

CHAPTER S.0

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

S.1 PURPOSE AND NEED FOR THE PROJECT

The purpose of the I-73 project, as proposed in this document, has five major components

1. To provide safety improvements along the U.S. Route 220 study area.
2. To support economic growth, economic vitality and to maintain existing economic competitiveness in the region.
3. To improve operations, access and capacity for vehicular and freight movement through the corridor and to/from other locations in the Michigan to South Carolina target market.
4. To enhance general mobility and transportation linkage through both the immediate Roanoke to North Carolina study area and through the broader Michigan to South Carolina travel corridor.
5. To address the Congressional intent that the portion of I-73 from Charleston, South Carolina to Portsmouth, Ohio be included as part of the Interstate system.

Congress designated I-73 a National High Priority Corridor as part of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The purpose of the National Highway System (NHS) "priority corridor" designation is to link the nation's regions and support economic growth. Needs were identified to improve goods movement between the port of Charleston, South Carolina and Sault Ste. Marie, Michigan. This would require an effective and efficient roadway that facilitates interstate travel between Michigan, Ohio, West Virginia, Virginia and North and South Carolina. It is an identified state and regional priority in Virginia to foster planned economic development between southwestern Virginia and North Carolina's Piedmont Triad regions (The Piedmont Triad region is generally defined as the area in North Carolina bounded by the cities of High Point, Greensboro and Winston Salem). Another regional priority in southwest Virginia is to address safety concerns along U.S. Route 220 resulting from high percentages of truck traffic, poor sight distances, steep grades and a large number of accidents. This would be achieved by developing a safe and direct transportation link for freight and other trip purposes between North Carolina's Piedmont Triad and the Roanoke Valley's I-581 and I-81 corridors.

To link Federal, state and regional objectives, Congress further defined the location of the I-73 corridor in 1995 when they passed the National Highway System Designation Act. In Virginia, I-73 was designated to generally follow U.S. Route 220 from the Virginia-North Carolina border to Roanoke. From Roanoke the corridor follows I-581 to I-81. The corridor remains on I-81 to Ironton, turning north on the new "Smart Highway" demonstration project to U.S. Route 460 in the vicinity of Blacksburg. The I-73 continues along the U.S. Route 460 alignment from Blacksburg to the West Virginia state line.

This document evaluates only the location of I-73 from the Virginia-North Carolina border to I-81 in the vicinity of Roanoke. A study to determine the location of I-73 from I-81 to the West Virginia State line will be conducted at a future date when funding becomes available.

S.2 ALTERNATIVES CONSIDERED

To address the Purpose and Need for I-73 (see Section 2), a broad range of options were considered and evaluated. Over 750 Interstate segments and other alternatives were developed for the Study using input from local jurisdictions, public meeting participants, stakeholder interviews, and input from the I-73 Location Study Team. Key alternative evaluation criteria included the ability to connect I-73 through Virginia, to address safety, to support economic development, and enhance access, mobility, linkage and capacity in the region. Other screening criteria evaluated impacts on archaeological and historic resources, wetlands, threatened and endangered species, prime farmlands, existing and future land uses and suitability for Interstate development.

The process resulted in three core alternatives: 1) No-Build, 2) Transportation System Management (TSM) and 3) New Interstate I-73 (Build) Alternative.

S.2.1 No-Build Alternative

The No-Build Alternative provides the baseline conditions against which other alternatives will be compared. The No-Build Alternative includes routine maintenance and currently programmed, committed and funded roadway and transit projects in the Virginia Department of Transportation (VDOT) Six Year Plan and the long range transportation plans adopted by the urban areas in the region. The VDOT Six Year Plan has been recently changed to the Virginia Transportation Development Plan (VTDP). A tentative VTDP has been developed and is under consideration by the Commonwealth Transportation Board (CTB). The VTDP for Fiscal Year 2000 – 2001 is not due for adoption by the CTB until November of 2000. Future references to the Six Year Plan in this document imply current and future programmed improvements in the VTDP.

S.2.2 TSM Alternative

The TSM Alternative includes all of the improvements in the No-Build Alternative plus improvements to upgrade U.S. Route 220. Sight distance improvements and crossover elimination in selected locations on U.S. Route 220 are included to enhance safety. No improvements are recommended, however, where the grades are in excess of 5 percent for short distances except where sight distances at the crest of a grade are less than the desirable distance in the vicinity of high accident locations.

S.2.3 Build Alternative

The Build Alternative includes all improvements in the No-Build Alternative, plus a new interstate with full access control (no turn lanes, cross traffic or driveway access permitted). The Build Alternative would be built to interstate design standards with a minimum of four travel lanes (two in each direction). Fifty-two segments were carried forward in the DEIS for further study. These were combined into four primary options and several variations ranging from 64.3 miles (103.5 km) to 79.0 miles (127.2 km) in length (see table S-1). The options are considered as representative routes or alignments for I-73, although the segments could be combined to form other options that could be selected. Each option is described briefly below.

- Option 1 and its variation would be the most eastern alignment, beginning on I-81 in Botetourt County near Exit 150 and continuing south through western Bedford County and northeastern Franklin County. Option 1 would continue southerly through eastern Franklin and Henry counties. The alignment would rejoin U.S. Route 220 in Henry County.
- Option 2 and its three variations would follow I-581 south then turn easterly south of Route 24 to cross the Blue Ridge Parkway. At Route 116, Option 2 would continue southerly in a route parallel to and east of U.S. Route 220. The Option 2 alignment would rejoin the U.S. Route 220 alignment for a short distance in southern Franklin County. It would then depart from the U.S. Route 220 corridor, north of the Franklin/Henry County line, and travel to the southeast crossing existing U.S. Route 58 east of Laurel Park. This option and its variations would use much of the existing U.S. Route 58 alignment until rejoining U.S. Route 220 south of Martinsville. The Option 2 variations continue south to the North Carolina State line on a new route west of existing U.S. Route 220. South of Ridgeway in Henry County, Option 2 would rejoin the existing U.S. Route 220.
- Option 3 would follow the existing alignments of I-581 and U.S. Route 220 and include the upgrade of existing U.S. Route 220 to full interstate standards. The three variations of this option leave the existing U.S. Route 220 alignment in locations where topographic or other constraints present a challenge. These variations use both existing U.S. Route 220 bypasses east of Rocky Mount and west of Martinsville in the alignments.

- Option 4 would be a western alignment that would begin in western Roanoke County on I-81 at existing Exit 132, the Dixie Caverns interchange. The alignment would travel east and turn to the south near the western edge of the City of Salem, crossing the Blue Ridge Parkway and continuing south into Franklin County. Option 4 would continue south on the west side of existing U.S. Route 220 through Roanoke and Franklin counties and into Henry County. This option would rejoin U.S. Route 220 east of Martinsville, then leave again south of Martinsville before returning to the U.S. Route 220 alignment south of Ridgeway for the remainder of the corridor.

S.3 SUMMARY OF IMPACTS

The following are narrative summaries of the primary consequences associated with the various alternatives within the I-73 Study area (study area). For the convenience of the reader, some, but not all, references to various resources and impacts are further illustrated in Table S-1.

Traffic and Transportation

Safety concerns on U.S. Route 220 include issues of closely spaced and narrow median openings, lack of left turn lanes at median openings, lack of access control along the roadway in many locations, increased daily traffic volumes, antiquated design standards, growing truck traffic, and higher vehicle speeds. Several goals of the proposed improvements would be to reduce congestion, the potential for accidents in the study area and improve overall travel times on the study area roadway network.

Year 2020 traffic volume forecasts and Level of Service (LOS) analyses were performed for all the alternatives. Forecast traffic volumes, expressed as average daily traffic (ADT) were highest along the sections of I-581 in downtown Roanoke, while the lowest ADT occur along U.S. Route 220 south of Rocky Mount.

The TSM Alternative is forecast to have similar traffic volumes and roadway operations as the No-Build Alternative in the year 2020. The improvements proposed to U.S. Route 220 as a part of the TSM Alternative would be expected to improve the safety of the existing roadway. The improvements, however, would not substantially affect the capacity or operations of the roadway and would not create noticeable shifts in travel patterns within the study area.

Projected I-73 ADT volumes for the Build Alternative vary slightly between the four proposed alignment options. The western alignment, Option 4, attracted the highest volume of traffic to the study area while the eastern alignment, Option 1, attracted the lowest volume of traffic to the study area. The western alignment also provides the most traffic relief to I-581 as compared to Options 1 through 3.

Operating conditions for study area U.S. Routes under the No-Build Alternative are forecast to remain about the same as existing conditions. However, it is anticipated that some of the two-lane highway traffic would notably increase under the No-Build Alternative and the resultant LOS would deteriorate. The inclusion of the Build Alternative in the interstate highway network would produce travel-time savings for interstate highway trips originating in Roanoke or Martinsville, and for those trips passing through the study area. A limited access facility, as currently proposed under the Build Alternative, would have a lower accident rate as compared to existing U.S. Route 220 and would divert motorists from U.S. Route 220 to I-73. As a result, reductions in traffic volumes along the existing U.S. Route 220 roadway would result in a reduction in the number of accidents forecast to occur along the roadway. All Build Alternative options reduce the forecast traffic volumes along existing U.S. Route 220 south of Route 419. The Build Alternative Option 3 would provide the most amount of traffic reduction on central portions of existing U.S. Route 220. Forecast traffic volumes on other roadways throughout the study area indicate acceptable future year peak hour conditions under all of the alternatives studied.

**TABLE S-1
COMPARATIVE SUMMARY OF ENVIRONMENTAL IMPACTS**

ALTERNATIVE	2020 TRAFFIC AND TRANSPORTATION				RELOCATION IMPACTS		LAND USE						COMMUNITY FACILITIES & SERVICES DISPLACEMENTS				HAZARDOUS MATERIALS	VISUAL QUALITY			AIR		NOISE	
	AVERAGE CONGESTED FLOW SPEED FOR ARTERIALS AND EXPRESSWAY (MPH)	TOTAL VEHICLE HOURS TRAVELED (PER DAY, STUDY AREA ROADWAYS)	TOTAL VEHICLE MILES (km) TRAVELED (PER DAY, STUDY AREA ROADWAYS) (in millions)	REDUCTION IN TOTAL ACCIDENTS	RESIDENTIAL UNITS	BUSINESSES	RESIDENTIAL [ac (ha)]	AGRICULTURAL [ac (ha)]	COMMERCIAL/INDUSTRIAL [ac (ha)]	FOREST [ac (ha)]	PUBLIC FACILITIES [ac (ha)]	TOTAL [ac (ha)]	SCHOOLS	NEIGHBORHOOD PARKS	CHURCHES	FIRE STATIONS	OTHER NON-PROFIT	TOTAL OCCURRENCES AT SITES WITHIN SEGMENT BOUNDARIES	VIEW CELLS SEEN FROM BLUE RIDGE PARKWAY	VISUAL QUALITY RANKING (VIEWS FROM THE ROAD)	VISUAL IMPACT RANKING (VIEWS OF THE ROAD)	2020 HIGHEST CO CONCENTRATION (PPM 1 HOUR)	2020 HIGHEST CO CONCENTRATIONS (PPM 8 HOUR)	HOMES EXPOSED TO LEVELS APPROACHING OR EXCEEDING 67 dBA OR EXCEEDING SI THRESHOLD (Increase of 10 dBA or Greater)
TSM	50.6	72,300	5.09 (8.19)	*	6	1	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0	52	N/A	12	1	8.6	5.3	N/A
OPTION 1	52.5	68,900	6.56 (10.56)	50	340	22	241 (98)	2177 (881)	42 (17)	4391 (1777)	0	6851 (2773)	0	0	1	1	1	9	940	1	10	9.4	6.0	411
OPTION 1a	52.5	68,900	6.56 (10.56)	50	420	23	308 (125)	2118 (857)	70 (28)	4326 (1751)	0	6822 (2761)	0	0	1	1	1	9	940	2	12	9.4	6.0	581
OPTION 2	51.9	68,900	5.68 (9.14)	195	463	42	479 (193)	2161 (875)	240 (97)	3401 (1377)	0	6281 (2542)	0	0	4	2	1	67	260	5	9	9.4	6.0	1365
OPTION 2a	51.9	68,900	5.68 (9.14)	195	487	42	523 (212)	2241 (907)	240 (97)	3209 (1304)	0	6213 (2520)	0	0	4	2	1	67	260	3	11	9.4	6.0	2058
OPTION 2b	51.9	68,900	5.68 (9.14)	195	370	63	474 (192)	2071 (838)	438 (177)	3176 (1286)	6 (2)	6165 (2495)	0	0	6	0	1	88	284	7	7	9.4	6.0	2062
OPTION 2c	51.9	68,900	5.68 (9.14)	195	479	42	481 (195)	2106 (852)	264 (107)	3228 (1307)	1 (0)	6080 (2461)	0	0	4	2	1	65	260	6	8	9.4	6.0	1517

* TSM improvements would result in marginal but not significant accident reductions as US Route 220 remains the same functional class of roadway.

**TABLE S-1
COMPARATIVE SUMMARY OF ENVIRONMENTAL IMPACTS**

ALTERNATIVE	2020 TRAFFIC AND TRANSPORTATION				RELOCATION IMPACTS		LAND USE						COMMUNITY FACILITIES & SERVICES DISPLACEMENTS				HAZARDOUS MATERIALS	VISUAL QUALITY			AIR		NOISE	
	AVERAGE CONGESTED SPEED FOR ARTERIALS AND EXPRESSWAY (MPH)	TOTAL VEHICLE HOURS TRAVELED (PER DAY, STUDY AREA ROADWAYS)	TOTAL VEHICLE MILES (km) TRAVELED (PER DAY, STUDY AREA ROADWAYS) (in millions)	REDUCTION IN TOTAL ACCIDENTS	RESIDENTIAL UNITS	BUSINESSES	RESIDENTIAL [ac (ha.)]	AGRICULTURAL [ac (ha.)]	COMMERCIAL/ INDUSTRIAL [ac (ha.)]	FOREST [ac (ha.)]	PUBLIC FACILITIES [ac (ha.)]	TOTAL [ac (ha.)]	SCHOOLS	NEIGHBORHOOD PARKS	NON-PROFIT ORG.			TOTAL OCCURRENCES AT SITES WITHIN SEGMENT BOUNDARIES	VIEW CELLS SEEN FROM BLUE RIDGE PARKWAY	VISUAL QUALITY RANKING (VIEWS FROM THE ROAD)	VISUAL IMPACT RANKING (VIEWS OF THE ROAD)	2020 HIGHEST CO CONCENTRATION (PPM 1 HOUR)	2020 HIGHEST CO CONCENTRATIONS (PPM 8 HOUR)	HOMES EXPOSED TO LEVELS APPROACHING OR EXCEEDING 67 dBA OR EXCEEDING SI THRESHOLD (Increase of 10 dBA or Greater)
OPTION 3	51.1	68,800	5.84 (9.40)	255	481	147	554 (224)	1203 (487)	710 (287)	2063 (835)	15 (6)	4545 (1839)	0	0	13	0	3	124	284	10	3	9.4	6.0	2835
OPTION 3a	51.1	68,800	5.84 (9.40)	255	707	135	542 (219)	1203 (487)	800 (324)	2242 (907)	30 (12)	4817 (1949)	0	0	9	0	2	119	329	9	4	9.4	6.0	3316
OPTION 3b	51.1	68,800	5.84 (9.40)	255	458	144	535 (216)	1203 (487)	710 (287)	2159 (874)	30 (12)	4637 (1876)	0	0	12	0	3	124	284	11	2	9.4	6.0	3055
OPTION 3c	51.1	68,800	5.84 (9.40)	255	455	145	552 (223)	1247 (505)	696 (282)	2014 (815)	30 (12)	4539 (1837)	0	0	12	0	2	121	284	8	6	9.4	6.0	2844
OPTION 4	53.3	68,700	6.98 (11.23)	140	341	14	325 (132)	1520 (615)	76 (31)	3413 (1381)	0	5334 (2159)	0	0	4	0	0	3	394	4	5	9.0	5.4	592
NO-BUILD	50.2	72,300	5.09 (8.19)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	N/A	N/A	N/A	8.6	5.3	N/A

**TABLE S-1
COMPARATIVE SUMMARY OF ENVIRONMENTAL IMPACTS**

ALTERNATIVE	ENERGY			WATER QUALITY			WATERS OF THE U.S. INCLUDING WETLANDS	TERRESTRIAL ECOLOGY & AGRICULTURE					SECTION 4(f) and 106 RESOURCES				DESIGN ELEMENTS & COSTS				
	2020 ENERGY CONSUMPTION [JOULES (BTU'S)] - Trillions			NUMBER OF STREAM CROSSINGS	NUMBER OF NAVIGABLE WATER CROSSINGS	NUMBER OF FLOODWAY CROSSINGS	TOTAL AREA IMPACTED	HABITAT IMPACT					4(f) USES		106 DETERMINATION		LENGTH [mi (km.)]	COST (\$, millions)			
	OPERATIONAL	CONSTRUCTION	TOTAL				Acres (Hectares)	FOREST [Ac. (Ha.)]			CULTIVATED FIELD [[Ac. (Ha.)]	PRIME FARMLAND [Ac. (Ha.)]	PARK LANDS USED	HISTORIC PROPERTIES USED	ADVERSE EFFECT	NO ADVERSE EFFECT		CONSTRUCTION (includes contingency)	R.O.W. / UTILITIES	ADDITIONAL COSTS ¹	TOTAL
TSM	4,036 (3.83)	2,804 (2.66)	6,840 (6.49)	25	2	4	4.35 (1.76)	12 (5)	6 (2)	80 (32)							38 (16)				
OPTION 1	3,654 (3.46)	12,510 (11.85)	16,164 (15.31)	166	3	6	26.29 (10.64)	1,757 (711)	624 (253)	2,010 (813)	2,177 (881)	121 (49)	1	1	1	0	78.8 (126.9)	929	167	168	1,263
OPTION 1a	3,586 (3.40)	13,418 (12.71)	17,004 (16.11)	164	2	8	25.62 (10.37)	1,754 (710)	780 (316)	1,792 (725)	2,118 (857)	84 (34)	1	1	1	0	79.0 (126.4)	979	190	177	1,346
OPTION 2	6,486 (6.15)	13,665 (12.95)	20,151 (19.10)	114	3	12	35.61 (14.41)	663 (269)	947 (383)	1,792 (725)	2,161 (875)	148 (60)	1	1	2	0	76.4 (122.9)	933	211	176	1,320
OPTION 2a	6,336 (6.01)	13,418 (12.71)	19,754 (18.72)	113	3	12	35.61 (14.41)	595 (246)	823 (333)	1,792 (725)	2,241 (907)	146 (59)	1	1	2	0	74.4 (119.7)	905	219	171	1,295
OPTION 2b	6,435 (6.10)	13,438 (12.73)	19,873 (18.83)	111	3	21	28.69 (11.61)	584 (236)	769 (311)	1,825 (739)	2,071 (838)	129 (52)	1	1	1	5	75.9 (122.2)	929	249	179	1,357
OPTION 2c	6,430 (6.09)	13,398 (12.69)	19,828 (18.78)	114	3	13	33.88 (13.71)	576 (233)	947 (383)	1,706 (691)	2,106 (852)	165 (67)	1	1	2	0	75.9 (122.1)	905	210	170	1,285

¹Additional cost includes: Traffic Maintenance, Environmental Mitigation, Engineering and Administration

**TABLE S-1
COMPARATIVE SUMMARY OF ENVIRONMENTAL IMPACTS**

ALTERNATIVE	ENERGY			WATER QUALITY			WATERS OF THE U.S. INCLUDING WETLANDS	TERRESTRIAL ECOLOGY & AGRICULTURE					SECTION 4(f) and 106 RESOURCES				DESIGN ELEMENTS & COSTS					
	2020 ENERGY CONSUMPTION [JOULES (BTU'S)] - Trillions			NUMBER OF STREAM CROSSINGS	NUMBER OF NAVIGABLE WATER CROSSINGS	NUMBER OF FLOODWAY CROSSINGS		TOTAL AREA IMPACTED	HABITAT IMPACT					4(f) USES		106 DETERMINATION		LENGTH [mi (km.)]	COST (\$, millions)			
	OPERATIONAL	CONSTRUCTION	TOTAL						Acres (Hectares)	Upland & Bottomland Hardwood	Pine Forests	Mixed Hardwood And Pine	CULTIVATED FIELD [[Ac. (Ha.)]	PRIME FARMLAND [Ac. (Ha.)]	PARK LANDS	HISTORIC PROPERTIES	ADVERSE EFFECT		NO ADVERSE EFFECT	CONSTRUCTION (includes contingency)	R.O.W. / UTILITIES	ADDITIONAL COSTS ¹
OPTION 3	6,191 (5.87)	12,352 (11.70)	18,543 (17.57)	79	2	28	14.85 (6.01)	535 (216)	465 (188)	1,064 (430)	1,203 (487)	94 (38)	1	1	1	5	69.0 (111.0)	767	313	164	1,243	
OPTION 3a	6,179 (5.86)	12,737 (12.07)	18,916 (17.93)	76	2	22	14.85 (6.01)	837 (339)	374 (151)	1,030 (417)	1,203 (487)	124 (50)	1	1	1	4	68.8 (110.8)	793	319	166	1,279	
OPTION 3b	6,663 (6.32)	12,421 (11.77)	19,084 (18.09)	80	2	25	14.85 (6.01)	636 (257)	460 (186)	1,064 (430)	1,203 (487)	73 (30)	1	1	1	5	69.7 (112.2)	777	305	165	1,247	
OPTION 3c	6,182 (5.86)	12,292 (11.65)	18,474 (17.51)	79	2	28	11.84 (4.79)	455 (184)	481 (195)	1,078 (436)	1,247 (505)	126 (51)	1	1	1	5	67.7 (108.9)	774	306	162	1,242	
OPTION 4	4,544 (4.31)	11,019 (10.44)	15,563 (14.75)	98	2	10	21 (8.5)	1,500 (607)	398 (161)	1,516 (613)	1,520 (615)	73 (30)	1	1	1	0	64.3 (103.5)	803	157	147	1,107	
NO BUILD	4,036 (3.83)	N/A	4,036 (3.83)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0	N/A					

¹Additional cost includes: Traffic Maintenance, Environmental Mitigation, Engineering and Administration

Relocation Impacts

A summary of relocation impacts for the alternatives is depicted in Table S-1. The Build Alternative would displace between 340 and 707 families and between 14 and 147 businesses depending on the option. Option 4 has the least number of total displacements while Option 3 and its sub-options have the greatest number of displacements.

Land Use

All of the local governments' comprehensive plans identified needs for improved safety and a transportation system that compliments the planned growth in the area. Improvements associated with either the No-Build Alternative or the TSM Alternative will be compatible with the locally approved comprehensive plans and those of the regional planning agencies. Each of the elements in the No Build and TSM Alternatives would improve a localized traffic condition or improve safety on the local road system.

Only the Franklin County Comprehensive plan anticipates and seeks specific alignments of a Build Alternative. The Botetourt County Board of Supervisors adopted a resolution of opposition to proposed alternative options located within the County. Bedford and Roanoke County plans are either silent or recognize the location study process as part of the decision making, while taking no position on either the route or the alignment. Henry County's Comprehensive plan strongly suggests that transportation improvements as well as development should be located within designated growth areas. In addition, the Henry County Board of Supervisors and the Martinsville City Council adopted resolutions of support for a Build Alternative alignment that is located east of the city and in eastern Henry County.

Table S-1 contains a summary of land use impacts for each of the alternatives. No change in existing land uses would result from the No-Build Alternative. No TSM improvements are proposed within Roanoke City, Bedford or Botetourt counties, therefore, there will be no land use or activity consequences on these jurisdictions. The TSM Alternative will require a minimal amount of land. The Build Alternative options would remove greater amounts of land from current use than either the No-Build or the TSM Alternatives. Forested lands account for the largest single category of land use removed by any of the Build Alternative options, followed by agricultural and residential respectively. Total acreage of land uses altered by the Build Alternative options range from 4,539 acres (1,837 hectares) for Option 3c to 6,851 acres (2,773 hectares) for Option 1.

An analysis of secondary growth resulting from the action was conducted for proposed I-73 interchange locations. The analysis indicated that growth and development is anticipated in most of the interchange locations and that the indirect and cumulative impacts from any of the proposed Build Alternative options would be minimal. The amount of land planned for conversion from undeveloped to developed within the impact areas ranges from 7,715 acres (3,122 hectares) equally for Options 2, 2a, and 2c to 14,212 acres (5,751 hectares) for Option 4.

Community Facilities and Services

Affects on public facilities would be limited under all the Build Alternative options. Property removal, access changes and response time changes would occur. Properties may be partially taken or completely relocated. Access changes can include direct entry to the specific public facility or changes in the travel between the facility and clients or to response sites. Response times would be affected by interchange locations.

The No-Build and the TSM Alternatives would displace no public facilities. The TSM Alternative would result in changes to direct access to two fire stations located on U.S. Route 220 through the elimination of median openings. Emergency response times would be minimally affected as a result of these changes. Build Alternative options to the east and west of U.S. Route 220 promote greater access to service areas, particularly when service providers have mutual agreements across jurisdictional boundaries. In general, the

Build Alternative options would improve access to parts of the study area served by proposed interchanges. Two public facilities would be directly affected by various options of the Build Alternative. Options 1, 1a, 2, 2a, and 2c would displace the Dyers Store Fire Department in northeastern Henry County. Options 2, 2a and 2c would relocate Roanoke City Fire Department Station Number 11 at the southern edge of the city's southeast neighborhood.

Historic and Archaeological Resources

A total of 14 resources located within the Area of Potential Effect (APE) of the project were found eligible for the National Register of Historic Places and were evaluated for Section 106 effects. These include 8 standing structures, three historic districts, two bridges and the Blue Ridge Parkway. Impacts to these resources have been estimated based only on a functional level of design. Currently, it is expected that two eligible resources would experience an adverse effect from the Build Alternative. These include the Green Richardson House and the Blue Ridge Parkway. The Green Richardson House is located adjacent to Build Alternative Options 2, 2a and 2c and all Build Alternative Options would require a crossing of the Blue Ridge Parkway. Crossings of the Blue Ridge Parkway have been evaluated in five separate locations.

A limited number of archaeological sites have been previously recorded within the proposed corridor options that could require preservation in place. Options 1 and 2b each contain one such site; Option 1a contains two; Options 3, 3a, 3b, 3c and the TSM Alternative each contain three; Option 4 contains four; and Options 2 and 2a each contain five. Options containing Segments 372, 374, 376, 294, 371, 105, 382, 152, 153, and 388 and Intersection #31 all contain previously recorded archaeological sites for which further work has been recommended. For all options, there appears to be a low to low/moderate potential for encountering rockshelter or cave sites, a low to very low potential for encountering fish dams or traps (except in options containing Segment 382 and Intersection #16), a moderate to moderate/high potential for large floodplain sites and a low potential for mound sites. There is no potential for battlefields in this area. A Phase I archaeological survey will be conducted once an alternative is selected. The Phase I archaeological survey will involve systematic shovel testing of the selected alternative in accordance with the practices of DHR.

Hazardous Materials

The hazardous materials analysis utilized both an environmental database search and field investigations to identify hazardous materials sites within the study area for the No-Build, TSM, and Build Alternatives. A total of 37 sites would be impacted by the No-Build Alternative. Fourteen of these sites are underground storage tanks (USTs). The TSM Alternative would impact a total of 52 sites. Thirty-four of these sites are USTs and one site is an active leaking underground storage tank (LUST).

Build Alternative Option 3 and its sub-options impact the highest number of sites (119-124). Option 2 and its sub-options affect a range of 65-88 sites. Options 1, 1a and 4 each impact fewer than 10 sites. The largest numbers of recorded hazardous materials sites are located along Segments 374, 375 and 376. This is due in large part to the fact that these segments are located along the urban and industrial corridor of Interstate 581/ U.S. Route 220 in the city limits of Roanoke.

Visual Quality

The Federal Highway Administration (FHWA) visual impact assessment methods were used to evaluate existing, proposed, and mitigated visual quality. Unique visual characteristics, the vividness of the landscape, its intactness and the unity of features of the landscape are factors that were considered to determine the overall visual quality. Viewer sensitivity was considered to identify visual impacts.

The TSM and Build Alternatives were evaluated for the overall visual effects along each option for both the viewers of the road and those traveling on the road. Views of the road were rated as "impacts." Views from the road were rated based on the "quality" of the view. High quality views tend to be in very scenic areas. Table S-1 provides the ranking of the visual effects for the TSM Alternative and Build Alternative. A number 1

ranking represents the option with the best views from the road. A number 1 ranking in visual impact represents the least impact for views of the road. The TSM Alternative had the least visual impact due to the lack of visual change that would occur in the U.S. Route 220 corridor. Option 3b had the least visual impact among the Build Alternative options. Options 1a and 2a had the highest visual impact because they pass through settled farm communities with a number of exposed views. The visual quality was highest with Options 1 and 1a and lowest with the TSM Alternative. The options that have the greatest potential for extent of visual impact on national and regional scenic resources (National Parks), are Options 1, and 1a. The options that have the lowest potential for extent of visual impact to national and local scenic resources are Options 2, 2a, and 2c.

Air

Maximum one-hour and eight-hour Carbon Monoxide (CO) levels were predicted for the Build Alternative options. All predicted concentrations of CO are below the applicable Federal and State Standards and the project is not predicted to cause or exacerbate a violation of the National Ambient Air Quality Standards (NAAQS). The study is located in an area designated as attainment for carbon monoxide and ozone; therefore, it is not subject to the conformity requirements of the Clean Air Act. The study is included in the Roanoke Region FY 1999-2001 Transportation Improvement Program and in the FY 1999 Statewide Transportation Improvement Program.

The Build Alternative would generally improve air quality in the region by diverting traffic from other study area roadways and by increasing the average travel speed. Air quality levels were predicted to decline slightly on I-581 and I-81 with the project, due to increased vehicular volume seeking to enter or exit the I-73 corridor. This is expected for options that include I-581. It is also projected that some I-81 northbound traffic would use I-581 to access portions of Option 1 or 1a south of Roanoke rather than bypassing I-581 to reach the Option 1 or 1a connection with I-81. Conversely, some southbound I-81 traffic would likely use I-581 to access portions of Option 4 south of Roanoke rather than bypassing I-581 to reach the Option 4 connection with I-81.

Noise

Noise impacts at outdoor sites have been assessed in accordance with FHWA Noise Abatement Criteria (NAC) and in accordance with the Virginia State Noise Abatement Policy. For the I-73 Study, a property was considered impacted if it would experience noise levels that approach or exceed 67 dBA L_{eq} (1-hour), or if the property would experience an increase of 10 dBA or more once the project was completed. Based on the evaluation of alternatives, Table S-1 shows that Build Alternative Options 1, 1a and 4 would impact the least number of properties (411 to 592 predicted). Options 2, 2a, 2b, and 2c would have impacts in the range of 1,365 to 2,062 properties. Options 3, 3a, 3b, and 3c would experience the highest number of impacts affecting from 2,835 to 3,316 properties.

Energy

Table S-1 shows predicted energy consumption for each alternative and, in the case of the Build Alternative, the various options. Due to the absence of identified funding and the variations in any potential construction scenarios, no annualized construction energy has been estimated. The Build Alternative options all exceed the total energy consumption of the No-Build or TSM Alternatives. The TSM Alternative would have same annual energy consumption as the No-Build Alternative due to the similarity of traffic volumes predicted for both. Build Alternative Options 1 and 1a consume less operational energy than the TSM and No-Build Alternatives, but exceed total No-Build and TSM consumption due to higher construction energy consumption. Option 2 and its sub-options have the highest total energy consumption, followed by Option 3 and its sub-options, Option 1 and its sub-option and Option 4, respectively.

Water Quality and Aquatic Ecology

Table S-1 shows the total number of streambed crossings as well as the number of navigable water crossings of each alternative. The TSM Alternative would result in the lowest number of stream crossings between the TSM and Build alternatives. The Build Alternative Option 1 would result in the greatest number of stream crossings with 166. Build Alternative Options 3 and 3c would result in the highest number of floodway crossings (at 28 crossings each) compared to other build options.

Wetlands

When total impacts to wetlands and deepwater habitat (components of waters of the U.S.) are considered alone, the Build Alternative Options 2 and 2a would result in the highest level of wetland encroachment (35.61 acres [14.41 hectares] each). When compared to other Build Alternative options, Option 3c would result in the least encroachment to wetlands and waters of the U.S. (at 11.84 acres [4.79 hectares]).

Terrestrial Ecology and Agriculture

Most of the improvements proposed under the TSM Alternative would be located in urbanized areas where relatively few forest communities remain. Accordingly, the TSM Alternatives would result in the smallest area of impacts to forest communities and associated wildlife habitat. Build Alternative Option 1 would result in the greatest area of direct or primary impacts to forest communities (at 4,390.6 acres [1,776.9 hectares]). The Build Alternative would result in a loss of approximately 0.4 percent of the total forest lands currently existing in the five-county area, the conversion of forest lands would not be a severe impact from a regional perspective.

The TSM Alternatives would result in small area of impacts to agricultural lands and associated wildlife habitat. Build Alternative Option 2a would result in the greatest area of direct or primary impacts to agricultural lands (at 2,240.7 acres [906.8 hectares])

In accordance with the Farmland Protection Policy Act, the impact of the proposed action on farmlands has been assessed. Table S-1 lists these impacts by alternative and option. The impacts to prime farmlands range from 55 acres (22 hectares) for the TSM Alternative to 165 acres (67 hectares) for Option 2c of the Build Alternative.

Threatened and Endangered Species

The TSM Alternative would also result in construction over or in close proximity to suitable habitat for the Roanoke logperch located in the Pigg River near Rocky Mount and the Smith River near southwestern Martinsville.

At least one suitable habitat for populations of the Roanoke Logperch would be subjected to impacts associated with new bridge construction under each of the build options under consideration. The range of suitable habitat for this fish species is somewhat narrowly defined due to the populations' sensitivity to disturbances and specific life history needs. Because of the need for perpendicular stream crossings, the width of the streams affected, and the resulting need for placement of bridge piers, no practicable avoidance alternative is available with respect to suitable aquatic habitat for the Roanoke Logperch.

Segment 192A of Options 1a and 4 was aligned during the preliminary engineering phase to avoid known populations of smooth coneflower. No other populations of smooth coneflower were reported or observed within areas of possible roadway construction where such observations could be made. Despite coordination with the Department of Conservation and Recreation (DCR), Natural Heritage Division, and field verification efforts to locate and verify known and suspected populations of the smooth coneflower, other populations may be present that have not yet been accounted for. Table 4.7-6 describes the locations of Federal and State Listed Threatened and Endangered Species in relation to the I-73 Alternatives.

For major Federal actions that have the potential to impact populations of federally threatened or endangered plant or animal species or habitat that has been designated critical to their survival, Section 7 of the Endangered Species Act requires the agency to prepare a biological assessment to determine the project's effect on those listed species that may exist in the project impact area. Should a build alternative be selected and a potential impact identified, then a biological assessment will be prepared and included in the Final EIS.

Section 4(f) and 106 Properties

Direct uses of property from one Section 4(f) resource, the Blue Ridge Parkway, will occur with all Build Alternative Options. Crossings of the Blue Ridge Parkway have been evaluated in five separate locations. Since the project runs from north to south and the Blue Ridge Parkway runs from east to west through the study area, there are no feasible avoidance alternatives of the Blue Ridge Parkway. Options 2b, 3, 3b and 3c cross the Parkway using existing U.S. Route 220 and will require the greatest use of Parkway right-of-way. The No-Build and TSM Alternatives would have no Section 4(f) involvement but these alternatives would not adequately address the purpose and need for the project.

Design Elements and Costs

Capital costs for this Study include estimated costs for construction, environmental mitigation, relocation of utilities, acquisition of right-of-way, relocations, and engineering design. The TSM Alternative consists of approximately 60 suggested improvements ranging from realignment or widening of several thousand feet of roadway to spot improvements such as closure of existing median openings. Total cost for all of the TSM improvements is estimated at \$146 million.

Estimated costs for the Build Alternative options range from a low of \$1.107 billion for Option 4 to a high of \$1.357 billion for Option 2b. Construction cost per mile (per kilometer) ranges from a low of \$16.02 million (\$9.96 million) for Option 1 to a high of \$18.58 million (\$11.55 million) for Option 3a. Option 1 and its variations, through Botetourt and Bedford and the eastern portions of Franklin and Henry counties, are the longest options in total mileage but are among the lowest cost options primarily due to the relatively low cost of right of way acquisition and utility relocation. Option 2 and its variations, which run along I-581 and continue south in the vicinity of Windy Gap and east of U.S. Route 220 and Martinsville, generally have the highest total cost. The higher costs reflect the need for several bridges over the Roanoke River, the length of the option, and the excavation cost of crossing the Blue Ridge. Option 3 and its variations, which generally follow existing U.S. Route 220, have the highest per mile cost, primarily due to the costs of right of way acquisition, utility relocation, and the need for frontage roads. Option 4 is the shortest of the options and has the lowest overall construction cost by approximately \$1.107 billion.

S.4 CONSULTATION AND COORDINATION

Scoping sessions and briefings were conducted with the state and Federal regulatory and resource agencies on three separate occasions for I-73. Initial Scoping was held on February 17, 1998 at VDOT's monthly Inter Agency Coordination Meeting (IACM). Subsequent briefings were held to review alternatives selection and early results on July 21, 1998 and April 20, 1999. Agencies participating at the IACM include; VDOT, FHWA, U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (COE), U.S. Fish and Wildlife Service (FWS), National Marine Fisheries, U.S. Coast Guard, Virginia Department of Environmental Quality (DEQ), Virginia Department of Game and Inland Fisheries (DGIF), Virginia Institute of Marine Sciences (VIMS), Virginia Marine Resources Commission (VMRC), Virginia Department of Historic Resources (DHR) and the DCR.

Additional agency coordination resulted in several meetings, phone conferences and data exchanges has occurred with the National Park Service (NPS) and the Appalachian Trail Conference regarding potential uses of the Blue Ridge Parkway and the Appalachian Trail. Coordination with the Natural Resources Conservation Service (NRCS) was provided to secure identification and rating of prime farmlands in the study area.

S.5 UNRESOLVED ISSUES AND AREAS OF CONTROVERSY

Policy positions regarding the need, location and impacts associated with I-73 have been developed and in some cases actively promoted by several organized citizens groups, environmental organizations, economic development associations, elected officials and jurisdictional bodies. This activity naturally attracts the attention of the media and many of the citizens in the study area. What influence this has on the outcome of public participation in the National Environmental Policy Act (NEPA) process is always difficult to gauge. Nevertheless, there are active groups who maintain very fixed positions on the I-73 proposal.

The dominant citizens groups and environmental organizations that have expressed input include the I-73 Regional Impact Network, the Blue Ridge Concerned Citizens, Virginians for Appropriate Rural Roads, Citizens Concerned About I-73, the Sierra Club, and the Appalachian Trail Conference. Regional public and private economic development interests which have taken a position on the I-73 project include; the Roanoke Valley Business Council, JobWay, the Roanoke Regional Chamber of Commerce, the Martinsville Chamber of Commerce, the Patrick Henry Development Council, the Rocky Mount Chamber of Commerce, Ferrum College, and the Southern Virginia Economic Development Partnership. Local and state jurisdictions have adopted various resolutions on I-73 including the City of Martinsville, the County of Franklin, County of Henry, the County of Botetourt and the Virginia General Assembly (in both 1998 and 1999 sessions).

A benefit-cost analysis was not conducted for this project, as it is not a requirement under FHWA's NEPA guidelines as set forth under FHWA's Technical Advisory T 6640.8. Such an analysis is complicated by extensive financial assumptions and economic behavioral conditions implicit in the identification of costs and benefits. While the direct capital costs of constructing each alternative have been estimated and are documented in the DEIS as well as indirect costs such as lost tax revenue resulting from business displacements, other indirect and cumulative benefits and costs are difficult to quantify and subject to academic and economic interpretation. For example, one group might assign a cost to secondary development while another group may view it as a benefit.

The economic development benefits of long-term job growth, economic spending and fiscal revenue enhancement for the I-73 alternatives have not been quantified nor have they been monetized into a dollar figure for comparison to the cost. Other long-term benefits include savings in travel times, reductions in fatalities, injuries and property damage, improved access to undeveloped areas and improved efficiencies in vehicle and roadway operations. These benefits have, to some extent been quantified, but have not been monetized for comparison to project capital costs.

Currently, the Virginia General Assembly has established a Communications Committee to annually review the progress of the I-73 project development process. This committee was recently briefed on November 11, 1999 and May 17, 2000.

S.6 APPROVALS REQUIRED

The proposed construction of I-73 would result in several actions requiring environmental regulatory permits. These include COE permits for work in navigable waters (Section 10 of the Rivers and Harbors Act), U.S. Coast Guard permit for crossings of navigable waterways (Code of Federal Regulations (CFR) 33, Part 199), and COE and VMRC permits for work in wetlands (Section 404 of the Clean Water Act and Title 62.1 of the Code of Virginia). Permission also will be required from the DEQ – Water Division pursuant to Sections 401 and 404 of the Clean Water Act.