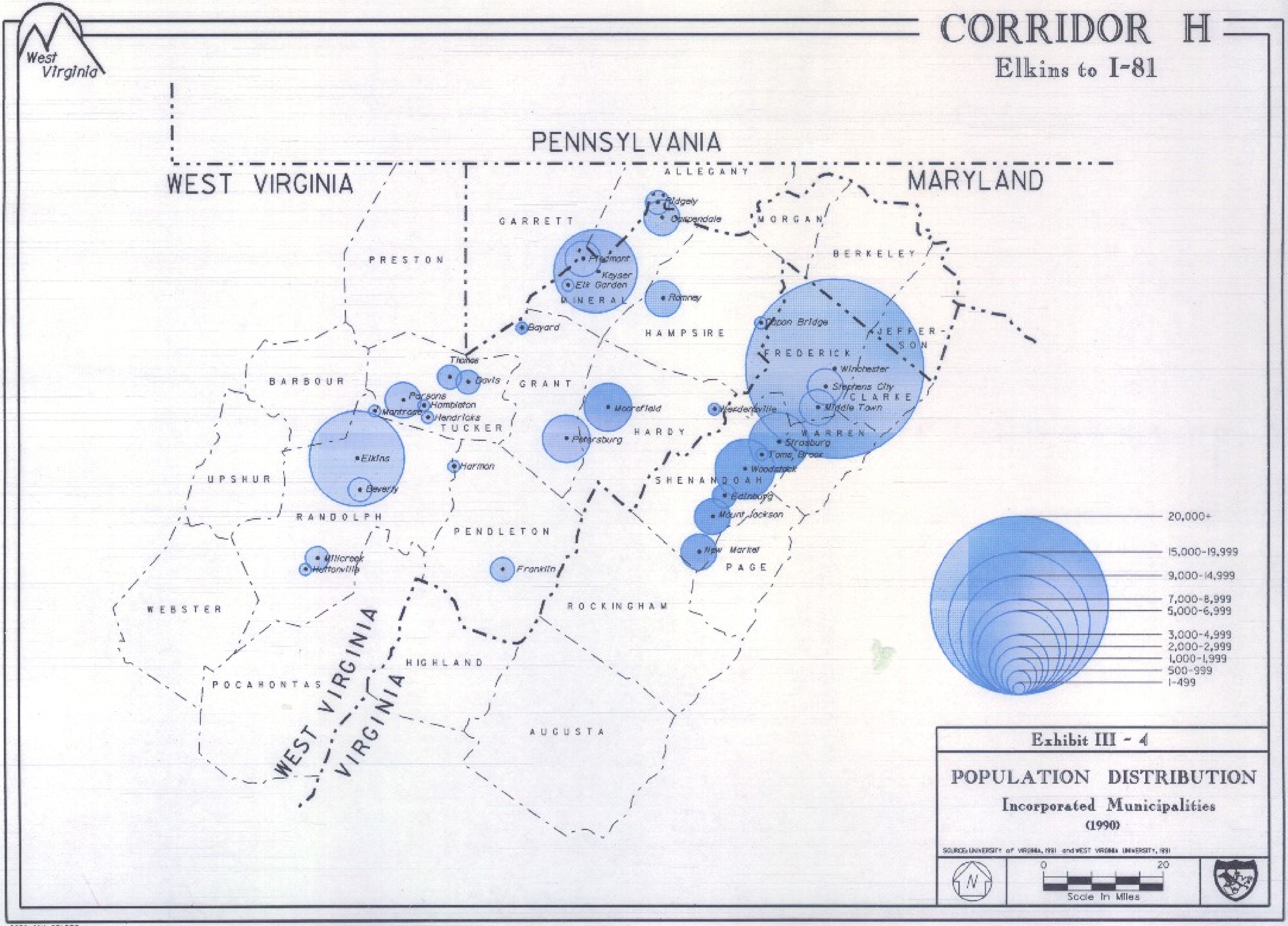

Exhibit III - 4

POPULATION DISTRIBUTION

Incorporated Municipalities

(1990)

SOURCE: UNIVERSITY of VIRGINIA, 1991 and WEST VIRGINIA UNIVERSITY, 1991

TABLE III-12
POPULATION CHARACTERISTICS BY INCORPORATED MUNICIPALITY

COUNTY/ Incorporated Municipality	TOTAL POPULATION		1980-1990 Average Annual	1990 RACIAL STATISTICS (%)			1990 AGE DISTRIBUTION (%)		
	1980	1990	% Change	White	Black	Other	0-18	19-64	65&Over
GRANT									
Bayard	540	414	-2.6	99.3	0.5	0.2	28.0	56.5	15.5
Petersburg	2,084	2,360	1.3	96.4	2.9	0.7	21.2	54.7	24.1
HAMPSHIRE									
Capon Bridge	191	192	0.1	100.0	0.0	0.0	28.7	58.3	13.0
Romney	2,094	1,966	-0.6	96.6	2.3	1.1	26.6	50.5	22.9
HARDY									
Moorefield	2,257	2,148	-0.5	92.7	7.0	0.3	22.8	60.2	17.0
Wardensville	241	140	-5.3	99.3	0.7	0.0	14.3	54.3	31.4
MINERAL									
* Carpendale	NA	1,100	NA	NA	NA	NA	NA	NA	NA
Elk Garden	291	261	-1.1	100.0	0.0	0.0	25.7	59.0	15.3
Keyser	6,569	5,870	-1.1	92.4	7.2	0.4	24.4	55.9	19.7
Piedmont	1,491	1,094	-3.0	79.2	20.0	0.8	25.7	56.5	17.8
Ridgeley	994	779	-2.4	99.9	0.0	0.1	20.0	58.7	21.3
PENDLETON									
Franklin	780	914	1.6	98.8	0.7	0.5	20.8	50.1	29.1
RANDOLPH									
Beverly	475	696	3.9	99.9	0.0	0.1	33.5	53.9	12.6
Elkins	8,536	7,420	-1.4	97.8	1.1	1.1	22.8	56.1	21.1
Harman	181	128	-3.4	100.0	0.0	0.0	21.9	59.4	18.7
Huttonsville	242	211	-1.4	100.0	0.0	0.0	30.3	55.9	13.8
Mill Creek	801	685	-1.6	100.0	0.0	0.0	28.6	56.9	14.5
Montrose	129	140	0.8	100.0	0.0	0.0	36.4	57.2	6.4
TUCKER									
Davis	979	799	-2.0	99.7	0.0	0.3	25.9	55.3	18.8
Hambleton	403	265	-4.1	100.0	0.0	0.0	23.4	59.2	17.4
Hendricks	390	303	-2.5	100.0	0.0	0.0	27.7	57.8	14.5
Parsons	1,937	1,453	-2.8	99.2	0.1	0.7	22.5	57.8	19.7
Thomas	747	573	-2.6	100.0	0.0	0.0	21.6	58.3	20.1
FREDERICK									
Middletown	841	1,061	2.4	94.2	5.5	0.3	28.8	60.0	11.2
Stephens City	1,179	1,186	0.1	92.3	6.4	1.3	27.3	62.3	10.4
Winchester	20,217	21,947	0.8	88.6	10.0	1.4	22.7	62.0	15.3
SHENANDOAH									
Edinburg	752	860	1.4	99.8	0.0	0.2	16.3	60.2	23.5
Mount Jackson	1,419	1,583	1.1	97.5	1.0	1.5	22.2	62.3	15.5
New Market	1,118	1,435	2.5	96.9	1.1	2.0	20.0	57.8	22.2
Strasburg	2,311	3,762	5.0	95.5	4.0	0.5	25.0	59.8	15.2
Toms Brook	226	227	< 0.1	93.8	5.7	0.5	28.6	55.5	15.9
Woodstock	2,627	3,182	1.9	96.2	3.0	0.8	20.1	50.1	29.8

* Incorporated January 1990, complete statistical record is not available (NA)

Source: U.S. Bureau of the Census, 1982; West Virginia University, 1991; Bland, 1991
U.S. Bureau of the Census, 1991; University of Virginia, 1991; Dyche, 1991
West Virginia Governor's Office of Economic and Community Dev., 1982

b. Potential Project Involvement

A principal function of Corridor H is to improve linkage and access between the primary traffic generators of the project area. The incorporated communities of the region constitute primary generators because they contain the highest concentrations of population, employers, and public facilities and services. An assessment of the Scheme Options reveals that:

- Scheme Options A2 through A7 would extend through counties which collectively have the largest population in the study area.
- Scheme Options C1, C2, E1, and E2 would potentially serve the greatest number of West Virginia residents.
- Scheme Option A2 through A7, C1, C2, E1, or E2 would extend through West Virginia counties which collectively experienced the greatest net out-migration in the project region between 1980 and 1986.
- Scheme Option C1, C2, E1, or E2 would potentially enhance medical care access in those West Virginia counties which collectively had the largest elderly populations.
- Scheme Option E1 or E2 would potentially serve the most residents of incorporated places, representing over 60 percent of the project area total.
- Scheme Option D1 through D6, E1, or E2 would extend within six miles of 12 incorporated municipalities, more than any other Scheme Option.
- Scheme Option E1 or E2 would potentially serve the most incorporated residents in West Virginia counties, representing over 65 percent of the West Virginia project area total.
- Scheme Option C1 or C2 would potentially serve the most incorporated minority residents in the West Virginia counties, representing nearly 60 percent of the West Virginia project area total for municipalities.
- Scheme Option E1 or E2 would potentially serve the most incorporated elderly residents in the West Virginia counties, representing over 65 percent of the West Virginia project area total for municipalities.

The degree of benefit experienced by either a rural or urban resident would likely depend upon the distance to access a particular Scheme Option. Such an assessment will be completed when a preferred corridor is selected and preliminary alignment design is initiated.

3. COMMUNITY COHESION

The Federal Highway Administration defined community cohesion as a community's level of commitment to itself, as demonstrated by the amount of interaction among individuals, groups, and institutions within the community. The cohesive qualities of a community is often based on ethnic, social, and family ties; school-age children; residential stability and longevity; population, labor and income, mix of local residents; community linkages; available public facilities and services; and cultural sites and events (FHWA, 1991).

These qualities are inherent to any community regardless of its size, age, or location. It is presumed that the incorporated and unincorporated communities of the project area possess any number of these qualities. Rather than detailing the qualities of each community, emphasis was placed on the community's involvement with the Scheme Options and on possible disruptions which may occur.

a. Community Characteristics

Incorporated and unincorporated communities in the project region were identified and tabulated. These included communities within the Scheme's corridor limits and communities outside the limits but immediately adjacent to a highway where through-traffic may be redirected. The results of this inventory show that 52 communities are within the 2,000 foot-wide corridor Scheme Options, and 18 communities are immediately adjacent to a highway which could potentially have traffic redirected to a Scheme Option. Of the inventoried communities, 13 are incorporated municipalities and the remaining communities are primarily unincorporated residential clusters.

b. Potential Project Involvements

Depending on the particular type of involvement, the various Scheme Options could either encroach upon or bypass those communities listed on Table III-13. An encroachment is more likely to occur when a community is within the 2,000 foot-wide corridor Scheme Option. In addition, if a Scheme Option has the potential of redirecting through-traffic around a community, the effects of a bypass are more likely to occur. Both effects may disrupt or improve the existing cohesive qualities of a community, depending on the perceptions of the community.

TABLE III-13
POTENTIAL COMMUNITY DISRUPTIONS

COUNTY/ Community	SCHEME OPTION	TYPE OF POTENTIAL INVOLVEMENT
GRANT		
Bismarck	B4-B6, D1-D6, E1, E2	Within Scheme Option
Cabins	A1, A4, A7, A8	Within Scheme Option
Falls	B1, B2, B4, B5, D1, D2, D4, D6	Within Scheme Option
Forman	B1-B6, D1-D6	Within Scheme Option
Greenland	B1, B4, D1, D6	Within Scheme Option
Hopeville	A1, A8	Within Scheme Option
Petersburg	A1-A8	Redirect Traffic/Bypass
Scherr	B1-B6, D1-D6	Within Scheme Option
Townhill	A1, A3, A4, A6-A8	Within Scheme Option
HAMPSHIRE		
Augusta	C1, C2, E1, E2	Redirect Traffic/Bypass
Capon Bridge	C1, C2, E1, E2	Within Scheme Option
Frenchburg	C1, C2, E1, E2	Within Scheme Option
Hanging Rock	C1, C2, E1, E2	Within Scheme Option
Junction	C1, C2, E1, E2	Redirect Traffic/Bypass
Loom	C1, C2, E1, E2	Within Scheme Option
Mechanicsburg	C1, C2, E1, E2	Within Scheme Option
Pleasantdale	C1, C2, E1, E2	Within Scheme Option
Romney	C1, C2, E1, E2	Redirect Traffic/Bypass
Shanks	C1, C2, E1, E2	Within Scheme Option
HARDY		
Baker	A1-A8, B1-B6, D1-D6	Within Scheme Option
Cunningham	D1-D6, B1-B6	Within Scheme Option
Fisher	A1-A8	Within Scheme Option
Fort Run	A1-A8	Within Scheme Option
McCauley	A1-A8, B1-B6, D1-D6	Within Scheme Option
Moorefield	A1-A8	Redirect Traffic/Bypass
Needmore	A1-A8, B1-B6, D1-D6	Redirect Traffic/Bypass
Rig	A1-A8	Within Scheme Option
Wardensville	A1-A8, B1-B6, D1-D6	Redirect Traffic/Bypass
Welton	A1-A8	Within Scheme Option
MINERAL		
Burlington	C1, C2, E1, E2	Within Scheme Option
Claysville	C1, C2, E1, E2	Within Scheme Option
Laurel Dale	C1, C2, E1, E2	Within Scheme Option
Ridgeville	C1, C2, E1, E2	Within Scheme Option
PENDLETON		
Onego	A1, A8	Within Scheme Option
Seneca Rocks	A1, A8	Redirect Traffic/Bypass

COUNTY/ Community	SCHEME OPTION	TYPE OF POTENTIAL INVOLVEMENT
RANDOLPH		
Canfield	A1-A8, B1-B6, C1, C2	Within Scheme Option
Crystal Springs	All Scheme Options	Within Scheme Option
Elkins	All Scheme Options	Redirect Traffic/Bypass
Evenwood	A1-A8, B1-B6, C1,C2	Within Scheme Option
Gilman	D1-D6, E1, E2	Redirect Traffic/Bypass
Harman	A1, A8	Redirect Traffic/Bypass
Highland Park	D1-D6, E1,E2	Redirect Traffic/Bypass
Job	A1	Within Scheme Option
Kerens	D1-D6, E1, E2	Within Scheme Option
Leadsville	D1-D6, E1,E2	Within Scheme Option
Montrose	D1-D3, E1, E2	Within Scheme Option
Smith Crossing	D1-D3, E1, E2	Within Scheme Option
Sullivan	A1-A8, B1-B6, C1, C2	Within Scheme Option
Sully	B1-B6, C1,C2	Within Scheme Option
Whyte	D1-D6, E1, E2	Redirect Traffic/Bypass
Wymer	A1, A8	Within Scheme Option
TUCKER		
Bretz	D1-D6, E1, E2	Redirect Traffic/Bypass
Davis	B4-B6	Redirect Traffic/Bypass
Gladwin	A2-A7	Within Scheme Option
Hambleton	D1-D6, E1, E2	Within Scheme Option
Moore	D1-D3, E1, E2	Within Scheme Option
Parsons	D1-D6, E1, E2	Redirect Traffic/Bypass
Pleasant Run	D4-D6	Within Scheme Option
Porterwood	D1-D6, E1, E2	Within Scheme Option
Red Creek	A2-A7, B1-B3, C1, C2	Within Scheme Option
Thomas	D1-D6, E1, E2	Redirect Traffic/Bypass
FREDERICK		
Gore	C1, C2, E1, E2	Within Scheme Option
Hayfield	C1, C2, E1, E2	Within Scheme Option
Hill Crest	C1, C2, E1, E2	Within Scheme Option
Round Hill	C1, C2, E1, E2	Within Scheme Option
Star Tannery	A1-A8, B1-B6, D1-D6	Within Scheme Option
Sunnyside	C1, C2, E1, E2	Within Scheme Option
Winchester	C1, C2, E1, E2	Redirect Traffic/Bypass
SHENANDOAH		
Clary	A1-A8, B1-B6, D1-D6	Within Scheme Option
Lebanon Church	A1-A8, B1-B6, D1-D6	Within Scheme Option
Wheatfield	A1-A8, B1-B6, D1-D6	Within Scheme Option

Encroachment-related involvements associated with the development and operation of a four-lane, divided highway within a particular corridor Scheme Option could involve:

- The acquisition and relocation of residences, businesses, and public facilities.
- Potential fragmentation of established community boundaries, neighborhoods, and intra-community vehicular and pedestrian access routes.
- The erection of a physical barrier that could possibly isolate residential areas from community resources and services such as retail centers, schools, medical facilities, libraries, churches, police and fire protection, and emergency medical services.
- The influx of additional traffic which may pose increased safety hazards and potentially result in elevated noise levels and pollutant emissions.
- Alterations to the present aesthetic properties of a community.
- Greater regional accessibility and linkage between communities, market areas, and recreational attractions.
- Greater opportunities for employment as access to existing employers improves and new employers locate in the newly accessible area.
- The opening of newly accessible areas to development and land speculation.

By directing through-traffic around a community, a bypass facility would avoid many of the adverse community disruptions associated with highway encroachment. Nevertheless, a bypass could potentially alter traffic flow and access conditions within a community. Such effects may have social and economic consequences which are likely more subtle than those associated with a highway encroachment, but are no less of a concern. A literature and information search was performed to investigate these possible consequences.

An Iowa Department of Transportation report, *Literature Review of Urban Bypass Studies* (1991), summarizes research which was completed over the past 30 years on over 85 bypassed communities in the country. The research focused on the social and economic effects of multi-lane, limited-access, bypass facilities. The principal findings of this report indicate the following:

- Small communities with less than 500 persons had a greater tendency to experience adverse economic effects from a bypass facility than did larger communities, because a higher percentage of its trade was usually derived from through-traffic.

- When an isolated community derived a major portion of its income from highway traffic, the bypassed community suffered from some decline in business volume.

- Traffic-sensitive businesses (including service stations, small restaurants, convenience stores, and motels) were more susceptible to declines in patronage. Other types of retailers (including grocery, apparel, furniture, and housewares) were not noticeably impacted because a majority of their cliental were locally generated and not dependent on through-traffic.

- Truck stops and motels which cater to truck drivers were identified as the most likely to experience a decrease in business.

- The geographic location of a bypass, as well as the extent and type of signing, greatly reduced the adverse economic effects attributed to a bypass facility.

- Restaurants and cafes having a good local reputation derived a high percentage of business from local residents within a range of approximately five miles. Many of these establishments found that bypasses had minimal effect on business.

- General trade in the central business district usually increased after opening of a bypass. Even highway-oriented establishments within the core of the community experienced no recorded decrease in business.

- State sales tax records showed that overall retail business was usually sustained or improved after traffic shifted onto a bypass.

- Of all the researched communities for which retail trade information was available, over 65 percent experienced either a greater increase or a smaller decrease in retail activity than occurred in comparable areas which were not bypassed.

- Surveys indicated that travelers with the intention of conducting business in a community would leave the limited-access, controlled bypass and enter the business area knowing that there would be only a small chance of encountering congested traffic and parking.

- A majority of the bypasses reduced congestion and enhanced traffic movement and parking for local shoppers. This, in turn, attracted increased business activity.

- Traffic congestion and accident rates consistently decreased with the development of bypasses.

- There was no definitive correlation between bypass development and declines in commercial property values in any of the communities surveyed.

The No-Build Alternative would have a limited effect on the current cohesive qualities of the existing communities. Traffic projections indicate that traffic volumes on primary east-west thoroughfares through the project area would continue to increase, causing further declines in the Level of Service. If appropriate measures are not taken to improve the highway system, access and mobility within and between communities and market areas can be expected to deteriorate. As a result, residents and businesses in the project area could become increasingly isolated as other areas in the Northeast, Mid-Atlantic, and Midwest regions of the country continue to expand their economic influence in an effort to economically compete.

c. Potential Mitigation Measures

Highway planning and design measures would be implemented to minimize and mitigate for adverse disruptions to the communities in the project area. Such measures could include the shifting of alignments within the preferred corridor to avoid sensitive community resources or to provide greater community exposure, the reconfiguration of intersections to facilitate community access, the placement of walkways and other devises to maintain existing vehicular and pedestrian access, and the installation of informative signing and community advertising.

Further detailed analyses regarding the potential adverse or beneficial project involvements with a particular community and possible mitigative actions will be undertaken following the selection of a preferred corridor and the initiation of preliminary alignment design.

4. COMMUNITY SERVICES AND PUBLIC SAFETY

a. Existing Characteristics

Community services and public safety include the areas of Health Care, Public Education, Law Enforcement, Fire Protection, and Emergency Medical Services (EMS). Each area relies upon the transportation systems of the project area to serve the public.

1) Health Care

The health care system serving the project area consists of ten hospitals and/or clinics. As Table III-14 indicates, these facilities are located in communities which are evenly distributed to effectively serve the entire region.

2) Public Education

With the exception of the City of Winchester, each public school system within the project area operates on a county-wide basis. The City of Winchester operates its school system independent of Frederick County. Because of the rural nature of the project area, many students regularly depend upon school bus transportation provided by the individual school districts. Buses often utilize major thoroughfares (e.g: US 33, 50, and 219; SR 93. 32, 72, 42, 28, and 55) to access the region's school facilities. These facilities are mainly located in incorporated or larger unincorporated communities. Buses using routes with a high percentage of truck traffic, such as those routes noted above, can experience frequent traffic delays caused by slow moving trucks. Safety is also a concern as heavy truck traffic and school buses share these winding mountainous roads.

3) Law Enforcement

Police protection and law enforcement within the project area consists of the West Virginia and Virginia Sate Police, the individual County Sheriffs Departments, and 21 municipal police departments.

4) Fire Protection

Fire protection throughout the project area is predominantly supplied by volunteer departments in the smaller rural communities. The more populated incorporated areas maintain either full-time, paid fire fighting departments or a combination of full-time and volunteer forces. Several counties have an overall coordinator for fire and/or rescue operations.

A system of stations and service districts is typical in rural areas. Each station serves a "first due" area, providing backup to other stations as warranted. A central dispatcher is responsible for assigning station crews to emergencies. The condition of the existing highway

TABLE III-14
HEALTH CARE FACILITIES

HEALTH CARE FACILITY	LOCATION
Davis Memorial Hospital	Elkins, WV
Grant Memorial Hospital	Petersburg, WV
Hampshire Memorial Hospital	Romney, WV
Potomac Valley Hospital	Keyser, WV
E.A. Hawse Clinic/Nursing Complex	Baker,WV
Pendleton Community Care Clinic	Franklin, WV
Riverton Clinic	Riverton
Tucker Co. Emergency Ambulatory Ctr.	Parsons, WV
Shenandoah Memorial Hospital	Woodstock, VA
Winchester Medical Center	Winchester, VA

network directly influences the response times of these departments. Even though they may provide more direct access, thoroughfares with a high percentage of truck traffic may be avoided because of the potential for delays.

5) Emergency Medical Services

Emergency Medical Services (EMS) encompass the communication, transportation, and medical care systems organized to respond rapidly to emergency situations. A majority of the EMS personnel in the project area are volunteers who often work in other fields of public safety. They may be assigned with the regional fire departments or hospitals, or they may function as independent rescue squads. In several instances, EMS in the project area are performed by private ambulance services or are operated through a hospital. Because the individual EMS providers of the project area are fewer in number, they usually cover larger service areas than do the fire departments. As a result, unimpeded access and mobility is crucial to ensuring short response times.

b. Potential Project Effects

While the degree of effect would likely depend upon the distance to a particular Scheme Option, Corridor H may, in the short-term, disrupt access and mobility during construction. However, in the long-term, it would improve community service capabilities and public safety responsiveness. The following describes these effects as they relate to the service characteristics of the project area.

- To accommodate the construction of any given Scheme Option, it may be necessary to temporarily close and/or detour existing access routes, alter existing traffic patterns, and reduce speed limits in construction zones. These actions would be expected to temporarily cause delays, increase mileage traveled, and increase the response times of emergency vehicles. The exact extent of the construction impacts would be determined when specific alignments and intersection locations are studied for the preferred corridor selected.

- Upon completion, any corridor would improve emergency response times and enhance rural access to educational and health care facilities, relative to its route. Those public service providers with large service areas or facilities along the preferred corridor would probably experience the greatest benefit. Scheme Option E1 or E2 would provide improved linkage to five medical complexes, one more than Scheme Option A1, A8, C1, or C2. In addition, Scheme Option E1 or E2 would serve a greater number of communities and a greater number of educational facilities associated with these communities than any other Scheme Option.

- There is the potential that the barrier effect of a four-lane, divided highway could impede existing pedestrian or vehicular access to a community facility. However, this inconvenience would be offset by the improved regional access and linkage provided by implementation of the project.

- The No-Build Alternative would not create the short-term, negative impacts associated with roadway construction. However, long-term, negative impacts would likely result in a reduced level of community service and public safety as access and mobility in the project area progressively deteriorates with projected increases in traffic demand and demand for services.

c. Potential Mitigation Measures

Mitigation of the short-term negative impacts of construction would include prudent scheduling and programming of the various phases of construction and the provision of construction detours and informative signing. Public safety service providers would be kept fully aware of project scheduling, planned road closings, and alternative route designations.

Mitigation measures to overcome the barrier effect of a four-lane, divided highway would be considered during engineering design and could include walkways. During the alignment design stage, all attempts would be made to see that no area, regardless of size, experiences a decrease in access and mobility as a result of project implementation. In cases where it is not prudent or feasible to provide access, landlocked land or parcel remnants would be purchased by WVDOT.

5. AFFECTED SOCIAL GROUPS

Special social groups addressed in this study are minorities and the elderly. Bureau of the Census data confirm that a large minority population is not present in the project area (Tables III-11 and III-12). As a result, it is unlikely that any Scheme Option would adversely affect a disproportionate number of minorities. The following describes the social groups potentially affected.

- Persons over the age of 64 comprised over 20 percent of the population in ten incorporated municipalities. The Scheme Options would involve five of these communities: Petersburg, Romney, Wardensville, Elkins, and Thomas.

- Scheme Options E1 and E2 would potentially serve the most elderly residents of incorporated communities. The elderly within these communities would directly benefit from improved access to medical care facilities.

- Scheme Options A1 through A8, B1 through B6, and D1 through D6 would improve access to the E. A. Hawse Nursing Home in Baker, West Virginia (Friddle, 1991).

Disruptive involvements with the elderly, including interruptions to accessible medical care due to highway construction or possible displacement, would be avoided or minimized to the extent possible. In accordance with the Uniform Act, as amended, WVDOT would provide for uniform and equitable treatment of persons displaced from their homes, businesses, or farms by federal and federally assisted programs, and would establish uniform and equitable land acquisition policies for federal and federally assisted programs. While the project is not anticipated to disproportionately effect elderly residents within the project area, proactive measures would be taken to ensure a variety of ways and means for successful relocation. A range of possible relocation options will be evaluated at the next stage of study, following the selection of a preferred corridor and the initiation of preliminary alignment design.

6. SECONDARY IMPACTS

Highway improvements may cause indirect impacts as a result of construction. At a corridor-level study, it is not appropriate to precisely determine secondary impacts; however, the extent of these impacts can be generalized from experience gained from construction of similar facilities in similar areas.

The construction of Appalachian Corridor H would have an impact on the future of the individual communities and the region as a whole. Currently, movement within and through the region is viewed as inefficient, time consuming, and potentially dangerous. However, implementation of the Build Alternative would substantially improve this movement, thereby improving access to facilities and services, as well as improving the movement of goods and services in and out of the area.

Growth, as a secondary impact resulting from the implementation of the Build Alternative, would affect the socioeconomic, natural, and visual environment of the study area. The potential exists for growth to create adverse impacts to community facilities and community services, as well as increased noise. Growth could also result in positive impacts, such as increased tax bases, new employment opportunities, and expanded cultural opportunities. Specifics for each of these factors would vary, depending on location, magnitude, and nature of the additional growth.

Based on similar APD System projects, it can reasonably be assumed that positive secondary economic impacts would follow implementation of the project. In ARC's *Fiscal 1993 Program* submitted to Congress, ARC reported that between 1980 and 1986:

- Over 80 percent of the jobs created in Appalachia were in counties with a major highway. In addition, over 75 percent of the firms expanding did so in counties with a major highway.

- ARC surveys indicated that since 1965 (when the corridor system was first announced), 182,700 jobs have been created in Appalachia in 801 manufacturing plants with 50 or more employees within 30 minutes of the corridors.

- Added to this is an estimated 32,200 jobs in smaller plants for a total of 215,000. Standard projections of one service job created for each manufacturing job suggest that 215,000 jobs in retail trade, commercial establishments, and various services have been opened up along the corridors for a total of over 430,000 jobs.

- These survey results do not necessarily imply that economic opportunities will only take place in the manufacturing or industrial sectors. Given the areas extensive supply of outdoor recreation opportunities, it is likely that development will center around supporting the recreation and tourism industry.

One potentially adverse secondary effect of constructing new highways is providing new or improved access into environmentally sensitive areas. During the development of the Alignment SDEIS, these areas will be identified and the potential secondary impacts will be evaluated in detail.

The potential for secondary impacts would be least with the No-Build Alternative. Within the study area, the potential would be greatest under the Build Alternative with the overall secondary impacts essentially equal among the 24 Scheme Options. Outside the study area, the potential for secondary impacts would be greatest in Strasburg, VA. While the corridors of Schemes A, B, and D do not reach the city limits of Strasburg, the city's location at the potential intersection of two major, cross-country, divided highways (I-81 and Corridor H/I-66) could have a strong influence on its future growth and development.

F. POTENTIAL DISPLACEMENTS

1. METHODOLOGY

Communities, local facilities, and utility systems within the corridor limits of the Scheme Options were inventoried. Their locations were derived from USGS 7.5 minute quadrangle sheets and from WVDOT's and VDOT's general county highway maps.

Utility companies serving the project region provided information on the existing utility systems. System mapping was reviewed to locate major facilities, such as electric substations and transmission lines of 138 KV and above; natural gas production lines, transmission lines, and compressor stations; and telecommunication switching facilities, microwave towers, toll routes, trunk lines, and local feeder lines. Localized utility distribution and collection systems were not located during this study, but will be identified once a preferred corridor is selected and preliminary alignment design is initiated.

2. POTENTIAL COMMUNITY INVOLVEMENTS

a. Project Involvement

Table III-15 presents the results of the potential displacements inventory. The findings show that:

- The greatest number of residences and commercial establishments (totaling over 1,000) are located within the corridor Scheme Options C1, C2, E1, and E2.
- Churches and cemeteries are located within all corridor Scheme Options.
- Recreational facilities such as athletic fields, golf courses, picnic grounds and public pools are located within corridor Scheme Options A3 through A7, D2, and D3.
- Designated camp sites are only located within corridor Scheme Option A1.
- There are more active mines within corridor Scheme Option E2 than any other Scheme Option.

Avoidance of all schools, major industrial complexes, hospitals, power plants, and fish hatcheries is anticipated. Although USGS mapping shows no gas or oil wells within the limits of any Scheme Option, confirmation of this finding would require the review of well permits issued by the

TABLE III-15
INVENTORY OF POTENTIAL DISPLACEMENT TYPES BY SCHEME OPTION

DISPLACEMENT TYPE	NUMBER OF POTENTIAL DISPLACEMENT TYPES BY SCHEME OPTION																							
	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	C1	C2	D1	D2	D3	D4	D5	D6	E1	E2
Residential/Commercial	901	662	669	779	662	669	779	886	552	548	529	575	572	553	1,263	1,289	625	621	601	581	561	585	1,336	1,296
Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Church	15	9	9	9	9	9	9	15	9	9	8	9	9	8	14	14	11	11	10	11	10	11	16	16
Hospital	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cemetery	18	14	11	13	14	11	13	17	7	7	7	8	8	8	13	14	7	7	7	7	7	7	13	13
School	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	4	4
Mining Operations/Quarry	0	0	0	0	0	0	0	0	0	0	0	5	4	4	3	7	6	5	5	5	5	6	8	8
Oil or Gas Well	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Power Plant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Camp Grounds/Facilities	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recreational Facilities (athletic fields, golf courses picnic grounds, pools)	0	0	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0
Fish Hatchery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

West Virginia Department of Energy and the Virginia Department of Mines, Mineral, and Energy, Division of Gas and Oil. This investigation will be undertaken following the selection of a preferred corridor and the initiation of preliminary alignment design efforts.

The identified community facility involvements imply the potential for an impact since the identified resource is within the 2,000 foot-wide corridor boundaries. Project related relocations and household and employee displacements would become quantifiable when right-of-way limits are established. The number of relocations and displacements will be substantially less than those involvements recorded in Table III-15.

b. Potential Mitigation Measures

The avoidance of all community resources would be a high project priority, representing the first level of mitigation. If it is eventually determined that an impact to a community facility could not be avoided or minimized to an acceptable level, WVDOT would implement an Acquisition and Relocation Program in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

Through the Acquisition and Relocation Program, WVDOT would provide payments and services to aid those being displaced. Relocation assistance would be made available without discrimination to all impacted individuals, families, businesses, farmers, ranchers, and nonprofit organizations. Suitable housing and/or business space would be consistent with the requirements of Title VIII of the Civil Rights Act of 1968. Personnel from WVDOT would be assigned to appropriately administer the program.

A real estate inventory would be conducted when project related acquisitions and relocations are quantified. Should market conditions hinder the relocation process, WVDOT, in accordance with FHWA policy, would propose the use of a Last Resort Housing Program in order to provide replacement housing.

3. POTENTIAL INVOLVEMENT WITH UTILITIES

a. Project Involvement

An expansive utility network is interspersed within the project area. Several major cross-country and interregional facilities (electric, natural gas, and communications), traverse the area, some extending to the East Coast and/or to the Midwest. Local distribution and collection systems are densely concentrated in more urbanized areas. Production facilities relating to electric power (the coal-fired Mt. Storm Power Plant) and to natural gas extraction are also present.

Table III-16 identifies the major utility involvements associated with each Scheme Option. Both transverse and longitudinal involvements are included. Localized distribution and collection facility (water, sewer, electric, natural gas, and communications) involvements were not determined, but would be assessed when individual alignments are evaluated following the selection of a preferred corridor.

Any of the Scheme Options could involve the relocation of several utility systems, resulting in possible short-term service interruptions. Although it is not appropriate at a corridor-level study to determine definitive impacts, they will be determined at the next step in the study process. At this stage of the study process, utility relocations would not be expected to pose a serious problem to the project. Many of the major involvements listed in Table III-16 would likely be avoided when a preferred corridor is selected and preliminary design efforts are initiated. The No-Build Alternative would not impact the existing utility network serving the project area.

b. Potential Mitigation Measures

A mitigation strategy would be implemented to reduce the extent and duration of utility involvements. Measures to mitigate potential adverse involvements and inconveniences could involve scheduling and design considerations, phasing strategies, contingency plans, etc. These measures would be developed and refined during the design phase of the project and would require close coordination between WVDOT and all identified utility owners.

A key component of the strategy would involve identifying utility customers that would be impacted by temporary service interruptions. These customers would be given written notification of the possible interruptions. If it were determined that a service interruption would impose a safety or health hazard or have a substantial economic effect on a particular customer, contingency plans (including means of sustaining crucial operations) would be assessed and developed to alleviate the situation.

G. ECONOMIC ENVIRONMENT

1. METHODOLOGY

Selected economic characteristics were inventoried within the project area to evaluate each Scheme Option in the context that it would become part of the Appalachian Development Highway System (APD). This economic inventory evaluation examines three economic factors as they relate to and may be influenced by the Scheme Options. The three factors include Economic Activity, Employment, and Income.

TABLE III-16
POTENTIAL UTILITY INVOLVEMENTS BY SCHEME OPTION

UTILITY Utility Provider	TYPE OF FACILITY	SCHEME OPTION INVOLVEMENT
ELECTRIC		
Monongahela Power Co.	138 KV Transmission Lines	All Scheme Options
	500 KV Transmission Line	D1-D6, E1, E2
The Potomac Edison Co.	138 KV Transmission Lines	All Scheme Options
Virginia Power	500 KV Transmission Line	B1-B6, C1, C2, D1-D6, E1, E2
Virginia Power/ The Potomac Edison Co.	500 KV Transmission Line	B1-B6, C1, C2, D1-D6, E1, E2
NATURAL GAS		
Columbia Natural Resources Inc.	6-inch Production Line	D1-D6, E1, E2
	3-inch Production Lines	B1-B6, C1, C2, D1-D6, E1, E2
Columbia Gas Transmission Co.	6-inch Transmission Line	B1-B6, D1-D6
	8-inch Transmission Lines	A1-A8, B1-B6, C1, C2
	10-inch Transmission Line	A1-A8, B1-B6, D1-D6
	12-inch Transmission Lines	D1-D6, E1, E2
	20-inch Transmission Lines	All Scheme Options
	26-inch Transmission Lines	A1, A8
	36-inch Transmission Lines	A1, A8
	Seneca Compressor Station	A1, A8
Hampshire Gas Co.	8-inch Transmission Line	C1, C2, E1, E2
	Storage Well No. 6	C1, C2, E1, E2
	Active Storage Field	C1, C2, E1, E2
COMMUNICATIONS		
AT&T	Cross-Country Toll Route	C1, C2, E1, E2
GTE of South Area	Cross-Country Toll Routes	All Scheme Options
	Interoffice Trunk Lines	All Scheme Options
	Primary Local Feeder Lines	All Scheme Options
	Remote Digital Switching Areas	C1, C2, E1, E2
	Microwave Tower	A1, A8, A4, A7
C&P Telephone	Cross-Country Toll Routes	All Scheme Options
	Interoffice Trunk Lines	All Scheme Options
Contel of West Virginia, Inc.	Interoffice Trunk Lines	A2-A7, B1-B6, C1, C2, D1-D6, E1, E2
	Primary Local Feeder Lines	A1, A8
Hardy Telephone Company	Interoffice Trunk Lines	A1-A8, B1-B6, D1-D6
	Primary Local Feeder Lines	A1-A8, B1-B6, D1-D6
Spruce Knob Seneca Rocks Telephone, Inc.	Interoffice Trunk Lines	A1, A8

Source:
Ferguson, 1991
Monongahela Power Company, 1991
The Potomac Edison Company, 1991
Columbia Natural Resources Inc., 1991
Columbia Gas Transmission Co., 1991
McDermott, 1991
Brewer, 1991
Shultz, 1991
Cain, 1991
Richeson, 1991
Davis, 1991
Stewart, 1991

Economic information and statistical data were used to establish the baseline economic characteristics of the project area. Principal contributors to this analysis included the U.S. Bureau of Economic Analysis; the U.S. Bureau of the Census; the West Virginia University, College of Business and Economics; the West Virginia Division of Employment Security; the Virginia Employment Commission; the West Virginia Coal Association; the West Virginia Department of Commerce, Labor and Environmental Resources; and the various economic planning and development authorities serving the area. The baseline characteristics were used to determine how the Scheme Options may interact with the economic resources of the area. This assessment formed the basis for projecting potential economic effects.

Because this is a corridor-level study, only primary economic effects (relative to the corridor location of the Scheme Options and their capacity to improve access and mobility) were analyzed. Secondary economic effects concerning induced economic growth, tax revenues, employment opportunities, increased tourism, and retail sales, could not be reasonably projected during this phase of study. Such determinations would be made when a preferred corridor is selected and preliminary design efforts are initiated.

2. ECONOMIC ACTIVITY

a. Current Trends and Characteristics

The project area is situated between the Northeast, Mid-Atlantic, and Midwest regions of the country, in geographic proximity of moderate to large sized metropolitan markets. The area's diverse supply of natural resources compliments its geographic position. Resources in the project area such as hardwood timber, coal, and limestone are valuable industrial commodities which can be utilized by industries both inside and outside the area. Other natural resources (e.g. forests, parks, recreation areas, and streams) offer expanded recreational opportunities to residents and nonresidents of the project area.

The primary industries of the project area have, in a large part, grown around the abundant supply of natural resources. Examples include the mineral extraction industry; the manufacturing sector; retail, service, and government; transportation and distribution; and tourism. A large tourism industry has emerged in the project area. This growth has increasingly influenced other sectors of the economy including retail trade, services and lodging, eating and drinking establishments, real estate, and recreational development. In 1990, tourism in West Virginia contributed nearly $2.5 billion to the state's economy (McClung, 1991). It is anticipated that as the recreational facilities of the project area continue to develop, and as people outside the area grow in their awareness of the available resources and attractions, the beneficial economic impacts of tourism on the economy will increase.

The tourism industry's ability to expand its share of the economy's dollar is considered critical to the growth of the other economic sectors. Because the region's tourism industry directly competes with other tourism markets in the Northeast, Mid-Atlantic, and Southeast United States for revenues, regional access becomes an important factor in attracting new visitors. If access to the recreational resources is difficult, prospective tourists would likely turn elsewhere for recreational opportunities.

The primary access routes providing linkage from I-81 in Virginia to the recreational resources of the project area (e.g. US 50, US 33, and SR 55) are generally substandard (Section I, Purpose and Need For Action). Recreational demand on these routes will likely increase, but existing highway deficiencies may deter prospective tourism (West Virginia Governor's Office of Community and Industrial Development, 1989). As projected traffic volumes increase on these routes, access and mobility will further deteriorate. This trend may discourage non-residents from traveling to the area.

b. Potential Project Effects

While other market areas in the Northeast, Mid-Atlantic, and Midwest regions of the country actively pursue strategies to enhance mobility to expand economic influence, limited progress has been made in correcting the transportation deficiencies of the project area. Project implementation would reverse this trend and offset the potential for increased economic isolation. The future economic competitiveness of the area largely depends upon overcoming its transportation deficiencies through improving access and network linkage between the communities and businesses of central West Virginia and the markets of the East Coast and Midwest.

By improving transportation service in areas with poor accessibility, the proposed project would create more positive opportunities for new investment, economic development, and land speculation. Such opportunities could effect property values and the tax bases of counties and local communities. At this corridor-level study, it is not appropriate to specifically determine these effects, however, this will be determined in the next step of the study process when a preferred corridor is selected and preliminary design efforts are initiated.

Economic specialists point out that, while highway development is considered an important variable to promoting economic competitiveness, it alone has not historically stimulated economic development. Other factors such as water supply, sewage treatment, and developable land must also be present (Associated Press, 1990). As a result, the development pressures often associated with a project of this type would more likely be focussed in areas identified as having a strong growth potential (Section III-C). Other areas less able to support and absorb growth would likely remain unaffected economically by the project because of the prohibitive costs associated with installing new utilities, expanding municipal service capabilities, and preparing land for development.

Access and mobility would continue to deteriorate in the project area with the No-Build Alternative. This condition would increase the potential for economic isolation by negatively affecting the area's ability to compete with other regional economic markets in attracting new investment and development. Furthermore, the established tourism industry of the area may begin to lose its share of the market to other more accessible areas.

3. EMPLOYMENT

a. Current Trends and Characteristics

Table III-17 presents selected labor force and employment statistics for the nine counties in the project area from 1980 to 1990. Four major employment trends were evident during this period:

- With the exception of 1981 and 1982, Frederick and Shenandoah Counties registered the highest employment and lowest unemployment rates in the project area. A large percentage of the area's labor force is concentrated in these two counties.

- Each of the nine counties experienced a relatively large increase in unemployment between 1982 and 1985. During this period, Mineral, Randolph, and Tucker Counties registered annual unemployment rates greater than 15 percent.

- Unemployment rates in Hampshire, Randolph, and Tucker Counties continued to exceed 10 percent in 1990.

- Relative to other counties in the project area, Grant and Randolph Counties experienced a substantial decrease in their labor forces, with a combined peak loss of 3,445 workers between 1980 and 1988.

Employment statistics for Manufacturing; Transportation and Distribution; and Services, Trade, and Government were analyzed to identify major employment trends within the project area. The figures indicate that the employment growth registered in the manufacturing sector

TABLE III-17
PROJECT AREA LABOR AND EMPLOYMENT STATISTICS 1980-1990

COUNTY/ Statistics	CIVILIAN LABOR FORCE	PERSONS EMPLOYED	PERSONS UNEMPLOYED	UNEMPLOYMENT RATE
GRANT				
1980	5,109	4,711	398	7.80
1990	4,800	4,380	420	8.80
% CHANGE	-6%	-7%	5%	11%
HAMPSHIRE				
1980	5,896	5,481	415	7.00
1990	7,390	6,550	840	11.40
% CHANGE	20%	16%	51%	39%
HARDY				
1980	4,858	4,514	344	7.10
1990	6,050	5,680	370	6.10
% CHANGE	20%	21%	7%	-14%
MINERAL				
1980	11,185	10,293	892	8.00
1990	11,060	10,450	610	5.50
% CHANGE	-1%	2%	-32%	-31%
PENDLETON				
1980	2,907	2,600	307	10.60
1990	4,180	3,960	220	5.20
% CHANGE	30%	34%	-28%	-51%
RANDOLPH				
1980	13,246	11,946	1,300	9.80
1990	12,200	10,470	1,730	14.20
% CHANGE	-8%	-12%	25%	31%
TUCKER				
1980	3,721	3,375	346	9.30
1990	3,920	3,470	450	11.40
% CHANGE	5%	3%	30%	23%
***FREDERICK**				
1980	18,077	16,807	1,270	7.00
1990	22,998	21,888	1,110	4.80
% CHANGE	21%	23%	-13%	-31%
SHENANDOAH				
1980	12,906	12,069	837	6.50
1990	17,879	16,979	900	5.00
% CHANGE	28%	29%	7%	-23%

*Frederick County figures do not include statistics for the City of Winchester during the 1970s has since shifted to other sectors of the economy in most counties. Conversely, since 1970, employment within the services, trade, and governmental sector has expanded regionally at an annual rate greater than three percent. The rate of employment growth within the transportation and distribution industry reached 2.6 percent between 1980 and 1988, a considerable increase over that rate which occurred during the 1970s. This growth reflects the increased dependency which industries have on the regional highway system for supplies and product distribution.

Many industrial employers place considerable demand on the regional highway system for deliveries and to access the markets of the East Coast and Midwest. As presented on Table III-18, 98 industrial employers in the project area with 20 or more employees were identified by economic planning and development authorities serving the region. Exhibit III-5 shows their approximate location.

As shown on Table III-19, eight industrial parks are located within the project area. The tenants of these industrial parks employ approximately 1,620 workers. The unoccupied acreage available for development totals 312 acres, representing over 50 percent of the total industrial park acreage (Dyche, 1991; Friddle, 1991; and Combs, 1991).

b. <u>Potential Project Effects</u>

Implementation of any Scheme Option would enhance access and mobility in the project region, as well as to the larger markets of the East Coast and Midwest. This positive development may attract new industries to the project area where land costs are comparatively low, tax and financing incentives exist, and utilities are in place (West Virginia Governor's Office of Community and Industrial Development, 1990). The in-migration of new industry and the expansion of existing industry are considered necessary to reverse losses in the region's labor force. The extent to which any Scheme Option could influence employment trends would, in part, depend upon its defined route.

- Scheme Option C1, C2, E1, or E2 would directly improve access and mobility in counties which experienced unemployment rates above 15 percent during the 1980's (Randolph, Tucker, and Mineral Counties).

- These Scheme Options would also extend through counties which had the largest labor forces and highest employment counts in the project area would traverse counties which had the highest 1990 unemployment rates (Randolph, Tucker, and Hampshire Counties).

TABLE III-18
INDUSTRIAL EMPLOYERS WITH 20 OR MORE EMPLOYEES

COUNTY	MAP INDEX NUMBER	TOTAL NUMBER OF EMPLOYERS	TOTAL NUMBER OF EMPLOYEES
Grant	1 thru 6	8	882
Hampshire	9 thru 13	5	281
Hardy	14 thru 18	5	2,339
Mineral	19 thru 27	9	3,708
Pendleton	28 thru 30	3	700
Randolph	31 thru 44	14	815
Tucker	45 thru 49	5	492
Frederick	50 thru 93	44	9,115
Shenandoah	94 thru 98	5	1,862

* Map Index Number refers to those employers identified on exhibit Map III-5

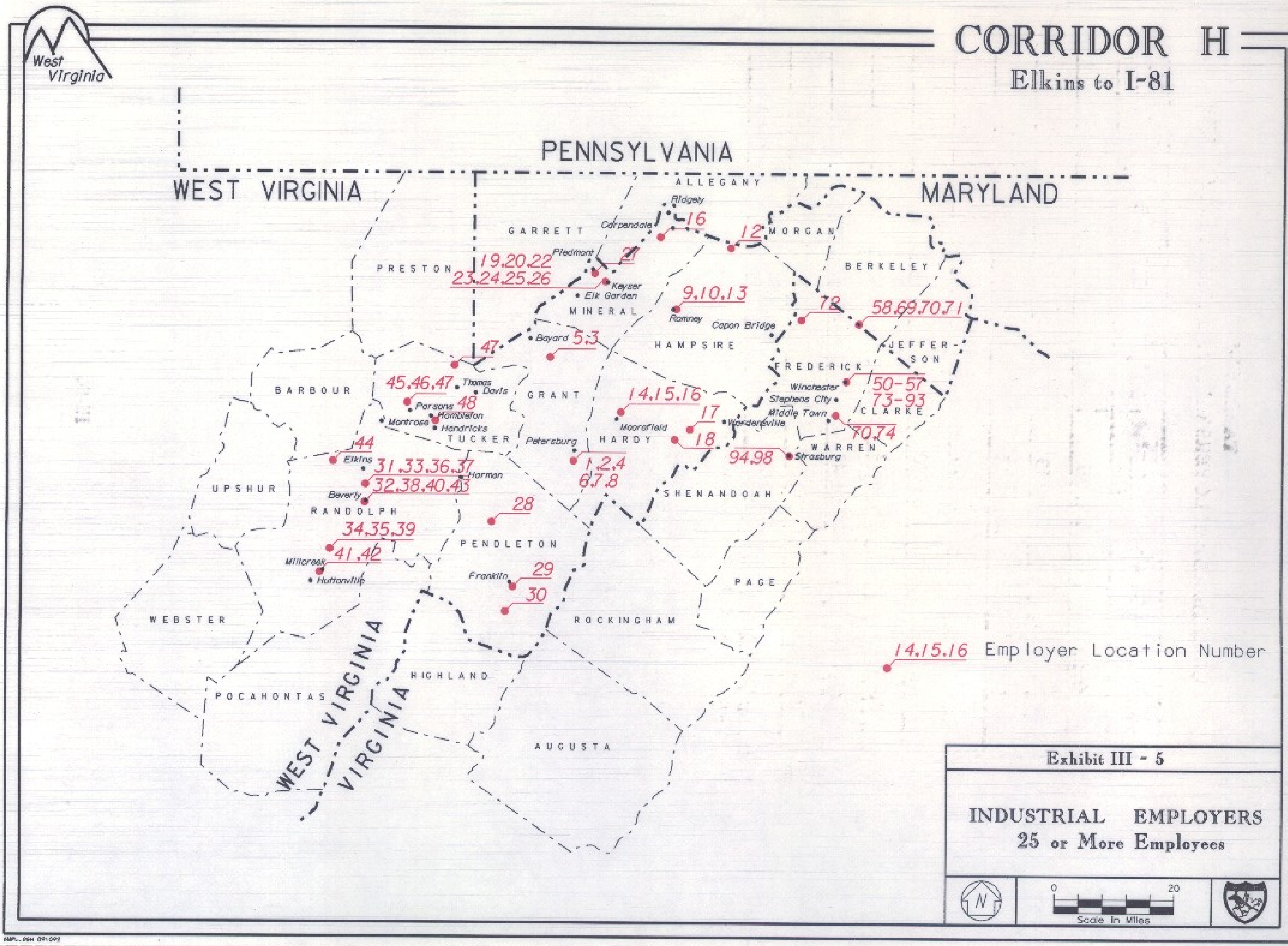
West Virginia
CORRIDOR H
Elkins to I-81
PENNSYLVANIA
WEST VIRGINIA
MARYLAND
ALLEGANY
GARRETT
PRESTON
MINERAL
HAMPSIRE
MORGAN
BERKELEY
JEFFERSON
FREDERICK
CLARKE
WARREN
SHENANDOAH
PAGE
ROCKINGHAM
HARDY
GRANT
TUCKER
BARBOUR
UPSHUR
RANDOLPH
PENDLETON
WEBSTER
POCAHONTAS
HIGHLAND
AUGUSTA
WEST VIRGINIA
VIRGINIA
Ridgely
Carpendale
Piedmont
Keyser
Elk Garden
Romney
Capon Bridge
Bayard
Thomas
Davis
Parsons
Hambleton
Hendricks
Montrose
Elkins
Harman
Beverly
Millcreek
Huttonville
Franklin
Petersburg
Moorefield
Wardensville
Winchester
Stephens City
Middle Town
Strasburg
16
12
21
19,20,22
23,24,25,26
9,10,13
72
58,69,70,71
5,3
47
45,46,47
48
14,15,16
17
18
50-57
73-93
70,74
94,98
1,2,4
6,7,8
44
31,33,36,37
32,38,40,43
28
34,35,39
41,42
29
30
14,15,16 Employer Location Number
Exhibit III - 5
INDUSTRIAL EMPLOYERS
25 or More Employees
N
0
20
Scale in Miles
EMPL.DGN 09-092

TABLE III-19
INDUSTRIAL PARKS

INDUSTRIAL PARK	LOCATION	NUMBER OF EMPLOYEES	PARK ACREAGE
Grant County Industrial Park	Petersburg, WV	275	120
Hampshire County Industrial Park	Romney, WV	100	40
Hardy County Industrial Park	Moorefield, WV	485	49
Wardensville Industrial Park	Wardensville, WV	0	28
Mineral County Industrial Park	Keyser, WV	600	130
Pendleton County Industrial Park	Franklin, WV	60	33
Elkins-Randolph County Park	Elkins, WV	100	55
New Moorefield Industrial Park	Moorefield, WV	0	100

Source: WV Regions VII and VIII Planning and Development Councils, 1991

- Scheme Options E1 and E2 would extend through the counties with the largest labor force, the greatest number of employed workers, and the highest unemployment rates in the study area.

A primary function of Corridor H would be to improve linkage and access to employers. Exhibit III-5 identifies those industrial employers with 20 or more employees which would be within six miles of the various Scheme Options.

- Over 20 West Virginia firms would be within six miles of Scheme Options A1 through A8, C1, C2, E1, and E2.

- Scheme Options A1 through A8, would improve access to five industrial parks, two more than any other Scheme Option. While two of the five industrial parks currently have no business or business tenants (Wardensville and New Moorefield Industrial Parks), improved access to these facilities would likely attract potential employers at the industrial parks.

- Collectively, the greatest number of workers employed in the project area in 1991 would be served by Scheme Option C1, C2, E1, or E2.

- If no action is taken, the deteriorating transportation conditions in the project area would progressively limit economic activity. As a result, the No-Build Alternative would adversely effect employment opportunities in the project area.

4. INCOME

a. Current Trends and Characteristics

Table III-20 profiles the personal and supplemental income characteristics of the project area from 1980 to 1988. Personal income has steadily increased in the project area since 1980. Income levels in Frederick and Shenandoah Counties have far exceeded those levels recorded in the West Virginia counties. Recently, Mineral County has registered the highest personal income levels in the West Virginia portion of the project area, surpassing Randolph County in 1986.

Unemployment insurance payments, relative to the unemployment rate, peaked in 1985 within most of the project area. Recorded payments in Randolph County have consistently exceeded payments made in other counties.

TABLE III-20

PERSONAL AND SUPPLEMENTAL INCOME PROFILE: 1980-1988 ($Millions)

COUNTY / Statistics	TOTAL PERSONAL INCOME (1)	SUPPLEMENTAL INCOME ASSISTANCE (2)	RETIREMENT/ DISABILITY INCOME (3)	UNEMPLOYMENT INSURANCE INCOME (4)
GRANT				
1980	$70,290	$2,648	$7,575	$802
1990	$116,312	$1,982	$13,772	$635
% CHANGE	40%	-25%	45%	-21%
HAMPSHIRE				
1980	$95,333	$2,402	$11,224	$419
1990	$183,347	$2,961	$23,727	$361
% CHANGE	48%	19%	53%	-14%
HARDY				
1980	$64,070	$1,847	$7,592	$567
1990	$126,662	$1,978	$15,040	$319
% CHANGE	49%	7%	50%	-44%
MINERAL				
1980	$199,434	$3,390	$24,931	$1,305
1990	$312,726	$4,348	$45,030	$1,054
% CHANGE	36%	22%	45%	-19%
PENDLETON				
1980	$42,183	$1,399	$5,276	$556
1990	$76,773	$1,553	$10,344	$249
% CHANGE	45%	10%	49%	-55%
RANDOLPH				
1980	$211,651	$3,239	$28,018	$3,239
1990	$302,296	$2,052	$46,595	$2,052
% CHANGE	30%	-37%	40%	-37%
TUCKER				
1980	$55,537	$1,109	$8,131	$963
1990	$84,878	$1,469	$12,666	$680
% CHANGE	35%	25%	36%	-29%
***FREDERICK**				
1980	$437,858	$3,989	$38,502	$3,430
1990	$961,283	$4,374	$83,972	$2,206
% CHANGE	45%	9%	54%	-36%
SHENANDOAH				
1980	$236,503	$1,814	$26,083	$1,562
1990	$489,892	$2,456	$46,250	$903
% CHANGE	52%	26%	44%	-42%

Notes

(1) Includes all wages, salaries, business income, investment income and other sources of income earned by the county's citizens.

(2) Includes Supplemental Security Income (SSI) payments, Aid to Families with Dependent Children (AFDC) and food stamps.

(3) Includes Old-Age, Survivors, and Disability Insurance (OASDI), Military Retirement Pay, and other federal and state retirement pay.

(4) Includes all federal and state administered unemployment insurance benefit programs.

Retirement/disability income generally reflects the size of the elderly population residing within an area. The level of supplemental income assistance is often influenced by economic conditions and correlates to the number of households with income deficiencies. While supplemental assistance payments peaked in most counties during the mid-1980's, retirement/disability income steadily increased. This trend is indicative of an aging population and/or an influx of elderly residents. Areas not experiencing a modest reduction in supplemental income assistance included Grant, Mineral, Pendleton, Tucker, and Shenandoah Counties.

Between 1980 and 1988, the annual rate of income growth declined in manufacturing; transportation and distribution; and services, trade, and government. During the 1970s, the manufacturing industry led the other industries in the rate of income growth. Since 1980, however, the rate of income growth within manufacturing has substantially declined in most counties, falling below the other industries. The retail service and governmental sector, generating the highest percentage of income in the region over the past 20 years, registered the highest rate of income growth in the 1980s. The expanding regional tourism industry contributed to this growth.

b. Potential Project Effects

Economic development specialists with the WV Economic Development Council and the Region VII and VIII Planning and Development Councils agree that implementation of the Build Alternative would open the markets of the East Coast and Midwest to businesses throughout the project area. This improved accessibility would be expected to attract investment and increase corporate interest. Based on the project area's supply of natural resources, its already successful tourism industry, its existing industrial and distribution capabilities, and its proximity to some of the largest markets in the country, there exists opportunities for the development of beneficial market relationships. Such relationships would enhance the income earning potential of residents and industries in the project area (Region VII Planning and Development Council, 1990; Region VIII Planning and Development Council, 1990; and Associated Press, 1990).

If no action is taken, the deteriorating transportation conditions in the project area would progressively limit economic activity and tourism. As a result, the No-Build Alternative would adversely affect long-term income opportunities in the project area.

H. PEDESTRIAN AND BICYCLE INVOLVEMENTS

The existing routes within the study area do not contain provisions for either pedestrian or bicycle use nor do future construction activities contain provisions for their implementation. West

Virginia's *Statewide Comprehensive Outdoor Recreation Plan: 1988-1992* and Virginia's *1989 Virginia Outdoors Plan* do not indicate plans to implement formally designated bikeways or bicycle routes in the study area in the future.

Bicycling is one of the fastest-growing outdoor recreation activities. The mountainous, rural scenic beauty of the study area is a major attraction to the bicycling public. Off-road cycling trails and forest roads are located throughout the Monongahela National Forest. Current on-road cycling opportunities are limited because of the narrow roads and narrow shoulders. Since Appalachian Corridor H would be designed to be a high speed facility, it is anticipated that the roadway design would not include sidewalks or bikeways. If, during preliminary design, a localized bicycle or pedestrian route is interrupted by the preferred corridor, the facility design would incorporate access provisions. This would be via a culvert tunnel or an overpass.

I. AIR QUALITY

Under the Clean Air Act of 1970, the Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for the protection of public health and welfare. The NAAQS addresses six major air pollutants, of which FHWA requires Carbon Monoxide (CO) to be evaluated in detail. Carbon Monoxide is noxious at high concentrations and can be analyzed on a microscale because it is more stable than the other five air pollutants, thus making model predictions more accurate. The NAAQS for CO are: a maximum 1-hour concentration of 35 parts per million (ppm) and a maximum 8-hour concentration of 9 ppm. Neither of the maximum concentrations are to be exceeded more than once a year.

1. METHODOLOGY

The NAAQS have not changed since the 1981 DEIS but the methodologies used to analyze the impact of transportation projects on air quality have been updated substantially. In 1984, FHWA published *Fundamentals of Air Quality for Highway Planning and Project Development* to provide technical guidance. In addition, the current FHWA Technical Advisory provides guidelines for conducting air quality analyses for National Environmental Policy Act (NEPA) and Section 4(f) projects.

The computer models utilized in air quality impact assessments have also undergone several revisions. To address these changes in methodologies, an air quality assessment of the worst-case conditions was conducted for the following scenarios:

- **Year 1990 Existing Condition**
- **Year 2000 No-Build Condition**
- **Year 2000 Build Condition**
- **Year 2010 No-Build Condition**
- **Year 2010 Build Condition**

Under the Year 1990 Existing Condition, Year 2000 No-Build Condition, and Year 2010 No-Build Condition, the worst-case traffic condition for the Elkins to Winchester route is along US 50, between Gore and Winchester, Virginia; for the Elkins to Strasburg route, the worst-case traffic condition is along US 33, between Elkins and Canfield. The worst-case traffic condition was identified for all Schemes under the Year 2000 Build Condition and the Year 2010 Build Condition. For Schemes A, B, and C, the corridor with the worst predicted traffic in year 2000 and 2010 would be between Elkins and Alpena. For Scheme D, the worst-case traffic would occur between Thomas and Davis. For Scheme E, the worst-case traffic would occur between Gore and Winchester. The traffic data used for the worst-case conditions is documented in greater detail in the *Traffic and Transportation Technical Report*, available from WVDOT.

Vehicular emission rates were developed using MOBILE 4, EPA's Mobile Source Emission Program. The currently approved CO dispersion model CALINE 3, was used to predict CO concentrations. The worst-case conditions were selected for the following model variables: wind speed of one meter per second; meteorological stability class F; mixing height of 1,000 feet; and a surface roughness of 120 (corresponding to low density development). The predicted 1-hour CO concentrations were added to a background concentration of 2.0 ppm. The results of the predicted1-hour CO concentrations under the various conditions are presented on Table III-21.

The 8-hour CO concentration was calculated by multiplying the 1-hour CO concentration by a meteorological persistence factor (0.6) to account for changes in atmospheric conditions. This number was then multiplied by a traffic persistence factor (0.75) to account for lower average hourly traffic volumes over the 8-hour period. The results of the predicted 8-hour CO concentrations under the various conditions are presented on Table III-21.

2. AFFECTED ENVIRONMENT

The project is in an area where the State Implementation Plan does not contain any transportation control measures. Therefore, conformity with procedures of 23 CFR 770 would not apply to this project. The Clean Air Amendments of 1991 do not require any additional analyses for the study area since all of the counties are in attainment.

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TABLE III-21
AIR QUALITY ANALYSIS: WORST-CASE TRAFFIC SEGMENTS

ROADWAY CONDITION (Year)	ROUTE	WORST-CASE ROADWAY SEGMENT	AVERAGE DAILY TRAFFIC	PEAK HOUR TRAFFIC	SPEED (mph)	1-HOUR CO		8-HOUR CO	
						NAAQS (ppm)	Predicted * (ppm)	NAAQS (ppm)	Predicted * (ppm)
EXISTING (1990)	**Elkins to Winchester**	US 50 - Gore to Winchester	8,800	968	50	*35*	**2.7**	*9*	**1.2**
	Elkins to Strasburg	US 33 - Elkins to Canfield	5,800	638	49	*35*	**2.4**	*9*	**1.1**
NO-BUILD (2000)	**Elkins to Winchester**	US 50 - Gore to Winchester	9,400	1,034	50	*35*	**2.3**	*9*	**1**
	Elkins to Strasburg	US 33 - Elkins to Canfield	9,200	1,012	49	*35*	**2.3**	*9*	**1**
BUILD (2000)	**Scheme A**	Elkins to Alpena	10,300	1,133	51	*35*	**2.3**	*9*	**1**
	Scheme B	Elkins to Alpena	10,300	1,133	51	*35*	**2.3**	*9*	**1**
	Scheme C	Elkins to Alpena	10,300	1,133	51	*35*	**2.3**	*9*	**1**
	Scheme D	Thomas to Davis	6,600	726	51	*35*	**2.2**	*9*	**1**
	Scheme E	Gore to Winchester	10,500	1,155	48	*35*	**2.3**	*9*	**1**
NO-BUILD (2010)	**Elkins to Winchester**	US 50 - Gore to Winchester	10,000	1,100	52	*35*	**2.3**	*9*	**1**
	Elkins to Strasburg	US 33 - Elkins to Canfield	13,700	1,507	39	*35*	**2.5**	*9*	**1.1**
BUILD (2010)	**Scheme A**	Elkins to Alpena	15,800	1,738	51	*35*	**2.5**	*9*	**1.1**
	Scheme B	Elkins to Alpena	15,800	1,738	51	*35*	**2.5**	*9*	**1.1**
	Scheme C	Elkins to Alpena	15,800	1,738	51	*35*	**2.5**	*9*	**1.1**
	Scheme D	Thomas to Davis	9,300	1,023	51	*35*	**2.3**	*9*	**1**
	Scheme E	Gore to Winchester	14,900	1,639	48	*35*	**2.4**	*9*	**1.1**

* Includes background predicted CO concentrations

3. POTENTIAL IMPACT ASSESSMENT

The results of the general microscale analysis for each existing and proposed roadway under each condition (Build and No-Build) are presented in Table III-21. The results are summarized below.

- The predicted concentrations from all scenarios would be well below the NAAQS.

- The scenario for the Year 1990 Existing Condition (along the Elkins to Winchester route) has the highest predicted CO concentrations.

- There would be little difference among predicted CO concentrations for the Year 2000 and Year 2010 Build and No-Build Conditions.

Following the selection of a preferred corridor and the initiation of detailed alignment studies, a detailed assessment of air quality impacts would be conducted based on currently accepted practices.

- The air quality emissions inventory contained within the State Implementation Plan (SIP) will be referenced and summarized. The relationship between the proposed project and the SIP will be described.

- A Carbon Monoxide screening procedure will be used to determine those areas with sufficient traffic volumes and other characteristics to warrant a site specific microscale CO analysis.

- For any receptor warranting a microscale analysis, MOBILE 4 and CALINE 3 will be used to predict site specific air quality impacts.

J. NOISE

The primary purpose of this corridor-level noise analysis is to provide comparative numbers among the Schemes that can be used to assist in the selection of a preferred corridor for the subsequent detailed analysis in the Alignment Selection SDEIS. As such, the results of the analysis on Table III-22 for the worst-case traffic segments present the distance from the edge of pavement at which FHWA's Noise Abatement Criteria (NAC) would be reached for an at-grade situation. This information will be useful in the initial development of highway alignments within the preferred

TABLE III-22
NOISE ANALYSIS: WORST-CASE TRAFFIC SEGMENTS

ROADWAY CONDITION	ROUTE	WORST-CASE ROADWAY SEGMENT	AVERAGE DAILY TRAFFIC (ADT)	NAC LIMIT	CRITICAL DISTANCE TO RECEPTOR (ft.)
EXISTING (1990)	**Elkins to Winchester**	US 50 - Gore to Winchester	8,800	67 dBA	250
	Elkins to Strasburg	US 33 - Elkins to Canfield	5,800	67 dBA	250
	Elkins to Strasburg	SR 55/28 - Seneca Rocks to Petersburg	5,800	67 dBA	200
NO-BUILD (2010)	**Elkins to Winchester**	US 50 - Gore to Winchester	10,000	67 dBA	300
	Elkins to Strasburg	US 33 - Elkins to Canfield	13,700	67 dBA	350
BUILD (2010)	**Scheme A**	Elkins to Alpena	15,800	55 dBA	2,000
	Scheme B	Elkins to Alpena	15,800	55 dBA	2,000
	Scheme C	Elkins to Alpena	15,800	55 dBA	2,000
	Scheme D	Elkins to Montrose	9,200	67 dBA	750
	Scheme D	Thomas to Davis	9,300	67 dBA	750
	Scheme E	Gore to Winchester	14,900	67 dBA	750

Analysis based on: FHWA's STAMINA 2.0 Highway Traffic Noise Model corridor. According to the regulations governing the determination of noise impacts (23 CFR 772), traffic noise impacts occur when the predicted noise levels substantially exceed existing noise levels. During the development of the Alignment Selection SDEIS, additional field measurements of existing noise levels will be required in order to assess the impacts that specific alignments will have on existing noise levels.

The analytical methods of traffic noise prediction modeling have progressively changed since 1981. In an effort to standardize and give support to available noise prediction techniques, FHWA published the 1982 revised *Federal-Aid Highway Program Manual* (FHPM 7-7-3), entitled, "Procedures for Abatement of Highway Traffic Noise and Construction Noise". (The FHPM is composed mainly of the regulatory material found in 23 CFR Part 772.) This manual implemented the policy requiring noise prediction modeling to be consistent with the methodology in FHWA's *Highway Traffic Noise Prediction Model* (Report No. FHWA-RD-77-108).

1. METHODOLOGY

The ability to predict future noise levels based on the implementation of the proposed project is dependent upon many detailed factors. These factors include: the type of facility (roadway or structure, number of lanes, design speed, median and shoulder treatment); centerline location; right-of-way limits; horizontal and vertical roadway profile (depressed, at-grade, or elevated, as well as vertical grade and degree of curvature); average daily automobile and truck traffic volumes; surrounding topography; ambient or existing noise levels; sensitive noise receptor locations; and FHWA's *Noise Abatement Criteria* (NAC) against which noise impacts are determined. In general, residential, institutional, and public areas are considered to be more sensitive to noise than commercial and industrial sites.

At this corridor-level study, the above factors which are known include the type of proposed facility (to the extent that it would be a four-lane, divided highway with a design speed of 50 mph, and a median width of approximately 40 feet); existing (1990) and design year (2010) average daily traffic volumes for both trucks and automobiles; and those sites which would qualify as sensitive noise receptors. In keeping with the appropriate level of detail required for a corridor-level study, a noise analysis was conducted using FHWA's *STAMINA 2.0 Highway Traffic Noise Model* to predict the noise levels for the worst-case traffic segments under the following conditions:

- ***Existing (1990) Traffic Conditions:*** Elkins to Winchester and Elkins to Strasburg Routes.

- ***Future (2010) No-Build Alternative Traffic Conditions:*** Elkins to Winchester and Elkins to Strasburg Routes.

- ***Future (2010) Build Alternative Traffic Conditions:*** Schemes A, B, C, D, and E.

The worst-case roadway segment is defined as the segment that carries the highest traffic volumes, as documented in the *Traffic and Transportation Technical Report* (available from WVDOT). A worst case roadway segment was identified for all traffic conditions evaluated. The following parameters were incorporated into the model for each traffic condition.

- Predicted noise levels were estimated for assumed at-grade receptors located at distances of 50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 750, and 1,000 feet from the edge of pavement.

- Peak hour traffic was assumed to be 11 percent of the Average Daily Traffic Volumes (ADT).

- All other traffic input (percentage of automobiles, as well as medium and heavy trucks, and operating speeds) were based on data generated as part of the *Traffic and Transportation Technical Report.*

2. AFFECTED ENVIRONMENT

The entire project area is rural in nature and there are no unusual, continuous generators of noise present. Certain areas such as Dolly Sods Wilderness, Otter Creek Wilderness, Canaan Valley State Park, and Seneca Rocks (within the Monongahela National Forest's Seneca Rocks Unit of the Spruce Knob/Seneca Rocks National Recreation Area) are particularly enjoyed for their quiet atmosphere. In order to provide an example of the existing noise environment in these areas, WVDOT measured random, off-peak hour, off-season, ambient noise levels at these locations. The results of these measurements collected in September, 1992, are presented below. The closest (therefore worst-case) corridor Scheme Option to these noise-sensitive resources is identified as well.

- **Dolly Sods Wilderness:** *Ambient noise level of 43 dBA (Leq)*
  - SubScheme AE-1 (Scheme Options A2 through A7) would be the closest to Dolly Sods Wilderness at the southwesternmost point of the Wilderness area, just east of the Laneville community, along Red Creek. At this point, the corridor Scheme

Options would be within 170 to 2,170 linear feet of the Dolly Sods Wilderness boundary.

- No other corridor Scheme Options would be as close to Dolly Sods Wilderness.

- **Otter Creek Wilderness:** *Ambient noise level of 41 dBA (Leq)*
  - At their closest point (along US 33, in the vicinity of Alpena Gap), all Options under Schemes A, B, and C would come within 4,000 to 6,000 linear feet of Otter Creek Wilderness.
  - SubScheme AE-1 would also come in close proximity to Otter Creek Wilderness as it parallels Shavers Mountain. At its closest point, SubScheme AE-1 (Scheme Options A2 through A7) would come within 2,000 to 4,000 linear feet of Otter Creek Wilderness in the vicinity of Woodford Run, near benchmark 2601.
  - No other corridor Scheme Options would be as close to Otter Creek Wilderness.

- **Canaan Valley State Park:** *Ambient noise level of 48 dBA (Leq)*
  - Corridor Scheme Options B1, B2, B3, and C1 would cross the southern one-third of Canaan Valley State Park along SR 32. There would be no distance between the above Scheme Options and the Park boundary.
  - No other corridor Scheme Options would be as close to Canaan Valley State Park.

- **Seneca Rocks:** *Ambient noise level of 50 dBA (Leq)*
  - Corridor Scheme Options A1 and A8 would come in closest proximity to Seneca Rocks. In the vicinity of SR 28 (near the Seneca Rocks Visitor Center) Scheme Options A1 and A8 would be within 2,000 to 4,000 linear feet of Seneca Rocks.
  - No other corridor Scheme Options would be as close to Seneca Rocks.

Two random samples were also collected along existing four-lane sections of Corridor H that are open to traffic both west of Buchannon and east of Elkins (between Canfield and Bowden). These measurements were collected approximately 50 feet from the nearest edge of pavement. The results are presented below:

- **US 33, west of Buchannon:** *Ambient noise level of 68 dBA (Leq)*

- **US 33, east of Elkins:** *Ambient noise level of 65 dBA (Leq)*

These existing noise measurements are not intended to represent the results of a thorough ambient noise level survey of the project area and should not be interpreted as such. Rather, they are presented to give a generalized comparison of the type of noise that could be expected in sensitive recreational or wilderness areas.

During the development of the Alignment Selection SDEIS, a complete ambient noise level survey will be conducted to document the existing noise levels that could be affected by construction and operation of a highway within the preferred corridor. The ambient noise level survey and the detailed traffic noise study will meet all the requirements of the Federal Highway Administration's *Procedures for Abatement of Highway Traffic Noise and Construction Noise*.

3. POTENTIAL IMPACT ASSESSMENT

Whether or not a noise impact would occur is based on the impact criteria established in FHWA's *Noise Abatement Criteria* (NAC). For areas such as residences and parks, a noise level of 67 dBA has been identified as the noise limit. For areas such as Dolly Sods Wilderness and Otter Creek Wilderness (areas protected to preserve a wilderness experience), the applicable FHWA NAC would be 55 dBA. The distances (in feet) from edge of the existing or proposed roadway pavement to a receptor site within which potential noise impacts could occur are presented on Table III-22. Under the Existing and No-Build roadway conditions, the exact location of the edge of pavement is a known factor. For this corridor-level study, the Build roadway condition consists of 2,000 foot-wide corridors; meaning the possible location of the edge of pavement could vary by ± 2,000 feet.

Noise impacts are said to occur whenever the design year predicted noise levels approach or exceed the limits set within the NAC. For example, in design year 2010 on the worst-case roadway segments, Schemes D and E would potentially approach or exceed the NAC of 67 dBA from the hypothetical edge of pavement to a distance of 750 feet away from the pavement. In other words, noise impacts would not be expected to occur beyond 750 feet from Scheme D or E's edge of pavement. However, because the Schemes are 2,000 foot-wide corridors, the distance between the receptor and the hypothetical edge of pavement could vary by ± 2,000 feet. The results of the noise analysis are noted below.

- Under the Build condition, worst-case roadway segments for corridor Schemes D and E, the critical distance to a receptor would be 750 feet (using a threshold of 67 dBA). That is, noise impacts would not be expected to approach or exceed the NAC beyond 750 feet from the hypothetical edge of pavement.

- Based on the worst-case roadway segment scenario, corridor Schemes A, B, and C would be in the proximity of Otter Creek Wilderness. Therefore, a threshold of 55 dBA was used for the noise analysis along the Elkins to Alpena roadway segment.

- At its closest point (under the worst-case roadway segment scenario), corridor Schemes A, B, and C would come within 4,000 to 6,000 linear feet of Otter Creek Wilderness. Based on the noise analysis, the critical distance to the sensitive Otter Creek Wilderness receptor would be 2,000 feet.

- Under the Existing and No-Build conditions, a threshold of 67 dBA was used along the Elkins to Canfield roadway segment because the roadway is an existing structure which already introduces traffic noise into the area. For this roadway segment, the critical distance to a receptor would be between 250 feet (Existing condition) to 350 feet (No-Build condition). Noise impacts would not be expected to occur 250 or 350 feet beyond edge of pavement for the respective conditions.

4. POTENTIAL MITIGATION MEASURES

The traffic noise study that is to be prepared for the alignments within the preferred corridor will provide a complete analysis of any noise abatement measures that may be required to eliminate or mitigate traffic noise impacts. These noise impacts may be a result of either exceeding the NAC or substantially increasing noise levels above those which now exist and would continue to exist if the road were not constructed. The types of noise abatement measures that may be considered include:

- Constructing noise barriers made of concrete, stone, or wood;

- Constructing earthen noise barriers, possibly using excess excavation from the construction of the highway;

- Shifting the centerline of the highway further away from a sensitive receptor; and

- Depressing the roadway below the level of the sensitive receptor.

These are examples of methods that can be used individually or in combination with each other to eliminate or mitigate traffic noise impacts. If noise abatement measures are necessary, WVDOT will consult with the owners or managers of the affected sensitive receptors prior to implementing any specific noise abatement techniques.

K. WATER RESOURCES

The Water Resources Assessment follows the guidance of FHWA Technical Advisory T6640.8A. The assessment addresses major streams, rivers, reservoirs, and springs within the corridor Scheme Options. Detailed information about the Water Resources Assessment can be found in the *Natural Resources Technical Report,* available from WVDOT.

1. METHODOLOGY

Many standard methods employed for environmental impact assessments are quantitative in nature, requiring intensive data collection or impact modeling. Due to the size of the project area and the length and width of the corridors, such an approach for this project is not practical. Therefore, a qualitative but methodical approach has been taken to assess the water resources and potential impacts within the project area.

a. Identification

This assessment focuses on the perennial streams and impoundments within the study area. Perennial streams support the majority of recreational, economic, and esthetic uses; fishery and wildlife habitat; and the other functions of surface waters in the project area. Intermittent streams provide some of these functions but generally to a lesser degree than perennial streams. Perennial streams and impoundments were initially identified based on 7.5 minute U.S.G.S. topographic maps. However, this mapping was not sufficiently detailed for identification of all intermittent streams in the study area. Field surveys were conducted of all identified perennial streams. In addition, certain streams identified on the mapping as intermittent, but based on drainage area or other factors were thought to potentially be perennial, were reviewed in the field.

b. Stream Classification

Existing information concerning classification of streams in the study area was collected from the West Virginia Department of Natural Resources, the Virginia State Water Control Board, and the Potomac River Basin and Monongahela River Basin Plans. During field surveys, qualitative assessments were made of the substrate, streamflow, riparian vegetation, fish and benthos populations, and water quality.

Under the legislation of both West Virginia and Virginia, High Quality streams are those which exceed the minimum standards applicable to their designated use. Since this is a corridor-level study, it is not appropriate to analyze water quality data to determine which streams meet or exceed their respective standards. Therefore, all streams were assumed to be High Quality unless they qualified for a classification which receives even greater protection, such as National Resource Waters in West Virginia.

"National Resource Waters" (NRW) is the West Virginia designation for streams which are afforded the highest level of protection. The following criteria qualify a stream as NRW:

- Presence of Threatened or Endangered species or habitat;
- Presence of naturally reproducing trout populations;
- All federally designated rivers under the "Wild and Scenic Rivers Act";
- Located within a state or federal forest or recreational area.

The Virginia equivalent to the West Virginia NRW is the Virginia "Outstanding State Resource Waters" (OSRW). The following criteria qualify a stream as OSRW:

- All designated rivers under the Virginia Scenic Rivers Act;
- All Class I and II trout streams;
- Waters containing Endangered or Threatened species.

There are no Virginia streams or rivers found in the project area which meet the criteria for Outstanding State Resource Waters.

c. **Impact Probability**

The probability for impacting streams in the project area was assessed for each stream involvement. There are a number of factors which contribute to the potential impact a highway project may have on a stream. A major factor determining the probability of the project impacting a stream is the orientation (perpendicular versus parallel) of the corridor to the stream. If the corridor is parallel to the stream, there is the potential for encroachment into floodplains, riparian areas, and stream channels, or in the worse case, require the relocation of the entire stream. When the corridor is perpendicular to the stream, the eventual crossing of the stream can be accomplished by bridges or culverts.

At a corridor-level study, it is not appropriate to determine the actual impacts to streams since many design specific details (such as angle of crossing, type of crossing, length of relocated channel, and length of stream loss to relocation), will not be available until the next step in the study process. Therefore, in order to evaluate the potential impacts of this project on the streams within the corridors, the orientation of the 2,000 foot-wide corridors to the streams was used as an estimate of the type of potential impacts each stream would experience.

Each involvement of a stream with one of the corridors received an impact probability rating of "High", "Moderate", or "Low", based on the stream orientation, the potential for utilizing existing crossings, and the potential to avoid the stream.

Situations were there would be a high probability for impacts to the streams were considered to be: new stream crossings; long stretches (> 3,000 feet) of parallel construction; or shorter stretches of parallel construction for which avoidance of the stream is not possible.

The probability of impacts were evaluated as moderate in cases which would require: modification or replacement of an existing crossing (i.e. replacing an existing two-lane bridge with a four lane structure); a moderate length of parallel construction; or there is some potential for avoidance of the stream.

Situations where there would be a low probability for impacts to the stream included: corridors where existing crossings via structures or culverts could be utilized; and where the potential to avoid the stream is high or parallel construction is minimal (< 500').

2. AFFECTED ENVIRONMENT

This section briefly describes the water resources found within the corridor Scheme Options.

a. Watersheds

The project area is drained by two major river systems: the Monongahela River and the Potomac River. Each river system is composed of several major watersheds and smaller subwatersheds.

The Monongahela River drains portions of West Virginia, Pennsylvania, and Maryland toward the Mississippi River. The West Virginia portion of the Monongahela River watershed comprises a total area of 4,180 square miles. Within the project area, the watershed of the Monongahela River is composed of the Cheat River and Tygart Valley River watersheds.

The Potomac River drains portions of West Virginia, Virginia, Maryland, Pennsylvania, and the District of Columbia toward the Chesapeake Bay and the Atlantic Ocean. Within West Virginia, the Potomac River drains 3,490 square miles. The major subwatersheds within the watershed of the Potomac River include the South Branch of the Potomac River, the North Branch of the Potomac River, the Cacapon River, and the Shenandoah River.

b. Streams

As shown on Exhibit III-6, there are a total of 146 individual streams within the corridors. In many cases the same streams are impacted at different locations by different Scheme Options, resulting in 163 separate potential involvements with streams. Table III-23 presents the number of streams in each classification for each Scheme Option. A summary of the existing stream resources is provided below.

- There are a total of 89 National Resource Waters designated streams, representing 61 percent of the total number of streams in the project area;
- Fifty-seven High Quality streams were identified, representing 39 percent of the total number of streams in the project area;
- In the project area, a total of 43 streams contain native or stocked trout and 90 streams are listed as West Virginia High Quality Streams;
- Eleven streams are included in the Nationwide Rivers Inventory and five are used as municipal drinking water supplies; and
- None of the streams within the project area support any known listed Endangered or Threatened species.

c. Impoundments

Three large impoundments located within the project area were identified: Linton Creek Impoundment in Grant County provides flood control and recreational trout fishing; Thorn Run Impoundment, a tributary of Patterson Creek, is used for flood control and recreational trout fishing; and Mount Storm Lake supplies cooling water for a coal fired power generation facility. A fourth impoundment, Stony River Reservoir, was drained by the owners in 1986 due to concerns over

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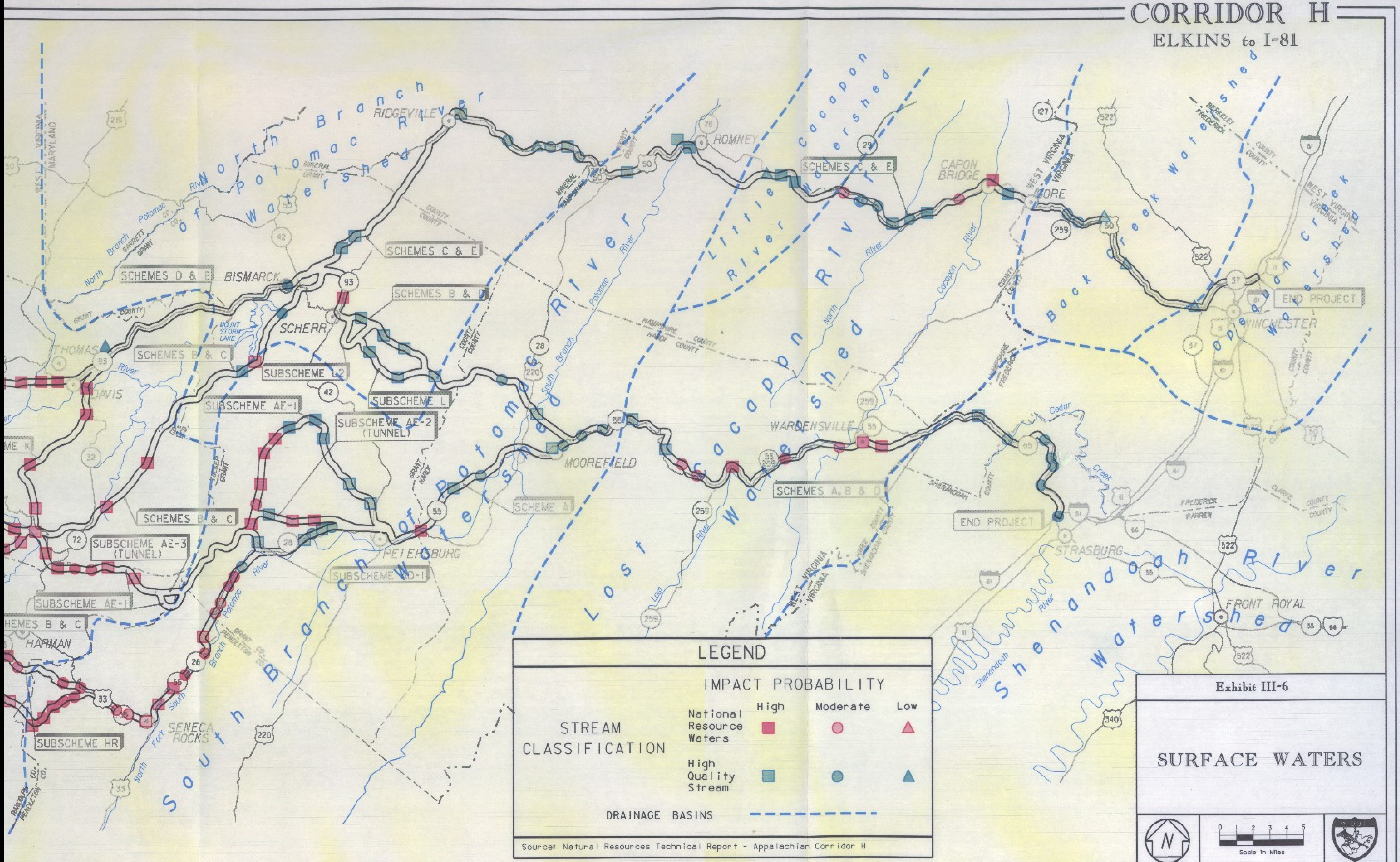

CORRIDOR H
ELKINS to I-81
North Branch Potomac River Watershed
South Branch of Potomac River Watershed
Little Cacapon River Watershed
Lost Cacapon River Watershed
Back Creek Watershed
Opequon Creek Watershed
Shenandoah River Watershed
RIDGEVILLE
ROMNEY
CAPON BRIDGE
GORE
WINCHESTER
BISMARCK
SCHERR
THOMAS
DAVIS
MOOREFIELD
WARDENSVILLE
PETERSBURG
STRASBURG
FRONT ROYAL
HARMAN
SENECA ROCKS
MOUNT STORM LAKE
SCHEMES C & E
SCHEMES D & E
SCHEMES B & D
SCHEMES B & C
SUBSCHEME L2
SUBSCHEME L
SUBSCHEME AE-1
SUBSCHEME AE-2 (TUNNEL)
SUBSCHEME AE-3 (TUNNEL)
SUBSCHEME HR
SUBSCHEME WD-1
SCHEME A
SCHEMES A, B & D
END PROJECT
LEGEND
IMPACT PROBABILITY
High
Moderate
Low
STREAM CLASSIFICATION
National Resource Waters
High Quality Stream
DRAINAGE BASINS
Source: Natural Resources Technical Report - Appalachian Corridor H
Exhibit III-6
SURFACE WATERS
Scale in Miles

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TABLE III-23
STREAM CLASSIFICATION

	A								B						C		D						E		PROJECT
CLASSIFICATION	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**C1**	**C2**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**E1**	**E2**	**TOTAL**
National Resource Waters	39	25	24	26	25	24	26	39	20	20	20	21	21	21	11	12	22	22	22	21	21	21	13	12	***89***
High Quality	24	28	24	23	28	24	23	21	24	23	22	24	23	24	33	34	24	22	22	22	20	23	34	33	***57***
TOTAL # STREAMS	***63***	***53***	***48***	***49***	***53***	***48***	***49***	***60***	***44***	***43***	***42***	***45***	***44***	***45***	***44***	***46***	***46***	***44***	***44***	***43***	***41***	***44***	***47***	***45***	***146***
# STREAMS MEETING RESOURCE CRITERIA																									
Threatened or Endangered Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	***0***
WV High Quality Streams	31	23	21	21	22	20	20	31	22	20	19	24	22	21	29	23	18	16	15	14	12	16	16	14	***90***
Native and Stocked Trout	23	12	12	13	10	10	11	23	16	16	16	17	17	17	16	17	9	9	9	7	7	7	9	7	***43***
Nationwide Rivers Inventory	6	5	5	6	5	5	6	6	5	5	6	5	5	5	5	5	3	3	3	3	3	3	3	3	***11***
Public Drinking Water Source	2	2	2	2	2	2	2	2	0	0	0	1	1	1	0	1	4	4	3	2	2	2	4	1	***5***

the stability of the dam structure. Small impoundments (i.e., farm ponds) are included under the assessment of wetlands (Section III-L).

d. Groundwater

In the project area, groundwater provides both the primary source of potable water, as well as the principle source of streamflow. Large industries utilize surface water, but groundwater (wells and springs) is the sole source for many private, small commercial/industrial, and public water users. Groundwater is intimately connected to the precipitation and surface water flows. The percent of total streamflow contributed by groundwater ranges from 60 to 85 percent in shale and limestone areas, respectively. During periods of base flow (summer and early fall) a substantial portion of streamflow is provided by groundwater. In some areas, perched streams also recharge groundwater by loosing surface water to underlying caverns and fractures.

The largest groundwater supplies are obtained from sandstone and carbonate-rock (limestone) aquifers containing secondary cavities such as faults, joints, or solution cavities. Sandstone is generally considered the most reliable for small wells, providing moderate quantities of good quality groundwater. Limestone, which often has large fractures and cavities, contains springs which can produce hundreds to thousands of gallons per minute. Shale and siltstone are poor sources of groundwater due to a lack of secondary openings; yet they underlie much of the stream valleys where populations are concentrated. In areas with permeable sandstone and limestone, a majority of precipitation infiltrates to become groundwater, while in areas underlain with shale or siltstone, a larger amount of the precipitation contributes to surface flow.

The project area is located within two large river basins: the Monongahela River basin to the west of the Allegheny Front, and the Potomac River basin in the Ridge and Valley physiographic province and the Appalachian Plateau near Mount Storm. The portions of these basins which lie west of the Allegheny Front receive more precipitation then the portions lying to the east of the front, which is reflected in the quantity of groundwater available. Each of these basins is composed of geological formations which, in varying degrees, account for the storage, transfer, and discharge of groundwater.

Within the Monongahela River basin, groundwater is obtained from consolidated bedrock in which sandstones are the most reliable source. The most favorable sources are the Pottsville and Allegheny Groups (found along the Backwater River) and the Greenbrier limestone and the Pocono Formation (found in Canaan Valley and along several stream valleys). Wells which tap these aquifers provide up to 250 gallons per minute (gpm), averaging 45 gpm. Yields from springs in

Greenbrier limestone can provide 50 to 1,000 gpm. Other formations within the basin have fair to good potential for small wells.

Within the project area, the most plentiful sources of groundwater in the Potomac River basin are the Pottsville Group and Allegheny Formation west of the Allegheny Front. However, groundwater in this area tends to have high iron, low pH, and excessive sulfate due to the presence of coal seams. Along the ridges (such as Mill Creek Mountain and Patterson Creek Mountain) wells yield up to 200 gpm from the Helderberg Group (limestone) and Oriskany Sandstone. In the valleys, wells generally yield less than 70 gpm from the Pocono Group (sandstone and some shale) and Brallier Formation (shale and some sandstone). Along some of the larger rivers, a few wells tap groundwater in the alluvial soils along the river, particularly near Petersburg and Moorefield. Water quality in the basin is acceptable, although sometimes hard, in areas with sandstone or limestone aquifers. In over half of the basin, groundwater in shale areas is high in iron. In addition, there are localized areas with poor water quality due to high levels of nitrate, chloride, and sulfate.

e. Public Water Supply

Both ground and surface water are used as sources of municipal drinking water, although surface water sources provide most of the supply. The rural population of the project area primarily uses individual groundwater wells for drinking water.

f. Bowden National Fish Hatchery

The Bowden National Fish Hatchery, located approximately eight miles east of Elkins, WV, is managed by the U.S. Fish and Wildlife Service. It is the largest hatchery in West Virginia, producing over 357,000 brook, brown, and rainbow trout, as well as over five million fingerling walleye for in-state and out-of-state stocking. The Hatchery also produces 120,000 striped bass for release in tributaries of the Chesapeake Bay to support the Chesapeake Bay Restoration Plan.

Bowden Fish Hatchery relies on three water sources for its water supply: the North Spring, the South Spring, and Shavers Fork River. These three sources are combined to provide the optimum quantity and quality of water required to sustain hatchery operations.

Shavers Fork is located on the southern edge of the Bowden Hatchery. Its use is limited to fish runways in the spring due to seasonal fluctuations in temperature and water quality. Shavers Fork receives both groundwater and surface water runoff from the watershed upstream of the Hatchery.

The South Spring is also a limited water source for the hatchery. Prior to 1972 this spring was heavily utilized by the hatchery because it provided large volumes of cold, high quality water. In 1972, roadway construction resulted in severe turbidity in the South Spring and the loss of a large number of fish in the hatchery. These problems prompted investigations by the West Virginia Department of Highways, the United States Geological Survey, the U.S. Fish and Wildlife Service, and the U.S. Forest Service. The principle source of turbidity at the spring was contaminated surface runoff that flowed into caverns which were exposed during highway construction. Not until construction was finished and the water cleared was it again utilized by the hatchery for fish production. However, the flow rate never regained its pre-construction level. The South Spring is now used when water quantity and quality permits. The Spring is located 2,500 feet to east of the hatchery grounds, where the water is collected and piped to the hatchery for use. The recharge area for the South Spring is roughly a five hundred acre area south of Shavers Fork along the northeast slope of Pond Lick Mountain.

The North Spring is the largest water source for the hatchery. It is able to supply 2.2 million gallons of water per day. The water from the North Spring is of the optimum temperature and water quality to sustain the most critical phases of hatchery production. Any damage to the North Spring could seriously affect the production levels of the hatchery. The North Spring is located 2,000 feet to the east of the hatchery property where it is captured and piped to the hatchery for use. The recharge area, though not completely defined, is located along the watersheds of Taylor Run and Wilson Run.

3. IMPACT PROBABILITY

The assessment of the probability for impacts from the Corridor H project on various water resources is presented in this section. Specific sections of the assessment address the potential impacts to streams, impoundments, groundwater, drinking water supplies, and the Bowden Fish Hatchery. The general location of all stream involvements, their stream classification, and probability for impacts are identified on Exhibit III-6.

a. <u>Watersheds</u>

There are nine separate watersheds within the project area, of which each Scheme Option would involve between five and eight. Table III-24 presents these watersheds and the streams within them that are affected by the corridor Scheme Options. Between 15 and 18 streams within the Monongahela River System and between 23 and 48 streams within the Potomac River System would be affected by the proposed project. The assessment of stream involvements for each watershed provides some estimation of the potential cumulative impacts to water resources.

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TABLE III-24
STREAMS AND WATERSHEDS

WATERSHED	Total in Project Area	NUMBER OF STREAMS WITHIN EACH WATERSHED																							
		A								B						C		D						E	
		A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	C1	C2	D1	D2	D3	D4	D5	D6	E1	E2
MONONGAHELA RIVER SYSTEM																									
TYGART VALLEY RIVER	13	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	9	9	9	6	6	6	9	6
CHEAT RIVER	41	12	15	15	15	15	15	15	12	13	13	13	15	15	15	13	15	10	10	10	11	11	11	10	11
SubTotal	**54**	**15**	**18**	**18**	**18**	**18**	**18**	**18**	**15**	**16**	**16**	**16**	**18**	**18**	**18**	**16**	**18**	**19**	**19**	**19**	**17**	**17**	**17**	**19**	**17**
POTOMAC RIVER SYSTEM																									
NORTH BRANCH	16	0	0	0	0	0	0	0	0	8	7	6	7	6	7	11	9	7	5	5	6	3	7	9	9
SOUTH BRANCH	44	34	21	16	17	21	16	17	31	6	6	6	6	6	6	2	2	6	6	6	6	6	6	2	2
LITTLE CACAPON	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	3	3
CACAPON RIVER	19	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
BACK CREEK	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	4	4
OPEQUAN CREEK	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
SHENANDOAH RIVER	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	0	0	5	5	5	5	5	5	0	0
SubTotal	**92**	**48**	**35**	**30**	**31**	**35**	**30**	**31**	**45**	**28**	**27**	**26**	**27**	**26**	**27**	**30**	**28**	**27**	**25**	**25**	**26**	**23**	**27**	**28**	**28**
GRAND TOTAL	**146**	**63**	**53**	**48**	**49**	**53**	**48**	**49**	**60**	**44**	**43**	**42**	**45**	**44**	**45**	**46**	**46**	**46**	**44**	**44**	**43**	**40**	**44**	**47**	**45**

Streams with impacts at multiple locations are counted only once per watershed

- Schemes A, B, and D would result in the largest number of involvements with the South Branch of the Potomac River watershed and with the Shenandoah River watershed.

- Schemes C and E would result in the highest number of stream involvements in the watersheds of the Tygart Valley River, Little Cacapon River, Back Creek, Opequan Creek, and the North Branch of the Potomac River.

- Schemes A, B, and C would potentially involve more streams in the Cheat River watershed than the other Schemes.

- Overall, Scheme A would involve in the greatest number of streams (48-63) within the fewest number of watersheds (4).

- The South Branch of the Potomac River watershed would contain the largest number of potentially impacted streams.

b. **Streams**

The types of potential impacts from highway construction to surface water resources include changes in hydrology and geomorphology, degradation of water quality, and loss or degradation of aquatic and riparian habitats. These impacts are often interrelated and interdependent and can occur as short-term impacts during construction or as long-term impacts due to the location, design, and operation of the facility.

Soil erosion and sedimentation of water bodies represents the greatest potential impact to water quality and aquatic habitat during construction. The combination of steep slopes, erodible soils, extensive excavation, clearing, and grading are major factors contributing to these problems. The results of these problems include loss of habitat and degradation of water quality.

Stream crossings can cause various impacts to water resources. Typically, stream crossings involve either a bridge or a culvert. Bridges are more commonly used to cross wide streams and rivers or to span deep valleys. Culverts are generally used for smaller streams. The fill typically associated with culverts may create a barrier across a stream valley, encroaching upon floodplains and riparian habitat and interrupting wildlife movements. In addition, the culvert itself also may create a barrier to movement of aquatic life within the stream. In comparison to a culvert, a bridge typically results in less impact to the floodplain and stream hydrology. Bridges also present less of a physical barrier to terrestrial and aquatic wildlife movements. Bridges may result in fewer environmental impacts, but often are too expensive for their use to be justified for all but larger stream crossings.

Construction parallel to a stream can result in encroachment on, or relocation of, a stream channel. Encroachment into a channel may result in direct loss of aquatic habitat and potential alteration of hydrology and water quality. Reduction in stream length and straightening of the channel results in increased stream velocity, which, in turn, results ultimately in the loss of stream habitat.

The major source of surface water pollution during operation of a highway is deposition of pollutants by vehicles. The amounts and types of pollutants deposited depend on factors such as traffic characteristics, highway design, maintenance activities, surrounding land use, climate, and accidents. Pollutants are washed from the highway into a stream primarily by stormwater. The effects of polluted highway runoff on receiving waters depend on the amount of stormwater runoff that discharges to the stream and the existing stream flow. Because of the low traffic volume predicted for this project (fewer than 14,000 vehicles per day), the potential water quality impacts from vehicle-derived pollutants are expected to be minimal.

There are a total of 163 separate potential stream involvements within the project area. Table III-23 presents the total number of stream involvements, the number of National Resource Waters and High Quality streams for each Scheme Option. The stream involvements are summarized below:

- In general, Scheme A has the largest number of stream involvements with Scheme Option A1 having the most (63);
- Scheme Option D5 would involve the least number of streams (41);
- Scheme Options A1 and A8 would involve the highest number of National Resource Waters while Schemes C and E would involve the least;
- Scheme Options A1 and A8 would involve the greatest number of streams containing native and stocked trout; while Schemes D and E would involve the least;
- Schemes A, B, and C would involve the largest number of streams listed in the Nationwide Rivers Inventory (NRI);

Table III-25 presents the assessment of potential impacts for each Scheme Option. Out of the total of 163 stream involvements for all corridor Scheme Options combined, 118 are perpendicular to the corridors and 45 are parallel corridor involvements, representing 73 and 27 percent of the total, respectively. The orientation of the corridor to the stream (i.e. parallel vs perpendicular) may not represent the actual orientation of the highway to the stream, but can serve as a guide to the potential types of impacts that could be anticipated at this stage in the planning process. Corridor Scheme Options with the highest and lowest number of involvements are as follows:

- Scheme Option A1 has the greatest number of perpendicular involvements (47) and Scheme Option A1 or B6 would have the greatest number of parallel involvements (16 each);

- Scheme Options B6 and D5 would have the fewest number of perpendicular involvements (29 each), while Scheme Options A3, A5, A6, and C1 would have the fewest number of parallel involvements (10 each).

Within the project area, there is a combined total of 94 stream involvements for all Scheme Options rated as having a High impact probability. This represents 58 percent of the total number of stream involvements. Because many new stream crossings and areas of parallel construction would be expected as a result of construction of the proposed facility, there are a large number of streams which have been determined to have a High probability for being impacted. A total of 57 streams are rated as having a Moderate impact probability (35 percent of the total) and a total of 12 streams are rated as having a Low impact probability within the study area. Corridor Scheme Options with the highest and lowest probabilities of impact are as follows:

- Scheme Options A2 and A5 have the greatest number (29) of stream involvements rated as having a High impact probability; while Scheme Option D5 would have the least (18);

- Schemes C and E would involve the greatest number of streams rated as having a Low impact probability (between 7 and 10) due to the use of the existing four-lane facility near Winchester;

c. <u>Impoundments</u>

The Linton Creek impoundment would be affected by the options under Scheme C or E, which would traverse the entire drainage of Linton Creek and parallel the impoundment on the west. Scheme Options B3, B6, D3, or D5 would involve the southern banks of the Thorn Run

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TABLE III-25
IMPACT PROBABILITY FOR STREAMS

IMPACT PROBABILITY	A								B						C		D						E		PROJECT TOTAL
	A1	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**C1**	**C2**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**E1**	**E2**	
High	27	29	25	25	29	25	25	24	22	21	20	22	21	22	23	23	22	20	20	21	18	22	23	23	***94***
Moderate	32	20	19	20	20	19	20	32	18	18	18	18	18	18	12	13	21	21	21	20	20	20	16	15	***57***
Low	4	4	4	4	4	4	4	4	4	4	4	5	5	5	9	10	3	3	3	2	2	2	8	7	***12***
TOTAL	***63***	***53***	***48***	***49***	***53***	***48***	***49***	***60***	***44***	***43***	***42***	***45***	***44***	***45***	***44***	***46***	***46***	***44***	***44***	***43***	***40***	***44***	***47***	***45***	***163***
PERPENDICULAR INVOLVEMENT	47	42	38	38	43	38	38	45	31	31	30	30	31	29	34	33	32	32	31	31	29	31	34	34	***118***
PARALLEL INVOLVEMENT	16	11	10	11	10	10	11	15	13	12	12	15	13	16	10	13	14	12	13	12	11	13	13	11	***45***

impoundment. Scheme Option B4, B5, B6, or C2, as well as the options under Scheme D or E would cross Mount Storm Lake at the present location of the dam. Scheme Option B1, B2, B3, or C1 would parallel the eastern shore of Mount Storm Lake.

d. Groundwater

The potential impact to groundwater quantity and quality would involve both surface waters (which receive a majority of their flow from groundwater) and wells (used for potable water). The potential impact to existing drinking water wells is related to the location of the greatest concentration of existing wells; found in the populated areas along existing transportation corridors such as US 50 and SR 55. In areas where the project corridors do not follow existing transportation routes, the major concern for groundwater quality would be the project's potential impact on springs and streams.

The potential impact of the proposed project on groundwater resources in the project area can be related to the geologic formations containing the aquifers. Limestone and sandstone with fractures and cavities are the best sources of groundwater. Construction activities which may create additional fractures or blockages in these water-bearing strata may alter the quantity of groundwater transmitted through the strata. Local wells, springs, and streams may experience a temporary or permanent loss of groundwater quantity. In some cases, fracturing caused by construction could increase the water capacity of a particular geologic strata.

In addition to potential impacts to groundwater quantity, groundwater quality may also be impacted by the proposed project. In limestone formations, changes in flow velocity or physical vibrations may resuspend clay particles found in cavities, resulting in turbid groundwater. In both sandstone and limestone, pollutants and sediment in surface waters that subsequently infiltrate groundwater systems may result in reduced groundwater quality. Blasting, drilling, and excavation could expose portions of underground caverns and cavities, providing a conduit for surface runoff to directly enter the groundwater system, thereby affecting groundwater quality. Water-born pollutants generated by the operation and maintenance of the highway may infiltrate into the groundwater, but the low volume of traffic projected to utilize the proposed facility would produce a relatively low concentration of several pollutants.

In the Monongahela River basin, a concern would be the potential affect groundwater impacts would have on streams, wetlands, and springs. Along the Blackwater River, Schemes D and E would cross the greatest area of permeable sandstone and limestone. Scheme A, B, and C would also cross important limestone formations which provide water for the Bowden Fish Hatchery, as well as numerous native and stocked trout streams. Groundwater discharge to streams is particularly important to the survival of trout during the summer and early fall when precipitation is low and temperatures are high.

In the Potomac River basin, where the corridors follow existing transportation routes, the greatest potential impact would be to existing wells. Particularly vulnerable would be the few shallow wells along the major rivers which yield groundwater from the highly permeable alluvial soils. In most of the other areas of the Potomac River basin, wells in the valleys are located in areas underlain by shale or siltstone, which are not very permeable. Contamination of the aquifers in this area from infiltration would be minimal.

e. Public Water Supplies

There would likely be minimal impact to municipal water systems from the proposed project. The relocation of some water and sewer lines may be necessary for construction, but little disruption of service is anticipated.

f. Bowden National Fish Hatchery

The potential impacts of highway construction on the water sources of the Bowden Fish Hatchery would be two-fold. Blasting, drilling, excavation, or other construction practices may divert water away from the cavern systems which supply groundwater to the North Spring, altering the amount of water supplied to the hatchery. Second, highway construction may create erosion and turbidity in surface waters, potentially contaminating the groundwater which feeds the North Spring.

Construction of any of the Scheme Options under Scheme A, B, or C could adversely affect the water supply of the Bowden Fish Hatchery. These Schemes would extend an existing four-lane highway through the drainage area of Taylor Run, which is a major recharge area for the North Spring and a surface water tributary to Shavers Fork. Construction in this area may result in temporarily or permanently decreased water quality and quantity in Shavers Fork and the North Spring, both of which provide water to the hatchery. Any of the options under Scheme D or E would completely avoid potential impacts to the hatchery. If the preferred corridor requires construction near the water supplies for the hatchery, a more detailed geological study will be performed to better define the extent of the recharge areas for the springs, and predict potential impacts to the water supplies.

4. POTENTIAL INVOLVEMENT SUMMARY

The results of the water resources assessment indicate that the entire study area is rich in water resources. The Scheme Options vary, however, in the type and quantity of water resources present and the potential involvements the project may have with these resources.

a. Scheme A

Scheme A would traverse the southern portions of the study area where the terrain is generally mountainous with narrow river valleys. Of the five Schemes, Scheme A would affect the greatest number of streams. The major streams that would be affected include Shavers Fork, Glady Fork, Laurel Fork, Seneca Creek, the North Fork of the South Branch of the Potomac River, Lost River, and Cedar Creek.

Options under Scheme A also contain the largest number of NRW and High Quality streams, reflecting the large number of native trout streams and streams within MNF. Scheme A would not affect any large impoundments, but would involve construction within the recharge areas for the water supply of the Bowden National Fish Hatchery.

b. Scheme B

Scheme B traverses terrain that varies from mountainous to level. Major streams potentially affected include Shavers Fork, Glady Fork, Laurel Fork, Lost River, and Cedar Creek. Scheme B would avoid some of the streams affected by Scheme A, such as Seneca Creek and the North Fork of the South Branch of the Potomac River, but would include other major streams such as the Blackwater River, Patterson Creek, and the South Branch of the Potomac River. Scheme B may have an affect on the Thorn Run impoundment and Mount Storm Lake. Scheme B would involve construction within the recharge areas for the water supply of the Bowden National Fish Hatchery.

c. Scheme C

Major streams potentially affected by Scheme C include Shavers Fork, Glady Fork, Laurel Fork, Patterson Creek, and the South Branch of the Potomac River. Additional streams affected by the northern portion of Scheme C include the Little Cacapon River, the Cacapon River, and the North River. Scheme C may involve the Linton Creek impoundment and Mount Storm Lake. Scheme C involves construction within the recharge areas for the water supply of the Bowden National Fish Hatchery.

d. Scheme D

Some of the major streams located within this Scheme include Leading Creek, the Blackwater River, Patterson Creek, the South Branch of the Potomac River, Lost River, and Cedar

Creek. Scheme D has surface waters that are affected by acid mine drainage and agricultural and industrial activities. Scheme D may involve the Thorn Run impoundment and Mount Storm Lake, but it would not involve the water supply of the Bowden National Fish Hatchery.

e. **Scheme E**

The major streams in this corridor would include Leading Creek, the Blackwater River, Beaver Creek, Patterson Creek, the Little Cacapon River, the Cacapon River, and the North River. Scheme E also may potentially involve the Linton Creek impoundment and Mount Storm Lake, but it would not involve the water supply of the Bowden National Fish Hatchery.

5. POTENTIAL MITIGATION MEASURES

Because this is a corridor-level study, it is not appropriate to determine precisely how much or what type of water resource impact would occur due to the construction of Corridor H. However, possible measures that may be used within the corridors to prevent, minimize, and compensate for impacts to water resources are discussed below.

The general approach to reducing impacts to the surface water resources within the project area is to avoid and minimize impacts to the greatest extent possible, then to compensate for any unavoidable impacts. Avoidance during the corridor selection stage of the project could consist of selecting the Scheme Option with the lowest number of streams and impoundments, particularly High quality streams and streams expected to suffer a High potential impact. However, considering the size and topography of the study area, avoidance of all water quality impacts would not be possible. Therefore, design and construction considerations may be used to minimize potential impacts.

Erosion and sedimentation can be controlled during construction by using best management practices as described in the Department's *Standard Specifications and Sedimentation Manual*. The plans may include the following features: clear water diversion; stormwater collection and treatment; temporary vegetative controls; and stream bank protection. Routine inspections in the field would be conducted to ensure that the erosion and sedimentation plan is adhered to.

Permanent erosion control measures are used after construction is completed. These measures may include stabilizing cut and fill slopes, shoulders, medians, and any other areas of exposed soils with perennial vegetation or non-erosive materials such as riprap or geotextiles; and establishing permanent discharge points for stormwater.

Water pollutants derived from the operation and maintenance of the highway can be controlled with the use of the following management measures: directing stormwater runoff over vegetated surfaces, use of wet or dry detention basins, and use of infiltration systems to retain runoff.

Stream crossing designs can incorporate features that minimize impacts to streams. Culverted crossings should be properly sized so as to have minimal impact on flood height and duration. Open-bottom culverts provide an unobstructed streambed which does not hinder movement of fish and benthic communities. For bridges and culverts, the volume of fill material placed within the floodplain of the stream should be minimized.

Perpendicular stream crossings often are preferable to parallel alignments to minimize stream impacts. However, where the highway would be unavoidably located parallel to a stream, the use of retaining walls instead of fill can prevent or minimize encroachment on the stream.

For unavoidable stream relocations or encroachments, the relocated stream could be designed to simulate the original stream conditions. This may require the following actions during construction:

- Construction of the new channel prior to disruption of the existing channel;
- Re-establishment of the pool-to-riffle ratio and stream meanders;
- Maintain the original gravel size of the streambed;
- Construction of low flow channels and pools;
- Establishment of stream shading vegetation;
- Revegetation of stream banks or other protection from scour and erosion.

To compensate for the reduction in the available aquatic habitat within a stream, habitat quality of the remaining stream may be increased. There are numerous methods of enhancing stream habitat quality, particularly the carrying capacity for trout. For example, man-made structures such as log dams, channel deflectors, overhanging bank cover, lunker structures, and boulders can be introduced.

A highway also may impact the terrestrial environment along the stream corridor. This riparian habitat is directly linked to water quality and aquatic habitat and provides important habitat for terrestrial wildlife. The greatest potential impact to riparian areas would be new construction parallel to a stream or impoundment of a stream. Avoiding parallel construction would provide the greatest potential reduction in impacts to riparian habitat. Other procedures that may minimize impacts include minimizing the clearing of riparian vegetation; protecting areas not intended to be cleared; revegetating the riparian area after clearing and grading; and managing the remaining riparian forest to retain that habitat.

Preventing potential impacts to the Bowden Hatchery water supply can be accomplished by avoiding construction in the recharge areas. However, if an option under Scheme A, B, or C were to be selected as the preferred corridor, potential impacts to the hatchery water supply may be minimized by conducting additional studies that would further refine knowledge of the recharge locations. Such studies may include fracture tracing, seismic refraction, micro-gravity surveys, dye tracing, groundwater hydrology, and speleological surveys. An additional mitigation measure that might be useful to minimize impacts would include developing alternative water supplies for the hatchery in order to compensate for any damage to the existing water sources. The feasibility of this approach would require additional studies to ensure that the alternative water source would provide adequate water quantity and quality, and would not itself be damaged during highway construction.

Groundwater can be protected from pollution by implementing best management practices to control erosion and sedimentation. Should an existing well be located in the preferred corridor, it would be properly sealed to prevent the introduction of pollutants into the groundwater.

L. WETLANDS

Presidential Executive Order 11990 (EO 11990) entitled, "Protection of Wetlands", establishes a National Policy to "avoid to the extent possible the long-term and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative". In accordance with EO 11990, FHWA has implemented its wetland policy through Technical Advisory T 6640.8A.

The Technical Advisory requires identification of wetland type, quality, and function; assessment of impacts to wetlands; evaluation of alternatives which would avoid wetlands; and identification of practicable measures to minimize harm to wetlands. This portion of the SDEIS addresses those issues. In addition, the Clean Water Act Section 404(b)(1) guidelines (40 CFR 230) regarding wetland disturbance are also addressed.

It should be noted that, as with all other natural resource evaluations in this SDEIS, all wetlands within the 2,000 foot-wide corridor Scheme Options have been identified. This has been done to provide a relative comparison of the effects of the various Scheme Options on wetlands. However, actual wetland impacts would be less than the acreage reported within this document since actual roadway design limits would likely range from 150 to 300 feet. Following the selection of a preferred corridor and the initiation of alignment design, efforts would be taken to avoid or minimize the project's involvement with wetlands. Additional detail about the Wetlands Assessment can be found in the *Natural Resources Technical Report, Volume I,* available from WVDOT.

1. METHODOLOGY

Many standard methods employed for environmental impact assessments are quantitative in nature, requiring intensive data collection or impact modeling. Due to the size of the project area and the length and width of the corridors, such an approach for this project is not practical. Therefore, a qualitative, but methodical, approach has been taken to assess the wetland resource values and potential wetland impacts within the project area.

Existing information and field reviews were used to identify the quantity, quality, and functions of wetlands within the study area. The U.S. Fish and Wildlife Service's "National Wetlands Inventory" mapping (NWI) and U.S.D.A. Soil Conservation Service's "Soil Surveys" were used for preliminary identification and mapping of wetlands. (It is generally understood that NWI mapping is a good tool for broad overviews such as this SDEIS, however, errors can exist in the mapping due to its development method.) Field reviews were conducted to verify the existence, size, and wetland type; to evaluate wetland functions and quality; and to determine the potential impact of the project on the wetland systems. The field determinations of wetlands conform to the method recommended in the 1989 *Federal Manual for Identifying and Delineation Jurisdictional Wetlands* and the U.S. Fish and Wildlife Service's Classification System was used in to identify wetland types. It should be noted that this preliminary identification of wetlands using the NWI mapping and limited field reviews will be refined using detailed field delineations during the alignment evaluation phase of the project.

a. <u>Resource Value</u>

Wetlands were assigned a resource value of Exceptional or Standard, based on a set of criteria developed from functional evaluation factors in the 1987 U.S. Army Corps of Engineers' *Wetlands Evaluation Technique* and the 1990 U.S. Fish and Wildlife Service's *Regional Wetlands Concept Plan.* If a wetland exhibited one or more of the criteria, it was identified as an Exceptional Resource Value Wetland. Otherwise, it was identified as a Standard Resource Value Wetland.

The purpose of this evaluation is to account for wetland functions and values as required by the Technical Advisory and the 404(b)(1) guidelines, as well as to identify rare and unique wetlands in the project area. This evaluation of wetlands is not meant to imply that one class of wetlands will be given less protection than another class. It is understood that all wetlands are protected by law and all will be avoided to the extent practicable. The evaluation is also not intended to usurp the state prerogative of classifying state waters. The Exceptional Resource Value criteria included the following:

- Critical habitat for state rare or federal endangered or threatened species;
- Lands that contain, support, or constitute a rare ecological community, an important recreational resource, a public water supply, or an educational or research site;
- Lands found within a special state or federal protection area (park, refuge, etc.), State Natural Heritage Inventory site, or National Natural Landmark;
- Lands that functionally support species with exceptionally narrow habitat requirements or extremely limited occurrence in the region (includes moss/lichen wetland vegetation types); and/or
- Lands for which substantial federal, state, or private expenditures have been made to create, restore, or protect the site.

b. <u>Impact Probability</u>

The probability that a corridor would impact wetlands was assessed independently of resource value, but in a similar manner. Each wetland site within the corridors received an impact probability rating of "High", "Moderate", or "Low", based on a list of qualitative criteria that addressed the possibility of avoiding or minimizing wetland impacts.

The probability of impacts were evaluated as High in cases where: the wetland sizes were equal to or greater than half the corridor width; or the wetland water source flows perpendicular to the corridor and avoidance of the wetland or water source is restricted.

The probability of impacts were evaluated as Moderate in cases where: the wetland size is less than half the corridor width; or the wetland water source flow is parallel to the corridor and avoidance options are restricted; or where the wetland water source flow is perpendicular to the corridor and new construction crossing the water source is required.

The probability of impacts were evaluated as Low in cases where: the wetland size is less than half the corridor width or wetlands water source flows are parallel to the corridor, in either case, avoidance options are not restricted; or an existing roadway or structure will be used.

The evaluation of impact probability assumes that all wetlands within a Scheme Option would sustain an impact if the highway were constructed within it. However, actual wetland impacts would be less than what is reported within this document since actual roadway design limits would likely range from 150 to 300 feet. Efforts would be taken during the preliminary and final design stage to avoid or minimize the project's involvement with wetlands.

2. AFFECTED ENVIRONMENT

The Corridor H study area lies within two physiographic provinces. The western portion of the study area is located in the Allegheny Mountain Section of the Appalachian Plateau Province. The eastern portion of the study area is located in the Middle Section of the Ridge and Valley Province. These two zones are divided by the Allegheny Front, which generally runs northeast to southwest and serves as both a topographic and climatic divide. Wetland types found in the Appalachian Plateau Province are varied. They range from man-made ponds and floodplain wetlands along the wider stream valleys to high mountain moss/lichen/sedge "meadows" and unique bog wetlands in the Canaan Valley. Wetland types found in the Ridge and Valley Province are mostly small, man-made ponds or floodplain wetlands formed along the wider stream valleys.

NWI mapping, the most current comprehensive estimate of wetlands in West Virginia, reports that there are 102,000 acres of wetlands in the state, excluding reservoirs. Approximately nine percent of the state's wetlands are concentrated in Canaan Valley. In Virginia, the NWI reports a total of 1,044,900 acres of wetlands in the state. Of this total, 77 percent (804,573 acres) are fresh water wetlands.

Total wetland acreage involvement by Scheme Option and wetland type is shown on Table III-26. General wetland characteristics within the various Schemes are as follows:

- The wetlands assessment identified a total of 1,568 acres of wetlands at 777 individual sites within all corridor Schemes.

TABLE III-26
WETLAND ACREAGE AND VEGETATION TYPES WITHIN SCHEME OPTIONS

SCHEME OPTION	FOREST Acres (%)	SHRUB Acres (%)	EMERGENT Acres (%)	OPEN WATER Acres (%)	MOSS/LICHEN Acres (%)	TOTAL ACREAGE
A1	83 (40)	29 (14)	64 (30)	33 (16)	0	**209**
A2	45 (29)	15 (10)	63 (40)	33 (21)	0	**156**
A3	45 (35)	15 (11)	42 (32)	29 (22)	0	**131**
A4	46 (32)	23 (16)	43 (30)	30 (22)	0	**142**
A5	45 (29)	15 (10)	63 (40)	33 (21)	0	**156**
A6	45 (35)	15 (11)	42 (32)	29 (22)	0	**131**
A7	46 (32)	23 (16)	43 (30)	30 (22)	0	**142**
A8	83 (40)	29 (14)	62 (30)	34 (16)	0	**208**
B1	175 (30)	229 (39)	117 (20)	52 (9)	13 (2)	**586**
B2	175 (30)	229 (39)	117 (20)	52 (9)	13 (2)	**586**
B3	175 (30)	229 (39)	115 (19)	62 (10)	13 (2)	**594**
B4	94 (14)	313 (48)	101 (15)	43 (7)	105 (16)	**656**
B5	94 (14)	313 (48)	101 (15)	43 (7)	105 (16)	**656**
B6	94 (14)	313 (47)	99 (15)	52 (8)	105 (16)	**663**
C1	194 (32)	229 (38)	108 (17)	66 (11)	13 (2)	**610**
C2	113 (17)	312 (46)	91 (14)	56 (8)	105 (15)	**677**
D1	127 (17)	369 (48)	142 (19)	57 (7)	70 (9)	**765**
D2	127 (7)	369 (48)	142 (19)	57 (7)	70 (9)	**765**
D3	126 (16)	369 (48)	141 (18)	66 (9)	70 (9)	**772**
D4	134 (18)	351 (48)	124 (17)	54 (7)	70 (10)	**733**
D5	133 (18)	351 (48)	123 (17)	64 (7)	70 (10)	**741**
D6	134 (18)	351 (48)	124 (17)	54 (7)	70 (10)	**733**
E1	146 (18)	367 (47)	133 (17)	70 (9)	70 (9)	**786**
E2	153 (20)	349 (46)	115 (15)	68 (9)	70 (10)	**755**
STATE (WV)	41%	24%	20%	16%	N/A	N/A

- While wetlands are found throughout the project area, they are concentrated in certain zones, including the area just south of Elkins, along the Tygart Valley River; the area north of Elkins, along Leading Creek; the area between Davis and Mount Storm Lake, parallel to Beaver Creek; Canaan Valley; and the area along the North Fork of the South Branch of the Potomac River.

- All of the proposed Scheme Options contain wetlands. Scheme Options A1 through A8 would involve the least wetland acreage (between 130 to 209 acres) and Scheme Options E1 and E2 would involve the most (between 755 and 786 acres).

- Forested wetlands are most common in Canaan Valley.

- The acreage of shrub wetlands is high in both Canaan Valley and along Beaver Creek.

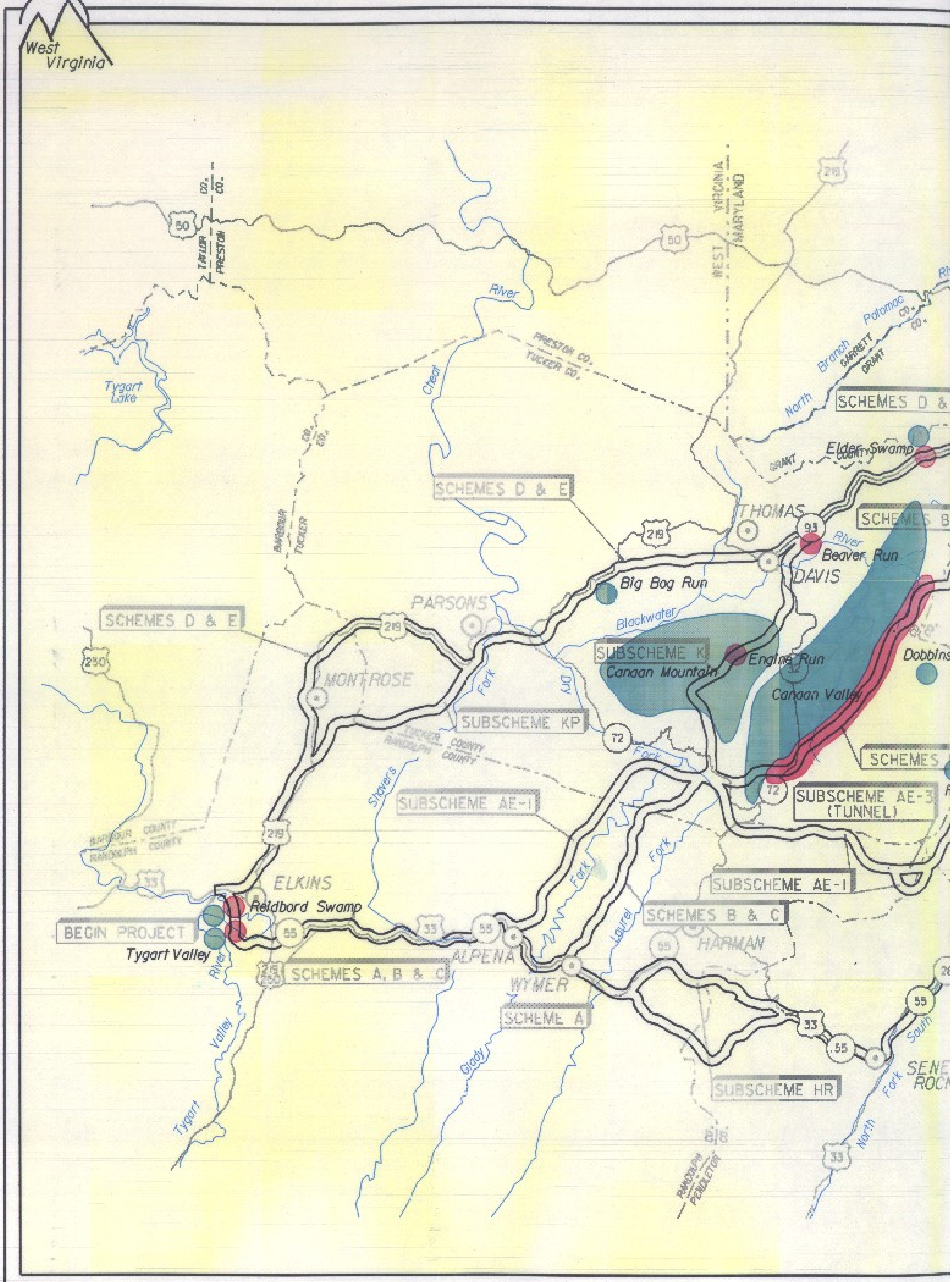
- Open water wetlands are most abundant in the area to the west of Winchester.

- Moss/lichen wetlands, even though rare, are found primarily in the mountains surrounding the Canaan Valley.

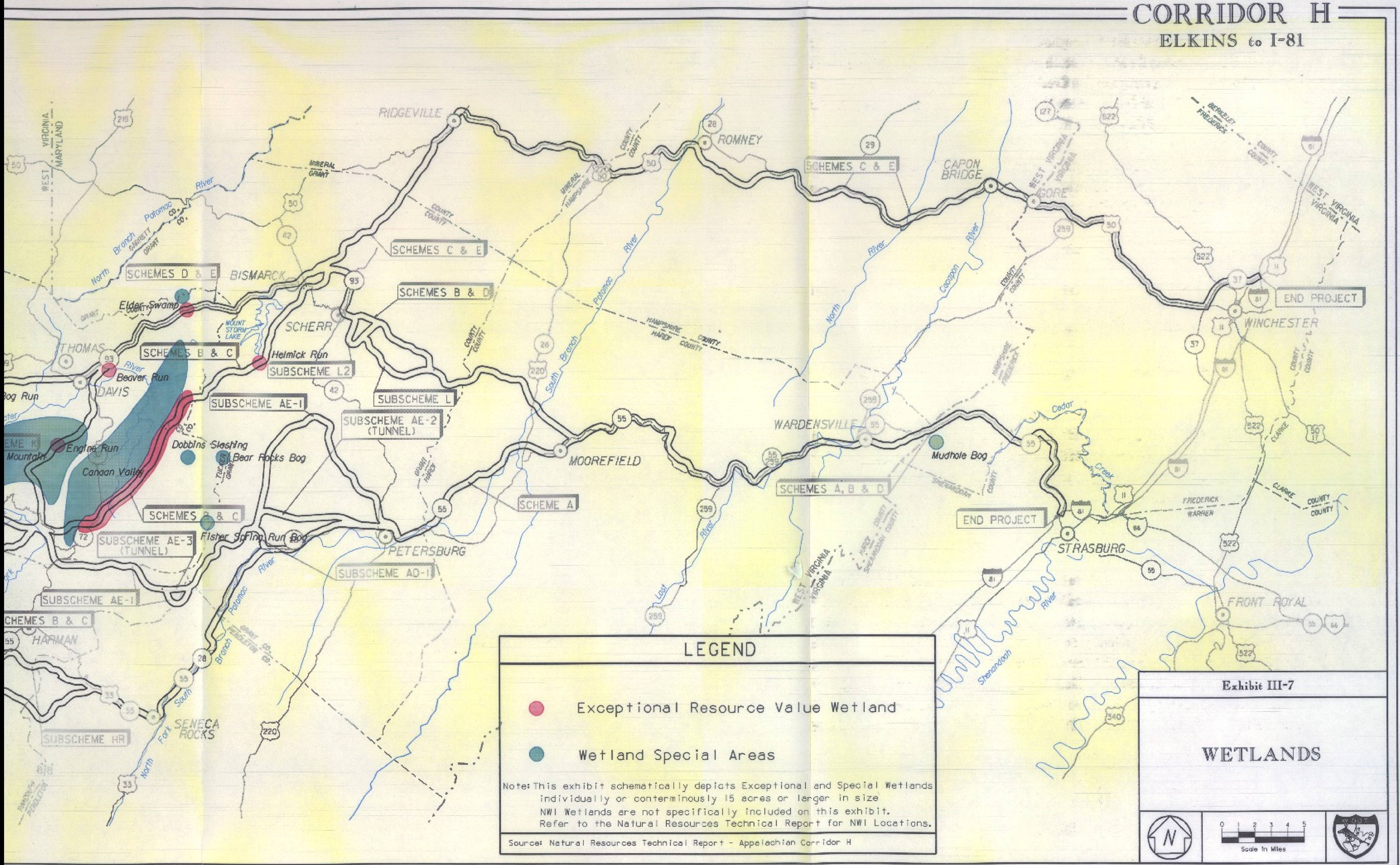
- Scheme Options B1, B2, B3, and C1 contain the largest acreage of forested wetlands, while the Scheme Options within Schemes D and E contain large acreages of shrub and emergent wetlands. The largest acreage of moss/lichen wetlands is found in Scheme Options B4, B5, B6, and C2.

3. RESOURCE VALUE

Wetlands within the study area have been evaluated to determine whether or not they exhibit functions that fulfill the Exceptional Resource Value criteria. Exceptional Resource Value Wetlands have been determined to be those qualifying wetlands located inside the corridor Schemes. Those wetlands which are outside the corridors, yet qualify as Exceptional Wetlands, have been identified as Wetland Special Areas. Wetland Special Areas have been identified separately so that potential indirect and secondary impacts can be identified. It should be noted that some of the Exceptional Resource Value Wetlands are part of Wetland Special Areas, but are discussed separately to identify the potential direct impacts of the corridor. The locations of these sites are illustrated on Exhibit III-7.



West Virginia
TAYLOR CO.
PRESTON CO.
WEST VIRGINIA
MARYLAND
PRESTON CO.
TUCKER CO.
GARRETT CO.
GRANT CO.
North Branch Potomac River
Cheat River
Tygart Lake
BARBOUR CO.
TUCKER CO.
SCHEMES D & E
SCHEMES D & E
SCHEMES D & E
Elder Swamp
GRANT COUNTY
THOMAS
DAVIS
Beaver Run
SCHEMES B
Big Bog Run
PARSONS
Blackwater River
SUBSCHEME K
Canaan Mountain
Engine Run
Canaan Valley
Dobbins
MONTROSE
SUBSCHEME KP
Dry Fork
TUCKER COUNTY
RANDOLPH COUNTY
SCHEMES
SUBSCHEME AE-3 (TUNNEL)
Shavers Fork
SUBSCHEME AE-I
BARBOUR COUNTY
RANDOLPH COUNTY
ELKINS
Reidbord Swamp
BEGIN PROJECT
Tygart Valley
SUBSCHEME AE-I
SCHEMES B & C
HARMAN
Laurel Fork
ALPENA
WYMER
SCHEMES A, B & C
SCHEME A
SUBSCHEME HR
Tygart Valley River
Glady Fork
RANDOLPH
PENDLETON
North Fork South
SENE
ROCK



CORRIDOR H
ELKINS to I-81
LEGEND
Exceptional Resource Value Wetland
Wetland Special Areas
Note: This exhibit schematically depicts Exceptional and Special Wetlands individually or conterminously 15 acres or larger in size
NWI Wetlands are not specifically included on this exhibit.
Refer to the Natural Resources Technical Report for NWI Locations.
Source: Natural Resources Technical Report - Appalachian Corridor H
Exhibit III-7
WETLANDS
Scale in Miles
RIDGEVILLE
ROMNEY
CAPON BRIDGE
GORE
WINCHESTER
END PROJECT
BISMARCK
SCHERR
THOMAS
DAVIS
MOOREFIELD
WARDENSVILLE
PETERSBURG
STRASBURG
FRONT ROYAL
HARMAN
SENECA ROCKS
SCHEMES C & E
SCHEMES D & E
SCHEMES B & D
SCHEMES B & C
SUBSCHEME L2
SUBSCHEME L
SUBSCHEME AE-1
SUBSCHEME AE-2 (TUNNEL)
SUBSCHEME AE-3 (TUNNEL)
SUBSCHEME AD-1
SUBSCHEME HR
SCHEMES A, B & D
SCHEME A
Elder Swamp
Helmick Run
Beaver Run
Engine Run
Canaan Valley
Dobbins Slashing
Bear Rocks Bog
Fisher Spring Run Bog
Mudhole Bog
Bog Run
Mount Storm Lake
North Branch Potomac River
South Branch Potomac River
North Fork South Branch
North River
Cacapon River
Lost River
Cedar Creek
Shenandoah River
WEST VIRGINIA
MARYLAND
VIRGINIA

a. Exceptional Resource Value Wetlands

Seven specific wetland units or areas within the corridors have been identified as exhibiting functions that meet the criteria for Exceptional Resource Value Wetlands and include Canaan Valley, Reidbord Swamp, Tygart Valley River, Elder Swamp, Helmick Swamp, Engine Run, and Beaver Run. In addition, numerous scattered areas have been identified as meeting the criteria for Exceptional Resource Value Wetlands. The total wetland area identified as qualifying for the Exceptional Resource Value rating is 644 acres; this represents 41 percent of the wetlands identified in the corridors

b. Wetland Special Areas

Wetland Special Areas are those wetland areas located outside the corridor that meet the previously discussed criteria for Exceptional Resource Value Wetlands. There are ten such sites, which are identified on Table III-27 in order to provide background material for a discussion of potential indirect and secondary impacts.

4. IMPACT PROBABILITY

Wetlands perform numerous important functions, such as flood control, shoreline anchoring, groundwater discharge and recharge, pollution control, providing habitat for fish and wildlife, and socio-economic services. Highway construction can affect wetlands by altering the quantity and/or quality of these functions. A highway can directly affect wetlands by reducing the amount of habitat available, reducing water flow, and adding pollutants to the wetland. Indirect affects may occur when vegetation is affected by siltation, water flow patterns are altered, and storm water runoff carries materials deposited on the highway into the wetland. Secondary affects may occur when a new road attracts additional human use to the area.

Highway construction can affect wetlands by altering the quantity and/or quality of the functions that they provide. A highway can directly affect wetlands by covering them with fill material, changing water flow, or adding pollutants to the wetland. Secondary effects may occur when a new road attracts additional human use to the area.

The probability that a corridor would involve wetlands has been assessed independently of wetland resource values. All wetlands within the corridors have been given an impact probability rating. The rating evaluates the likelihood of a corridor impacting a specific wetland. Because this is a corridor-level study, it is not appropriate to determine the form of the impact (such as fill or water flow alteration) at this time. Therefore, the evaluation of impact probability assumes that all wetlands within a Scheme Option would sustain an impact if the highway were constructed within it. The

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TABLE III-27
WETLAND SPECIAL AREAS AND EXCEPTIONAL RESOURCE VALUE WETLANDS

WETLAND AND LOCATION	SCHEME OPTION INVOLVEME		DESIGNATED WETLAND VALUE	QUALIFICATIONS FOR SPECIAL WETLAND VALUE DESIGNATION
	Inside Corridor	Outside Corridor		
CANAAN VALLEY - **Tucker Co., WV**	B1, B2, B3 & C1	B1, B2, B3 & C1	Exceptional & Special	• Special Protection Area • Species of Special Concern • Rare Habitat/Adjacent HQS • Expenditures for Protection • Functionally Supports Species w/ Narrow Habitat Range
CANAAN MOUNTAIN - **Tucker Co., WV**		B4, B5, B6 & C2	Special	• Functionally Supports Species w/ Narrow Habitat Range • Special Protection Area
BIG RUN BOG - **Tucker Co., WV**		D1, D2, D3, D4, D5, D6, E1, & E2	Special	• Special Protection Area • Functionally Supports Species w/ Narrow Habitat Range
DOBBIN SLASHING - **Tucker Co., WV**		B1, B2, B3, & B6	Special	• Species of Special Concern • Functionally Supports Species w/ Narrow Habitat Range
BEAR ROCKS BOG - **Tucker Co., WV**		A2 & A5	Special	• Special Protection Area • Species of Special Concern • Functionally Supports Species w/ Narrow Habitat Range
FISHER SPRING RUN BOG - **Tucker Co., WV**		A2 & A5	Special	• Special Protection Area • Functionally Supports Species w/ Narrow Habitat Range
TYGART VALLEY - **Randolph Co., WV**	A1 to A8, B1 to B6, & C1 and C2	A1 to A8, B1 to B6, & C1 and C2	Exceptional & Special	• Functionally Supports Species w/ Narrow Habitat Range • Listed in WV Regional Wetlands Conservation Plan
REIDBORD SWAMP - **Randolph Co., WV**	A1 to A8, B1 to B6, & C1 and C2	A1 to A8, B1 to B6, & C1 and C2	Exceptional & Special	• Species of Special Concern • Functionally Supports Species w/ Narrow Habitat Range • Listed in WV Regional Wetlands Conservation Plan
ELDER SWAMP - **Tucker Co., WV**	B4 to B6, C2 D1 to D6, & E1 and E2	B4 to B6, C2 D1 to D6, & E1 and E2	Exceptional & Special	• Rare Habitat/Adjacent HQS • Functionally Supports Species w/ Narrow Habitat Range • Listed in WV Regional Wetlands Conservation Plan
MUDHOLE BOG/ VANCE'S COVE - **Frederick Co., VA**	-	A1 to A8, B1 to B6, & D1 to D6	Special	• Functionally Supports Species w/ Narrow Habitat Range
ENGINE RUN - **Tucker Co., WV**	B4 to B6, & C2		Exceptional	• Functionally Supports Species w/ Narrow Habitat Range
HELMICK RUN - **Tucker Co., WV**	B1 to B3, & C1		Exceptional	• Functionally Supports Species w/ Narrow Habitat Range
BEAVER RUN - **Tucker Co., WV**	B4 to B6, & C2		Exceptional	• Functionally Supports Species w/ Narrow Habitat Range
MISCELLANEOUS SITES - **Tucker and Randolph Co., WV**	All		Exceptional	• Special Protection Area

actual wetland impact would likely be less than indicated in this assessment since it is based on involvements within a 2,000 foot corridor and actual roadway design limits would likely range from 150 to 300 feet. Impact probability for all wetlands and for the Exceptional Resource Value Wetlands are discussed below.

a. <u>Impact Probability for All Wetlands</u>

Table III-28 presents the impact probability levels within each Scheme Option for all wetlands and designated Exceptional Resource Value wetlands. A summary of this table is provided below:

- Scheme Options A1 through A8 have nearly equivalent wetland acreages of High, Moderate, and Low impact probabilities (averaging 40, 23, and 37 percent, respectively), although this Scheme involves the smallest total wetland acreage (130 to 209 acres).

- Scheme Options B1, B2, B3, and C1 have a High impact probability for approximately 70 percent of their wetland acreage, which ranges from 586 to 677 acres. Moderate and Low impact probability for these Scheme Options are approximately 18 and 12 percent, respectively, of their total acreage.

- The remaining Scheme Options have a High impact probability for roughly 58 percent of their wetland acreage, which ranges from 656 to 786 acres. Moderate and Low probability impacts for these Scheme Options occur for 30 and 10 percent, respectively, of their total acreage.

b. <u>Impact Probability for Exceptional Resource Value Wetlands</u>

- All of the corridors have a High impact probability for at least 50 percent of their Exceptional Resource Value wetlands, although the actual acreage varies by Scheme Option.

- Scheme Options A1 and A8 have a High impact probability for 50 percent of their Exceptional Resource Value Wetlands (out of 120-121 acres).

- All of the other Scheme Options have a High impact probability for 77 to 91 percent of their Exceptional Resource Value Wetlands (out of Scheme A: 41-53 acres; Schemes B and C: 157-388 acres; Schemes D and E: 133 acres).

TABLE III-28
WETLAND IMPACT PROBABILITY MATRIX

SCHEME OPTION	IMPACT PROBABILITY (Acres within Scheme Option Corridor)					
	EXCEPTIONAL RESOURCE VALUE			ALL RESOURCE VALUES		
	High	Moderate	Low	High	Moderate	Low
A1	60	34	27	81	56	71
A2	33	1	7	55	44	56
A3	33	1	7	55	23	52
A4	41	3	9	63	25	54
A5	33	1	7	55	44	56
A6	41	3	9	55	23	52
A7	41	3	9	63	25	54
A8	60	32	28	81	54	72
B1	327	53	8	413	106	67
B2	327	53	8	413	106	67
B3	327	53	8	413	114	67
B4	131	21	5	376	211	70
B5	131	21	5	376	211	70
B6	131	21	5	376	219	70
C1	327	53	8	443	70	98
C2	131	21	5	403	175	101
D1	122	2	9	439	244	81
D2	122	2	9	439	244	81
D3	122	2	9	439	252	81
D4	118	0	15	410	242	80
D5	118	0	15	410	250	81
D6	118	0	15	410	242	80
E1	122	2	9	466	208	112
E2	118	0	15	436	206	111

Those sites designated as Wetland Special Areas may suffer indirect or secondary impacts from road construction and operation. However, the extent of those impacts can not be quantified due to their unpredictable nature. The following Scheme summary discusses, in general terms, which Scheme Options have the potential to affect the Wetland Special Areas.

5. SCHEME SUMMARY

The results of the wetlands assessment indicate that the entire study area is rich in wetland resources. Each of the 24 Scheme Options contains wetlands, including wetlands of Exceptional Resource Value, although not in the same amount nor the same wetland types. Further, the Scheme Options would vary in their degree of potential impact to the wetlands within them.

The evaluation of potential impacts assumes that all wetlands within a Scheme Option would sustain an impact if the highway were constructed within it. This assumption has been used to provide a relative comparison of the effects of the various Scheme Options on wetlands. The actual wetland impact would likely be less than predicted in this assessment since this assessment is based on impacts within a 2,000 foot corridor and actual roadway design limits would likely range from 150 to 300 feet. A comparison of wetland impacts by Scheme follows and is presented on Table III-29.

a. Scheme A

The eight Scheme Options of Scheme A would traverse the southern portion of the study area where the terrain is generally mountainous with narrow river valleys. The Scheme Options would be similar in character, including the acreage of wetlands and level of potential impact. The total wetland acreage encountered in the eight Scheme Options would range from 131 to 209 acres, the majority of which is located in two areas: near Elkins and along the North Fork of the South Branch of the Potomac River.

Impact probability for wetlands in Scheme A would be evenly divided between Low, Moderate, and High levels or predominantly High. Most of the High impact probability wetlands are found in the western portion of the Scheme near Elkins. All Scheme Options would encounter two Exceptional Resource Value Wetlands: Reidbord Swamp and Tygart Valley River, both near Elkins. All eight Scheme Options also may cause indirect or secondary impacts to the Wetland Special Areas at Reidbord Swamp, Tygart Valley River, and Mudhole Bog. Scheme Option A2 or A5 may indirectly or secondarily affect the Wetland Special Areas at Bear Rocks Bog and Fisher Spring Run Bog.

TABLE III-29
WETLAND ASSESSMENT
(Acres within the Corridor)

CHARACTERISTICS	SCHEME A	SCHEME B	SCHEME C	SCHEME D	SCHEME E
Total Wetlands In Corridor	131-209	586-663	610-677	733-772	755-786
Forested Wetland	45-83	94-175	113-194	126-134	146-153
Shrub Wetland	15-29	229-313	229-312	351-369	349-367
Emergent Wetland	42-64	99-117	91-108	123-142	115-133
Moss\Lichen Wetland	0	13-105	13-105	70	70
Open Water Wetland	29-34	43-62	56-66	54-66	68-70
Total Wetlands with High Impact Probability	55-81	376-413	403-443	410-439	436-466
Total Wetlands with Moderate Impact Probability	23-56	106-219	70-175	242-252	206-208
Total Wetlands with Low Impact Probability	52-71	67-70	98-101	80-81	111-112
TOTAL EXCEPTIONAL RESOURCE VALUE (ERV) WETLANDS IN CORRIDOR	41-121	157-388	157-388	133	133
ERV Wetlands with High Impact Probability	33-60	131-327	131-327	118-122	118-122
ERV Wetlands with Moderate Impact Probability	1-34	21-53	21-53	0-2	0-2
ERV Wetlands with Low Impact Probability	7-28	5-8	5-8	9-15	9-15

TABLE III-29
WETLAND ASSESSMENT
(Acres within the Corridor)

CHARACTERISTICS	SCHEME A	SCHEME B	SCHEME C	SCHEME D	SCHEME E
Total Wetlands In Corridor	131-209	586-663	610-677	733-772	755-786
Forested Wetland	45-83	94-175	113-194	126-134	146-153
Shrub Wetland	15-29	229-313	229-312	351-369	349-367
Emergent Wetland	42-64	99-117	91-108	123-142	115-133
Moss\Lichen Wetland	0	13-105	13-105	70	70
Open Water Wetland	29-34	43-62	56-66	54-66	68-70
Total Wetlands with High Impact Probability	55-81	376-413	403-443	410-439	436-466
Total Wetlands with Moderate Impact Probability	23-56	106-219	70-175	242-252	206-208
Total Wetlands with Low Impact Probability	52-71	67-70	98-101	80-81	111-112
TOTAL EXCEPTIONAL RESOURCE VALUE (ERV) WETLANDS IN CORRIDOR	41-121	157-388	157-388	133	133
ERV Wetlands with High Impact Probability	33-60	131-327	131-327	118-122	118-122
ERV Wetlands with Moderate Impact Probability	1-34	21-53	21-53	0-2	0-2
ERV Wetlands with Low Impact Probability	7-28	5-8	5-8	9-15	9-15

b. **Scheme B**

Along these Scheme Options, the terrain varies from mountainous to level. Scheme Options B1, B2, and B3 exhibit similar characteristics, as do Scheme Options B4, B5, and B6. The total wetland acreage in the Scheme B corridors would range from 586 to 663 acres, the majority of which are found along either Canaan Valley or Beaver Creek.

All of the Scheme Options of Scheme B would encounter the two Exceptional Resource Value wetlands near Elkins, Reidbord Swamp, and Tygart Valley River. Additionally, Scheme Options B1, B2, and B3 would encounter Exceptional Resource Value wetlands at Canaan Valley and Helmick Run, while three Scheme Options would encounter three Exceptional Resource Value wetlands at Engine Run, Beaver Run, and Elder Swamp. Impact probability for wetlands in all Scheme B options would be predominantly High.

All six Scheme Options also may cause indirect or secondary impacts to the Wetland Special Areas at Reidbord Swamp, Tygart Valley River, and Mudhole Bog. Additionally, Scheme Options B1 through B3 may indirectly or secondarily affect the Wetland Special Areas at Canaan Valley and Dobbin Slashing, while Scheme Options B3 through B6 may indirectly or secondarily affect the Wetland Special Areas at Canaan Mountain and Elder Swamp.

c. **Scheme C**

The terrain within the two Scheme Options of Scheme C varies from mountainous to level, with river valleys that are wide and gently sloping. Scheme Option C1 is similar to Scheme Option B1, while Scheme Option C2 is similar to Scheme Option B4. Total wetland acreage encountered in this Scheme would range from 610 to 677 acres. Typical wetland types include forested, shrub, and emergent floodplain wetlands, and high elevation bogs.

All of the Scheme Options of Scheme C would involve two Exceptional Resource Value Wetlands near Elkins: Reidbord Swamp and Tygart Valley River. Additionally, Scheme Option C1 would encounter Exceptional Resource Value Wetlands at Canaan Valley and Helmick Run, while Scheme Option C2 would encounter Exceptional Resource Value Wetlands at Engine Run, Beaver Run, and Elder Swamp. Impact probability for wetlands in both Scheme Options would be predominantly High. High impact probability sites would be found primarily in the Canaan Valley or along Beaver Creek, where the wetlands are large and the alignment constraints would be numerous. Scheme Option C1 also may cause indirect or secondary impacts to the Wetland Special Areas at Reidbord Swamp, Tygart Valley River, Dobbin Slashing, and Canaan Valley. Scheme Option C2 may indirectly or secondarily affect the Wetland Special Areas at Reidbord Swamp, Tygart Valley River, Canaan Mountain, and Elder Swamp.

d. Scheme D

All six Scheme Options of Scheme D are similar to each other. Total wetland acreage encountered in the Scheme would range from 733 to 772 acres, the majority of which is found along Beaver Creek, although a substantial amount is found along Leading Creek.

All Scheme D Scheme Options would involve the Exceptional Resource Value Wetland at Elder Swamp. Impact probability for wetlands in Scheme D would be predominantly High. High impact probability sites would be found primarily in the vicinity of Elder Swamp, where the wetlands are large and the alignment constraints would be numerous. All Scheme Options also may cause indirect or secondary impacts to the Wetland Special Areas at Big Run Bog, Elder Swamp, and Mudhole Bog.

e. Scheme E

Both Scheme Options of Scheme E are similar to each other. Total wetland acreage encountered in the Scheme corridors would range from 755 to 786 acres, the majority of which is found along Beaver Creek, although a substantial amount is found along Leading Creek.

Both Options under Scheme E would involve the Exceptional Resource Value Wetland Elder Swamp. Impact probability for wetlands in Scheme E would be predominantly High. High impact probability sites are found primarily in the vicinity of Elder Swamp, where the wetlands are large and alignment constraints would be numerous. Both Scheme Options may also cause indirect or secondary impacts to the Wetland Special Areas at Big Run Bog and Elder Swamp.

f. Comparison of Schemes

The following comparisons can be made among the Schemes:

- Scheme A corridors would involve the smallest total wetland acreage.
- Scheme A corridors would involve the smallest acreage of Exceptional Resource Value Wetlands whereas Scheme B and Scheme C corridors would involve the largest acreage.
- Scheme A corridors would involve the smallest acreage of forested wetland and Scheme B (B1, B2, B3) and Scheme C (C1) corridors would involve the largest acreage.

- The largest acreage of moss/lichen wetland would be involved in Scheme B (B4, B5, B6) and Scheme C (C2); Scheme A corridors would involve none.

- Scheme A corridors would involve the smallest acreage of High impact probability to Exceptional Resource Value Wetlands; Scheme B (B1, B2, B3) and Scheme C (C1) corridors would involve the greatest.

- Scheme A corridors would involve the smallest acreage of High impact probability to all wetlands; Scheme B (B1, B2, B3), Scheme C, Scheme D, and Scheme E corridors would involve the greatest.

6. POTENTIAL MITIGATION MEASURES

Because this is a corridor-level study, it is not appropriate to determine precisely how much or what type of wetland impact would occur as a result of the implementation of the Build Alternative. However, possible measures that may be used within the corridor to prevent, minimize, and compensate for impacts to wetlands are discussed below.

Mitigation is considered a three-step procedure in the regulatory process. The first step is avoidance of wetland impacts to the extent practicable. The second step involves minimizing wetland impacts. The third step, if wetland impacts are unavoidable, is compensation. There are both physical and operational means to avoid and minimize highway construction impacts to wetlands.

Physically avoiding wetland impacts could entail moving the highway out of wetland areas, where feasible. Another approach might be to bridge a wetland area rather than constructing the road on solid fill. Using existing roadway instead of new roadway may also prevent or minimize wetland impacts.

Operational measures to avoid wetland impacts could entail several proactive measures. These could include, but are not limited to, ensuring that fill material is not toxic or otherwise detrimental to the local flora and fauna; assuring that construction equipment is not used in a wetland, unless necessary; providing appropriate care and maintenance of machinery to eliminate spills of petroleum-based products into wetlands; providing employee training emphasizing environmentally safe procedures; and, during construction activities, employing a construction inspector knowledgeable about wetland impacts in order to provide additional avoidance opportunities.

When avoidance of a wetland is not practicable, there are numerous opportunities to minimize the impacts of highway construction. Reducing a highway "footprint" in a wetland could be accomplished by minimizing the right of way width. To do this, the road could be constructed at a reduced elevation to minimize shoulder width, the median width could be reduced, or retaining walls could be utilized. Planning stormwater conveyance systems to treat water flow quantity and quality before it reaches the wetland could be used to reduce erosion and sedimentation. Implementation of erosion and sediment control management practices, such as seeding exposed slopes, during and after construction could also be useful. From an operational perspective, avoiding construction during sensitive periods such as breeding or nesting could be an important feature in minimizing impacts to wetland-dependent species. In addition, construction machinery with specially designed wheels or tracks, and the use of mats under heavy machines, could reduce wetland surface compaction and rutting.

Compensation for loss of wetland functions and values could take several forms, including restoration, enhancement, and replacement. A wetland that is disturbed by construction activity could be restored to its original form through regrading and planting. Restoration of water flow through the wetland may also be required.

In general, restoration is considered the most successful form of compensation. Enhancement would involve improving the functions of, or adding functions to, an existing wetland. For example, constructing a boardwalk and providing guided tours through a wetland may enhance a wetland's opportunity to provide public education. Replacement of a lost wetland generally involves construction of a new wetland. Wetland construction, especially fresh water systems, is a growing field. Replacement may occur either adjacent to the highway (on-site) or at some distant location (off-site). The replacement goal may be to provide the same kind of wetland (in-kind) or a different kind of wetland (out-of-kind). Further, the replacement of a lost wetland may be conducted on the basis of either acreage or functional value. A wetland is usually constructed by grading the site to a shape and elevation adequate to obtain a water source. The soil may be improved by adding top soil or hydric soil. Wetland plants could be allowed to naturally regrow or may be planted.

M. VEGETATION AND WILDLIFE

The vegetation and wildlife assessment describes the unique plant communities, forests, and associated wildlife habitat within the corridors; the potential direct and indirect impacts to these resources; and possible mitigation measures that could be used to minimize or compensate for potential impacts. Details of the vegetation and wildlife analyses are documented in the *Natural Resources Technical Report*, available from WVDOT.

1. METHODOLOGY

The methodology used to evaluate potential impacts to vegetation and wildlife began with a comprehensive review of all previously compiled information, including the DEIS. Additional information was gathered by literature searches and through direct communication with representatives of the West Virginia Department of Natural Resources, West Virginia Natural Heritage Program (WVNHP), Monongahela National Forest, Virginia Department of Game and Inland Fisheries, the Virginia Natural Heritage Program (VNHP), and the George Washington National Forest.

Several assessments were conducted to determine the relative potential for impacts to wildlife and habitat among the 24 Scheme Options. At this corridor-level of study, it is not appropriate to quantify the actual impacts since right-of-way limits have not yet been defined. This would occur at the next step of the study process. Therefore, the reported information is not the actual impact anticipated from the project, but an inventory of resources within the corridors. After selection of the preferred corridor, more detailed evaluations will be conducted as part of the alignment SDEIS.

a. Forest Habitat

The extent of forest types (deciduous, evergreen, and mixed) within each Scheme Option was determined based on Anderson Level II Land Cover Mapping obtained from the U. S. Geological Survey. Acreage of deciduous, evergreen, and mixed forest land cover within the 2,000 foot-wide corridors were calculated for each Scheme Option.

b. Remote Habitat

Habitat in the study area which supports game and non-game species (i.e. bear, turkey, bobcat, warbler) intolerant of disturbance was identified as remote habitat. The Monongahela National Forest's (MNF) *Land and Resource Management Plan* identifies three Management Prescriptions (MP) that promote remote habitat. The three management prescriptions include: MP 5 - areas which are Congressionally-designated Wilderness; MP 6.1 - areas which emphasize management for species intolerant of disturbance, such as black bear and wild turkey, as well as many non-game species; and MP 6.2 - areas which emphasize semi-primitive, non-motorized recreation in a natural setting.

The total acreage of lands managed under each MP was determined as reported in the MNF *Land and Resource Management Plan*. Based on the location of the corridors and the areas classified as remote habitat, the involvement of each Scheme Option was determined. Each involvement of remote habitat was classified as either major or minor. When the corridor bisected a large area of remote habitat, the involvement was classified as major. In this case, remote habitat would be lost to highway construction, as well as to indirect impacts. In this situation, direct loss of habitat would be unavoidable. When the corridor was located along or just outside of the perimeter of the remote habitat, the involvement was classified as minor. A limited amount of remote habitat might be lost to highway construction but opportunities for avoidance would be greater. For minor involvements, the acreage of remote habitat affected by indirect impacts would be greater than acreage impacted by actual highway construction.

c. Forest Fragmentation

Based on Anderson Level II Land Cover/Land Use mapping, forest fragmentation and its impacts on wildlife were assessed by identifying the number of large forest tracts within the 2,000 foot-wide corridor Scheme Options. The assessment incorporates private and public lands, including areas identified as remote habitat. Forests sensitive to fragmentation were defined as those within the corridors which are larger than 200 acres (i.e. 2,000 feet by a minimum of 4,300 feet in length). A forest of this size would have a sufficient interior or "core area" to support breeding populations of a wide range of wildlife associated with the interior of forests. Smaller tracts of forest would not contain a sufficient core area to support forest interior species. (For a more detailed discussion of this methodology, refer to the *Natural Resources Technical Report*, available from WVDOT.)

d. Special Botanical Areas

Areas with unique or rare botanical communities were identified through literature reviews, communication with VNHP and WVNHP, and a review of the MNF *Land and Resource Management Plan*. Within the MNF, areas with special botanical communities are managed under MP 8 - emphasizing preservation of unique ecosystems, areas of national significance, and research areas.

e. Wildlife

The potential impact of the proposed project on wildlife was evaluated by assessing the types of wildlife habitat which would be encountered by each Scheme Option. Based on the Anderson Level II land cover acreages of deciduous, evergreen, and mixed forest areas, the acreage of various wildlife habitats within each Scheme Option was determined. These forested areas account for the majority of the wildlife habitat with in the corridors. Combining a measurement of forest habitat with a description of typical wildlife use of that habitat provides an evaluation of the potential impacts of the Scheme Options on wildlife.

Habitats with special characteristics important to wildlife are given additional evaluation. These habitats include large forest tracts potentially subject to fragmentation (see Forest Fragmentation), important habitat for Threatened or Endangered species (see Threatened and Endangered Species), or habitat managed for the production of species sensitive to disturbance (see Remote Habitat).

2. AFFECTED ENVIRONMENT

The affected environment provides an inventory of habitat (i.e. forest, remote areas) and wildlife within the study area and within the corridors.

a. Physiographic Provinces and Climate

Understanding the physiographic and climatic conditions present in the study area is a key to understanding the various vegetation and wildlife communities. The study area lies in two distinct physiographic provinces of the Appalachian Mountains: the Allegheny Mountain Section of the Appalachian Plateau Province is in the west, and the Middle Section of the Ridge and Valley Province is in the east. A major divide known as the Allegheny Front, running northeast to southwest along the western borders of Pendleton and Grant Counties, separates the Appalachian Plateau Province from the Valley and Ridge Province.

The Allegheny Mountain Section includes areas of Tucker County, the northern section of Randolph County, and the westernmost edges of Grant, Mineral, and Pendleton Counties. Side slopes of the mountains are generally steep, with broad mountain tops. Valleys are narrow, except for the Cheat River and the Blackwater River. The drainage system is a well developed dendritic pattern. Gorges are common, and most streams decline in elevation rapidly. Within this area there are several unique features including Canaan Valley, Blackwater Falls, and Dolly Sods Wilderness.

The Middle Section of the Ridge and Valley Province includes Hampshire and Hardy Counties, those portions of Grant, Mineral and Pendleton Counties not on the Allegheny Plateau, and the Virginia counties of Shenandoah and Frederick. Long, narrow, and level valleys between steep parallel slopes prevail in this region. Unique features of this portion of the study area include the Allegheny Front, Greenland Gap, Seneca Rocks, and Lost River Sinks. This portion of the Valley and Ridge Province contains a trellised drainage pattern.

The climate of the study area is termed "humid continental" because of the marked seasonal differences in temperature, wide yearly temperature range, and abundant, evenly distributed precipitation. The prevailing storm systems move from west to east, causing the area west of the Allegheny Front to receive a greater amount of precipitation (41 to 51 inches per year) than the area to the east (27 to 42 inches per year).

b. <u>Vegetation Communities</u>

The majority of land in the study area is undeveloped forest. The section east of the Allegheny Front belongs to the Northern Forest Biome and is subdivided into the Northern Evergreen and the Northern Hardwood cover types. West of the Allegheny Front, the study area is part of the Mixed Mesophytic Forest Biome. Associated treeless zones found within this biome include grass balds, heath barrens, and sphagnum glades.

The Northern Evergreen Forest is characterized by stands of Red Spruce (*Picea rubens*). Once abundant at high elevations in the mountains, red spruce was one of the principle timber trees of the state. Intense clearcutting and forest fires around the turn of the century caused the acreage to decline drastically. Many areas formerly covered by spruce forests are now covered by hardwoods. The Northern Hardwood Forest is found at elevations of 2,500 to 3,000 feet up to the lower edge of the Northern Evergreen Forest. The three dominant tree species are sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), and yellow birch (*Betula allegheniensis*).

The Mixed Mesophytic Forest is found in rich, moist sites on lower slopes, and is characterized by a great diversity of hardwood species. Among the more important trees are: tulip tree (*Liriodendron tulipfera*), sugar maple, northern red oak (*Quercus rubra*) , hickories (*Carya spp.*), black cherry (*Prunus serotina*), white oak (*Quercus alba*), basswood (*Tilia americana*), cucumbertree (*Magnolia acuminata*), white ash (*Fraxinus americana*), red maple (*Acer rubrum*), sweet birch (*Betula lenta*), beech, elm (*Ulmus americana*), and black locust (*Robinia pseudoacacia*).

Treeless mountain tops in West Virginia are covered by stands of grasses and grass-like plants, dotted with cushions of moss, patches of ferns and other herbaceous plants, and occasional shrubs. Heath barrens also occur on mountain top areas and are predominantly covered with a variety of heath shrubs and other low growing plants. Throughout the mountainous portion of West Virginia, poorly drained treeless areas are known as glades. Glades are very similar to the bog communities of the northern latitudes, both in appearance and floristic composition.

Approximately 20 percent (432,940 acres) of the total forest habitat in the combined areas of the corridors is located in two National Forests: the Monongahela National Forest and the

George Washington National Forest. Table III-30 presents the total forested acreage within each Scheme Option, which ranges from 16,245 to 21,611 acres (58 to 73 percent, respectively). Deciduous and mixed forest types are found in approximately equal proportions among the Scheme Options, (6,000 to 11,000 acres) while coniferous forests are much less abundant (less than 2,000 acres).

c. Remote Habitat

There are two Congressionally-designated Wilderness Areas within the project area (Dolly Sods and Otter Creek) which represent over 30,000 acres of remote habitat. Both of these areas are located within the MNF and managed under MP 5. Other remote habitat within the study area includes twelve separate tracts managed under MP 6.1 (totaling 65,000 acres), and six separate tracts managed under MP 6.2 (totaling 38,000 acres). Remote habitat in areas managed as either MP 6.1 or MP 6.2 includes the following areas: Canaan Mountain, Roaring Plains, Mozark, Lower Glady, Red Creek, High Ridge, McCray Ridge, Laurel Run, Olson, Lower Glady, Upper Glady, and North Fork Slope. The involvement (major or minor) of each Scheme Option with remote habitat is discussed in the next section.

d. Forest Fragmentation

Forest fragmentation is the process whereby large, continuous, and often homogenous areas of forest are broken into smaller tracts. Large tracts of forest are important for the survival of species which require the conditions found in the interior of forests, as well as for some large game species. Forest interior species include mammals (e.g. fishers and bobcats) and birds such as certain woodpeckers, thrushes, warblers, gnatcatchers, and flycatchers. Within each Scheme Option there are between 20 and 31 large forest tracts. The predominant forest type is either deciduous or mixed, with evergreen forests being relatively rare.

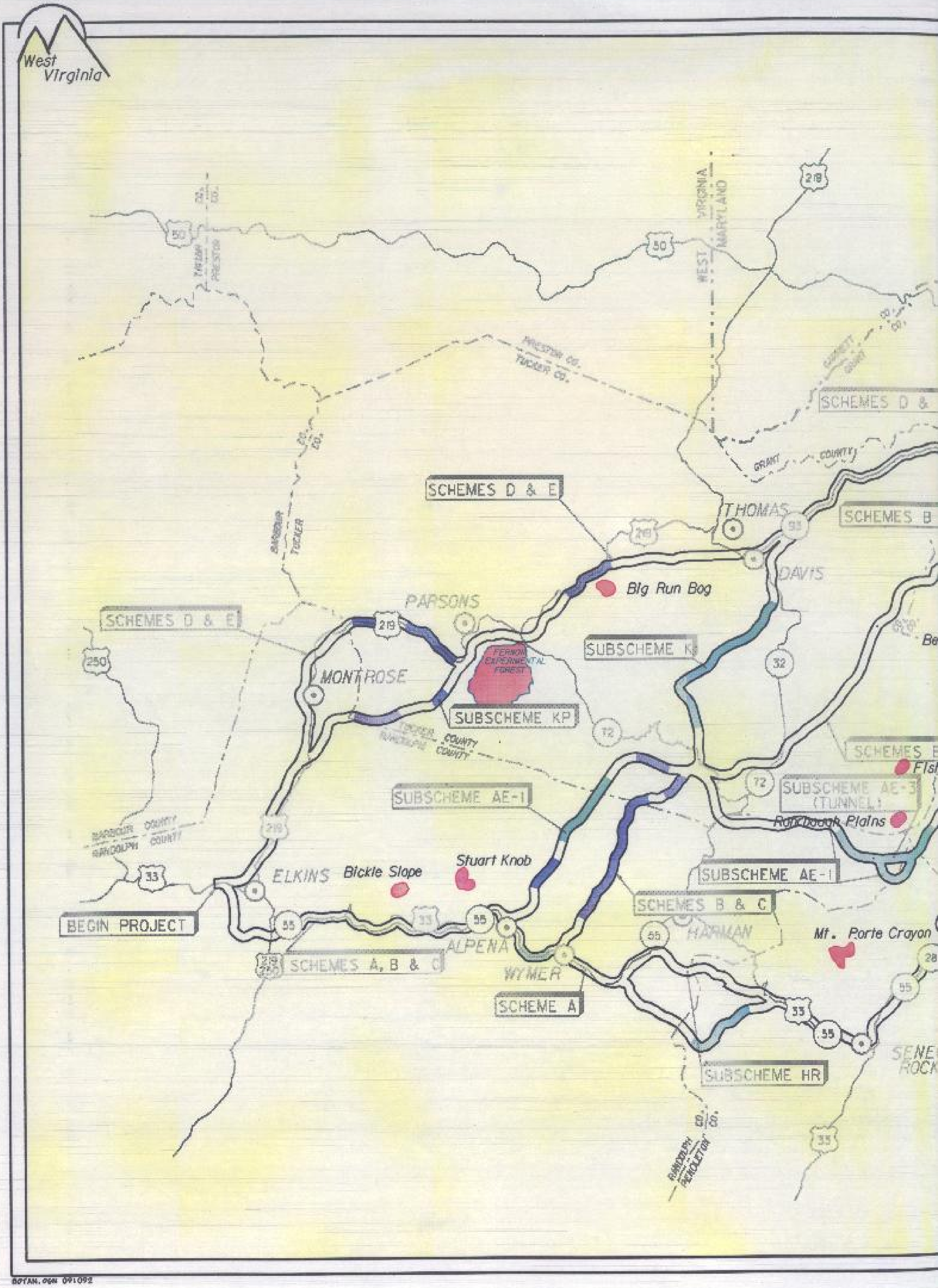
e. Special Botanical Areas

There are a number of unique botanical communities present in the study area near the corridors, as illustrated in Exhibit III-8. These sites include shale barrens, Powers Hollow cedar glades and barrens, Greenland Gap, and MNF areas which are managed under MP 8. The MP 8 sites include: Bear Rock Bog, Fisher Spring Run Bog, and Big Run Bog which are all high altitude wetlands similar to those found in northern latitudes; Mt. Porte Crayon, Rohrbaugh Plains, Stuart Knob, and Bickle Slope which all contain rare plant species or communities; and Fernow Experimental Forest, a watershed utilized for research.

Shale barrens are rocky slopes in the mid-Appalachians that support a unique plant community adapted to very hot, dry, and unstable soil conditions. These barrens harbor a number of

TABLE III-30
INVENTORY OF FOREST TYPES WITHIN SCHEME OPTIONS

SCHEME OPTION	DECIDUOUS FOREST (Acres)	CONIFEROUS FOREST (Acres)	MIXED FOREST (Acres)	TOTAL FOREST ACREAGE	PERCENTAGE OF CORRIDOR FORESTED
A1	8,714	833	7,409	16,956	63
A2	10,311	896	7,515	18,722	65
A3	9,540	781	5,693	16,014	60
A4	9,230	833	7,377	17,442	65
A5	10,101	897	7,363	18,361	64
A6	9,233	827	7,335	17,395	66
A7	9,073	833	7,292	17,198	65
A8	8,735	831	7,382	16,948	63
B1	10,100	1,303	8,496	19,899	69
B2	10,609	1,352	8,450	20,411	70
B3	10,382	1,352	8,648	20,382	70
B4	8,419	1,511	10,173	20,103	69
B5	9,927	1,511	10,173	21,611	73
B6	9,730	1,538	10,340	21,608	73
C1	11622	228	8,028	19,878	64
C2	10,922	836	9,760	21,518	68
D1	7,443	1,605	9,360	18,408	66
D2	8,531	1,606	9,477	19,614	69
D3	8,297	907	7,041	16,245	58
D4	7,814	1,453	6,620	17,887	65
D5	5,965	1,606	9,542	17,113	63
D6	7,680	1,606	9,381	18,667	69
E1	9,527	480	9,060	19,067	63
E2	9,185	480	8,965	18,630	63



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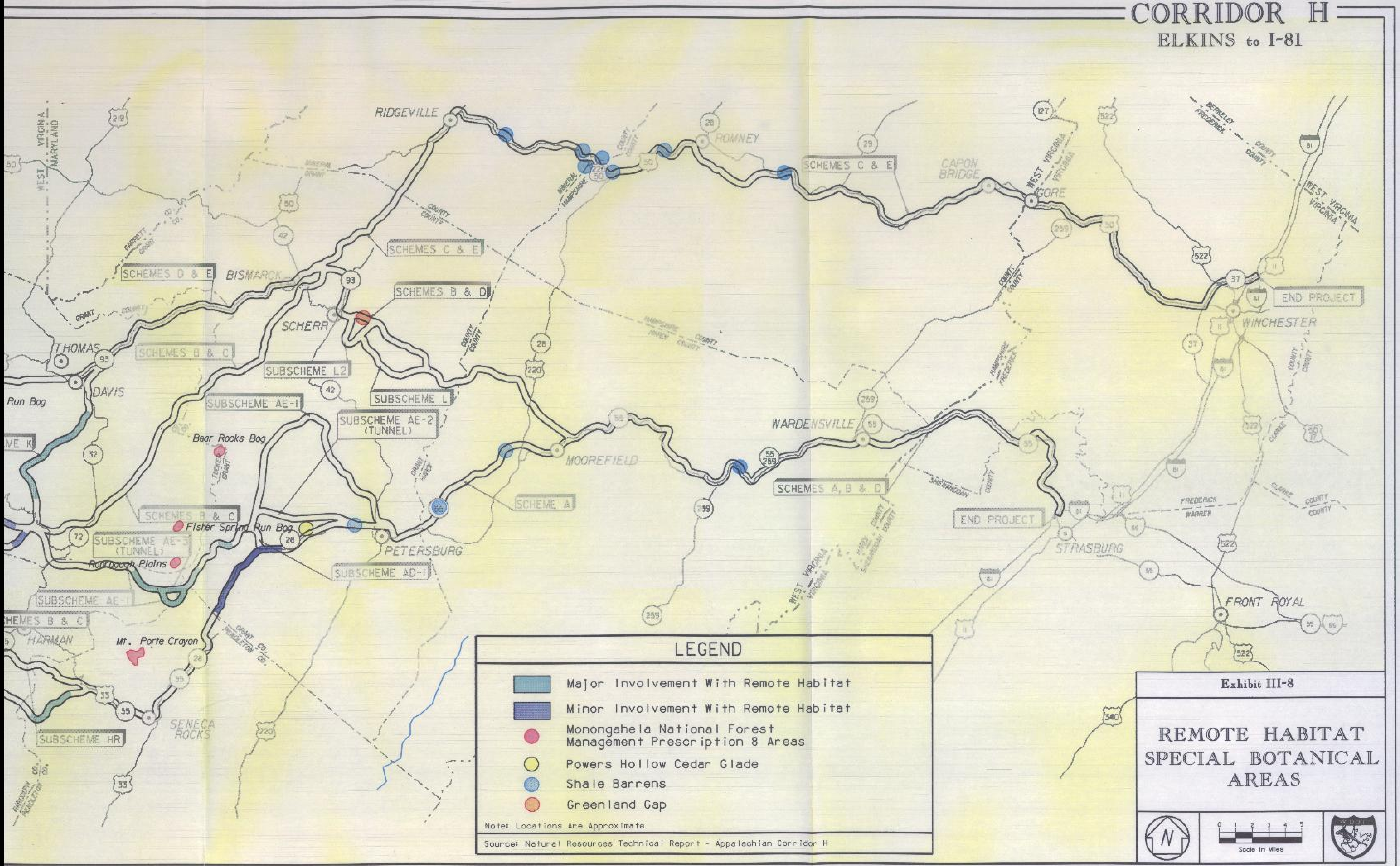
CORRIDOR H
ELKINS to I-81
LEGEND
Major Involvement With Remote Habitat
Minor Involvement With Remote Habitat
Monongahela National Forest Management Prescription 8 Areas
Powers Hollow Cedar Glade
Shale Barrens
Greenland Gap
Note: Locations Are Approximate
Source: Natural Resources Technical Report - Appalachian Corridor H
Exhibit III-8
REMOTE HABITAT SPECIAL BOTANICAL AREAS
Scale in Miles
RIDGEVILLE
ROMNEY
CAPON BRIDGE
GORE
WINCHESTER
END PROJECT
BISMARCK
SCHERR
THOMAS
DAVIS
Run Bog
Bear Rocks Bog
Fisher Spring Run Bog
Roaring Plains
Mt. Porte Crayon
HARMAN
SENECA ROCKS
PETERSBURG
MOOREFIELD
WARDENSVILLE
STRASBURG
FRONT ROYAL
SCHEMES C & E
SCHEMES D & E
SCHEMES B & D
SCHEMES B & C
SUBSCHEME L2
SUBSCHEME L
SUBSCHEME AE-1
SUBSCHEME AE-2 (TUNNEL)
SUBSCHEME AE-3 (TUNNEL)
SUBSCHEME AD-1
SUBSCHEME HR
SCHEME A
SCHEMES A, B & D
WEST VIRGINIA
MARYLAND
VIRGINIA

endemic plant species including several which are candidate species for protection under the Endangered Species Act. Shale barrens occur primarily on lower flanks of ridges, generally between 1,000 and 2,000 feet in elevation. Within the study area, shale barrens occur in the Valley and Ridge Physiographic Province, east of the Allegheny Front.

Cedar glades and barrens are another type of unique plant community found in the study area. Only known since 1983, this community contains several plant species typically found in shale barrens, others that are typical of the Midwest prairies, and others that reach their northern or southern limit of distribution. Although there are several cedar glades known in the study area, those located in Powers Hollow, west of Petersburg, are the best examples of this community and are the closest to the corridors.

Greenland Gap is a water gap formed by the cutting action of the North Fork of Patterson Creek. Located in Grant County, this 255 acre site contains unique geological, biological, and water resources, and is owned and managed by The Nature Conservancy. The plant communities varies from Table Mountain pine on the cliff tops to the mixed hemlock forest in the gap. Greenland Gap is a designated National Natural Landmark.

e. Wildlife

A wide range of wildlife is present in the study area due to the abundance and variety of forest and other habitats. Wildlife is an important ecologic, economic, and recreation resource. The abundance of wildlife is made up of game, non-game, and furbearing mammals, as well as upland game birds, waterfowl, non-game birds, and raptors. Small mammals such as shrews, moles, mice, and voles are common and provide the prey required for predators such as red fox, bobcat, mink, least weasel, and various owls and hawks. Other small game mammals, game birds, and furbearers are common throughout the study area and include gray and fox squirrels, cottontail rabbits, ruffed grouse, mourning dove, woodcock, and raccoon.

The primary big game species are black bear, turkey, and white tailed deer. Much of the Monongahela National Forest is managed (MP 6.1 and 6.2) for production of black bear and turkey, as well as the many non-game and small game species which occupy the same habitat. Black bear typically inhabit mixed hardwood forests interspersed with streams. Black bear are omnivorous, feeding on berries, nuts, tubers, insects, small mammals, and carrion. They require territories as large as 1 to 2 square miles (600-1200 acres). Based on harvest statistics, black bear are most abundant within Randolph and Tucker Counties. Turkey are often found in the same habitat as black bear, since they both rely heavily on acorns and nuts produced in the deciduous and mixed forests. Turkey do not require as large a territory or as remote a habitat as black bear. Based on harvest statistics, Randolph and Hampshire Counties have the highest turkey populations within the project area.

The discussion on remote habitat is specifically focused on the type of habitat that is best suited for black bear, turkey, and associated wildlife. The discussion of forest habitat and, to a lesser extent, forest fragmentation, also applies to the potential impacts to these game animals.

The evergreen forests found at high elevations provide habitat for a community of more typically "northern" or boreal species. These forests provide habitat for snowshoe hare, northern flying squirrel, and fishers as well as a variety of migratory songbirds, small mammals and salamanders. Discussions on the potential impacts to evergreen forest habitat, remote habitat, and endangered species would apply to the potential impacts to these species.

3. POTENTIAL IMPACTS

The affects of constructing a highway include the direct loss of unique plant communities and large amounts of forests, including those areas that provide remote habitat. In addition, indirect affects of highway construction and operation include increased noise, airborne and waterborne pollutants, and increased access which may alter or degrade the habitat.

a. Forest Habitat

The impact of the project to forests primarily involves the direct loss of habitat for wildlife. Direct impacts would occur through the conversion of forest to highway right-of-way, as well as habitat loss from borrow pits, mitigation sites, and other construction related land uses. Although a large percentage of the corridors are forested, most corridors follow an existing transportation corridor (e.g., US 50).

The following is a summary of the potential involvements of the Scheme Options with forested habitat.

- Scheme Options A3 and D3 involve the least amount of forest, while Scheme Options B5 and B6 involve the greatest amount of forest;

- Scheme Option D5 involves the least acreage of deciduous forest while Scheme Options C1 and C2 involve the greatest acreage of deciduous forest;

- Scheme Options C1, E1, and E2 involve the least acreage of evergreen forest Scheme Options D1, D2, D5 and D6 involve the highest acreage of evergreen forest.

b. <u>Remote Habitat</u>

Major involvement with remote habitat may result in direct habitat loss for right-of-way construction. In addition to direct impacts, man-made intrusions such as increased noise levels into remote habitat may indirectly impact the area's ability to support species intolerant of intrusion. The proposed highway may increase access to remote habitat by the public which, in turn, may degrade the remote quality of the habitat. Table III-31 identifies the potential involvement of each Scheme Options with remote habitat. This is also shown graphically on Exhibit III-8.

Approximately 10 percent of the total acreage of remote habitat identified within the study area lies within the 24 Scheme Options. The individual Scheme Options would only involve 0.5 to 3 percent of the total remote habitat in the study area. The actual direct impacts due to construction of the facility would be less than one fourth of the acreage reported in Table III-31. For example, assuming a maximum right-of-way width of 500 feet, the greatest potential direct impact would be less than 650 acres.

All of the Scheme Options avoid direct impacts to designated Wilderness Areas, but may impact other areas which provide remote habitat. Depending on the Scheme Option selected, major involvements may occur in the following areas: Canaan Mountain, Roaring Plains, Mozark, Lower Glady, Red Creek, High Ridge, and/or McCray Ridge. Minor involvements may occur in the following areas, depending on which Scheme Option is selected: Laurel Run, Olson, Lower Glady, Upper Glady, and/or North Fork Slope. The greatest potential for direct impacts would occur in the Canaan Mountain area (SubScheme K), which includes Scheme Options B4, B5, B6, and C2.

The following is a summary of the potential involvements of the Scheme Options with remote habitat.

- None of the Schemes would directly involve Wilderness Areas but all of the Scheme Options would have minor involvements with remote habitat;

- Schemes A, B, and C would have major involvements with remote habitat, while Schemes D and E would not have major involvements with remote habitat;

TABLE III-31
INVOLVEMENT WITH REMOTE HABITAT, FORESTED TRACTS, AND SPECIAL BOTANICAL AREAS

SCHEME OPTION	ACRES OF REMOTE HABITAT		NUMBER OF LARGE FORESTED TRACTS	NUMBER OF SPECIAL BOTANICAL AREAS	
	Major Involvement	Minor Involvement		Direct Involvement	Indirect Involvement
A1	690	1,454	24	1	4
A2	2,497	242	23	0	3
A3	2,339	242	20	1	3
A4	1,999	1,212	20	1	4
A5	1,999	242	23	0	3
A6	1,999	242	21	1	3
A7	1,999	1,212	20	1	4
A8	691	1,745	23	1	4
B1	267	1,845	29	1	1
B2	267	1,845	29	0	1
B3	267	1,845	29	0	1
B4	2,036	1,845	31	1	1
B5	2,036	1,845	31	0	1
B6	2,036	1,845	31	0	1
C1	267	1,845	31	0	8
C2	2,691	1,845	33	0	8
D1	0	1,309	27	1	1
D2	0	1,309	28	0	1
D3	0	1,309	25	0	1
D4	0	897	27	0	1
D5	0	1,018	27	0	1
D6	0	1,018	28	0	1
E1	0	1,309	30	0	8
E2	0	1,018	29	0	8

- Scheme Option C2 would have the greatest involvement (major and minor) with remote habitat;

- Scheme Options B4, B5, and B6 would have the second highest involvement with remote habitat.

c. **Forest Fragmentation**

The construction of a highway through a large forest would create habitat fragmentation, resulting in a variety of direct and indirect impacts to the plant and animal communities. Fragmentation creates an opening or edge that enables certain plant and animal species adapted to such areas to invade the forest. The forest edge species often displace forest interior species through competition for food and nesting areas; predation; and nest parasitism. Increased light penetration into the remaining forest may result in a change in the plant and wildlife communities.

A major concern in forest fragmentation is its impacts on migratory song birds, often called neotropical migrants, which appear to experience population declines as a result of forest fragmentation. These species winter in Central America and the Caribbean, and to a leaser extent in South America, but breed in North America. The recent declines in neotropical migrants may be a function of the following factors:

- Factors affecting survival on the wintering grounds (i.e., survival in the tropics),

- Factors impacting reproductive success in North America, and

- A combination of factors in both the wintering and breeding areas.

However, the contribution of forest fragmentation in North America toward the decline in migratory songbird populations is not clearly understood at this time.

The numbers of forest parcels sensitive to fragmentation that may be involved with each Scheme Option are also presented on Table III-31. A summary of the findings is noted below.

- Scheme Option C2 would involve the greatest number of large forest tracts (33);

- Scheme E would involve the greatest number (18-19) of large mixed forest tracts;

- Scheme C would involve the greatest number (14-15) of large deciduous forest tracts;

- Scheme A, B and D each would involve two or three large coniferous forest tracts; while Scheme C and E would not involve large coniferous forests tracts.

d. <u>Special Botanical Areas</u>

Impacts to the Special Botanical Areas could consists of both direct and indirect impacts. None of the MNF MP 8 areas would be directly affected by any of the corridor Scheme Options. Indirect impacts may occur due to increased access to MNF as a result of improved transportation. Direct impacts would be limited to Greenland Gap and Powers Hollow, while all of the special botanical areas may experience indirect impacts due to the proximity of at least one of the corridors.

None of the identified shale barrens would be directly impacted by the proposed project, but indirect impacts may be possible. Schemes C and E are located near eight shale barrens; Scheme A could affect three to four shale barrens; while Schemes B and D would avoid indirect involvement with all but one shale barren.

The Scheme Options that cross any portion of Powers Hollow were assumed to potentially impact (directly or indirectly) the cedar glades and barrens. Scheme Options A1 and A8 would cross the mouth of Powers Hollow, whereas Scheme Options A2, A3, A4, A6, and A7 would cross Powers Hollow near the headwaters. Schemes B, C, D, and E would avoid Powers Hollow cedar glades and barrens. Existing quarrying activity in Powers Hollow is currently jeopardizing the future status of this site.

Scheme Options B1, B4, and D1 would require extensive construction (direct impact) within Greenland Gap. SubScheme L and L2 were developed to avoid Greenland Gap, thus the remaining B and D Scheme Options would avoid it, as would Schemes A, C, and E.

The following is a summary of the potential involvements of the Scheme Options with Special Botanical Areas.

- None of the MNF MP 8 areas would be directly impacted;

- All Schemes would indirectly involve at least one shale barren;

- Scheme C and E would indirectly involve the greatest number (8) of shale barrens; while Scheme B and D would indirectly involve only one shale barren;

- Scheme Options A1, A3, A4, A6, A7, and A8 may directly or indirectly impact Powers Hollow cedar glades and barrens;

- Scheme Option B1, B4, and D1 would directly impact Greenland Gap.

e. Wildlife

Potential impacts to wildlife include direct habitat destruction due to construction, and indirect loss of habitat due to degradation of the surrounding area as a result of increased human access and activity. The new highway facility may interfere with animal movement patterns. For large mammals, this may result in individual deaths due to collisions with vehicles. For small mammals, reptiles, and amphibians, the highway may create a barrier that reduces movement between populations. The highway facility would not impede migration of birds, but may increase forest fragmentation, a particular concern for migratory songbirds.

4. POTENTIAL IMPACT SUMMARY

None of the Scheme Options would directly involve Congressionally-designated Wilderness Areas, botanical areas managed under MP 8, or shale barrens. Over 58 percent of the area within each Scheme Option corridor is forested. In addition, each Scheme Option corridor contains at least 20 large forest tracts. The following provides a summary of the potential impacts by Scheme.

a. Scheme A

Scheme A would involve fewer forested areas than the other Schemes, but would include several coniferous forests. Scheme A would fragment the fewest number of large forest tracts. Except for Scheme Option A8, Scheme A would have major involvements with remote habitat. All of the Scheme Options would avoid Greenland Gap and indirectly involve three to four shale barrens. All but Scheme Options A2 and A5 would involve Powers Hollow.

b. Scheme B

Because of SubScheme K over Canaan Mountain, Scheme Options B4, B5, and B6 would involve a high amount of remote habitat, the greatest area of forested land, and a high potential for forest fragmentation. Scheme Options B1, B2, and B3 involvement with remote habitat would be substantially less. Scheme Options B1 and B4 would directly involve Greenland Gap, while all other

Scheme Options under Scheme B would avoid direct impacts to Special Botanical Areas and would indirectly involve one shale barren.

c. Scheme C

Because of SubScheme K over Canaan Mountain, Scheme Option C2 would involve the greatest amount of remote habitat and deciduous forest and the highest potential for forest fragmentation. Scheme C avoids Greenland Gap and Powers Hollow but may indirectly involve the greatest number of shale barrens, as would Scheme E.

d. Scheme D

Scheme Options under Scheme D would avoid major involvement with remote habitat but would involve the highest amount of coniferous forest. Scheme Option D1 would directly involve Greenland Gap, while all other Scheme Options under Scheme D would avoid direct impacts to Special Botanical Areas and would indirectly involve one shale barren.

e. Scheme E

Scheme E would avoid major involvement with remote habitat and coniferous forests, but would potentially fragment a number of mixed and deciduous forests. Scheme E avoids Greenland Gap and Powers Hollow but may indirectly involve the greatest number of shale barrens, as would Scheme C.

f. Comparison of Schemes

Overall, Scheme Options B4, B5, B6, and C2 would have the greatest potential impacts to wildlife through direct and indirect impacts to forest habitat and remote habitat, and through forest fragmentation. These Scheme Options include SubScheme K over Canaan Mountain, which represents a very large, mostly undisturbed forest. Scheme Options B1, B4, and D1 traverse through the middle of Greenland Gap, with little chance for avoidance. The other Scheme Options provide a greater opportunity to avoid impacts to Special Botanical Areas.

5. POTENTIAL MITIGATION MEASURES

There are numerous methods available to minimize potential impacts to vegetation and wildlife from constructing and operating a highway facility.

a. Vegetation and Habitat

To mitigate forest fragmentation and associated impacts to forest interior species, as well as impacts to remote habitat, it would be best to avoid bisecting large forest tracts. While avoidance of all large forest tracts may not feasible, impacts may be reduced by selecting the corridor that bisects the smallest number of large forest tracts. When avoidance is not possible, forest fragmentation and its impact on wildlife may be minimized by preserving the largest "core area" by considering the following:

- Utilization of existing non-forest lands and transportation corridors.
- Routing the highway facility near the existing edge of a forest tract instead of bisecting a forest.
- Minimizing the length and width of the highway right-of-way through or along a forest, thereby reducing the new forest edge created.
- Avoiding or minimizing right-of-way through areas managed as remote habitat.

There is little that can be done to mitigate for direct impacts to Special Botanical Areas due to their sensitive nature and limited distribution. Should a Scheme Option be selected which may directly impact a Special Botanical Area, more detailed studies of the site should be conducted to better define its location and evaluate the potential for avoidance and minimization of impacts from the project.

b. Wildlife

The first step in mitigating loss of wildlife would be avoiding and minimizing impacts to forest and remote habitat and reducing or avoiding forest fragmentation. Unavoidable direct loss of habitat could be compensated by increasing the population carrying capacity of the remaining habitat. There are numerous wildlife habitat improvement methods available, such as planting vegetation that provides wildlife food, selectively harvesting and managing tree species to increase food production, and protecting and providing access to water supplies. Indirect impacts such as increased human access and activity may be controlled through management policies.

N. FLOODPLAINS

Protection of floodplains and floodways is required by Executive Order 11988 "Floodplain Management"; U.S.DOT Order 5650.2, "Floodplain Management and Protection"; FHPM 6-7-3-2 "Location Hydraulic Design of Encroachments of Floodplains"; and 23 CFR Part 650. The intent of these regulations is to avoid or minimize highway encroachments within the 100 year (base) floodplain, where practicable, and to avoid supporting land use development which is incompatible with floodplain values. Where encroachment is unavoidable, the regulations require WVDOT to take appropriate measures to minimize impacts.

1. METHODOLOGY

In accordance with Executive Order 11988 and FHPM 6-7-3-2, a Location Hydraulic Study was conducted to determine if encroachment would occur with implementation of the project. This study is documented in the *Floodplains Technical Report*, available from WVDOT. Because this is a corridor location study, the level of detail provided is commensurate with the level of detail surrounding the Build Alternative. Given that impacts have been assessed based on a 2,000 foot-wide corridor inventory of resources, details of potential floodplain involvements are only general in nature.

The Location Hydraulic Study involved analyzing the flooding risk of each corridor Scheme Option. Three categories were viewed as relevant indicators of potential flooding risk: regulatory floodway impacts;.100-year floodplain impacts; and flood hazard impacts. Regulatory floodways and 100-year floodplains are established by the Federal Emergency Management Agency (FEMA) through detailed hydraulic studies. Detailed studies are performed in regions thought by federal agencies to contain significant flooding risk potential. In this study, 100-year floodplains and regulatory floodway regions are considered areas of moderate to high flooding risk potential. Flood hazard zones are areas where flooding is not considered to impose a prominent risk. As a result, they are considered areas of low to moderate flooding risk potential.

Areas subject to these types of flooding were identified by copying the flood boundaries delineated under FEMA's National Flood Insurance Program onto the same scale base mapping of the Corridor H study area. Mapping resources included Flood Hazard Boundary Maps (FHBM), Flood Insurance Rate Maps (FIRM), and Flood Boundary and Floodway Maps (FBFM). The specific Community Panel Numbers of the mapping used are documented in the Floodplains Technical Report. The area of each floodway, 100-year floodplain, and flood hazard zone encroachment was then measured within each Scheme Option based on a corridor width of 2,000 feet.

2. AFFECTED ENVIRONMENT

In general, floodplains are considered valuable for the natural and beneficial roles they play. Floodplains serve to moderate the flow of floods, provide water quality maintenance, and act as an area for groundwater recharge. Many types of aquatic and terrestrial plants and animals find their habitats in floodplains. Archaeological and historical resources, as well as recreation sites, are often located in floodplains. From an agricultural standpoint, floodplains often contain the most fertile and productive soils because topsoil washed from upstream areas is deposited in the floodplains downstream. These floodplain functions generally apply to the study area. Given the study area's overall undeveloped and densely vegetated character, the ability of the floodplains within the study area to perform these functions has not been impaired. The project area has a high potential for flash flooding and the floodplains are important for the conveyance of flood waters.

3. POTENTIAL INVOLVEMENTS

Based on the study findings, 89 unique involvements were identified throughout the study area. Exhibit III-9 shows the general location of these involvements within the corridor Scheme Options. The acreage of each involvement is tabulated in Table III-32. This includes the entire acreage for the floodplain, floodway, and/or flood hazard area that exists within the corridors. The actual encroachment would be less, since structures bridging these areas would likely be used. Although details of structure location and type would be prepared following the selection of a preferred corridor, WVDOT would ensure that any structure would not increase backwater or the risk of upstream flooding from a 100-year storm event, nor would it overtop the highway facility.

A method was developed to rate the flood risk potential of each Scheme Option based on the magnitude of the potential floodway, the 100-year floodplain, and the flood hazard involvement. Details of how the rating was developed are documented in the Floodplains Technical Report. Table III-33 summarizes the computed ratings for each Scheme Option. Other factors considered in the assessment of risk include damages from prior floods (Table III-34), particularly the flood of record in November, 1985, and potential incompatible floodplain development. The ratings presented on Table III-33 provide the following Scheme Option results.

- Scheme Options B1, B2, and B3 would involve the least risk due to the relatively minor involvement with the 100-Year Floodplain and Flood Hazard Zone (Table III-32) and to the area's smaller scale damages attributed to the November, 1985 flood (Table III-34).

- However, as shown on Exhibit III-9, three potential development regions of Elkins, Canaan Valley, and Romney are located within the corridor Scheme Options.

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CORRIDOR H
ELKINS to I-81

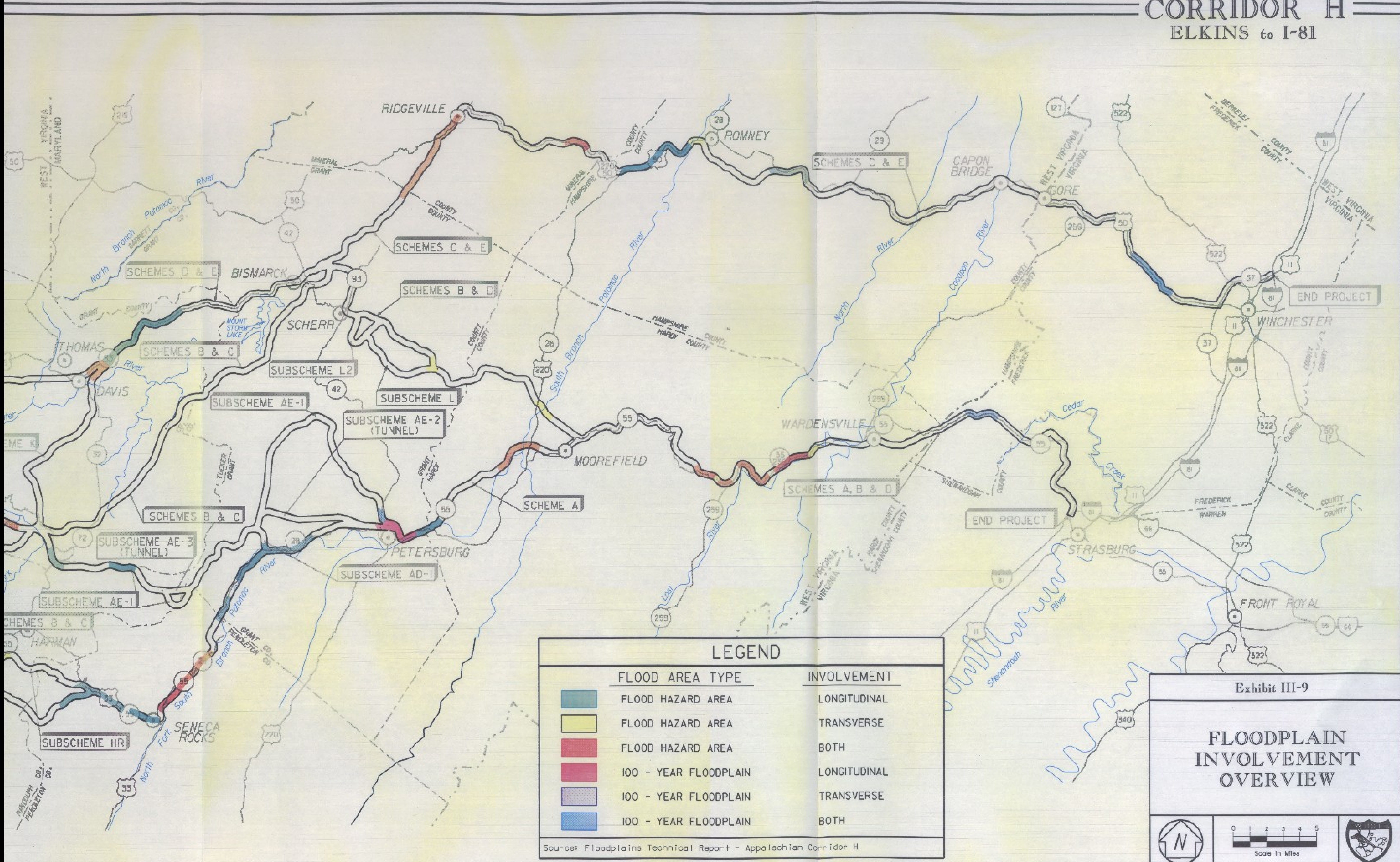

Exhibit III-9

FLOODPLAIN INVOLVEMENT OVERVIEW

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TABLE III-32
FLOODPLAIN INVOLVEMENT AREAS

SCHEME OPTION	FLOODPLAIN INVOLVEMENT (ACRES)								TOTAL FLOODPLAIN INVOLVMENT (Acres)	FLOODWAY INVOLVEMENT	
	FLOOD HAZARD ZONE				100-YEAR FLOODPLAIN						
	Long.*	Trans.**	Both	SubTotal	Long.*	Trans.**	Both	SubTotal		Acres	Feet
A1	1,235	165	1,746	3,147	447	68	50	566	3,712	0	0
A2	460	114	1,286	1,859	305	68	151	523	2,383	0	0
A3	460	114	1,286	1,859	394	68	50	513	2,372	0	0
A4	687	114	1,286	2,086	447	68	50	566	2,652	0	0
A5	460	114	1,286	1,859	305	68	151	523	2,383	0	0
A6	460	114	1,286	1,859	394	68	50	513	2,372	0	0
A7	687	114	1,286	2,086	447	68	50	566	2,652	0	0
A8	1,159	209	1,703	3,071	447	68	50	566	3,637	0	0
B1	282	487	733	1,502	0	68	50	119	1,620	0	0
B2	282	487	733	1,502	0	68	50	119	1,620	0	0
B3	282	425	681	1,388	0	68	50	119	1,507	0	0
B4	515	460	830	1,805	0	68	50	119	1,924	0	0
B5	515	433	830	1,778	0	68	50	119	1,897	0	0
B6	515	449	830	1,794	0	68	50	119	1,913	0	0
C1	718	220	991	1,930	0	193	151	344	2,273	5	2,150
C2	991	228	1,152	2,371	0	193	151	344	2,715	5	2,150
D1	684	480	1,483	2,647	0	68	50	119	2,765	0	0
D2	684	480	1,483	2,647	0	68	50	119	2,765	0	0
D3	684	450	1,483	2,618	0	68	50	119	2,736	0	0
D4	1,021	450	909	2,380	0	68	50	119	2,499	0	0
D5	1,021	480	909	2,409	0	68	50	119	2,528	0	0
D6	1,021	463	909	2,393	0	68	50	119	2,511	0	0
E1	1,121	212	1,742	3,075	0	193	151	344	3,419	0	0
E2	1,457	212	1,168	2,837	0	193	151	344	3,181	0	0

* Long. = Longitudinal Impact ** Trans. = Transverse Impact

Source: WVDOT-Division of Highways. "Floodplains Technical Report: Appalachian Corridor H-Elkins to I-81", 1991.

TABLE III-33
MAGNITUDE OF FLOOD INVOLVEMENT

SCHEME OPTION	MAGNITUDE OF FLOOD INVOLVEMENT			
	FLOOD SEVERITY RATING	FLOODWAY INVOLVEMENT (Acres)	100-YEAR FLOODPLAIN INVOLVEMENT (Acres)	FLOOD HAZARD INVOLVEMENT (Acres)
A1	0.70	0	566	3,147
A2	0.58	0	523	1,859
A3	0.57	0	513	1,859
A4	0.63	0	566	2,086
A5	0.58	0	523	1,859
A6	0.57	0	513	1,859
A7	0.63	0	566	2,086
A8	0.70	0	566	3,071
B1	0.20	0	119	1,502
B2	0.20	0	119	1,502
B3	0.19	0	119	1,388
B4	0.22	0	119	1,805
B5	0.22	0	119	1,778
B6	0.22	0	119	1,794
C1	1.23	5	344	1,930
C2	1.25	5	344	2,371
D1	0.27	0	119	2,647
D2	0.27	0	119	2,647
D3	0.27	0	119	2,618
D4	0.26	0	119	2,380
D5	0.26	0	119	2,409
D6	0.26	0	119	2,393
E1	0.50	0	344	3,075
E2	0.48	0	344	2,838

Source: WVDOT-Division of Highways. "Floodplains Technical Report-Appalachian Corridor H", 1991.

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TABLE III-34
NOVEMBER 1985 FLOOD EVENT - SUMMARY MATRIX

STREAM NAME	COUNTY	MUNICIPALITY	STATE	USGS GAGE	DISCHARGE (CFS)	STAGE (FT)	ESTIMATED FREQUENCY	DAMAGES (OCTOBER 1989 PRICE LEVEL)	AFFECTED SCHEME(S)
South Branch Potomac River	Grant	Petersburg	WV	# 01606500 near Petersburg	130,000	21.80	400 Year Flood	Damages to homes, businesses, industries, roads, railroads, airport, and water/sewer lines estimated to be $33 million.	Scheme Options A1 thru A8.
Tygart Valley River	Randolph	Elkins	WV	# 03050500 near Elkins	23,500	22.81	Exceeded 200 Year Flood	Homes flooded and damaged, people evacuated, damages listed as minimal.	Scheme Options A1 thru A8, B1 thru B6, and C1 thru C2.
Blackwater River	Tucker	Davis	WV	# 03066000 at Davis	12,500	17.67	Exceeded 200 Year Flood	None documented.	No Scheme Options directly impact this river. However, Scheme Options C2, D1 thru D5, and E1 thru E2 would promote development.
Shavers Fork	Tucker	Parsons	WV	# 03069000 at Parsons	43,000	19.86	Exceeded 200 Year Flood	None documented.	Scheme Options D1 thru D4, and E1.
Cheat River	Tucker	Parsons	WV	# 03069500 near Parsons	170,000	24.30	Exceeded 200 Year Flood	Within the Cheat River Basin, including Parsons, nearly 600 homes and 200 mobile homes destroyed, 350 homes suffered extensive damage, and 150 businesses destroyed.	No Scheme Options directly impact this river. However, Scheme Options C2, D1 thru D5, and E1 and E2 would promote development.
South Fork-South Branch of Potomac River	Hardy	Moorefield	WV	# 01608000 near Moorefield	110,000	20.00	Not Available	Agricultural damage over $10,000,000 with over 3,000 acres of farmland destroyed and five fatalities.	Scheme Options A1 thru A8.
South Branch Potomac River	Hampshire	Romney and Springfield	WV	# 01608500 near Springfield	240,000	44.20	Not Available	Extensive damage to roadways and bridges and three fatalities.	Scheme Options C1, C2, E1, and E2.

Source: WVDOT-Division of Highways. "Floodplains Technical Report: Appalachian Corridor H-Elkins to I-81". 1991.

- Scheme Options A1 and A8 would have the greatest involvement with Flood Hazard Zones and the 100-Year Floodplain, involving a total of approximately 3,712 and 3,637 acres, respectively.

- Scheme Options C1 and C2 would be the only Scheme Options with a Floodway Involvement.

4. POTENTIAL MITIGATION MEASURES

Possible measures to minimize the types of base floodplain impacts could include the following efforts (Federal Register, 1978). If the floodplain encroachment is longitudinal, the alignment within the Scheme's corridor could be shifted to either avoid or minimize the impact. If the encroachment is transverse, the alignment could be designed such that it crosses the floodplain at its narrowest point.

During construction, minimum grading requirements and limiting the compaction of the floodplain could be used. Following construction, undeveloped land could be returned to original contours, where possible. During and after construction, the control of increased stormwater runoff could be accomplished using stormwater management facilities. Following the selection of the preferred corridor and the initiation of Alignment Selection SDEIS, a stormwater management plan would be developed in an effort to retain additional flood discharges created by an increase in impervious land cover.

Following construction, efforts would be made to maintain and re-establish wetland and floodplain vegetative buffers to reduce sediment erosion, siltation, and the delivery of chemical pollutants downstream. At the preliminary design stage, methods to restore and preserve water quality would be addressed in the erosion and sediment control plan. The plan would be designed to prevent accelerated erosion of the disturbed land and to re-establish the vegetation removed during construction.

The installation of stormwater management facilities would not only control increased runoff but would also control point and nonpoint source pollutant runoff from the developed surfaces. Before construction, controlled disposal sites for spoil and waste material would be established so as not to contaminate ground and surface water. Emphasis will be placed on locating these disposal sites beyond the limits of the floodplains. Following construction, the unused land would be restored with the original material, where practicable.

O. ENVIRONMENTAL PERMITS

Federal and state laws and regulations require that various environmental permits be acquired for implementation of the proposed Corridor H project. The No-Build Alternative would not require the acquisition of environmental permits.

Regardless of the Scheme Option, the U.S. Army Corps of Engineers would require two federal permits, Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, before construction activities could take place. In addition, both West Virginia and Virginia are empowered to implement Sections 401 and 402 of the Clean Water Act. Where applicable, construction activities in Virginia would require a Subaqueous Bed Permit from the Virginia Marine Resources Commission.

When a preferred corridor is selected and design limits are established, all appropriate and applicable permits will be obtained prior to the initiation of construction activities.

P. WILD AND SCENIC RIVERS

Several rivers in the study area are either listed as eligible or under study for designation as state or federal wild and scenic rivers. There are several steps in the designation process and variations in the protection status afforded rivers in each category. Coordination concerning wild and scenic rivers was conducted with the Department of Interior-National Park Service; Monongahela Nation Forest; George Washington National Forest; and the Virginia Department of Conservation and Recreation. This assessment focuses only on the river segments as they relate to the Wild and Scenic River System. The Water Resources Section of this document provides further information concerning other aspects of these rivers. Details of the Wild and Scenic Rivers impact assessment are contained in the *Natural Resources Technical Report*, available from WVDOT.

1. NATIONAL WILD AND SCENIC RIVERS ACT

The National Wild and Scenic Rivers Act of 1968 is intended to preserve and protect wild and scenic rivers and their immediate environment. This act identifies federally administered rivers included in the National Wild and Scenic River System, identifies additional rivers to be studied for possible inclusion, and provides guidance for management. Rivers so designated are afforded federal protection from projects that would adversely affect the characteristics for which they were designated. The three classifications for Wild and Scenic Rivers are as follows:

- ***Wild River Areas*:** Those rivers or river segments that are free of impoundments and generally inaccessible, except by trail, with watersheds or shorelines essentially primitive and waters unpolluted.

- ***Scenic River Areas*:** Those rivers or river segments that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

- ***Recreational River Areas*:** Those rivers or river segments that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

2. NATIONWIDE RIVERS INVENTORY

Several rivers or segments of rivers are included in the National Park Service's *Nationwide River Inventory* (NRI) which lists rivers and segments of rivers that appear to meet minimum criteria for addition to the National Wild and Scenic Rivers System (NWSRS). Federal protection of NRI rivers is minimal in that agencies are only directed to consider and avoid or mitigate potential impacts, as well as consult with the Park Service during the planning process on projects which will affect listed rivers.

Rivers are listed in the NRI pending study to verify eligibility, identify probable classification, and determine suitability for inclusion in the NWSRS. If determined to be both eligible and suitable for inclusion, they may be recommended for designation by an act of Congress or, following the appropriate state legislation, by request of the governor to the Secretary of the Interior.

Federal protection of Study Rivers specifically identified in the Wild and Scenic Rivers Act is more stringent than it is for rivers only listed in the NRI. Federal projects that would affect the free flowing characteristics of a Study River are prohibited unless they are determined not to have a direct and adverse effect on the values for which the river might be designated. River crossings are not prohibited by the provisions of the Act if they do not affect free flow, but they may affect the potential classification or even suitability. [NOTE: The Cacapon River was the only identified Study River within the project area. However, the study period for this river has expired, meaning the Cacapon River is no longer afforded protection as a Study River.]

Other rivers can be studied by federal land management agencies to determine their eligibility and suitability for inclusion in the NWSRS. Several such rivers within the project area are currently being studied within the Monongahela National Forest. These rivers have no legislative or formal administrative status.

3. VIRGINIA SCENIC RIVERS

The purpose of the Virginia Scenic Rivers Act is to provide protection for those rivers or streams with natural, scenic, historic, and/or recreational qualities that are of statewide significance. There are no designated rivers within the project area. However, Cedar Creek, from its headwaters to the North Fork of the Shenandoah River, has been determined to merit evaluation to determine if it qualifies for inclusion in the Virginia Scenic Rivers System.

4. AFFECTED ENVIRONMENT

Eleven river segments (ten in West Virginia and one in Virginia) are listed in the NRI. Table III-35 lists these river segments and identifies the qualities or characteristics which warranted listing the river segment in the NRI.

5. POTENTIAL INVOLVEMENT

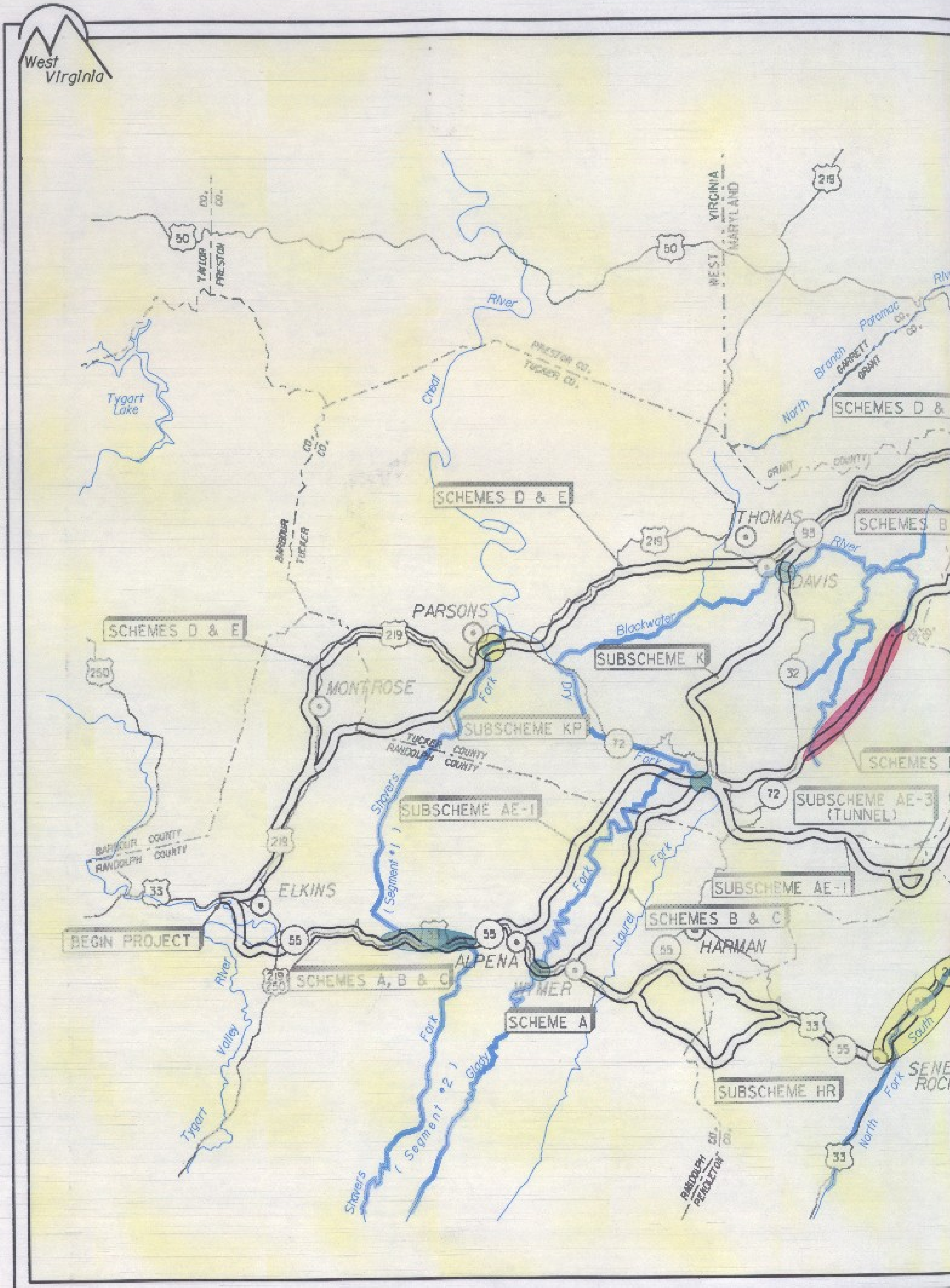
Each river segment within the corridor Scheme Options was evaluated to determine if the project would adversely affect the eligibility of the river segment for Wild, Scenic, or Recreational status. Highway construction may or may not adversely affect the characteristics that make a river eligible for Wild and Scenic designation. A typical new bridge crossing or bridge replacement would not substantially alter the free flow conditions of a stream and would have limited impact to the cultural, scenic, or natural qualities required for eligibility for Scenic or Recreational status but a new bridge would impact eligibility for Wild status. However, most river segments near the corridors already have existing road crossings that would preclude their eligibility for Wild status. Additional crossings required for the Corridor H project at those same locations would likely have no additional or cumulative effect on eligibility for Wild status. Channel relocations or parallel construction within the stream valley which could impact the cultural, natural, or scenic qualities for which the river was originally listed in the NRI could disqualify a river from designation as Wild, Scenic, or Recreational.

Exhibit III-10 indicates the location of the NRI-listed river segments within the project area. Table III-36 summarizes the potential involvement of the project with each NRI river segment and the potential affect on the eligibility of each river segment for classification as Wild, Scenic, or Recreational. One of the NRI-listed river segments within the study area, the South Branch of the Potomac River (Segment #1), is located outside of the study corridors and would not be affected by

TABLE III-35
NATIONWIDE RIVERS INVENTORY BY RIVER SEGMENT

RIVER	COUNTY	SEGMENT	LENGTH (Miles)	NRI QUALITIES
Blackwater River	Tucker	Hendricks to headwaters	32	R,B,S,F
Cacapon/Lost River	Morgan Hampshire Hardy	From dam below Great Cacapon upstream to Baker	90	HY
Shavers Fork, Cheat River (Segment #1)	Tucker Randolph	From confluence with the Cheat River upstream to Falkner	30	B,WL
Shavers Fork, Cheat River (Segment #2)	Randolph	From Falkner upstream to headwaters above Spruce	51	R
Glady Fork, Cheat River	Randolph Tucker	From confluence with Dry Fork of Cheat River upstream to headwater above Glady	30	W
Dry Fork, Cheat River	Tucker	From confluence with Blackwater River upstream to Gladwin	9	R
North River	Hampshire Hardy	From confluence with Cacapon River upstream to headwaters	44	HY
North Fork of the South Branch of the Potomac River	Pendleton Grant	From the confluence of South Branch of Potomac River upstream to the mouth of Seneca Creek	19	S,R
South Branch of the Potomac River (Segment #1)	Pendleton Grant Hardy	From the National Forest Boundry near Petersburg, upstream to Jake Hill Road	26	S,R
South Branch of the Potomac River (Segment #2)	Hampshire Hardy	From confluence of North Branch upstream to Rt. 220 crossing north of Moorefield	34	G
Cedar Creek	Shenandoah (Virginia)	From Route 622 bridge upstream to headwaters	25	H

R=Recreation B=Botanical S=Scenic F=Fish HY=Hydrologic
WL= Wildlife W=Wild G=Geological H= Historic



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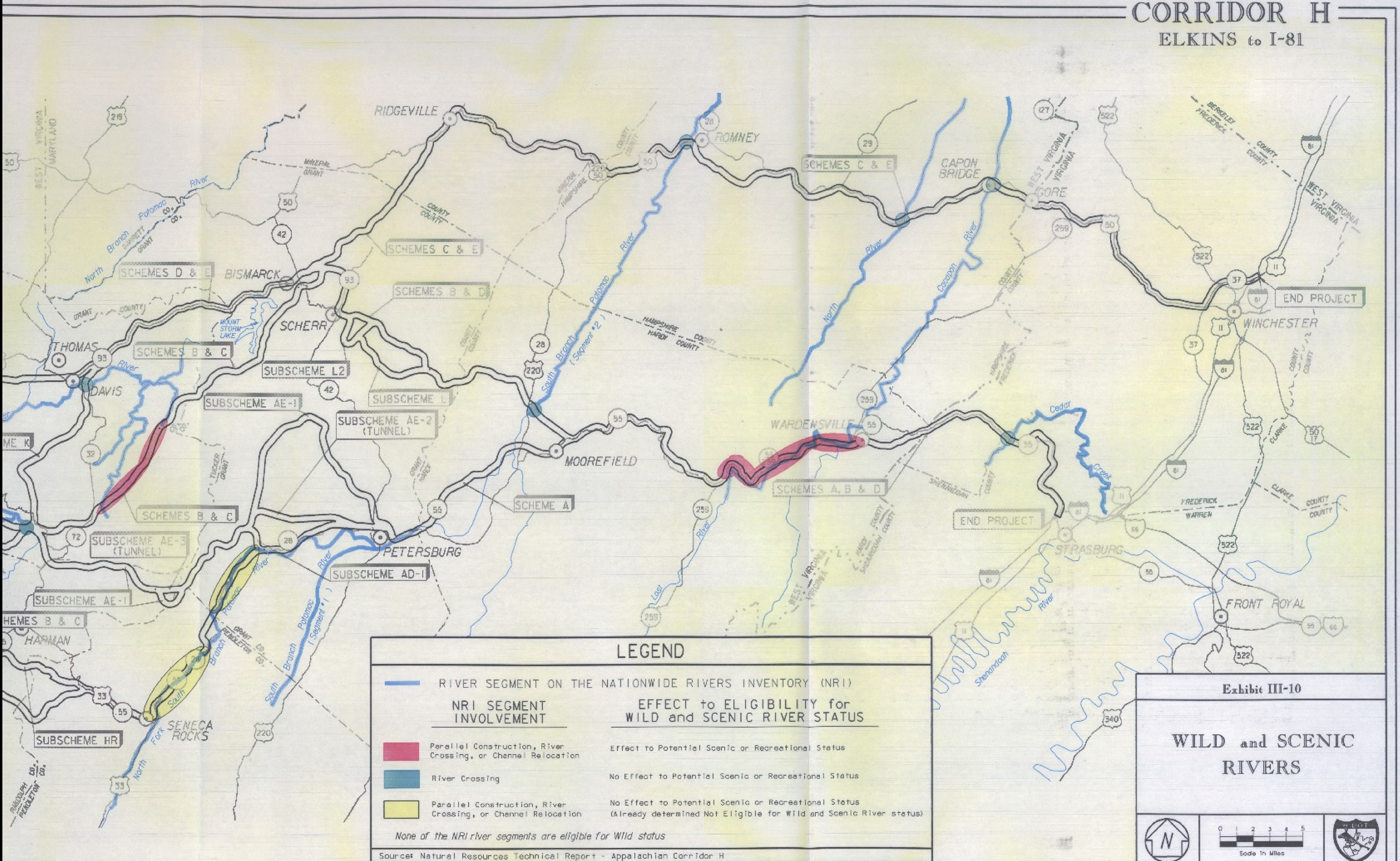

CORRIDOR H
ELKINS to I-81
LEGEND
RIVER SEGMENT ON THE NATIONWIDE RIVERS INVENTORY (NRI)
NRI SEGMENT INVOLVEMENT
EFFECT to ELIGIBILITY for WILD and SCENIC RIVER STATUS
Parallel Construction, River Crossing, or Channel Relocation
Effect to Potential Scenic or Recreational Status
River Crossing
No Effect to Potential Scenic or Recreational Status
Parallel Construction, River Crossing, or Channel Relocation
No Effect to Potential Scenic or Recreational Status (Already determined Not Eligible for Wild and Scenic River status)
None of the NRI river segments are eligible for Wild status
Source: Natural Resources Technical Report - Appalachian Corridor H
Exhibit III-10
WILD and SCENIC RIVERS
Scale in Miles
RIDGEVILLE
ROMNEY
CAPON BRIDGE
GORE
WINCHESTER
END PROJECT
BISMARCK
SCHERR
THOMAS
DAVIS
MOOREFIELD
WARDENSVILLE
PETERSBURG
SENECA ROCKS
HARMAN
STRASBURG
FRONT ROYAL
SCHEMES C & E
SCHEMES D & E
SCHEMES B & D
SCHEMES B & C
SUBSCHEME L2
SUBSCHEME L
SUBSCHEME AE-1
SUBSCHEME AE-2 (TUNNEL)
SUBSCHEME AE-3 (TUNNEL)
SUBSCHEME AD-1
SUBSCHEME HR
SCHEME A
SCHEMES A, B & D
MOUNT STORM LAKE
North Branch Potomac River
South Branch Potomac (Segment #2)
South Branch Potomac River (Segment #1)
North Fork South Branch Potomac River
North River
Cacapon River
Lost River
Cedar Creek
Shenandoah River
WEST VIRGINIA
MARYLAND
VIRGINIA

TABLE III-36
POTENTIAL IMPACT TO ELIGIBILITY

RIVER	SCHEME/ SUBSCHEME	TYPE OF IMPACT	IMPACT TO ELIGIBILITY		
			WILD	SCENIC	REC.
Blackwater River	B, C	◆ Parallel Construction	Yes*	Yes	Yes
	K	◆ Potential Crossing	Yes*	No	No
Cacapon/Lost River	C, E	◆ Potential Crossing	Yes*	No	No
	A, B, D	◆ Parallel Construction ◆ Potential Crossing ◆ Potential Relocation	Yes*	Yes	Yes
Shavers Fork, Cheat River (Segment #1)	D, E	◆ No Impact	No**	No**	No**
Shavers Fork, Cheat River (Segment #2)	A, B, C	◆ Utilize Existing Four Lane Facility	Yes*	No	No
Dry Fork, Cheat River	A	◆ Potential Crossing	Yes*	No	No
Dry Fork, Cheat River	A	◆ Potential Crossing	Yes*	No	No
North River	C, E	◆ Potential Crossing	Yes*	No	No
North Fork of South Branch of the Potomac River	A (South of High Ridge Run)	◆ Parallel Construction ◆ Potential Crossing ◆ Potential Relocation	No**	No**	No**
	A (North of Hopeville)	◆ Parallel Construction ◆ Potential Crossing ◆ Potential Relocation	No**	No**	No**
South Branch of the Potomac River (Segment # 1)	None	◆ No Impact	Yes*	No	No
South Branch of the Potomac River (Segment # 2)	B, D (Near Moorefield)	◆ Potential Crossing	Yes*	No	No
	C, E (Near Romney)	◆ Potential Crossing	Yes*	No	No
Cedar Creek	A, B, D	◆ Potential Crossing	Yes*	No	No

Yes* = Existing crossing would preclude Wild status.
No** = Forest Service's preliminary determination is that portions of this river segment are not eligible for designation.

the project. The remaining ten river segments are crossed by at least one of the corridors. In all cases, the listed segments would not be eligible for Wild status due to existing bridge crossings, and thus new bridges proposed for this project would not additionally impact the river segments' eligibility for Wild status. It should be noted that the river segments could be subdivided such that portions which are not crossed by existing bridges would be eligible for Wild status.

All eleven river segments would involve a crossing by a bridge structure, in which case the rivers' eligibility for classification as Scenic or Recreational would not be negatively affected by this project. Two of the river segments involved with the study corridors may include parallel construction or channel relocation, which would make that portion of the river segment ineligible for Wild, Scenic, or Recreational status. The North Fork of the South Branch of the Potomac River is listed in the NRI, but the Forest Service has determined that portions of this river segment (including those segments within the corridor Scheme Options) do not warrant classification as Wild, Scenic, or Recreational, thus the proposed project would not affect eligibility. The same applies to the northern portion of Shavers Fork (Segment #1). Other river segments, after detailed study, may no longer warrant inclusion in the NRI due to existing conditions and future development.

Table III-37 presents involvements of each river segment with each Scheme Option. Twenty-one of the 24 Scheme Options would potentially involve construction which would impact eligibility of at least one river segment. Scheme Options C2, E1, and E2 would not impact the eligibility of any river segments for Scenic or Recreational status.

- All Scheme Options involve at least three river segments.

- Two of the 24 Scheme Options (B1 and B2) would potentially preclude two river segments from classification as Scenic or Recreational.

- Schemes A, B, and D would involve the Cacapon/Lost River which would impact the eligibility of this river segment for Scenic or Recreational status.

- Although Scheme Options A1, A4, A7, and A8 would involve the North Fork of the South Branch of the Potomac River, these portions of the river are ineligible for designation.

TABLE III-37
POTENTIAL IMPACT TO ELIGIBILITY STATUS BY SCHEME OPTION

RIVER		A								B						C		D						E	
		A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	C1	C2	D1	D2	D3	D4	D5	D6	E1	E2
Blackwater River										▨	▨		▓	▓	▓	▨	▓								
Cacapon/Lost River		▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▓	▓	▨	▨	▨	▨	▨	▨	▓	▓
Shavers Fork, Cheat River (Section 2)		▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓								
Glady Fork, Cheat River		▓							▓																
Dry Fork, Cheat River			▓	▓	▓	▓	▓	▓																	
North River																▓	▓							▓	▓
South Branch of the Potomac River (Segment #2)										▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Cedar Creek		▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓			▓	▓	▓	▓	▓	▓		
TOTAL # 0F	▓	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	5	2	2	2	2	2	2	3	3
TOTAL # 0F	▨	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	0	1	1	1	1	1	1	0	0

▓ River involvement which would not impact eligibility for National Scenic and Recreational Status.

▨ River involvement which would preclude eligibility for National\ Wild, Scenic, and Recreational Status.

- Scheme Options B1, B2, and C1 may involve the Blackwater River which would impact the eligibility of this river segment for Scenic or Recreational status.

6. POTENTIAL MITIGATION MEASURES

Possible mitigation measures specific to NRI rivers would include:

- Avoiding channel relocation or encroachment to the greatest extent possible;
- Avoiding parallel construction to the greatest extent possible;
- Avoiding impacting the river resources for which the river segment was nominated to the NRI;
- For river segments eligible for Recreational status, ensuring that bridge structures would provide sufficient vertical clearance so as to not to impede recreational boating.
- For river segments eligible for both Scenic and Recreational status, considering innovative features to lessen the visual impacts of the crossing, as well as the vertical clearance requirements for recreational boating; and
- For unavoidable impacts to rivers, identifying and permanently preserving a river segment of similar value and uniqueness to compensate for the loss of the river resources.

Q. THREATENED AND ENDANGERED SPECIES

The Endangered Species Act of 1973 (16 USC 1531 et seq.) declares the intention of Congress to conserve Threatened and Endangered species and the ecosystems upon which those species depend. The U.S. Fish and Wildlife Service (USFWS) is the primary federal environmental regulatory agency responsible for enforcing the Endangered Species Act and is assisted by state regulatory agencies. The USFWS lists plant and animal species as Threatened or Endangered and designates habitat that is vital to the maintenance of Threatened and Endangered species populations as Critical Habitat. These designations provide protection from disturbance resulting from federally funded, licensed, or permitted development projects.

The USFWS maintains additional categories which do not provide legal protection, but should be considered during the planning process for any federal project. The Proposed Endangered and Proposed Threatened designation includes taxa that are currently in the process of being formally considered as Endangered or Threatened. There are three additional categories informally called federal candidate categories. Category 1 includes taxa for which there is sufficient information on the biological vulnerability and threat(s) to a species to support proposing them for listing as Endangered or Threatened. Category 2 includes taxa for which existing information indicates that proposing to list them as Endangered or Threatened species is possibly appropriate, but for which substantial data on biological vulnerability and threat(s) are not currently available to support the immediate preparation of rules. Category 3 includes taxa that were once being considered for listing, but are no longer receiving consideration.

In addition to federal legislation, Virginia has legislation for the protection of Threatened and Endangered plant and animal species within the state. The Virginia Department of Game and Inland Fisheries (VDGIF), the Virginia Natural Heritage Program (VNHP), and the Virginia Department of Agriculture and Consumer Services (VDACS) maintain data on the presence of federal and state listed Threatened or Endangered plant or animal species.

In West Virginia, the Department of Natural Resources - Natural Heritage Program (WVNHP) maintains information on federally listed Threatened and Endangered species. WVNHP maintains information on state rankings which provide the status of the populations within the state, but this is not a legal designation. Since West Virginia does not have its own state legislation to protect Threatened or Endangered species, it relies upon federal legislation to protect these resources. Detailed information about Threatened and Endangered plant and wildlife species is contained in the *Natural Resources Technical Report*, available from WVDOT.

1. METHODOLOGY

All information on Threatened and Endangered species previously collected for the 1981 *Corridor H Draft Environmental Impact Statement* was reviewed. Current information was obtained through coordination with state and federal agencies (USFWS, MNF, VNHP, WVNHP, and VDGIF). Because this is a corridor-level study, it is not appropriate to conduct detailed field investigations to discover or confirm known locations of Endangered or Threatened species. Following the selection of a preferred corridor and the initiation of alignment design within the preferred corridor, detailed field investigations will be conducted and Biological Assessments will be prepared. The assessment of impacts was based on the best available location information. In assessing potential corridor involvements with caves, all caves which were within one-half of a mile of a corridor were assumed to be potentially impacted.

2. AFFECTED ENVIRONMENT

Specific locations of these species are not discussed to protect these sensitive sites from intrusion by the public but the approximate locations of confirmed populations of these species are illustrated on Exhibit III-11.

a. Endangered & Threatened Species

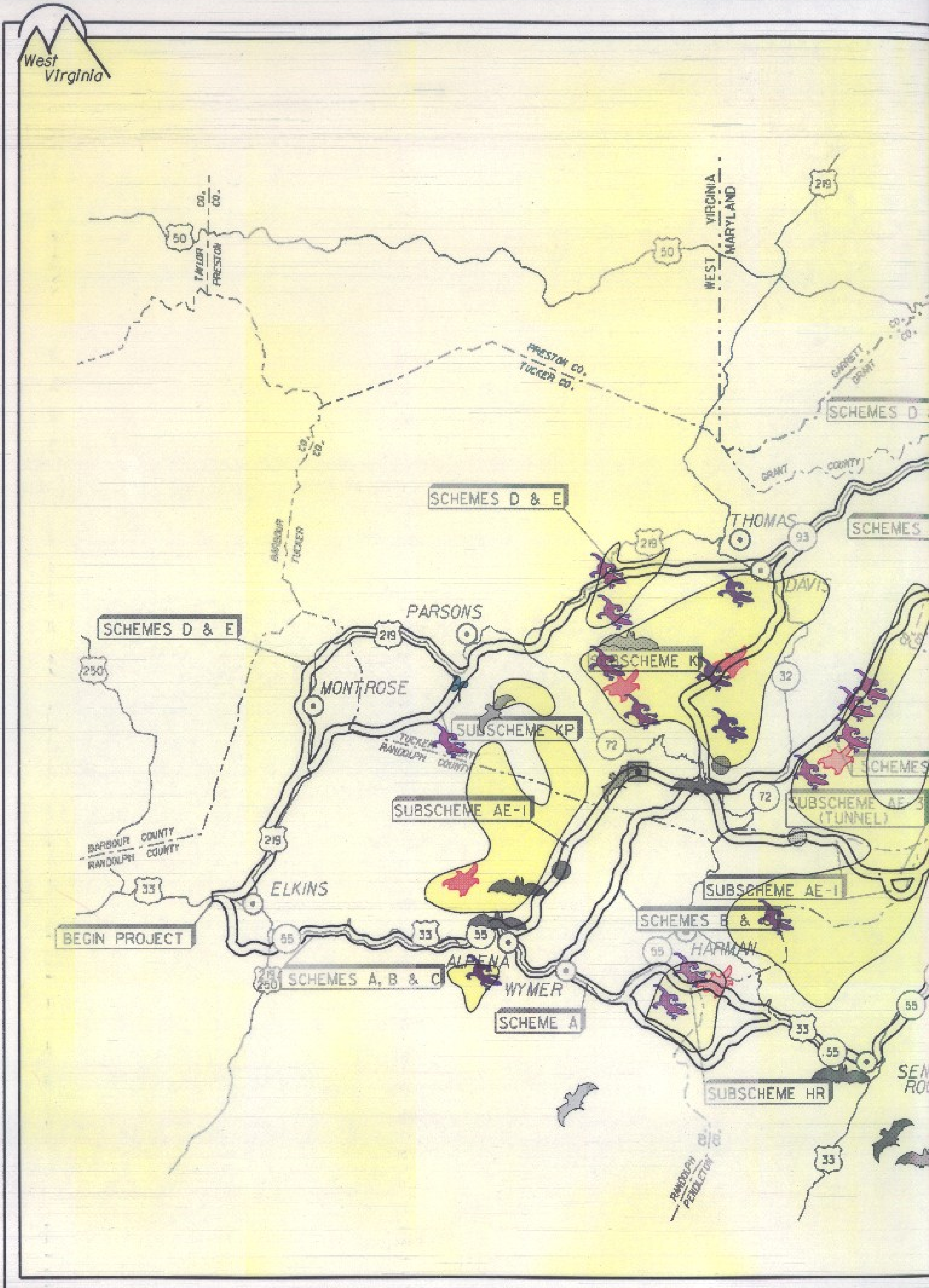
One federally listed Threatened and five federally listed Endangered wildlife species, as well as one federally listed Endangered plant species are known to exist within the study area, but not necessarily within the corridor Scheme Options. There are no known state listed (i.e. Virginia) Threatened or Endangered species resident within the study area. However, the Loggerhead Shrike, a state Endangered species, could be found in the project area, if appropriate habitat is available.

1). Virginia Northern Flying Squirrel *(Glaucomys sabrinus fuscus)*

The Virginia northern flying squirrel (*G. s. fuscus*) is currently listed by the federal government as Endangered. The Virginia northern flying squirrel generally lives at high elevations (greater than 3,000 feet) in the mid-Appalachian Mountains of Virginia and West Virginia in cool, moist forests containing conifers such as red spruce and eastern hemlock.

There are five confirmed Virginia northern flying squirrel populations within the study area, but only two populations are directly located within the study corridor. Confirmed populations are located on Brierpatch Mountain, Stuart Knob, Canaan Mountain (two sites), and Backbone Mountain. Their locations are identified on Exhibit III-11.

It is likely that Virginia northern flying squirrel habitat is present in the study area. Their preferred habitat includes relatively large tracts of undisturbed forest above 3,000 feet in elevation. Potential habitat sites (not to be confused with Critical Habitat) are located on Shavers Mountain, Flatrock Plains, Brierpatch Mountain, Cabin Mountain, Canaan Mountain, and Backbone Mountain. Much of the potential habitat surrounds confirmed populations and may contain additional populations which have yet to be identified. The general location of their potential habitat is presented in Exhibit III-11.



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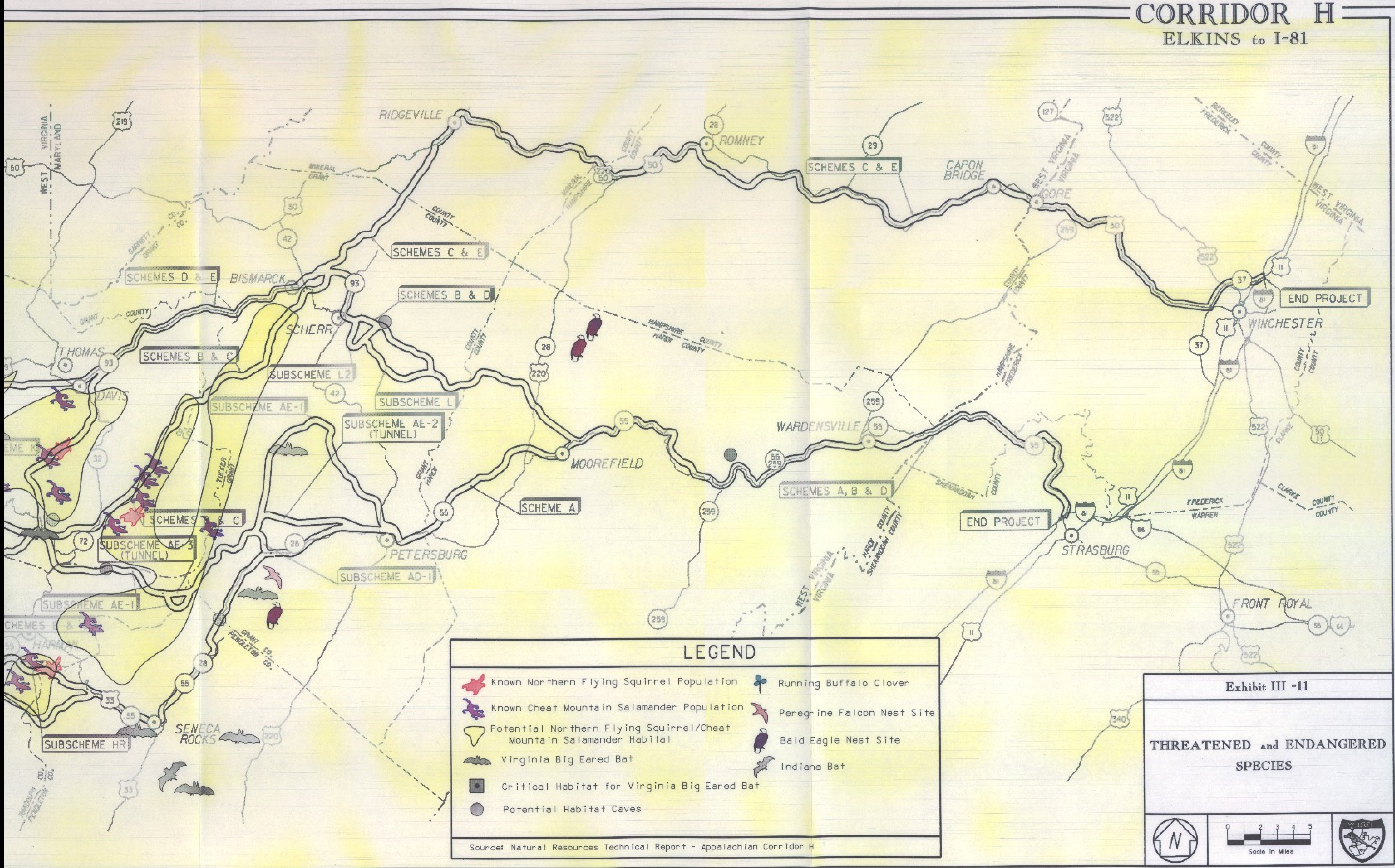

CORRIDOR H
ELKINS to I-81
RIDGEVILLE
ROMNEY
CAPON BRIDGE
GORE
WINCHESTER
END PROJECT
BISMARCK
SCHERR
THOMAS
DAVIS
MOOREFIELD
WARDENSVILLE
PETERSBURG
STRASBURG
FRONT ROYAL
SENECA ROCKS
HARMAN
SCHEMES C & E
SCHEMES D & E
SCHEMES B & D
SCHEMES B & C
SUBSCHEME L2
SUBSCHEME L
SUBSCHEME AE-1
SUBSCHEME AE-2 (TUNNEL)
SUBSCHEME AE-3 (TUNNEL)
SUBSCHEME AD-1
SUBSCHEME HR
SCHEME A
SCHEMES A, B & D
END PROJECT
WEST VIRGINIA
MARYLAND
VIRGINIA
LEGEND
Known Northern Flying Squirrel Population
Known Cheat Mountain Salamander Population
Potential Northern Flying Squirrel/Cheat Mountain Salamander Habitat
Virginia Big Eared Bat
Critical Habitat for Virginia Big Eared Bat
Potential Habitat Caves
Running Buffalo Clover
Peregrine Falcon Nest Site
Bald Eagle Nest Site
Indiana Bat
Source: Natural Resources Technical Report - Appalachian Corridor H
Exhibit III -11
THREATENED and ENDANGERED SPECIES
Scale in Miles

2). Cheat Mountain Salamander *(Plethodon nettingi)*

The Cheat Mountain salamander was listed by the federal government as a Threatened species in September, 1989. It is currently known to exist at approximately 68 sites within an 700 square mile area in West Virginia. Most of the known populations consist of less than ten individuals which forage for food beneath forest leaf litter within a very small territory. This small woodland salamander is found in red spruce and mixed deciduous forests above 2,980 feet in elevation.

There are 16 confirmed populations within the project study area. The confirmed populations are located on Brierpatch Mountain, Job Knob, Flatrock Plains, the west side of Cabin Mountain (four sites), Mount Porte Crayon, Dolly Sods, Blackwater Falls State Park, Spruce Run, McGowan Mountain, Canaan Mountain (several sites), and Backbone Mountain. Their locations are identified on Exhibit III-11

In addition to the location of confirmed populations, there is considerable potential habitat where additional populations may be present. Since the habitat requirements for the Cheat Mountain salamander are similar to those of the Virginia northern flying squirrel, the potential habitat for these two species is presented together on Exhibit III-11. Potential habitat is found associated with the confirmed population sites, as well as near Mount Storm lake.

3). Indiana Bat *(Myotis sodalis)*

The Indiana bat was listed by the federal government as an Endangered species in 1979. Males and females congregate in the late fall to hibernate in large caves and mine tunnels. Most males continue to use underground roosts in the summer, but females form maternity colonies utilizing the loose bark of trees such as shagbark hickory, oaks, and maples. The Indiana bat winters in some West Virginia caves, but most likely migrates north, out of state, in the summer.

There are two caves in West Virginia listed by the USFWS as Critical Habitat which serve as major hibernation caves (hibernacula) for the Indiana bat: Hellhole Cave and Cave Hollow Cave (Exhibit III-11). Hellhole Cave is the largest known hibernacula in West Virginia.

There are additional caves within the project area which are not listed as Critical Habitat but are known to contain Indiana bat populations such as Bear Haven, Big Springs, Peacock, and Minor Rexrode Caves. There are caves near the corridors which may potentially contain populations of the Indiana bat during the winter, but they have not been completely surveyed. They include Bennet, Baker Quarry, Greenland Gap, Hanging Rock Shelter, Jim, Jordans, and Schmidlen Caves.

4). Virginia Big-Eared Bat *(Plecotus townsendii virginianus)*

The Virginia big-eared bat was listed by the federal government as an Endangered species in 1979. Although the Virginia big-eared bat may be periodically found in cave systems containing Indiana bats, their habitat requirements and associated behavior differ from the Indiana bat. The Virginia big-eared bat spends both summers and winters in some West Virginia caves. Females and males hibernate together during winter months. Females congregate in nursery colonies in just a few caves in the summer. Males have been found in caves in the summer, both scattered singly and in large numbers, perhaps in bachelor colonies.

There are five caves in West Virginia listed by USFWS as Critical Habitat which serve as hibernacula and maternity caves for the Virginia big-eared bat: Cave Mountain Cave; Hoffman School Cave, Sinnit Cave, Hellhole Cave, and Cave Hollow Cave (including Arbogast Cave). Cave Mountain Cave is the largest known maternity cave in the country. Cave Hollow Cave is the largest known hibernacula in West Virginia.

There are additional caves within the project area which are not listed as Critical Habitat but are known to contain Virginia big-eared bat populations, including Alpena #1, Bear Haven, Peacock, Minor Rexrode, New Trout, Big Spring, Kline Gap, Lambert, and Mystic caves. Peacock Cave is the second largest known maternity cave in West Virginia. There are caves near the corridor Scheme Options which may potentially contain populations of the Indiana bat during the winter, but they have not been completely surveyed. They include Bennet, Baker Quarry, Greenland Gap, Hanging Rock Shelter, Jim, Jordans, and Schmidlen Caves.

5). Peregrine Falcon *(Falco peregrinus)*

The peregrine falcon was placed on the Endangered Species list in 1975. Since then, a recovery program involving USFWS, Monongahela National Forest, and WVDNR has successfully reintroduced the peregrine falcon to West Virginia. The peregrine falcon forages in a wide variety of habitats including coastal waters, open valleys, tundra, and occasionally urban areas. It nests throughout the world on cliffs, bluffs, talus slopes, pinnacles, and on the ground. Historically, nesting in the southern United States occurred in the hollows of old trees or in old nests of eagles, hawks, and ravens placed in tree tops or on cliff ledges.

Two confirmed peregrine falcon nest sites are located in the project area, but are outside the 2,000 foot-wide corridor boundaries. Both are located in rugged terrain above 3,000 feet. Additional nest sites may exist in regions with similar terrain within the project study area.

6). **Bald Eagle (*Halieetus leucocephalus*)**

The bald eagle forages along coasts, rivers, and large lakes. Nest sites vary in habitat type and distance from human activity. Nesting territory size is also variable, but typically may encompass about 1 square mile. Most nest sites are found in the midst of large wooded areas adjacent to marshes, on farmland, or in logged-over areas where scattered seed trees remain. Nest sites are usually relatively remote from human activity. Some bald eagles, however, build nests close to railroad tracks, highways, airfields, and human residences. Most eagle nests are less than 1 mile from feeding areas, but some are as much as 2 miles from primary food sources.

The location of four bald eagle nests are presently confirmed in West Virginia. The nest sites all occur along the South Branch of the Potomac River in Grant, Hardy, and Hampshire Counties. Two of the nest sites occur within the study area in the "Trough" and one occurs south of Petersburg in the Smoke Hole area. The fourth nest is north of Romney in the vicinity of Springfield.

7). **Running Buffalo Clover (*Trifolium stoloniferum*)**

The running buffalo clover is a plant species associated with historic migration trails of the once prevalent buffalo (bison) and elk. Many botanists speculate that a major reason for the decline of this Endangered plant from its once abundant, widely distributed status is the absence of bison and elk, which once provided the soil enrichment, periodic habitat disturbance, and seed dispersal this species apparently needs to thrive.

A running buffalo clover population is located west of Parsons, West Virginia, along Shavers Fork. It is found along a historic buffalo (bison)/elk trail. It is believed to be the largest known population in the state.

b. Candidate Species

There are approximately 25 "Category 2" plants and animals which are found within or near the project area. These species are associated with a variety of unique habitats within the study area such as: wetlands, cedar glades, shale barrens, talus slopes, cliffs, caves, high quality warm and coldwater streams, and floodplains, and northern hardwood and coniferous forests. The potential involvement of the project with many of these habitats is discussed under other headings in Section III of this SDEIS (see Wetlands, Floodplains, Streams, and Special Botanical Areas).

c. Species of Special State Concern

Although West Virginia does not have a state listing of protected species, the West Virginia Natural Heritage Program has identified a list of Vertebrate Species of Special State Concern which includes 6 fishes, 13 amphibians and reptiles, 13 birds, and 8 mammals. The WVNHP also ranks plant and animal species based on their population status within the state. These species, which may be limited in the state but more abundant and wide-spread on a regional basis, are not afforded special legal protection as are federally listed Threatened or Endangered species. Some of the species which are identified as Special State Concern or have restricted state distribution are already listed as federally listed candidate species.

3. POTENTIAL INVOLVEMENTS

The potential involvement of the proposed project with federally or state listed Threatened and Endangered species, federally listed Critical Habitat, federally listed candidate species, and Species of Special State Concern are addressed below.

a. Virginia Northern Flying Squirrel

Highway construction would potentially impact the Virginia northern flying squirrel directly through loss of habitat and indirectly through habitat fragmentation and increased human activity. Forest fragmentation may increase the genetic isolation of individual populations by creating a barrier to movements between populations. Table III-38 presents the potential involvements with confirmed populations and potential habitat. These involvements are summarized below.

- Scheme Option A8 would involve the population on Brierpatch Mountain, along SubScheme HR.
- Scheme Options A2-A8 would involve potential habitat located along Flatrock Plains.
- Scheme Options B1, B2, B3, and C1 would not involve any known populations but would involve two areas of potential habitat (Cabin Mountain and near Mt. Storm Lake).
- Scheme Options B4, B5, B6, and C2 (which include SubScheme K) would involve one confirmed population and an adjacent area of potential habitat (Canaan Mountain).
- Schemes D and E would avoid all known populations, but would involve one potential habitat site (Backbone Mountain).

TABLE III-38
THREATENED AND ENDANGERED SPECIES

COMMON NAME (Scientific Name)	PROTECTIVE STATUS	HABITAT STATUS	A								B						C		D						E	
			A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	C1	C2	D1	D2	D3	D4	D5	D6	E1	E2
Virginia Northern Flying Squirrel	*Federal*	Confirmed	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0
(Glaucomys sabrinus fuscus)	*Threatened*	Potential	0	1	1	1	1	1	1	1	2	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1
Cheat Mountain Salamander	*Federal*	Confirmed	0	1	1	1	1	1	1	1	2	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1
(Plethodon nettingi)	*Threatened*	Potential	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1
Indiana Bat	*Federal*	Confirmed	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(Myotis sodalis)	*Threatened*	Potential	1	3	3	3	3	3	3	2	2	2	2	3	3	3	1	1	2	2	2	2	2	2	1	1
Virginia Big-eared Bat	*Federal*	Confirmed	2	4	3	4	3	3	3	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0
(Plecotus townsendii virginianus)	*Threatened*	Potential	2	3	3	3	3	3	3	2	2	2	2	3	3	3	1	1	2	2	2	2	2	2	1	1
Bald Eagle	*Federal*	Confirmed Nest Site	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(Haliaeetus leucocephalus)	*Threatened*	Feeding Area	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Running Buffalo Clover ***(Trifolium stoloniferum)***	*Federal Threatened*	Confirmed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Peregrine Falcon ***(Falcon perenginus)***	*Federal Threatened*	Confirmed	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL NUMBER OF INVOLVEMENTS	*Federal Threatened*	Confirmed	0	1	1	1	1	1	1	1	2	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1
		Potential	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1
	Federal Endangered	Confirmed	3	5	4	6	4	4	5	4	2	2	2	3	3	3	2	3	1	1	1	1	1	1	1	1
		Potential	3	7	7	7	7	7	7	5	6	6	6	7	7	7	4	3	5	5	5	5	5	5	3	3
TOTAL NUMBER OF SPECIES	*Federal Threatened*	Confirmed	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Potential	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Federal Endangered	Confirmed	2	2	2	3	2	2	3	3	1	1	1	2	2	2	1	2	1	1	1	1	1	1	1	1
		Potential	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

b. Cheat Mountain Salamander

Highway construction would potentially impact the Cheat Mountain salamander through direct loss of habitat and indirectly through habitat fragmentation and increased human activity. Because of the very small size of salamander populations, forest fragmentation may increase the genetic isolation of individual populations by creating a barrier to movements between populations. Increased human activity may result in new trails which may impact populations.

Of the 16 confirmed populations within the project area, six are located within the corridor Scheme Options. These sites include Brierpatch Mountain, Flatrock Plains, the west side of Cabin Mountain (2 sites) and Canaan Mountain near Red Run, and Backbone Mountain. Their locations are identified on Exhibit III-11. Table III-38 presents the potential involvements with confirmed populations and potential habitat. These involvements are summarized below.

- Scheme Options B1, B2, B3, and C1 would involve two confirmed populations while all other Scheme Options would involve one confirmed population.
- Schemes A, D, and E would involve one area of potential habitat, while Schemes B and C would involve two areas of potential habitat.
- Scheme Option A8 (which includes SubScheme HR) would involve the confirmed population and potential habitat on Brierpatch Mountain.
- Scheme Options A2 through A7 would involve one confirmed population and potential habitat located along Flatrock Plains.
- Scheme Options B4, B5, B6, and C2 (which include SubScheme K) would involve one confirmed population and additional potential habitat on Canaan Mountain.
- Scheme Options B1, B2, B3, and C1would involve two confirmed populations (west side of Cabin Mountain) and potential habitat on Cabin Mountain and near Mt. Storm Lake.
- Schemes D and E would involve confirmed populations and potential habitat on Backbone Mountain.

c. **Indiana Bat**

The environment within a cave is critical to the success of bat populations. Changes in temperature, humidity, and air flow can make the cave unsuitable for the bats. Highway construction could potentially impact the characteristics of a cave by creating new openings in the cavern system, changing air flows, or blocking passages. The major indirect impact to the bat populations would be the potential for increased access by the general public. Intrusion into the caves can disturb bats during hibernation or maternity seasons, with serious consequences for the survival of the colony. A few of the caves have been gated to exclude the public during the winter when the Indiana bats are in hibernation. Other indirect impacts would include ~~potential involvement with feeding~~ areas ~~or~~ movement-corridors between feeding areas and the caves. Table III-38 presents the potential involvements with confirmed populations and potential habitat. The following summarizes these involvements.

- Scheme Options A2-A7 would directly involve Cave Hollow Cave (including Arbogast Cave). This cave is listed as Critical Habitat for the Indiana bat because it serves as a major hibernacula. This is the only known population of Indiana bat which would involve any of the Scheme Options.

- All of the caves within the project area which are not listed as Critical Habitat but are known to contain Indiana bat populations are located too far from the corridors to be affected by the project.

- There are eleven additional caves near the corridors which may potentially be directly or indirectly affect by the proposed project. These caves, which may contain Indiana bats during the winter, include Bennet Cave, Baker Quarry Cave, Greenland Gap Cave, Hanging Rock Shelter, Jim Cave, Jordans, Cave, Alpena #1 Cave, Lambert Cave, and Kline Gap Cave and Schmidlen Cave.

- Scheme Options A2 through A7 and B4 through B6 would involve three potential habitat caves, while Options under Schemes C and E would involve one potential habitat cave.

d. **Virginia Big-Eared Bat**

The same types of potential involvements can be expected for Virginia big-eared bat as discussed for the Indiana bat. The Virginia big-eared bat utilizes caves in the project area for hibernation and breeding. Intrusion into the caves during these periods (which account for much of the year) can disrupt the colony with potential serious consequences for future use of the site. A few of the caves have been gated to exclude the public, particularly during critical times (hibernation or maternity seasons). Other indirect impacts would include involvement with feeding areas or movement-corridors between feeding areas and the caves. Table III-38 presents the potential involvements with confirmed populations and potential habitat.

- Four of the Critical Habitats are not within proximity of the corridor Scheme Options.

- Cave Hollow Cave, the fifth Critical Habitat ~~cave, is located in Tucker~~ County near SubScheme AE-1. The entrance of this cave system is located outside of the corridor but the caverns themselves may extend below ground, well within the corridor. Scheme Options A2-A7, which incorporate SubScheme AE-1, may result in direct impacts to both the cave environment and feeding areas for the Virginia big-eared bat at Cave Hollow Cave.

- Of the nine caves within the project area which are not listed as Critical Habitat but are known to contain Virginia big-eared bat populations, three would be directly or indirectly involved with at least one of the Scheme Options. These caves are Alpena #1, Kline Gap, and Lambert.

- In combination with Cave Hollow Cave, Scheme Options A2 and A4 would involve the largest number of caves (4) containing confirmed populations, while Schemes D and E would involve none.

- Seven of the caves near the corridors which have not been completely surveyed for populations of the Indiana bat during the winter would be involved with at least one of the Scheme Options. Schemes A, B, and D would involve two to three potential habitat caves, while Schemes C and E would involve one potential habitat cave.

e. <u>Peregrine Falcon</u>

All Schemes would avoid direct impact to the known Peregrine Falcon nesting sites. Scheme Options A1, A4, A7, and A8 would require construction along the valley of the North Fork of the South Branch of the Potomac River, within one mile of one of the known nesting sites, possibly resulting in indirect impacts to the birds during the construction period. All other Schemes would avoid potential indirect impacts to peregrine falcons.

f. Bald Eagle

None of the Schemes would directly involve nesting sites for the bald eagle, however, all of the Schemes would cross rivers which serve as feeding areas. Of particular importance is the South Branch of the Potomac River and its major tributaries. The increased activity, particularly during construction, may hinder feeding activity in these areas.

g. Running Buffalo Clover

The Scheme Options which utilize SubScheme KP (D4, D5, D6 and E2) would directly involve the confirmed population of running buffalo clover. The other Scheme Options under Scheme D and E (Scheme Options D1, D2, D3, and E1) would likely involve this population, but the possibility for avoidance may be greater.

h. Candidate Species

The potential involvement of the project with "Category 2" species is presented in Table III-39. Of the total number of Candidate Species in the study area, the various Scheme Options involve between 6 and 13 separate species. Some of the species are located at multiple sites within or near the corridors. Scheme Option A1 and A8 have the largest number of individual involvements with Candidate Species (25), while Scheme Options D3 and D5 have the least (13).

i. Species of Special State Concern

The potential involvement with these species is less defined than the federally listed species due to less detailed location information. Scheme Option C2 has the greatest number of potential involvements while Scheme Options D3 and D5 have the least number of involvements with Species of Special State Concern. A number of these species which are considered rare in the state (S1 or S2) are identified in Table III-39. For more detailed information, refer to the *Natural Resources Technical Report*, available from WVDOT.

4. POTENTIAL IMPACT SUMMARY

a. Scheme A

All Options under Scheme A would involve known and potential habitat for Virginia big-eared bats, potential habitat for Indiana bats, and feeding areas for bald eagles. None of the Options under Scheme A would involve bald eagle nesting sites or running buffalo clover populations.

- Scheme Options A2 through A8 would involve potential Virginia northern flying squirrel habitat, known and potential Cheat Mountain salamander habitat.

TABLE III-39
FEDERAL CANDIDATE SPECIES (Category 2)
Number of Potential Involvements

COMMON NAME (Scientific Name)	STATE RANK	A								B						C		D						E	
		A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	C1	C2	D1	D2	D3	D4	D5	D6	E1	E2
Brook Floater Mussel *Alasmidonta varicosa*	WV S2/S3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Cave Pseudoscopion *Apochthonius paucispinosus*	WV S1												1	1	1		1								
Cave Isopod *Caecidotea cannulus*	WV S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1								
Isopod *Caecidotea sinuncus*	WV S1	1							1																
Glade Spurge *Euphorbia purpurea*	WV S2									2	2	2	2	2	2	2	2								
Loggerhead Shrike *Lanius ludovicianus*	WV S1	2	2	2	2	2	2	2	2	1	1	1	1	1	1			1	1	1	1	1	1		
Green Floater Mussel *Lasmigona subviridis*	WV S1	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Rock Vole *Microtus chrotorrhinus carolinensis*	WV S3																	1	1	1	1	1	1	1	1
Small-footed Bat *Myotis leibii*	WV S2/S3																								
Canby's Mountain-lover *Pachistima canbyi*	WV S2	2	1	1	2	1	1	2	2							1	1							1	1
Virginia Nailwort *Paronychia virginica*	WV S1	1			1			1	1																
Jacob's Ladder *Polemonium van-bruntiae*	WV S2									2	2	2	2	2	2	2	2								
Timber Ridge Cave Beetle *Pseudanophthalmus hadenoecus*	WV S1	1							1																
Mountian Cave Beetle *Pseudanopthalmus montanus*	WV S1									2	2	2	3	3	3	2	3								
Cheat Minnow *Rhinichthys bowseri*	WV S2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1								
Heart-leaved Skullcap *Scutellaria ovata*	WV S1	1	1	1	1	1	1	1	1																
New England Cottontail *Sylvilagus transitionalis*	WV S3												1	1	1		1	2	2	2	2	2	2	2	2
Mountain pimpernel *Taenidia montana*	WV S3	6	4	4	6	4	4	6	6	1	1		1	1		2	2	1	1		1		1	2	2
Eastern Ribbon Snake *Thamnophis sauritus*	WV S3	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1	1	1		
Kates Mountain Clover *Trifolium virginicum*	WV S2/S3	2		2	2		2	2	2							3	3							3	3
NUMBER OF INVOLVEMENTS		25	17	19	23	17	19	23	25	19	19	18	22	22	21	22	25	14	14	13	14	13	14	17	17
NUMBER OF SPECIES		13	9	10	11	9	10	11	13	10	10	9	12	12	11	10	12	7	7	6	7	6	7	7	7

- Scheme Options A2 through A7 would involve a cave listed as Critical Habitat for the Indiana bat and the Virginia big-eared bat.

- Scheme Option A1, A4, A7, and A8 may indirectly involve a peregrine falcon nesting site.

b. **Scheme B**

All Options under Scheme B would involve known and potential habitat for Virginia big-eared bats, potential habitat for Indiana bats, known and potential Cheat Mountain salamander habitat, potential habitat for the Virginia northern flying squirrel and feeding areas for bald eagles. None of the Options under Scheme B would involve peregrine falcon nesting sites, bald eagle nesting sites, known Indiana bat populations or running buffalo clover populations.

- Scheme Options B4, B5, and B6 would involve one confirmed Virginia northern flying squirrel population.

c. **Scheme C**

All Options under Scheme C would involve known and potential habitat for Virginia big-eared bats, potential habitat for Indiana bats, known and potential Cheat Mountain salamander habitat, potential habitat for the Virginia northern flying squirrel, and feeding areas for bald eagles. None of the Options under Scheme C would involve peregrine falcon nesting sites, bald eagle nesting sites, known Indiana bat populations or running buffalo clover populations.

- Scheme Option C2 would involve one confirmed Virginia northern flying squirrel population.

d. **Scheme D**

All Options under Scheme D would involve potential habitat for Virginia big-eared bats and Indiana bats, potential habitat for the Virginia northern flying squirrel, known and potential habitat for the Cheat Mountain salamander, a confirmed population of running buffalo clover and feeding areas for bald eagles. None of the Options under this Scheme would involve peregrine falcon nesting or bald eagle nesting sites, known population of the Virginia big-eared bat or Indiana bat; or known population of the Virginia northern flying squirrel.

e. **Scheme E**

All Options under Scheme E would involve potential habitat for Virginia big-eared bats and Indiana bats, potential habitat for the Virginia northern flying squirrel, known and potential habitat for the Cheat Mountain salamander, a confirmed population of running buffalo clover and feeding areas for bald eagles. None of the Options under this Scheme would involve peregrine falcon nesting or bald eagle nesting sites, known population of the Virginia big-eared bat or Indiana bat; or known population of the Virginia northern flying squirrel.

f. Comparison of Schemes

The potential involvement of each Scheme Option with each listed species should be considered individually. An overall comparison of the potential involvements of the Schemes with all of the species indicates the following:

- All Scheme Options (except A1) would involve at least one known population of a federally listed Endangered species, and the potential habitat for three federally listed Endangered species.

- All Scheme Options (except A1) would involve at least one known population of a federally listed Threatened species, and the potential habitat for one federally listed Threatened species.

- Scheme Options A4, A7, and A8 would involve the largest number of federally listed Endangered species.

- Scheme Option A4 would involve the greatest number of known populations of federally listed Endangered and Threatened species (6).

- Options under Schemes D and E would involve the fewest (one) known populations of a federally listed Endangered or Threatened species.

- Scheme Options A1 and A8 would involve the greatest number of Candidate species, whereas Scheme Options D3 and D5 would involve the least.

5. POTENTIAL MITIGATION MEASURES

Federally funded or licensed projects (such as Corridor H) that may impact federally listed Endangered or Threatened species or Critical Habitat must be coordinated with the USFWS. Potential impacts to listed Endangered or Threatened species and Critical Habitat must be mitigated to the satisfaction of the USFWS. Field investigations will be conducted as part of the alignment SDEIS and Biological Assessments prepared to further define the potential impacts and mitigation measures required. The hierarchy for mitigation strategies places primary emphasis upon avoidance of potential impacts to listed Endangered or Threatened species and listed Critical Habitat. Secondary emphasis is placed upon minimization of impacts and compensation for impacts which may be unavoidable.

a. Virginia Northern Flying Squirrel

Mitigation for the Virginia northern flying squirrel should focus on avoiding and protecting known populations. Avoiding and minimizing forest fragmentation would also be an important mitigation measure. Minimizing impacts may ~~include saving denning trees~~, standing dead or live trees with cavities, and standing snags and downed logs. To date, mitigation of direct impacts by transplanting a squirrel population has not been successfully accomplished.

b. Cheat Mountain Salamander

Mitigation for the Cheat Mountain salamander should include avoiding known populations. One method of minimizing impacts would be to create buffer zones around known populations. The recommended minimum buffer zone between known Cheat Mountain salamander populations and proposed development is 300 feet. Activities such as trail construction for off-road vehicles and foot traffic which would have indirect impacts on salamander populations should be limited or prohibited near known populations. Previous attempts to relocate Cheat Mountain salamander populations have been unsuccessful.

c. Indiana Bat

The mitigation of direct impacts to caves which are used during hibernation would be difficult. Methods to minimize the potential impact of blasting may include a temporary buffer that prohibits blasting within a set distance from any confirmed site or during the hibernation period (September to May). Damage to caves during non-hibernation periods may still impact the suitability of a cave for hibernation. The intensity of the blasting also may be limited, based on recommendations contained in the Monongahela National Forest's *Land Management Plan*.

A one-quarter mile buffer between a cave entrance and the highway right-of-way may be sufficient to avoid direct impact on the utilization of the cave by the bat colony. Gating of cave entrances may be a viable means of protecting the cave systems from access by the public, a potential indirect impact of this project. Gating of an entrance could be limited to the hibernation period.

d. Virginia Big-Eared Bat

The same considerations discussed concerning mitigation of impacts to the Indiana bat would also apply to the Virginia big-eared bat. The major difference between these two bat species would be the need to protect Virginia big-eared bats during the breeding season in maternity caves. The protection of Virginia big-eared bat foraging habitat is also an important consideration. Virginia big-eared bats may forage over two miles from the caves in which they roost during the summer months. Gating of cave entrances may be a viable means of protecting the cave system from access by the public, a potential indirect impact of this project. Gating of the entrance could be limited to the period that the cave is utilized (winter, summer, or all year).

e. Peregrine Falcon

Potential indirect impacts to peregrine falcons may be prevented by restricting blasting within 1,300 feet of known nest sites during the breeding season.

f. Bald Eagle

Since there are no direct or indirect impacts to nesting sites, mitigation measures would not likely be required. Construction may take place near potential feeding areas along major rivers, but would not sufficiently affect feeding resources to require mitigation

g. Running Buffalo Clover

Following the selection of a preferred corridor and the initiation of alignment design within the preferred corridor, more detailed information on the abundance and distribution of running buffalo clover will be collected and documented in the Alignment Selection SDEIS and its supporting Technical Reports. During the Alignment Selection SDEIS process, design considerations which would avoid or minimize impacts will be developed. If impacts are unavoidable, then transplanting or propagation may be a viable means to mitigate the impacts.

R. CULTURAL RESOURCE PRESERVATION INVOLVEMENTS

1. INTRODUCTION

"Cultural resources" may be defined as the patterned physical remains of human activity distributed about the landscape over time. They include, for example, historically or architecturally notable structures, the locations of significant historical events, industrial resources, battlefields, early historic roads and railroads, and Native American archaeological sites. They may range in size and complexity from an entire district containing dozens of majestic high-style buildings to the scattered, perhaps millennia-old remnants of a Native American camp site. Whatever their composition or scale, they are portions of a rich and diverse cultural heritage, a valuable legacy from the past and a trust to be passed on to future generations of West Virginians and Virginians.

In order to determine the potential effect of Corridor H on cultural resources located within the proposed project area, WVDOT has reexamined all of the corridor Scheme Options. This study is undertaken to comply with the Antiquities Act of 1906; the National Historic Sites Act of 1935; Section 106 of the National Historic Preservation Act of 1966, as amended; the Department of Transportation Act of 1966; the National Environmental Policy Act of 1969; Executive Order 11593: "Protection and Enhancement of the Cultural Environment" (1971); the Archaeological and Historical Preservation Act of 1974; the regulations of the Advisory Council on Historic Preservation (36CFR800); the Secretary of the Interior's Standards and Guidelines (48 FR 44716-44742); the West Virginia State Historic Preservation Officer's Criteria for Comprehensive Statewide Historic Survey and Plans; the Code of Virginia (S 10.1-1208; 1991 Cum. Supp.); and other regulations and guidance provided by the West Virginia Division of Culture and History (WVDCH) and the Virginia Department of Historic Resources (VDHR).

The following sections summarize the scope and results of this study and provide a proposed outline for the identification and management of cultural resources within the Corridor H Project Area once a preferred corridor is selected. Detailed information on the cultural resources landscape of the project area is presented in the Historic and Archaeological Resources Technical Report: Appalachian Corridor H SDEIS - Elkins to I-81 (HARTR), available from WVDOT. Other historic and archaeological reports prepared throughout the history of the project are summarized in this Section and are cited under Section III References.

2. THE NATIONAL REGISTER OF HISTORIC PLACES

The National Historic Preservation Act of 1966, as amended, contains legislation requiring an Archaeological and Historical resource assessment on all transportation projects. Among the key provisions of this federal act is Section 106, which requires that agencies or project sponsors take into consideration the effect of federally assisted, licensed, or permitted projects on cultural resources, and that the Advisory Council on Historic Preservation be afforded the opportunity to comment on these effects. The process for accomplishing the mandate of Section 106 is contained in the implementing regulations, 36 CFR 800, issued by the Advisory Council on Historic Preservation. As part of this evaluation process, the National Register of Historic Places (NRHP, hereafter the "National Register") was created.

The National Register is a list of properties that are significant resources in the fields of history, architecture, archaeology, and engineering. The list is maintained by the U.S. Department of the Interior, National Park Service. A principal task of cultural resource evaluations is to determine the effects of projects on properties in and near the project area that are listed on, or that are eligible to be listed on, the National Register. Properties eligible for nomination to the National Register meet one or more of the following four criteria:

"The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association and:

A. Are associated with events that have made a significant contribution to the broad patterns of our history; or

B. Are associated with the lives of persons significant in our past; or

C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded, or may be likely to yield, information important to prehistory or history." (36 CFR 800.10).

Utilizing these four criteria, a preliminary evaluation of National Register eligibility has been made for known cultural resources within the Appalachian Corridor H Scheme Options. A detailed discussion is contained in the *Historic and Archaeological Resources Technical Report*, available from WVDOT. (National Register listed and eligible sites area also discussed in detail in Section IV, under Section 4(f) properties, and are presented on Table IV-2).

3. PROJECT AREA CULTURAL OVERVIEW

The Corridor H project area abounds in both prehistoric and historic-period cultural resources, reflecting its 12,000 years of human occupation. The following discussion briefly sketches the nature of this resource base.

a. Prehistoric Culture History Overview

The Corridor H project area has been continuously occupied by Native American peoples for at least the last 12,000 years. As a result, the project area is rich in prehistoric archaeological sites and the remains of Native American material culture. Previous prehistoric culture reconstructions associated with the project (Cunningham and Barse 1979) echo the paleo-environmental scheme and culture history sequence set forth in the mid-1970's by William M. Gardner (1984). Following more recent studies (e.g., Watts 1979, 1983; Gardner 1986; Anderson et al. 1992), a revised culture chronology is proposed for the project area. This scheme represents a reassessment of previous chronologies, and is presented and discussed in detail in the *Historical and Archaeological Resources Technical Report*. Since prehistoric cultural development followed somewhat different paths in the two major physiographic regions of the project area, the proposed culture periods are shown contemporaneously for each area. The culture chronology is presented on Table III-40.

b. Historic Period Culture History Overview

The social and economic history of the Appalachian Corridor H project area was dramatically affected by the land's mineral wealth and dissected physiography, as well as by its numerous streams, creeks, and rivers. The contact between the Valley and Ridge and Appalachian Highlands physiographic provinces and the resulting rugged, hilly to mountainous terrain proved an initial barrier to early European settlement of western Virginia and restricted the first Virginian settlers to the eastern side of the Appalachian Mountains (Jakle 1977; Rice 1985). The earliest Euro-American explorations of the western Virginia interior may have begun after Captain Abraham Wood was given control of the trading station at Fort Henry (present-day Petersburg, Virginia) by the Virginia House of Burgesses in 1646; however, the full extent of the exploration undertaken by Wood's expeditions in the seventeenth century is not known.

Few Native Americans were permanent residents in this part of the present state of West Virginia during the historic period, but hunting and war parties of the Cherokee, Delaware, Shawnee, and Iroquois often traversed the nine counties of the project area (McWhorter 1915; Hale 1931; Hughes 1932; Kegley 1938). Travel, raiding, communication, and trade among these Native Americans utilized streams and river bottoms, as well as ridge-top trails. Indian trails along the South Branch of the Potomac River, for example, connected on the west with the Ohio River Valley and formed the earliest routes of trade and travel for Euro-American settlers, just as they had served Native Americans in the centuries and millennia before.

TABLE III-40
PREHISTORIC CULTURE CHRONOLOGY

CULTURE PERIOD	PHYSIOGRAPHIC PROVINCE	
	APPALACHIAN PLATEAU	RIDGE AND VALLEY
Paleoindian	10,000 - 8,500 B.C.	10,000 - 8,500 B.C.
Early Archaic	8,500 - 6,000 B.C.	8,500 - 6,000 B.C.
Middle Archaic	6,000 - 4,000 B.C.	6,000 - 4,000 B.C.
Late Archaic	4,000 - 1,900 B.C.	4,000 - 1,900 B.C.
Terminal Archaic	1,900 - 1,100 B.C.	1,900 - 1,100 B.C.
Early Woodland	1,100 B.C. - A.D. 1	1,100 B.C. - A.D. 450
Middle Woodland	A.D. 1 - 400	A.D. 450 - 800
Late Woodland	A.D. 400 - 1,100	A.D. 800 - 1,575
Late Prehistoric	A.D. 1,100 - 1,575	No Equivalent Designation
Protohistoric	A.D. 1,575 - 1,673	A.D. 1,575 - 1,673

All of the present-day West Virginia Counties of Hampshire and Mineral, most of Grant and Hardy, and part of Tucker County, as well as both Shenandoah and Frederick Counties in Virginia were part of a 1664 land grant by England's Charles II to Lord Culpepper (Maxwell 1884, 1961; Boggs 1960; Fansler 1962; Allman 1979; Ambler 1940; Brannon 1976; Kek 1976). These lands eventually passed to Lord Fairfax, who became their sole proprietor in 1719 (Commonwealth Associates, Inc. 1979: 54-55). Fairfax's enormous land holdings in western Virginia remained largely unexplored and unsettled, however (Anonymous 1937). Settlement of the project area was retarded by both natural barriers and Native American resistance (Boughter and Pence 1927).

The earliest documented settlement in the project area was Jacob Stover's (or Stauber's) 5,000 acre tract in the Shenandoah Valley, which he purchased in 1730. Dr. Thomas Walker's four-month expedition of interior Virginia in 1750 discovered breaks or gaps in the southern Appalachian Mountains chain through which settlers later passed into the American interior. The fertile farmlands of the Shenandoah Valley were reached by following river drainages and mountain cuts by way of such places as Harpers Ferry and Snickers Gap. Settlement was much slower in the more rugged Allegheny Mountain section of the project area, however; the Tygart and Cheat Rivers, for example, remained outside the mainstream of settlement until after 1800 (Harris 1950).

The outbreak of the Seven Years War (also known as the French and Indian War) in 1754 and the defeat of General Edward Braddock's expedition against French-held Fort Duquesne (at present-day Pittsburgh, Pennsylvania) in 1755 temporarily halted English settlement beyond the Allegheny Front. Most of the scattered settlements already established were either destroyed or abandoned until after the conclusion of the war in 1763 (Bailyn and Morgan 1991). Indian resentment at the encroachment of new English settlers continued into the post-war period, however, and promoted the widespread uprising known as Pontiac's Rebellion in 1763-64.

Tension along the western frontier continued as the American Revolution approached, and most Native Americans of western Virginia were drawn into the fighting on the side of the British, upon whom they had become dependent for trade goods. Many of the small number of American frontier settlements were raided and others were abandoned once again. In the post-Revolutionary period, continued Indian trouble further retarded settlement of the western frontier until after the battle of Fallen Timbers in northwest Ohio in 1794 and the conclusion of the Treaty of Greene Ville in August, 1795 (Cobb 1923[?]; Frost 1856; Kercheval 1850; Morrison 1979).

Although a few early and largely informal roads linked the South Branch Valley, the Cheat River, and other interior places with the East, a more formal road was not constructed until 1831-1838, when a turnpike was built that linked Romney with Winchester through Burlington and

Ridgeville to Parkersburg (Ambler 1932; Federal Writers' Project 1937; Cometti and Summers 1966; Romney Anniversary Commission 1937; Wolfe 1974). This road became the Northwest Turnpike, and the route is generally followed by present-day U.S. Route 50.

Road building was an incentive to the formation of new towns and villages. Other early roads in the project area included the Seneca Road, which connected the Tygart Valley with the South Branch Valley, the Staunton and Parkersburg Turnpike, and a road from Elkins to the Staunton and Parkersburg Pike (Commonwealth Associates, Inc., 1979: 69-70; Elkins Board of Trade 1906; Elkins Rotary Club and Elkin's Business Men's Association 1935; Eley 1947).

Political development of counties and towns in the project area followed on the heels of exploration, population growth, and road building. Increasing sectionalism and political strife accompanied this growth, however, particularly as the institution of slavery was extended into Virginia's western counties, where slaves accounted for 9% of the population in 1860 (Commonwealth Associates, Inc. 1979: 73, Note). The anti-slavery and pro-Union sympathies of many residents in western Virginia's counties led to the separation of these counties from Virginia and to the establishment of a provisional state government at Wheeling in 1861; however, a popular vote on the separation and the establishment of the new state of West Virginia was not taken until March 26, 1863, two years into the Civil War.

The counties that make up the Corridor H project area were home to both Northern and Southern sympathizers and occupied a political and cultural fracture zone between the contesting sides. The agriculturally rich Shenandoah Valley was of special importance to the South, and forces under General Joe E. Johnston occupied it from 1861 until driven out by Union forces in 1864 (Rhodes 1900; Siviter 1938; Evans 1962; Calhoun 1974; M.R. Smith 1977; Michael and Carlisle 1979; Marwitt 1982). The physical destruction of much of the Shenandoah Valley's agricultural potential and infrastructure was followed in the post-war period by retarded development of banks, railroads, and other accoutrements of a rapidly industrializing nation. Land speculation was rife, however, and although agriculture and livestock made a slow comeback after the Civil War, timbering and coal mining soon provided newer sources of quicker wealth. Profitability of both industries relied upon the railroad for economical transportation of products, however, and the development of large-scale lumber and mining waited upon the tardy arrival of the railroad in the 1880s (Conley 1960; Dix 1977. Many small West Virginia towns of this period also originated or were economically sustained and connected with the outside world by the railroad, and their spatial orientation to the railroad tracks often reflects the importance of this transportation development much as earlier towns had developed alongside roads and turnpikes (e.g., Carlisle 1983; Roberts and Carlisle 1992).

Low-level technology and unskilled labor requirements meant that timbering produced a quick profit, but overzealous cutting of virgin stands of trees without replacement by new growth spelled a rapid end to West Virginia's timber industry by the 1920s. Mining of the immensely rich coal, oil, and gas deposits beneath the trees, however, more than economically compensated and attracted thousands of African-Americans from the South as well as eastern European immigrants to the southern Appalachian coal fields (Thoenen 1964; Trotter 1990, 1991). Racial, ethnic, and labor strife soon followed in many places, problems exacerbated by the onset of the Depression after 1929 (Tams 1963; D.C. Smith 1977; Lunt 1979; Sullivan 1979; Corbin 1981; Savage 1990). The effects of the Depression were magnified throughout West Virginia, and the counties of the Corridor H project were no exception. In Tucker County, for example, four out of five coal mines closed as did all of the pulp mills, sawmills, and tanneries (Commonwealth Associates, Inc. 1979: 82).

The massive influence of the mining companies over the lives of their workers extended to the very houses in which the miners and their families lived and the stores at which they shopped with company script. The surviving coal patches and towns of the project area provide an architectural and cultural link to this important period in West Virginia history just as the tipples, coal washers, mines, and other industrial resources scattered over the landscape are evocative and significant architectural reminders of the area's rich industrial history.

4. PREVIOUS CULTURAL RESOURCES WORK: HISTORY AND METHODOLOGY

Since the initiation of the Corridor H studies in the late 1970s, there have been a number of archaeological and historical investigations commissioned by WVDOT within the project area. These projects are summarized below in chronological order.

a. <u>Prehistoric Investigations for the 1981 DEIS</u>

1.) West Virginia

In 1979, an Archaeological Technical Report for the Corridor H project area (then consisting of Schemes A, B, C, D, and E, and SubSchemes K, KP, L, L2, and HR) was prepared by Kevin Cunningham and William Barse (1979) for WVDOT. This report presented the results of a preliminary field survey of the project area, and the results were incorporated into the 1981 DEIS.

Cunningham and Barse's investigation consisted of an initial archival and literature search, informant interviews, and the examination of private artifact collections. Based on this archival research, informant data, and previously developed regional settlement pattern models, the authors developed a predictive model for the location of aboriginal cultural resources within the project area. Cunningham then tested his model through a physical investigation of predetermined high probability areas. Accessible plowed fields and other exposed areas (creek banks, roads cuts, etc.) were examined, and local informants were interviewed for information on site locations. No sub-surface testing was performed. Cunningham and Barse identified 173 Paleoindian through Woodland prehistoric sites in West Virginia within or near the various Scheme.

Cunningham subsequently presented a paper at the Upland Archaeological Symposium at James Madison University (Cunningham 1984: 171-224). The paper outlined the results of his investigations and presented a refined version of his aboriginal settlement pattern model for the Ridge and Valley physiographic province portion of the Corridor H project area.

2.) Virginia

The eastern terminus of the Corridor H project is located in western Virginia, at either the town of Winchester or Strasburg. The northernmost Schemes (C and E) follow US 50 through approximately 18 miles of Virginia, while the southern Schemes (A, B, and D) follow SR 55 through approximately 13 miles of Virginia.

Howard A. MacCord, then the Virginia Department of Transportation's Archaeologist, performed a preliminary survey for the Virginian corridor segments (MacCord 1979). Within the northernmost Schemes, controlled surface collection and limited excavation of shovel test probes in areas of high probability within a 5.2 kilometer (3.25 mile) long segment produced completely negative results. In the southern Schemes, one historic building foundation and a single prehistoric site (44FK7) were documented, just east of Hayfield, Virginia.

b. Historic Period Investigations for the 1981 DEIS

Concurrent with the prehistoric investigations, an historical and architectural resources assessment for the Corridor H project area in both West Virginia and Virginia was performed by Commonwealth Associates, Inc. (1979). Commonwealth's task was to study and evaluate the historical and architectural significance of properties potentially impacted by the project schemes.

Commonwealth conducted an architectural field reconnaissance along each of the proposed corridor schemes. They photographed and examined all accessible properties of appropriate age or potential historic significance, maintaining field notes for each structure or site. All structures previously recorded within the project area by the WVDCH and the VDHR (then, the Virginia State Historic Landmarks Commission) were also reassessed.

A program of background archival research was also completed. This included the review and analysis of regional, state, and local records and historical collections relevant to the historical development of the project area. This research facilitated the documentation of additional historical and architectural resources and the preparation of a background discussion on the historical development of the study area. Upon completion, a compilation of the field survey and background research permitted a preliminary determination of significance and potential National Register eligibility for all identified historic sites and districts.

Commonwealth Associates, Inc.'s (1979) survey identified 212 historic properties, including: 153 residences, 19 churches, 9 schools, and 9 historic districts. Additional properties included barns, bridges, rail fences, coke ovens, and a spring house. Of these resources, 72 individual properties and seven historic districts were proposed for a determination of eligibility. These resources were then given a second, more detailed, on-site evaluation (Anonymous n.d.). Based on this evaluation, the State Historic Preservation Offices of Virginia and West Virginia determined that 47 individual historic structures/sites and five historic districts were potentially eligible for inclusion in the National Register of Historic Places (Anonymous n.d.: 1)

c. **1984 Phase I and II Investigations**

In 1984, Phase I archaeological survey and Phase II testing were conducted in portions of the project area by Randall Boedy of the University of Kentucky for WVDOT (Boedy 1984). Boedy's report documented the methodology and results of the Phase I survey of Scheme A at the Elkins Bypass, as well as the Phase II testing of several prehistoric sites identified along Scheme A by Cunningham and Barse (1979).

Boedy's Phase I survey methodology combined controlled surface collection with sub-surface shovel probe testing. Fourteen additional sites (eight prehistoric and six historic) were identified within the 10 kilometer (6.2 mile) long study area.

Of the 36 sites previously identified by Cunningham and Barse (1979) within Scheme A, 10 randomly chosen sites (ca. 28%) were tested at a Phase II level of effort to determine their significance and National Register eligibility. Of these 10 sites, three (46GT20, 46GT25, and 46HY44) were subsequently determined to be potentially eligible for nomination to the NRHP.

d. **1991 SDEIS Investigations**

In the 1990s, the Section 4(f) avoidance Scheme Options, A2 through A7, were developed to avoid the Spruce Knob/Seneca Rocks National Recreation Area. A preliminary survey of these new corridor segments was conducted in April of 1991.

Initial background research was conducted at the WVDCH to identify all previously recorded prehistoric and historic-period cultural resources within the corridor segments. Field examination of the avoidance corridor was then performed utilizing the same methodology and general level of field effort employed by Cunningham and Barse (1979) and Commonwealth Associates, Inc. (1979). The field reconnaissance lasted approximately two weeks and was limited to public land contained within the Monongahela National Forest. The field effort was coordinated with Monongahela National Forest archaeologists to insure procedural compliance and to identify areas of cultural sensitivity. High probability areas were defined using the model developed by Cunningham (1984). These areas were then examined and documented.

The remainder of Scheme Options A2 through A7 not situated within publicly owned lands was subject to a vehicular reconnaissance and limited informant interviews to identify potentially significant cultural resources. The combined archival research and field efforts resulted in the identification of two previously recorded and one unrecorded prehistoric site, six previously recorded and four unrecorded historic archaeological sites, 13 potentially significant historic period structures and farmsteads, and one National Register site.

5. CURRENT INVESTIGATIONS

To bring the cultural resource inventory up to date, an examination of cultural resource maps, site forms, cultural resource reports, and other available records was conducted at the West Virginia Division of Culture and History. Forty 7.5' U.S.G.S. Quadrangle maps containing the location of all archaeological sites registered in or near the various corridor Scheme Options were examined, and the locations and agency designations of all recorded resources were transferred to project 7.5' Quadrangle maps. County standing-structure files were reexamined to confirm and update the identification and location of historic structures, historic districts, and other potentially significant historic resources located within the project area, as were listings for the National Register of Historic Places. Site records or files were photostatically copied for all identified sites or properties.

Using this data base and previous project reports, master cultural resource tables were generated. As the data permit, these tables list the agency designation, common name, location, type, and cultural/temporal affiliation of each resource, sources of additional information, and comments. These tables summarize the currently known cultural resource data base for each of the 24 proposed corridor Scheme Options. This data organization approach facilitates the assessment of potential cultural resource impacts to each of the 24 corridor Scheme Options, and promotes the comparison of potential cultural resource involvements among the 24 Scheme Options. These tables are presented in the *Historic and Archaeological Resources Technical Report*. Each table presents the various categories of resources found within or immediately adjacent to the boundaries of the 2,000 foot-wide corridor Scheme Options. Cultural resources have been grouped into eight categories.

1) Prehistoric Archaeological Sites: NRHP Potentially Eligible
2) Prehistoric Archaeological Sites: NRHP Not Potentially Eligible
3) Historic Archaeological Sites: NRHP Potentially Eligible
4) Historic Sites: NRHP Listed
5) Historic Sites: NRHP Eligible
6) Historic Sites: NRHP Potentially Eligible
7) Historic Sites: NRHP Eligibility Undetermined
8) Historic Districts: NRHP Potentially Eligible

6. ORGANIZATION OF THE DATA BASE

a. Prehistoric Cultural Resources

Prehistoric cultural resources refers to the material culture remains of pre-European contact, indigenous native peoples and are widely distributed throughout the project area. Since previous field investigations have rarely been conducted at a level sufficient to assess significance, the majority of Native American sites located in the project area are, pending additional testing, at least potentially eligible for nomination to the NRHP under Criterion D. Only those sites consisting of "isolated finds" or which have been tested at the Phase II level with negative results have been recorded on the tables as "not potentially eligible." No prehistoric sites are currently listed on or determined to be eligible for listing in the National Register within or near the boundaries of the corridor Scheme Options.

b. Historic Cultural Resources

Historic period cultural resources refer to those sites, buildings, or structures of post-contact, Euro-American origin. They include historic period archaeological sites, usually the surficial and subsurface remnants of former buildings/structures with their associated features (e.g., wells, privies, outbuildings, dependencies, etc.) and artifacts, and various categories of standing structures. "Standing structures", which may include both architect-designed and vernacular examples, have been divided into four categories, National Register Listed, Eligible, Potentially Eligible, or Eligibility Undetermined. The Listed and Eligible categories refer to structures either currently listed on the National Register or that have been determined eligible by the State Historic Preservation Office in conjunction with the National Park Service (see Section IV, "Section 4(f)/6(f) Inventory"). The Potentially Eligible category consists of all structures that, in the opinion of the registrar of the property, the internal assessments of the State Historic Preservation Staffs, or based on a review of available documentation, are at least potentially eligible for nomination, normally under Criteria A, B, or, for the greater part, C. The Eligibility Undetermined category is reserved for historic structures where insufficient information is available, or those that were determined to be non-eligible 10 or more years ago. Changing standards in the assessment of significance require, however, that these structures be reassessed if located within the preferred Scheme Option.

Six historic districts potentially eligible for nomination to the National Register were identified: Kerens, Flannagan's Hill, Onego, Scherr, and Mill Creek in West Virginia, and Lebannon Church in Virginia.

Finally, the number and location of historic cemeteries shown on project area 7.5' Quadrangle maps were noted and entered on project maps.

7. RESULTS

a. Assessment of Previous Work

The decade following the work of Cunningham and Barse (1979) and Commonwealth Associates, Inc. (1979) has seen significant changes in the public management of cultural resources. In West Virginia, Virginia, and elsewhere, the increasing professionalism and commitment of the State review agencies have altered the legal and conceptual framework for cultural resource management. Increasingly, more theoretically and methodologically sophisticated approaches to field work are being mandated, leading to often dramatic increases in the size and complexity of the data base.

Previous work performed for the 1981 SDEIS and subsequent efforts were professionally conducted and generally of high quality, given the research standards of the period, and, particularly, given the obvious constraints imposed on available field and report production time (Cunningham and Barse 1979; Commonwealth Associates, Inc. 1979; MacCord 1979). The historic structure assessment performed by Commonwealth Associates, Inc. (1979) is particularly well-organized and informative. However, with the partial exception of the work subsequently performed by Boedy (1984) in Scheme A, no portion of the Corridor H project area was subjected to what would be today considered a theoretically or methodologically adequate Phase I cultural resources reconnaissance, or appropriate additional Phase II testing or recordation.

Since Cunningham and Barse's (1979) efforts were generally restricted to opportunistic surface collecting and informant interviews, plowed agricultural lands are arguably over-represented at the expense of non-agricultural uplands areas (ridge tops and lobes, benches, saddles and other terrain forms). Subsurface testing (shovel probing) was not performed in zones of low surface visibility, and the potential for the presence of deeply buried sites in fluvial or colluvial settings was not assessed. Further, the relative absence of closed sites (rockshelters) in the inventory suggests that areas suitable for prehistoric closed site formation were not fully considered in this earlier survey.

An accurate paleo-climatic and environmental reconstruction is crucial to understanding the evolution of prehistoric man's adaptation to the changing environment of the region. Cunningham and Barse (1979) follow the environmental scheme and culture-history sequence set forth in the mid-1970s by Gardner (1984). Following more recent assessments (see, for example, Watts 1979, 1983; Gardner 1986; Anderson et al. 1992), the dates for the end of the terminal Pleistocene and the onset of the Holocene presented in Cunningham and Barse (1979) are 1,500 to 2,000 years too late. Further, Gardner and his students (e.g., Gardner 1984, 1986; Custer 1989; Curry and Custer 1982) have placed great emphasis on the importance of the Mid-Holocene xerothermic in forcing cultural and settlement pattern changes in the greater Middle Atlantic area. They place the xerothermic maximum between ca. 2500 and 800 B.C. This interpretation has been challenged by Stevens (1991) because it deviates significantly from the better documented pattern posited by paleontologists in the Upper Great Plains, Midwest, Southeast, and the Middle Atlantic. It is also at variance with climatic reconstructions suggested by site-specific data from the greater Chesapeake Bay area (see Kinsey 1959; Coe 1964; LeeDecker and Holt 1991).

Further, the prehistoric culture overview in Cunningham and Barse (1979) presents a cultural sequence that is not congruent with that employed in most of the rest of eastern North America in general and the greater Middle Atlantic and Middle Ohio River Valley, specifically, for the Paleoindian and Archaic periods. Nor is it synchronous with Gardner's most recent culture reconstructions for the Middle Ridge and Valley province (Gardner 1986; Anderson et al. 1992). The cultural sequence imposed on the Piedmont portion of the Allegheny Mountain section of the project area by Cunningham and Barse (1979) was developed in the Potomac River Valley. Work performed by Dragoo (1958), Broyles (1964), Jensen (1970), Baker (1976), and others suggests that this area of the West Virginia Appalachian Plateaus province falls more properly within a central Appalachian culture area, which was oriented more to the south towards the mid-Appalachian mountains and the Kanawha River basin.

The cultural reconstruction set forth in Cunningham and Barse (1979) did not have the benefit of more recent work in the northern Middle Ridge and Valley province and in the Kanawha River basin. Extensive recent work has recently been completed in the Gathwright Dam-Lake Moomaw area on the Upper James River immediately to the south of the project area. Numerous significant smaller cultural resource Phase III data recovery projects have been recently concluded in the Upper Potomac-Shenandoah River area. Finally, the massive Baltimore Corps of Engineers Flood Wall Project, located in four counties traversed by the various proposed Corridor H Scheme Options, has identified numerous prehistoric sites associated with the floodplain and lower terraces of the South Branch of the Potomac River.

Of the 212 historic structures/districts that were initially identified by Commonwealth Associates, Inc. (1979), 52 properties (47 historic structures and five historic districts) were subsequently determined to be potentially eligible. The remaining 160 structures were not further assessed, and at least some of them may now be potentially eligible under more recent standards of significance for rural vernacular architecture. Further, the general absence of early rural road system and commercial/industrial structures (early gas stations, general stores, movie theaters, coal mining-related structures, etc.) suggests a possible emphasis by Commonwealth Associates, Inc. (1979) on the identification of residences at the expense of other types of historic resources now considered to be of importance in the historical development of Virginia and West Virginia.

Differential coverage of the various Scheme Options is evident in the earlier studies. Scheme A, as the previously preferred corridor, was given proportionately more intensive field coverage than the other Schemes. This is seen in the relative proportions of sites attributable to each Scheme Option and in the absence of recorded resources from certain portions of the project area, most notably the western portions of Schemes B, C, D, and E, west of the Ridge and Valley, and in the general vicinity of the Canaan Valley. This probably reflects the rugged, inaccessible nature of the terrain, and (in the case of prehistoric sites) the lack of agricultural lands suitable for pedestrian reconnaissance.

Finally, as noted, in the years since the formulation of the prehistoric settlement pattern model proposed by Cunningham (1984), much new information has been added to the archaeological data base; however, little systematic testing of the model has occurred to verify or refine its basic assumptions. Moreover, the Cunningham model applies primarily to the Ridge and Valley physiographic province, while the western one-half of the project area falls within the Allegheny Mountain Section of the Allegheny Plateau physiographic province, where different environmental/ecological factors may have affected the choice of aboriginal site locations.

b. <u>Summary of Current Data Base</u>

The eligibility category and number of all currently tabulated cultural resources within or near the Corridor H project area have been assessed and reorganized. They are presented in Table III-41 by Scheme Option. The tables in the *Historic and Archaeological Resources Technical Report*

TABLE III-41
CULTURAL RESOURCE TOTALS BY SCHEME OPTION

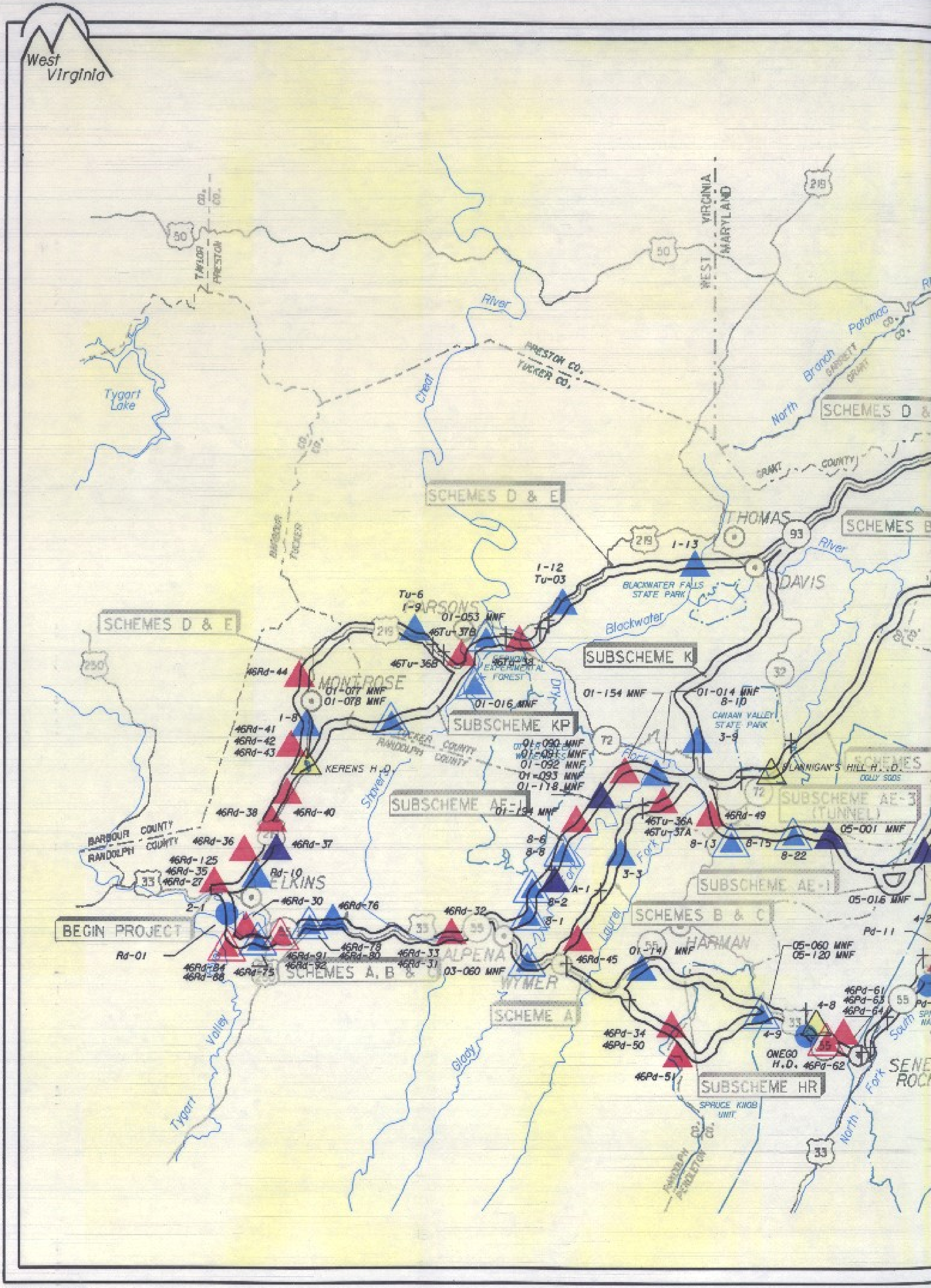
CULTURAL RESOURCE TYPE	SCHEME OPTION																							
	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	C1	C2	D1	D2	D3	D4	D5	D6	E1	E2
Prehistoric Archaeological Sites: NRHP Potentially Eligible	49	32	33	34	32	33	34	40	27	26	23	26	25	23	24	24	28	27	24	15	21	25	28	26
Prehistoric Archaeological Sites: NRHP Not Potentially Eligible	9	8	7	8	7	7	8	10	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0
Historic Archaeological Sites: NRHP Potentially Eligible	1	10	11	11	11	11	11	1	0	0	0	0	0	0	3	3	1	1	1	1	1	1	4	4
Historic Sites: NRHP Listed	0	1	0	0	1	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	4	4
Historic Sites: NRHP Eligible	17	14	13	14	14	13	14	17	10	10	10	10	10	10	1	1	9	9	9	9	9	9	0	0
Historic Sites: NRHP Potentially Eligible	7	6	6	6	6	6	6	7	15	15	16	16	16	15	24	23	20	14	20	11	17	16	27	24
Historic Sties: NRHP Eligibility Undetermined	9	14	13	13	14	13	13	9	5	4	4	4	4	4	37	37	2	2	2	5	5	5	34	38
Historic Districts: NRHP Potentially Eligible	2	1	1	1	1	1	1	2	3	3	3	2	2	2	2	2	3	3	3	3	3	3	2	2
Cemeteries	21	11	11	12	12	11	12	20	11	11	11	11	11	11	18	16	13	13	13	11	11	11	19	17
TOTALS	116	97	95	99	98	95	99	106	75	73	71	73	72	72	117	98	76	69	72	55	67	70	118	115

*NRHP = National Register of Historic Places provide specific summary data on each resource, including agency designation, common name, location, site or property type, information source and date, and comments (if applicable). The geographical distribution of these resources is illustrated in schematic form in Exhibit III-12. Note that Exhibit III-12 is organized by Scheme and SubScheme only. To equate the 24 Scheme Options presented in the tables with the map site/structure distributions shown on Exhibit III-12, the reader is directed to the discussion of Scheme Options on pages S-5 to S-8 in the Summary.

The results of the cultural resource assessment of all the 2,000 foot-wide Corridor H Scheme Options confirm that the entire project area is rich in significant or potentially significant prehistoric and historic resources. Simply counting prehistoric and historic archaeological sites, as well as historic buildings and structures, does not accurately reflect or measure potential National Register significance, but charting the numerical distribution of known resources throughout the project area does allow a rank-ordering of cultural resource probability throughout the project that is appropriate for the corridor selection process.

In this regard, the distribution of known cultural resources varies from a minimum of 55 individual resources for Scheme Option D4 to a maximum of 118 for Scheme Option E1, a difference of 214%. Even so, the majority of the Scheme Options contain roughly similar numbers of known cultural resources, and the evaluation of alternative alignments within the preferred Scheme Option will require additional cultural resource evaluation. The No-Build Alternative would avoid any potential impact to cultural resources. A simple ranking of the 24 Scheme Options by total number of currently known cultural resources, from the fewest to the greatest number of resources, is presented on Table III-42.

It is apparent from examination of this ranking that Scheme Options D2, D4, D5, and D6 may have the fewest number of potential cultural resource impacts based upon the number of known resources in each, although the differences among any of the Scheme D and Scheme B Options are slight. Scheme Options A1 and A8 reflect substantially larger numbers of cultural resources due, primarily, to the more extensive field examination those Scheme Options received as components of the previously preferred Corridor. Also, since 1981, numerous prehistoric sites have been identified within all of the Scheme A Options as a result of the massive Baltimore Corps of Engineers Flood Wall project on the South Branch of the Potomac River. Scheme Options C1, E1, and E2, also have substantial numbers of cultural resources due to the large number of potentially eligible but currently unevaluated historic structures associated with US 50 and SR 55 in the northeast portion of the project area.



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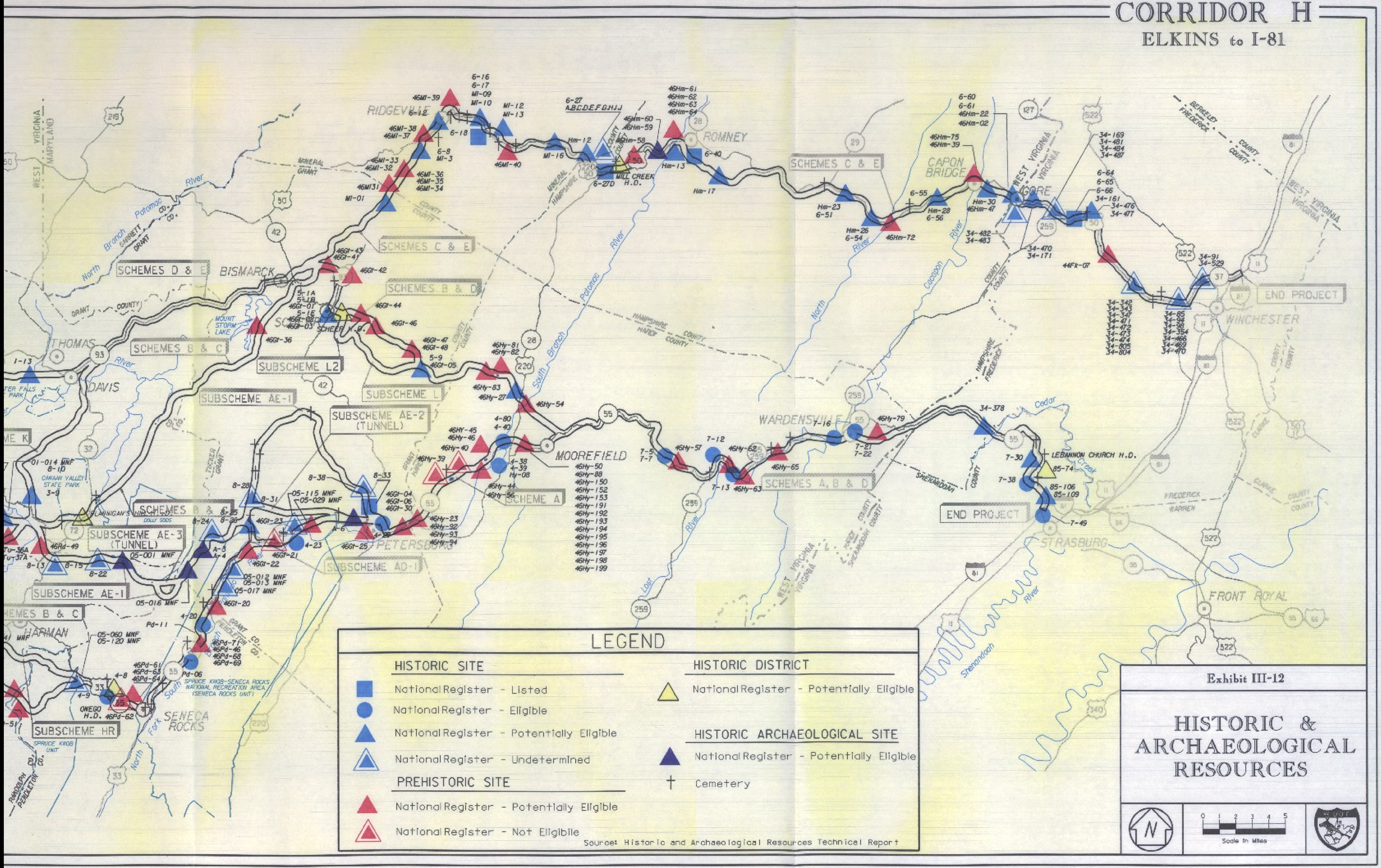
CORRIDOR H
ELKINS to I-81
LEGEND
HISTORIC SITE
National Register - Listed
National Register - Eligible
National Register - Potentially Eligible
National Register - Undetermined
PREHISTORIC SITE
National Register - Potentially Eligible
National Register - Not Eligible
HISTORIC DISTRICT
National Register - Potentially Eligible
HISTORIC ARCHAEOLOGICAL SITE
National Register - Potentially Eligible
Cemetery
Source: Historic and Archaeological Resources Technical Report
Exhibit III-12
HISTORIC & ARCHAEOLOGICAL RESOURCES
Scale in Miles
RIDGEVILLE
ROMNEY
CAPON BRIDGE
GORE
WINCHESTER
END PROJECT
BISMARCK
THOMAS
DAVIS
MOOREFIELD
WARDENSVILLE
PETERSBURG
HARMAN
SENECA ROCKS
STRASBURG
FRONT ROYAL
LEBANON CHURCH H.D.
MILL CREEK H.D.
SCHEER H.D.
OWEGO H.D.
SCHEMES C & E
SCHEMES D & E
SCHEMES B & D
SCHEMES B & C
SCHEMES A, B & D
SCHEME A
SUBSCHEME L2
SUBSCHEME L
SUBSCHEME AE-1
SUBSCHEME AE-2 (TUNNEL)
SUBSCHEME AE-3 (TUNNEL)
SUBSCHEME AD-1
SUBSCHEME HR
WEST VIRGINIA
VIRGINIA
MARYLAND
SPRUCE KNOB-SENECA ROCKS NATIONAL RECREATION AREA (SENECA ROCKS UNIT)
CANAAN VALLEY STATE PARK
MOUNT STORM LAKE

TABLE III-42
SIMPLE RANKING OF POTENTIAL
SCHEME OPTION INVOLVEMENT WITH CULTURAL RESOURCES

SCHEME OPTION	TOTAL POTENTIAL INVOLVEMENTS
D4	55
D5	67
D2	69
D6	70
B3	71
B5	72
B6	72
D3	72
B2	73
B4	73
B1	75
D1	76
A3	95
A6	95
A2	97
A5	98
C2	98
A4	99
A7	99
A8	106
E2	115
A1	116
C1	117
E1	118

Of the five project area sites currently listed on the National Register of Historic Places, four are in Scheme Options C1, C2, E1, and E2. Scheme Options A2 and A5 each have one NRHP-listed site. By far the greatest numbers of National Register-Eligible sites are associated with Scheme Options A1 through A8, ranging from 13 to 17 properties per Scheme Option. Schemes B and D have ten and nine National Register-Eligible sites per Scheme Option, respectively. Schemes C and E contain one and no National Register-Eligible sites, respectively.

While a simple resource count is helpful in assessing potential cultural resource impacts in the project area, other historic and topographic factors must be considered. Furthermore, most of the project area has not received the level of field examination that would reveal the presence of prehistoric or historic archaeological sites in areas of low surface visibility or in potentially buried contexts. Thus, additional field investigation within the preferred Scheme Option is likely to identify new cultural resources, particularly in portions of the project area where few are now recorded.

The association of known prehistoric sites with areas of Quaternary fluvial deposition suggests that the vicinity of higher-order streams with sizable floodplain development will be zones of high archaeological sensitivity within the project area. Areas of particular concern will include floodplains and/or upper terraces associated with the following higher-order streams and rivers (from east to west):

- The Cacapon River in Hardy County, West Virginia, traversed by all Options of Schemes A, B, and D.
- The South Branch of the Potomac River in Hampshire County, West Virginia, west of Romney, traversed by all Options of Schemes E and C.
- The South Branch of the Potomac River in Hardy County, West Virginia, north of Moorefield, traversed by all Options of Schemes B and D.
- The South Branch of the Potomac River in Hardy County, West Virginia, north of Moorefield, traversed by all Options of Scheme A.
- The South Branch of the Potomac River in Grant County, West Virginia, east, south, and west of Petersburg, traversed by all Options of Scheme A.

- The North Branch of the South Fork of the Potomac River in Pendleton County, West Virginia, within the Spruce Knob/Seneca Rocks National Recreation Area, and traversed by Scheme Options A1 and A8.

- The Cheat River in Tucker County, West Virginia, south and west of Parsons, traversed by all Options of Schemes D and E.

- The Tygart Valley River in Randolph County, West Virginia, west of Elkins, traversed by all Options of Schemes A, B, C, D, and E.

It should also be noted that Gardner (1984: 13) stresses the association of uplands resource extraction stations with valley-floor site occupations. Therefore, the identification of additional prehistoric resources can be anticipated in uplands areas surrounding higher-order stream valleys.

Substantial amounts of archaeological work also have been performed in uplands areas, especially in the Monongahela National Forest portion of the project area (Brashler 1984). Brashler notes that data developed after 1981 reveal a surprising number of Late Archaic (ca. 4000 - 1900 B.C.) prehistoric sites located within the Forest in diverse environmental settings. She has further proposed that a variety of research questions concerning the Late Archaic can be potentially addressed through additional test excavation (Brashler 1984: 17-21). All Scheme Options traverse substantial portions of the massive Monongahela National Forest, and the potential exists for prehistoric site identification in uplands contexts.

Distributions of known historic sites predictably follow the trend of historic roads of sufficient time depth. This is particularly notable in the central and eastern portion of the project area where the various corridor Scheme Options follow older east-west routes (US 33 and US 50). One of the goals of the on-going cultural resources study will be to formulate testable diachronic models for the distribution of historic period resources within the alignments of the preferred corridor. These models will be sensitive to additional site location variables such as the presence of cleared Native American fields, or access to higher-energy streams suitable for mill construction.

Finally, a total of 52 historic period cemeteries are shown on project area 7.5' Quadrangle maps. The distribution of these cemeteries by Scheme Option is given in Table III-41 and illustrated in Exhibit III-12. The distribution of known cemeteries throughout the project area is relatively uniform, generally ranging from 11-13 cemeteries per Scheme Option. Exceptions are, in ascending order, Scheme Option C2 with 16 cemeteries, E2 with 17 cemeteries, C1 with 18 cemeteries, E1 with 19 cemeteries, A8 with 20 cemeteries, and A1 with 21 cemeteries.

8. PROPOSED FUTURE CULTURAL RESOURCE EFFORTS

As the Corridor H project is in a planning or corridor location stage, no design studies are in progress. Since alignment rights-of-way and detailed engineering data (such as right-of-way limits, location and type of structures, cut and fill estimates, roadway elevations, etc.) are not presently available, it is not feasible at this level of investigation to assess the type or degree of potential impact to any given resource within all of the various Scheme Options. The study corridor width of 2,000 ft should permit sufficient design flexibility to avoid or otherwise mitigate potential impacts to significant cultural resources. These impacts will be fully assessed and presented in the Alignment SDEIS, which will focus specifically on alternative alignments within the preferred corridor.

A Phase I level survey conducted to contemporary professional standards covering all 150 square miles of the corridor Scheme Options would prove enormously expensive and time-consuming, particularly considering the fact that only one of the 2,000 ft wide 24 corridor Scheme Options will be carried forward for the development of design alternatives. Thus, a Phase I examination of all corridor Scheme Options could negatively impact possible cultural resources that would otherwise be unaffected by project construction activities. It is therefore proposed that a sufficient cultural resource data base currently exists to permit an informed decision about the relative potential impact of the various Corridor H Scheme Options on the project area's cultural resource landscape. A consideration of potential costs versus derived benefits suggests that future cultural resource efforts would best be directed towards assessing the cultural resources of the alignments developed within the preferred corridor. As stated previously, the results of this work will be presented in the Alignment SDEIS.

A "three stage" approach to the completion of all cultural resource management requirements for this project offers the best means of properly assessing and protecting the cultural landscape of the project area within a reasonable temporal and financial framework. An outline of this proposed effort is provided below:

a. "Pre-Phase I" Study

Requirement: Perform a preliminary assessment of the location and potential National Register eligibility of all previously known/registered or potentially existing cultural resources within the selected corridor. This document will organize cultural resource data in sufficient detail to allow agencies to make an informed decision on the recommendation of a proposed highway alignment within the selected corridor.

Methodology: WVDOT will:

- Update the inventory of known cultural resources within the selected corridor.

- Make field determinations of the current state of preservation of these properties. Since the degree of impact to these resources cannot be properly evaluated prior to the selection of an alignment or alignments, Baker proposes that the evaluation of impact to these resources be deferred until potential alignments within the selected corridor option are designated. Current standards of evaluation will be employed to assess all potentially significant properties within the viewshed of the selected alignment(s).

- Perform additional background literature search, field reconnaissance and informant interviews to identify other potentially significant unrecorded historic and archaeological sites and structures within the selected corridor. As part of this field effort, a preliminary evaluation will be made of the potential for deeply buried cultural resources in the preferred corridor, based on field examination and known site distribution data. No deep testing or other significant subsurface examinations will be performed at this "Pre-Phase I" level.

- Analyze and refine the Cunningham (1984) aboriginal settlement pattern model and develop additional models for predicting the locations of historic resources. Based on these models, the literature search, and field results, prioritize the selected corridor into zones of high, medium, and low potential for the preservation of both prehistoric and historic cultural resources.

Data resulting from this proposed work will be discussed in the Alignment SDEIS and will be included in a "Pre-Phase I" report on the preferred corridor Scheme Option.

b. **Phase I Archaeological Reconnaissance**

Requirement: Perform a Phase I archaeological reconnaissance of the final Preferred Alignment.

Methodology: WVDOT will:

- Perform all project coordination with the WVDCH and VDHR.
- Perform additional background literature search and informant interviews, as required.
- Conduct a complete pedestrian reconnaissance and shovel probe sub-surface test program for the selected alignment. Mechanically excavated trenches ("backhoe trenches") and the manual excavation of 1 m x 1 m (3.3 ft x 3.3 ft) squares will be employed to assess potentially deeply buried resources in colluvial or fluvial environments. Site location models developed during the Pre-Phase I study will be tested by surveying statistically significant portions of each probability zone and comparing the results with model projections.
- Conduct artifact processing, tabulation, and analysis at a Phase I level.
- Register newly identified, potentially significant sites and structures.
- Produce a Phase I report satisfying all applicable regulations and guidelines.
- Make recommendations for the management of cultural resources located in or near the Preferred Alignment impact zone and viewshed.

A draft Phase I report on the Preferred Alignment will be prepared and submitted to the WVDCH and VDHR for comment. Agency revisions will be included in the final Phase I report.

c. **Phase II Testing and Phase III Mitigation**

Requirement: WVDOT will perform additional Phase II testing and Phase III excavation, as required, in coordination with the WVDCH, the VDHR, and other concerned agencies.

Deliverables: Additional cultural resource management reports will be prepared, as required.

S. <u>HAZARDOUS MATERIALS SITES</u>

Hazardous waste sites are regulated by the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund). WVDOT's 1989 *Guidelines for Identifying and Dealing with Hazardous Waste on Highway Projects* states that the disposal of hazardous waste in landfills, surface impoundments, lagoons, pit sites, and other locations was once common. The above federal laws give the Environmental Protection Agency (EPA) responsibility for regulating hazardous waste. In response to this directive, the EPA is inventorying uncontrolled sites and has published the *Hazardous Waste Sites National Priorities List*, which includes sites in West Virginia and Virginia. In West Virginia, EPA has delegated much of its hazardous waste regulatory authority to the Department of Natural Resources, Division of Waste Management. In Virginia, this authority has been delegated to the Department of Waste Management.

Both the West Virginia Division of Waste Management and the Virginia Department of Waste Management maintain lists of all known hazardous waste sites. Coordination with the appropriate federal and state agencies was undertaken to determine the location of known, permitted and non-regulated hazardous material sites located within the corridor Scheme Options.

1. METHODOLOGY

Letters of inquiry were sent to the West Virginia Division of Waste Management and the Virginia Department of Waste Management. Both agencies supplied county-wide lists of the following types of hazardous materials sites: CERCLA (Superfund); RCRA; Landfills; and Underground Storage Tank systems (UST), including those listed as having confirmed releases of hazardous substances. Due to the size of the study area and the voluminous number of underground storage tank systems within each county, only those systems with confirmed releases were evaluated to determine their presence in the study area. When a preferred corridor is selected and preliminary alignment design is initiated, the location of all UST systems within the preliminary alignments will be identified.

Hazardous materials sites were located on county mapping (1"=1 mile) to determine location within the corridors. Those sites not within the 2,000 foot-wide corridors were eliminated from further investigation. The exact locations of sites within the corridors were verified through further agency and owner contact.

2. POTENTIAL INVOLVEMENTS

No CERCLA (Superfund) sites, leaking UST sites, or landfills are located within any corridor Scheme Option. However, as shown on Exhibit III-13, 14 RCRA or hazardous waste generator sites are

CORRIDOR H
Elkins to I-81

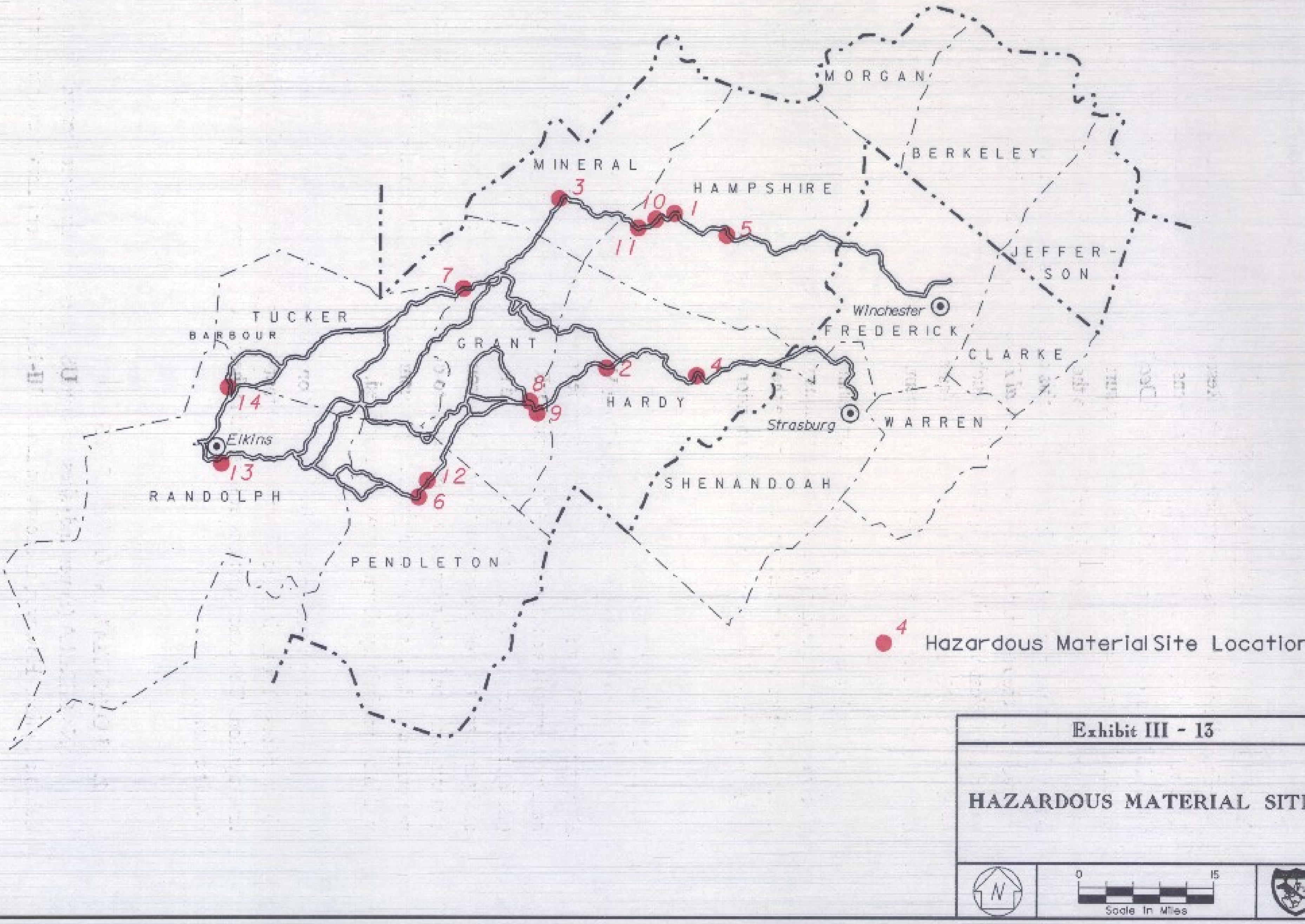

Exhibit III - 13

HAZARDOUS MATERIAL SITES

HAZMAT.DGN 091092

located within the various Scheme Option corridors. Hazardous waste generators are classified from 1 to 3, based on the quantity of waste produced. The generator class descriptions are as follows:

Class 1: These generators are large, producing 1,000 kg or more of hazardous waste or 1kg of acutely hazardous waste per month.

Class 2: These generators produce between 100 kg to 1,000 kg of hazardous waste or up to 1 kg of acutely hazardous waste per month.

Class 3: These are the smallest generators, producing up to 100 kg of hazardous waste or less than 1 kg of acutely hazardous waste per month.

Because the amount of hazardous waste generated by Class 3 facilities is so small, EPA has determined those classified as such are conditionally exempt from reporting. A description of the 14 RCRA sites is provided on Table III-43. Scheme Option involvement with these known sites is presented on Table III-44. A summary of Scheme Option involvement is described below.

- Of the 14 RCRA sites, one is Class 1, five are Class 2, and eight are Class 3.
- Of the five Schemes, Scheme B would have the least involvement with hazardous waste sites, with an average of two Class 3 involvements for each Scheme Option.
- Scheme E would have the greatest number of involvements with these sites, averaging three Class 2 sites and four Class 3 sites for any of the Scheme Options.
- Scheme Options A1 and A8 are the only corridors having a Class 1 generator located within the corridor.

3. POTENTIAL MITIGATION MEASURES

Should a preferred corridor with a known hazardous material site be selected, avoidance of the site would be a priority during the refinement of the alignment and the determination of right of way limits. WVDOT's *Hazardous Waste Guidelines* state that it is the West Virginia Department of Transportation, Division of Highway's practice to avoid known hazardous waste locations. In general, hazardous waste sites shall be avoided as locations for highway projects if at all practicable. However, since Class I sites are considered the most hazardous, avoidance of these sites would be a top priority. When avoidance is not possible (eg.: avoidance alternatives would create greater adverse environmental impacts or would involve

TABLE III-43
KNOWN HAZARDOUS MATERIALS SITES

SDEIS SITE NO.	SITE TYPE	SITE NAME	SITE LOCATION	EPA I.D. NUMBER	CLASS * STATUS
1	RCRA	WVDOT	Romney,WV	WVD988760196	3
2	RCRA	WVDOT	Moorefield, WV	WVD988769154	3
3	RCRA	WVDOT	New Creek, WV	WVD988769170	3
4	RCRA	WVDOT	Baker, WV	WVD988769113	3
5	RCRA	Potomac Edison Company	Augusta, WV	WVD988770368	2
6	RCRA	Columbia Gas - Seneca Compression Station	Seneca Rocks, WV	New Notifier - I.D. Not Available	3
7	RCRA	Mount Storm Power Station	Mount Storm, WV	WVD080548191	2
8	RCRA	Petersburg Block, Inc.	Petersburg, WV	WVD988776589	2
9	RCRA	Tunnelectric	Petersburg, WV	WVD988769600	2
10	RCRA	Romney Concrete Sales	Romney, WV	WVD988775706	2
11	RCRA	Romney Stone Quarry, Inc.	Romney, WV	WVD988780110	3
12	RCRA	TCO-Seneca Compression and Transmission	Seneca Rocks, WV	New Notifier - I.D. Not Available	1
13	RCRA	Monogold Lumber Company, Inc.	Elkins, WV	WVD004381778	3
14	RCRA	Siron Trucking	Montrose, WV	New Notifier - I.D. Not Available	3

Source: WV Waste Management Section and VA Department of Waste Management

Class Status:

1 - Large Generator = produces 1,000 kg or more of hazardous waste or 1kg of acutely hazardous waste per month.

2 - Small Generator = produces between 100 kg and 1000kg of hazardous waste or up to 1kg of acutely hazardous waste per month.

3 - Conditionally Exempt = produces less than 100 kg of hazardous waste per month .

TABLE III-44
HAZARDOUS MATERIALS SITES BY SCHEME OPTION

SCHEME	SCHEME OPTION	SDEIS HAZARDOUS MATERIALS SITE & STATUS CODE*													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	A1		3		3		3			2			1	3	
	A2		3		3				2					3	
	A3		3		3					2				3	
	A4		3		3					2				3	
	A5		3		3									3	
	A6		3		3					2				3	
	A7		3		3					2				3	
	A8		3		3		3			2			1	3	
B	B1				3									3	
	B2				3									3	
	B3				3									3	
	B4				3			2						3	
	B5				3									3	
	B6				3									3	
C	C1	3		3		2					2	3		3	
	C2	3		3		2		2			2	3		3	
D	D1				3			2							3
	D2				3			2							3
	D3				3			2							3
	D4				3			2							3
	D5				3			2							3
	D6				3			2							3
E	E1	3		3		2		2			2	3			3
	E2	3		3		2		2			2	3			3

1 - Large Generator = produces 1,000 kg or more of hazardous waste or 1kg of acutely hazardous waste per month.

2 - Small Generator = produces between 100 kg and 1000kg of hazardous waste or up to 1kg of acutely hazardous waste per month.

3 - Conditionally Exempt = produces less than 100 kg of hazardous waste per month .

excessive costs), the early evaluation of hazardous waste locations allows time for site management and environmental protection. The chances of discovering unknown hazardous waste sites are remote; however, the potential added cost and adverse environmental impact warrants careful research early in the planning process.

A detailed analysis of hazardous waste sites will be performed, once a preferred corridor is selected and detailed alignment studies are initiated. These analyses will be conducted in accordance with WVDOT's *Guidelines for Identifying and Dealing with Hazardous Waste on Highway Projects, 1989*, guidelines set forth in FHWA's *Technical Advisory T 6640.8A*, and FHWA's *Interim Guidance: Hazardous Waste Sites Affecting Highway Project Development, August, 1988.*

T. VISUAL RESOURCE INVOLVEMENTS

A visual involvement assessment has been prepared in accordance with FHWA's Technical Advisory T6640.8A. The assessment methodology was based on the guidelines provided in FHWA's *Visual Impact Assessment for Highway Projects*. Because this is a corridor-level study, the assessment consists of a general description of the methodology, the principal visual characteristics of selected sensitive visual resources in the area, the principal viewers of the selected resources, the potential involvements with the selected sensitive visual resources and viewers, and the possible means to mitigate visual involvements. Once a preferred corridor is selected and alignments within the preferred corridor are developed, a detailed visual impact analysis will be performed in accordance with NEPA requirements, 23 USC 109 (h) and Technical Advisory T 6640.8A.

1. METHODOLOGY

The visual assessment was based on the visual resource management (VRM) system used by several federal agencies. The major components of this process included identifying representative sensitive visual resources, inventorying existing visual characteristics, identifying the type and volume of viewers of the resources, and determining the existing quality of the visual resources. These components defined the existing or baseline conditions. Once these components were established, the degree of visual involvement was determined based on potential visual changes introduced by the project and the expected viewer response.

The existing visual character of each resource was inventoried during site visits. This inventory included determining the visual percentage of each type of visual unit within the viewshed of the observer. Visual units include landscape, water, vegetation, and manmade facilities or structures. A rating scale was used to qualify the relative degree of potential involvement based on the importance of the visual resource, the volume of viewer activity, and the sensitivity of the viewer. The ratings are characterized as follows:

- ***No Involvement:*** The project would not be visible to viewers, with the exception of those using the proposed facility.

- ***Low Involvement:*** The view of the project would be limited, the visual resource is limited in importance, the level of viewer activity is low, the nature of viewer activity is not affected, there are dominating visual intrusions in the viewshed from other sources, or there is a weak visual contrast between the proposed facility and the existing landscape.

- ***Medium Involvement:*** The view of the project would be a moderate intrusion into the existing visual environment with greater contrast than a low involvement but not as great as a high involvement.

- ***High Involvement:*** The project would be in close proximity and visible to viewers, would have a strong contrast with the landscape, would be in an area of substantial visual importance with limited other visual intrusions, or would involve substantial viewer activity and sensitivity.

2. AFFECTED ENVIRONMENT

a. Principal Visual Characteristics of the Study Area

The study area has unique visual qualities due to the mountainous terrain, vast forested areas, and rural and natural scenic beauty. The land within the study area is primarily forested, approximately 70 percent of the total land area. Twenty percent of this forest land is contained within the Monongahela and the George Washington National Forests. These forests provide scenic tourism and outdoor recreation activities to thousands of visitors daily. Cropland and pasture occupy approximately 25 percent of the land within the study area. The remaining five percent of land within the study area is in residential, commercial, industrial, and mining use. The distribution of these land uses is presented on Exhibit III-2.

The study area lies in two distinct physiographic regions of the Appalachian Mountains: the Allegheny Mountain Section of the Appalachian Plateau Province and the Middle Section of the Ridge and Valley Province. The dominant features of the topography are mountains characterized by high plateaus and long, narrow valleys situated between moderately steep to steep slopes and rugged mountains (Exhibit II-1). A major divide known as the Allegheny Front generally runs northeast to southwest along the western borders of Pendleton and Grant Counties. This divide of the Alleghenies separates the Appalachian Plateau Province from the Ridge and Valley Province.

The Appalachian Mountain Section of the Appalachian Plateau includes areas of Tucker County, the northern section of Randolph County, and the westernmost edge of Grant, Mineral, and Pendleton Counties. Side slopes of the mountains are generally steep except for the valleys of Cheat River north of Parsons and Blackwater River in Canaan Valley. Valleys are narrow and mountaintops are broad. The drainage system is a well-developed dendritic pattern. Gorges are fairly common and most streams have steep gradients. Within this area of Corridor H are several outstanding topographical and natural features, including Canaan Valley, Blackwater Falls, and Dolly Sods.

The Ridge and Valley Province, bounded on the east by the Great North Mountain and on the west by the Allegheny Front, includes Hampshire and Hardy Counties, the portions of Grant, Mineral, and Pendleton Counties not on the Allegheny Plateau, and Shenandoah and Frederick Counties in Virginia. Long, narrow, and level valleys between steep parallel slopes dominate this region, as can be seen in Patterson Creek Mountain and South Branch Mountain. A trellised drainage pattern exists in this area. Outstanding topographical features of this portion of the study area include the Allegheny Front, Greenland Gap, Seneca Rocks, and Lost River Sinks.

b. <u>Representative Sensitive Visual Resources</u>

Sensitive visual resources were selected based on their visual proximity to the proposed project and the viewer activity and frequency. Many of the sites are located within the Monongahela National Forest. These sites were selected based on their designation as visually sensitive resources (as noted in the 1984 adopted MNF Land Use Plan). Table III-45 presents the 36 sites selected to represent the sensitive visual resources within the study area, as well as the existing visual character of each site and those sites designated as visually sensitive by either the Forest Service or the Park Service. These sites are shown on Exhibit III-14. The visual character consists of the various visual units which make up each site. These visual units include landscape (the overall visual setting such as mountains, valleys, plateaus, etc.), water, vegetative, and manmade. The approximate percentage of the visual environment each unit occupies has been determined. As presented in Table III-45, the "landscape" visual unit occupies 100 percent of the visual environment because it is the overall setting. However, because the other visual units do not necessarily occupy the entire viewshed, the sum of each unit's presence is not always 100 percent.

c. <u>Principal Viewers of the Study Area</u>

Because of the size of the study area, there are numerous visual perspectives associated with the project. The presence of the proposed facility through these areas would be viewed differently by different persons. To some, a road or bridge that has been carefully designed to blend with the

TABLE III-45
EXISTING VISUAL CHARACTER MATRIX

VISUAL RESOURCE		Onego H.D. (SR 55)	Alpena Gap (US 33)	Dolly Sods Picnic Area	S. Prong Trail (D. Sods)	Bear Rocks (D. Sods)	Scenic Overlook (D. Sods)	Seneca Rx Visitor Center	Seneca Rx Scenic Overlook	North Fork Gap (SR 55)	Champe Rx (from N. Fork Mtn. Trail)	Echo Park (SR 55)	Seneca Parking (CR 33/3)	Whites Run (CR 33/3)	Stinking Run (CR 33/3)	Laurel Fork (US 33)	Glady Fork (US 33)	Glady Fork (CR 12)	Mozark Mountain (SR 72)	Canaan Mountain (SR 72)	Canaan Valley S.P. (Entrance)	Canaan Valley S.P. (Chair Lift)	Canaan Valley (Cabin Mtn)	Mount Storm Lake
SCHEME INVOLVEMENT		A	A, B, C	AE-1	E-1, AE-	AE-1	A, AE-1	A	A	A, AD-1	A	A	A	A	A	A	A, B, C	AE-1, B,C	K	K	B, C	B, C	B, C	D, E
VISUAL UNIT																								
LANDSCAPE UNIT	Mountains	25%	100%	50%	50%	25%	25%		50%	30%	20%	40%	50%	40%	40%	40%	5%	10%	50%	40%		50%	10%	
	Steep Ridges	25%		50%						10%	20%			5%		10%								
	Rolling Hills										20%	20%		5%	35%		85%		30%	50%	10%			50%
	Undulating Land																							
	Level Land																			10%	40%			
	Rock Outcrop					50%	50%		50%	20%				20%	5%									
	Plateaus				50%	25%	25%																	
	Valleys	50%						100%		30%	20%	20%	50%	30%	20%	50%	10%	90%	20%		50%	50%	90%	50%
	Cliffs									10%	20%													
WATER UNIT	Rivers							20%	2%	50%														
	Streams/Creeks	10%			2%								20%	50%	2%	70%	70%	80%					1%	
	Lakes																							50%
	Ponds																							
	Wetlands																							
	Waterfall/Rapid	10%												30%				30%						
	Spring/Seep												2%	20%										
VEGETATIVE UNIT	Coniferous	10%			80%	20%	20%	20%	25%		20%		30%		10%	25%	10%	10%		10%	10%	70%	1%	5%
	Deciduous	10%		100%	20%		20%	20%			70%		70%		20%	70%	85%	90%		40%	20%	30%	19%	95%
	Mixed Woods	50%	100%				50%		50%	70%		20%		100%					90%					
	Scrubland					30%	10%								20%								80%	
	Grassland																							
	Agricultural						1%	5%	5%			5%												
	Pasture	25%					1%	10%	5%	20%	5%	20%			50%	5%	5%		10%	50%				
	Parks							25%	3%			50%									70%			
	Lawns	5%						20%	2%	10%		5%												
MANMADE UNIT	Urban					1%	1%																	
	Industrial																							30%
	Commercial	30%						20%	5%														1%	
	Institutional								2%															
	Residential	30%							2%	10%	1%	2%					1%						1%	
	Recreational		10%	5%				70%	3%		1%	50%									20%	30%		2%
	Highways	5%	5%			1%	1%	5%	2%	5%	1%	2%				2%	2%				2%	1%	1%	2%
	Unpaved Road		5%	5%		1%	1%						5%	2%	2%			1%					1%	
	Railroads																							2%
	Utility Lines	3%								1%									1%	1%	1%	1%		2%
	Tower/Structure																							2%
	Bridges/Dams	1%								2%						2%	1%							2%
	Parking/Storage	2%	5%					5%	1%				40%											2%
	Embank/Pit/Cut																							
	Canal/Channel																							
	Billboard/Sign																							
	Strip Mine					1%	1%																1%	
VISUALLY SENSITIVE RESOURCE DESIGNATION	Historic	*																						
	NRA			*				*	*		*		*	*										
	Recreational		*	*	*	*	*	*	*		*	*	*	*		*	*	*			*	*	*	
	Geologic				*	*	*		*	*	*												*	
	Scenic Area			*	*	*	*				*											*		
	Nat. Landmark									*	*												*	

* Table III-45 continues on the following page

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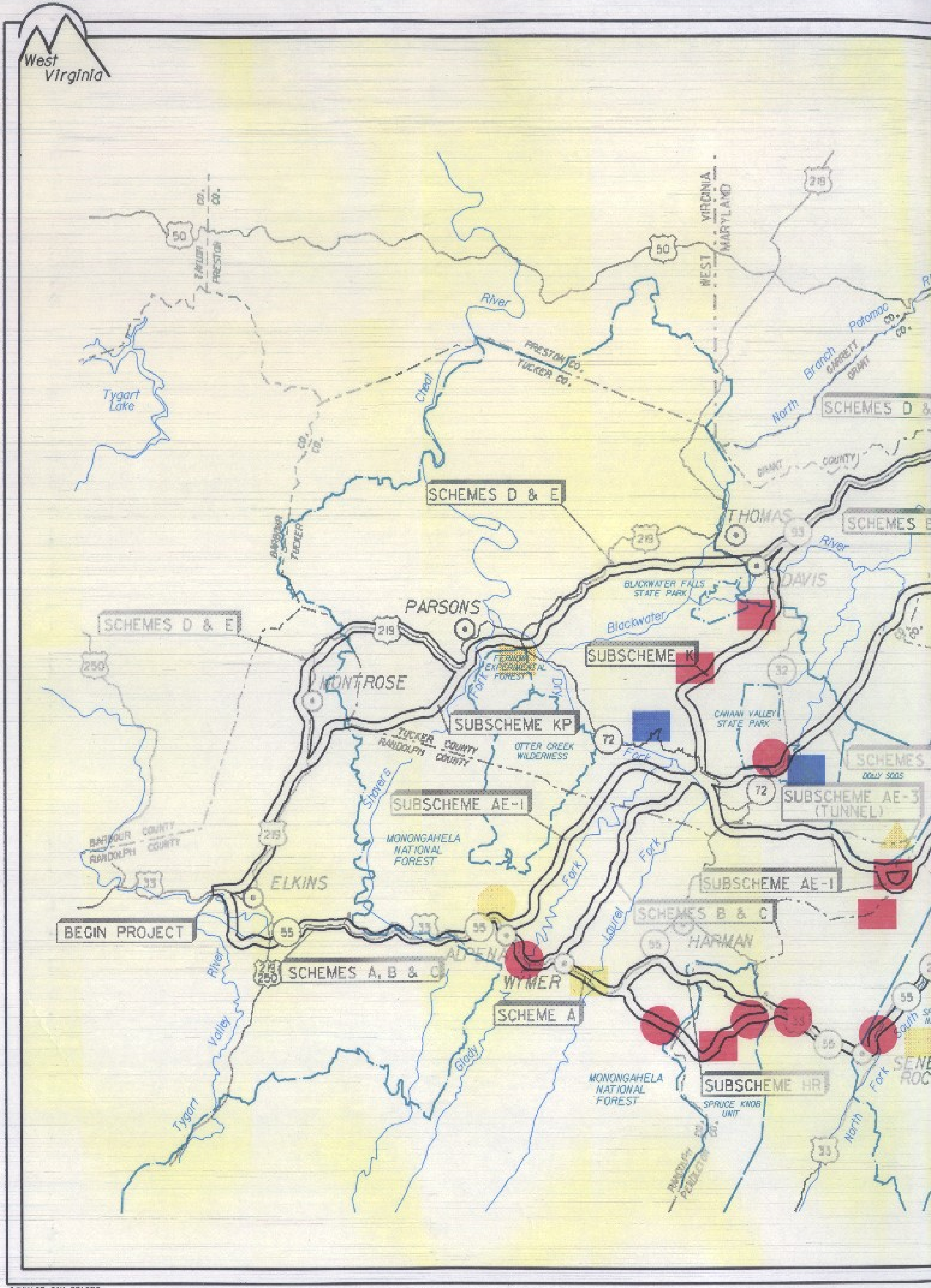
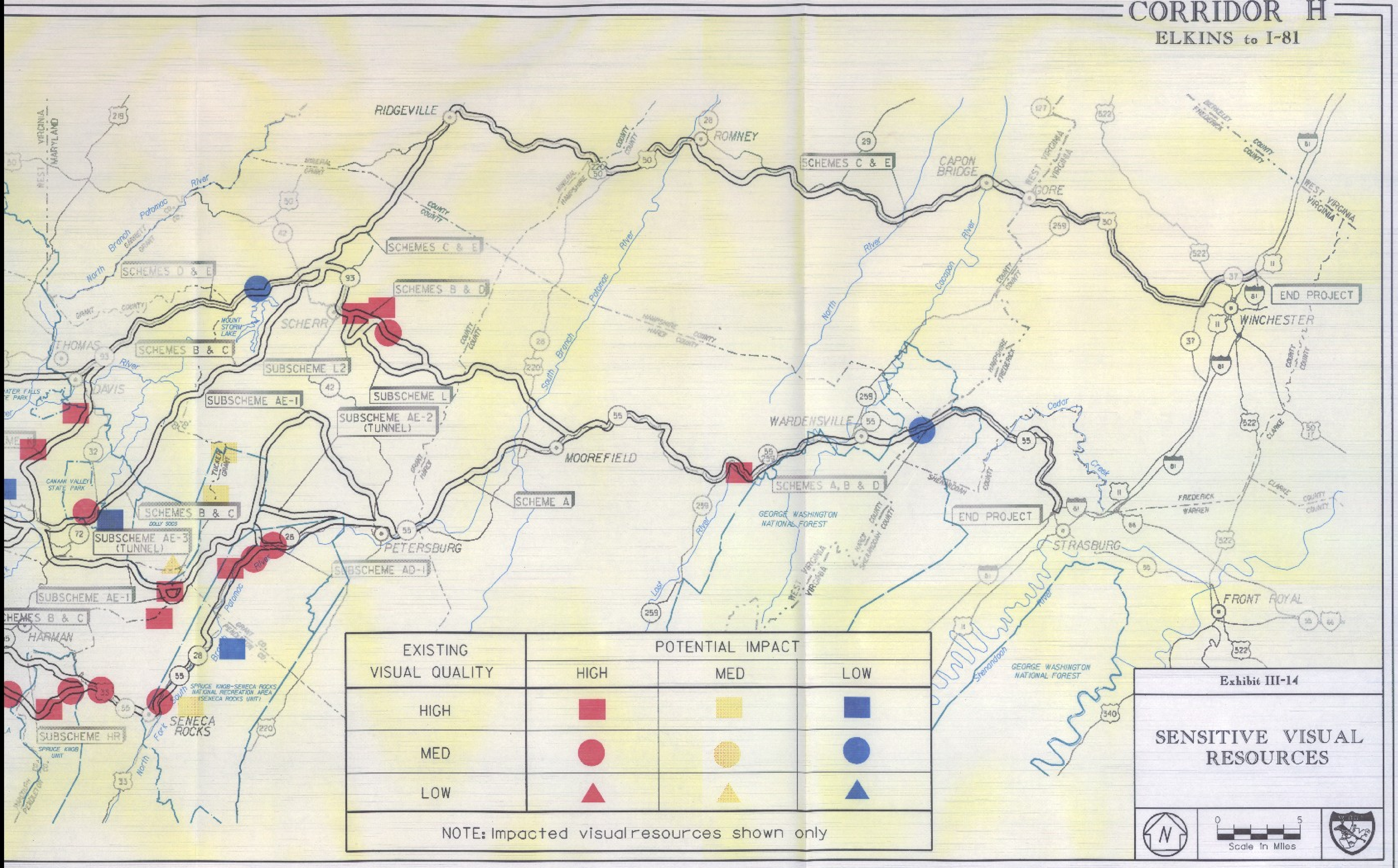
TABLE III-45 (Cont'd.)
EXISTING VISUAL CHARACTER MATRIX

	VISUAL RESOURCE	Davis Trail (FR 13)	Lindy Run Trail (FR 13)	Greenland Gap (from Bridge)	Greenland Gap (Outside)	Greenland Gap (Inside)	Big Blue Trail (SR 55)	Hanging Rock (SR 55)	Shavers Mtn. Trail (Otter Creek Wild.)	Fernow Experimental Forest	N.F.S. Branch Potomac R. (SR 55-Cabins)	.F.S. Branc Potomac R. 55-Seneca	N. Fork Mtn. Trail	Red Creek Plains
SCHEME INVOLVEMENT		K	K	B, D	B, D	B, D	A, B, D	A, B, D	AE-1	D, E	A, AD-1	A	A	AE-1
VISUAL UNIT														
LANDSCAPE UNIT	Mountains			25%	25%	25%	50%		30%	40%	10%	30%	20%	
	Steep Ridges			25%	25%	25%	50%		40%	20%	30%	10%	20%	
	Rolling Hills												20%	
	Undulating Land													
	Level Land													50%
	Rock Outcrop			25%		25%				40%	30%	20%		50%
	Plateaus													
	Valleys	100%	100%	25%	50%	25%		50%	30%		20%	30%	20%	
	Cliffs							50%			10%	10%	20%	
WATER UNIT	Rivers							25%			30%	50%		
	Streams/Creeks	10%		30%	30%	30%				2%				10%
	Lakes													
	Ponds													
	Wetlands	10%	30%											30%
	Waterfall/Rapid			5%		5%								
	Spring/Seep		10%											
VEGETATIVE UNIT	Coniferous		60%				20%			40%			20%	10%
	Deciduous		40%				80%		100%	40%			70%	
	Mixed Woods	100%		100%	100%	100%		100%			60%	70%		
	Scrubland									20%				40%
	Grassland													30%
	Agricultural										20%			
	Pasture										20%	20%	5%	
	Parks													
	Lawns				2%							10%		
MANMADE UNIT	Urban													
	Industrial				10%									
	Commercial													
	Institutional													
	Residential				5%						5%	10%	1%	
	Recreational												1%	
	Highways			5%	5%	5%	2%	5%			2%	5%	1%	
	Unpaved Road									2%				
	Railroads													
	Utility Lines											1%		
	Tower/Structure													
	Bridges/Dams			5%		5%						2%		
	Parking/Storage				1%									
	Embank/Pit/Cut				2%									
	Canal/Channel													
	Billboard/Sign													
	Strip Mine				5%									
VISUALLY SENSITIVE RESOURCE DESIGNATION	Historic													
	NRA												*	
	Recreational	*	*	*		*	*		*				*	*
	Geologic			*		*		*		Biological	*	*	*	*
	Scenic Area			*		*			*				*	*
	Nat. Landmark			*		*					*	*	*	


West Virginia
SCHEMES D & E
SUBSCHEME K
SUBSCHEME KP
SUBSCHEME AE-I
SUBSCHEME AE-3 (TUNNEL)
SUBSCHEME HR
SCHEMES B & C
SCHEMES A, B & C
SCHEME A
BEGIN PROJECT
PARSONS
MONTROSE
THOMAS
DAVIS
ELKINS
HARMAN
WYMER
BLACKWATER FALLS STATE PARK
CANAAN VALLEY STATE PARK
OTTER CREEK WILDERNESS
MONONGAHELA NATIONAL FOREST
SPRUCE KNOB UNIT
FERNOW EXPERIMENTAL FOREST
DOLLY SODS
Tygart Lake
WEST VIRGINIA
MARYLAND
PRESTON CO.
TUCKER CO.
TUCKER COUNTY
RANDOLPH COUNTY
BARBOUR COUNTY
GRANT COUNTY
North Branch Potomac River
Cheat River
Blackwater
Tygart Valley River
Shavers Fork
Laurel Fork
Glady Fork
North Fork
South Fork


CORRIDOR H
ELKINS to I-81
RIDGEVILLE
ROMNEY
CAPON BRIDGE
GORE
WINCHESTER
END PROJECT
SCHEMES C & E
SCHEMES D & E
SCHEMES B & D
SCHEMES B & C
SUBSCHEME L2
SUBSCHEME L
SUBSCHEME AE-1
SUBSCHEME AE-2 (TUNNEL)
SUBSCHEME AE-3 (TUNNEL)
SUBSCHEME AD-1
SUBSCHEME HR
SCHEME A
SCHEMES A, B & D
THOMAS
DAVIS
SCHERR
MOUNT STORM LAKE
CANAAN VALLEY STATE PARK
MOOREFIELD
PETERSBURG
WARDENSVILLE
STRASBURG
FRONT ROYAL
HARMAN
SENECA ROCKS
SPRUCE KNOB-SENECA ROCKS NATIONAL RECREATION AREA (SENECA ROCKS UNIT)
GEORGE WASHINGTON NATIONAL FOREST
North Branch Potomac River
South Branch Potomac River
Cacapon River
North River
Lost River
Cedar Creek
WEST VIRGINIA
MARYLAND
VIRGINIA
EXISTING VISUAL QUALITY
POTENTIAL IMPACT
HIGH
MED
LOW
NOTE: Impacted visual resources shown only
Exhibit III-14
SENSITIVE VISUAL RESOURCES
N
0
5
Scale in Miles

natural surroundings would be aesthetically pleasing and may even contribute to a positive visual experience. The proposed facility could open up scenic vistas along the new facility which would otherwise not be available to the motorist. However, to others, the same road or bridge could represent an unfortunate imprint of human activity upon nature and would strongly detract from their visual experience of the area.

As shown on Table III-46, visual resource users are divided into two groups: those viewing from the road (tourist, local, and through traffic) and those with a view of the road (residential, recreational, tourist, educational, commercial, and industrial). The frequency with which these resources are viewed by the viewer groups ranges from High to None. Sensitivity to the visual environment is dependent on the nature of the viewer's activity, the significance of the visual resource, and the attitudes of the viewer. The principal viewers most sensitive to changes in the visual environment would be those participating in the various outdoor recreation activities which dominate the area. The primary viewer-sensitive activities within the project area are camping, hiking, rock climbing, down hill and cross country skiing, canoeing, rafting, fishing, biking, trail riding, photography, and scenic viewing of the natural beauty of the area. As an indication of the quantity of such viewers in the study area, the Monongahela National Forest provided approximately 1.2 million visitor days of recreation in 1983; this number is expected to increase 2.4 million by the year 2030 (Monongahela National Forest *Land and Resource Management Plan*, 1984). Given the mountainous, scenic nature of the area and that it is located within a day's drive of approximately one-fifth of the nation's population, the area is becoming increasingly attractive to people seeking vacations and those leaving urban areas to find a simpler lifestyle (Monongahela National Forest *Land and Resource Management Plan*, 1984).

3. POTENTIAL VISUAL INVOLVEMENTS

The assessment of potential visual involvements is based on two factors: evaluating the visual components of the facility itself and how the facility relates to the surrounding environment; and evaluating the potential involvement the facility could have on the sensitive viewers of the resource. As noted above, this involvement could range from no visual intrusion to a high visual intrusion. Table III-46 presents the viewer's visual proximity to the proposed facility in order to determine whether or not a visual intrusion would occur. The proposed facility could be in the foreground, midground, or background, and at-grade, above-grade, or below-grade from the viewer. Depending on topography, vegetation, and season, the proposed facility may or may not be visible.

Table III-47 identifies the overall visual variety of the existing foreground, middle ground, and background. Visual quality is based on the following categories.

TABLE III-46
PRINCIPAL VIEWERS AND THEIR POTENTIAL PROXIMITY TO THE PROJECT

	VISUAL RESOURCE ☞	Onego H.D. (SR 55)	Alpena Gap (US 33)	Dolly Sods Picnic Area	S. Prong Trail (D. Sods)	Bear Rocks (D. Sods)	Scenic Overlook (D. Sods)	Seneca Rx Visitor Center	Seneca Rx Scenic Overlook	North Fork Gap (SR 55)	Champe Rocks	Echo Park (SR 55)	Seneca Parking (CR 33/3)	Whites Run (CR 33/3)	Stinking Run (CR 33/3)	Laurel Fork (US 33)	Glady Fork (US 33)	Glady Fork (CR 12)	Mozark Mountain (SR 72)	Canaan Mountain (SR 72)
	SCHEME	A	A, B, C	AE-1	AE-1, AE3	AE-1	A, AE-1	A	A	A, AD-1	A	A	A	A	A	A	A, B, C	AE-1, B, C	K	K
VIEWER TYPE & VOLUME																				
VIEW OF ROAD	Residental	Med.	None	None	None	None	None	None	None	High	None	None	None	None	Low	Low	Low	None	Low	Low
	Recreational	Low	Med	Med-Low	Med-Low	High	High	High	High	Med	High	High	High	High	Low	Low	Med	High	Low	Low
	Tourist	Low	Med	Med-Low	Med-Low	High	High	High	High	Med	None	Med	Low	Med	Low	None	None	Low	Low	Low
	Educational	None	None	None	None	None	None	Med	Med	None	None	None	None	None	None	None	None	None	None	None
	Commercial	Low	None	None	None	None	None	None	None	None	None	None	None	None	Low	None	None	None	None	None
	Industrial	None	None	None	None	None	None	None	None	None	None	None	None	None	Low	None	None	None	None	None
VIEW FROM ROAD	Tourist Traffic	Med.	None	None	None	None	None	High	High	High	High	High	High	High	High	High	High	None	Med	Med
	Local Traffic	Med.	None	None	None	None	None	High	High	High	High	High	High	High	High	High	High	None	Med	Med
	Through Traffic	Med.	None	None	None	None	None	High	High	High	High	High	High	High	High	High	High	None	Med	Med
	Scheme Option																			
VIEWER'S VISUAL PROXIMITY	A1	FA V 300'	FG V 0'				BB V 22000'	FA V 1000'	MB V 3000'	FG V 0'	FB V 7500'	FG V 200'	FG V 0'	FA V 100'	FA V 0'	FG V 0'	FG V 0'	N		
	A2		FG V 0'	BB V 5500'	FG V 0'	BB N 13000'	MB V 3000'													
	A3		FG V 0'	BB V 5500'	FG V 0'		MB V 3000'													
	A4		FG V 0'	BB V 5500'	FG V 0'		MB V 3000'			FG V 0'										
	A5		FG V 0'		FG V 0'		MB V 3000'													
	A6		FG V 0'		FG V 0'		MB V 3000'													
	A7		FG V 0'				MB V 3000'			FG V 0'										
	A8	FA V 300'	FG V 0'				BB V 22000'	FA V 1000'	MB V 3000'	FG V 0'	FB V 7500'	FG V 200'				FG V 0'	FG V 0'			
	B1		FG V 0'														FG V 0'	N		
	B2		FG V 0'														FG V 0'			
	B3		FG V 0'														FG V 0'			
	B4		FG V 0'														FG V 0'		BA V 7000'	N
	B5		FG V 0'														FG V 0'		BA V 7000'	N
	B6		FG V 0'														FG V 0'		BA V 7000'	N
	C1		FG V 0'														FG V 0'	N		
	C2		FG V 0'														FG V 0'		BA V 7000'	N
	D1																			
	D2																			
	D3																			
	D4																			
	D5																			
	D6																			
	E1																			
	E2																			

LEGEND

VIEW OF ROADWAY	VISUAL PROXIMITY OF ROADWAY		
	Foreground	Midground	Background
At Grade	FG	MG	BG
Above Grade	FA	MA	BA
Below Grade	FB	MB	BB

Where: V = Roadway Would be Visible
N = Roadway Would Not Be Visible
0' = Distance (ft.) of Viewer to Roadway

* Table III-46 continues on the next page

TABLE III-46 (Cont'd.)
PRINCIPAL VIEWERS AND THEIR POTENTIAL PROXIMITY TO THE PROJECT

	VISUAL RESOURCE ☞	Canaan Valley S.P. (Entrance)	Canaan Valley S.P. (Chair Lift)	Canaan Valley (Cabin Mtn)	Mount Storm Lake	Davis Trail (FR 13)	Lindy Run Trail (FR 13)	Greenland Gap (from Bridge)	Greenland Gap (Outside)	Big Blue Trail (SR 55)	Hanging Rock (SR 55)	Shavers Mtn. Trail (Otter Creek Wild.)	Fernow Experimental Forest	N.F.S. Branch Potomac R. (SR 55-Cabins)	N.F.S. Branch Potomac R. R 55-Seneca R	North Fork Mountain Trail	Red Creek Plains
	SCHEME	B, C	B, C	B, C	D, E	K	K	B, D	B, D	A, B, D	A, B, D	AE-1	D, E	A, AD-1	A	A	AE-1
VIEWER TYPE & VOLUME																	
VIEW OF ROAD	Residental	Low	None	None	None	None	None	None	Med	None	Med	None	None	Med	High	None	None
	Recreational	High	High	Med	Med	High	High	High	High	High	Med	Med	Med	Med	Med	High	High
	Tourist	High	High	Low	None	Low	Low	High	High	None	Med	None	Low	Med	Med	None	Low
	Educational	Low	None	None	None	None	None	Low	Low	None	Low	None	Med	None	None	None	Low
	Commercial	None	None	None	None	None	None	None	Low	None	Low	None	None	None	None	None	None
	Industrial	None	None	Low	High	None	None	None	Med	None	Low	None	None	None	None	None	Med
VIEW FROM ROAD	Tourist Traffic	High	None	High	High	High	High	High	High	High	High	None	High	High	High	High	Low
	Local Traffic	High	None	High	High	High	High	High	High	High	High	None	High	High	High	High	Low
	Through Traffic	High	None	High	High	High	High	High	High	High	High	None	High	High	High	High	Low
VIEWER'S VISUAL PROXIMITY	**Scheme Option**																
	A1									FG V 0'	FG V 0'			FG V 0'	MA N 5000'	BB N 6800'	
	A2									FG V 0'	FG V 0'	BB N 2000'					FG V 0'
	A3									FG V 0'	FG V 0'	BB N 2000'					FG V 0'
	A4									FG V 0'	FG V 0'	BB N 2000'		FG V 0'			FG V 0'
	A5									FG V 0'	FG V 0'	BB N 2000'					
	A6									FG V 0'	FG V 0'	BB N 2000'					
	A7									FG V 0'	FG V 0'	BB N 2000'		FG V 0'			
	A8									FG V 0'	FG V 0'			FG V 0'	MA N 5000'	BB N 6800'	
	B1	FG V 0'	MB V 2000'	B N				FG V 0'	FG V 0'	FG V 0'	FG V 0'						
	B2	FG V 0'	MB V 2000'	B N					MA V 2000'	FG V 0'	FG V 0'						
	B3	FG V 0'	MB V 2000'	B N						FG V 0'	FG V 0'						
	B4			B N	FG V 0'	FG V 0'	FG V 0'	FG V 0'	FG V 0'	FG V 0'	FG V 0'						
	B5				FG V 0'	FG V 0'	FG V 0'		MA V 2000'	FG V 0'	FG V 0'						
	B6				FG V 0'	FG V 0'	FG V 0'			FG V 0'	FG V 0'						
	C1	FG V 0'	MB V 2000'	B N													
	C2				FG V 0'	FG V 0'	FG V 0'										
	D1				FG V 0'			FG V 0'	FG V 0'	FG V 0'	FG V 0'		BB V 2200'				
	D2				FG V 0'				MA V 2000'	FG V 0'	FG V 0'		BB V 2200'				
	D3				FG V 0'					FG V 0'	FG V 0'		BB V 2200'				
	D4				FG V 0'				MA V 2000'	FG V 0'	FG V 0'		BB V 2200'				
	D5				FG V 0'					FG V 0'	FG V 0'		BB V 2200'				
	D6				FG V 0'			FG V 0'		FG V 0'	FG V 0'		BB V 2200'				
	E1				FG V 0'								BB V 2200'				
	E2				FG V 0'								BB V 2200'				

LEGEND

VIEW OF ROADWAY	VISUAL PROXIMITY OF ROADWAY		
	Foreground	Midground	Background
At Grade	FG	MG	BG
Above Grade	FA	MA	BA
Below Grade	FB	MB	BB

Where: V = Roadway Would be Visible
N = Roadway Would Not Be Visible
0' = Distance (ft.) of Viewer to Roadway

TABLE III-47
EXISTING VISUAL QUALITY AND POTENTIAL RESOURCE INVOLVEMENT

	VISUAL RESOURCE	Onego H.D. (SR 55)	Alpena Gap (US 33)	Dolly Sods Picnic Area	S. Prong Trail (Flatrock Plains)	Bear Rocks (D. Sods)	Scenic Overlook (D. Sods)	Seneca Rx Visitor Center	Seneca Rx Scenic Overlook	North Fork Gap (SR 55)	Champe Rx (From N. Fork Mtn. Trail)	Echo Park (SR 55)	Seneca Parking (CR 33/3)	Whites Run (CR 33/3)	Stinking Run (CR 33/3)	Laurel Fork (US 33)	Glady Fork (US 33)	Glady Fork (CR 12)	Mozark Mountain (SR 72)
SCHEME INVOLVEMENT		A	A,B,C	AE-1	AE-1, AE-3	AE-1	A, AE-1	A	A	A, AD-1	A	A	A	A	A	A	A, B, C	AE-1, B,C	K
TYPE AND VOLUME OF VIEWERS																			
VIEW OF ROAD	Residental	Med.	None	None	None	None	None	None	None	High	None	None	None	None	Low	Low	Low	None	Low
	Recreational	Low	Med	Med-Low	Med-Low	High	High	High	High	Med	High	High	High	High	Low	Low	Med	High	Low
	Tourist	Low	Med	Med-Low	Med-Low	High	High	High	High	Med	None	Med	Low	Med	Low	None	None	Low	Low
	Educational	None	None	None	None	None	None	Med	Med	None	None	None	None	None	None	None	None	None	None
	Commercial	Low	None	None	None	None	None	None	None	None	None	None	None	None	Low	None	None	None	None
	Industrial	None	None	None	None	None	None	None	None	None	None	None	None	None	Low	None	None	None	None
VIEW FROM ROAD	Tourist Traffic	Med.	None	None	None	None	None	High	High	High	High	High	High	High	High	High	High	None	Med
	Local Traffic	Med.	None	None	None	None	None	High	High	High	High	High	High	High	High	High	High	None	Med
	Through Traffic	Med.	None	None	None	None	None	High	High	High	High	High	High	High	High	High	High	None	Med
VISUAL QUALITY RANKING*																			
HIGH	*Foreground*				Distinctive	Distinctive	Distinctive		Distinctive	Common	Distinctive			Distinctive		Distinctive		Distinctive	Common
	Middle Ground				Distinctive	Distinctive	Distinctive		Distinctive	Distinctive	Distinctive			Distinctive		Common		Distinctive	Common
	Background				Distinctive	Distinctive	Distinctive		Distinctive	Common	Distinctive			Common		Common		Distinctive	Distinctive
MEDIUM	*Foreground*	Distinctive	Minimal	Common				Common				Common	Minimal		Minimal		Distinctive		
	Middle Ground	Common	Common	Common				Common				Common	Common		Common		Common		
	Background	Common	Common	Common				Distinctive				Common	Common		Distinctive		Common		
LOW	*Foreground*																		
	Middle Ground																		
	Background																		
EXISTING VISUAL QUALITY		**Med**	**Med**	**Med**	**High**	**High**	**High**	**Med**	**High**	**High**	**High**	**Med**	**Med**	**High**	**Med**	**High**	**Med**	**High**	**High**
POTENTIAL INVOLVEMENT		**High**	**Med**	**Low**	**High**	**Med**	**Med**	**High**	**Med**	**Med**	**Low**	**High**	**High**	**High**	**High**	**Med**	**High**	**None**	**Low**

*** Distinctive, Common, or Minimal Visual Variety**

Where: **Distinctive** = Unique or outstanding visual resource which most clearly or dramatically exhibits the natural processes characteristic of the geographic region.

Common = Visual resource characteristically typical within the geographic region.

Minimal = Visual resource with low visual diversity, often times not visually pleasing due to intrusions such as trash and manmade alterations to the resource (e.g. strip mines & gravel pits).

* Table III-47 continues on the following page

TABLE III-47 (Cont'd.)
EXISTING VISUAL QUALITY AND POTENTIAL RESOURCE INVOLVEMENT

	VISUAL RESOURCE	Canaan Mountain (SR 72)	Canaan Valley S.P. (Entrance)	Canaan Valley S.P. (Chair Lift)	Canaan Valley (Cabin Mtn)	Mount Storm Lake	Davis Trail (FR 13)	Lindy Run Trail (FR 13)	Greenland Gap (from Bridge)	Hanging Rock (SR 55)	Shavers Mtn. Trail (Otter Creek Wild.)	Fernow Experimental Forest	N.F.S. Branch Potomac R. (SR 55-Cabins)	N.F.S. Branch Potomac R. (SR 55-Seneca Rx)	North Fork Mountain Trail	Red Creek Plains
SCHEME INVOLVEMENT		K	B, C	B, C	B, C	D, E	K	K	B, D	A, B, D	AE-1	D, E	A	A	A	AE-1
TYPE AND VOLUME OF VIEWERS																
VIEW OF ROAD	Residential	Low	Low	None	None	None	None	None	None	Med	None	None	Med	High	None	None
	Recreational	Low	High	High	Med	Med	High	High	High	Med	Med	Med	Med	Med	High	High
	Tourist	Low	High	High	Low	None	Low	Low	High	Med	None	Low	Med	Med	None	Low
	Educational	None	Low	None	None	None	None	None	Low	Low	None	Med	None	None	None	Low
	Commercial	None	None	None	None	None	None	None	None	Low	None	None	None	None	None	None
	Industrial	None	None	None	Low	High	None	None	None	Low	None	None	None	None	None	Med
VIEW FROM ROAD	Tourist Traffic	Med	High	None	High	High	High	High	High	High	None	High	High	High	High	Low
	Local Traffic	Med	High	None	High	High	High	High	High	High	None	High	High	High	High	Low
	Through Traffic	Med	High	None	High	High	High	High	High	High	None	High	High	High	High	Low
VISUAL QUALITY RANKING*																
HIGH	*Foreground*	Common		Common	Common		Distinctive	Distinctive	Distinctive	Distinctive	Distinctive	Distinctive	Distinctive	Common	Distinctive	Distinctive
	Middle Ground	Common		Common	Distinctive		Distinctive	Distinctive	Distinctive	Distinctive	Distinctive	Distinctive	Distinctive	Distinctive	Distinctive	Distinctive
	Background	Distinctive		Distinctive	Distinctive		Distinctive	Distinctive	Distinctive	Common	Distinctive	Common	Distinctive	Common	Distinctive	Distinctive
MEDIUM	*Foreground*		Common			Minimal										
	Middle Ground		Common			Common										
	Background		Common			Distinctive										
LOW	*Foreground*															
	Middle Ground															
	Background															
EXISTING VISUAL QUALITY		**High**	**Med**	**High**	**High**	**Med**	**High**	**High**	**High**	**High**	**High**	**High**	**High**	**High**	**High**	**High**
POTENTIAL INVOLVEMENT		**None**	**High**	**Low**	**None**	**Low**	**High**	**High**	**High**	**High**	**None**	**Med**	**High**	**None**	**None**	**High**

*** Distinctive, Common, or Minimal Visual Variety**

Where:

Distinctive = Unique or outstanding visual resource which most clearly or dramatically exhibits the natural processes characteristic of the geographic region.

Common = Visual resource characteristically typical within the geographic region.

Minimal = Visual resource with low visual diversity, often times not visually pleasing due to intrusions such as trash and manmade alterations to the resource (e.g. strip mines & gravel pits).

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- ***Distinctive:*** Unique or outstanding visual resource which most clearly or dramatically exhibits the natural processes and features characteristic of the geographic region.

- ***Common:*** Visual resource characteristically typical within the region.

- ***Minimal:*** Visual resource with low visual diversity, often times not visually pleasing due to intrusions such as trash and manmade alterations to the resource (e.g., strip mines and gravel pits).

To determine the visual context of each site, the quality of the viewshed was evaluated based on the presence of distinctive, common, or minimal visual variety within the foreground, middle ground, and background.

a. Visual Components of Corridor H

While at this corridor-level stage, it is not appropriate to determine the exact visual characteristics of the proposed facility, it is possible to identify how various roadway characteristics would affect the visual environment. The following is a general description of how differences in design and landscape techniques could alter the appearance of the proposed facility.

As noted in FHWA's *Visual Impact Assessment for Highway Projects*, "The most immediately obvious visual component of a highway project is the facility itself. The exact cross-section, plan, and profile proposed for a specific road are far more important to its visual effects than the generalized characteristics of its functional class. Roadway variables with clear visual implications include the number of travel lanes and their width, as well as pavement material and color. Shoulders can also be visually important; for example, paved shoulders enlarge the roadway's apparent scale, whereas grass shoulders minimize it. Design speed and gradient standards also help determine the roadway's visual effects on its environment. The relationship of opposing travel lanes is also visually significant; an undivided four-lane highway looks very different from a divided highway with an independent alignment for each travel direction."

FHWA's manual further states that, "The visual characteristics of the roadside (all lands within the right-of-way that are not part of the roadway) are determined by the landcover and landform modifications employed to fit the roadway into the right-of-way (eg: clearing, earthwork, slope retention, drainage, and roadside planting). The appearance of the roadside helps to determine the visual scale and dominance of the highway. A wider right-of-way may actually reduce the visual scale of the highway by reducing apparent roadside width. For example, it may allow flatter side slopes which blend back into the surrounding landscape and are not perceived as roadside. It may also allow a natural-appearing median between independently aligned roadways, substituting the appearance of two smaller highways for one large highway."

When a preferred corridor is selected and alignment design is initiated, a detailed visual assessment of the proposed facility would be undertaken. This assessment would evaluate the visual effects of the various design elements in relation to the surrounding landscape and vegetation.

b. <u>Potential Viewshed Involvements</u>

Exhibit III-14 graphically presents the results on Table III-48, including the location of the various sites evaluated, as well as the potential visual involvement with the resource. Potential visual involvement with the existing viewshed could range from high to moderate, low, and none. Scheme Option involvements with sensitive visual resources are summarized below.

- As presented on Table III-48, existing visual quality is considered to be high at 24 of the 36 sites evaluated and medium or moderate at 12 sites.

- The majority of those sites identified as sensitive are located within the vicinity of Scheme Options A and B (Table III-45).

- Scheme A and its various Scheme Options would have the greatest potential for altering the existing viewshed of visually sensitive resources (Table III-48). The proposed facility would have a high to moderate visual involvement with over half of the sites within the viewshed of Scheme A Options.

- Many of the Monongahela National Forest's designated scenic resources are located within visual proximity of the proposed corridors of Scheme A. Scheme A Options would come within visual proximity of Otter Creek Wilderness and Dolly Sods Wilderness. Some of the current views from the limits of the wilderness areas contain some distant visual intrusions related to existing land use and roadway facilities. Scheme Options A2 through A7 would add an extra visual intrusion into the viewshed. This visual involvement would not exist everywhere in the wilderness areas and, when it would occur, would vary depending on the location of the viewer within the wilderness areas. However, because of the sensitivity of the viewer, the nature of the viewer's activity, and the undeveloped nature of the area around Otter Creek and Dolly Sods, these Scheme Options would have a high negative visual involvement. In addition, intrusions of the proposed facility into the existing viewshed would likely adversely affect the views at sites such as Onego, Seneca Rocks Visitor Center, Whites Run, Stinking Run, Glady Fork, the South Branch of the

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TABLE III-48
POTENTIAL VISUAL INVOLVEMENT BY SCHEME OPTION

VISUAL RESOURCE NAME	EXISTING VISUAL QUALITY	POTENTIAL INVOLVEMENT: High (H), Medium (M), Low (L), or None (N)																							
		A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	C1	C2	D1	D2	D3	D4	D5	D6	E1	E2
Onego Historic District	Medium	H							H																
Alpena Gap	Medium	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M								
Dolly Sods Picnic Area	Medium		L	L	L	L	L	L																	
South Prong Trail - Flatrock Plains	High		H	H	H	H	H	H																	
Bear Rocks - Dolly Sods	High		M																						
Scenic Overlook - Dolly Sods	High	M	M	M	M	M	M	M	M																
Seneca Rocks - Visitor Center	Medium	H							H																
Seneca Rocks - Scenic Overlook	High	M							M																
North Fork Gap	High	M			M			M	M																
Champe Rocks	High	L							L																
Echo Park	Medium	H							H																
Seneca Parking	Medium	H																							
Whites Run	High	H																							
Stinking Run	Medium	H																							
Laurel Fork	High	M							M																
Glady Fork - US 33	Medium	H							H	H	H	H	H	H	H	H	H								
Glady Fork - CR 12	High		N	N	N	N	N	N		N	N	N	N	N	N	N	N								
Mozark Mountain	High												L	L	L		L								
Canaan Mountain	High												N	N	N		N								
Canaan Valley State Park - Entrance	Medium									H	H	H				H									
Canaan Valley State Park - Chair Lift	High									L	L	L				L									
Canaan Valley	High									N	N	N				N									
Mount Storm Lake	Medium												L	L	L		L	L	L	L	L	L	L	L	L
Davis Trail	High												H	H	H		H								
Lindy Run Trail	High												H	H	H		H								
Greenland Gap - from Bridge	High									H		H	H					H					H		
Greenland Gap - from Outside	Medium									H	H		H					H	H	H			H		
Greenland Gap - from Inside	High									H	H		H					H	H	H			H		
Big Blue Trail - SR 55	Medium	L	L	L	L	L	L	L	L	L	L	L	L	L	L			L	L	L	L	L	L		
Hanging Rock - SR 55	High	L	L	L	L	L	L	L	L	L	L	L	L	L	L			L	L	L	L	L	L		
Shavers Mountain Trail - Otter Creek	High		N	N	N	N	N	N																	
Fernow Experimental Forest	High																	M	M	M	M	M	M	M	M
S. Branch Potomac River - Cabins	High	H							H																
S. Branch Potomac River - Seneca Rocks	High	N							N																
North Fork Mountain Trail	High	N							N																
Red Creek Plains	High		H	H	H	H	H	H																	
TOTAL SITES AFFECTED*		**16**	**8**	**7**	**7**	**7**	**7**	**8**	**13**	**9**	**8**	**7**	**11**	**8**	**8**	**4**	**6**	**7**	**6**	**6**	**4**	**4**	**7**	**2**	**2**

* Does not include those resources determined not affected.

Potomac River in the vicinity of Cabins, South Prong Trail on Flatrock Plains, Red Creek Plains, and the scenic overlook at Dolly Sods.

- Options under Scheme B would not involve as large a number of such sites (8 to 11 sites) but would also have a high to moderate visual involvement with over half of the sensitive visual resources in the proximity of its corridors. Intrusions of the proposed facility into the existing viewshed would likely adversely affect the views at sites such as Glady Fork, the entrance to Canaan Valley State Park, Canaan Valley, Davis Trail, Lindy Run Trail, and Greenland Gap.

- Scheme Options C1 and C2, D2 through D6, E1, and E2 would have the least potential for altering the existing visual quality of the area.

- The No-Build Alternative would not involve the existing visual quality of the area.

4. POTENTIAL MITIGATION MEASURES

The quality of the view from the road and of the road are important considerations for this project because the highway would serve as one of the principal means of entry into West Virginia and because it would serve as the gateway to the area's vast forested and rural and natural scenic beauty. As such, an objective of the design of Corridor H would be to construct a facility which would be visually compatible with the mountainous, natural environment.

A means of visual mitigation would be to design the highway as a modified parkway by providing a generous right-of-way, wide medians with island plantings, rounded slopes, and heavy plantings between the highway and frontage roads. This design concept could result in additional right-of-way acquisition costs and displacements. However, it would be visually effective and, in the long-run, would improve the scenic quality of the viewshed from the roadway and of the roadway by returning the landscape to a more natural looking state; it would improve the chances for faster and more successful revegetation of the right-of-way; and it would reduce the chances for slope stability and erosion problems. Strategic gaps in plantings could also be used to frame scenic views or roadside plantings could be used to help hide views of unattractive features such as power lines (FHWA, 1990).

By laying the roadside cuts back and planting them densely with indigenous vegetation, the visual quality of the area could also be enhanced. This would eliminate the barren, unnatural appearance of the roadside and would provide a much more appropriate entrance into the State.

When a preferred corridor is selected and preliminary design is initiated, extensive inventories of the physical, ecological, socio-economic, and visual aspects of the selected corridor would be taken into consideration to accomplish this objective. These inventories would then form the basis to develop alternative highway alignments within the preferred corridor. As the alternative alignments within the preferred corridor evolve, special designs could be incorporated based on specific information developed from the inventories.

U. RECREATION RESOURCES

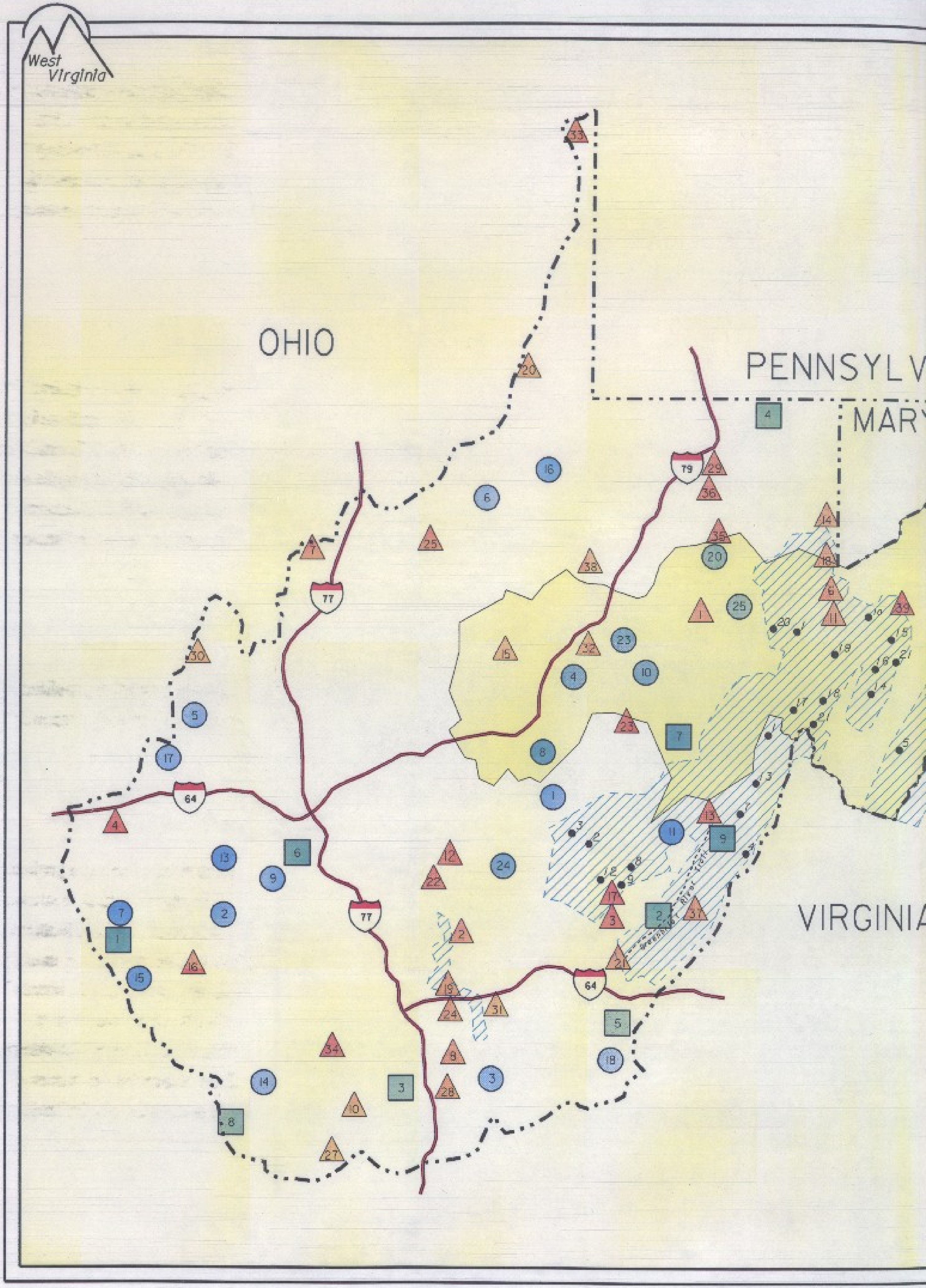
A large, outdoor recreation tourism industry has emerged in the study region. Growth within this industry has increasingly influenced the region's economic character and vitality. In 1990, tourism in West Virginia contributed nearly $2.5 billion to the State's economy (West Virginia University). It is anticipated that as the recreational facilities and resources of the study area continue to develop, and as people outside the study area grow in their awareness of the region's resources and attractions, the beneficial economic impacts of tourism on the area's economy will increase. Recreation resources and tourism are discussed in detail in the *Transportation Needs Study*, available from WVDOT.

1. METHODOLOGY

Recreation resources within the study area were inventoried based on information provided by the West Virginia Department of Commerce, Labor & Environmental Resources, the Virginia Department of Conservation and Recreation, and the U.S. Forest Service.

2. AFFECTED ENVIRONMENT

Several of West Virginia's most unique recreational attractions are located within the project study area. The study area contains state-maintained parks, public hunting and fishing areas, and recreational areas; two National Forests, two Congressionally-designated Wilderness areas, and several National Natural Landmarks. Within the study area, recreation activities range from backpacking, berry picking, camping, canoeing, caving, chairlift rides, commercial caverns, driving for pleasure, fishing, golf, guided nature hikes, horseback riding, hunting, ice skating, nature study, miniature golf, mountain biking, photography, picnicking, rock climbing, cross-country and down hill skiing, sledding, swimming, tennis whitewater rafting, trapping, and windsurfing. Exhibit III-15 identifies the location of the various recreation resources within and around the study area. The major recreation attractions within the study area are described below.



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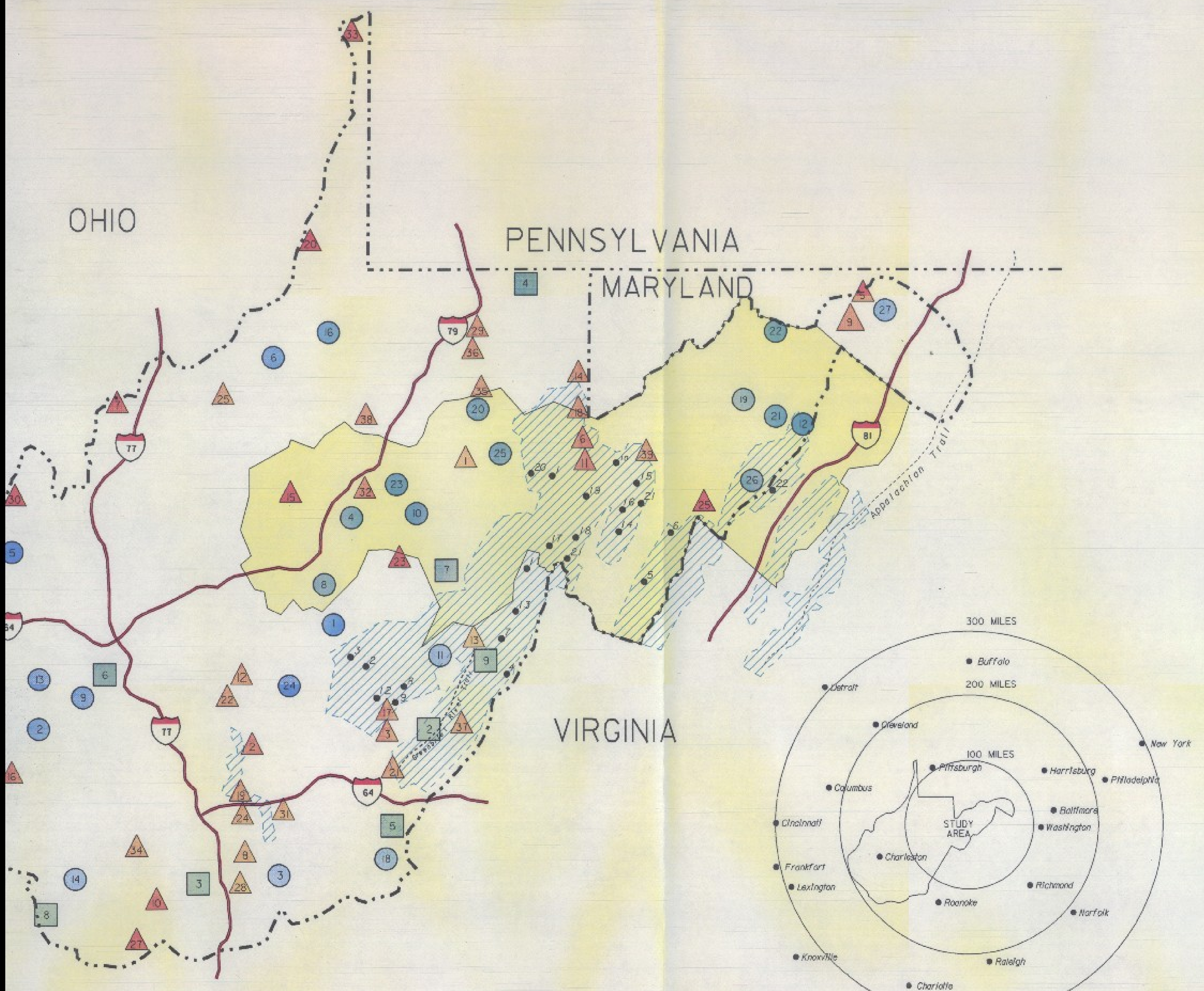
CORRIDOR H
ELKINS to I-81



	STATE PARK
1	AUDRA
2	BABCOCK
3	BEARTOWN
4	BEECH FORK
5	BERKELEY SPRINGS
6	BLACKWATER FALLS
7	BLENNERHASSETT ISLAND
8	BLUESTONE
9	CACAPON
10	CAMP CREEK
11	CANAAN VALLEY
12	CARNIFEX FERRY BATTLEFIELD
13	CASS SCENIC R.R.
14	CATHEDRAL
15	CEDAR CREEK
16	CHIEF LOGAN
17	DROOP MOUNTAIN BATTLEFIELD
18	FAIRFAX STONE
19	GRANDVIEW
20	GRAVE CREEK MOUND
21	GREENBRIER RIVER TRAIL
22	HAWKS NEST
23	HOLLY RIVER
24	LITTLE BEAVER
25	LOST RIVER
26	NORTH BEND
27	PINNACLE ROCK
28	PIPESTEM
29	PRICKETTS FORT
30	PT. PLEASANT MONUMENT
31	SANDSTONE FALLS
32	STONEWALL JACKSON
33	TOMLINSON RUN
34	TWIN FALLS
35	TYGART LAKE
36	VALLEY FALLS
37	WATOGA
38	WATTERS SMITH MEMORIAL
39	WELTON

	STATE FOREST
1	CABWAYLINGO
2	CALVIN W. PRICE
3	CAMP CREEK
4	COOPERS ROCK
5	GREENBRIER
6	KANAWHA
7	KUMBRABOW
8	PANTHER
9	SENECA

	PUBLIC HUNTING / FISHING AREA
1	BIG DITCH
2	BIG UGLY
3	BLUESTONE
4	BURNSVILLE LAKE
5	CHIEF CORNSTALK
6	CONAWAY LAKE
7	EAST LYNN LAKE
8	ELK RIVER
9	FORK CREEK
10	FRENCH CREEK
11	HANDLEY
12	HAWK
13	HILBERT
14	HORSE CREEK LAKE
15	LAUREL CREEK
16	LEWIS WETZEL
17	MILL CREEK
18	MONOCOVE
19	NATHANIEL MT.
20	PLEASANT CREEK
21	SHORT MT.
22	SPRINGFIELD
23	STONECOAT LAKE
24	SUMMERSVILLE LAKE
25	TETER CREEK
26	WOLF GAP
27	SLEEPY CREEK

•	NATIONAL FOREST RECREATION AREA
1	ALPENA GAP
2	BIG BEND
3	BIG ROCK
4	BIRD RUN
5	BRANDYWINE
6	CAMP RUN
7	CASS SCENIC R.R.
8	CRANBERRY GLADES
9	CRANBERRY VISITOR CENTER and PEARL BUCK MUSEUM
10	DOLLY SODS
11	GAUDINEER KNOB
12	HILLS CREEK FALLS
13	NATIONAL RADIO ASTRONOMY OBSERVATORY
14	SENECA CAVERNS
15	SENECA ROCKS UNIT
16	SENECA ROCKS
17	SINKS of GANDY
18	SPRUCE KNOB
19	SPRUCE KNOB UNIT
20	STUART PARK
21	WOODBINE
22	WOLF GAP

NATIONAL FOREST

W.V. RECREATION PLANNING AREAS VII/VIII

Exhibit III-15

SELECTED RECREATIONAL ATTRACTIONS within WEST VIRGINIA and NORTHWESTERN VIRGINIA

N

0 16

Scale in Miles

- Two of West Virginia's largest state-owned parks are located within the study area: Blackwater Falls State Park and Canaan Valley Resort, both of which are popular year-round tourist attractions. In addition, the Monongahela National Forest provides year-round recreation activities, making recreation/tourism a major industry in the study area.

- ***Blackwater Falls State Park:*** Located on 1,688 acres and provides a variety of amenities including a 55-room lodge, 25 cabins, a 65-site tent and trailer campground, and 60 picnic sites. The park also provides 12 miles of maintained hiking and cross-country skiing trails, a Nordic learning center, a four-season nature/recreation program, and the waterfalls of the Blackwater River with its panoramic views from several vantage points within the park.

- ***Canaan Valley State Park***: One of the most developed and diverse parks in West Virginia's state park system. Located on 6,015 acres, it includes a 250-room lodge, 15 vacation cottages, 34 campsites, a nature center, tennis courts, swimming pools, an 18-hole championship golf course, 3 miles of down-hill ski runs, 13 miles of maintained hiking and cross-country skiing trails, and several large natural areas.. Ski facilities include modern chair lifts, snow-making equipment, and rental alpine and cross-country ski equipment. Numerous resort developments and support businesses (e.g.: real estate, second home developers, lodging establishments, restaurants, and outdoor outfitters) have become established in the Canaan Valley area as a result of these recreational opportunities.

- ***Commercial Ski Centers:*** Aside from the skiing opportunities available at the two state parks, skiing opportunities are available in the Canaan Valley area include Timberline Four Seasons Resort, White Grass Ski Touring Center, Blackwater Outdoors Center.

- ***Monongahela National Forest (MNF):*** This is the largest recreation resource in the study area. The MNF encompasses over 273,000 acres. As noted in the West Virginia Highlands Conservancy's *Monongahela National Forest Hiking Guide,* resources within the MNF include 23 developed campgrounds; 16 picnic sites; 4 swimming sites; 5 impoundments for fishing and boating; 570 miles of hiking trails; 100 miles of all purpose trails for horse, pedestrian, and 2 or 3 wheel vehicle traffic; 570 miles of forest roads offering outstanding scenery; 700 miles of fishing streams; 5 Congressionally designated Wilderness Areas totaling 122 square miles; Spruce Knob/Seneca Rocks National Recreation Area; and several National Natural Landmarks.

- ***Spruce Knob/Seneca Rocks National Recreation Area (NRA):*** This was created by Congress in 1965. Facilities include a major visitor center and picnic grounds, scenic overlook tower, and campground. While the visitor center was destroyed by fire in 1992, funds have been appropriated for its reconstruction. Within the Seneca Rocks Unit of the NRA is Seneca Rocks, a 900 vertical-foot formation of Tuscarora sandstone. It is known for its scenic beauty and as the best vertical climb in the eastern United States.

- ***Public Hunting and/or Fishing Areas:*** Within the study area are four such areas, including Nathaniel Mountain, Short Mountain, Hawk, and Wolf Gap. With the operation of five fish hatcheries in the region, many of the streams in the area are stocked and maintained with a variety of game fish.

- ***George Washington National Forest (GWNF):*** In Virginia, Frederick and Shenandoah Counties contain a variety of passive and active recreation opportunities. The most prominent recreational feature of this region is the George Washington National Forest . Among the activities available in the GWNF are picnicking, camping, sightseeing, hiking, hunting, swimming, fishing, and boating. While outside the limits of the study area, major attractions within the GWNF are in close proximity, including the Bryce Mountain and Mount Run Ski Areas and Wolf Gap Recreation Area. Several Civil War monuments and sites including the New Market Battlefield Park are noted attractions in the region.

3. POTENTIAL RECREATION RESOURCE INVOLVEMENTS

While none of the above developed recreation facilities are located within the 2,000 foot-wide corridor Scheme Options, improved access to the various resources would have an effect on the area's recreational resources. The determination of adverse or beneficial effects resulting from access improvements to developed and undeveloped recreation resources varies depending upon the views of the recreation user and the recreation provider. One point of view would be that improved access would result in a reduction of recreational enjoyment as resource visitation increases in volume and frequency. This would likely be the case for those individuals who come to the area seeking a more remote and primitive recreation experience. However, to others, improved access would be positive, providing recreation opportunities that they might otherwise not have visited. To the recreation provider, improved access might place user demands on resources which the provider may be unable to meet. On the other hand, increased visitation could provide an opportunity for growth and development of natural and developed recreation resources within the area. The potential access improvements to recreation resources are identified below.

- No Scheme Option would directly involve Congressionally-designated Wilderness Areas.

- Options under Scheme A would provide direct access through the MNF. For Scheme Options A1 and A8, the proposed corridor would primarily follow existing SR 55/28 and US 33 through the NRA. Scheme Options A2 through A7 would mainly be on new location through the MNF, coming in close proximity to Otter Creek and Dolly Sods Wilderness Areas and traversing many areas designated for semi-primitive recreation.

- Scheme D would improve access to MNF resources but would do so indirectly. Because Scheme D would head to the northwest in the vicinity of Moorefield, it would avoid many of the sensitive resources which Scheme A would provide direct access to. Since the existing route through MNF (SR 55/28) would remain unimproved, current capacity limits of the roadway would serve to limit the volume of traffic/visitors in the MNF sensitive recreation areas.

- Scheme Options B1 and C1 would provide the most direct access improvements to commercial ski areas

- Options under Schemes D and E would have the least involvement with recreation resources within MNF lands and MNF lands in general. They would avoid any involvement with Otter Creek or Dolly Sods Wilderness Areas, as well as the Spruce Knob/Seneca Rocks National Recreation Area.

- Scheme Options B1 through B3 and Scheme Option C1 would cross through lower portion of Canaan Valley State Park and across the proposed Canaan Valley National Wildlife Refuge. While Scheme Options B4 through B6 and Scheme Option C2 would avoid Canaan Valley State Park, in doing so, they would cross through areas managed by the MNF for semi-primitive recreation.

- Scheme Options B2, C2, D1 through D6, E1 and E2 would provide improved access to Blackwater Falls State Park.

- Options under Schemes A, B, and C would improve direct access to the GWNF. The project would not have an adverse effect on existing uses of the GWNF since the proposed corridors would follow existing SR 55 through the area.

- All Scheme Options would provide improved access to the various Public Hunting and Fishing Areas within the study area.

Welton Park is located within the 2,000 foot-wide corridor of all Options under Scheme A. Welton Park (also known as Petersburg Gap Park) is a 26 acre park located in Grant County at the Grant County/Hardy County line, approximately one mile east of Petersburg, WV. The park contains three picnic shelters, a playground, a volleyball court, a ball field, a boat launch, toilet facilities, and a parking lot. Since Scheme A generally follows US 220 in the area and since the park is bordered by US 220 along the park's northern boundary, it is likely that the park would be impacted, should Scheme A be selected as the preferred corridor. The extent of the involvement would ultimately depend on topographical and alignment constraints and the ability to avoid the park based on the surrounding topographical conditions.

4. POTENTIAL MITIGATION MEASURES

Following the selection of a preferred corridor and the initiation of preliminary alignment design, every effort would be made to avoid developed recreation facilities and designated sensitive recreational resources. In situations where improved access to a recreation resource would be considered a benefit, appropriate intersections will be incorporated into to roadway design to maximize the benefit. In situations where improved access to a recreation resource would be considered adverse, efforts will be made to reduce intersections/roadway access through or near the area. Where limiting access would not be possible, efforts would be made to minimize access involvement by remaining on existing roadways or routing the corridor on the outer boundaries of the resource.

V. MINERAL RESOURCES

1. METHODOLOGY

The U.S. Department of the Interior, Bureau of Mines provided the following information on mineral resources within the study area, as well as their determination of potential corridor involvements with mineral resources. Mineral resource information provided by the Bureau of Mines was based on project mapping (7.5 minute USGS topographical mapping) submitted to them for their review, as well as available, existing information. Because this is a corridor-level study, it was determined to be appropriate to review existing information as a means to inventory the existing mineral resources within the area. Following selection of a preferred corridor and the initiation of the alignment SDEIS, the Bureau of Mines will conduct a field investigation to determine the extent of the potential project-related mineral resource impacts. As noted in the Bureau of Mine's correspondence, mineral resource information was provided on a technical assistance basis only, and may not reflect the opinions of the Department of the Interior (see Appendix B, letter dated 8-21-92).

2. AFFECTED ENVIRONMENT

Mineral resources within the corridor Scheme Options include coal, natural gas, limestone, sandstone, shale, marl, a ferrovanadium processing plant, and small iron and manganese prospects.

3. POTENTIAL INVOLVEMENTS

Today, the most valuable mineral resource in the study area is low-volatile bituminous coal, located in Grant, Mineral, Pendleton, Randolph, and Tucker Counties, WV. Other minerals currently being extracted include limestone and sandstone, shale, natural gas fields, and iron and manganese. The following summarizes the corridor Scheme Option involvements with mineral resources.

- A large area of coal resources in eastern Tucker and western Grant Counties would be crossed by Scheme D (Scheme Options D1 through D6) and Scheme E (Scheme Options E1 and E2) and SubScheme K in particular (Scheme Options B4, B5, B6, and C2). Coal is currently mined from several surface mines near Davis and from an underground mine near Thomas.

- There are several active surface mines in Grant County, west of Schemes C and E and south of the Mineral/Grant County line. These resources would not be affected by the project.

- Most of the corridor Scheme Options would cross undeveloped limestone resources in West Virginia and Virginia and pass by several active limestone and sandstone quarries.

- Schemes A, B, and C pass several limestone quarries between Elkins and Faulkner.

- A sandstone quarry and two limestone quarries west of Thomas are near but possibly bypassed by Schemes D and E.

- A limestone quarry at Scherr would be near Schemes B and D.

- SubScheme AE-2 (Scheme Options A3 and A6) comes near a sandstone quarry and a limestone quarry west of Petersburg.

- SubScheme AE-1 (Scheme Options A2 through A7) comes near a limestone quarry northwest of Petersburg.

- Schemes C and E would pass near several mines; a limestone quarry near Romney; a sandstone quarry west of Capon Bridge; several sandstone quarries near Gore, VA; a shale quarry and a limestone quarry west of Winchester, VA; a marl pit north of Winchester; and another shale quarry northeast of Winchester.

- Schemes A, B, and D are close to several quarries and lime plants at the terminus in Strasburg, VA. This area also includes undeveloped reserves of high-calcium limestone suitable for the manufacturing of lime.

- Schemes B and C would cross several gas fields between their point of divergence from Scheme A to where they intersect SR 32.

- Schemes C and E would cross a gas field about ten miles east of Romney.

- Schemes A, B, and D would be near a ferrovanadium processing plant near Capon Road (Strasburg, VA). In addition, Schemes A, B, and D would pass near several iron and manganese prospects between Baker and Strasburg.

- An isolated mine or prospect lies along the North Fork of the South Branch of the Potomac River near Scheme A, and another lies along Schemes C and E a few miles west of Capon Bridge. However, little or no production has occurred from the deposits since World War II.

Based on the inventory provided by the Bureau of Mines, mineral resources are fairly evenly distributed throughout the study area. Following selection of a preferred corridor and the initiation of the alignment SDEIS, the Bureau of Mines will conduct a field investigation to determine specific impacts to mineral resources, as well as provide recommendations to mitigate potential impacts.

W. ENERGY

In general, the short-term construction energy requirements for any of the Scheme Options would be similar and would be greater than the energy requirements of the No-Build Alternative. However, post-construction operational energy requirements of the facility should be less with the Build Alternative than with the No-Build Alternative. It is generally accepted that the savings in operational energy requirements would more than offset construction energy requirements and thus, in the long-term, result in a net savings in energy usage. The proposed facility would result in reduced traffic congestion and shorten the distance for east/west travel, thereby resulting in an overall reduction in vehicular energy consumption.

X. CONSTRUCTION

Construction activities for any of the Scheme Options would affect the residents of the immediate project area and those traveling in the vicinity. These construction-related involvements could include the temporary degradation of air, noise, and water quality; the temporary impedance to the maintenance and control of traffic; additional safety concerns as a result of changes in traffic flow patterns; the stockpiling and disposal of construction materials; and the use and mitigation of borrow areas.

1. AIR QUALITY

During the construction of Corridor H, air quality disturbances would be temporary and would primarily be the result of open burning, emissions from diesel-powered construction equipment, and dust from embankments, stock piles, and haul roads. All burning would be done in accordance with all applicable laws, ordinances, and regulations, and would be subject to the regulations of the West Virginia Air Pollution Control Commission and the Virginia State Air Pollution Control Board. Airborne particles from embankments, stockpiles, and haul roads would be controlled through the use of watering and other techniques in strict accordance with WVDOT's *Standard Specifications - Roads and Bridges*, Sections 107 and 636, and VDOT's *Road and Bridge Specifications*, Sections 107 and 513.

2. NOISE

Heavy equipment movement and certain construction activities would likely create noise and vibrations. The Heavy Construction Noise Model (HCNOM) would be used to determine where noise abatement measures would be needed. Noise abatement measures could include using temporary noise barriers and limiting construction activities to certain hours, as well as additional measures contained in both WVDOT's and VDOT's *Standard Specifications*. Additional noise abatement measures are discussed in Section III-J.

3. WATER QUALITY

Effects to water quality resulting from erosion and sedimentation, as well as from pollutants such as chemicals, fuels, lubricants, bitumens, raw sewage, and other harmful waste, would be strictly controlled in accordance with Sections 107 and 642 of WVDOT's *Standard Specifications* and Sections 107 and 303 of VDOT's *Specifications*. The contractor would exercise every reasonable precaution necessary during construction to prevent pollution of rivers, streams, or impoundments. All construction discharge would be adequately filtered prior to discharge into waters and would meet the requirements of the West Virginia Administrative Regulations, State Water Resources Board, Chapters 20-5 and 20-5A. During spawning seasons, discharges and construction activities in spawning areas would be restricted so as not to disturb or inhibit aquatic species. In the event the contractor dumps, discharges, or spills any contaminate which may affect water quality, he/she would immediately notify all appropriate local, state, and federal agencies and would take immediate action to contain and remove the contaminate.

4. MAINTENANCE AND CONTROL OF TRAFFIC

The maintenance of traffic, construction sequencing, and detouring would be planned and scheduled so as to minimize any adverse impacts to the traveling public. Signs would be used and local newspapers notified to provide ample notice of detours, closings, and other construction-related activities in order to plan alternate travel routes and accommodate time delays in advance. Traffic congestion and delays would be controlled where many construction operations are in progress at the same time. In addition to standard practices to assure safe traffic passage, the contractor would use the devices and conditions described in Section 636 of WVDOT's *Standard Specifications* and Section 514 of VDOT's *Specifications*. Access to residences and businesses would be maintained through construction scheduling, sequencing, and temporary driveway construction.

5. HEALTH AND SAFETY

During the course of construction, the contractor would comply with all federal, state, and local laws governing safety, health, and sanitation. All reasonable safety considerations and safeguards necessary to protect the life and health of employees on the job, the safety of the public, and the protection of property in connection with roadway construction, would be taken.

6. POLLUTION CONTROL

The construction of Appalachian Corridor H would consist of roadways and bridges requiring excavation of unsuitable materials, placement of embankments, and the use of materials such as aggregates, bituminous, and portland cement concrete. The stockpiling and disposal of the construction and excavation materials may be visually displeasing to some of the residents along the construction corridor. However, this would be a temporary condition and should pose no permanent problems with the use of the required temporary erosion control features. The contractor would be responsible for his/her methods of placing the necessary features of pollution control on haul roads, borrow and other material pits, areas used for the disposal of waste materials, and other potential pollutants associated with the construction of the project. Temporary erosion control features would consist of berms, dikes, temporary seeding, sediment traps, fiber mats, silt fences, slope drains, mulches, crushed stone, and others, as specified in Section 642 and Section 107, respectively, of WVDOT's and VDOT's *Specifications*.

Existing conditions that would pose problems to the constructability of Corridor H, such as large cuts and fills, rockfall areas, deep-mined and strip-mined areas, stream crossings and relocations, etc., would be handled individually during preliminary and final design. The final alignment would be placed in the most practical location to avoid construction problem areas and sensitive natural resource areas. In-depth geotechnical research, reconnaissance, and core borings would be used to make sound engineering judgements to solve difficult construction problems as they arise.

Y. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

In general, the various Scheme Options would have similar impacts on the local, short-term uses of resources and the maintenance and enhancement of long-term productivity.

The construction phase of the project would cause limited adverse effects on the human environment which are deemed to be short-term in nature. There may be siltation of local surface waters during construction; however, careful attention would be given to these problems during design and current requirements for erosion control, siltation, and pollution would be applied. These control measures, both temporary and permanent, would minimize adverse short-term effects and reduce substantial, long-term damage.

The proposed project would be classified as a long-term productive facility. This project, with its desirable design characteristics, would provide for safe and efficient vehicle operation for future, as well as present, traffic volumes. Benefits of the project would include reduced operating costs, reduced travel time, reduced accidents and fatalities, and economic enhancement of the area.

Z. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION

Implementation of the project would involve a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed facility would be considered an irreversible commitment during the time period that the land is used for a highway facility. However, if a greater need arises for use of the land, or if the highway facility is no longer needed, the land could be converted to another use. At present, there is no reason to believe such a conversion would be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material would be expended. Large amounts of labor and natural resources would be used in the fabrication and preparation of construction materials. These materials are generally not retrievable. They are not in short supply, and their use would not have an adverse effect upon continued availability of these resources. Any construction would also require a substantial expenditure of both state and federal funds which would not be directly retrievable. Indirectly, construction costs could be recovered through highway taxes, user fees (gasoline taxes), and income taxes generated by a more robust economy.

The commitment of these resources is based on the concept that residents in the immediate area, state, and region would benefit by the improved quality of the transportation system. These benefits would consist of improved accessibility and safety, savings in time, fuel savings, and greater availability of quality services which are anticipated to outweigh the commitment of these resources.

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SECTION IV:
Section 4(f)/6(f) Inventory

SECTION IV: SECTION 4(f)/6(f) INVENTORY

In accordance with Section 4(f) of the 1966 Department of Transportation Act and Section 6(f) of the 1965 Land and Water Conservation Fund Act (LWCFA), overall evaluations have been conducted for properties determined to be qualified for Section 4(f) and Section 6(f) evaluations. The purpose of this inventory is to identify Section 4(f) and Section 6(f) resources within the 2,000 foot-wide corridor Scheme Options. Following selection of a preferred corridor and initiation of preliminary engineering, detailed impact assessments within the preferred corridor will be undertaken, the results of which will be documented in the second SDEIS and its supporting Technical Reports.

A. SECTION 4(f)/6(f) APPLICABILITY

Section 4(f) was enacted under the Department of Transportation Act of 1966 and only applies to agencies within the U.S. Department of Transportation. Section 4(f) applies to publicly owned parks, recreation areas, and wildlife and waterfowl refuges, as well as historic and archaeological sites listed or considered eligible for listing on the National Register of Historic Places.

Publicly owned land is considered to be a park, recreation area, or wildlife and waterfowl refuge when the land has been officially designated as such or when the federal, state, or local officials having jurisdiction over the land determine that its major purpose or function is for park, recreation, or refuge purposes. For multiple-use lands (e.g.: National Forest lands), only those portions of the land which are designated by statute or identified in current management plans of the administrating agency as being for the above uses would potentially qualify for protection under Section 4(f). If a publicly owned wildlife management area is not officially designated as a "refuge" but functions as a sanctuary for the protection of species, then Section 4(f) may apply. This would also be the case for areas which are not officially designated as park or recreation areas, yet function as such.

Section 4(f) would not apply to multiple-use areas which do not function for the purposes protected by Section 4(f), (park, recreation, refuge). Multiple-use can include lands in private ownership where residential and commercial uses are common, such as Spruce Knob/Seneca Rocks National Recreation Area (NRA)

There are often concurrent requirements of other federal agencies when Section 4(f) lands are involved in highway projects. This includes the approval of land conversions covered by Section 6(f) of the Land and Water Conservation Fund Act (LWCFA). State and local governments often obtain grants through the LWCF to acquire or make improvements to parks and recreation areas. Section 6(f) of the LWCF prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without the approval of the U.S. Department of the Interior - National Park Service. Section 6(f) ensures that, where a Section 6(f) land conversion is proposed for a highway project, replacement land will be available.

B. PROPOSED ACTION

The West Virginia Department of Transportation, Division of Highways (WVDOT), in conjunction with the Federal Highway Administration (FHWA), is proposing to construct an approximately 110 to 130 mile highway through northeastern West Virginia and northwestern Virginia. The proposed Corridor H facility would provide a divided, four-lane highway with partial control of access on new and existing location from Elkins, West Virginia to Interstate 81 in either Strasburg or Winchester, Virginia. The project area includes portions of the West Virginia Counties of Grant, Hampshire, Hardy, Mineral, Pendleton, Randolph, and Tucker, as well as the Virginia Counties of Frederick and Shenandoah (Exhibit I-1).

1. PROJECT PURPOSE

This proposed facility would complete Corridor H of the Appalachian Development Highway System. As an element of the Appalachian Development Highway System, the project's purpose is to improve east/west access and thereby stimulate economic growth within the rugged, mountainous terrain of rural, northeastern West Virginia.

2. PROJECT NEED

The need for this proposed facility (documented in Section I) is based on seven primary factors:

- Legislation;
- Social demands and economic development considerations;

- The importance of the project in the local and regional transportation system (System Linkage);

- The current and future capacities and levels of service of the existing transportation network;

- Current and future transportation demands (from a local and regional planning authority perspective);

- Safety considerations; and

- Roadway deficiencies.

While the principal need for the project is based on legislation, socioeconomic demands, and system linkage, the cumulative effect of the above seven factors provides strong support for the proposed facility.

3. PROJECT DESCRIPTION - THE BUILD ALTERNATIVE

The Build Alternative serves to solve the identified system linkage and transportation problems and to meet the associated purpose and needs of the project. Under this alternative, numerous Schemes and SubSchemes have been studied. The *Draft Environmental Impact Statement: Appalachian Corridor H - Elkins, West Virginia to Interstate 81, Virginia,* dated March 1981, identified five Schemes which were determined to be feasible and practicable. As such, these warranted further investigation and were evaluated in detail for their potential social, economic, and environmental impacts. These five Schemes (Schemes A, B, C, D, and E) and their corresponding SubSchemes (HR, K, KP, L, and L2) are identified on Exhibit I-3.

At the initiation of the Corridor H SDEIS process, the possibility of a SubScheme branching from Scheme A was investigated. The purpose of this was to develop an alternate corridor which would avoid or minimize Scheme A's involvement with the Spruce Knob/Seneca Rocks National Recreation Area (Section 4(f) properties). The result of this investigation has been the development of SubSchemes AE-1, AE-2, AE-3, and AD-1. These new SubSchemes and the original DEIS Schemes and SubSchemes create 24 unique Scheme Options for the routing of Corridor H. The 2,000 foot-wide corridor locations of the Schemes and SubSchemes are shown on Exhibit II-1.

C. HISTORIC AND ARCHAEOLOGICAL SITES

The Corridor H study area contains numerous historic and archaeological resources, as described in the *Historic and Archaeological Resources Technical Report* (available from WVDOT). This report identifies the location of recorded sites relative to each Scheme Option, assesses the potential impacts of the proposed Corridor H project on these cultural resources, and presents measures to mitigate the potential impacts.

In a corridor level study, the number of such sites and the site types encountered by a given Scheme Option is the most meaningful measure of potential impacts to these resources. This level of analysis is a deviation from the classic components of description of Section 4(f) properties. Because this is a corridor-level study, analysis focuses on the frequency of occurrence and type of historic and archaeological sites along the Scheme Options where potential 4(f) involvements could occur.

This report and previous archaeological and historical studies conducted in conjunction with the Corridor H study establish that the area is rich in cultural resources. Within the vicinity of the various Scheme Options, the *Historic and Archaeological Resources Technical Report* identified 5 historic structures listed on the National Register of Historic Places and 18 historic structures and 1 historic district eligible for inclusion on the National Register. These sites are within the 2,000 foot wide corridor Scheme Options. Their Scheme Option involvements are presented on Tables IV-1 and IV-2. As shown on Exhibit IV-1, these sites are fairly evenly distributed throughout the study area.

A Section 4(f) Inventory Form has been prepared for each site listed on Tables IV-1 and IV-2. While the Onego Historic District has been determined to be eligible for listing on the National Register of Historic Places, only one structure (the Stone House) within the proposed district is listed on the Register and no other structures have been determined eligible. Therefore, an inventory form has only been prepared for the Stone House. When available, comments from jurisdictional authorities have been included with regard to their perceived impact to the resource.

1. POTENTIAL INVOLVEMENTS

Four of the five NRHP-listed sites (Vandiver-Trout-Clause House, Stone House, Sycamore Dale, and Willa Cather Birthplace) are either on or very near the Great Northern Turnpike (US 50), and were built between 1831 and 1838. These four sites are located within the 2,000-foot corridor Scheme Option of C1, C2, E1, or E2. Considering the impact of the Great Northern Turnpike on the growth of the area, concentration of such sites along this route is not surprising. The Manor is

81092

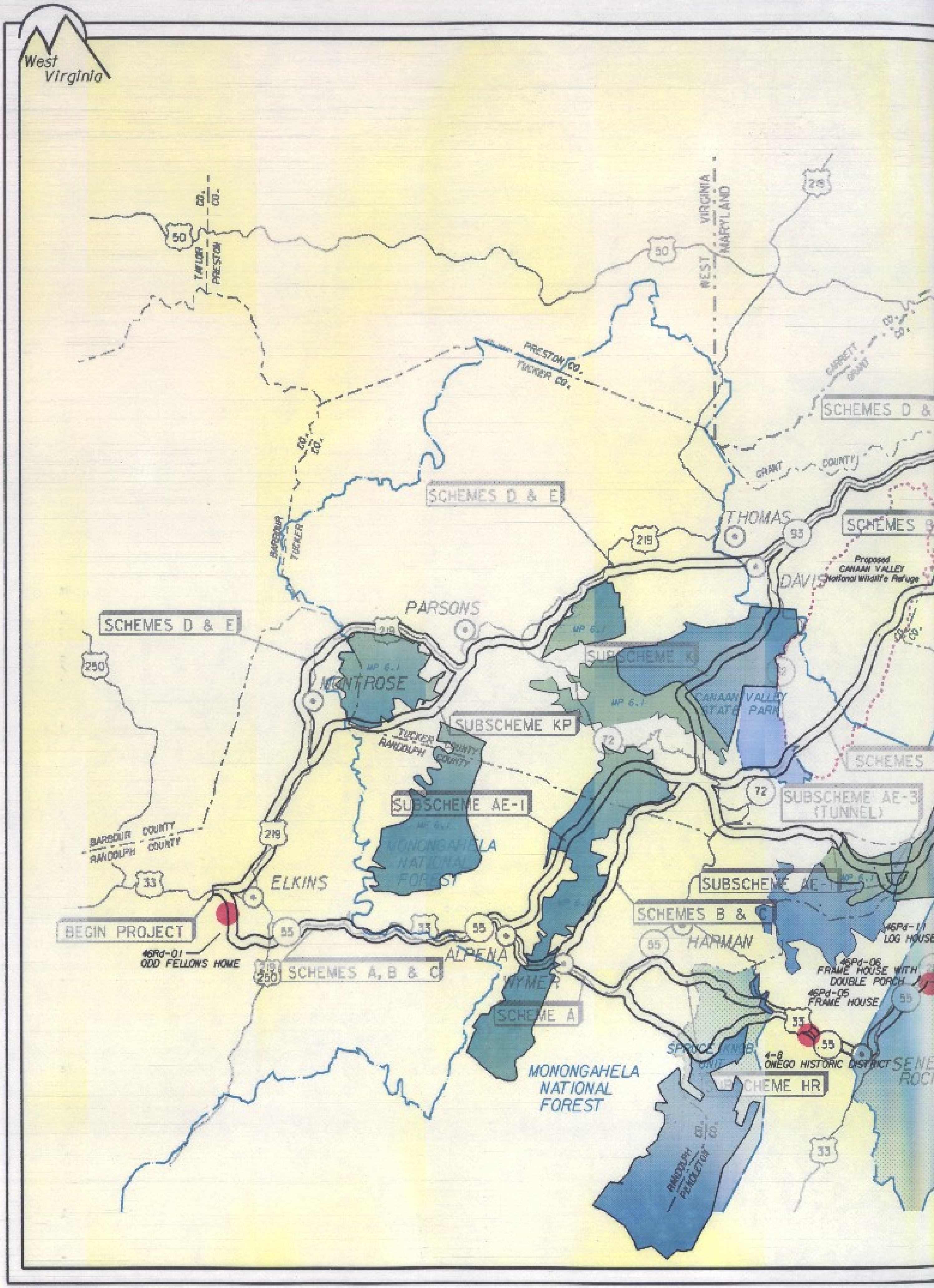
TABLE IV-1
KNOWN OR POTENTIAL SECTION 4(F) RESOURCE INVOLVEMENTS BY SCHEME OPTION

4(F) RESOURCE NAME	4(F) RESOURCE TYPE	SCHEME OPTION INVOLVEMENT																							
		A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	C1	C2	D1	D2	D3	D4	D5	D6	E1	E2
The Manor	Listed		*			*																			
Vandiver-Trout-Clause House	Listed															*	*							*	*
The Stone House	Listed															*	*							*	*
Sycamore Dale	Listed															*	*							*	*
Willa Cather Birthplace	Listed															*	*							*	*
I.O.O.F. Retirement Home	Eligible	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*								
Onego Historic District	Eligible	*	*	*	*	*	*	*	*																
Dolly House	Eligible	*	*	*	*	*	*	*	*																
William Boggs House	Eligible	*	*	*	*	*	*	*	*																
William Hevner House	Eligible	*	*	*	*	*	*	*	*																
Grant County Poor House	Eligible	*			*			*	*																
Welton Farm	Eligible		*			*																			
Will Fisher Farm	Eligible	*	*	*	*	*	*	*	*																
John Inskeep House	Eligible	*	*	*	*	*	*	*	*																
Abraham Inskeep House	Eligible	*	*	*	*	*	*	*	*																
William Hawes House	Eligible	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*		
John Bott House	Eligible	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*		
William Warden House	Eligible	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*		
Baughman House	Eligible	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*		
Francis Godlove House	Eligible	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*		
Valentine Switzer House	Eligible	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*		
Nicholas Switzer House	Eligible	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*		
Boehm-Coffelt Place	Eligible	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*		
Elijah Pifer House	Eligible	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*		
Canaan Valley State Park	Park									*	*	*				*									
Spruce Knob Unit - NRA	Recreation Area	*							*																
Seneca Rocks Unit - NRA	Recreation Area	*		*	*	*	*	*	*																
Welton Park	Park	*	*	*	*	*	*	*	*																
Big Blue Trail	National Trail	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*	*	*	*	*	*		
MNF 6.2 Areas (Potential Section 4(f))	Recreation Area	*							*	*	*	*	*	*	*	*	*								
Canaan Valley Wildlife Refuge (proposed)	Wildlife Refuge									*	*	*				*									
TOTAL SITES		23	21	20	21	22	20	21	23	14	14	14	12	12	12	8	6	10	10	10	10	10	10	4	4

TABLE IV-2
NRHP* LISTED AND ELIGIBLE SITES

SCHEME OPTION INVOLVEMENT	SITE NUMBER	SITE NAME	NRHP STATUS
A2 and A5	085-H-Gt-10 (8-33)	The Manor	Listed
C1, C2, E1, and E2	022-H-Mi-11 (6-18)	Vandiver-Trout-Clause House	Listed
C1, C2, E1, and E2	6-27D	The Stone House	Listed
C1, C2, E1, and E2	46-Hm-04 (6-40)	Sycamore Dale	Listed
C1, C2, E1, and E2	34-161 (6-66)	Willa Cather Birthplace	Listed
A1 thru A8, B1 thru B6, C1 and C2	061-H-Rd-01 (2-1)	I.O.O.F. Retirement Home	Eligible
A1 and A8	4-8	Onego Historic District	Eligible
A1 and A8	073-H-Pd-05 (4-9)	Dolly House	Eligible
A1 and A8	074-H-Pd-06 (4-14)	William Boggs House	Eligible
A1 and A8	079-H-Pd-11 (4-20)	William Hevner House	Eligible
A1, A4, A7, and A8	081-H-Gt-06 (4-23)	Grant County Poor House	Eligible
A2 and A5	4-29	Welton Farm	Eligible
A1 thru A8	092-H-Hy-06 (4-38)	Will Fisher Farm	Eligible
A1 thru A8	094-H-Hy-08 (4-39)	John Inskeep House	Eligible
A1 thru A8	094-H-Hy-08 (4-40)	Abraham Inskeep House	Eligible
A1 thru A8, B1 thru B6, and D1 thru D6	101-H-Hy-15 (7-5)	William Hawes House	Eligible
A1 thru A8, B1 thru B6, and D1 thru D6	103-H-Hy-17 (7-7)	John Bott House	Eligible
A1 thru A8, B1 thru B6, and D1 thru D6	107-H-Hy-21 (7-12)	William Warden House	Eligible
A1 thru A8, B1 thru B6, and D1 thru D6	108-H-Hy-22 (7-13)	Baughman House	Eligible
A1 thru A8, B1 thru B6, and D1 thru D6	7-16	Francis Godlove House	Eligible
A1 thru A8, B1 thru B6, and D1 thru D6	7-21	Valentine Switzer House	Eligible
A1 thru A8, B1 thru B6, and D1 thru D6	111A-H-Hy-28	Nicholas Switzer House	Eligible
A1 thru A8, B1 thru B6, and D1 thru D6	7-38	Boehm-Coffelt Place	Eligible
A1 thru A8, B1 thru B6, and D1 thru D6	7-49	Elijah Pifer House	Eligible

*NRHP = National Register of Historic Places


West Virginia
TAYLOR CO.
PRESTON CO.
WEST VIRGINIA
MARYLAND
PRESTON CO.
TUCKER CO.
GARRETT CO.
GRANT CO.
SCHEMES D & E
GRANT COUNTY
SCHEMES D & E
THOMAS
SCHEMES B
Proposed CANAAN VALLEY National Wildlife Refuge
DAVIS
BARBOUR
TUCKER
PARSONS
SCHEMES D & E
SUBSCHEME K
MP 6.1
MONTROSE
CANAAN VALLEY STATE PARK
SUBSCHEME KP
TUCKER COUNTY
RANDOLPH COUNTY
SCHEMES
SUBSCHEME AE-1
SUBSCHEME AE-3 (TUNNEL)
BARBOUR COUNTY
RANDOLPH COUNTY
MONONGAHELA NATIONAL FOREST
ELKINS
SUBSCHEME AE-1
SCHEMES B & C
BEGIN PROJECT
HARMAN
46Pd-11 LOG HOUSE
46Rd-01 ODD FELLOWS HOME
ALPENA
SCHEMES A, B & C
46Pd-06 FRAME HOUSE WITH DOUBLE PORCH
46Pd-05 FRAME HOUSE
WYMER
SCHEME A
SPRUCE KNOB UNIT
4-8 ONEGO HISTORIC DISTRICT
MONONGAHELA NATIONAL FOREST
SUBSCHEME HR
RANDOLPH
PENDLETON
50
219
93
250
72
33
55

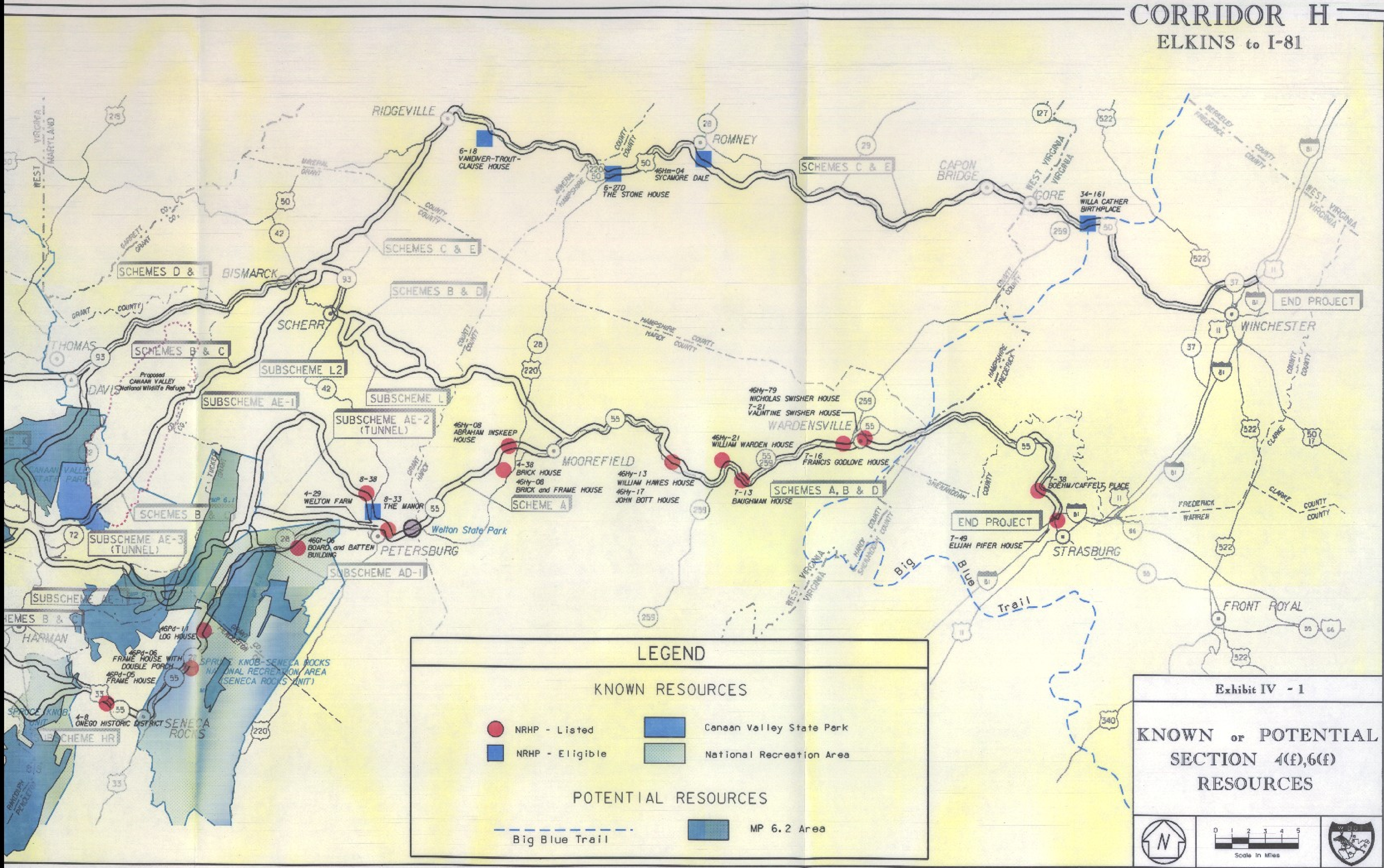


Exhibit IV - 1

KNOWN or POTENTIAL SECTION 4(f),6(f) RESOURCES located within corridor Scheme Option A2 or A5. None of the remaining Scheme Options would involve any currently listed NRHP sites.

The sites determined to be eligible for listing in the NRHP generally occur along Scheme A, in conjunction with US 33 and SR 28/55. Of the 18 NRHP-eligible sites, 18 are located within corridor Scheme Option A1 or A8; 14 are located within Scheme Option A4, A5, or A7; and 13 are located within Scheme Option A2, A3, or A6. Ten sites would be located within any of the corridor options under Scheme B, 1 site would be located within Scheme Options C1 and C2, and 9 sites would be located within any of the corridors of Scheme D. Neither Scheme Option E1 nor E2 would involve any NRHP-eligible sites.

The abundance of NRHP-eligible sites along Scheme A, as well as the coinciding portions of Schemes B and C, is attributable to previous investigations performed along Scheme A. Because numerous investigations along Scheme A have been conducted prior to the SDEIS efforts, more is known of the Scheme's resources. Conversely, because numerous investigations along the remaining Schemes have not been conducted prior to the SDEIS efforts, less is known of their resources. This does not imply that Scheme A would involve the most NRHP-eligible sites and the remaining Scheme Options would involve the least. It only means that, because more studies have been conducted along Scheme A, more is known. When a preferred corridor is selected and alignment studies within the selected corridor initiated, detailed investigations would be undertaken to evaluate the existence of and potential impact to cultural resources.

2. AVOIDANCE ALTERNATIVES

At this stage of the study process, the likelihood of avoiding Section 4(f) historic and archaeological resources is greater since preliminary and final design could incorporate direct avoidance and impact minimization measures. However, while direct impacts could likely be avoided within a 2,000 foot wide corridor, indirect impacts such as noise and visual intrusions would not be as easy to avoid. While none of the Scheme Options completely avoid these known Section 4(f) resources, some encounter fewer than others. The No-Build Alternative would avoid these resources.

3. MEASURES TO MINIMIZE HARM

Measures to minimize harm to these Section 4(f) resources could include the following:

a. Location and Design Considerations

Where historic sites are encountered in the highway design of a selected Scheme Option, attention would be focused on placing the highway as far away as possible from historic sites; in a manner that is consistent with the overall goals of the project, the provision of service to the area, and a logical relationship to land parcels.

b. Landscaping

Visual intrusion and highway noise would be minimized by the retention or provision of appropriate landscaping to screen the highway and/or blend it into the natural landscape in the least obtrusive manner possible.

4. COORDINATION

Coordination includes input and assistance from the West Virginia Department of Education and the Arts, Division of Culture and History and the Virginia Department of Historic Resources. Documentation of coordination efforts is contained in the Appendices. Coordination efforts with the appropriate resource authorities would continue throughout the selection of a preferred corridor and alignment development.

D. CANAAN VALLEY STATE PARK

Located approximately nine miles south of Davis, Canaan Valley State Park is in the southwest section of the 3 by 15 mile natural bowl known as Canaan Valley. The state-owned recreational/resort park contains 6,000 acres (18 percent) of the valley's approximately 34,000 acres. Approximately 800,000 people visit the park annually.

Accessible via SR 32 from US 33 at Harman to the south and US 219 at Davis to the north, Canaan Valley State Park offers a variety of recreational activities including down hill and cross-country skiing, golfing, camping, horseback riding, swimming, tennis, ice skating, nature trails, miniature golf, and bicycling. The park has a 250 room lodge, 15 rental cabins, and 34 campsites.

1. POTENTIAL INVOLVEMENTS

The following information has been provided by the Superintendent of the Canaan Valley State Park to the Director of the WV Division of Tourism and Parks, in a letter dated September 27, 1991. Impacts from the construction and maintenance of Corridor H through Canaan Valley State Park would be substantial. The following impacts would be expected should Scheme Options B1, B2, B3, or C1 be implemented:

- Scheme Options B1, B2, B3, or C1 would be highly visible from almost all park facilities. The panoramic views from the lodge and from the ski slopes would be altered. With the potential for a reduction in air quality from vehicle emissions, there is the chance that the project would contribute to reduced visibility, possibly detracting from the scenic vistas of the park overlooks.

- Noise levels from both construction and subsequent traffic could detract from the quiet, peaceful environs of the publicly used facilities. The section of the proposed roadway which would follow SR 45/3 would be a long, uphill grade. Noise from trucks on this grade could be very disturbing to guests in rental cabins. Noise levels throughout the park could potentially increase, detracting from the overall natural park setting.

- Due to the bowl-like configuration of Canaan Valley, there is the possibility that vehicle emissions could be trapped between the Canaan Mountain and Cabin Mountain ranges, resulting in reduced air quality.

- Scheme Options B1, B2, B3, and C1 would cross Mill Run and skirt the headwaters of Club Run, both of which are major tributaries of the Blackwater River. These two streams provide a large percentage of the raw water which is drawn from the Blackwater River for the parks potable water treatment plant. Increased sediment loads in these streams could decrease the filtering capacity of park water treatment facilities.

- Mill Run contains a small population of naturally reproducing brown trout and a healthy population of largemouth bass. Club Run contains native brook trout and naturally reproducing brown trout. Fish reproduction could be impacted should sediment loads increase.

- The following facilities would likely require relocation if either Scheme Option B1, B2, B3, or C1 were implemented.
  - Three park residences
  - Two 5-million gallon snowmaking ponds
  - Two 1-acre sewage polishing ponds

- Suitable sites may not exist for relocation of these structures due to the limited availability of sites outside of sensitive wetland areas.

- Construction of Scheme Option B1, B2, B3, or C1 could result in a less than satisfactory buffer zone between the highway and many other park facilities. The cabin area, golf course, campground, and ski complex would suffer aesthetically from the Corridor H construction.

Federal Land and Water Conservation Fund money was used for construction of the pool, tennis courts, skating rink, a parking area and a road between the lodge and golf course. Since Scheme Options B1, B2, B3, and C1 do not involve any of these facilities, 6(f) land exchange involvements would likely be minimal.

2. AVOIDANCE ALTERNATIVES

As a means to avoid involvement with Canaan Valley State Park, SubScheme K was developed as an alternate corridor for Schemes B and C. Following SubScheme K, Scheme Options B4, B5, B6, and C2 would avoid any involvement with the park. However, while SubScheme K would avoid the Section 4(f) resource of Canaan Valley State Park, it would traverse several areas through the Monongahela National Forest designated as MP 6.2 (a Management Prescription which may be determined to qualify for protection as a Section 4(f) resource).

Scheme Options which would completely avoid involvements with Canaan Valley State Park include all Options under Schemes A, D, and E, as well as the No-Build Alternative. While Scheme A would avoid the Canaan Valley State Park Section 4(f) resource, all Options under Scheme A (with the exception of Scheme Option A2) would require the use of the Spruce Knob and/or Seneca Rocks Units of the NRA (Section 4(f) and 6(f) resources). In addition, all Options under Scheme A would require the use of potential Section 4(f) land from MP 6.2 lands within the Monongahela National Forest.

3. MEASURES TO MINIMIZE HARM

Should the preferred corridor be located within Canaan Valley State Park, site specific measures would be developed during preliminary design, through coordination with Park officials. Locations of impacts would be identified and measured to mitigate potential impacts. Such measures could include location and design sensitivity and landscaping.

a. Location and Design Sensitivity

The exact location and design of the selected Scheme Option would be accomplished with regard to topography and effect on the Park and the visitor's park experience, so that the highway is as unobtrusive as possible.

b. Landscaping

Within the Park, all possible existing vegetation could be retained and additional landscaping added to visually and functionally blend the highway right-of-way into the existing landscape.

4. COORDINATION

Early coordination with appropriate state and federal agencies resulted in WVDOT's receipt of letters expressing comments and concerns. These comments and concerns have been incorporated into the preparation of the corridor SDEIS and are included in the Appendices. Should the preferred corridor identified involve Canaan Valley State Park, early and extensive coordination will be undertaken with park officials during preliminary and final design.

E. SPRUCE KNOB/SENECA ROCKS NATIONAL RECREATION AREA

Established in 1965 within the Monongahela National Forest (MNF), the Spruce Knob/Seneca Rocks National Recreation Area (NRA) comprises 26,000 acres in the Spruce Knob Unit and 74,000 acres in the Seneca Rocks Unit, for a total of 100,000 acres. Approximately 82 percent of the land within the NRA is forested and 18 percent is pasture or other farmland. Approximately one half of the land within the NRA is in public ownership and the other half in private ownership. These private land uses coexist within the area. Conservation and scenic easements, grazing permits, and timber management programs ensure that private ownership uses are compatible with the NRA's objectives.

As noted in the Forest Service's Spruce Knob/Seneca Rocks brochure, the NRA is suited to a wide variety of outdoor activities, especially the more primitive types of activities such as hiking, mountain climbing, caving, and white-water canoeing. This unique outdoor recreation resource is situated within 250 miles of more than a third of the nation's population.

The NRA was developed, in part, with Land and Water Conservation Funds. Therefore, the NRA (in its entirety) falls under the National Park Service's Section 6(f) restrictions.

1. INVOLVEMENTS

In the Spruce Knob Unit of the NRA, Scheme Options A1 and A8 would traverse the northernmost portion of the area. Either of the two corridors would be on new alignment through this unit of the NRA, requiring acquisition of property for right-of-way.

In the Seneca Rocks Unit of the NRA, Scheme Options A1, A3, A4, A5, A6, A7, and A8 would traverse the northwestern portion of the area. Scheme Options A1 and A8 would have the greatest involvement with the Seneca Rocks Unit. These Options would enter the Unit near the town of Seneca Rocks, and basically follow existing SR 28/55 through the Unit to the point where the existing route exits the NRA's easternmost boundary. The remaining Options under Scheme A were developed as a means to minimize involvement with the Seneca Rocks Unit of the NRA. Scheme Options A4 and A7 would enter the Seneca Rocks Unit on new alignment in the vicinity of Smoke Hole Caverns, and then follow existing SR 28/55 through the Unit to the point where it exists the NRA. Of those Scheme Options involving the Seneca Rocks Unit, Scheme Options A3 and A6 would have the least involvement.

Details of the corridor involvements and potential impacts to resources (streams, vegetation and wildlife, recreation resources, visual resources, etc.) are documented in Section III. Following selection of the preferred corridor and initiation of the alignment SDEIS, detailed studies will be conducted to determine the extent of impacts (if any).

2. AVOIDANCE ALTERNATIVES

Of the Options under Scheme A, Scheme Option A2 would be the only one to completely avoid both the Spruce Knob and Seneca Rocks Units of the NRA. All of the Options under Schemes B, C, D, and E, as well as the No-Build Alternative, would avoid both NRA units. However, while the other Schemes would avoid the NRA, other Section 4(f) resources would be located within their corridors.

3. MEASURES TO MINIMIZE HARM

Specific measures that could be used to minimized harm to the NRA could include, but are not limited to, the following.

- Examination of alignment shifts within the preferred corridor, once it has been selected and design studies initiated.
- Replacement of all publicly owned land and facilities in kind.
- Incorporation of noise abatement measures, where determined necessary.
- Efforts to reduce visual impacts could include blending the facility into the existing environment, revegetation, selective cutting, and landscaping.

4. COORDINATION

Extensive coordination will be undertaken with all involved state and federal agencies during the design of the preferred corridor.

F. COMMUNITY PARKS

Through coordination with the West Virginia Governor's Office of Community and Industrial Development, examination of USGS 7.5 minute series topographic mapping, and WVDOT's General Highway Map (by county), one community park (Welton Park) was identified within the 2,000 foot-wide corridors inventoried. (Two other community facilities {Central Hampshire Park and Burlington Elementary School} are located close to but outside of the 2,000 foot-wide corridor limits of the Section 4(f)/6(f) inventory.)

Welton Park (also known as Petersburg Gap Park) is a 26 acre park located in Grant County at the Grant County/Hardy County line, approximately one mile east of Petersburg, WV. The northern boundary of the park fronts US 220 and the southern park boundary fronts the North Fork of the South Branch of the Potomac River. The park is sponsored by the Grant County Commission. Welton Park has received funds from the Land and Water Conservation Fund; therefore, the provisions of Section 6(f) as well as Section 4(f) would apply to this park resource.

The park contains three picnic shelters, a playground, a volleyball court, a ball field, a boat launch, toilet facilities, and a parking lot. Future expansion at the park is planned. Known future improvements include additional parking.

While the park is within a reasonable walking distance from Petersburg, most users arrive by vehicle off of US 220. No user/visitor count is available at this time. The park is the only facility of its kind in the immediate area.

1. INVOLVEMENTS

Welton Park is located within the 2,000 foot-wide corridor of all Options under Scheme A. Since Scheme A generally follows US 220 in the area and since the park is bordered by US 220 along the park's northern boundary, it is likely that the park would be impacted, should Scheme A be selected as the preferred corridor. The extent of the Section 4(f)/6(f) involvement would ultimately depend on topographical and alignment constraints and the ability to avoid the park based on the surrounding topographical conditions.

2. AVOIDANCE ALTERNATIVES

Aside from Scheme A, none of the remaining Schemes would involve Welton Park. However, while the remaining Schemes would not effect the park, there would be other Section 4(f) resource involvements associated with each avoidance alternative. The No-Build Alternative would be the only option to completely avoid Section 4(f)/6(f) resource involvements.

3. MEASURES TO MINIMIZE HARM

Specific measures that could be used to minimized harm to Welton Park could include, but are not limited to, the following.

- Examination of alignment shifts within the preferred corridor, once it has been selected and design studies initiated.
- Replacement of all publicly owned land and facilities in kind.
- Incorporation of noise abatement measures, where determined necessary.

- Efforts to reduce visual impacts could include blending the facility into the existing environment, revegetation, selective cutting, and landscaping.

4. COORDINATION

Extensive coordination will be undertaken with all involved local, state, and federal agencies during the design of the preferred corridor.

G. MNF MANAGEMENT PRESCRIPTION 6.1 AND 6.2 AREAS

The Monongahela National Forest's 1986 adopted *Land and Resource Management Plan* provides guidelines for the management of the Forest's resources. A major component of the Plan is the implementation of ten Management Prescription (MP) areas in which specific standards, guidelines, and practices are followed for each type of area. These MP's consist of management practices which are applied to achieve a desired future forest condition.

Of the ten Management Prescriptions, two (MP 6.1 and MP 6.2) were initially considered by FHWA as potentially qualifying for protection under Section 4(f). According to the Forest Supervisor of the Monongahela National Forest, MP 6.1 areas are neither designated as wildlife refuges nor do they function as sanctuaries. They are open to hunting and other multiple-use activities, including timber management. Therefore, FHWA has determined that the MP 6.1 areas do not qualify for protection under Section 4(f).

The management of MP 6.2 primarily emphasizes semi-private, non-motorized recreation; therefore potentially qualifying for Section 4(f) status as a publicly owned recreation area. The location of the MP 6.2 areas within the study area are shown on Exhibit IV-1 and involvements are presented on Tables IV-3 and IV-4. A separate Section 4(f) inventory form has been prepared for the MP 6.2 areas and is included in Appendix A.

Lands assigned to MP 6.2 emphasize a semiprimitive, non-motorized setting allowing various dispersed recreational activities and remote wildlife habitat. It applies to 16 specifically designated areas that are characterized by a predominantly natural-appearing environment where other uses may be evident, but where interaction with other users is low. Little or no evidence will exist of roads or motorized use, and structures will be rare. In addition, these areas may have a distinct quality that is exhibited by outstanding scenery, vegetative type, geology, or dispersed recreational potential. Areas will be least 2,500 acres in size or will be able to reach that size through acquisition.

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TABLE IV-3
KNOWN OR POTENTIAL SECTION 4(f) RESOURCES:
MNF MP 6.2 CORRIDOR INVOLVEMENTS

MNF MANAGEMENT PRESCRIPTION	MNF MP OPPORTUNITY AREA	MNF MP AREA NAME	TOTAL MNF MP ACREAGE	SCHEME OPTION INVOLVEMENT	TYPE OF INVOLVEMENT	MP ACREAGE WITHIN CORRIDOR
6.2	16.201	Laurel Fork	3,151	B1 thru B6, C1 and C2	Minor	921
	16.202	Canaan Mt.	13,532	B4 thru B6 and C2	Major	1350
	56.201	North Fork/Hopeville	4,637	A1, A4, A7, and A8	Minor	970
	56.202	Smokehole	2,670	None	None	0
	56.203	Flatrock/Roaring Plains	7,772	A2 thru A7	Major	97
	56.204	Seneca Creek - Gandy	6,548	A1 and A8	Major	424

Major Involvement = Where a corridor directly bisects a continuous tract of MNF MP 6.2 land.
Minor Involvement = Where a corridor is on MNF MP 6.2 land but is located along the perimeter of the tract.

TABLE IV-4
KNOWN OR POTENTIAL SECTION 4(f) RESOURCES: MNF MP 6.2 AREA INVOLVEMENTS BY SCHEME OPTION

	CORRIDOR INVOLVEMENT		
	NF MP 6.2 AREAS		
SCHEME OPTION	Major (Acres)	Minor (Acres)	TOTAL (Acres)
A1	424	970	*1,394*
A2	97	0	*97*
A3	97	0	*97*
A4	97	970	*1,067*
A5	97	0	*97*
A6	97	0	*97*
A7	97	970	*1,067*
A8	424	970	*1,394*
B1	0	921	*921*
B2	0	921	*921*
B3	0	921	*921*
B4	1,350	921	*2,271*
B5	1,350	921	*2,271*
B6	1,350	921	*2,271*
C1	0	921	*921*
C2	1,350	921	*2,271*
D1	0	0	*0*
D2	0	0	*0*
D3	0	0	*0*
D4	0	0	*0*
D5	0	0	*0*
D6	0	0	*0*
E1	0	0	*0*
E2	0	0	*0*

Major Involvement = Where a corridor directly bisects a continuous tract of MNF MP 6.2 land

Minor Involvement = Where a corridor is on MNF MP 6.2 land but is located along the perimeter of the tract.

As a result of the application of this prescription the areas will meet the criteria for semi-primitive, non-motorized recreation. Vegetative management will be used only to protect the resource or complement the recreational value, with the predominant forest setting being natural vegetation. A variety of dispersed recreational activities may take place, with management providing facilities and settings to maximize the areas' potential. For the most part, the transportation system will be closed to public motorized use, and no additional system roads will be built.

While MP 5 areas (Congressionally-designated Wilderness) qualify for protection under Section 4(f), there would be no direct corridor involvement with such lands. Following selection of a preferred corridor and development of alignments within the preferred corridor, the potential for proximity impacts (if any) to these areas would be evaluated.

1. INVOLVEMENTS

The Scheme Option involvements with MP 6.2 areas are shown on Exhibit IV-1. The potential involvement of the proposed highway on these areas would be a function of both the distance traveled through the areas and the size of the area affected. For example, if a Scheme Option were to skirt the edge of a 6.2 area, the potential impact would be less than if it were to bisect the area. If a Scheme Option generally bisects an area the effect is considered major, if it were to skirt the area, it is considered minor.

Potential involvements are presented on Tables IV-3 and IV-4 and discussed in detail in Section III of the SDEIS. As shown in the tables, the major and minor impacts have been quantified in terms of acreage within the 2,000 foot wide corridor for each Scheme Option. The quantified potential involvements of the various Scheme Options vary over a considerable range. Those Scheme Options incorporating SubSchemes K and AE-1 are judged to be among those having the greatest involvement with Management Prescription 6.2.

The nature of the impact to these areas is simply one of basic incompatibility. Highways are not a compatible use within large ares devoted to remote wildlife habitat or non-motorized recreation. The associated noise, visual intrusion, and barrier effect would be considered negative impacts.

Details of the corridor involvements and potential impacts to resources (streams, vegetation and wildlife, recreation resources, visual resources, etc.) are documented in Section III. Following selection of the preferred corridor and initiation of the alignment SDEIS, detailed studies will be conducted to determine the extent of impacts (if any).

2. AVOIDANCE ALTERNATIVES

None of the Scheme Options completely avoid impact to the 6.2 areas; however, as depicted on Exhibit IV-1 and shown in Tables IV-3 and IV-4, some Scheme Options would have far less involvement than others. Schemes D and E would have only minor involvements with these areas.

3. MEASURES TO MINIMIZE HARM

Measures that could be used to minimize negative impacts to the Management Prescription 6.2 areas include the items listed below. The use of these mitigation measures would depend upon whether or not the MP 6.2 areas are determined to qualify for protection as a Section 4(f) resource.

a. Location and Design Sensitivity

The exact location and design of the selected Scheme Option will be accomplished with regard to topography and effect on the 6.2 areas so that the highway is as unobtrusive as possible.

b. Landscaping

Within the 6.2 areas, all possible existing vegetation will be retained and additional landscaping added to visually and functionally blend the highway right-of-way into the forest.

4. COORDINATION

Coordination to date includes input from the U.S. Forest Service and close attention to the Forest Land and Resource Management Plan. Management Prescription Area 6.2 has been avoided insofar as possible, consistent with the objective of evaluating viable alternatives for the location of Corridor H.

H. PROPOSED CANAAN VALLEY NATIONAL WILDLIFE REFUGE

The Canaan Valley National Wildlife Refuge remains a proposal at this time and therefore is yet to become a Section 4(f) Property, not currently being in public ownership. Nevertheless, because of commitment to the project by the U.S. Department of the Interior and the desirability of achieving its purposes, both the West Virginia Department of Transportation and the Federal Highway Administration propose to address the proposed refuge area in a fashion not unlike that for a genuine Section 4 (f) property.

This approach is consistent with that of the 1981 Corridor H DEIS. Consultation with the U.S. Fish and Wildlife Service indicates that little has changed in the spirit of the proposal since 1981; however, due to the deletion of some areas where development patterns have been established and due to additional studies relative to habitats, certain areas have been deleted from the approved project boundary. This results in a total of approximately 21,000 acres as contrasted with approximately 28,000 acres originally. The currently proposed boundary is shown on Exhibit IV-1. Since Corridor H Schemes B and C, which would pass through a portion of the proposed area are unchanged, the corresponding analysis of the 1981 Section 4(f) Statement remains essentially applicable.

Located in an upland valley 15 miles wide, the proposed Refuge Area is defined by 1,000-foot ridges, including Canaan Mountain to the southwest, Brown Mountain to the northwest, and Cabin Mountain on the east. Bogs and swamps are located along the watercourses, within the proposed area, which include four tributaries of the Blackwater River.

The 1979 *Final Environmental Impact Statement for the Canaan Valley National Wildlife Refuge* provides a summary of the proposal:"The U.S. Fish and Wildlife Service proposes to acquire approximately 28,000 area of unimproved wetlands and uplands in Canaan Valley, Tucker County, West Virginia. Acquisition will protect and preserve a unique boreal ecosystem. The wetland complex is the largest in West Virginia, representing about 39 percent of the states wetland habitat. Refuge development will emphasize environmental education, interpretation, and a broad range of wildlife-oriented recreation. Other land uses compatible with refuge objectives will be encouraged through use of easements, use reservations, and cooperative agreement." The function of the Wildlife Refuge would be diverse and related to its existing physical character.

Under study by the U.S. Fish and Wildlife Service as a potential refuge as early as 1961, Canaan Valley was designated by the Secretary of the Interior in 1974 as a National Natural Landmark, one of only 455 sites nationwide. When the 1976 Land and Water Conservation Fund Act amendments made funds available for purchase of areas primarily suitable for activities other than migratory bird conservation, Canaan Valley became a likely candidate for refuge status.

Although it has substantial migratory bird and residual wildlife values, the valley's principal value is its "diverse and unusual assemblage of habitats and relict boreal species," a diversity that has been described by a Heritage Conservation and Recreation Service official as making Canaan Valley "a virtual living museum of Pleistocene Time in West Virginia." Containing what the same author calls "the largest known freshwater wetland area in the central and southern Appalachians," the proposed

Canaan Valley National Wildlife Refuge area is unique in the size, diversity, and southern location of its boreal ecosystem.

The largest single wetland area in West Virginia, its nearly 7,000 acres represent 39 percent of the state's total wetland acreage. The potential refuge is, according to state Department of Natural Resources biologists, home for some 583 species of flora (109 species and varieties of which have a distinct northern range) and 286 species of mammals, birds, reptiles, amphibians and fish.

Major objectives of the potential refuge are the preservation of the unique habitat and ecosystem and development of habitat for woodcock and waterfowl and the provision of firsthand outdoor experiences, including bird watching, photography, nature study, hiking, and managed wildlife-oriented activities such as hunting, fishing, and trapping.

The proposed Wildlife Refugee is accessible via SR 37 to the south, SR 32 and its spurs along its western border, and via four-wheel-drive roads and trails from SR 93 in its northern area.

Only very limited physical facilities (such as parking lots) along existing activity corridors and a headquarters are planned to enhance the enjoyment of the wildlife area. Proposed activities are projected to result in approximately 380,000 visits annually, this estimate is broken down as follows:

ANNUAL ESTIMATED VISITATION

Number Visitors	**Use Type**
20,000	*Interpretation*
3,350	*Education*
280,000	*Nonconsumptive/Consumptive Wildlife Recreation*
28,688	*Hunting*
54,000	*Stream Fishing*
386,038	**TOTAL**

A number of refuge area activities such as photography, hiking, hunting, bird watching, trapping, and fishing may be duplicated to some degree elsewhere in the area. The contiguous Monongahela National Forest and Canaan Valley State Park or the nearby Spruce Knob/Seneca Rocks National Recreation Area and Blackwater Falls State Park, as well as other recreation areas within the state offer similar opportunities; however, nowhere else is there an area of such immense size with such a diversity of plant and animal life for potential nature study.

Ownership of the refuge area currently lies with corporate and private entities. The southern one-third of the valley, lying within the proclamation boundary of the U. S. Forest Service's Monongahela National Forest and therefore requiring a resolution of overlapping jurisdictions or joint or cooperative use if the refuge status is approved, presently comprises privately owned individual farms and residences. The northern two-thirds comprise private corporate holdings, including those associated with recreational development, such as Allegheny Properties, Inc., and those associated with utilities, such as Allegheny Power Systems, Inc.

1. INVOLVEMENTS

Schemes B and C would pass through the proposed Wildlife Refuge as shown on Exhibit IV-1 and would require an area for right of way of between approximately 150 acres and 223 acres or roughly one percent of the total area proposed.

Schemes B and C enter the proposed refuge area at the southwest corner, northeast of SR 32. Intersecting with SR 37 and following a northeasterly direction, Schemes B and C continue northeast along the base of Cabin Mountain. Schemes B and C ascend the western side of the mountain and pass through the rounded saddle at the summit, leaving the proposed refuge to continue on to Scherr.

Access to the proposed refuge area, particularly the southeastern section, would be improved by the construction of Schemes B or C, with a potential for an increase in usage over what might otherwise occur.

Where stream channel work or bridging would be required, attention will be given to the use of temporary and permanent erosion control measures. These measures could include seeding with fast-growing grasses, check dams, and sedimentation ponds. These efforts would minimize the temporary effects on water quality from the construction of new stream channels or structures.

Coordination with West Virginia Department of Natural Resources, U.S. Fish and Wildlife Service, and other agencies will be undertaken to provide a plan for minimizing erosion and to provide a plan for collecting and safely depositing suspended soils.

Visual effects of a four-lane highway through presently undeveloped land will be enhanced by design measures as necessary to make the highway as unobtrusive as possible.

An major concern in the routing of Schemes B and C through the proposed refuge is protection of the existing ecosystem. All necessary measures, such as those listed above, will be taken to insure its stability. Additional measures will include the construction of underpasses of the highway for safe passage in areas of heavy deer population. In areas where specific danger to any species has been noted by any of the coordinating agencies, consideration will be given to rerouting portions of the alignment or physical removal and replacement of the threatened life forms in adjoining areas. Design measures such as reduced medians, retaining walls, and shifts in alignments will be utilized, where feasible, should Scheme B or C be chosen.

2. AVOIDANCE ALTERNATIVES

Alternatives to the acquisition of right-of-way within the proposed Canaan Valley National Wildlife Refuge relative to Schemes B and C are provided by Schemes A, D, and E; however, Scheme A would require the use of 4(f) land from the Spruce Knob/Seneca Rocks Recreation Area and Schemes A, B, and D would require the use of 4(f) land from the Big Blue Trail.

An additional avoidance alternative to Schemes B and C through the proposed refuge is SubScheme K, which avoids entering Canaan Valley. Beginning west of Red Creek at SR 35/2 and turning northward, SubScheme K bridges Big Run, ascends Canaan Mountain and provides a connector with SR 72 before crossing Red Run and SR 13. Continuing northeasterly through undeveloped forest land for approximately eight miles, it bridges the Blackwater River before connecting with SR 93 common to Schemes D and E northeast of Davis.

While avoiding the Canaan Valley area, SubScheme K is a longer and more costly route which would provide lesser service to local population centers and lesser associated development potential than Schemes B or C. Affecting approximately 340 acres of undeveloped forest land and three streams, SubScheme K would involve steep grades through the mountains surrounding Canaan Valley.

Early in the original Corridor H study, a preliminary line passing to the south of Canaan Valley State Park and east of the proposed refuge was eliminated from further consideration because it would pass directly through Dolly Sods Wilderness.

3. MEASURES TO MINIMIZE HARM

Specific measures that will be used to minimize harm to the proposed Canaan Valley National Wildlife Refuge include, but are not limited to, the following:

a. Location and Design Measures

In specific areas where such action may be beneficial, sensitive location, use of retaining walls, or reduction of median width or total roadway width may be utilized to reduce the acreage required of the potential Section 4(f) property. Strict access control would be instituted to restrict access to Canaan Valley.

b. Replacement

Should any property necessary for the highway be publicly owned prior to construction, it will be replaced in kind.

c. Landscaping

Sensitive landscape treatment will lessen visual impacts and blend the highway into existing surroundings, including retention of as much existing vegetation as possible and revegetation.

d. Steam Features

Where possible, natural stream bottoms will be used. In addition, all possible erosion and sedimentation control measures (including seeding with fast-growing grasses, check dams, and sedimentation ponds) will be used to maintain existing habitat as much as possible. Extensive coordination will be undertaken with all agencies during the design stage, should Schemes B or C be selected.

4. COORDINATION

Coordination to date includes input and assistance from the U.S. Department of the Interior, Fish and Wildlife Service relative to the proposed boundary revision and related information.

I. BIG BLUE TRAIL

The Big Blue Trail is the southwestern section of a long circuit trail consisting of the Appalachian Trail on the east and the Tuscarora Trail in the northwest. The Big Blue is 144 miles long. It begins in the north at Hancock, Maryland, on the C&O Canal Towpath under the US 522 bridge. The southern terminus is the place where it connects with the Appalachian Trail in the Mathews Arm section of the Shenandoah National Park. The overall route of the Big Blue Trail is shown on Exhibit IV-1.

The Big Blue Trail was conceived in the 1960's as a major segment of an alternative to a portion of the Appalachian Trail, there being concern that the continuity of the Appalachian Trail might be interrupted due to the closing of the Trail by private landowners. It was completed in 1981 and consists of some public ownership, use of private land with permission, and some areas where it follows existing roads.

The Big Blue Trail traverses the eastern portion of the Corridor H Study Area in a north-south direction. Consequently, all corridor Scheme Options cross it. Options under Schemes C and E cross the Big Blue Trail as they generally parallel U.S. Route 50 near Gore. At this point, the Trail merely follows state roads and is not in separate public ownership and therefore not considered a Section 4(f) property.

Options under Schemes A, B, and D cross the Big Blue Trail as they generally parallel SR 55, where the Trail follows the crest of Great North Mountain. Here the Trail is within the George Washington National Forest and is in public ownership. The Trail is maintained though a cooperative agreement by the U.S. Forest Service and the Potomac Appalachian Trail Club. This portion of The Big Blue Trail is considered a Section 4(f) property.

The function of the Trail is traditional hiking aimed at the serious hiker/backpacker, although the Trail is accessible in segments so that less rigorous excursions are available to the occasional hiker.

Facilities consist of the Trail itself. Plans include the continuing improvement of the Trail by acquiring additional routes through natural areas to replace those portions where the Trail simply follows a road.

Access to the Trail is from the various public roads crossed by the Trail. The Trail is accessible in logical segments as described in the *The Big Blue, A Trail Guide*, published by the Potomac Appalachian Club in 1987.

No count of current number of users has been made. The 1981 Corridor H Section 4(f) Statement estimated that 1,680 hikers used the Trail annually. It is likely that this number has increased due to publicity from the publication of the *Trail Guide*, ongoing improvements to the Trail, and a general increase in interest in outdoor activities.

The relationship of The Big Blue Trail to other similarly used lands in the vicinity is that it is unique in the study area as a long continuous Trail. In connection with the Tuscarora Trail to the north, it provides both a link and a more rural alternative to the more traveled Appalachian Trail.

While deed research has not been conducted, it is presumed that The Big Blue Trail, in the vicinity of Options under Schemes A, B, and D, is in fee simple public ownership.

1. INVOLVEMENTS

As noted, Options under Schemes A, B, and D essentially follow the alignment of SR 55 in the area of the crossing of the Big Blue Trail. The Trail currently crosses SR 55 at grade at the crest of Great North Mountain. Should Schemes A, B or D be selected, the impact will be that the Trail will cross a four-lane divided controlled access highway rather than a two-lane highway. Acquisition of public land occupied by the Trail would be necessary for highway right-of-way. Replacement land could take the form of an area for additional parking for hikers who wish to begin and/or end at this point. Depending on the highway design, access to the trail could be less convenient and the safe crossing of the new highway could be a challenge. This effect would be mitigated by the provision of an overpass or adequate at-grade crossing to ensure that hikers can safely cross the new highway.

Noise and air pollution impacts are not expected to be substantial in comparison to the existing condition, since Options under Schemes A, B, and D follow existing SR 55. Only the increase in traffic would be any factor. The visual intrusion of the new highway would not enhance the wilderness hiking experience; however, careful and appropriate landscape treatment would minimize the effect of crossing a wider right-of-way. Should a Trail overpass prove to be the best solution, a case can be made from a public safety perspective that it is safer to cross a four-lane highway on a pedestrian bridge than it is to cross a two-lane highway at grade.

2. AVOIDANCE ALTERNATIVES

The Big Blue Trail traverses the entire width of the eastern portion of the study area in a generally north/south direction. For this reason, it is impossible not to cross the Trail within the given parameters of the study.

Alternatives to avoid the portion of the Trail considered to be Section 4(f) property would be the selection of Schemes C or E. (See Alternatives Section for description of Scheme C and E.)

3. MEASURES TO MINIMIZE HARM

Measures available to minimize the impacts of Schemes A, B, and D on The Big Blue Trail include:

a. Design Measures

Where such action may be beneficial, a grade separation structure and reduction of median width or of total roadway width may be utilized to reduce the Section 4(f) take. Such an overpass or at-grade crossing will provide safe access for hikers between trail sections.

b. Replacement

All publicly owned land will be replaced in kind.

c. Landscaping

Sensitive landscape treatment will be employed to lessen visual impacts to hikers and blend the highway into existing surroundings. This would include revegetation and retention of as much existing vegetation as possible.

d. Coordination

Extensive coordination will be undertaken with appropriate agencies and groups, especially the U.S. Forest Service and the Potomac Appalachian Trail Club.

4. COORDINATION

Coordination to date includes input from the U.S. Forest Service and the Potomac Appalachian Trail Club. Background information includes comments relative to the Big Blue Trail from the 1981 DEIS review process.

SECTION V:
List of Preparers

SECTION V: LIST OF PREPARERS

This document was prepared by the U.S. Department of Transportation, Federal Highway Administration, and the West Virginia State Highway and Transportation Department, with assistance from Michael Baker Jr., Inc., consulting engineers and planners.

FEDERAL HIGHWAY ADMINISTRATION (FHWA)

Mr. Charles O'Neill	B.S. degree with 12 years experience in Transportation.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Mr. Ben L. Hark Environmental Services Section Chief	M.A. degree in Guidance and Counseling with 19 years experience at WVDOT - Division of Highways.
Mr. Norse B. Angus Environmental Analyst	B.S. degree in Biology with 8 years experience with WVDOT - Division of Highways.
Ms. Susan Byrd-Yurkiewicz Environmental Analyst	B.S. degree in Wildlife Resources with 2 years experience with WVDOT - Division of Highways.
Mr. James Colby Geologist	B.S. degree in Geology with 8 years experience.

MICHAEL BAKER JR., INC.

Mr. Philip A. Shucet, Manager Transportation Planning Department ***Project Manager.***	B.A. degree with 20 years Transportation Planning experience.

Ms. Susan Manes-Harrison Environmental Scientist ***Assistant Project Manager, Document Preparation, Visual Analysis, Section 4(f)/6(f) Analysis Farmlands, Hazardous Materials***	M.S. degree in Natural Resource Management with 6 years experience in environmental analysis and document preparation.
Mr. Robert C. Siegfried, II Senior Environmental Scientist ***Document preparation, Natural Resource Analysis***	M.A. degree in Marine Science with 7 years experience in wetland delineations and environmental analysis.
Ms. W. J. "Marsh" Zellhoefer Environmental Scientist **Document Preparation, Wetland Analysis.**	B.A. degree in Biology with 13 years experience in wetland ecology, wildlife biology, and water quality.
Mr. Ernst F. Aschenbach, III Environmental Scientist ***Farmlands, Threatened and Endangered Species, Wildlife and Vegetative Analysis***	B.S. degree in Biology/Ecology with 5 years experience in aquatic and terrestrial ecology, environmental monitoring, and document preparation.
Mr. William J. Jeffords, Jr. Environmental Scientist ***Water Resources, Farmlands, Hazardous Materials***	B.S. degree in Secondary Science Education with 6 years experience in aquatic and terrestrial ecology.
Mr. Joseph S. Shalkowski Environmental Scientist ***Needs Analysis, Socioeconomic Analysis***	B.S. degree in Environmental Resource Management with 8 years experience in environmental document preparation.
Mr. Edward J. Siemon, III Senior Archaeologist ***Prehistoric Archaeology; Cultural Resources Studies***	B.A. degree in Anthropology with 15 years experience in archaeology and cultural resource studies.
Dr. Ronald C. Carlisle Director, Cultural Resources ***Historical Archaeology; Historic Structures; Cultural Resource Studies***	B.A. degree in History and Anthropology; M.A. degree in Anthropology; and Ph.D. degree in Anthropology with 20 years experience in historical architectural and archaeological projects.

MICHAEL BAKER JR., INC. (cont'd)

Dr. William C. Johnson Senior Archaeologist ***Prehistoric Archaeology; Cultural Resource Studies***	B.A. degree in History; M.A. degree in Anthropology; and Ph.D. degree in Anthropology with 22 years experience in prehistoric and historic archaeological projects.
Ms. Alice K. Smith Environmental Scientist ***Historical and Archaeological Background Work***	B.A. degree in Anthropology with 7 years experience in archaeological analysis.
Ms. Mara R. Pritchard, P.E. Traffic Engineer ***Needs Analysis, Transportation and Traffic Engineering***	B.S. degree in Civil Engineering with 4 years experience in transportation planning and traffic engineering.
Mr. Max L. Heckman, P.E Assistant Engineering Manager ***Needs Analysis and Transportation and Traffic Analysis***	B.S. degree in Civil Engineering with 9 years in directing and conducting transportation and traffic planning.
Mr. Robert A. Dudash, P.E. Senior Traffic Engineer ***Needs Analysis, Transportation and Traffic Analysis***	M.S. degree in Civil Engineering with 16 years of traffic control engineering and analysis.
Mr. Dominic F. Saulino Assistant Engineer II ***Construction and Hazardous Materials***	B.S. degree in Civil Engineering with 14 years experience in mass transit, highway, and pipeline distribution systems.
Mr. William E. Rock, Jr., P.E. Engineer ***Design of Section 4(f) Avoidance Alignment***	B.S. degree in Civil Engineering with 14 years experience in transportation and site development for governmental agencies.
Mr. Donald G. Petcovic Assistant Engineering Manager ***Design of Section 4(f) Avoidance Alignment***	38 years of experience in highway design, field survey, and right-of-way compilation.
Mr. Benjamin P. Thayer, P.E. Engineering Manager ***Design of Section 4(f) Avoidance Alignment***	B.S. degree in Civil Engineering with 35 years experience in highway and bridge design.

<u>**MICHAEL BAKER JR., INC. (cont'd)**</u>

Mr. David DiBenedetto Environmental Scientist ***Computer Based Graphics***	M.S. degree in Geography with 15 years experience in the development of Geographic Information Systems, environmental research, and remote sensing, mapping, and surveying.
Ms. Mary R. Rosick, P.E. Engineer ***GIS Programming,*** ***Computer Based Graphics***	M.S. degree in Civil Engineering with 5 years experience in structural analysis, interactive graphics software development (IGDS) and computer drafting and programming.
Mr. Mark S. Fetch Drafting Technician ***Computer Based Graphics***	15 years experience as a graphics operator for geological projects.
Mr. Willard L. Smith Senior Planner ***Section 4(f)/6(f) Analysis***	M.A. degree in Government with 26 years experience in planning analysis, concept development, and master plan preparation and design.
Mr. Thomas J. Yucha Assistant Engineer ***Water Resource Field Verification,*** ***Farmlands***	B.S. degree in Civil Engineering with 5 years experience in highway design, bridge inspection, and environmental projects.
Mr. Michael J. Nutting Geophysicist ***Geophysical Survey of Bowden*** ***Fish Hatchery***	M.S. degree in Geophysics with 16 years experience in multi-discipline geophysical surveys.
Mr. Preston Turner Senior Geologist ***Geophysical Survey of Bowden*** ***Fish Hatchery***	M.S. degree in Geology with 18 years in geological/geotechnical investigations.
Mr. Jeffery A. Pusateri Assistant Environmental Scientist ***Assisted with Field Work***	8 years of environmental-related work, including assisting wetland delineations, archaeological investigations, and noise monitoring.
Mr. Randy D. Luketic Drafting Technician II ***Computer Based Graphics***	5 years experience as a CADD operator for highway and environmental projects.
Ms. Kather M. Bradley Engineering Technician ***Computer Based Graphics***	11 years experience as Drafting Technician and CADD operator for highway, traffic, and environmental projects.

MICHAEL BAKER JR., INC. (cont'd)

Mr. S. Christopher Earley Drafting Technician ***Computer Based Graphics***	9 years experience as CADD operator for highway design projects.
Mr. Carlo L. Leo Drafting Technician ***Computer Based Graphics***	12 years of experience as CADD operator for highway and bridge design.
Ms. Deborah L. Brimner Graphic Artist ***Cover Graphics, Free-hand Graphics***	14 years experience as graphic artist.

SECTION VI:
Distribution of Statement

SECTION VI: DISTRIBUTION OF STATEMENT

Copies of the Supplemental Draft Environmental Impact Statement have been distributed to the following agencies and organizations:

A. FEDERAL AGENCIES

1. United States Army Corps of Engineers
2. United States Environmental Protection Agency-Region III
3. United States Fish and Wildlife Service
4. National Park Service
5. Office of Environmental Project Review
6. Federal Railroad Administration
7. United States Department of Agriculture
8. United States Soil Conservation Service
9. Federal Highway Administration

B. STATE OF WEST VIRGINIA

1. West Virginia Division of Natural Resources
2. West Virginia Department of Commerce, Labor, and Environmental Resources
3. West Virginia Department of Education and Arts

C. COMMONWEALTH OF VIRGINIA

1. Virginia Department Transportation
2. Virginia Department of Game and Inland Fisheries
3. Virginia Department of Conservation and Recreation
4. Virginia Department of Historic Resources
5. Virginia State Water Control Board

D. PRIVATE INTEREST GROUPS

1. Potomac Appalachian Trail
2. The Nature Conservancy - The West Virginia Chapter
3. The Wildlife Society - The West Virginia Chapter
4. Trout Unlimited - Allegheny Highlands Chapter
5. Trout Unlimited - The West Virginia State Council
6. West Virginia Highlands Conservancy
7. West Virginia Citizens Action Group
8. West Virginia Wildlife Federation
9. Pine Ridge Ecological Laboratory
10. Mountain Stream Monitors
11. National Wildlife Federation - Mid-Atlantic Region
12. Brooks Bird Club
13. Cacapon River Conservancy
14. League of Women Voters of West Virginia
15. Mountaineer Audubon Society
16. Sierra Club - Eastern Panhandle Chapter
17. Sierra Club - West Virginia Chapter

SECTION VII:
Comments and Coordination

SECTION VII: COMMENTS AND COORDINATION

A public involvement program was initiated for the Corridor H SDEIS to address the concerns of federal, state, and local agencies, as well as those concerns expressed by the general public. The public involvement program began with a formal Scoping Meeting and was expanded by WVDOT to include an extensive interagency consultation effort and numerous public meetings. This section describes the scoping process, WVDOT's involvement in agency and public meetings conducted since the scoping meeting, and written comments received from the public.

A. SCOPING PROCESS

The public involvement program was initiated with a formal Scoping Meeting on October 30, 1990. This meeting served as a forum for explaining project history and established a standard for future communications with the public. The scoping meeting is described in the document titled: *Scoping Meeting: Materials, Minutes, Comments: Appalachian Corridor H*, West Virginia Department of Transportation Division of Highways, April 1991.

B. PUBLIC MEETINGS CONDUCTED SINCE THE SCOPING MEETING

A number of formal and informal meetings have been sponsored by various public groups to discuss the proposed project.

1. ELKINS TOWN MEETING

A town meeting was held in Elkins, WV, on Thursday, February 14, 1991, at the Federal Building courtroom. The meeting was attended by over 60 area residents. Four area transportation officials served as commentators during the forum: Mike Wenger of the Appalachian Regional Commission; Roger McMahon, President of the Randolph County Development Authority; Tom Staud, District 8 Engineer for the West Virginia Department of Transportation, Division of Highways; and Jay Carter, Manager of the West Virginia Public Transit Authority. The discussions were wide-ranging and included: the history of the Appalachian Development Highway System;

funding for West Virginia highway projects; the history and status of Corridor H; and economic development in West Virginia.

2. TUCKER COUNTY MEETING

A citizens' meeting was held at Canaan Valley Resort on Tuesday, April 9, 1991, and was attended by over 100 area residents. The meeting was sponsored by the Tucker County Commission, the Development Authority, Planning Commission, Allegheny Front Regional Development Corporation, the County's Convention and Visitors Bureau, Chamber of Commerce, and Alpine Festival, Inc. The West Virginia Department of Transportation, Division of Highways was represented by Randolph Epperly. Michael Baker Jr., Inc. was represented by Phil Shucet, Ernie Aschenbach, and Bill Jeffords.

Numerous area residents expressed their reasons for believing that Corridor H should be routed via the northeast route through Tucker County. Justification for the northern route included: potential future connection with Corridor O (proposed route connecting Toronto, Canada and Elkins, West Virginia); avoidance of more populated areas impacted by the southern alignment; facilitation of tourists coming to Canaan Valley State Park; reduced environmental impact; and reduced impact to Section 4(f) properties.

3. WEST VIRGINIA HIGHLANDS CONSERVANCY

As part of its annual meeting at Yokum's Vacationland and Campground in Seneca Rocks, WV, the Conservancy held a public forum on Saturday, May 4, 1991. The meeting's topic was the possible routing of Corridor H and the potential impacts associated with its construction through sensitive and unique areas. The panelists for the forum are identified below.

Mary Wimmer, representing the West Virginia Sierra Club, discussed her role in developing the U. S. Forest Service's *Monongahela National Forest: Land and Resource Management Plan*. A brief discussion of the Committee on Corridor H recommendations, as written in their Spring 1990 position paper, ensued. There was further emphasis on the many potential environmental impacts (Bowden Fish Hatchery, unique topographic features, wilderness areas, wild and scenic rivers, national forest), along with a proposal for a parkway (like the Cranberry Glades Scenic Parkway) rather than a highway.

Norm Roush, representing the West Virginia Department of Transportation, Division of Highways, discussed the design criteria of the proposed facility, plus possible mitigation techniques (possibility of WVDOT donating right-of-way to the U. S. Forest Service), safety, and maintenance issues.

Larry Miller, Chairman of the Eastern Panhandle Coalition for Corridor H (Mr. Miller is also a member of the Hampshire County Development Authority, but he represented the Eastern Panhandle Coalition at this meeting). Mr. Miller stated for the record that the Coalition supports the northern alignment. The Coalition also officially suggested a revision to the northern alignment (following the existing northern alignment from Elkins to Romney, continuing to Martinsburg following Route 29). He further suggested that the southern route would have too many negative environmental and socioeconomic impacts. The southern route would also "make folks forget about West Virginia's Eastern Panhandle".

Phil Shucet and Susan Manes-Harrison, representing Michael Baker Jr., Inc., answered questions as needed.

4. TUCKER COUNTY ROTARY CLUB

A meeting was held in Davis, WV, on Thursday, June 20, 1991. Fred VanKirk, Commissioner of the West Virginia Department of Transportation, told club members that a final decision on Corridor H would not be made until the spring of 1993. He also discussed environmental issues and potential drawbacks of the various routes.

5. HAMPSHIRE COUNTY CHAMBER OF COMMERCE

Approximately 100 citizens attended an open forum that was held on Tuesday, June 25, 1991, in Augusta, WV, sponsored by the Hampshire County Chamber of Commerce. The discussion was moderated by Ed Bishop, a representative of the Capon Valley Ruritans Club. Panelists at the meeting were asked to discuss the Corridor H project and its potential impacts.

Ben Hark, representing the West Virginia Department of Transportation, Division of Highways-Environmental Section, discussed the project's history and status. Susan Manes-Harrison, representing Michael Baker Jr., Inc., answered questions as needed. Larry Lemon, the Northern Area Coordinator for Senator J.D. Rockefeller, IV, discussed the concept of the Appalachian Corridor System and the federal funds allocated to West Virginia for transportation projects. George Constantz, representing the Pine Run Ecological Lab, discussed the potential environmental impacts.

The public expressed the following general concerns: potential funding sources, discussion of a preferred alternative in the SDEIS, consideration of a No-Build Alternative, availability of various Technical Reports and the *Traffic and Transportation Needs Analysis* document, cost per mile, potential impact to wildlife movement, and potential impact to regional socioeconomics and culture.

C. RESOURCE AGENCY MEETINGS CONDUCTED SINCE THE SCOPING MEETING

Since the Scoping Meeting, numerous informal meetings, phone conversations, and written exchanges of information have taken place with various local, regional, state, and federal authorities. (See Appendices B through G for pertinent correspondence.)

Prior to distributing the corridor SDEIS, WVDOT and FHWA conducted a workshop for federal resource agencies on May 5th and 6th, 1992, in Charleston, WV. The purpose of the workshop was to discuss how issues raised at the 1990 Scoping Meeting were addressed in the working draft SDEIS, as well as to determine if sufficient information was presented or if additional data would be necessary. During this two-day meeting, representatives of WVDOT and Michael Baker Jr., Inc. provided an overall description of the workshop purpose and objectives, project status and projected schedule, and detailed discussions of issues and assessment methodologies. Agency representatives were provided an opportunity to comment at any time during the course of the workshop. (Copies of the workshop minutes are available from WVDOT. This includes a list of all agency representatives at the meeting.)

Working draft copies of the corridor SDEIS and the various supporting Technical Reports were distributed to agencies in attendance. WVDOT requested comments on the working draft from the agencies. Once all agencies had provided written comments, WVDOT compiled the agency letters and distributed a complete set to all representatives attending the workshop. This corridor SDEIS has been revised based on the agency comments received following the May 5th and 6th workshop. A summary matrix of comments received and how they were addressed in the corridor SDEIS, as well as copies of the agency letters, are located at the end of this Section.

A follow-up resource agency workshop was held September 23rd and 24th, 1992, in Charleston, WV. The purpose of this workshop was to provide an opportunity for WVDOT to discuss the changes made in the corridor SDEIS: i.e., to go over the comments received, how WVDOT responded to those comments and incorporated the information into the corridor SDEIS, and where these revisions can be found. This workshop facilitated a more comprehensive document review by the various resource agencies during the public review process.

D. PUBLIC CORRESPONDENCE

Expressions of concern were received from numerous entities. In order to better facilitate response to written concerns, letters received were divided into three categories: general citizens, business interests, and special interest groups. This section provides an overview of written comments from each category.

Letters received up to September 1, 1992 from general citizens included a wide range of comments:

- 15 letters expressed support of Scheme A and 44 letters expressed opposition to Scheme A.
- 11 letters expressed support of Scheme B and 34 letters opposed Scheme B.
- 32 letters expressed opposition to Scheme C.
- 3 letters expressed support of Scheme D and 32 letters expressed opposition to Scheme D.
- 38 letters expressed support for Scheme E and 6 letters expressed opposition to Scheme E.
- 3 letters expressed unconditional opposition to the project.
- 4 letters expressed support for the No-Build Alternative.
- 4 letters expressed general project support, without regard to the corridor chosen.
- 2 letters requested that a low-impact highway design be used.
- 12 letters requested avoidance of Seneca Rocks, Spruce Knob, and Canaan Valley.
- 16 letters requested avoidance of the Monongahela National Forest.
- 9 letters requested avoidance of Dolly Sods Wilderness.
- 1 letter stated that maintenance of existing roads needs to take priority over construction of a new highway.
- 1 letter requested maintaining the integrity of black bear habitat.

Letters received up to September 1, 1992 from business interests also included a wide range of comments:

- 41 letters expressed support of Scheme A and 4 expressed opposition to Scheme A.
- 15 letters expressed support of Scheme B and 3 expressed opposition to Scheme B.
- 3 letters expressed opposition to Scheme C.
- 3 letters expressed opposition to Scheme D.

- 8 letters expressed support for Scheme E and 9 letters expressed opposition to Scheme E.
- 1 letter expressed opposition to all existing proposals.
- 1 letter expressed support for the No-Build Alternative.
- 1 letter requested a dual-lane facility with unlimited access.
- 1 letter was a request for information.
- 1 letter stressed the importance of avoiding impact to Dolly Sods.
- 1 letter stressed avoidance of Dolly Sods.
- 1 letter stressed the importance of upgrading feeder roads along the main arterial interstate highways.

Letters received up to September 1, 1992 from special interest groups also included a wide range of comments. Most of these letters were from environmental groups. Letters received from the West Virginia Chapter of the Sierra Club expressed support of a northern route and a parkway design. Two local chapters and the West Virginia Council of Trout Unlimited opposed the southern route and supported a northern route. The Nature Conservancy letter expressed their objection to any corridor that would cross its property at Greenland Gap. The West Virginia Wildlife Federation opposed the southern route and supported upgrading existing roads. The West Virginia Highlands Conservancy opposed any corridor traversing Canaan Valley and urged consideration of Scheme E. The Pine Run Ecological Laboratory expressed concern about impacts to the Cacapon River, and supported the idea of a parkway design. A proposal for project-related research was received from a member of Wheeling Jesuit College's Biology Department.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS:

Follow-Up Comments to the
May 5th and 6th, 1992 Resource Agency Workshop

The Resource Agency Workshop generated comments on the preliminary draft SDEIS from the following resource agencies:

- U.S. Department of the Army - Corps of Engineers (ACOE), Pittsburgh District (Letter dated 6/23/92).
- U.S. Department of Agriculture - Soil Conservation Service (SCS) (Letter dated 6/16/92).
- U.S. Environmental Protection Agency (EPA), Region III (Letter dated 7/2/92).
- U.S. Department of the Interior - Fish and Wildlife Service (FWS)
- U.S. Department of Agriculture - Monongahela National Forest (MNF) (Letter dated 6/30/92).
- W.V. Department of Commerce, Labor and Environmental Resources - Division of Natural Resources (DNR) (Letter dated 6/30/92).
- W.V. Division of Culture and History (DCH) (Letter dated 7/2/92).
- In addition to resource agency comments, WVDOT received comments on the preliminary draft SDEIS from the Public Lands Chair (Ms. Mary Wimmer) of the Sierra Club's West Virginia Chapter (Letter dated 6/18/92).

A summary of the comments received, by resource agency, has been compiled in the Summary Matrix which follows. The matrix provides a brief summary of WVDOT's response to the agency comments and identifies the location of the applicable revisions within the document. Resource agency comments have been numbered for ease of response. Copies of the letters received with the appropriate comment reference numbers follow the Summary Matrix.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
US Dept. Army COE, Pittsburgh District	ACOE - 1	Concluded that document is sufficiently comprehensive for a corridor-level study	N/A	No response necessary
USDA - Soil Conservation Service	SCS - 1	In light of purpose of selecting highway corridor, data provided adequately addresses natural resources and environmental concerns	N/A	No response necessary
		FLOODPLAINS		
	SCS - 2	Potential for impacting large number of impoundments built by SCS for flood protection in Potomac River Basin. This information not necessary to make corridor selection	N/A	Locations of and impacts to SCS flood protection projects will be evaluated in detail in the subsequent Alignment SDEIS.
	SCS - 3	Because area has high potential for flash flooding, avoidance of floodplains should be prime consideration in corridor selection.	N/A	No response necessary
US EPA - Region III	EPA - 1	Current document provides good foundation on which to base subsequent decisions.	N/A	No response necessary
	EPA - 2	Exhibits should be easier to read and interpret	Entire Document	Exhibits have been revised throughout the document.
	EPA - 3	More references to Technical Reports	Entire Document	Suggestion has been incorporated in text throughout SDEIS
	EPA - 4	In Summary Section, include George Washington National Forest under "Other Major Federal Actions"	Summary B.2	This has been added
	EPA - 5	Expand economic development discussion	Sect I-C and Sect III-G	Discussion has been expanded
	EPA - 6	From regional standpoint, what percentage of use would be from through-traffic	Sect I-D	Traffic figures have been updated; 14 to 26 % of the traffic on the proposed facility would be through traffic in the design year 2010.
		SUMMARY		
	EPA - 7	Summarize negative impacts of highway construction	Summary D.2	Summary has been revised, identifying overall beneficial and adverse involvements, as well as adverse involvements by Scheme
	EPA - 8	Delete reference to and quote from Green Jones (EPA)	Sect I-C	This has been deleted

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
US EPA - Region III	EPA - 9	Compare accident rates to other Appalachian states	Sect I-H, Sect II	Comparing accident rates of different states does not provide an accurate reflection of the facility condition since the methodologies used in gathering the data differ throughout the nation's state transportation departments.
	EPA - 10	Recommend considering design exceptions	Sect II-B, C, D, F	A four-lane, divided facility best meets the purpose of and need for the project.
				However, following selection of a preferred corridor, design exceptions will be considered in the Alignment SDEIS.
	EPA - 11	Need to clarify Scheme, SubScheme, Scheme Option terminology	Sect II-C, D	Terminology has been clarified throughout the document. Section II provides in-depth explanation
	EPA - 11	Identify Schemes which would be carried into the next EIS stage and provide impact analysis for those Schemes only	N/A	All 24 corridor Scheme Options are being equally evaluated at this corridor-level of study. None of these Scheme Options will be dropped prior to selection of a preferred corridor.
		LAND USE		
	EPA - 12	Discuss impacts to recreation resources	Sect III-U	A new subsection "Recreation Resources" has been added to the document to cover potential project involvements
	EPA - 13	Reexamine consistency with MNF Management Prescriptions	Sect III-C.5	Consistency determinations have been revised
		STREAMS		
	EPA - 14	Recommends screening criteria used to assign value rating to streams be consistent with state's criteria	Sect III-K	SDEIS has been revised to identify stream classifications - National Resource Waters (NRW) and High Quality Streams - instead of Resource Value
	EPA - 14	Need more detailed information for each stream crossing	Sect III-K	SDEIS has been revised to identify if the stream is perpendicular or parallel to the corridor. Greater detail will be provided in the Alignment SDEIS
		WETLANDS		
	EPA - 15	Generally pleased with new level of effort placed on quantifying and qualifying wetlands resources and impacts	N/A	No response necessary

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
US EPA - Region III	EPA - 16	Ensure process and procedures used to address impacts to waters of the U.S. are in full compliance with Section 404(b)(1) Guidelines	Sect III	WVDOT is committed to ensuring compliance
	EPA - 17, 18	Potential impacts assigned to corridors could be misleading without more detailed look at ways alignments could avoid and minimize impacts	Sect III-L	More detailed analyses of wetlands identification, functions and values, and avoidance and minimization will be conducted for the Alignment SDEIS
	EPA - 19	Emphasize 40 CFR 230.10(a) requires no discharge of fill be permitted where practicable alternatives exist, so long as other significant adverse environmental impacts would result	Sect III-L	This requirement is recognized and being given careful consideration. The focus of NEPA process is to identify ALL potential impacts and select a corridor which would be least damaging overall.
		VEGETATION AND WILDLIFE		
	EPA - 20	Disagree with use of MNF management objectives to determine impacts to wildlife, since they focus on commercial (big-game) species	Sect III-M	Assessment using MNF management objectives has been eliminated, but reference to territory sizes or population densities has been made. Expanded discussion of non-game species.
				During the Alignment SDEIS, land cover mapping and HEP analysis of upland habitat will be conducted to better address non-game species.
	EPA - 21	Forest fragmentation - impacts on migratory birds	Sect III-M	Methods of minimizing forest fragmentation are provided. Discussion of fragmentation has been expanded.
				Detailed determination of impacts on populations not possible due to lack of basic scientific understanding of effect of fragmentation on different populations
	EPA - 22	EPA defers to Fish and Wildlife Service for comments on Threatened and Endangered Species.	N/A	No response necessary
		NOISE AND AIR QUALITY		
	EPA - 23, 24	Air and Noise analyses should be performed	Sect III-I, J	General analyses appropriate for a 2,000 foot-wide corridor study have been performed and are documented in the SDEIS.
				Microscale analyses for air and noise will be conducted and documented in the Alignment SDEIS.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
US EPA - Region III	EPA - 25	Not sufficiently addressed	Sect III-E	Discussion of secondary and cumulative impacts has been expanded in both Section I and Section III. More detailed analyses will be conducted for the Alignment SDEIS.
US DOI - Fish & Wildlife Service		***PURPOSE AND NEED***		
	FWS - 1	Pre-draft does adequate job of describing purpose and need	Sect I	No response necessary
		ALTERNATIVES		
	FWS - 2	SDEIS would be improved if it would frequently refer reader to more in-depth coverage of topic in Technical Reports	Entire Document	Where appropriate, involvements have been summarized and references to more in-depth information have been provided.
	FWS - 3	Discussion of alternatives considered but eliminated was inadequate with respect to Improved Roadway Alternative	Sect II-B.3	This discussion has been expanded
	FWS - 4	Recommends that number of Scheme Options presented and reviewed in SDEIS be limited to those that are practical and feasible from a permitting or cost standpoint	Sect II, III	Terminology has been clarified throughout the document. Section II provides in-depth explanation All 24 corridor Scheme Options are being equally evaluated at this corridor-level of study. None of these Scheme Options will be dropped prior to selection of a preferred corridor.
	FWS - 5	Resources adversely affected proposed corridors should be quantified and summarized in a table for comparison	Summary	A comparison of potential involvements (adverse and beneficial) is provided on Table S-2 "Summary Matrix".
	FWS - 6	WVDOT should utilize GIS database for "best fit" of Alignments within corridors at the corridor-level stage.	N/A	Use of GIS database to assist in "best-fit" Alignment (to avoid or minimize impacts) will be used extensively for the Alignment SDEIS.
	FWS - 7	Secondary Impacts	Sect I, III-E	Discussion of secondary and cumulative impacts has been expanded in both Sect I and Sect III. More detailed analyses will be conducted for the Alignment SDEIS.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
US DOI - Fish & Wildlife Service		***Noise***		
	FWS - 8	Noise analysis should be performed	Sect III-I, J	General analysis appropriate for a 2,000 foot-wide corridor study has been performed and documented in the SDEIS.
				Microscale analysis for noise will be conducted and documented in the Alignment SDEIS.
		Visual		
	FWS - 8	Visual impacts should be addressed	Sect III-T	Analysis of potential visual resource involvements has been incorporated into the SDEIS
		Wetlands		
	FWS - 9	Service takes exception to WVDOT's assignment of resource values to wetlands. All wetlands are proteted by state and/or federal law or executive order. Service feels that rating resource value of wetlands should only be factored in for mitigation (compensatory) purposes after all efforts to avoid wetlands are exhausted.	Sect III-L	Valuation of wetlands was conducted to comply with FHWA's Technical Advisory T6640.8A and EPA's 404(b)(1) Guidelines, and is seen to be a necessary part of the SDEIS. Wetland resource value section was modified to include all factors involved in the National Resource Waters (NRW), and is now more comprehensive than the NRW designation. It should be noted that this valuation is not meant to imply that one class of wetlands will be afforded more protection than another; all wetlands will be avoided to the extent practicable. More detailed evaluation of wetland functions and values will be conducted during the Alignment SDEIS
		Bowden Fish Hatchery		
	FWS - 10	Discussion of potential impacts to Bowden Fish Hatchery and the north spring recharge area should be expanded	Sect III-K	SDEIS text has been revised to incorporate much of the text in the Natural Resources Technical Report
		Threatened and Endangered Species		
	FWS - 11	SDEIS does not contain most recent information on E/T species	Sect III-Q	Resource agency office visits were conducted to update all information. This information has been included in the revised SDEIS.
	FWS - 11	Biological Assessment should be conducted	N/A	Biological Assessment will be conducted for the Alignment SDEIS
	FWS - 12	SDEIS does not address Candidate species	Sect III-Q	Text has been revised to include Candidate species

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
US DOI - Fish & Wildlife Service	FWS - 13, 14	SDEIS does not address Species of Special State Concern	Sect III-Q	Text has been revised to include vertebrate species of special state concern, but there is no listing for plants or invertebrates. Therefore, S1 and S2 species were used.
		Section 4(f)/6(f) Inventory		
	FWS - 15	Recommends MP 5 be evaluated as potential Section 4(f) properties.	Sect IV	None of the corridors have a direct involvement with MP 5 areas (Congressionally Designated Wilderness). Potential proximity impacts (if any) will be evaluated for the Alignment SDEIS.
	FWS - 16	SDEIS provides only brief coverage of direct and indirect impacts to MP 5, 6.1, 6.2, and 8 areas.	Sect IV	Discussion of direct impacts to MP 6.1 and 6.2 areas has been expanded. Potential proximity impacts (ie; indirect impacts) will be evaluated for the Alignment SDEIS.
		Summary		
	FWS - 17	Revise description of roadways between Gore and Winchester	Summary	Incorrect roadway descriptions have been corrected
	FWS - 18	"Other Government Actions": Update information on Canaan Valley Wildlife Refuge, include Monongahela and George Washington National Forest Management Plans	Summary F	This subsection has been revised, based on these comments
	FWS - 19	Concerned that 2,000 foot-wide corridor may exaggerate impacts	Summary, Sect III	Assessment methodology used in this SDEIS provides a means to compare the 24 corridor Scheme Options. Throughout Section III, clarification has been provided that actual right-of-way impacts for a specific alignment located within the preferred corridor will be much less than those reported in the 2,000 foot-wide corridor inventory.
	FWS - 20	Service concurs with inclusion of NRA, MP 6.1, and MP 6.2 in Section 4(f) evaluation. Recommends their recreational value, as well as visual and noise (indirect) impacts, be addressed.	Summary, Sect III, Sect IV	Impacts to these resources are discussed under the impact headings "Noise", "Visual Resources", and "Recreation Resources".
	FWS - 21	Summary Matrix should include all impacts. Discussion should include them as well.	Summary	Text and table have been revised accordingly
		Purpose and Need		
	FWS - 22	Mention of 13 mile, 4-lane section west of Winchester has been overlooked	Sect I	Text revised accordingly

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
US DOI - Fish & Wildlife Service	FWS - 22, 23	Delete statement concerning Bowden to Canfield "improvement would only remain in the APD System if a southern corridor were selected".	Sect I	Text has been revised to state that FHWA would not require WV to return federal funds used in this section's construction should a corridor be selected which would not utilize it.
	FWS - 24	Delete quote from Green Jones	Sect I	Text revised accordingly
		Alternatives		
	FWS - 25, 26	Service does not believe that prospect of 3-lane or parkway system was adequately covered. Service considerd Improved Roadway Alternative viable	Sect II	A four-lane, divided facility best meets the purpose of and need for the project.
				However, following selection of a preferred corridor, design exceptions will be considered in the Alignment SDEIS.
	FWS - 27	Editorial correction	Sect II	Error corrected
	FWS - 28	Canaan Valley should be listed as National Natural Landmark	Sect II, Sect III, Sect IV	Text revised accordingly
		Affected Environment		
	FWS - 29	The Service only provided comments on those Schemes which they felt were practical and feasible (Schemes A, D, and E)	Sect III	No response necessary
		Traffic and Transportation		
	FWS - 30	Level of Service (LOS) text and exhibits have conflicting information.	Sect I, Sect III-A	Inconsistency has been corrected
	FWS - 31	Define term "cycles"	Sect III-A	Term has been defined
		Land Use		
	FWS - 32	Anderson Level II (1976) information is relatively old.	Sect III-C	This was the most current, available information which covered the entire study area. Land use and land cover data will be updated for the Alignment SDEIS
	FWS - 32	Service recommends emphasizing "actual acreage impacted" would be less than reported for the 2,000 foot-wide corridor inventory	Sect III-C	Text has been revised accordingly
	FWS - 33	Service recommends SDEIS discuss and quantify acreage affected by noise and visual impacts; these impacts could extend beyond 2,000 foot corridor width.	Sect III-J, T	Noise and visual resource impacts are discussed under their respective headings. Detailed impact assessment of each will be conducted for the Alignment SDEIS.
	FWS - 34	Provide more comparative discussion of Scheme Options	Sect III-C	Text revised accordingly

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
US DOI - Fish & Wildlife Service	FWS - 35	Section is biased towards industrial development of land. Should address primary and secondary impacts of industrial and recreational development	Sect III-C	Text revised and expanded accordingly
	FWS - 36	"Scheme Option Involvement" section should be expanded or dropped - it is confusing	Sect III-C	This section has been dropped
	FWS - 37, 38, 39	Service disagrees with discussion concerning conflicts with MNF Management Prescriptions. There could be conflicts with MP 5 and 8 for some Scheme Options.	Sect III-C.5	Consistency determinations have been revised accordingly. WVDOT will defer to MNF for final consistency determinations with Management Prescriptions.
	FWS - 40	Expand discussion of potential social impacts.	Sect III-E	Text expanded accordingly. Service's comments incorporated into expanded discussion.
	FWS - 41	Expand discussion of secondary impacts	Sect III-E.6	Text has been expanded. Detailed analysis of secondary impacts will be conducted for Alignment SDEIS.
	FWS - 42	Expand discussion of potential community facility involvements	Sect III-E.4	Text has been expanded accordingly. Service's comments incorporated into expanded discussion.
	FWS - 43	All community resources need to be defined and listed.	Sect III-E.4	SDEIS contains an adequate inventory of community resources within each corridor Scheme Option.
		Economic Environment		
	FWS - 44	Types of tourism and approximate dollar amounts generated should be listed.	Sect I, Sect III-G, U	Discussion of tourism activities and dollar contribution to the area has been incorporated into the text in Section I, Section III-Economic Environment, and Section III-Recreation Resources.
	FWS - 45	SDEIS fails to consider potential secondary adverse impacts of increased access on certain aspects of outdoor recreation and the areas that provide these opportunities.	Sect III-U	This topic has been included in the discussion of Recreation Resources.
	FWS - 46	Expand discussion of employment conditions in relation to employment opportunities afforded each Scheme.	Sect III-G	Text revised accordingly. Service's comments have been incorporated into revised discussion.
		Noise		
	FWS - 47	Discussion of noise impacts is inadequate for a thorough evaluation of potential Scheme Option impacts.	Sect III-J	A noise analysis has been prepared and incorporated into the text. It provides sufficient information for corridor-level comparisons. Detailed noise analysis will be prepared for the Alignment SDEIS.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
US DOI - Fish & Wildlife Service		***Water Resources***		
	FWS - 48	Service recommends higher classification for trout streams, consistent with NRW	Sect III-K	SDEIS has been revised to identify stream classifications - National Resource Waters (NRW) and High Quality Streams, instead of Resource Value.
				All streams which qualify as NRW (this includes all native trout streams) are included in this classification.
	FWS - 49	Service suggests that the high, medium, and low impact ranking was a good starting point, but wants more detailed information for a reduced number of Scheme Options.	Sect III-K	All Scheme Options will be retained until the selection of a preferred corridor. Detailed analyses for specific alignments within the preferred corridor will be included in the Alignment SDEIS.
				The qualitative approach used in the corridor SDEIS incorporates the potential type of impact (crossing versus relocation), opportunities to avoid streams, and the presence of existing crossings.
	FWS - 50	Service recommends that the SDEIS separate out the streams to be relocated and those to be bridged. Assessment of secondary and cumulative impacts should be included as well.	Sect III-K	Total number of parallel versus perpendicular corridor involvements has been identified. This would not necessarily correspond to the type of impact which could occur (bridge, culvert, relocation). Such details will be provided for Alignment SDEIS.
	FWS - 51, 52	Editorial comments	Sect III-K	No response necessary
	FWS - 53	Service would like expanded discussion of Bowden Fish Hatchery	Sect III-K	Expanded discussion has been incorporated into SDEIS
	FWS - 54	Suggests use of open bottom culverts as a form of mitigation	Sect III-K	This has been included as possible mitigation measure.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
US DOI - Fish & Wildlife Service		***Wetlands***		
	FWS - 55	Service takes exception to WVDOT's assignment of resource value to wetlands. All wetlands are protected.	Sect III-L	Valuation of wetlands was conducted to comply with FHWA's Technical Advisory T6640.8A and EPA's 404(b)(1) Guidelines, and is seen to be a necessary part of the SDEIS. Wetland resource value section was modified to include all factors involved in the National Resource Waters (NRW), and is now more comprehensive than the NRW designation. It should be noted that this valuation is not meant to imply that one class of wetlands will be afforded more protection than another; all wetlands will be avoided to the extent practicable. More detailed evaluation of wetland functions and values will be conducted during the Alignment SDEIS
	FWS - 56	Reporting potential wetland impacts based on a 2,000 foot-wide corridor can be misleading.	Sect III-L	The assessment methodology used in this SDEIS provides a means to compare wetlands within the 24 corridor Scheme Options. Throughout Section III, clarification has been provided that actual right-of-way impacts for a specific alignment located within the preferred corridor will be much less than those reported in the 2,000 foot-wide corridor inventory.
	FWS - 56	Disclaimer statement made at the end of the "Potential Impact" section should be moved to the head of this section.	Sect III-L	Text has been revised accordingly
	FWS - 56	Service recommends that wetland impacts be quantified and the cost of mitigation internalized.	Sect III-L	Wetlands impacts have been quantified in that an inventory of all wetlands within 2,000 foot wide corridors has been taken. Environmental mitigation costs for specific alignments within the preferred corridor will be included in the cost estimates for the Alignment SDEIS.
	FWS - 57, 58	Editorial comments	Sect III	Editorial comments addressed
		Vegetation and Wildlife		
	FWS - 59	Discuss forest segmentation and its effect on migratory birds	Sect III-M	Methods of minimizing forest fragmentation are provided, as well as a discussion of impacts to migratory bird populations.
	FWS - 60	Service recommends WVDOT contact WVDNR and VA Dept. of Game and Inland fisheries for their input on assessing wildlife impacts.	Sect III-M	These resource agencies have been contacted and their input incorporated into the document.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
US DOI - Fish & Wildlife Service	FWS - 61, 62	Editorial comments	Sect III-M	Editorial comments addressed
	FWS - 63	Service requests explanation of logic behind 200+ acre forest tracts as the qualifier for a determination of a large forest tract.	Sect III-M	The primary type of animal considered in forest fragmentation analysis is migratory song birds. Current research indicates that the median range size for migratory song birds within forest habitats is approximately 200+ acres.
		Floodplains		
	FWS - 64	Service recommends SDEIS expand discussion of floodplain values and address secondary impacts to floodplains from highway construction. Include reference to Technical Report	Sect III-N	SDEIS summarizes floodplain values and impacts, as well as provides reference to Floodplains Technical Report for more detailed discussion.
	FWS - 65	Editorial comment	Sect III-N	Editorial comment addressed
		Wild and Scenic Rivers		
	FWS - 66	Editorial comment	Sect III-P	Editorial comment addressed
	FWS - 67	Table for Wild and Scenic Rivers is confusing	Sect III-P	Table has been clarified: each river segment is now identified separately.
	FWS - 68	Editorial comment	Sect III-P	Editorial comment addressed
		Threatened and Endangered Species		
	FWS - 69 to 73	Service provided additional information on T/E species	Sect III-Q	This information has been incorporated into the SDEIS and revised based on the Service's input.
		Hazardous Materials		
	FWS - 75	Evaluation by corridor for underground storage tanks has not been done.	Sect III-S	Text states that all known, leaking underground storage tanks within the corridors have been identified. A detailed hazardous materials analysis will be conducted for the Alignment SDEIS.
		Visual Resources		
	FWS - 76	Need to discuss outstanding visual resources within region.	Sect III-T	Visual Resources has been added to the SDEIS
		General Comments		
	FWS - 77	Service is not convinced that the Improved Roadway Alternative should be ruled out from further consideration in light of the significant environmental and social costs of the Build Alternative. However, of the Schemes, the SDEIS clearly indicates that Scheme Option E1 would provide the greatest social benefit while avoiding and minimizing adverse impacts to human and natural resources to the greatest extent possible	N/A	No response necessary

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
USDA - Monongahela National Forest		***Purpose and Need***		
	MNF - 1	Purpose and Need has not been adequately covered in the SDEIS	Sect I	This Section has been expanded.
	MNF - 2	Lack of economic information significantly reduces usefulness of this document	Summary, Sect I, Sect III	Data on predicted economic growth has been added to the SDEIS.
	MNF - 3	If the only concern is highway safety, study should focus on Schemes which would improve West Virginia's existing highway system.	Summary, Sect I	Safety is one of many concerns addressed by the proposed project. Focussing on the existing highway system alone would not address other needs for the proposed facility.
	MNF - 4	Potential lifestyle changes brought about by the proposed facility: who will be effected, where, and how are very important considerations.	Sect I, Sect III	Affected populations are discussed in the SDEIS.
	MNF - 5	Editorial comment	Entire document	Comment has been taken into consideration and will be carried over into the Alignment SDEIS.
	MNF - 6	Safety benefits are not clearly presented.	Sect I	Safety section has been revised. A more detaild safety analysis will be conducted and documented in the Alignment SDEIS.
	MNF - 7	If improved safety is the main reason for building the highway, the analysis of safety needs to be improved.	Sect I	The entire Purpose and Needs Section has been revised and strengthened. Safety is but one consideration of the proposed facility.
	MNF - 8	How will construction of a 4-lane highway and increased traffic and noise impact recreation facilities in the Seneca Rocks area	Sect III-J, T, U	Direct impacts to recreation resources within the corridor Scheme Options are documented in the SDEIS. Proximity (indirect) impacts will be evaluated for the specific alignments within the preferred corridor in the Alignment SDEIS
		Recreation Resources		
	MNF - 9	Discuss visual impacts to recreation resources within MNF	Sect III-T, U	Corridor Scheme Option involvements with sensitive visual resources (including those within the MNF) have been documented in the SDEIS. Detailed visual analysis will be performed for the Alignment SDEIS.
	MNF - 10	Quantify impacts to Dolly Sods Scenic Area and Dolly Sods Wilderness Area. While they are outside corridor, they would still be affected by noise, air, and visual impacts	Sect III-I, J, T, U	Proximity (indirect) impacts to resources will be analyzed in depth for the alignments developed within the preferred corridor and documented in the Alignment SDEIS.
	MNF - 11	Noise impacts should be addressed and displayed		General analysis appropriate for a 2,000 foot-wide corridor study has been performed and documented in the SDEIS. Microscale analysis for noise will be conducted and documented in the Alignment SDEIS.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
USDA - Monongahela National Forest	MNF - 12	Impacts of access to forest recreation sites should be addressed.	Sect III-U	This has been included in the discussion of recreation resources.
	MNF - 13	SDEIS does not address the quantity, type, and pattern of use that might be expected with the development of each corridor and whether that use is a benefit to forest resources or an adverse impact.	Sect III-C.5, U	Potential impacts to recreation resources have been covered in general. A detailed analysis of potential impacts to recreation resources will be prepared for the specific alignments of the preferred corridor and documented in the Alignment SDEIS.
	MNF - 13	More site-specific analysis is needed of a selected alternative to address concerns such as specific impacts to viewing, recreational opportunities, economic effects, noise impacts and levels of use.	Sect III-U	Site specific analyses of direct and indirect impacts to recreation resources will be prepared for the Alignment SDEIS.
		Section I - Purpose and Need		
	MNF - 14	Since Level of Service (LOS) is a foreign term to lay people, this section needs clarification	Sect I-E	Level of Service has been clarified in this section.
	MNF - 15	Inconsistency between LOS text and exhibit	Sect I-E	This inconsistency has been corrected.
	MNF - 16	Need to consider impact to other attractions such as Cass Scenic Railroad and ski resorts outside the immediate study area.	Sect I-C	These attractions have been included in the discussion of Social Demand and Economic Development.
	MNF - 17	Editorial comments	Sect I-C	These comments have been incorporated into the text.
	MNF - 18	Should give the actual fatalities along the existing routes; not just an estimate.	Sect I-H	Data provided on fatalities is not an estimate, it is an average for the area. Accident data was obtained from WVDOT statistical records.
	MNF - 19	Editorial correction	Sect I	Table has been corrected

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
USDA - Monongahela National Forest		***Section II - Alternatives Considered***		
	MNF - 20	Editorial correction	Sect II	Table has been corrected
	MNF - 21	Editorial comment	Sect II	Comments have been taken into consideration
	MNF - 22	Define "at-angle" accident	Sect II	This term has been defined
	MNF - 23	Reader could benefit from a set of exhibits showing each Scheme and its corridor Scheme Options separately	Sect II	Exhibits have been revised to more clearly display the 24 corridor Scheme Options.
		Wetlands		
	MNF -24	Wetland discussion completely misses the potential to create new wetlands in lieu of displacement.	Sect III-L	The creation of new wetlands (not related to mitigation) is not planned and is not the function of WVDOT or FHWA.
	MNF - 25	Need to expand discussion of riparian areas.	Sect III	Additional information on riparian areas was incorporated from the Natural Resources Technical Report
		Water Resources		
	MNF - 26, 27	Insufficient consideration of groundwater effects. Need delineation of sensitive recharge areas for groundwater.	Sect III-K	Groundwater discussion has been expanded, including identification of the most permeable geologic formations, those that provide the best groundwater, general well locations, importance of groundwater for potable water, and stream base flow.
		Soil/Rock Complexes		
	MNF - 28	Comparison of amount of corridor that traverses sensitive soil/rock complexes may be relevant to the decision on a preferred corridor.	N/A	This topic is not addressed specifically, but some of the same issues are addressed in Farmlands, Wetlands (hydric soils), and groundwater (geology).
				Geotechnical analyses will be conducted for the specific alignments within the preferred corridor for the Alignment SDEIS.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
USDA - Monongahela National Forest		***Caves***		
	MNF - 29	There may be other important caves in the study area. See Forest cave inventory.	Sect III-Q	Cave inventory conducted by the MNF has been reviewed and the cave information incorporated into the discussion of E/T bat species.
				Caves as a resource in and of themselves have not been addressed, but all caves (with or without bats) in the MNF inventory which were near the corridors were included in the bat discussion.
	MNF - 30	Editorial comments about Wild and Scenic Rivers	Sect III-P	Errors in text have been corrected.
		Economic Development		
	MNF - 31	From SDEIS and related Technical Reports, there is little documentation of dialogue with business and industrial concerns in the Elkins, Beverly, and Mill Creek area.	Sect I, Sect III-G	The Transportation Needs Analysis Technical Report documents dialogue with business and industrial concerns throughout the area. Sections I and III provide an areawide overview of this.
		Traffic and Transportation		
	MNF - 32	Unclear what Table III-1 is about.	Sect III-A	Text has been expanded to provide a better explanation of this table.
	MNF - 33	User costs should be translated into savings for typical vehicle.	Sect III-A.3	Information on User Costs has been revised.
		Land Use		
	MNF - 34	Information is not relevant as shown; it is not helpful to know the total acreage for all corridors. How much is within a single corridor is what is helpful.	Sect III-C	Former Tables III-7 and III-8 have been combined into Table III-7. Totals by corridor Scheme Option are provided. The area total has been provided as a means of measuring corridor acreage involvement magnitude.
	MNF - 35	Editorial corrections on Exhibit and Table	Sect III	Errors have been corrected
		MNF Management Prescriptions		
	MNF - 36	No-Build Alternative will not conflict with MP 5 and 6.2 areas.	Sect III-C.5	This has been corrected accordingly
		Social Environment		
	MNF - 37	Is there no more recent Census data than 1983?	Sect III-E	Data used in SDEIS was from 1990 Census figures.
	MNF - 38	Strasburg should be included in the analysis	Sect III-E.6	Potential inpacts to Strasburg are discussed under Secondary Impacts. Detailed analysis of secondary impacts will be conducted for specific alignments within the preferred corridor for the Alignment SDEIS.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
USDA - Monongahela National Forest	MNF - 39	Editorial correction on health care facilities.	Sect III-E.4	Text has been revised accordingly.
	MNF - 40	Unit of measures seem unclear on Table III-21	Sect III-E	This has been clarified in the text. Unit of measure is in $millions.
		Bicycling		
	MNF - 41	Study should address how cycling demand can be incorporated into the corridor Scheme Options.	Sect III-H	This section has been expanded to cover the attraction of the area to the bicycling public. Incorporation of bicycling into the Schemes will be taken into consideration during the Alignment SDEIS.
		Water Resources		
	MNF - 42	Elkins Flood Control Structure might be listed here.	Sect III-K	This structure is not located within any of the corridor Scheme Options. Therefore, it was not included in any of the resource inventories. Possible indirect effects (if any) will be covered in the Alignment SDEIS.
	MNF - 43	Editorial suggestion.	Sect III-K	This information has been taken into consideration.
	MNF - 44	Predicted traffic volume of 14,100 vehicles per day is used in relation to building the highway. Is that figure for the No-Build situation.	Sect III-K	No, it is for the design year 2010 Build condition.
	MNF - 45	Mitigation measures for Bowden should include no blasting and reduced charges.	Sect III-K	These options have been added to the mitigation measures for Bowden Fish Hatchery.
		Wetlands		
	MNF - 46	Editorial correction	Sect III-L	Table has been revised to indicate involvement measurements are in acres.
	MNF - 47	Percentage of wetland acres impacted alone gives a false reading	Sect III-L	It was intended that text would not duplicate information presented in the tables. However, this section of text has been clarified and presents the comments suggested.
	MNF - 48	Potential impacts on Exceptional Resource Values could also be shown since these are of most interest.	Sect III-L	This has been incorporated into the SDEIS.
	MNF - 49	Comparison of Schemes: This format should be used throughout the document	Sect III-L	Other sections of the SDEIS have been modified to incorporate this format

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
USDA - Monongahela National Forest		***Vegetation and Wildlife***		
	MNF - 50	Unaware of occurrence of natural grass balds in West Virginia.	Sect III-M	Text has been modified.
	MNF - 51	MNF MP 6.1 emphasizes remote habitat for black bear and wild turkey "association" - not just black bear and wild turkey	Sect III-M	Text on wildlife has been revised to identify the other species associated with the same habitat as black bear and turkey.
	MNF - 52	State basis or logic for using 200+ acres as being sensitive to fragmentation.	Sect III-M	While this is briefly discussed in the methodology, more detail is provided in the Natural Resources Technical Report.
				Based on information in Finch (FWS, 1991), 200 acres is approximately the median size of a parcel required for many long-distance migrating birds
	MNF - 53	Editorial comments on Wildlife text	Sect III-M	Text has been revised as suggested. Deer population density is no longer included in the text.
	MNF - 54	Discuss wildlife injury and mortality due to collisions with vehicles	Sect III-M	Wildlife collisions with vehicles are briefly discussed.
	MNF - 55	Would like to expand original wildlife analysis methods to all private lands as well.	Sect III-M	Due to objections from DNR, this method has been removed from the document and replaced by a discussion of habitat impacts.
	MNF - 56	Statement "Unavoidable direct loss of habitat could be compensated for by increasing the carrying capacity of the remaining habitat" is misleading	Sect III-M	The text has been revised.
	MNF - 57	Comments on wildlife mitigation	Sect III-M.5	Text has been revised to reflect the suggested changes
	MNF - 58	Editorial comment	Sect III-M	Text and table have been deleted. Comment no longer applicable
		Floodplains		
	MNF - 59	Calling 1985 flood damages "minimal" is not going to sit well. Add potential development areas to floodplain exhibit. Last sentence does not make sense.	Sect III-N	Text has been revised to reflect magnitude of flooding impacts. Potential development regions have been added to floodplains exhibit. Last sentence was deleted.
	MNF - 60	Information on damages from 1985 flood should be consistent througout area	Sect III-N	Consistent level of information was not available throughout the entire study area. All available information was presented.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
USDA - Monongahela National Forest		***Wild and Scenic Rivers***		
	MNF - 61, 62, 63	Suggested revisions to Wild and Scenic Rivers	Sect III-P	Text has been modified to reflect the suggested changes.
	MNF - 64	Suggested including non-Nationwide Rivers Inventory (NRI) river	Sect III-P	The NRI already contains many of the major streams in the study area. The additional streams being studied by the MNF are mentioned, but are not included in the table.
	MNF - 65, 66, 67	Editorial comments	Sect III-N, P	These comments have been taken into consideration during the revision of the SDEIS.
		Threatened and Endangered Species		
	MNF - 68 thru 77	Comments on the revision of the Threatened and Endangered species text.	Sect III-Q	The two bat species have been addressed separately. Text, tables, and exhibits have been revised and MNF comments have been incorporated into the revisions.
		Cultural Resources		
	MNF - 78	Mitigation should indicate a cultural resource survey will be conducted as part of the site-specific analysis of the preferred corridor alignments.	Sect III-R	Text has been revised accordingly.
		Irreversible and Irretrievable Committments of Resources		
	MNF - 79	If the scope of the analysis were refocused, results would show that construction costs could be recoverd through highway taxes and income taxes generated by a more robust economy	Sect III-Z	Text has been revised accordingly
		Section 4(f)/6(f) Involvements		
	MNF - 80	The Forest Service has decided not to comment on this section at this time. WVDOT has asked Forest Service to render an opinion of Section 4(f) applicability to MNF lands.	Sect IV	No response necessary

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
WV Division of Natural Resources		***Purpose and Need***		
	DNR - 1	Division concurs with WVDOT regarding the need to complete Corridor H from Elkins to Virginia. Division believes modern, efficient transportation is necessary for growth of north-central West Virginia.	Sect I	No response necessary
		General Comments		
	DNR - 2	Division also agrees highway can be constructed in an environmentally sound manner, but this can be accomplished efficiently only with significant continued cooperation between agencies to identify areas of controversy and expedite review process	Entire Document	WVDOT and FHWA are committed to maintaining strong coordination efforts between resource agencies throughout the course of the project.
	DNR - 3	Division presently agrees that this type of initial qualitative review is all that is possible because of the significant project scope and the unique natural and human resources which will be impacted by many of the proposed Schemes.	Entire Document	No response necessary
	DNR - 4	The reviewing public must understand that each corridor Scheme Option involves a 2,000 foot wide corridor within which up to 7 four-lane highways could be aligned.	Sect I-C.1	Text has been revised to clearly state this. Exhibit has been prepared to present this as well.
	DNR - 5	DNR review found the evaluation of 24 corridor Scheme Options tedious and extremely difficult	Sect III	Text has been revised to make data interpretation easier for the reader.
	DNR - 6	To meet NEPA's intent, suggest considering reducing the number of corridor Scheme Options.	Sect III	Because all 24 corridor Scheme Options meet the project purpose and need, they all will be retained for evaluation in the corridor SDEIS.
	DNR - 6	DNR believes Scheme A, without several of its tunnel SubSchemes, and Schemes D and E are reasonable and practicable alternatives which can be adequately assessed by a DEIS	N/A	No response necessary

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
WV Division of Natural Resources		***Water Resources***		
	DNR - 7	Qualitative approach to stream disturbance is not sufficient, request quantitative data such as location crossing, angle, etc.	Sect III-K	It is not appropriate to provide such detail at a corridor-level study. The SDEIS has been revised to identify if the stream is perpendicular or parallel to the corridor, but this does not necessarily correspond to the type of impact which may occur.
				Specific impacts and the potential for avoidance or the use of existing crossings will be addressed in the Alignment SDEIS.
	DNR - 8	DNR disagrees with definition of intermittant versus perennial streams; request use of legal definition. DNR believes too many streams which may have been dry during field review were eliminated from consideration.	Sect III-K	Although the legal definition of perennial stream was not utilized in the field, less than 3 streams originally identified as perennial on USGS maps were later excluded from the assessment.
				Several streams identified on the USGS maps as intermittent were checked in the field and included in the survey as perennial. Intermittent streams were not included due to a lack of mapping of sufficient detail to locate all of these streams.
				The text will be modified to better reflect the efforts to include all perennial streams and describe why intermittent streams were excluded, even though they have values worth protecting.
	DNR - 9, 10	Native trout streams must be put into a higher resource protection category consistent with state law and there should be a classification that is compatible with NRW.	Sect III-K	The resource Value system has been replaced by a stream classification system which includes National Resource Waters (NRW) and High Quality Streams
		High Quality classification must include streams which exceed their use attainability		All streams not qualifying as NRW were assumed to be High Quality due to lack of sufficient water quality data to determine if standards for each stream's Use Designation has been exceeded or not.
	DNR - 11	DNR disagrees with classification of streams as Moderate or Low resource value, this contradicts state regulations.	Sect III-K	This classification system has been modified to eliminate these classes.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
WV Division of Natural Resources	DNR - 12	DNR requests that the stream resource classification be based on requirements of WV legislative rules.	Sect III-K	SDEIS involves streams in both WV and VA, each of which has their own classification system. In order to simplify the assessment, the classification in the SDEIS must be compatible with both WV and VA regulations.
				The classification has been modified to have only two classifications: High Quality (all streams which meet standards based on Use Designation), and Streams of Special State Concern (includes NRW in WV and Special State Waters in Virginia).
		Wetlands		
	DNR - 13	DNR considers all WV wetlands as sensitive, high quality resources because of their scarcity.	Sect III-L	No response necessary
	DNR - 14	DNR disagrees with design of a wetland classification system for use in evaluating wetlands located in the corridors. If valuation or classification of state waters is to be conducted, must be consistent with State law.	Sect III-L	Valuation of wetlands was conducted to comply with the FHWA's Technical Advisory T 6640.8A and EPA's 404(b)(1) Guidelines, and is seen to be a necessary part of the SDEIS
	DNR - 14	Such classification is the responsibility of the State resource agencies, not the private sector.	Sect III-L	This evaluation was not intended to usurp State authority.
	DNR - 15	Wetlands which meet any of the NRW designations or are associated with streams which meet any of the above categories, are afforded the highest level of protection. Consequently, wetlands in this category are to be avoided.	Sect III-L	It was believed to be necessary to address wetland values in the SDEIS. However, the wetland resource value section was modified to include all factors involved in the NRW, and is now more comprehensive than the NRW designation.
				This valuation system is not meant to imply that one class of wetland will be protected more than any other; all wetlands will be avoided to the extent practicable.
	DNR - 16	The valuation categories of Exceptional and Standard should be eliminated	Sect III-L	The analysis and text documentation has been revised accordingly.
				During Alignment SDEIS, land cover mapping and HEP analysis of upland habitat will be conducted to better address these issues.
	DNR - 19	Discuss effect of highway on wildlife populations in response to forest fragmentation.	Sect III-M	Discussion of forest fragmentation has been expanded. More detailed determination of impacts on populations is not possible due to lack of basic scientific understanding of effects of fragmentation on different populations.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
WV Division Natural Resources	DNR - 20	Editorial correction	Sect III-M	Error has been corrected.
WV Division of Culture and History	DCH -	The Division expressed strong concern over the adequacy of the Cultural Resources information provided in the SDEIS, and requires additional written analysis.	Sect III-R	WVDOT and Baker have met with WVDCH to discuss changes in the Cultural Resources evaluation. Coordination with WVDCH has continued throughout the revision. Data will be presented in the SDEIS in the format requested by WVDCH.
			Sect III-R	*Because the Cultural Resources section has been completely redone (analysis, text, and tables), an itemized list of the Division's comments and how they were addressed in the SDEIS is not included in this summary matrix.*
Sierra Club - WV Chapter		***Section 4(f) Resources***		
	SC - 1	Wilderness areas should be listed as 4(f) and potential impacts discussed. Strongly disagree that impacts to adjacent wilderness areas would be none.	Sect III-T, U; Sect IV	Wilderness areas as recreation resources are discussed under the new subsection "Recreation Resources" as well as "Visual Resources".
				Because these areas are not directly located within any of the corridor Scheme Options, they have not been included in the Section 4(f) evaluation. A determination of proximity (indirect) impacts at the corridor-level would not be appropriate.
				Following selection of a preferred corridor and development of alignments, potential proximity impacts to these resources will be evaluated in-depth and documented in the Alignment SDEIS.
	SC - 1	Agree that MNF MP 6.1, 6.2, and 8 areas should be listed as Section 4(f) resources.	Sect IV	WVDOT is seeking the Forest Service's opinion concerning Section 4(f) applicability to all resources within their MNF jurisdiction.
	S C - 1	More discussion should be done of the Dolly Sods Scenic Area relative to noise and visual impacts of nearby Schemes.	Sect III-J, T	Potential impacts have been assessed for both noise and visual. Proximity (indirect) impacts will be evaluated in-depth for specific alignments within the preferred corridor in the Alignment SDEIS.

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
Sierra Club - WV Chapter		***Noise***		
	SC - 2	Evaluation of noise is clearly inadequate	Sect III-J	General analyses appropriate for a 2,000 foot-wide corridor study have been performed and are documented in the SDEIS.
				Microscale analyses for air and noise will be conducted and documented in the Alignment SDEIS.
		Alternatives		
	SC - 3	Design standards are very limited and are not at all sensitive. Recommend consider parkway type design and discussion of its benefits.	Sect II	A four-lane, divided facility best meets the purpose of and need for the project.
				However, following selection of a preferred corridor, design exceptions will be considered in the Alignment SDEIS.
		Summary		
	SC - 4	Summary needs to include all major elements	Summary	Summary has been expanded accordingly. All major involvements (beneficial and adverse) are included in the Summary Matrix.
		Water Resources		
	SC - 5	Trout streams should be added to areas of controversy list, as well as MNF ,Canaan Valley State Park, etc.	Summary	Trout streams fall under water resources, which is listed. Parks and the MNF fall under Section 4(f), which is listed.
		General Comment		
	SC - 5	Does the cover of this document focus on Scheme A	Cover	It is only a coincidence that all of the photos on the cover are along Scheme A. This was not intentional
	SC - 6	Recommend map showing the Scheme Options along with table	Summary, Sect I, Sect II	Corridor Scheme Option Exhibit has been included in the Summary. In addition, exhibits have been revised to better show the area and information of the SDEIS.
		Recreation Resources		
	SC - 7	Discussion of outdoor recreation demand in the study area is totally lacking.	Sect III-U	This topic has been added to the SDEIS. Comments provided have been incorporated into text. Exhibit has been prepared showing recreation resources within the area.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
Sierra Club - WV Chapter	SC - 9	Should be clearly pointed out that the need for access to remote recreational areas must be balanced with need to protect remote rural qualities. This should be presented fairly.	Sect III-U	An unbiased presentation of this need is presented in this section of the SDEIS.
	SC - 10	Editorial comments and information on recreation provided	Sect III-U	This information has been incorporated into the discussion of recreation resources.
	SC - 10	American Discovery Trail (ADT) goes through the Corridor H study area. Discuss potential impacts.	Summary	At this time, discussion of ADT falls under "Other Government Actions". Information about the trail has been requested, it is our understanding the trail is still in the planning stages for route designation.
		Alternatives		
	SC - 11	Tunnels should have been considered for the northern routes.	Sect II	Additional options involving tunnels (if needed) anywhere along the project will be pursued following selection of a preferred corridor and the development of alignments for the Alignment SDEIS.
		Purpose and Need		
	SC - 12	Are 3 years of accident data sufficient. How does this compare to other facilities in other states	Sect I-H	Comparing accident rates of different states does not provide an accurate reflection of the facility since methodologies used in gathering accident data vary across the nation.
	SC - 13	Editorial correction	Sect II	Error has been corrected
		Alternatives		
	SC - 14	Construction costs do not include costs of mitigation. This should be clearly pointed out and an estimate of these costs made.	Sect III-B	Text has been revised to emphasize that cost estimates are for construction only. Environmental mitigation costs for specific alignments will be included in the Alignment SDEIS.
		Land Use, Noise, Visual		
	SC - 15	While land use impacts would be less than 2,000 foot wide corridor, this may not be the case for such areas as noise and visual impacts. Need to discuss	Sect III-C, J, T	Such proximity impacts which go beyond the physical limits of the facility will be evaluated in detail in the Alignment SDEIS.
	SC - 16	Land suitability discussion is totally prejudiced against rural rugged mountains.	Sect III-C.4	This section has been revised to reflect a more balanced presentation of environmentally sensitive development possibilities (eg: recreation) within mountainous terrain.

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
Sierra Club - WV Chapter	SC - 17	Agree with most of discussion about consistency with land use plans except determinations for MP 5 and MP 8.	Sect III-C.5	Land use consistency determinations have been revised accordingly.
		General Comments		
	SC - 18	What further NEPA process will be used to analyze the site specific data	N/A	Following selection of the preferred corridor, the NEPA process will begin again with initiation of the Alignment SDEIS (to examine alignment-specific impacts within the preferred corridor).
		Social Environment		
	SC - 19	Need to include discussion that rural nature of the area is what attracts some people to settle there.	Sect III-C	Text has been revised accordingly
	SC - 20	Need to discuss splitting of farms and communities as an impact to community cohesiveness.	Sect III-E.3	Detailed analysis of community cohesion will be conducted for the Alignment SDEIS.
	SC - 21	Need to discuss increased demand on local services with influx of people to these rural areas, increase in crime rate, etc., with examples from other similar areas.	Sect III-E	These suggestions have been taken into consideration.
	SC - 22	Need to add visual negative impacts to secondary impacts	Sect III-E.6	Text has been revised accordingly
		Air and Noise		
	SC - 23, 24	Questions validity of 1981 DEIS air quality data for use in the 1992 SDEIS. Need noise analysis and evaluation.	Sect III-I, J	General air and noise analyses appropriate for a 2,000 foot-wide corridor study have been performed (in 1992) and are documented in the SDEIS.
				Microscale analyses for air and noise will be conducted and documented in the Alignment SDEIS.
		Water Resources		
	SC - 25	Recommend adding "outstanding recreational or scenic value" as a High resource value stream qualification.	Sect III-K	Streams were classified according to state guidelines. A category for "outstanding recreational or scenic value" does not exist in current stream valuation guidelines.
		Wild and Scenic Rivers		
	SC - 25	Discussion of rivers found eligible for Forest Service study for Wild and Scenic River designation should be included.	Sect III-P	This information has been added to discussion of Wild and Scenic Rivers

PRELIMINARY DRAFT SDEIS RESOURCE AGENCY COMMENTS

FEDERAL RESOURCE AGENCY	AGENCY COMMENT NUMBER	RESOURCE AGENCY COMMENT	RESPONSE LOCATION: REVISED SDEIS	RESPONSE
Sierra Club - WV Chapter		***Recreation Resources***		
	SC - 26	No discussion of stream-associated recreation activities and how impacted	Sect III-U	Recreation resource involvements (be they stream-associated or not) are discussed in this section. Indirect impacts will be discussed in detail in the Alignment SDEIS.
	SC - 27	Editorial comment	Sect III-U	This information has been incorporated into the text
		Water Resources		
	SC - 28	Need to expand groundwater discussion: mention good water quality, threats to it, and impacts.	Sect III-K	This section has been expanded
	SC - 29	Discuss mitigation of stream impacts for recreational users other than trout fishermen.	Sect III-K	Suggested stream restoration and fish management techniques are to mitigate for impacts to aquatic habitat, which includes fish and benthos: not intended to mitigate for recreational uses of the stream, although they would contribute toward that goal.
		Wetlands		
	SC - 30	Need more in-depth discussion of avoidance of wetland resources	Sect III-L	Wetlands section has been revised. In-depth analysis of avoidance measures will be conducted for the Alignment SDEIS.
		Wildlife and Recreation Resources		
	SC - 31	Editorial comments	Sect III-M, U	The wildlife section focusses on wildlife habitat for game and non-game species. It does not address recreational issues. This is covered under recreational resources.
	SC - 31	Lacking discussion of forest ecosystem diversity; impacts of non-native species	Sect III-M	Discussion of forest types, wildlife supported by remote habitat, special botanical areas, and the impacts of forest fragmentation are all addressed as components of forest ecosystem diversity.
	SC - 32, 33, 34	Editorial corrections and comments		Text has been corrected and clarified.
		Visual Resources		
	SC - 35	Need visual resources discussion	Sect III-T	Visual resources have been included in the SDEIS discussion
		Long Term Impacts		
	SC - 36	Need much more discussion of long term impacts	Sect III-Y	Comments have been taken into consideration
		General Comments		
	SC - 37	Suggest matrix of all negative impacts in order of severity, cumulative list of all permits required, and bar graphs for each issue.	N/A	Summary matrix of all impacts (adverse and beneficial) is included in the Summary. Summary contains general list of permits needed. Detailed list will be prepared for Alignment SDEIS. Additional bar charts will not be prepared for this SDEIS.

JUL 6 1992

ROADWAY DESIGN DIVISION
W. VA. DEPT. OF HIGHWAYS

WEST VIRGINIA DIVISION OF CULTURE AND HISTORY

July 2, 1992

Randolph T. Epperly, Jr.
Director - Roadway Design Division
WVDOT - Division of Highways
State Capitol Complex, Building Five
Charleston, WV 25305

RE: Corridor H - Supplemental DEIS

Dear Mr. Epperly,

We have received and reviewed the Draft Supplemental Environmental Impact Statement for Corridor H. At this time, we do not recommend that the Division of Highways choose a corridor based upon the information provided in this document and the Historic and Archaeological Resources Technical Report for primarily two reasons. Baker's reevaluation of the original work conducted by Commonwealth and Cunningham is embarrassingly weak and the presentation of information is inadequate.

The SDEIS has directed its efforts in an attempt to quantify the evaluation of historic resources. The numerous tables suggest that one should count the number of structures and sites recorded on each corridor to pick the appropriate corridor. The archaeological material is based primarily on a predictive model. And there is a variety of "bean-counting" for the structures. This "scientific approach" might be more profitable if it was complemented by a thorough analysis of the context of this portion of the state; but the brief background statement of the historic report is rote, providing little contextual description of the historic landscape of this part of the state.

The historic development of these seven counties is unique. The full flavor of its history is not captured by the report. For example, what changes to the development of this state occurred because of the Civil War? Or the impact of the railroad? What about the nineteenth century turnpike system? Will the new interstate impact historic road systems? This kind of understanding of the region is needed before one can determine the impact an approximately 120 mile interstate highway will have on the historic landscape.

There is the fundamental argument that the Division of Highways is j picking the scheme, that a thorough Phase I survey will be conducted for the chosen scheme. However, it is our opinion that this decisio should not be taken lightly. The presentation of information is unconscionably poor to make this choice. My staff is not satisfied Baker has made a thorough analysis of existing information and evaluated what additional survey would be needed to supplement that year old information. It was our understanding that Baker was inde supplementing the existing information. But in reality, only the presentation has changed. My staff has made specific comments regarding the soundness of this information. The following address s these concerns.

ARCHITECTURE

The most frustrating aspect of this report is the lack of information regarding the impact of the schemes on existing National Register sites. There are sixty four listings in the seven county area. Whi of these listings would be impacted by the schemes? One would assume that Baker has reviewed the listings and if there was an impact, the site would be noted on the maps and tables. However, for example, Moorefield historic district is not included on the map. Would Scheme A completely avoid the town of Moorefield? The visual impact, if not direct impact, on this historic district needs evaluation. Baker ne d to work through the list and identify all resources that are within "spitting distance" of the schemes to evaluate the viewshed impact.

The information presented relies almost completely upon existing inventory information. If the appendix of inventory forms has been understood correctly, approximately ten new sites were identified as being historic and worthy of evaluation. What did Baker do in the field? Did they evaluate the existing information? Do they have any idea how many structures Commonwealth missed? Can they estimate what additional survey work would be needed on each scheme?

Per 36 CFR 800.4(c)(1), with the passage of time, especially over the last ten years, historians have changed their perception of vernacula architecture. But Baker has not addressed this issue. There is nothing to make my staff feel confident in this information, because it is primarily the same information presented in a different manner. Remember that the early work preferred Corridor A; survey informatio leaned heavily toward that corridor. Any reevaluation will be skewed unless solid work has been conducted in the field to outweigh that early preference.

We would require that Baker amend and add to the SDEIS. Additional explanation of the methodology in the field is necessary. There was bibliography; did Baker rely solely on Kerns report? It certainly appears that way. How many oral interviews did their staff conduct the field? How many days were they on the road? How much time was spent on each corridor? Did they make any notes regarding potential sites that would need evaluation? Are we to conclude that Commonwea was thorough and complete?

Each scheme could have had a written summary describing the resource that could be impacted by each scheme. Instead, Baker chose matrices marking what resource would be impacted by the various schemes. Only inventory numbers were given. This presentation is almost useless fo the reader. With some editing of the layout of these tables, there could be improvement. If the first two columns of the tables are changed, there is space to provide site name and nearest town. This would allow easier recognition of the resource.

These charts are unreliable. For example, the chart for "considered eligible" sites includes twenty structural sites. Volume 2 of the original Historic and Architectural Resources Evaluation included fort nine nominations. What happened to the remaining twenty nine sites? Are they included in another chart? It is difficult to determine what has been included from the original information.

The inventory forms should be organized by scheme location. Has this been done? It appears that the appendices are organized by the source of information. The current arrangement seems to be: Baker, National Register nomination forms, original WV historic property inventory forms, Monongahela National Forest forms and WV archaeological inventory forms. This organization is useless. Organizing this information by scheme would enable an individual to understand what is impacted by each one.

We would also note that the ten inventory forms that Baker prepared in the field were presented as field notes. These forms could have been cleaned up and typed. Their appearance is unprofessional.

Finally, did Baker examine cemeteries in the field? What potential impact on historic cemeteries will each scheme have?

In conclusion, the SDEIS does not add any new understanding to the existing information. In fact, the presentation is confusing and frustrating for the user. As indicated, there are several recommendations for improvement. Additional written analysis of listed and eligible National Register sites can be conducted. Field methodology needs elaboration; an evaluation of potential inventory needs along each scheme. The information can be presented in a usable manner: correct the maps, fix the tables, rearrange the inventory forms, include all existing data.

It was our understanding that Baker would be adding to the inventory completed in 1979. This research was disappointing. In retrospec staff would have asked more questions when representatives were at offices.

ARCHAEOLOGY

Regarding the archaeological resources, there are similar concerns. The analysis relied upon the work by Cunningham which was unsystema and did not involve subsurface investigations. Once again, the information provided did not reference or cite any survey activity has occurred in the area since 1981 - even though, for example, the Corps of Engineers has carried out investigations at Moorefield and Petersburg for flood wall projects. The report did not include an assessment of historical archaeological sites, especially Civil War sites. Finally, the model used has not been tested empirically in a manner that demonstrates its statistical viability, at least not in this report.

There are several additional problems with the analysis of archaeological sites. Classifying sites as eligible and non-eligibl is inappropriate given the superficial level of work carried out by Cunningham.

While certain areas may have a low probability for sites with comple site structure, they are also high probability areas for certain types of sites (e.g., quarries and logistical sites).

Buried sites (either colluvially or alluvially) are ignored.

Additional Work Needed for Preferred Corridor:

1. Systematic Phase I of entire corridor for prehistoric and historic archaeological sites following the WV guidelines.
2. Subsurface testing that will include using hand excavated units and/or backhoe trenches to locate buried cultural deposits when appropriate.
3. Archaeological investigations of historic properties within and immediately adjacent to the corridor to locate possible archaeological deposits (e.g.,privies, outbuildings, and earlier domestic sites)
4. A viewshed analysis of all structures within or adjacent to the 2000-foot-wide corridor.

In conclusion, we have not expressed a preferred scheme because Bak needs to fix the report prior to picking a scheme. The existing document is not good enough to make such an important choice that w impact seven counties, their resources and people.

Thank you for the opportunity to comment and the deadline extension. My staff would be happy to meet with staff members of DOH and Baker address further the necessary changes. If you have any specific questions, please contact Susan Pierce, Director of Review and Compliance.

Sincerely,

William G. Farrar

William G. Farrar, Deputy
State Historic Preservation Officer

WGF/SMP:ps

DEPARTMENT OF THE ARMY
PITTSBURGH DISTRICT, CORPS OF ENGINEERS
WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE, PITTSBURGH, PA 15222

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REPLY TO
ATTENTION OF

W. VA. DEPT. OF HIGHWAYS
DEVELOPMENT

Regulatory Branch

June 23, 1992

RECEIVED
JUN 30 1992

ROADWAY DESIGN
W. VA. DEPT. OF HIGHWAYS

Mr. Fred Vankirk
Acting Commissioner
West Virginia Division of Highways
State Capitol Complex
Building Five
Charleston, West Virginia 25305

Dear Mr. VanKirk:

I refer to your March 5 and 6, 1992 Agency Workshop held in Charleston concerning Corridor "H" between Elkins and I-81 in Virginia.

ACOE-1

We have reviewed the preliminary supplemental Draft Environmental Statement and have concluded that the document is sufficiently comprehensive for a corridor level study.

At this point in the process, the Corps is not in a position to comment on a particular alternative.

We look forward to working with the Highway Department in this matter.

Sincerely,

Albert L. Zupon, P.E.
Chief, Operations and
Readiness Division

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CORRESPONDENCE &
CENTRAL FILES

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Mr. Randolph T. Epperly, Jr.
Director, Roadway Design Division
West Virginia Division of Highways
State Capitol Complex, Building 5
Charleston, WV 25305

JUL 02 1992

re: Pre-draft supplemental Environmental Impact Statement for the Appalachian Corridor H project

Dear Mr. Epperly:

The Environmental Protection Agency (EPA), Region III would like to thank you for the opportunity to submit informal comments on the pre-draft sDEIS for the proposed Corridor H project. Our comments, at this time, do not represent official comments which will be provided at the time of the release of the sDEIS for public review. We, however, are happy to provide you with our preliminary comments, as follows.

EPA-1 EPA commends the efforts your agency and consultants have made in providing us with information and supporting documentation. We believe that the current documents provide a good foundation on which to base subsequent decisions. There are several areas, described below which EPA feels would benefit from additional information or further evaluation.

General Comments

EPA-2 In general, we would like to see maps which are more easily read and interpreted. For example, Exhibit I-3 is difficult to interpret, primarily due to a lack of distinction between colors. This is true for many of the other exhibits.

EPA-3 The use of technical reports enables the lead agency to present detailed information without adding bulk to the sDEIS. We recommend, however, frequent reference to those reports and brief summaries of the information, as appropriate.

EPA-4 Other Major Federal Actions should include the implementation of the Forest Plans for Monongahela and George Washington National Forests.

Purpose and Need

As stated in the pre-sDEIS, the intent of the APD was to provide adequate

EPA-5 transportation facilities enabling economic development to occur. Information is provided which evaluates system linkage, level of service, transportation demand, etc. While we have no major objections to the information provided, EPA questions the lack of information regarding the potential for economic development. Given the sensitivity of the area, it is this kind of (secondary) impact which should receive careful consideration.

EPA-6 EPA questions the ADT data which suggests that 88 percent of the current ADT is derived from local traffic. If this is to be a regionally important road, what percentage of the projected ADT will be from regional traffic vs. local traffic?

EPA-7 The document provides sufficient information on the positive aspects justifying the need for this highway facility. We would like to see similar information on the negative aspects which may result from the construction and use of a 4-lane highway.

EPA-8 On page I-20, Greene Jones of EPA is quoted. Please either delete this paragraph or put it into the proper context. The letter from which this quote was taken referred to another segment of Corridor H west of Elkins, WV.

EPA-9 Accident rate information for the existing roads in the project area was presented. Given the numerous causes for accidents (i.e. weather conditions, driving while under the influence, vehicle mechanical problems, etc.), EPA would like to see how these accident rates reflect actual road deficiencies. A discussion of how the accident rates compare to other Appalachian states would be beneficial.

Alternatives

EPA-10 In previous discussions with WV DOH, EPA encouraged the agency to develop innovative approaches to fulfill the need for an adequate transportation system. The proposed design of the highway does not appear to take into consideration the uniqueness and sensitivity of the area. EPA would recommend that design exceptions be considered including, but not limited to, the construction/upgrade of a 2-lane highway with passing lanes. The document, to date, does not present compelling reasons for the elimination of that alternative, nor does it explore any alternative other than a standard 4-lane road. We encourage you to do so as a means to reduce or eliminate many of the potential adverse impacts.

EPA-11 The dividing of the schemes into subschemes and then into scheme options does not facilitate a clear understanding of the project. EPA has recommended on other projects (i.e. New River Parkway), that such an approach be abandoned in favor of one that is more readily comprehended. We believe that many of the options are not feasible nor can they be considered reasonable alternatives. We suggest that WV DOH arrange a meeting of federal and state agency representatives to discuss which options should be carried forward into the sDEIS. We believe that the early elimination of several options will permit WV DOH to devote more time and resources to the evaluation of the remaining alternatives.

Then, we would recommend that a map be included which displays each of the scheme option routes, in its entirety.

Affected Environment and Environmental Consequences

In general, EPA believes that the project area has been well described and documented. A good faith effort has been made to identify the potential impacts to resources which may result from the build alternatives. The following comments represent areas we believe require additional information or analysis. Secondary impact assessment, cumulative impacts and noise impacts are among those areas which we believe are not sufficiently described.

- Land Use -

Understanding the limited availability of current land use data, efforts to provide meaningful information should be undertaken.

EPA-12 WV DOH must consider the context within which the proposed highway will be constructed. The area is known and valued for its recreational opportunities, wilderness, and remote habitat for wildlife. Given that the transportation needs assessment was based on regional as well as local facility deficiencies, etc. a similar context should be utilized when describing the potential for direct, indirect and cumulative impacts which may result from the highway construction. The project area, including the Monongahela and George Washington Forests and adjacent lands provide aesthetic, recreational and natural resource values and functions not found in other parts of the eastern United States. Potential impacts which may enhance or diminish those opportunities/values from a regional perspective should be briefly described.

EPA-13 Table III-10 describes compatibility with various comprehensive development plans. EPA believes that consistency with the Monongahela Forest Plan has not been demonstrated. While several of the Management Prescriptions provide for motorized recreation, it is unlikely that a major highway can be considered consistent with the desired future condition of the forest and in keeping with the standards and guidelines for those management areas.

In addition, several scheme options while not directly passing through sensitive areas, are parallel or adjacent to them. Indirect impacts in these cases should be carefully considered. Noise and visual impacts can have a profound effect on recreational activities.

- Aquatic Resources -

EPA-14 EPA recommends that the screening criteria used to assign a value rating to streams be consistent with the state's criteria. We would also like to raise the concern that, although the assignment of values is to used as a screening tool, it has the potential to weight the decision-making process inappropriately. To help avoid this, we recommend that potential impacts to streams be separated. For example, EPA would like to see data on the number and extent of stream relocations, and the number of crossings per stream identified separately and not necessarily lumped under high, medium or low impact.

- Wetlands -

EPA-15 We are generally pleased with the new level of effort that the WVDOH is placing on quantifying and qualifying wetlands resources and impacts. The treatment given wetlands, for the most part, is commensurate with the magnitude and scope of the project and its current stage of planning. There are still some concerns that we have with the wetlands portion of the document, for which we offer the following recommendations.

EPA-16 First and foremost, we urge you to ensure that the process and procedures used for addressing impacts to waters of the United States, including wetlands, results in a proposal that is in full compliance with the Section 404(b)(1) Guidelines (40 CFR 230). Ensuring compliance at this stage of planning is critical if an attempt is being made to merge the requirements of NEPA with those of the Guidelines.

EPA-17 We make this recommendation particularly with regard to the manner in which wetlands are quantified within the corridors and the use of a wetlands values categorization in the assessment. Although an effort is made to consider the difficulty or ease with which wetlands could be avoided within corridors, the coarse approach may mask some opportunities for avoiding and minimizing wetlands impacts. Therefore, potential wetlands impacts assigned to any particular corridor could be misleading without a more detailed look at ways the alignment can be configured within the corridor to avoid and minimized impacts.

EPA-18 Relative to the values categorization, we agree that where impacts to wetlands cannot be avoided, wetlands values should be considered in selecting which wetlands are to be impacted. We submit, however, that insufficient empirical data exist to provide an accurate assessment of wetlands values given that use of such an assessment in the document could result in the loss wetlands with values higher than that reported for them. The Section 404(b)(1) Guidelines make clear that wetlands in general are a valuable resource that should be protected to the extent practicable. We therefore recommend that any categorization of wetlands be confined to "exceptional value wetlands" and "wetlands."

EPA-19 Finally, we must emphasize that 40 CFR 230.10(a) requires that no discharge of fill be permitted where a practicable alternative exists that would have less impact on the aquatic environment, so long as other significant adverse environmental impacts would result. We ask that you give careful consideration to this requirement, particularly the latter portion, during the process of selecting the corridor. The environmentally preferable corridor may have more wetlands impacts than one or more of the other corridors.

- Vegetation and Wildlife -

EPA-20 EPA questions the reliance on the Monongahela Forest Plan as the primary source of data regarding wildlife impacts. The Forest Plan mainly considers commercially important species and thus, does not represent the range of potential wildlife impacts. Additional information on wildlife resources can be obtained from the appropriate state agencies and the state foresters.

EPA-21 Of specific concern to EPA, in light of our involvement in the Partners in Flight program, are the potential impacts to migratory bird populations, with special reference to long-distance (neotropical) migrants. Habitat loss and alteration are considered to be likely factors contributing to the decline of these migratory bird populations. Thus, forest fragmentation remains a concern to EPA. Large tracts of forested land are of great importance to a wide variety of wildlife species. Alternative actions which serve to reduce forest fragmentation should been given careful consideration.

EPA-22 EPA defers to the U.S. Fish and Wildlife Service for comments on Threatened and Endangered Species. As such, we concur with the Service and their assessment of the potential impacts and adequacy of the documentation.

- Noise and Air Quality -

EPA-23 Given the remote, rural characteristics of the area, a comprehensive noise analysis should be conducted and within the context of the recreational and wildlife values of the area. Attached are references which may provide you with pertinent information.

EPA-24 Upon the release of the official sDEIS, a review of the air quality impacts will be conducted by technical experts in our Regional office. We will attempt to provide you with additional information throughout the process.

Secondary and Cumulative Impacts

EPA-25 As stated previously, EPA does not believe that secondary impacts are sufficiently described in the present document. The purpose and need for Corridor H is based on the need for adequate transportation facilities which will enhance the feasibility for economic development to occur. Economic development, be it industrial, commercial or tourism, brings with it the need for infrastructure changes, additional support facilities, access roads, etc. Secondary impacts have the potential for longterm and cumulative effects, leading to the degradation of air, water, and terrestrial resource quality. Consequently, the sDEIS should provide sufficient information regarding these potential impacts.

Cumulative impacts, while more difficult to assess, have the potential to severely degrade the environment. Consideration of cumulative impacts should be undertaken, especially as it relates to the alteration and/or degradation of terrestrial and aquatic resources. The World Wildlife Fund has recently published a document which may assist in your analysis.

EPA acknowledges the effort devoted to the compilation, documentation and analyses of information contained in the pre-sDEIS. We appreciate your providing us with the opportunity to review and comment on this preliminary draft document. We remain concerned, however, about the degree and extent of potential environmental impacts associated with the construction and use of Corridor H. We will continue to work your agency to resolve these issues. Please contact Susan McDowell (215.597-0355), John Forren (215/597-3361), or myself should you have any additional questions regarding our comments.

Sincerely,

Diana Esher

Diana Esher, Chief
Environmental Planning and Assessment Section

cc: Chris Clower, US FWS
Roger Anderson, WV Division of Natural Resources
file

Selected Noise References

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Bond,J. 1971. Noise: its effect on the physiology and behavior of animals. Sci. Rev. 9(4):1-10.

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Agriculture Service

75 High Street, Room 301
Morgantown, WV 26505

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JUN 24 1992
W. VA. DEPT. OF HIGHWAYS

June 16, 1992

Mr. Randolph T. Epperly, Jr., Director
Roadway Design Division
West Virginia Department of Transportation
State Capitol Complex, Building 5
Charleston, West Virginia 25305

Dear Mr. Epperly:

SUBJECT: Appalachian Corridor H

The United State Department of Agriculture Soil Conservation Service (SCS) has reviewed the draft resource data prepared by Michael Baker, Jr. Inc. of Appalachian Corridor H. The Soil Conservation Service appreciated the opportunity to attend the resource agencies scoping meeting in Charleston, West Virginia, May 5 and 6. The information provided at that time and draft documents made available for our review were very helpful in assessing natural resource and environmental concerns of the Soil Conservation Service.

SCS-1 In light of the purpose of selecting a highway Corridor, we feel that the data provided adequately addresses natural resources and environmental concerns. SCS-2 We would note that there is a potential for impacting more a large number of impoundments built by the Soil Conservation Service for flood protection in the Potomac River Basin than is listed in The Natural Resources Technical Report Book I - Section III - 28. SCS-3 We can provided you with this information, however, we don't feel that this information would be critical in selecting the corridor. The area being studied has a high potential for flash flooding. We would suggest that avoidance of flood plain be a prime consideration in selecting the Corridor.

Mr. Randolph T. Epperly, Jr., Director
Roadway Design Division
West Virginia Department of Transportation
Charleston, West Virginia

Appalachian Corridor H - page 2

In the future we would be pleased to provide you with information on prime and important farmland, flood retarding structure, and other pertinent resource data on the selected corridor.

Sincerely,

Rollin N. Swank
State Conservationist

cc: Fred VanKirk, Commissioner

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Suite 322
315 South Allen Street
State College, Pennsylvania 16801

July 8, 1992

Mr. Randolph T. Epperly, Jr.
Roadway Design Division
Division of Highways
West Virginia Department
of Transportation
State Capitol Complex Building Five
Charleston, WV 25305

Dear Mr. Epperly:

The U.S. Fish and Wildlife Service (Service) has completed its review of the Pre-Supplemental Draft Environmental Impact Statement (SDEIS) for Appalachian Corridor H--Elkins, West Virginia to Interstate 81, Virginia. We appreciate the opportunity to review the SDEIS in its pre-draft state and look forward to review and comment on an official SDEIS. We have the following comments:

These comments do not constitute the review of the Secretary of the Interior within the meaning of Section 2(b) of the Fish and Wildlife Coordination Act (P.L. 83-624), the National Environmental Policy Act (NEPA) of 1969 (P.L. 92-500), the Clean Water Act of 1977, as amended (P.L. 95-217), the Endangered Species Act of 1973, as amended (P.L. 93-205), or other pertinent legislation.

General Comments

a. Purpose and Need

FWS-1 The pre-draft does an adequate job of describing purpose and need for the project. However, we will address several specific concerns in the Specific Comments section.

b. Alternatives

The goal of the National Environmental Policy Act of 1969 is to provide a basis for decisions resulting from analysis of environmental alternatives. The current SDEIS reflects an extensive effort on the part of the West Virginia Department of Transportation (WVDOT) and Michael Baker, Jr. (Baker) to analyze environmental impacts associated with the proposed project. However, the volume of material analyzed and reported in the SDEIS and its numerous technical reports and appendices overly complicates the decision-making process.

FWS-2 The text of the SDEIS is a summation of information contained in the various supporting documents. The SDEIS would be improved if it would frequently refer the reader to the more in-depth coverage of a topic in the technical bulletins and appendices.

FWS-3 We believe the discussion of alternatives considered but eliminated (Section II, B.) was inadequate with respect to the improved roadway alternative. Other types of improved roadways, 2-lane parkway with dividers, 2-lane with passing/climbing lanes with dividers, and other parkway-type designs should be discussed in the SDEIS. The Service agrees that accident rates are higher on roads like the old West Virginia Turnpike and present U.S. Route 19, however, it should be possible to design a safe parkway with low impact to environmental resources.

FWS-4 The Service recommends that the number of build alternatives presented and reviewed in the SDEIS be limited to those alternatives that are practical and feasible from a permitting or cost standpoint. The WVDOT stated during the May 5-6 meeting that Schemes B and C would not likely be built because they traverse Canaan Valley. While these schemes may meet transportation needs, they do not seem to be viable due to provisions of the Clean Water Act and the availability of alternatives that avoid the valley's wetlands (Schemes A, D, and E). We believe future discussions of Schemes B and C within the "Alternatives Considered for Additional Study" section will unnecessarily complicate the process and confuse the public. Instead, discussions of Schemes B and C should be located in the "Alternatives Considered but Eliminated" section. Likewise, Schemes AE-2 and AE-3, which have tunnels and are not likely to be built because of the excessive cost, should be moved to that section as well.

FWS-5 An extensive list of resources that may be adversely affected by the proposed corridors has been identified. These resources should be quantified and summarized in a table by corridor. This would enable a more accurate comparison of the human and environmental costs associated with each corridor.

FWS-6 At the corridor level of study it is difficult to assess specific impacts. At the May 5-6, 1992 meeting, Baker indicated that all natural and cultural resource information was stored in a Geographical Information System database. They stated that the database would be helpful in identifying alignments within a preferred corridor which would avoid or minimize adverse impacts to sensitive resources. The WVDOT should consider utilizing this database for proposing "best fit" alignments within each corridor that avoids or minimizes adverse impacts to human and natural resources.

FWS-7 The discussion of build alternatives fails to take into consideration the secondary impacts associated with potential increased development on endangered species, wetlands, etc. Due to the relatively undeveloped (commercial and industrial) nature of the region, secondary impacts to sensitive natural and cultural resources need to be identified and discussed.

C. <u>Affected Environment and the Environmental Consequences</u>

FWS-8 As discussed in the Alternatives section the SDEIS is a corridor level study investigating the "potential" social and environmental impacts within a 2,000-foot wide corridor for each scheme. Most of the categories in this section are adequately addressed considering the study's level of detail (2,000-foot wide corridor). However, discussion of Noise impacts is severely inadequate and discussion of Visual impacts is non-existent. This roadway, if built, will traverse some of the wildest land in West Virginia, if not the Mid-Atlantic Region. Noise and visual impacts to human and natural resources should be addressed in sufficient detail to assist the WVDOT and Federal Highway Administration (FHWA) with selecting the least-damaging corridor.

FWS-9 Potential wetland impacts for Corridor H, Elkins to I-81, vary with scheme option. The Service considers all wetlands valuable and protected under the Clean Water Act, the FWCA and Executive Order 11990. The Service feels that rating the resource value of wetlands should only be factored in for mitigation (compensatory) purposes after all efforts to avoid wetlands are exhausted.

FWS-10 The Service is disappointed with the extent of discussion on the Bowden National Fish hatchery contained in the SDEIS in light of the grave potential impacts Scheme A options would have on this facility. While the discussion in the Natural Resources Technical Report: Book II, is extensive, the majority of the public will only review the SDEIS. Discussion of the potential impacts to the hatchery and the north spring recharge area should be expanded (including maps) for review by the majority of the public.

FWS-11 The SDEIS does not contain the most recent and detailed information necessary to identify, locate, and protect the numerous threatened, endangered, and candidate species known to occur in the study area. In addition, indirect and cumulative impacts are inadequately addressed. Therefore, in accordance with Section 7(c) of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) (ESA), the Service will require that you prepare a Biological Assessment (BA) to determine the effects of the preferred scheme on the listed species that may occur in the project impact area. The BA shall be completed before any contract for construction is entered into and before construction is begun. The Service recommends that the following steps be taken in preparation of the BA.

1. Conduct a scientifically sound, on-site inspection of the area to be affected by the action. This will include a detailed survey of the area to determine if listed species are permanent or seasonal residents and whether suitable habitat exists within the area for expanding the existing populations; a requirement for the recovery and eventual de-listing of threatened and endangered species.

2. Conduct interviews of recognized experts on the species at issue, including those within the Service, West Virginia Division of Natural Resources, universities, and others who may have data not yet found in scientific literature.

3. Review recent literature and other scientific data to determine the species distribution, habitat needs, and other biological requirements. (Most of items 2 and 3 are contained in the SDEIS and only need to be updated.)

4. Analyze the effects of all proposed actions on individuals and populations of each species and its habitat, including <u>indirect and cumulative effects of the action</u>.

5. Analyze alternative actions that may provide conservation measures.

6. Conduct all studies necessary to fulfill the requirements of (1) through (5) above.

7. Review any other relevant information.

If you determine that the proposed action "may affect" any of the listed species or critical habitats you must request, in writing, formal consultation with our office, pursuant to Section 7(a) of the ESA. If the determination is "no effect," no further consultation is necessary, unless requested by the Service. Regardless of your findings you should provide this office a copy of the BA and any other relevant information that assisted you in reaching your conclusion.

Listed species to be considered in the BA

Virginia Northern flying squirrel, *Glaucomys sabrinus fuscus*
Cheat Mountain salamander, *Plethodon nettingi*
Indiana bat, *Myotis sodalis*
Virginia big-eared bat, *Plecotus townsendii virginianus*
Peregrine falcon, *Falco peregrinus anatum*
Bald eagle, *Haliaeetus leucocephalus*
Running buffalo clover, *Trifolium stoloniferum*

FWS-12

There is no discussion in the SDEIS of the possible presence of candidates species. Candidate species are those being reviewed by the Service for possible future listing as threatened or endangered species. Even though no substantive or procedural provisions of the ESA apply to species that are designated as a candidate for listing, federal agencies are expected to account for these species during the planning process and these species must be addressed in the SDEIS. The 1988 amendments to the ESA require that the Service monitor the status of and protect candidate species to prevent their extinction while awaiting listing.

The following is a list of Category 2 plants published in the *Federal Register*, February 21, 1990 (55 FR 6184-6229), and Category 2 animals published in the *Federal Register*, November 21, 1991 (56 FR 58804-58836), which are found within or near the study area and could be directly or indirectly impacted by the highway project. Category 2 species are those for which the information now in the possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which conclusive data on biological vulnerability and threat are not currently available to support proposed rules. These species are associated with a variety of unique habitats within the study area such as: wetlands, cedar glades, shale barrens, talus slopes, cliffs, caves, high quality warm and coldwater streams and floodplains, and northern hardwood and coniferous forests.

PLANTS

Darlington's spurge, *Euphorbia purpurea*
Horsemint, *Monarda fistulosa* var. *brevis*
Silvery nailwort, *Paronychia virginica* var. *virginica*
Canby's Mountain lover, *Paxistima canbyi*
Butternut, *Juglans cinerea*

ANIMALS

Southern rock vole, Microtus chrotorrhinus carolinensis
Eastern small-footed bat, Myotis subulatus leibii
Eastern woodrat, Neotoma floridana magister
Southern water shrew, Sorex palustris punctulatus
New England cottontail rabbit, Sylvilagus transitionalis
Northern goshawk, Accipter gentilis
Cerulean warbler, Dendroica cerulea
Loggerhead shrike, Lanius ludovicianus
Hellbender, Cryptobranchus alleganiensis
Chest minnow, Rhinichthys bowersi
Brook floater mussel, Alasmidonta varicosa
Green floater mussel, Lasmigona subviridis
Tapered cavesnail, Fontigens holsingeri
Timber ridge cave beetle, Pseudanophthalmus hadenoecus
Dry Fork Valley cave beetle, Pseudanophthalmus montanus
Grizzled skipper, Pyrgus wyandot
Dry Fork Valley cave pseudoscorpion, Apochthonius paucispinosus
Isopod, Caecidotea cannulus
Isopod, Caecidotea sinuncus
Culver's planarian, Sphalloplana culveri

FWS-13

In addition to the federally listed and candidate species, there a numerous vertebrate species within the study area which the State of West Virginia lists in its publication, Vertebrate Species of Concern. In addition, numerous plants and invertebrates which are rare in the State and probably occur in the study area, but for which a comprehensive list has not been compiled. A list of these species may be obtained from the West Virginia Heritage Data Base located in the WVDNR's Operation Center located in Elkins, West Virginia. Contact:

Mr. Brian McDonald
West Virginia Heritage Data Base
West Virginia Division of Natural Resources
P.O. Box 67
Elkins, West Virginia 26241

Phone: 304-637-0245

FWS-14

During your site specific surveys for threatened and endangered species, you are encouraged to identify the following species and consider them in the planning and construction phases of the project.

VERTEBRATE SPECIES OF CONCERN IN WEST VIRGINIA OCCURRING IN THE STUDY AREA

Fishes

Redside dace, *Clinostomus elongatus*
Tonguetied minnow, *Exoglossum laurae*
Satinfin shiner, *Notropis analostanus*
Popeye shiner, *Notropis ariommus*
Potomac sculpin, *Cottus girardi*
Slimy sculpin, *Cottus cognatus*

Amphibians and Reptiles

Jefferson salamander, *Ambystoma jeffersonianum*
Green salamander, *Aneides aeneus*
Eastern spadefoot toad, *Scaphiopus holbrooki*
Cricket frog, *Acris crepitans*
Upland chorus frog, *Pseudacris triseriata feriarum*
Northern leopard frog, *Rana pipiens*
Wood turtle, *Clemmys insculpta*
Redbelly turtle, *Pseudemys rubriventris*
Ground skink, *Scincella lateralis*
Northern coal skink, *Eumeces anthracinus*
Eastern ribbon snake, *Thamnophis sauritus*
Mountain earth snake, *Virginia valeriae pulchra*
Eastern kingsnake, *Lampropeltis getulus*

Birds

American bittern, *Botaurus lentiginosus*
Least bittern, *Ixobrychus exilis*
Black vulture, *Coragyps atratus*
Cooper's hawk, *Accipiter cooperi*
Northern harrier, *Circus cyaneus*
Upland sandpiper, *Bartramia longicauda*
Barn owl, *Tyto alba*
Long-eared owl, *Asio otus*
Olive-sided flycatcher, *Contopus borealis*
Sedge wren, *Cistothorus platensis*
Golden-winged warbler, *Vermivora chrysoptera*
Dickcissel, *Spiza americana*
Lark sparrow, *Chondestes grammacus*

Mammals

Long-tailed shrew, Sorex dispar
Pygmy shrew, Sorex hoyi
Star-nosed mole, Condylura cristata
Eastern mole, Scalopus aquaticus
Northern long-eared bat, Myotis septentrionalis
Meadow jumping mouse, Zapus hudsonius
Least weasel, Mustela nivalis
Eastern spotted skunk, Spilogale putorius

d. Section 4(f)/Section 6(f) Statement.

FWS-15 The Service supports the FHWA designation of Management Prescriptions 6.1, 6.2, and National Recreation Areas on the Monongahela National Forest (MNF) as 4(f) properties. This is consistent with the Land and Resource Management Plan for the MNF. The Service recommends that Management Prescription 5.0 areas should be evaluated as potential 4(f) properties. While no wilderness areas fall within a corridor, secondary impacts from noise and increased access should be addressed. Designation of Prescription Areas 5.0 would also be consistent with the Forest Plan.

FWS-16 The construction of Corridor H will have direct and/or indirect impacts on Management Prescriptions 5.0, 6.1, 6.2, and 8.0. The SDEIS provided only brief coverage of these issues.

Specific Comments

a. Summary

FWS-17 Page S-2. The claim that, with the exception of the 6.6 mile segment just east of Elkins, the "remaining route is a series of two-lane, winding mountain roads extending from Elkins to I-81 and I-66" is false. There are approximately 13 miles of constructed 4-lane highway (U.S. Route 50) between Gore, Virginia and Winchester, Virginia.

FWS-18 (B. Other Major Government Actions). The Service has proposed to establish a national wildlife refuge in Canaan Valley. The Monongahela Power Company no longer believes the Davis Power Project is viable due to their inability to get a Section 404 permit for the dam and has petitioned (unsuccessfully) to the Federal Energy Regulatory Commission to have their license fees returned. The Service will start purchasing land in the Valley when Congress approves funding. The summary failed to mention U.S. Forest Service (Monongahela and George Washington National Forest) actions.

FWS-19 Page S-6, D. (Major Environmental Impacts). The Service is concerned that the 2,000-foot corridor width may tend to exaggerate impacts that are measured by area rather than linearly (i.e., wetland acreage versus number of stream crossings).

FWS-20 The Service concurs with inclusion of National Recreation Area, 6.1, and 6.2 (management prescription) areas in the Section 4(f) evaluation and recommends that adverse impacts (including visual and noise) to their recreational value as well as their natural value be addressed in the SDEIS.

FWS-21 Page S-7. Table S-1 should include all potential impacts (positive and negative) from highway construction. Discussions for each corridor should include them as well. In addition, these discussions should also be accurate. Table III-8 notes Scheme Option E-1 for having the least involvement with forest land, not scheme A-1 or A-8, as stated in the discussion on page III-17.

b. Section I. Purpose and Need for Proposed Action

FWS-22 Page I-4, 3. Current Status of Corridor H. This section discusses the present construction of the route between Buckhannon and Elkins, and also mentions the 6.6 mile segment between Canfield and Bowden, West Virginia. As noted in the Summary Section, mention of the approximately 13-mile segment west of Winchester has been overlooked. Statements that the Bowden to Canfield "improvement would only remain in the Appalachian Corridor System if a southern alignment were selected" could arouse supporters of both the northern and southern alignments and should be deleted.

FWS-23 Page I-6, Regional System Linkage. Discussion that the closest I-68 is to the study area is between 54 and 84 miles, seems to indicate that Schemes D and E, which at their closest point are 26 miles from I-68, have been left out of the author's thought process. Please explain.

FWS-24 Page I-20. The quote by Mr. Greene Jones of the U.S. Environmental Protection Agency is used out of context and was taken from a letter recommending denial of a Corps Section 404 permit to fill 37 acres of wetlands for Corridor H west of Elkins. Statements (out of context) such as this can lead the unknowing reader (of the SDEIS) to believe a major federal agency supported the project prior to review of the NEPA documentation. In addition, there is no reference for this letter on pages I-27 and I-28.

c. Section II. Alternatives Considered

FWS-25 Page II-3, a. Roadway Deficiencies. The improved roadway alternative is doomed to failure as long as expressway standards are imposed by the APD System designation. The Service does not believe that the prospect of a 3-lane or parkway system was adequately considered.

FWS-26 Page II-4, b. Safety Considerations. The improved roadway alternative considered a "Build Alternative" in this paragraph but it appears in the Alternative Considered but Eliminated Section of the SDEIS. As previously mentioned, the Service considers an improved roadway alternative viable and in need of thorough and adequate consideration.

FWS-27 Page II-13, 5. Scheme E. Correction, in the third paragraph of the narrative on Scheme E, the road remains close to US 50 not US 55.

FWS-28 Page II-16, d. Subscheme K. Canaan Valley should also be listed as National Natural Landmark.

d. Section III. Affected Environment and the Environmental Consequences

FWS-29 For the purposes of the following comments (with the exception of threatened and endangered species) the Service will limit its discussion to the Scheme Options that are practical and feasible (A, D, and E).

FWS-30 Page III-4, Exhibit III-1. The level of service (LOS) and traffic volume in this figure conflict with the same information in Exhibit I-6 for the Year 2010 No-build alternative for the segment of road from Elkins to Bowden. Exhibit III-1 appears to indicate that the traffic volume and LOS for alignment E would be superior to all other routes.

FWS-31 Page III-II, Table III-5. Define cycles.

FWS-32 Page III-I, 3. Potential Land Use Impacts. The data discussed from Table III-8 was published in (Anderson) 1976. This is relatively old information and may now be meaningless. The Service recommends that the SDEIS emphasize the "actual acreage impacted" would be less than figures given within the 2,000-foot corridors, possibly moving this to the head of the discussion.

FWS-33 In light of the region's reputation for providing extensive, high quality, outdoor recreational opportunities, the Service recommends that the SDEIS discuss and quantify the acreage affected by noise as well as visual impacts. These impacts could extend well beyond the 2,000-foot wide corridor and could adversely affect the region's growing tourist industry.

FWS-34 The Service recommends that comments discussing Table III-8 reflect the reduced number of scheme options (Schemes A, D, and E), as recommended above in our General Comments. It would be helpful if these comments reflected the degree by which various alignments affect more/less resources. For instance, Scheme Option E-1 involves only 0.28 percent more cropland, pasture, and other agricultural land than Scheme Option A-1. In addition, these comments should be accurate. As previously noted Scheme Option E1 would involve less acreage of forest land than Scheme Options A1 or A8.

FWS-35 Page III-20, c. Land Suitability. This section is biased towards industrial development of land which typically requires level land. Rough, mountainous land can be "developed" for the outdoor recreation/tourist industry as has been the case in the study region. Additionally, the area is highly suitable for second home/vacation cabin development. Many people from neighboring areas "escape" to the region to recreate. The SDEIS should address the primary and secondary impacts of both industrial and recreational development.

FWS-36 Page III-21, e. Scheme Option Involvement. This section needs to be expanded or dropped because it is confusing.

FWS-37 Page III-21, 5. Consistency with Comprehensive Development Plans. The Service disagrees with the discussion concerning conflicts with Management Prescriptions. There could be conflicts with Management Prescriptions 5.0 and 8.0 with the different schemes. The Service agrees that Scheme Options A1 through A8 would pose the greatest potential for conflicting with the MNF Plan as they traverse Management Prescriptions 6.1 and 6.2. Conflicts with the Forest Plan would be minimal and represented by minor encroachment along the "outer fringes of zones having a

Management Prescription of 6.1" for Scheme Options D1 through D6, E1, and E2. The encroachment for Scheme Options D1 through D3 and E1 would be limited to the existing U.S. Route 219 corridor.

FWS-38 Page III-23, Table III-10. The Service disagrees with the N designation for Management Prescription areas 5.0 and 8.0 for Scheme Options A1 through A8. The designation should be X. Indirect, noise and visual impacts will occur to these areas. In addition, the Service does not necessarily think construction of a 4-lane highway is consistent with Management Prescriptions 2.0 and 3.0 which allow for motorized recreation.

FWS-39 Page III-24, 6. Potential Mitigation Measures. The Service concurs with the potential mitigation measures (avoidance) for potential impacts to Management Prescription Areas 6.1 and 6.2. The Service also feels this would be the best mitigative measure for Management Prescriptions 5.0 and 8.0. Scheme Options D1 through D3 and E1 would avoid these impacts to the maximum extent practical.

FWS-40 Page III-33, b. Potential Project Involvement. As stated, the principle function of Corridor H is to improve linkage and access between the primary traffic generators in the area, the incorporated communities of the region. According to the DSEIS, Scheme Options E1 and E2 would potentially serve the most West Virginians, extend through the counties which have experienced the most net out-migration between 1980 and 1988, enhance medical care for the most elderly West Virginians, and serve the most residents of incorporated places. The SDEIS also states that Scheme E1 and E2 would also provide better access to more medical facilities, serve the most communities, and serve a greater number of educational facilities than the other routes (page III-43, b. Potential Project Affects).

FWS-41 Page III-44, 6. Secondary Impacts. This section needs to be expanded in detail. Merely stating that growth could have positive or negative impacts on community facilities and services is insufficient. Any discussion of these impacts should include, as stated previously, noise and visual impacts associated with each Scheme Option.

FWS-42 Page III-45, 2. Potential Community Facility Impacts, a. Project Involvement. Scheme Options E1 or E2 would involve the greatest number of residences and commercial establishments within their respective 2,000-foot corridors: 32 percent more than Scheme A1 and roughly 100 percent more than Scheme Options in D1 through D5. Unlike Scheme E1 and E2, the SDEIS states that Scheme Options A3 through A7, D2 and D3 would involve recreational facilities.

FWS-43 Page III-48, b. Potential Mitigation Measures. The document states that avoidance of all community resources would be a high project priority. The Service is assuming these community resources are man-made. They need to be listed and defined. The Service contends that all resources, human and natural, are community resources and avoidance of adverse impacts for all should be a high priority.

FWS-44 Page III-52, 2. Economic Activity, a. Current Trends and Characteristics. The SDEIS states that "a large tourism industry has emerged in the area". The types of tourism (sightseeing, hiking, hunting, etc.) and approximate dollar amounts generated should be listed.

FWS-45 Page III-53. b. Potential Project Affects. The Service agrees with the SDEIS that improved access would serve to expand aspects of the economy. The SDEIS fails to consider the potential secondary adverse impacts of increased access on certain aspects of outdoor recreation and the areas that provide these opportunities.

Page III-59. 3. Employment. b. Potential Project Affects. The SDEIS states that Scheme Options E1 and E2 would improve access to Randolph, Tucker, and Mineral Counties which experienced unemployment rates above 15 percent during the 1980's, and Randolph, Tucker, and Hampshire Counties which had the highest unemployment rates in 1990. Scheme Options E1 and E2 would also extend through the counties with the largest labor force, the greatest number of employed workers, and the highest unemployment rates in the study area.

FWS-46 "Scheme Options A1 through A8 would potentially improve access to five industrial parks, two more than any other route." This statement is somewhat misleading since two of the industrial parks along the A scheme options have no employees (see Table III-20).

FWS-47 Page III-64. 2. SDEIS Noise Analysis. Discussion of noise impacts is inadequate for a thorough evaluation of potential scheme options impacts. This is understandable in light of the large scope of the (2,000-foot corridor) study. Detailed noise impacts studies may be possible if the number of scheme options are pared down to those that are practical and feasible (Schemes A, D, and E).

The Service cannot emphasize the importance of accurate and thorough analyses of noise impacts in a region where ambient noise levels are almost non-existent.

FWS-48 Page III-66. k. Water Resources. b. Resource Value. The Service recommends that outstanding recreational streams be included as a characteristic of a high quality stream. Native brook trout streams have been designated as Resource Category 1 by the Service in accordance with the Service's Mitigation Policy (Federal Register, Volume 46, No. 15, January 23, 1981). The designation criteria for Category 1 is the habitat to be impacted is of high value for evaluation species and is unique and irreplaceable on a national basis or in an ecoregion section. The Service's mitigation goal is to allow no loss of existing habitat value. Trout streams in West Virginia also receive the highest protection by State (West Virginia) law (National Resource Waters).

FWS-49 Page III-67. c. Potential Impact. The high, moderate, low potential (physical) impact approach is probably a good starting point considering the number of streams potentially impacted by the various alignments. However, a number of other factors (angle of crossing, method of crossing, channel alteration, encroachment, etc.) are necessary to accurately determine the extent of impacts. If the SDEIS contains a reduced number of scheme options, as recommended, the WVDOT should provide the level of detail necessary to more accurately assess impacts.

FWS-50 The Service recommends that the SDEIS separate out the streams that will be relocated and those which will be bridged. An assessment of secondary and cumulative impacts should be included as well.

FWS-51 Page III-69. 3. Potential Impacts. a. Watersheds. According to the SDEIS options under Scheme A would have the most potential for watershed impacts; roughly 30 percent more than other Scheme Options.

FWS-52 Page III-73, Table III-23, Surface Water Resources, Resource Value. A review of this table reveals that with the exception of low quality streams, the northern scheme options (D and E) would adversely affect fewer streams than the southern alignment (Scheme A options). In most cases the difference is 25 to 50 percent more adverse impacts to all streams along the southern route than the northern routes. (There should be a reference to Natural Resources Technical Report, Book II, in this section).

FWS-53 Page III-77, 1. Bowden National Fish Hatchery. As previously stated, the Service feels coverage of this issue in the SDEIS should be expanded. Trout production at the facility could be severely curtailed if water quality and/or quantity from the north spring is diminished due to construction. The primary and secondary impacts of reduced trout production and trout stocking should be evaluated. The potential adverse impacts to striped bass production at the facility would be similar to those of trout but should also be included in the SDEIS. A discussion of secondary adverse impacts to striped bass restoration efforts in the Chesapeake Bay is needed.

According to the SDEIS, Scheme A options have the greatest potential for adverse impacts to the hatchery. Scheme D and E options avoid any impacts to the facility.

FWS-54 Page III-81, b. Mitigation of Impacts. Unavoidable impacts associated with stream crossings may be partially mitigated by the use of open-bottomed culverts.

FWS-55 Page III-84, L. Wetlands, 1. Methodology, b. Resource Value. The Service takes exception to the WVDOT's assignation of resource values to wetlands. All wetlands are protected by state and/or federal law or executive order and adverse impacts to them should be avoided to the extent practicable. The value of a wetland is difficult to determine due to the multitude of functions they perform. Wetland values need only be determined when all efforts to avoid these high quality resources have failed and compensatory (replacement) mitigation is necessary.

FWS-56 Reporting potential wetland impacts can be misleading. The potential impact of each alignment on wetlands is exaggerated due to the 2000-foot wide corridor study area. The disclaimer statement made at the end of the Potential Impact section should be moved to the head of this section. Some schemes have very high totals of potential impacts but actual impacts may be substantially less. The Service will recommend that these impacts be quantified and the cost of mitigation internalized as recommended in our December 12, 1990 scoping comments.

FWS-57 Page III-88, 3. Potential Impacts. According to the SDEIS all scheme options will affect wetlands. Scheme Options A1 through A8 would potentially involve the least while Scheme Options E1 and E2 would involve the most. During the May 5-6, 1992 meeting, Baker indicated that a best fit line in any corridor would reduce wetland impacts to relatively low levels (50+ acres) considering the length of the proposed project (110 to 130 miles). WVDOT also stated during that meeting that an alignment could be shifted out of a study corridor to avoid or minimize impacts. (There should be a reference to the Natural Resources Technical Report, Book II in this section).

FWS-58 Page III-102, m. Vegetation and Wildlife, 1. Affected Environment, c. Remote Habitat and Large Forest Tracts. Congressionally designated wilderness areas are management prescription 5.0 not 8.0.

FWS-59 The Service scoping comments requested the SDEIS address forest segmentation and its affect on migratory birds. The SDEIS attempts to do this and has identified large tracts as forest parcels 200 acres or larger. The Service requests that the SDEIS discuss the significance of this size limit and how it was determined.

FWS-60 Page III-104, a. Wildlife. Utilizing National Forest management objectives is a first-step approach to assessing impacts to wildlife on National Forest lands. It may not be appropriate on private land. Secondary impacts to wildlife from increased development on private lands must be discussed. The Service recommends the WVDOT contact the West Virginia Division of Natural Resources and the Virginia Department of Game and Inland Fisheries for their input on assessing wildlife impacts.

FWS-61 Page III-107, b. Remote Habitat. According to the SDEIS, Scheme A options would result in major adverse impacts to remote habitat ranging from 287 to 2,400 acres. Scheme options D and E would have no major adverse impacts. All Scheme options have some minor adverse impacts, ranging from 242 to 1,892 acres, associated with them.

FWS-62 Page III-107, c. Large Forest Tracts. The Service requests the WVDOT explain the logic behind 200+ acre forest tracts and then make comparisons between the scheme options using smaller tracts sizes (50 acres, 100 acres).

FWS-63 Page III-111, Table III-32, Potential Wildlife Impacts by Scheme Options. A review of this table reveals that, if one excludes Scheme Options B and C, Scheme A options adversely affect significantly greater (in some cases 100+ percent) numbers of bear, deer, and turkey than Scheme D and E options.

FWS-64 Page III-114, n. Floodplains. The Service recommends that the SDEIS expand the discussion of floodplain values and address secondary impacts to floodplains from highway construction. There should be a reference to the Floodplains Technical Report in this section.

FWS-65 Page III-116, Exhibit III-6. The legend color and text are confusing; there are two colors associated with the 100-year floodplain - flood area type for longitudinal involvement.

FWS-66 Page III-122, p. Wild and Scenic Rivers. The Service recommends that alternatives to minimize a river's potential for inclusion as a Wild and Scenic River be avoided to the extent practicable.

FWS-67 Page III-127, Table III-37. There two listings for the North Fork of the South Branch of the Potomac River. If two segments of this river may be impacted, the segments should be labeled by rivermile, towns, etc.

FWS-68 Page III-128, Table III-38, Impact to Eligibility by Scheme Option. A review of this table indicates that Scheme A Options will preclude eligibility of the "Cacapon/Lost River" and the North Fork of the South Branch of the Potomac River. Scheme D options would also preclude eligibility of the Cacapon/Lost River. Only Scheme E would not preclude the eligibility of any study streams.

FWS-69 Page III-130, and page II-40 of the Natural Resources Technical Report (NRTR), a. Threatened and Endangered Wildlife Species. These introductory sections refer generally to the presence of listed species in the study area. They state that one threatened and four endangered species occur in the study area and state explicitly that no listed plants are known. Two additional listed species occur in the study area, one endangered plant, the running buffalo clover, and the endangered bald eagle.

Four bald eagle nests are presently known in West Virginia. The nest sites all occur along the mainstem of the South Branch of the Potomac River in Grant, Hardy, and Hampshire Counties. Two of the nest sites occur within the study area in the "Trough" and one occurs south of Petersburg in the Smoke Hole. The fourth nest is north of Romney in the vicinity of Springfield. Even though direct disturbance to nest sites is unlikely from construction, the direct impacts to the feeding and resting corridor and the indirect and cumulative impact to the eagles' overall habitat could adversely affect this population and should be addressed in the SDEIS and the BA.

At present, four running buffalo clover sites are known in the study area. One site is located in the floodplain of the Shavers Fork near Porterwood, Tucker County. The population is located within the study corridor of scheme option E2 and just to the south of E1. Three additional populations are located in Randolph County. These populations are not located within any scheme option, however, the Rich Mountain population gives strong evidence that potential habitat exists along scheme options A2, B1, and C1.

FWS-70 Page III-130, 2. Affected Environment. Two additional listed species have been added to the study area for this discussion, the endangered running buffalo clover and the endangered bald eagle. In addition, one population of the running buffalo clover occurs in the study corridor of scheme option E2.

FWS-71 Page III-133, a. Northern Flying Squirrel, and page II-43, of the NRTR, state that there are two confirmed locations of northern flying squirrel populations within the study area, with one being located within a study corridor. There are now three additional confirmed locations of squirrel populations in the study area, one of which is approximately one mile east of scheme options B1 and C1 in the Cabin Mountain area. All three populations are located in potential habitat identified by the SDEIS.

FWS-72 In the third paragraphs of sections of the SDEIS and NRTR for Northern Flying Squirrel, (Glaucomys sabrinus) (NRTR, page II-43) and the Cheat Mountain Salamander, (Plethodon nettingi), (NRTR, page II-44) it is stated that schemes D and E would avoid all known populations of these species, but would impact potential habitat sites. According to the SDEIS, Exhibit III-11, THREATENED and ENDANGERED WILDLIFE SPECIES and NRTR, Exhibit II-5, THREATENED and ENDANGERED WILDLIFE, scheme options D and E do not effect potential habitat of the northern flying squirrel and the Cheat Mountain salamander.

FWS-73 The second paragraph, NRTR, page II-43, b. Cheat Mountain Salamander, (Plethodon nettingi) states that no known sites of the salamander will be impacted by a scheme corridor. This is incorrect since scheme options A2 through A7 impact both known and potential salamander habitat. Scheme options B1 through B8 and C1 through C2 would also impact potential habitat.

FWS-74 Page III-135, c. Indiana Bat and Virginia Big-Eared Bat, states that if and when a preferred Build Alternative is selected, a more detailed survey of the caves would be required to determine the presence or absence of bat populations. The Service believes that this is too late in the planning process to avoid impacts to the listed species, which is the primary responsibility of the federal agency pursuant to the ESA. If potential bat habitat exists, including both the cave and surface foraging area, in or near a realistic scheme option, detailed surveys should be conducted before selection of the Build Alternative in order to select the least damaging alternative.

FWS-75 Page III-165, a. Hazardous Material Sites, Potential Impacts. Evaluation by corridor has not been done for underground storage tanks. If the WVDOT does not consider the information useful, it should so state.

The Service does not feel the level of detail of sites located on county maps (1 inch = 1 mile) is of sufficient detail for accurate assessment of potential hazardous material sites

Class 1 sites are the most hazardous. Avoidance of these sites must be a top priority. Scheme Options A1 and A8 have a potential impact with a Class 1 site.

I. Visual Impacts

FWS-76 This section was not available for inclusion in the pre-draft SDEIS. The Service has identified, throughout these comments, the need to address impacts of highway construction on the outstanding visual resources of the region.

Natural Resource Technical Report: Book I

Water Resources - field review. The statement was made that some sections of streams within the corridor were inaccessible. The Service would like to know why these streams were inaccessible.

Bowden National Fish Hatchery. The hatchery produces 250,000 brook, brown, and rainbow trout, as well as over five million walleye fry for in-state and out-of-state stocking.

Natural Resource Technical Report: Book II

The water resource and wetland maps that are numbered 1 of 85 should label the shown route as Schemes D and E not Scheme A.

Wetlands mapped in this document appear to have been taken from NWI maps. NWI maps are a good tool but should not be used to delineate a wetland boundary on a regular basis. Service biologists are aware of several discrepancies in mapped wetlands. More thorough mapping will be necessary to assess impacts to this resource, especially for jurisdictional purposes.

Summary

As stated above, the Service recommends that all information and discussions pertaining to Scheme Options B and C be moved to the Alternative Considered but Eliminated section since they are not considered feasible alternatives. For purposes of the following summary discussion and recommendations, we will limit our remarks to Scheme Options A, D, and E.

NEPA requires consideration of mitigation measures and carries with it the obligation to mitigate, to the fullest extent possible, the adverse impacts of major federal actions. Mitigation is a sequential process that involves avoidance, minimization and compensation, in that order, of impacted resources. The construction of Corridor H is a major federal action. The Service offers the following analysis in an effort to assist the WVDOT with selection of an alternative that mitigates adverse impacts to human and natural resources and accomplishes the project purpose.

Scheme Option D3 is the least expensive ($840M) and overall alternatives in Schemes D and E ($840M to $844M) are less expensive than Scheme A ($984M to $1649M). Schemes D and E intersect more regions identified for growth than Scheme A. Scheme E, and to a lesser extent Scheme D, would provide the greatest benefit to the social environment by serving the greatest number of West Virginia residents, the most incorporated residents, the greatest number of employed workers, the most potential employees, and the counties with the highest unemployment. They would enhance medical care and access to those West Virginia counties which collectively had the largest elderly populations. Scheme Options E1 and E2 would provide improved linkage to the most (five) medical complexes and would serve the greatest number of educational facilities. Scheme E options would provide a better LOS over its entire route than other options.

Scheme E options could adversely affect the most residences and commercial facilities and could impact slightly more (0.29 percent) cropland, pasture, and other agricultural land than Scheme A options. Scheme Options D2, D3, and A3 through A7 could affect recreational resources.

The options under Scheme A would adversely affect the greatest number of watersheds (63). Options under Schemes D and E have fewer adverse impacts (25 to 50 percent), in general, to surface waters than Scheme A options and they would have far fewer adverse impacts to moderate and high resource value streams than Schemes A options. In addition, Schemes D and E options would not affect the water supply for Bowden National Fish Hatchery.

The 2,000-foot wide study corridor for Scheme A revealed it would affect the smallest total wetland acreage. No estimate of actual wetland impacts for any corridor can be made without more detailed plans. Sufficient flexibility exists within each corridor to reduce impacts to a manageable level. The Service will recommend that any alignment chosen contain the fewest adverse wetland impacts practicable. All mitigation costs associated with unavoidable wetland impacts must be internalized.

Scheme A options would result in major impacts to remote habitat (Management Prescription Areas 6.1 and 6.2). All options would result in some minor impacts from noise and encroachment. Scheme A options intersect the fewest 200+ acre forest tracts (A7=20) while Scheme E options intersect the most (E1=30). Scheme Option

E-1 involves less forest land than Scheme Options A-1 or A-8 which also occur in the Spruce Knob and Seneca Rocks Units of the National Recreation Areas. Scheme A would have the most impacts to big game and would preclude the eligibility of three streams and potential Wild and Scenic Rivers.

Scheme A options would have the greatest involvement with the 100-year floodplain and flood hazard zones. Scheme Options D4, D5, and D6 would have the least. Some Scheme A (1 and 8) options would impact a Class I hazardous materials site.

Scheme Options E1 and D1 through D3 have the least impacts to listed threatened and endangered species from both the standpoint of impacting known populations and impacting unsurveyed, potential habitat. Scheme Option E1 impacts no known site of a listed species, and according to Exhibit III-11 only traverses two potential bat cave areas, one in Mineral County and one in Hampshire County. Scheme Options D1 through D3 do not impact listed species and according to Exhibit III-11 only traverses two potential bat cave areas, one in Grant County and one in Hardy County near the Grant County line. Based on the habitat range of the Indiana and Virginia big-eared bat in West Virginia, it would be unlikely that these caves would provided habitat for these species, although surveys would be conducted to attempt to locate other caves not listed in the available literature. All of these scheme options could have some impact upon potential habitat of the peregrine falcon and the bald eagle as do all of the main alternatives. Scheme Option D1 impacts Greenland Gap which is a National Natural Landmark and contains a number of state sensitive species and at least one federal candidate species.

The remainder of the alternatives have considerable involvement with known listed species and unsurveyed, potential habitat. From the standpoint of threatened, endangered, and candidate species, the Service would discourage selection of schemes A through C and scheme options E2 and D4 through D6 and encourage selection of scheme options E1 or D2 and D3. Only those listed species involved in the preferred scheme option should be addressed in the BA.

FWS-77

Based on our review of the material presented in the pre-draft SDEIS and the associated technical reports and appendices the Service is not convinced that the improved roadway alternative should be ruled out from further consideration in light of the significant environmental and social costs of the other build alternatives. However, of the other build alternatives, the SDEIS clearly indicates that Scheme Option E1 would provide the greatest social benefit while avoiding and minimizing adverse impacts to human and natural resources to the greatest extent possible.

Any questions you may have regarding these comments may be directed to William A. Tolin (endangered species) or John E. Schmidt of my staff at (304) 636-6586.

Sincerely,

Charles J. Kulp

Charles J. Kulp
Supervisor

cc:
WVDNR - Miles
EPA - Farren
FWE - ARD
Readers file
Project file
ES:WVFO:JESchmidt:7/6/92
Filename: COR-H.COM

UNITED STATES
DEPARTMENT OF
AGRICULTURE

Forest
Service

Monongahela National Forest
200 Sycamore Street
Elkins, West Virginia 26241-3962

Caring for the Land and Serving People

RECEIVED
JUL 2 1992
ROADWAY DESIGN DIVISION
W. VA. DEPT. OF HIGHWAYS

Reply to: 1920

Date: June 30, 1992

Mr. Randolph T. Epperly, Jr.
Director - Roadway Design Division
WVDOT - Division of Highways
State Capital Complex, Building Five
Charleston, West Virginia 25305

Dear Mr. Epperly;

In response to your May 6, 1992 request we have reviewed the Preliminary Supplemental Draft Environmental Impact Statement for Appalachian Corridor H, Elkins to I-81. My staff and staff specialists have looked closely at the SDEIS and to a limited extent the related Technical Reports. This review has generated a large number of general and editorial comments for your further consideration as you prepare the SDEIS for release to the public. The attached comments are arranged to correspond with the appropriate section in the preliminary SDEIS.

We have decided not to comment on Section IV of the preliminary SDEIS. Instead, we are currently considering our response to Fred VanKirk's June 8, 1992 letter requesting we render an opinion of the the applicability of Section 4(f) and Section 6(f) to National Forest System lands which are managed under Management Prescriptions 5.0, 6.1, 6.2, 7.0, and 8.0.

We hope the attached comments will be useful in revising the present document for release to the public. If you have any further questions or concerns with these comments please call Lynn Hicks, in this office, at (304) 636-1800.

Sincerely,

JIM PAGE
Forest Supervisor

Attachment

COMMENTS ON APPALACHIAN CORRIDOR H PRELIMINARY SDEIS

Forest Service
6-30-9

General Comments:

MNF-1 One of the major functions of Appalachian Corridor Highways is to facilitate economic development. This purpose and need has not been adequately covered in the SDEIS. It is not listed as a purpose of the highway (Page I-4) and the subject is mentioned only in passing on Page I-3. Differences in economic benefits between Alternative Schemes would seem to be a primary factor in determining which build alternative, if any, should be selected.

MNF-2 There is little information in the SDEIS about predicted economic growth which might be stimulated by the build alternatives that will help decide between alternatives. This lack of economic information significantly reduces the usefulness of this document.

MNF-3 The document as written leaves us to weigh highway safety against environmental impacts. Many of the highways in West Virginia are in worse condition then US 33 and if the only concern is highway safety, the study should focus on alternative schemes to improve West Virginia's existing highway system.

MNF-4 While it goes without saying that people are concerned by potential impacts to the environment, and changes in National Forest user experiences, many residents are also concerned about potential lifestyle changes. Who will be effected, where and how, is a very important consideration.

Are the changes in economic growth and lifestyles worth the dollar and environmental costs? Which Subscheme will provide the best balance? These questions cannot be answered by the analysis results documented in the SDEIS.

MNF-5 The whole analysis focuses on the impacts of highway construction. The document ignores what will happen after the highway is built. As we are frequently reminded in the document, the impacts of construction can't really be known until a site-specific analysis of the selected build alternative. The preliminary SDEIS is, we agree, so general we are unable to determine which scheme would have the greatest environmental effects. However, the southern schemes would impact more National Forest System land than the northern routes.

MNF-6 Even the safety benefits are not that clearly presented. How many lives will be saved or injuries avoided by each route? What safety hazards are presented by each of the routes? For example, there is a lot of fog along the northern routes, but this is not mentioned. If a tunnel were built, as in some subschemes, what different safety hazards does this present? MNF-7 If improved safety is the main reason for building the highway, the analysis of safety needs to be strengthened.

MNF-8 How will the construction of a 4-lane highway and increased traffic levels and associated noise impact the Seneca Rocks Visitors Center and associated facilities? The same concern for noise impact to Seneca Shadows Campground and in the general Seneca Creek/NorthFork Potomac area.

MNF-9 What impacts to viewing will occur due to the construction of the 4-lane highway in the narrow canyon along the North Fork of the Potomac? These could significantly impact the pastoral atmosphere. The highway could also impact many of the recreational activities along the river due to access problems caused by the 4-lane highway.

General Comments: (cont.)

FS 6-30-92

MNF-10 There can be major impacts to the Dolly Sods Scenic Area and the Dolly Sod_ Wilderness with Scheme Options in this area. Noise, visual impacts, increased use, and congestion, etc. The Otter Creek Wilderness could be similarl impacted with Sub-scheme AE-1. These impacts should be quantified and clearl_ displayed. Such impacts from a 4-lane highway are clearly not restricted to a 2,000-foot wide corridor.

MNF-11 Noise impacts from a 4-lane highway to the Forest environment should be addressed and displayed.

MNF-12 Impacts of access to forest recreation sites should also be addressed. Viewing impacts are not adequately addressed - cuts and fills will have major impacts on the forested landscape. Input during the Forest Plan indicated a stron desire to retain the naturally-appearing forest environment as opposed t development activities. Similarly, a desire for dispersed recreation opportunities of a semi-primitive nature were favored over development. Ho does a 4-lane highway impact that resource in each alternative?

MNF-13 The preliminary SDEIS does not address the quantity, type, and pattern of use that might be expected with the development of each corridor and whether that use is a benefit to forest resources or an adverse impact. The 1969 NRA Plan estimated an annual visitation of 5.0MM visitors by 1990. The current estimated use for the entire Forest is approximately 2.0MM visitors. Is the level of use estimated in the 1969 Plan desirable? (It is assumed the figure was developed based on Corridor H passing near the Visitors Center). What would be the impacts, favorable and adverse, of such a level of use from the economic and natural resources standpoint? Would there be a significant difference depending on the route selected?

More site-specific analysis is needed of a selected alternative to address concerns, such as specific impacts, etc. to viewing, recreational opportunities, economic effects(recreation), noise impacts, and levels of use.

Section I:

MNF-14 Page I-15 introduces the concept of Level of Service (LOS) and then it states LOS less than "C" is unacceptable. Since LOS is a foreign term to lay individuals, this section needs some expansion.

MNF-15 Exhibit I-6. The text says that the LOS between Elkins and Alpena is A, but the map color codes indicate it is D in 1990 and will be F in 2010.

MNF-16 Page I-20. Cass Scenic Railroad and the ski resorts at Snowshoe are also area attractions; as are the ski areas in Canaan. Their futures may rise or fall based on whether and where the highway is built. Other ski areas could be developed if the area is made accessible.

Section I: (cont.)

FS 6-30

MNF-17 Cass Scenic Railroad could become a major US attraction if the Corridor were built. This area is second to none when it comes to fall colors; the Corridor could make fall colors into a major attraction. These kinds of things never come into consideration, because the perspective of the study is that of a highway safety project.

MNF-18 Page I-21. Should give the actual fatalities along the existing routes; not just an estimate.

MNF-19 Page I-23. Table I-4 indicates the high of 3.94 is between Moorefield and Petersburg, not Wardensville.

Section II:

MNF-20 Table I-4. Labeled as Accidents Per Vehicle Mile. It should say Accidents Per Million Vehicle Miles.

MNF-21 Exhibit II-1 Proposed Typical Sections. Alternative typical sections which may be feasible to mitigate impacts should be displayed and discussed. Stacked lanes and tunnels are two examples.

MNF-22 Page II-4; last paragraph. Define "at-angle accident".

MNF-23 Page II-7. The reader could benefit greatly from maps showing each Alternative Scheme and its subschemes on separate maps. This would add 5 maps, but the clarity and additional detail would be worth it.

Section III:

General Comments:

MNF-24 Wetland discussion completely misses the potential to create new wetlands in lieu of displacement.

MNF-25 While the study addresses floodplains and wetlands, it does not appear to address impacts on riparian areas in general. The analysis of riparian effects (wildlife habitat values and impacts) may be weak.

MNF-26 Insufficient Consideration of Groundwater Impacts - This document treats groundwater impacts in a cursory fashion yet it indicates that the rural population of the project area primarily uses individual groundwater wells for drinking water. The potential impacts to groundwater are mentioned, most of which could result in permanent changes to groundwater quality and quantity, with the only conclusion being that the effects are difficult to predict. However, some comparison of the risks to existing groundwater supplies could and should be made between alternatives.

F,

MNF-27 For example, the areas within the alternative corridors that are or have the potential to be the largest groundwater supplies or aquifers could be defined and delineated as having the highest potential for severe impacts. Likewise, moderate or low potential for severe impacts to groundwater could be defined and delineated. The amount of corridor within high, moderate or low potential for impacts to groundwater by Scheme and subscheme could then be compared.

MNF-28 Sensitive Soil/Rock Complexes - A comparison of amount of corridor that traverses sensitive soil/rock complexes, such as Mauch Chunk Group, by scheme and subscheme may be relevant to the decision on a preferred Corridor H route.

MNF-29 Caves - The preliminary SDEIS mentions only potential for impact to caves used by endangered bats. There may be other important caves within the various schemes and subschemes. The recently completed Forest cave inventory should be utilized to revise the impacts of caves on each scheme and subscheme.

MNF-30 Wild and Scenic Rivers - preliminary SDEIS contains a number of statements which seem to be mistakes. The suggested changes are listed in the specific comments section of this section. In addition, corresponding changes to Section V of the Natural Resources Technical Report are recommended.

MNF-31 Economic Development - From the preliminary SDEIS and related Technical Reports there is little documentation of dialogue with business and industrial concerns in the Elkins, Beverly, and Mill Creek area.

Specific Comments:

MNF-32 Page III-6. Not clear what this table is all about. What are the "Alternative Schemes Not Chosen"?

MNF-33 Page III-5 to 11. User costs should be translated into savings for the typical vehicles over the various schemes. Data provided indicates there will be savings. but it is not usable to compare among alternatives.

MNF-34 Table III-7. Information is not relevant as shown. This kind of information is only relevant by build scheme. How much area is within any individual corridor is relevant. For example, it is no help to the reader to know that 678,795 acres are in all of the corridors together.

MNF-35 Exhibit 2 and Table III-8. The map legend and table should show same categories; wetlands are shown on the map, but not in the table, for example.

MNF-36 Page III-24. The No-Build Alternative will not conflict with our 5.0 and 6.2 prescriptions. They do not promote recreation. Delete management prescriptions from the sentence, unless the GWNF has some which promote recreation within the Corridor.

MNF-37 Page III-29. Is there no more recent Census data than 1983? Is data not yet available from the 90 Census?

FS 6.30

MNF-38 Page III-37. Strasburg should be included in the analysis. While the Corridor does not quite reach it, the City could be as much or more impacted than any other. It's location at the potential intersection of two major cross-country divided highways could be significant (I-81 and I-66/Corridor H) to it's growth. This might even pull development away from Winchester.

MNF-39 Page III-44. First para. It states there is only one elderly health care facility, the E.A. Hwse Nursing Home in Baker. This is not true. There are three of these facilities in Elkins and a number of similar facilities in towns along various schemes.

Page III-51. Economic Development. See general comments.

MNF-40 Table III-21. Unit of measure seems unclear. Is it millions of $? How might these figures change by scheme?

MNF-41 Page III-62. The mountains, contrary to the Preliminary SDEIS, are clearly an attraction to the bicycling public for a variety of reasons including scenery, etc. There are numerous examples across the country of how these can be safely incorporated in highway design to provide such opportunity (I-70 through the Vail Pass). Bicycling is one of the fastest-growing outdoor recreation activites and fits with the semi-primitive nonmotorized emphasis in the Forest Plan. Current cycling opportunity is discouraged by narrow roads with lack of shoulders rather than grade. The study should address how such cycling demand can be incorporated in the alternatives.

MNF-42 Page III-68. Impoundments. The Elkins Flood Control Structure might be listed here or perhaps where flooding is discussed.

MNF-43 Page III-78, para 1. Reference page III-83 for mitigation measures.

MNF-44 Page III-81, para 2. The predicted traffic volume of 14,100 vehicles per day is used in relation to building the highway. Is that figure for the no build situation?

MNF-45 Page III-83, para 2. The mitigation measures for Bowden should also include no blasting and reduced charges; see page III-136.

MNF-46 Table III-28. Indicate that figures are in acres.

MNF-47 Page III-93, para 1. Indicating the percentage of wetland acres impacted alone gives a false reading. The discussion should say that Scheme A options impact 87 percent of 33 acres and so on. The reader sees that Scheme C only impacts 80 percent of wetlands, but unless he/she studied the preceding table, will fail to note it is 80 percent of 130 - 321 acres.

MNF-48 Table III-29. The potential impacts on exceptional resource values could also be shown, since these are of most interest.

MNF-49 Page III-97, Comparison of Schemes. This format should be used throughout the document - it presents the information more clearly than lumping it all in one paragraph.

FS 30
6

MNF-50 Page III-101, We are not aware of the occurrence of natural grass balds in West Virginia. These are more often found in North Carolina and other high elevation areas in the Southern Appalachians.

MNF-51 Page III-102. MP 6.1 emphasizes remote habitiat for the black bear and wild turkey "association" - not just for black bear and wild turkey. The association includes many other species of wildlife. The Dolly Sods and Otter Creek Wilderness Areas are MP 5, not MP 8.

MNF-52 Page III-102. State basis or logic for using 200 acres as being sensitive to fragmentation.

MNF-53 Page III-104, Wildlife, para 3. The pheasant is not native to West Virginia. It is not found in reproducing populations. A few escape or are released/stocked. Recommend pheasants be dropped from the list of game animals.The figures for deer are low - 50 to 60 deer per square mile might be more correct. Refer to WVDNR for latest population figures.

MNF-54 Page III-105. Potential Impacts - The SDEIS should identify "injury and mortality due to collision with vehicles" as an impact, and then address this in the document. Perturbation affects not only habitat but animal populations/numbers as well.

MNF-55 Page III-110. Is the analysis limited to only MNF land? If so, the analysis should be expanded to cover all lands along the route. Habitat for bear and turkey exists on other ownerships and impacts on this habitat should be estimated also. This is the right methodology, just apply it to all ownerships having wildlife habitat.

MNF-56 Page III-112, para 5. The statement "Unavoidable direct loss of habitat could be compensated for by increasing the carrying capacity of the remaining habitat" is misleading to the readers of this document. We are not aware of any highway project that has mitigated direct loss of habitat by spending large amounts of additional money to implement habitat improvements.

MNF-57 Page III-112, last para. Doubt that viewing wildlife is desired by most drivers on a 4-lane highway. In fact, if the main need for the highway is safety, vegetation along highway should be designed to discourage wildlife. Mitigating lost habitat should be done elsewhere, away from the highway.

MNF-58 Table III-32. Are figures only for MNF land?

MNF-59 Page III-119, para 2. Calling the damage done by the 1985 Flood "minimal" is not going to sit well with those people who experienced it. Exhibit III-9 shows flood plains, but not potential development regions. Last sentence does not make sense.

MNF-60 Table III-35. Information in the "Damages" column should be displayed in a consistent detail. Suggest the level of detail shown for the Cheat River. There were more than eight deaths due to the flood: 11-12 on the North Fork of South Branch alone.

MNF-61 Page III-122, Sec 1. The National Wild and Scenic Rivers Act was signed in 1968 not 1975. In addition, the Wild and Scenic Rivers act also identifies federally administered rivers included in the National Wild and Scenic Rivers System, additional rivers to be studied for possible inclusion, and provides guidance for management.

MNF-62 Page III-122-123. Suggested changes to item 2. NATIONWIDE RIVERS INVENTORY

"Several rivers or river segments are included in the National Park Service's Nationwide Rivers Inventory (NRI) which lists rivers or segments that appear to meet minimum criteria for addition to the National Wild and Scenic Rivers System (NWSRS). Protection of NRI rivers is minimal in that agencies are directed to consider and avoid or mitigate potential impacts, and consult with the Park Service in project planning which might affect listed rivers.

Rivers are listed in the NRI pending study to verify eligibility, identify probable classification, and determine suitability for inclusion in the NWSRS. If determined to be both eligible and suitable for inclusion, they may be recommended for designation by act of Congress or, following appropriate state legislation, by request of the governor to the Secretary of Interior.

Federal protection of Study Rivers actually identified in the Wild and Scenic Rivers Act is more stringent than for NRI rivers. Federal projects that would affect free flowing characteristics of a Study River are prohibited unless determined not to have a direct and adverse effect on the values for which the river might be designated. River crossings are not prohibited by the provisions of the Act if they do not affect free flow, but they may affect the potential classification or even suitability. [NOTE: The Cacapon River is the only identified Study River within the project area and the study period for that river has expired. This paragraph may be irrelevant.]

Other rivers can also be studied by federal land management agencies to determine their eligibility and suitability for inclusion in the NWSRS. Several such rivers within the project area are currently being studied on the Monongahela National Forest. These rivers have no legislative or formal administrative status.

MNF-63 Page III-125, Sec b., last para. Modify as follows, "In addition, Scheme Options A1, A4, A7, and A8 could affect...." Comment: It seems premature to say the highway would "likely preclude eligibility". It might affect classification.

MNF-64 Table III-36. [NEED TO LIST THE NON NRI RIVERS IN THE AREA, TOO]

MNF-65 Exhibit III-9. Color scheme masks flood plains - can't tell where they are, if they are on the map.

MNF-66 Table III-37, foot notes. Just use Forest Service or, USDA Forest Service, not National Forest Service.

MNF-67 Table III-38. The North Fork and South Branch lines appear to need different crosshatching in order to show which line is which (crossings vs parallel construction).

MNF-68 Page III-130, Sec. A. Text is inaccurate for Northern Flying Squirrel. It should read "The Virginia Northern Flying Squirrel (G.S. Fuscus) generally lives at high elevations (>3000 ft.) in the mid appalachian mountains of Virginia and West Virginia in cool, moist forests containing a conifer component of red spruce or eastern hemlock." The title for "a." should be "Virginia Northern Flying Squirrel". G.S. Coloratus does not occur in the project area.

MNF-69 Page III-131, Sec. C. Saying the habitiat requirements of both species of endangered bats (Indiana and Virginia Big-Eared) is similar is incorrect. The Indiana bat winters in some West Virginia caves, but it is not known to summer in the state and most likely migrates north, out of the state, in summer. The Virginia Big-Eared bat spends both summers and winters in some West Virginia caves. They often hibernate and raise their young in the same cave system. The Indiana bat does not use caves to rear its young.

MNF-70 Page III-131, Sec D. Technically correct. Although the US Fish and Wildlife Service is involved in the protection, management, and recovery of endangered species it was the Monongahela National Forest working cooperatively with the West Virginia DNR endangered species section that successfully reintroduced the Peregrine Falcon to West Virginia.

MNF-71 Page III-133, Sec. A. A greater impact to the Virginia Northern Flying Squirrel than increased human activity is genetic isolation resulting from fragmentation of its habitat.

MNF-72 Page III-133, Cheat Mtn. Salamander, para 1. Don't see relevance of statement about trails established by off road vehicles or hikers?

MNF-73 Page III-135, para 2. Why should impacts to Cave Hollow Cave be "most likely"? Won't the mitigation measures listed on next page work to avoid intrusion into the cave environment? In this case you have a known quantity that can't be avoided by some alignment, so some further discussion of why direct impacts are most likely and what kind is warranted. If direct effects really are most likely, then some further thought to possible mitigation is needed - beyond the ordinary.

MNF-74 Page III-136, Sec A. Mitigation for Virginia Northern Flying Squirrel would/should also include protection of occupied habitat.

MNF-75 Page III-136, Sec B. Relocation of Cheat Mountain Salamanders has been tried by Dr. Thomas Pauley and found to be unsuccessful.

MNF-76 Page III-136, Sec C. In protecting bats, especially the Virginia Big-Eared bat, protection of its foraging habitat is also very important. Virginia Big-Eared bats may forage over 2 miles from the caves in which they roost during the summer months.

Section III - Specific Comments (cont.)

MNF-77 Page III-137, para. 1. Mitigation measures for bats as listed in the MNF plan are no longer applicable for both Indiana and Virginia Big-Eared bats. Recent studies indicated that Virginia Big-Eared bats do not necessarily forage over riparian areas as previously thought. Indiana bats are more likely to do so. In addition, the concept of a forested travel corridor 330 feet wide between caves and foraging areas is no longer valid. Again, recent studies of Virginia Big-Eared bats show that individual bats select individual foraging areas in various/numerous directions from a cave. These bats do not all stay within a 330 foot corridor and fly to one central foraging area.

MNF-78 Page III-164, top of page. This indicates with more survey more sites will be discovered. So the mitigation listed just below should indicate a cultural resource survey will be conducted as part of the site-specific analysis of the selected corridor alternative.

MNF-79 Page III-173. Construction costs are said to be a one-time expenditure which are not retrievable. If the scope of the analysis were refocused, as it ought be, then would the results show that the construction costs could be recovered through highway taxes and income taxes generated by a more robust economy?

Section IV:

MNF-80 The Forest has decided not to comment on this section at this time. The WVDOT Division of Highways has asked this agency to render an opinion of Section 4(f) applicability, and to identify MNF lands protected by Section 6(f). The request was made to Jim Page by Fred VanKirk in a letter dated June 8, 1992.

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STATE OF WEST VIRGINIA
DEPARTMENT OF COMMERCE, LABOR AND ENVIRONMENTAL RESOURCES
DIVISION OF NATURAL RESOURCES

GASTON CAPERTON
Governor

State Capitol Complex
Building 3, Room 812
1900 Kanawha Boulevard, East
Charleston, West Virginia 25305-0664
TDD 558-1439 TDD 1-800-354-6087
Telephone (304) 558-2771 Fax (304) 558-3147

J. EDWARD ...
Directo...

ANN A. S...
Deputy D...

June 30, 1992

Mr. Randolph Epperly Jr.
Director-Roadway Design Division
WVDOT - Division of Highways
State Capitol Complex, Building Five
Charleston, WV 25305

Dear Randy:

The West Virginia Division of Natural Resources (DNR) has completed their review of the (Working) Supplemental Draft Environmental Impact Statement (WSDEIS) for Appalachian Corridor H, Elkins, West Virginia, to Interstate 81 in Virginia, and wishes to provide the following comments.

Consistent with our discussion at the May 5, 1992 meeting, our comments on the WSDEIS will address completeness and not specific alignment (scheme) preferences. We will recommend our choice of scheme(s) following receipt of the Supplemental Draft Environmental Impact Statement (SDEIS).

We appreciate the opportunity to review this working draft prior to formal issuance of the DEIS. Our review has found the document and its appendices to be a qualitative review of the proposed 24 alternatives.

Purpose & Need

DNR-1

The Division concurs with the WV Department of Transportation (DOT) regarding the need to complete Corridor H from Elkins to the State of Virginia. We believe modern, efficient transportation is necessary for growth of north-central West Virginia.

DNR-2 We also believe this highway can be constructed in an environmentally sound manner, but this can be accomplished efficiently only with significant continued cooperation between agencies to identify areas of controversy and expedite the environmental review process. On July 1, 1992, the Water Resources Section of DNR will move to the Division of Environmental Protection. We do not anticipate any significant changes on the amount or type of effort currently expended for environmental review of DOT projects. To best accommodate environmental review needs, in light of agency reorganization, the DOT should solicit environmental review from DEP, as well as DNR.

General Comments

DNR-3 We presently agree that this type of initial qualitative review is all that is possible because of the significant project scope and the unique natural and human resources which will be impacted by many of the proposed schemes.

DNR-4 The project scope, the lack of specifics, and absence of quantitative data make the document difficult to review and constitute major shortcomings. If the SDEIS follows the form of the WSDEIS, the reviewing public must understand that each scheme involves a 2000 foot wide corridor within which up to 7 four lane highways could be aligned. Some of the natural and human resources impacts, theoretically, will be only by 1/7 of the total impacts reported in the WSDEIS. This is further dependent on the actual alignment chosen within the 2000 foot wide scheme.

This concept is difficult to understand and is further complicated by the natural and human impacts associated with each of the 24 possible schemes and subschemes.

DNR-5 We realize you attempted to aggregate and interpret large amounts of qualitative information. We are, however not yet convinced you have condensed the information to a point where it is digestible by the reader. Our review found the evaluation of 24 schemes tedious and extremely difficult.

It is not the intent of the National Environmental Policy Act (NEPA) to require unnecessarily voluminous and confusing project documentation. It is NEPA's intent to examine all alternatives and intensively evaluate all that are reasonable.

DNR-6

To meet NEPA's intent we suggest you consider reducing the number of schemes and subschemes to include only those judged reasonable and practical (although perhaps not totally acceptable from a resource impact perspective) to build. We believe Scheme A, without several of its tunnel subschemes, and schemes D&E are reasonable and practical alternatives which can be adequately assessed by a DEIS.

We do not mean to imply we recommend eliminating schemes B & C from the documentation, but because of the extremely sensitive wetlands and parks of Canaan Valley and current emphasis on protection of these areas from further impact, the likelihood of approval of these schemes is remote. We suggest their elimination from further consideration in the SDEIS. We similarly recommend you exclude the scheme A tunnel alternatives from further consideration because of their economic infeasibility. This approach would reduce the number of schemes and subschemes to 12 which is a much more comprehendible and realistic number for evaluation.

NEPA allows the flexibility to document any alternative and then eliminate it from consideration because of its lack of reasonableness and practicality without jeopardizing the process.

While this agency can understand and accept the lack of specificity, broad scope, multiple options and lack of quantitative environmental data in the WSDEIS, the DOT needs to realize that this approach in the SDEIS will make the document extremely difficult to work with and will slow progress toward selecting a final alignment. To expedite providing a detailed SDEIS for public review, we suggest the following:

1) Eliminate from further consideration schemes which are not reasonable and practicable on an environmental or economic basis.

2) Coordinate with resource agencies to choose 2 or 3 reasonable and practical schemes and through office and

field review develop approximate highway alignments that minimize natural and human resource impacts within these schemes.

3) Provide a narrative and tables of unavoidable human and environmental impacts within each scheme. This will allow a more realistic scheme evaluation.

4) After alignments within the schemes are developed, roughly detail how unavoidable impacts will be mitigated and incorporate the mitigation costs into the project.

5) Select a final alignment utilizing the NEPA process.

Specific Comments

Our specific comments refer to our previously expressed concern and address the need for a detailed analysis of impacts in conjunction with highway alignments within preferred scheme(s).

Water Quality

DNR-7

There are several major concerns with respect to stream impacts and resulting water quality. First, the qualitative approach to stream disturbance (i.e., high, moderate, low) is inappropriate and provides insufficient information for evaluation by resource agencies. It is unrealistic to assume impact assessment could be made using these criteria. Secondly, specificity relative to streams crossed or otherwise affected, including details such as location of crossing, angle of crossing, etc., will need to be provided before a satisfactory evaluation of impacts can be accomplished.

DNR-8

The DNR disagrees with the surface water evaluation applied to each of the schemes. With regards to determination of intermittent streams, the use of U. S. Geological Survey maps to determine if a stream is perennial or intermittent is not sufficient. We recognize that some field reconnaissance did occur to substantiate whether the mapping was correct, however, precipitation in the proposed project area during the past several years has been below normal. Streams that were found dry during field reviews may not necessarily constitute an intermittent stream.

The West Virginia Legislative Rules, Title 47, Series, 1, Requirements Governing Water Quality Standards (West Virginia Legislative Rules) define intermittent streams as "streams which have no flow during sustained period of no precipitation and which do not support aquatic life whose life history requires residence in flowing waters for a continuous period of at least six (6) months." Even if a stream is intermittent in nature, it continues to be a high quality stream as long as water quality is at or above levels necessary to maintain designated uses. Water quality standards, narrative and specific, as applied to high quality streams are applicable if uses are maintained. Water quality standards do not apply only when there is no flow or flow is less than 7Q10.

DNR-9

Respective of High Quality streams, the majority of the criteria used were correct; however; native trout streams must be put into a higher resource protection category consistent with State law. The West Virginia Legislative rules includes a National Resource Water (NRW) category which provides the highest level of protection for waters of the state which meet the NRW designation. The NRW category applies to, but is not limited to, the following waters of the state: all federally designated rivers under the "Wild and Scenic Rivers Act", Public Law 95-542, as amended, 16 U.S.C. 1271, et seq.; all naturally reproducing trout streams; all streams and other bodies of water in State and National Forests and Recreation Areas; and National Rivers under Public Law 95-625, as amended, 16 U.S.C. 1, et seq. Furthermore, National Resource Waters are defined under the West Virginia Legislative Rules as "those whose unique character, ecological or recreational value or pristine nature constitutes a valuable national or State resource." The definition takes into account state rare species, Federally-listed threatened or endangered flora, fauna, etc.

DNR-10

Determination of high quality streams must also take into account use-attainability. If water quality is better than the minimum levels necessary to achieve the national water quality goal uses, the stream is a High Quality stream. The levels necessary to achieve water quality goal uses are contained in the narrative and specific criteria of the West Virginia Legislative Rules.

DNR-11

The DNR disagrees with any designation of Moderate Quality streams. All waters of the state are provided a base-level of protection which requires compliance with the specific water quality criteria. High quality streams are provided an elevated level of protection and National Resource Waters are provided the greatest level of protection. At no time are waters designated as low or moderate value. Regardless of the stream designation, all activities which may impact water quality must be conducted to ensure the maintenance of minimum standards applicable for the stream as classified by State law.

DNR-12

We request that if the surface water evaluation is presented in the future, a resource classification system based on requirements of the West Virginia Legislative Rules be used in the determination of resource value.

Wetland Impacts

DNR-13

We consider all West Virginia wetlands as sensitive, high quality resources because of their scarcity. Because all wetlands in West Virginia are similarly regulated, categorizing them arbitrarily is not warranted.

DNR-14

The DNR disagrees with the design of a wetland classification system for use in evaluating wetlands located in the corridors. If valuation or classification of state waters is to be conducted, it must be consistent with State law and such classification is the responsibility of the State resource agencies, not the private sector.

DNR-15

Under Chapter 20 of the West Virginia Code, wetlands are included as waters of the State and receive protection equal to that provided for surface waters. Currently, West Virginia does not use a value-based classification system with the exception of the previously discussed NRW category. Wetlands which meet any of the NRW designations as described earlier (e.i., wetlands in national forests, recreation areas; wetlands that provide habitat for state rare or Federally-listed threatened and endangered species, etc.,) or are associated with streams which meet any of the above categories, are afforded the highest level of protection. Consequently, wetlands in this category are to be avoided.

DNR-16 It is requested, therefore, that the valuation categories of Exceptional and Standard be eliminated and any further evaluation of wetland resources within the corridors be consistent with State law.

DNR-17 Additionally, we recommend that each scheme presented for further consideration incorporate the alignment that minimizes wetland impacts by maximizing wetland avoidance. Each scheme presented must also include quantitative assessments of unavoidable impacts as well as inclusion of the cost of appropriate mitigation as part of the overall construction cost for each of the schemes.

Wildlife

DNR-18 The document presents data for public lands; private lands are not addressed. The document addresses wildlife impacts in terms of estimates of animals lost to the population using acres of impacted habitat and population levels projected from National Forest optimum management goals. Using management goals to project wildlife population impacts is unrealistic. We prefer you address expected wildlife impact in terms of acres of habitat (by category) lost. A discussion of the effect of the highway on wildlife populations' responses to forest (habitat) fragmentation should be incorporated. Effects of fragmenting a broad expanse of forest as well as dividing individual habitat types should be included. The removal of especially productive and/or limiting and/or limited habitat types (i.e., bottomland, coves, gentle slopes with higher soil fertility, etc.) has a synergistic negative effect on wildlife populations beyond what would be expected from the simple removal of a particular forest type. Mitigation for direct and immediate impacts to habitat during construction and future impact from habitat loss and fragmentation can be effected through zoning, easements, leases, or purchases through careful consideration of siting and controlling highway access. Proposals for mitigating these impacts should be included in the DEIS.

Vegetation/Remote Habitats

DNR-19 Congressionally designated wilderness areas are MP5 areas not MP8 areas.

Resource Book II

Sheet one of 65 - the label for scheme A is misplaced. We believe the existing label should read scheme D & E.

Sheet 25-65 - same comment.

Conclusion

As you are aware from past project comments, we believe interagency coordination is critical to anticipate and prevent otherwise unexpected and many times unpleasant reactions to impact documentation. We believe your present efforts, which included meetings and a preliminary review of the Working Supplemental Draft Environmental Impact Statement for this important, but environmentally sensitive project, are commendable.

As explained in our comments, we have serious but resolvable concerns about the large number of schemes, the absence of any indication of the alignments within those schemes that minimize environmental impact and the need for detailed quantitative studies before final scheme selection occurs. We believe a significant part of the information required to develop a SDEIS is present within the information provided in the working draft.

The May meeting provided this agency with an interesting, broad based approach to the NEPA process. We believe that this positive first step will benefit the DOT by preventing unnecessary confrontation over resource impacts as the process evolves. If you have questions or require clarification of any of these comments please contact Roger Anderson (WVDNR, 637-0245) or Barbara Taylor (WVDEP, 256-6850).

Sincerely,

J. Edward Hamrick III
Director

JEH/raf

PRELIMINARY COMMENTS ON CORRIDOR H PRELIMINARY DEIS
by Mary Wimmer, Public Lands Chair, WV Sierra Club
June 18, 1992

SC-1. S-6: Wilderness Management Prescription 5.0 should clearly be listed as 4(f) land, in particular, Otter Creek, Dolly Sods and Laurel Fork North Wilderness Areas. The proximity of proposed routes to these areas results in impacts due to noise, visual effects, and the potential for overuse in the future, thereby destroying wilderness attributes. These impacts should be carefully evaluated for each of these wilderness areas. Strongly disagree that impacts to adjacent wilderness areas would be none.

Agree that M.P.'s 6.2, 6.1, and 8.0 should be listed as 4(f). It is clear that the Forest Management Plan, whose public involvement history is omitted and should be described, places a clear direction on the management of this public resource. That direction specifically designates, with clear guidelines, that 3/4 of the land emphasize remote wildlife habitat and semiprimitive nonmotorized recreation in a natural setting, as the 4(f) evaluation forms describe, both of which are incompatible with the impacts of a 4-lane super-highway.

More discussion should be done of the Dolly Sods Scenic Area (M.P. 8) relative to noise and visual impacts of the nearby alternatives (varieties of A, B and D). Will B and D affect the visual and natural sound experience in the Bear Rocks and Dobbins Slashing areas? How will the noise carry?

SC-2. The evaluation of noise (see below) is clearly inadequate. In view of the very low levels of natural noise that predominate within the Monongahela National Forest area, the impacts of a major 4-lane superhighway will be severe.

SC-3. S-5, II-17,18, 19: The design standards are very limited, and are not at all sensitive to the special nature of this part of West Virginia, the hub of its large travel and tourism industry. Recommend expand to include a divided parkway type design (with trucks and proper speed limit, not 45 mph) and discussion of its benefits (visual, noise, winter maintenance and safety, wildlife, etc).

SC-4. S-10: Summaries need to include all major elements. For example, Scheme A also impacts the most 4(f) land and known historic and archeological sites. The most incorporated communities are along Schemes D and E.

SC-5. S-11: Trout streams should be added to the areas of controversy list, as well as Monongahela National Forest, Canaan and Blackwater Falls State Parks, and Canaan Valley as entire entities.

Does the cover of this document focus on Alternative A scenes?

SC- 6. Recommend map showing the scheme options along with table.

SC-7. The discussion of the outdoor recreation demand in the study area is totally lacking. Under the effected environment section, and perhaps also in the purpose and need section, there should be a map and in depth discussion showing the role that the Monongahela National Forest and associated state parks play in the regional demand for outdoor recreation, especially in remote, generally natural land. We have a very unique resource here for the eastern U.S..

There should be dicussion of the scarcity of remote land in the eastern United States despite the majority of the population. Concentric circles with travel mileage levels to eastern population centers should be included to illustrate the large population being served, and thus the need to protect these resources in view of the state's travel and tourism industry.

Along with this discussion, the acreage figures and %'s of public verses private land for each corridor and the area as a whole should be given somewhere to make it clear how much public land is involved. Perhaps Table III-7, p. III-16.

There should be graphs (available from the U.S. Forest Service) showing the projected demands for the various resources of National Forest lands, especially the increase in demand for remote recreation. Also included should be projected use figures if Corridor H goes in and the resulting impact on the wildland resources.

Suggest that a remote recreation specialist be given this task, surely not an engineer. This discussion is critical in laying out the resources to be impacted.

SC- 8. Where is the Recreational Resource technical document?

SC-9. I-20, III-35, III-52: It should be clearly pointed out that the need for access to remote recreational areas must be balanced with the need to protect the remote rural qualities for which a) many of those who live there choose to do so, and b) the users of these areas come to West Virginia. The discussion is not balanced or accurate in the sense that no mention is made of the negative sides of the proposed superhighway. No description of what it is that tourists and outdoor recreationists come to this area of West Virginia for, largely the natural, undeveloped nature of the area.

The conflicting "needs" should be fairly presented. The quoted letter from the US EPA is clearly taken out of context, and likely relates primarily to environmental concerns about the project, not outright support of it. In fact, the letter is about wetland concerns in the area of Corridor H west of Elkins. If you use the letter, relate the rest of it as well.

SC- 10. I-21, III-62: Only heavy-industry transporation uses and motorized transportation (vehicle, air) are discussed. In terms of intermodal transportation for the large tourism & outdoor recreation industry of the area, all types of roads, trails, and boatable waterways (hiking, biking, rails-to-trails, canoeing/kayaking, etc.) and associated facilities such as campgrounds and access points should be shown on a map and discussed, as well as the user populations of these facilities. As has been made clear from the 1991 amendments to the Federal Transportation Act as regards Intermodal Transportation, more emphasis is being placed on non-automotive transportation facilities.

The newly established American Discovery Trail (ADT) goes through the Corridor H study area. It should be shown and impacts discussed, as it has national as well as regional and local significance. (See a spring 1992 issue of Backpacker Magazine). There is now a proposed Greenway Trail plan for the region which includes the Corridor H study area. This plan should be shown. (Contact National Park Service in Philadelphia.)

SC- 11. Tunnels should clearly be considered for the northern routes, esp. Alt. D. (I have been saying this for over a year, and yet have been ignored.) If they were, then the impacts of the route would be greatly lessened and should be discussed, for example less forest fragmentation, visual impact, noise, winter maintenance, etc.

SC-12. I-24: Are 3 years of accident data sufficient? How compare with other roads, e.g. Iowa? New Hampshire?

SC-13. II-13: Typo -- Line 5 up should be Rt. 50, not Rt. 55.

SC-14. III-13: The construction costs apparently do not include the costs of mitigation. This should be pointed out clearly, and an estimate made of those costs for the various alternatives.

SC 15. III-17: Is the 1976 Anderson data of Table III-7 the same in 1991? The middle of p. III-17 states that impacts will be "substantially less" because acreage impacted would only be the roadway. This is not at all true for noise and visual impacts which not only will impact the corridor, but are very likely to impact far beyond the corridor acreage to adjacent lands. Recommend this be recognized and discussed.

SC -16. III-20: The land suitability discussion is totally prejudiced against rural rugged mountainous land as having the right to exist for its <u>own</u> values, <u>high</u> values for many who live or who visit there. Many people would very much disagree with the statement that the project area "suffers" from a shortage of "readily developable space;" this is the <u>natural</u> ecosystem of the area, with tremendous biodiversity, having recovered from the turn-of-the-century timbering disaster. This recovery to the present should be described. This discussion should be changed to reflect that modern day values are beginning to reflect much more regard for natural ecosystem and biodiversity preservation as opposed to remodeling and manipulation by humans solely for human benefit separate from nature.

SC- 17. Agree with most of discussion about consistency with land use plans except for a) the elimination of wilderness areas which should be added in; disagree with the designation of "N" for M.P. 5.0 in Table III-10, p. III-23 due to noise, visual and overuse impacts; and b) disagree with the "N" designation for scenic areas (esp. Dolly Sods M.P. 8) where the same impacts will clearly be significant for some alternatives.

SC- 18. Numerous times throughout the document the comment is made that a thorough analysis of impacts can not be done because no preferred alternative has been chosen. If this is the case, then what further NEPA process will be used to analyze the site-specific data? How can a choice of a preferred alternative be made without sufficient information? Examples are: soils (III-25); noise (III-65); residents (III-34); community (III-39); oil/gas (III-48); utilities (III-49); economic environment (III-51); surface water (III-80); wetlands (III-98); wildlife (III-104).

SC-19. III-29 typo -- line 3 up omit "West." The rural character of the study area is why many people have chosen to live there; it is a positive attribute for many, including the visitors to the area, and should not be presented as something bad that needs to be significantly altered. Ample transportation can be provided without destroying the area's rural nature. The demographic info missing (III-33) would appear to be necessary to make an accurate evaluation of road impacts on these communities.

SC- 20. III-35: A discussion of the impacts of splitting as well as building over the family farm is recommended as they can be very significant to family as well as community cohesiveness.

SC- 21. III-40: No comments have been made relative to the demand placed on local services with a major increase in the influx of people the these rural areas. No discussion on expected increase in crime rate mentioned, with examples from other areas similarly impacted.

SC- 22. III-44: Need to add visual negative impacts to the list at bottom of page.

SC-23. III-63: One has to question the admittedly "out-of-date" air quality evaluation methods. What is the difference?

SC-24. III-64-65: In view of the fact that noise impacts of a super-highway in this largely natural area are sure to be very significant, much more noise analysis and evaluation must be done. A full description of the current noise levels in the area need to be made (most - low level of primarily natural noise) so that the impact on these levels can be accurately evaluated. The impact will be much greater in areas of natural quiet than if this road were to be an extension of the Washington beltway, and this should be reflected in the discussion. The present text is clearly inadequate. Site specific information also important here to accurately determine impacts. The impacts, like visual, will likely spill over beyond the corridor as some noise carries a long way in this topography. Need to document this for each alternative. This is why Otter Creek and Dolly Sods Wilderness Areas must be added to 4(f) special areas impacted.

SC-25. III-66,67, III-122: Recommend adding "Outstanding recreational or scenic value" as a High resource value stream qualification. Also, discussion of the rivers found eligible for study for ongoing USFS Wild and Scenic River designation, and impacts on that eligibility.

SC-26. No discussion on the impact of stream-associated recreation activities such as hiking, biking, backpacking, birdwatching, swimming, etc. and how road pollution/noise will impact them.

SC-27. III-52: Again, need to comment on what has made the tourism industry so successful, why people come.

SC-28. III-69: Need to comment on the generally excellent quality of the rural groundwater supplies in this part of West Virginia.

III-77: Need to expand on groundwater threats, including the potential of contamination by hazardous substances (e.g. by truck accidents), and impacts to individual water well supplies.

SC-29. How compensate for other recreational users of the streams besides just trout anglers? Only "habitat manipulation" for trout is discussed.

SC-30. Considering the controversy surrounding wetland destruction, a more careful analysis of the ability to avoid wetland resources within the corridor is necessary for proper decision-making.

SC-31. Wildlife and Recreation should be covered under separate sections, not lumped together as done here. Recreation as well as wildlife are two of the most significant uses of the public (and private) land of the area, and each deserves a full analysis. Noise and aesthetic/visual impacts again need a much more thorough analysis. The MNF Management Plan's Visual Quality Objectives (VQO) are not mentioned. No analysis of wildlife migration impacts is done.

A discussion of impacts on forest ecosystem biodiversity is lacking, and might be incorporated in the forest fragmentation section. What are potential impacts due to increased spread of non-native species of all kinds (birds, plants, etc.)?

What will be the impacts on the spread of the gypsy moth with the enhanced motor vehicle traffic around the area? Could have nationwide impacts. Contact Dick Reardon for a start, USFS, Morgantown, 285-1566.

SC-32. III-102: Error -- end of second paragraph, wilderness is not M.P. 8. M.P. 5.0 should be fully discussed.

SC-33. III-116: Errors in legend of Exhibit III-9, color bars and text.

SC-34. III-127: Confusing why two listings for N. Fk. of S. Branch of Potomac.

SC-35. III-169: Visual impact section?

SC-36. III-172,3: Need <u>much</u> more discussion about the long term impacts of such a major alteration in this particular rural area as will be done by construction of a superhighway as proposed. Long term impact/productivity on <u>all</u> land use values of public land resources should be discussed, including remote wildlife, semiprimitive nonmotorized recreation, water quality, etc. (See the NEPA resource impact list in the Forest Plan EIS for topics that should be included.) Sighting of what has happened in other formerly rural areas this close to major population centers after superhighway construction should be documented, both for public and private lands. Certainly these impacts are not the same across alternatives, as suggested; major differences.

Ditto for the Irreversible/Irretreivable Commitment of Resources. <u>All</u> resources. The probability of "reclaiming" a once constructed superhighway is virtually zero; thus irreversible is the nature of this project and the discussion should reflect this. Where are Cumulative Impacts evaluated?

<u>Strongly disagree</u> with the last sentence on p. III-172-3.

SC- 37. Overall suggestions:
- -- a matrix table of all negative impacts in order of severity
- -- cumulative list of all permits required for the project
- -- bar graphs for each issue/concern like done for wetlands

SC- 38. Suggested additions to mailing list will be forthcoming.

-- END OF PRELIMINARY COMMENTS --

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