Windy Gap
Mountain Village

December 12, 2000

Franklin County Board of Supervisors
40 East Court Street
Rocky Mount, Virginia 24151

Re: I-73 Highway Project

Gentlemen:

Windy Gap Mountain Village is a community of sixty two property owners. We are located off Route 116 overlooking the mountain pass through which I-73 might be constructed. While our member- ship divides in its opinion favoring the TSM vs. I-73 options, they are unanimous in their opposition to the eastern route, or any of the central variations that would pass through thel Windy Gap corridor.

VDOT's summary of the Draft Environmental Impact Statement shows conclusively what many of us have felt for the past three years. Specifically, that if I-73 is built at all, the western route would have to be the one selected. From every aspect - loss of prime farmland, relocations, accident reduction, environmental of course the overall costs - the western corridor is the only route that can be defended. By VDOT calculations, a quarter of a billion dollars separates the eastern from the western routes. With this data available, no fiscally responsible decision maker at the state or federal level could possibly support the building or I-73 to the east.

But there are other considerations that come into play. Imagine, if you will, an I-73 traveler having to make the northward turn towards Roanoke to eventually head south into the Carolinas. If the eastern route were to be selected over the western route, eighteen additional miles would be added to the journey along I-81. This is the approximate distance between the proposed Dixie Caverns and Cloverdale interchanges. If one projects the senseless additional travel costs imposed on every vehicle and driver who is forced to take this route, construction of the eastern route will be forever seen as an absurdity.

Response: *The selection of a preferred alternative is based on a number of factors including environmental impacts, social impacts, cost, as well as how well the alternative addresses the purpose and need for the proposed action.*

Imagine also a swath of vehicle pollution that might encircle the Roanoke Valley as motorists head northward for eighteen unproductive miles, then eastward for another five before heading south through Botetourt and Bedford counties. This pollution problem can be avoided completely if the I-73 traveler makes the eastward turn at Dixie Caverns and then heads directly for the Carolinas.

Response: *As already documented in Section 3.3 of the DEIS, all of the counties and localities in the study area are currently designated by EPA as being in attainment for the 1-hour standard for ozone, nitrogen dioxides, and particulate matter. Recently, the EPA determined that the Roanoke area consisting of the City of Roanoke, City of Salem, Roanoke County and Botetourt County exceeded the 8-hour standard for ozone. However, instead of designating the area nonattainment, they designated it "basic" and deferred the nonattainment designation because the area is proactively working to clean up the air through implementation of an Early Action Compact (EAC), which identifies voluntary measures that the region will employ to address the air quality violations. If the area meets the required milestones prescribed for EAC areas and can submit three consecutive years of clean monitoring data, then the region will be reclassified as an attainment area in 2007. Interstate 73 would have no bearing on this effort since it would be nowhere near construction by 2007.*

The alternatives that were advanced to the draft EIS for detailed analysis came out of an extensive public outreach effort where the public was afforded the opportunity to suggest build alternatives for I-73 (see Section 2.2.2). Initially, VDOT did not anticipate considering an alternative to the east because of the added length. However, after receiving public support for the consideration of an eastern alternative, VDOT decided to include it in the analysis. As stated in your comments, the impact that the added length of an eastern alternative would have on travel patterns has been born out by the traffic analysis. Notwithstanding, the western option is not without its shortcomings. Despite providing a more direct route for those traveling from the west, this option does not carry or attract as much of the local traffic as the centrally located options.

A final point that must be stressed concerns flooding. Those who experienced the great flood that visited the area in 1985 will appreciate the problem. Every creek, stream or river crossing in the Roanoke Valley becomes a Potential choke point when the mountains empty their runoff to the east. It is not scare tactics to imagine the ponding effect that the eastern routing of I-73 would have on the valley when the next great flood occurs.

Response: *Floodplain encroachments have been addressed in Sections 3.7.5 and 4.7.4 of the DEIS as well as the Natural Resources Technical Memorandum and the Hydrology and Hydraulics Technical Memorandum. The protection of floodplains and associated floodways is mandated under Executive Order 11988 (Floodplain Management), USDOT Regulation 23 CFR 650 Subpart A (Location Hydraulics Studies), USDOT Order 5650.2 (Floodplain Management and Protection), and FHWA Policy Memorandum FHPM 6-7-3-2 (Location and Hydraulic Design of Encroachments on Floodplains). A Location Hydraulic Study will be performed as part of the design phase so that the hydraulic openings of bridges and culverts are designed to handle the floodplain hydrology to prevent increases in floodplain elevations of more than one foot (0.3048 meters). Coordination with FEMA and local agencies will be carried out as needed.*

In addition, erosion and sediment control measures have also been addressed in Sections 4.6.1.3, 4.6.2.3, and 4.14.7 of the DEIS as well as the Natural Resources Technical Memorandum. Erosion and sedimentation controls, consistent with VDOT's Erosion and Sedimentation Control Handbook, will be developed during final design to limit impacts to stream crossings.

The residents of our community want the very best for the region and we appreciate the tremendous effort that is being made to keep everyone informed. We know that something must be done to remedy the Route 220 and I-81 problems and we certainly do not want to stifle growth and opportunity for others. Yet,given the results of the DEIS, and the intense competition for federal and state funds everywhere, the TSM and the western routing of I-73 seem to be the only realistic options. Please reflect our thinking in your deliberations on this very important project.

Response: *The TSM Alternative was evaluated in the I-73 Draft Environmental Impact Statement using the same range of criteria and level of detail as the new Interstate alternatives. While it results in substantially fewer environmental impacts and is significantly less expensive than the build alternatives, those factors have to be weighed against the degree to which each alternative is forecasted to address the purpose and need of the study. While the western alternative has comparable impacts to the other build alternatives, its impacts and the degree to which it will address the purpose and need of the study will have to be balanced against the other alternatives by the decision makers also.*

Sincerely,

B. E. Goehring President, WGPO-A

Virginia Department of Transportation 12/12/00

Re: I-73 Highway Project

Thank you for allowing us to participate in the hearings on this project. Attached are our comments which will be stated at the public hearing in Rocky Mount on 12/12/00. We would welcome the opportunity to defend our position before the Commonwealth Transportation Board should that be possible. Selection of the wrong route for I-73, if it is to happen, would be a colossal blunder, given the huge amount of federal funding involved.

Respectfully,

B. E. Goehring

From: Dick & Dolores [ddhachsml@worldnet.att.net]
Sent: Sunday, January 07, 2001 11:53 AM
To: Charles Nottingham; Mr. James G. Browder; Mr. Fred Altizer
Subject: 1-73 Routing Alternative

Mr. Charles Nottingham, Commissioner
Mr. James Browder, Chief Engineer
Mr. Fred Altizer, Mgr., Salem District

Gentlemen:

My wife claims that I am growing into this seat in front of my computer, since I have spent so much time in communication with people that are either responsible for determining the routing of 1-73, or are passionately concerned with the decision/recommendation that you are about to make. Indeed, I have been involved in this matter for a long time, having read most of what has been published, pro and con, including your ambiguous, faulted DEIS. I know you don't want to hear that, but I believe it to be true, and now is the time to be frank. I have reached several conclusions and wish to share these with you in an attempt to influence your recommendation to the CTB:

1. The concept of proposed 1-73 is flawed, in that it duplicates many of the routes already in existence. We cannot possibly pave this country with Interstates to the trucking industry and give no thought to alternative means of transportation. We as a nation are becoming more and more dependent on petroleum and individual vehicular transportation. This proposal exacerbates that problem just look at what it will cost in fuel alone to build a "new route". Interstates were designed to get from A to B quickly and directly I-77 goes directly to the Carolinas; that was the original intent of 1-73...but it will dogleg 30+ miles North to Roanoke to get to NC; was this an "Engineering decision"?

Response: *Back in the early 90s, when it became apparent that the Congressional routing of Interstate 73 included in the Intermodal Surface Transportation Efficiency Act would likely impact Virginia, VDOT initiated a feasibility study to define the general location of I-73 in Virginia instead of having it dictated to them by Congress. In conducting the feasibility study, they looked at a number of broad corridors or study areas throughout southwestern Virginia for I-73 (see Figure 2.2-1 of the draft EIS) The feasibility study evaluated the different corridors using five criteria: environmental impacts, economic impacts, traffic service, capital support, and public support. In March of 1994, based on the results of this study, the Commonwealth Transportation Board selected a proposed location for the I-73 corridor that entered Virginia from West Virginia on Route 460 west of Narrows, and which generally followed Routes 460 and 220 to the North Carolina State line (i.e. no "dogleg"). In late 1994, the cities of Roanoke and Salem and the County of Roanoke expressed a desire that the location of I-73 be improved by routing it along I-581 and I-81. In December of 1994, VDOT prepared a supplemental report for I-73 that determined it feasible to refine the location of I-73 using I-581 and I-81. The CTB approved the revised location and with the passage of the NHS Designation Act of 1995, Congress included the CTB-approved corridor for Interstate 73 in legislation which was the impetus for the draft EIS.*

2. There is no economic justification for a new Interstate, when you can spend far less to improve US220 and accomplish nearly the same thing. The TSM alternative creates an acceptable class of road, akin to others in the state, such as US29, US360 or US460, but does not destroy existing business sites. In fact, most businesses along 220 opt for an improved road over a "new build". The only "guarantee" of new business along the Interstate will be the sprawl of Hotel/Motel/Fast Food emporiums at the interchanges, which will provide low paying jobs, not "career positions", for local folks. Interstate through traffic is exactly that, "through"; not many stop to shop at 70MPH. They are on the road to "git whur they're goin", whereas those who travel at a lower speed and pass flourishing businesses along the way are more likely to stop. Those who benefit from a "new road" are the out-of-state chains and those who own the property around the interchange. Without a "Cost/Benefit Study" to support a new road, claims of economic prosperity are just that "claims"

Response: *TSM improvements will enhance safety on existing US Route 220, but it will not bring all of US Route 220 up to current VDOT or AASHTO design standards for roadways currently classified as urban or rural principal arterials. Implicit in that standard is the improved safety features that accrue with the horizontal and vertical geometry of a principal arterial. TSM improvements would not achieve long-term safety improvements on US Route 220 the way that a new interstate facility could. In the long run true safety benefits, which include fatalities, bodily injury and property damage, are enhanced with the proposed interstate alternative. An interstate facility provides significant accident rate reductions over the conventional urban and rural arterial. According to statistics compiled for the year 2000, the National Highway Traffic Safety Administration indicates Virginia's interstate system has a fatality rate of 66 deaths per 100 million vehicle miles traveled in rural areas whereas principal arterials have a fatality rate of 102 deaths per 100 million vehicle miles traveled. In terms of saving lives, an interstate facility reduces fatalities by 35.3%.*

The TSM ranges from 10.76% to 13.19% of the cost for the full build options, but the TSM alternative would not rebuild many miles of US Route 220. The TSM improvements affect approximately 86, 600 LF of US Route 220 from Roanoke to the North Carolina line. This represents 30.8% of the 281,000 LF of US Route 220 from Roanoke to the North Carolina state line. The 86,600 LF of TSM improvements to US Route 220 include an array of minor and major improvements ranging from additional left turn lanes, the closing of median crossovers, signal improvements, shoulder widening to major grade and pavement replacement. TSM is a series of spot improvements that address immediate safety needs along 16.4 miles of roadway

The TSM alternative fails to convincingly address the components of the I-73 purpose and need such as:

- *TSM will not enhance the functional classification of US Route 220,*
- *TSM will not increase capacity of the entire US Route 220 corridor, nor will it improve the level of service,*
- *TSM will not improve mobility and access between Virginia and other regions,*
- *TSM will not attract the economic activity of an Interstate facility, and*
- *TSM does not adequately address the Congressional intent.*

As a $146 million alternative TSM is not a low cost alternative for scattered improvements to 16.4 miles of rural principal arterial highway. TSM is lacking in terms of its operating benefits and characteristics when compared to the more aggressive interstate alternatives.

The results of corridor studies for other projects (e.g. TransAmerica) were referenced in the draft EIS to illustrate that an interstate facility located in this part of the state has an economic development advantage over lesser type facilities. Since the draft EIS was circulated, a cost/benefit analysis was prepared for the alternative approved by the CTB demonstrating a positive benefit-cost ratio overall, and the information is included in the final EIS. As can be expected, the results of this analysis demonstrate that the benefit-cost of the facility in rural areas will be much lower than the benefit-cost of the facility in developed areas. This follows logically because traffic is greater in developed areas and it has the supporting infrastructure and population to more readily accommodate economic development than rural areas do. Therefore, if development is to occur, it will first occur in close proximity to developed and developing areas.

The draft EIS acknowledges that an interstate facility does not guarantee economic development. Rather it is a tool for local governments to use to attract economic development. An improved transportation system and its link to retail markets will improve the attractiveness of the area to businesses, but it is just one factor that influences a business's decision to locate to an area. Other factors include the availability of a skilled and educated work force, the availability of and distance to existing and planned residential development, the presence of supporting infrastructure (i.e. water, sewer, electricity, etc.), etc. The EIS attempted to qualitatively describe which alternatives were better

suited or more compatible with the developmental goals of the localities by addressing their proximity to growth areas.

Finally, as documented in the draft EIS, the center options that were considered carried more local traffic than the western and eastern options. Therefore, an Interstate facility won't necessarily just carry through-traffic.

3. What is a farm or forest worth? wetlands? homes which have been in existence for many generations? a rural atmosphere that folks around here , want? Fully 70% of those who spoke at your hearings voted for TSM or "No- Build" over 2300 people from this County signed a petition supporting TSM a canvass of Lake residents done in June showed an 85% preference for TSM , over any "new build" option, and Lake residents have first-hand experience with water quality problems. A new road close to the Lake poses environmental problems that no one wants, either the people who live here or those that visit. , The Lake is a source of revenue for this County that has no equal, nothing even close. To jeopardize that resource is unconscionable.

Response: *Worth or value is subjective and means different things to different people. Most farmland and residential development came about by converting forest land and to a lesser degree, wetlands. Generally speaking, the value of a resource is reflected in the laws that have been passed by politicians to protect them. The value reflected in law is further defined by the degree to which the individual laws provide mechanisms to protect the resource. For example, the laws protecting farmland have far less authority and strength than laws protecting wetlands.*

Public opinion during the public hearing process was widely dispersed in Franklin County and the remaining study area. During the hearing and post-hearing period, 8,669 citizens from the counties of Roanoke, Bedford, Botetourt, Franklin and Henry and the Cities of Roanoke, Salem, Rocky Mount, Martinsville and Danville responded to the I-73 project through written comments, signed petitions, letters, oral testimony at the hearing, e-mail or comment sheets from December 11, 2000 to January 12, 2001. Petitions represented 46% of the respondents and form letters represented nearly 8% of the respondents. Discounting the petitions and form letters and looking at the remaining 46% of the respondents who took the time to write a letter, e-mail, fill out a comment sheet or provide testimony at the hearing, 270 participants supported a No Build Alternative, 1,977 respondents supported the TSM alternative and 1,972 citizens supported a new build alternative. When asked the straightforward question "Do you support the project?" 2,517 respondents logged in a yes and 1,138 logged in a no.

In Franklin County, 205 respondents took the time to provide written comments at the public hearing on December 12, 2000. Of those 205 respondents 202 answered the question "Which alternative best fulfills the need?" as follows; 27 responded No Build, 101 responded TSM and 74 responded New Build Alternative. During the formal hearing that same evening, 71 speakers provided their input. Nine of the speakers supported a No Build Alternative, 24 supported TSM and 38 supported a New Build Alternative.

In addition, the TSM alternative would not satisfy the Congressional intent that this route be an interstate highway, nor would it achieve or guarantee the desired long-term level of safety improvements expected with this type of investment

Please recommend the TSM alternative we need it NOW we DON'T NEED the destruction of Franklin County.

Sincerely,

Richard G. Hach
65 Pinecrest circle
Moneta, VA 24121

F. E. " Rick" James, Jr.
5171 Burnt Quarter Drive
Vinton, VA 24179

December 18 2000

Dear 1-73 Location Study Officials:

I recently attended your 1-73 Location Study Public Hearing in Roanoke and desire for this letter to be included in the “official" record of public comment as a vote of support for an interstate solution. I was impressed with the information provided and excited about the possibilities this facility would provide. I will attempt to tie my comments to your stated purpose and need for the project.

Any required improvements are worth the time and money to do them right the first time. As motorist delays and impacts worsen with time, it is imperative that we make needed improvements along this corridor as early as possible. Attached In Table 1., you will see statistics that compare and contrast crash counts and person counts by Highway Functional-Classification. The Fatality Analysis Reporting System (FARS), managed by the National Highway Transportation Safety Administration, includes data on motor vehicle traffic crashes that resulted in a fatality to a vehicle occupant or nonmotorist, from injuries resulting from a traffic crash, that occurred within 30 days of the crash. From the data provided, one can determine that approximately 50% more fatal crashes will occur on the principal arterial system, the classification of Route 220, within Virginia as opposed to those on the interstate system. Additionally, 24% more people will be involved in an accident in which one or more persons will be fatally injured. While some could argue that more vehicle miles are traveled on the principal arterial system as opposed to the interstate system, I believe it is important to note the significance in crash events and persons involved in crashes involving at least one fatality as they relate to highway systems. We must pursue an interstate solution for those persons traveling the Route 220 corridor in order to minimize the number of traffic crashes and personal injuries and/or fatalities.

Response: *Comment noted. Safety issues associated with U.S. Route 220 (Section 3.1.3) and the safety effects of the proposed build alternatives (Section 4.1.14) are based on accident data supplied by the Virginia State Police and VDOT. This data is more roadway-specific than the FARS data supplied by the National Highway Transportation Safety Administration but demonstrates the same point.*

Based on the most recent numbers I have heard, approximately $7 out of every $10 of goods shipped in Virginia is shipped by truck. We need to appreciate the importance of a highway infrastructure on economic development, or lack thereof. Recent layoffs in the Danville and Martinsville area indicate the need for a more efficient infrastructure. If we are going to promote and enhance the economic development of those counties serviced by the Route 220 corridor, we need an interstate alternative. A report recently completed in the Roanoke area cited our economic growth as stagnant. We need to fund and construct needed infrastructure improvements to sustain and enhance our local economies as well as improving and enhancing our quality of life.

It is important that those in the decision making process determine fact from fiction, and emotion from engineering. I recognize many people will be impacted by a project of such magnitude, and unfortunately, that is inevitable. Some impacts will ultimately be positive, while others may remain negative. It is often tough the see the good for the majority if you are one that is negatively, or at least they feel negatively affected. At that point when emotion takes control, your bias and ability to be objective is jeopardized. It is highly important that those in the decision-making role remain

focused and objective throughout this process. I recognize that many persons will no doubt voice their adamant and fierce opposition to an interstate solution; however, it is important that we understand what the transportation professionals are telling us. We may not like what they have to say, but this is their trained profession. Many of the engineers working on this project are licensed professional engineers in Virginia. Law, the Virginia Administrative Code specifically, regulates the conduct of licensed professional engineers in Virginia. These professionals have a primary obligation to the public. If you are not familiar with the Standards of Practice and Conduct as it relates to the conduct of a professional engineer, I urge you to investigate for yourselves. While some may argue, one man, one vote on this particular issue, this doesn't necessarily apply in this instance. If you are not feeling well, do you value the opinion of your automobile mechanic or doctor the most? Again, I emphasize the importance of not letting emotion cloud your judgment or ability to be objective about the decisions that must be made regarding this issue.

I challenge each decision-maker in this process to look at this Situation not just from a viewpoint of a single residence or a local or regional issue, but the corridor as a whole. The interstate solution is not self serving roadway improvement as some might conclude, it is a component of a much larger project, an Interstate infrastructure “priority corridor" from Michigan, through Ohio, West Virginia, Virginia, North Carolina into South Carolina. This corridor was designated as a part of the Intermodal . Surface Transportation Efficiency Act (ISTEA) in 1991. Congress further defined the location in 1995 when they passed the National Highway System Designation Act.

In closing, I issue my support for an interstate solution for the 1-73 corridor. I invest my trust with the qualified engineers, planners and environmental representatives to identify and investigate thoroughly the corridor that best serves the stated purpose and need for this improvement. We need to select the corridor that provides the most cost benefit for the taxpayers and motoring public. The areas requiring review should include, but not be limited to, user delays and impacts, reduction in travel time post construction, improvement in the overall levels of service on the adjacent routes experienced in each affected community and overall improvement in safety. Sections of roadways are routinely evaluated for safety using the number of crashes per 100 million vehicle miles traveled and intersections are evaluated using the number of crashes per million vehicles entering the intersections. I thank you in advance for the consideration of my point of view.

Response: *Comments and support noted.*

Respectively submitted

F.E. James, Jr. P.E.

Table 1.
Crash Counts

	1995	1996	1997	1998	1999	Average
Virginia						
Rural Principal Arterial	110	91	112	85	84l	
Rural Principal Arterial-Interstate	74	59	71	132	53	
Arterial vs. Interstate	149%	154%	158%	137%	158%	151%
Nationally						
Rural Principal Arterial	4193	4388	4496	4535	4475	
Rural Principal Arterial-Interstate	2210	2441	2527	2600	2674	
Arterial vs. Interstate	190%	180%	178%	174%	167%	178%

Person Counts By Crash

	1995	1996	1997	1998	1999	
Virginia						
Rural Principal Arterial	268	232	286	203	199	
Rural Principal Arterial- Interstate	205	157	249	154	204	
Arterial vs. Interstate	131%	148%	114%	132%	98%	124%
Nationally						
Rural Principal Arterial	12777	13642	14023	13657	13426	
Rural Principal Arterial- Interstate	7113	7705	8156	8452	8493	
Arterial vs. Interstate	180%	177%	172%	162%	158%	170%

Note: Data retrieved from Fatality Analysis Reporting System within the National Highway-Transportation Safety Administration.

214SummerCircle
Boones Mill, Virginia 24065
January 12, 2001

Mr. F. C. Altizer, Jr., Administrator
Salem District Office
Virginia Department of Transportation
Post Office Box 3071
Salem, Virginia 24153

Dear Mr. Altizer:

Here are some comments about your Daft Environmental Impact Misstatement for the seventy-third Interstate Highway.

Alternatives Identification and Screening

(Concerning 1.0 112) Are the "corridors considered to have the most economic potential" those with the potential to create the greatest economic value or to generate economic activity? A city such as Martinsville, Roanoke, or Norfolk certainly generates economic activity. If disasters leveled any of these cities, they could be rebuilt over time with quantities of materials, labor, and money. Economic value would be lost, but activity would increase. In Los Angeles, the insurance money and disaster relief received after an earthquake boost economic activity. Does that mean that people wish for earthquakes?

Response: *Back in the early 90s, when it became apparent that the Congressional routing of Interstate 73 included in the Intermodal Surface Transportation Efficiency Act would likely impact Virginia, VDOT initiated a feasibility study to define the general location of I-73 in Virginia instead of having it dictated to them by Congress. In conducting the feasibility study, VDOT looked at a number of broad corridors throughout southwestern Virginia for I-73 (see Figure 2.2-1 of the draft EIS). The feasibility study evaluated the different corridors using five criteria: environmental impacts, economic impacts, traffic service, capital support, and public support. Therefore, the initial decision to locate I-73 in this part of the state was based, in part, on its economic development potential. In developing the draft EIS, alternatives were identified and screened using the process described in Section 2.2.2; economic development potential was not a criteria used in that screening process. In the most general sense, the feasibility study demonstrated that economic development potential was greater in those areas where the corridor carried more traffic and provided the greatest access to existing urbanized areas and areas proposed for development. For the draft EIS, once the corridors were narrowed down using the criteria described in Section 2.2.2, a detailed traffic analysis was conducted and interchange locations identified. Once this was done, economic development potential could be grossly assessed by comparing the various alternatives in terms of traffic, the number of interchanges, and their proximity to developed areas. Since the draft EIS was circulated, a benefit-cost analysis was prepared for the location corridor approved by the CTB. This information has been included in the final EIS.*

While the question of rebuilding a city is a choice to be made by local people, there is little question that it can be done, just as San Francisco rebuilt after its 1906 earthquake and fire, just as Hiroshima, Nagasaki, Dresden, and many other cities rebuilt after World War 1I. In two visits to San Francisco, I saw little evidence that an earthquake had ever occurred.

On the other hand, natural resources of significance, such as mountainsides along the Blue Ridge, the Ellet Valley, Blackwater Creek and the Antarctic and Greenland ice caps have value beyond the ability of human civilization to replace. Has a mature forest ever been replaced by human labor? Not satisfactorily. There are forests in the Berkshire mountains of Massachusetts which replaced those cleared by colonial farmers who later abandoned the land. Unfortunately,

the current forests lack soil. It washed away down the Connecticut River. Instead of finding a soft, sure footing, hikers have to step over roots onto slippery bedrock Burrowing animals, such as moles and gophers, who once occupied an important niche in the ecosystem, are long gone. So are varieties of trees and shrubs that can only grow in soil not within cracks in rocks. Restoring one of those forests to its precolonial state would require a vast caravan of trains and trucks to

carry topsoil from Illinois up into the mountains. To prevent their demise (which would make replacement necessary), each tree would have to be carefully chipped out of the rock and transplanted higher, at the new ground surface. Species of tree which have disappeared from the Berkshires would have to be located elsewhere, shipped in, and planted. Although immature trees would create the potential of restoration, doing the job right would require mature trees with wide root balls, which might cost about $100,000 each to handle, with several required on each acre.

Replacing the ice cap over Antarctica would be much trickier. There is not enough ice in the rest of the world. Vast quantities of fresh water would have to be transported to Antarctica and frozen. Where would this water come from? The seawater that will someday flood Norfolk will be contaminated with salt, which inhibits freezing. So desalinization will be necessary: evaporating the water with heat, then recondensing it. Presumably engineers can figure out how to do it, then the desalinated water must be refrozen at some location. Here, we run into thermodynamic limitations. Refrigeration merely transfers heat from the inside of the refrigerator to the outside. No matter where on earth this heat is released, it can find its way back to Antarctica and melt more ice. The more that is done to solve the problem, the worse it gets. No amount of labor can change that.

Response: *Generally speaking, the purpose of the National Environmental Policy Act (NEPA) is so that federal agencies can make informed decisions after considering the impacts of their project on the environment. NEPA does not require an agency to select the alternative that has the least impact on the environment nor does it restrict an agency's decision-making authority in any way. NEPA also doesn't require that an agency avoid environmental impacts or completely mitigate them. In addition to NEPA, there are a plethora of federal laws protecting individual resources like water, air, public parks, historic resources, wetlands, etc. Each one of these laws establish different controls for protecting the resources they are written to protect. Some resources are afforded a lot of protection by law while others are not. For example, public parks are afforded more protection than wetlands and wetlands are afforded more protection than forests, historic resources and farm land. The level of control that the laws provide is a reflection of the value the public and elected officials place on the resources they aim to protect. In many cases, these federal laws only apply when the federal government has an approval role over a particular project or when federal funds are used to develop a particular project. Generally speaking, these laws don't apply to state or local projects. Therefore, decisions are often made at the state and local level without the benefit of detailed environmental impact information that the federal government is required to consider.*

This is analogous to road building. Roads don't eliminate traffic jams, they feed them. Why is it that the worst traffic jams and the hugest multi-vehicle collisions occur on roads VDOT has built within the past 50 years? There are plenty of old roads around, but they tend not to have the enormous problems that plague the new ones.

Response: *Older roads and less developed roads like secondary roads tend to have fewer accidents than modern roads because they carry much less traffic. However, instead of comparing accidents in a vacuum, they must be adjusted to allow for an apples-to-apples comparison. For this reason, accident data is often expressed as the number of accidents per million miles driven for a particular facility.*

One reason some have the impression that new roads only fuel traffic congestion is because they are only looking at that individual roadway or corridor. If you look at the overall transportation network, you

would find that while a new facility attracts vehicles because of unimpeded traffic flow, it is attracting vehicles from other, more congested roadways while reducing congestion on them. Planners are aware of this redistribution of traffic and account for it when they conduct long range planning and identify their transportation needs for the next 20-30 years. Another reason roads haven't solved all of the traffic problems is because road building has not kept up with growth. According to statistics published by EPA in Indicators of Environmental Impacts of Transportation, the U.S. population has grown by 30% the past 30 years, the number of licensed vehicles is up 87 percent and the number of vehicle miles driven has increased more than 125 percent. In contrast, new highway capacity has only increased 6 percent in that timeframe.

In large cities like New York London, and Tokyo, much of the land is occupied by motor vehicles, either stationary or in motion. Yet most of the people travel through the city in underground trains that occupy much less space. If the people in cars switched to trains, it would free up a lot of land. The cities might even choose to build small commercial buildings in the vacated middle lanes of some the larger streets, increasing both economic value and activity. If the people in trains switched to automobiles, the majority of buildings in the business districts of these cities would have to be replaced by parking garages. Economic value would be lost Economic activity would be cut drastically.

If you want to benefit the economy of a city, you won't do it by bringing in more cars.

(Concerning 1.02) The report says the initial route "followed U.S, Route 220 and U.S. Route 460 to I-81". That would bring it right through the middle of Roanoke, through the downtown business district, past the civic center, through Gainsboro and Melrose. Then we are to believe that "the selected corridor was revised to route it through Roanoke to I-81". It was already there, wasn't it?

Response: *No. Back in the early 90s, when it became apparent that the Congressional routing of Interstate 73 included in the Intermodal Surface Transportation Efficiency Act would likely impact Virginia, VDOT initiated a feasibility study to define the general location of I-73 in Virginia instead of having it dictated to them by Congress. In conducting the feasibility study, they looked at a number of broad corridors throughout southwestern Virginia for I-73 (see Figure 2.2-1 of the draft EIS) and evaluated them using five criteria: environmental impacts, economic impacts, traffic service, capital support, and public support. In March of 1994, based on the results of this study, the Commonwealth Transportation Board selected a proposed location for the I-73 corridor that entered Virginia from West Virginia on Route 460 west of Narrows, and which generally followed Routes 460 and 220 to the North Carolina State line, staying south of Roanoke. In late 1994, the cities of Roanoke and Salem and the County of Roanoke expressed a desire that the location of I-73 be improved by routing it along I-581 and I-81. In December of 1994, VDOT prepared a supplemental report for I-73 that determined it feasible to refine the location of I-73 using I-581 and I-81. The CTB approved the revised location and with the passage of the NHS Designation Act of 1995, Congress included the CTB-approved corridor for Interstate 73 in legislation which was the impetus for the draft EIS.*

(Concerning 2.1) "For those who had a preference for a Build Alternative, a map was provided and the attendees were asked to draw the alternative routes", we are told. That means that people who favored a no-build or TSM alternative were never asked their routing preferences. Moreover, when I expressed my routing preferences in verbal form to VDOT on 24 May 1998, they were omitted from the study. Both these omissions breach the social contract binding citizens to defer to VDOT's authority. Therefore, until such time as this situation is rectified, the wronged parties will be free from any obligation to turn overtax money or land for construction of Interstate 73. It will be up to VDOT to decide whether to end this state of anarchy. Although I suppose I can adjust to anarchy, the prevailing social order of my distant Hibernian paternal

ancestors, bureaucrats who currently make their careers in the halls of government may be less comfortable.

Response: *As explained in Section 2.5 of the draft EIS, the TSM alternative consists of improvements in the Route 220 corridor within existing right-of-way. Therefore, there are no routing issues associated with the TSM alternative. In developing the build alternatives, input was considered from several sources: public input received during a series of open house meetings, input from local jurisdictions, stakeholder interviews, and input from the I-73 Study Team (the I-73 Study Team includes VDOT staff and VDOT's consulting staff for this project). Open forum Citizen Information Meetings for the region were held in the City of Martinsville, the Town of Rocky Mount, and the City of Roanoke. Over 1,200 citizens attended these meetings at which attendees were asked to suggest alternatives. For those who had a preference for a Build Alternative, a map was provided and the attendees were asked to draw alternative routes. The Study Team received over 750 Build Alternative suggestions from the public. Other alternatives received from the public included requests that nothing be done at all relative to a new Interstate, known as the No-Build Alternative, or that existing U.S. Route 220 be improved but not to interstate standards, known as the Transportation System Management (TSM) Alternative. In summary, the suggested alternatives produced by this form of public involvement included:*

- *No-Build Alternative*
- *Transportation System Management (TSM) Alternative*
- *New Interstate I-73 (Build) Alternative*

Each of the individual Build Alternative options that were received at a particular meeting were transferred to a composite map depicting all of the alternatives suggested. Composite maps were also made based on the input from the other meetings as well as input from the other sources mentioned above. The composite maps were then combined into a single map. These options were further reduced to a set of alternatives that were representative of all of the combined options from the four individual maps. This map represents the broad range of options.

These options were then broken into segments to allow for elimination of those segments that were unsuitable for further study while retaining portions of the options that merited further consideration. The broad range of options initially included approximately 370 individual segments. The segments were generally numbered consecutively beginning in Roanoke and moving south towards North Carolina. The number of segments under consideration were further narrowed down as described in Section 2.2.2. After the segments were narrowed down, they were then recombined to form alternatives stretching from the Virginia/North Carolina state line to I-81 in the vicinity of Roanoke. Just because an alternative suggested by the public wasn't carried forward for analysis in the draft EIS doesn't mean it wasn't given consideration.

The routes I suggested to VDOT on 24 May l998 are listed at http://www,rev.net/people/aloe/transportation/may98.txtt> and below:

Capacity and safety improvements to US 220;

Railroad by way of Winston-Salem, Martinsville, Ferrum, Rocky Mount, Boones Mill and Roanoke, with improvements to the tracks and grade for simultaneous passage of passengers and freight in both directions;

Railroad by way of Greensboro, Martinsville, Ferrum, Rocky Mount, Boones Milt and Roanoke, with improvements to the tracks and grade for simultaneous passage of passengers and freight in both directions;

Railroad by way of Greensboro, Winston-Salem, Martinsville, Ferrum, Rocky Mount, Boones Mill, and Roanoke, with improvements to the tracks and grade for simultaneous passage of passengers and freight in both directions;

Railroad by way of Greensboro, Danville, Martinsville, Ferrum, Rocky Mount, Boones Mill, and Roanoke, with improvements to the tracks and grade for simultaneous passage of passengers and freight in both directions;

Railroad by way of Greensboro, Danville, Gretna, Rocky Mount, Boones Mill, and Roanoke, with improvements to the tracks and grade for simultaneous passage of passengers and freight in both directions;

Railroad by way of Greensboro, Danville, Gretna, Hurt, Moneta and Roanoke, with improvements to the tracks and grade for simultaneous passage of passengers and freight in both directions;

Railroad by way of Greensboro, Danville, Gretna, Alta Vista, Lynchburg, Bedford, and Roanoke, with improvements to the tracks and grade for simultaneous passage of passengers and freight in both directions;

Railroad by way of Greensboro, Danville, Gretna, Alta Vista, Lynchburg, Glasgow, Buchanan, and Roanoke, with improvements to the tracks and grade for simultaneous passage of passengers and freight in both directions;

Response: *Non-highway alternatives were not found to be reasonable alternatives to satisfy the different components of the purpose and need of this study. In response to public comment on the draft EIS, VDOT looked at the diversion that could be expected from Route 220 to rail, and that diversion was not sufficient to consider pursuing a rail alternative. In addition, given the rural nature of most of the study area, it lacks the density to support a mass transit option such as rail.*

Capacity and safety improvements to US 220 and railroad tracks;

Installation of a longer, stronger guardrail at the dangerous curve near Fork Mountain (with no other change);

Capacity and safety improvements to US 220, with addition of bypasses at Boones Mill and Fork Mountain;

Road by way of Mount Airy, Fancy Gap, Fort Chiswell, Glenvar, Poages Mill, Clearbrook, Roanoke, Staunton, Elkins, Morgantown, Pittsburgh;

Road by way of Winston-Salem, Danville, Lynchburg, Bedford, Chamblissburg, Vinton, Roanoke, Clearbrook, Poages Mill, Glenvar, Wytheville, Bluefield;

Road by way of Winston Salem, Danville, South Boston, Lynchburg, Bedford, Chamblissburg, Vinton, Roanoke, Clearbrook, Poages Mill, Glenvar, Wytheville, Bluefield;

Road by way of Winston-Salem, Danville, Lynchburg, Bedford, Chamblissburg, Vinton, Roanoke, Clearbrook, Poages Mill, Salem, Staunton, Elkins, Morgantown, Pittsburgh;

Road by way of Winston-Salem, Danville, South Boston, Lynchburg, Bedford, Chamblissburg, Vinton, Roanoke, Clearbrook, Poages Mill, Salem, Staunton, Elkins, Morgantown,

Pittsburgh;

Road by way of Mount Airy, Fancy Gap, Fort Chiswell, Christiansburg, Adney Gap, Boones Mill, Clearbrook, Poages Mill, Salem, Staunton, Elkins, Morgantown, Pittsburgh;

Road by way of Mount Airy, Fancy Gap, Fort Chiswell, Christiansburg, Adney Gap, Boones Mill, Clearbrook, Poages Mill, Salem, Vinton, Chamblissburg, Bedford, Lynchburg, Glasgow, Staunton, Elkins, Morgantown, Pittsburgh;

Road by way of Stewartsville and Vinton, which I understand would be the lowest altitude possible and therefore advantageous for safety in fog and storms;

Road from Boones Mill northwest along corridor #105 to a point south of the Blue Ridge Parkway, then west along corridor #371 to Glenvar,

Road by way of Adney Gap, Bent Mountain, and Christiansburg;

Crossing the Blue Ridge by means of a tunnel;

No construction.

Response: *All suggested alternatives within the study area that were submitted in writing during the open forum citizen information meetings were considered.*

If people expressed preference for tunnels under the Blue Ridge, how are these designated in the report? I looked behind the maps to see if there were tunnels, but there were only other maps.

Response: *No preferences for tunnels under the Blue Ridge Parkway were expressed. The limited design work that has been completed to support the draft EIS does not include any tunnels at this time. Tunnels are generally cost prohibitive and only employed as a last resort or when required under certain circumstances (e.g. in Hampton Roads where the movement of ships comprising the Naval fleet can't be impeded). Also, the topography of the study area does not warrant their use on this project. The alternative approved by the CTB is the same alternative preferred by the National Park Service for the crossing of the Blue Ridge Parkway. This alternative utilizes the existing Route 220 crossing of the Blue Ridge Parkway eliminating the need for a tunnel.*

If there was any valid reason to include Endicott on the base map, yet to exclude Copper Hill, Check, Critz, and Chamblissburg, it is not clear. Presumably, a road would not swing over to Endicott without entering either Floyd or Patrick Counties. I hereby reserve the right to draw conclusions from this incongruity at a later date.

Response: *The town of Endicott is shown on the project mapping only as a point of reference to orient the reader when viewing the map.*

It is apparent that about half the suggested alternatives, including most of those VDOT chose to evaluate, were submitted by shills of the construction lobby.

Response: *There is no evidence to support your unsubstantiated claim. If anything, the alternatives that the construction industry would favor most, those that are longer in length and more indirect in their routing have not made their way into the draft EIS for detailed analysis.*

(Concerning 2.2) The "fatal flaw" criteria are fatally flawed. The first to "avoid crossing Smith Mountain Lake", might be credible were there not a bridge across that man-made monstrosity already. The second, to "avoid crossing Philpott Reservoir", would be reasonable if

not also combined with the omission of one side of the reservoir from the map, making it difficult to run the road west of it. The third, to "avoid impacts to Fairy Stone State Park" has the effect of deceiving the public, because the park does not appear on the maps at all, so otherwise acceptable routes that accidentally cross the park can be disqualified. The fourth, to "consider proximity to logical termini", would tend to exclude any route approaching Roanoke, which is out of the way for anyone driving from Ohio to South Carolina. The final criterion, "avoid excessive cost", should exclude from consideration any billion-dollar superhighway.

Response: *We assume that this comment refers to the maps provided to the public at the citizen information meetings upon which the alternatives were drawn. If that is the case, then the process had shortcomings; the criteria themselves are not flawed. Crossing Smith Mountain Lake was included as a fatal flaw, not because it is infeasible from an engineering perspective, but because of the cost associated with a constructing and maintaining a bridge crossing, the associated potential for water quality impacts, and the distance from the high priority corridor identified by Congress in the National Highway System Designation Act of 1995 for I-73. Public parks, including Fairy Stone State Park, were avoided to the degree practical because Section 4(f) of the 1966 Department of Transportation Act precludes a project from impacting public parks unless there is a prudent and feasible avoidance alternative. While alternatives that impacted the park were eliminated, alternatives in the vicinity of the park were initially considered. Logical terminus is a legal term, and it is not defined as being the most direct route between two points. Instead, it establishes the end points for a project between which the environmental analysis will be conducted. The logical termini for this study were defined as I-81 in the vicinity of Roanoke and U.S. Route 220 near the Virginia/North Carolina state lines. The termini were established based on the description of the I-73 high priority corridor included by Congress in law. Cost is not to be viewed in a vacuum. Excessive cost as a fatal flaw is to be understood in terms of the length of the alternatives under consideration. Those alternatives that took a more circuitous or indirect route between the two termini were longer in length and tended to be more excessive in cost because of it.*

(Concerning 3.2) The idea that transportation system management (TSM) can be reduced to one alternative is beyond my ability to understand.

Yours truly,

Charles Jordan

cc:
Peter Stokely, EPA/EPIC, 12201 Sunrise Valley Drive, 555 National Center, Reston, VA 20192
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January 4, 2001

Mr. Earl T. Robb, State Environmental Administrator
Virginia Dept. of Transportation,
1201 E. Broad Street
Richmond VA 23219

Dear Mr. Robb:

Attached are comments on the I-73 Draft Environmental Impact Statement & Section 4(f) Evaluation. I prepared these comments and am submitting them to you on behalf of Virginians for Appropriate Roads. Virginians for Appropriate will be submitting additional comments under separate cover. I look forward to your response once VDOT has had an opportunity to consider these comments, and comments from other interested stakeholders in the I-73 project development process.

I also request that you add me to the list of individuals who have submitted substantive comments, and thus to whom either a newly revised DEIS or final EIS will be sent as provided under NEPA regulations at 40 CFR 1502.19(d).

Sincerely,

Peter T. Kleeman, Ph.D
Transportation/Environmental Consultant

Cc: Ann Rogers, Virginians for Appropriate Roads
Roberto Fonseca, FHWA Virginia Division

Comments on the I-73 Draft Environmental Impact Statement
& Section 4(f) Evaluation

Submitted to VDOT on behalf of Virginians for Appropriate Roads

prepared by:
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EXECUTIVE SUMMARY

The comments provided below are submitted on behalf of Virginians for Appropriate Roads and should be considered along with comments submitted by others on behalf of Virginians for Appropriate Roads. These comments are provided under the National Environmental Policy Act (NEPA) public involvement process. The comments relate directly to NEPA document requirement that do not appear to have been adequately addressed by VDOT in the I-73 draft Environmental Impact Statement (DEIS). The major comments included address substantive errors or omissions in (1) the purpose and need statement; (2) identification and evaluation of a full range of reasonable alternatives for consideration in the DEIS, (3) use of inappropriate traffic assumptions in determining future traffic levels for the identified build alternatives, and in the air quality and noise impact assessment modeling efforts presented; and (4) non-disclosure of fundamental modeling parameters used by VDOT in the noise impact assessment modeling effort. The identified shortcomings of the DEIS appear to be significant in nature and revisions of the DEIS are necessary to meet minimum NEPA requirements.

Comments are organized by DEIS chapter, but comments in some chapters overlap with comments in others. Text taken directly from the DEIS or from a referenced Federal document is presented in italics. Implications of the identified shortcomings in the DEIS and recommended remedial actions to eliminate the problems identified in the comments are provided to assist VDOT in revising the DEIS so this it will comply with NEPA requirements.

The primary conclusion to be drawn from the comments given below is that VDOT has failed to meet the requirement of NEPA to consider all reasonable alternatives and determine adequately the environmental consequences of the proposed actions. VDOT's rationale for considering only Interstate standard alternatives is based on Congressional language provided in the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991 but that was removed in the Transportation Efficiency Act for the 21st Century (TEA-21) in 1998. Although it is clear that the DEIS should be revised to include additional alternatives to comply with NEPA, the revised DEIS should also provide documentation of model assumptions used in determining future traffic demand in section 4.1, and in estimating air quality and noise impacts in section 4.3 and 4.4. Only after adequate revision, and another opportunity for the public to comment on the revision should this document be considered for action by FHWA.

Response: *The comments summarized here are addressed below.*

COMMENTS BY CHAPTER

1.0 Purpose of and Need for Action

Statements in this section of the I-73 DEIS misrepresent the nature of the Congressional high priority corridor program as provided in ISTEA and later amendments the National Highway System Designation Act, and TEA-21. VDOT states in section 1.1 that "With the passage of TEA-21, Congress – provided funding and directed Virginia to conduct preliminary engineering on the section of I-73 from the Virginia/North Carolina state line to the City of Roanoke." Although it is true that funding is made available for use by VDOT and that preliminary engineering is eligible for Federal funding, there is no Congressional direction that VDOT must conduct preliminary engineering on this project. Funding is available to VDOT for this purpose but it must be requested by VDOT if VDOT chooses to apply these funds to the identified corridor. To date, however, it appears that VDOT has never requested funding for preliminary engineering or any other aspect of the I-73 project from FHWA under the high priority corridor program. Grant request and award information is available online at http://www.fhwa.dot.gov/hepl0/corbor/corbor.html and no I-73 grant activity in Virginia has been identified. VDOT appears to be inappropriately using requirements for accepting funds under the high priority corridor funds made available by Congress as a basis for specifying the purpose and need for a project. I find no basis for the claim made by VDOT in any Federal acts mentioned, in Title 23 of the United States Code, or in Title 23 of the Code of Federal Regulations.

The statutory language from TEA-21 (P.L. 105-178) at sec. 1118 (National Corridor Planning and Development Program) includes no directive requiring preliminary engineering be done, but indicates that States must submit a request to FHWA for this funding if a State wishes to do preliminary engineering or any other work using the high priority corridor funds on any of the high priority corridors designated by Congress.

Response: *You are correct. Congress did not "direct" VDOT to conduct preliminary engineering on Interstate 73. This wording has been corrected. As for grant information, the federal-aid program is a reimbursable program. This means that a state highway agency must expend its own funds up front before submitting a request for reimbursement with federal funds. This might explain why grant and award information was not available online – VDOT had not yet asked for reimbursement at the time the site was viewed. Notwithstanding, a better indicator of the status of the commitment to use federal funds is a state's request of FHWA to approve and/or authorize a particular phase of work as well as the project agreement entered into by the state highway agency and FHWA for that work. For Interstate 73, FHWA and VDOT entered into a Federal-aid project agreement on January 2, 1997, for $10 million for preliminary engineering work to determine the location of Interstate 73 (i.e. develop an EIS); $8 million of that money was federal funds consisting of National Highway System funding and High Priority Demonstration funding. This agreement serves as a commitment on the part of FHWA to VDOT that FHWA will reimburse VDOT for all work performed in accordance with the agreement. As of 6/2004, VDOT has been reimbursed more than $5 million for work performed in accordance with the agreement.*

Also, VDOT appears to be overstating statutory language in ISTEA and in 23 USC 103 concerning designation of future interstate system routes. VDOT states that "In designating I-73 as a high priority corridor in ISTEA, the Congressional intent of the route as an interstate facility was clear. With additional legislation and amendments, Congress has designated the section of I-73 from Charleston, South Carolina to Portsmouth, Ohio as a future part of the Interstate subject to the conditions that the section to be added meets Interstate design criteria and connects to an existing Interstate segment. Accordingly, the Interstate design standard is the preferred alternative for I-73 in Virginia."

Part 470 of Title 23 of the Code of Federal Regulations states at 23 CFR 470.107(a)(2) that "Additional Interstate System segments are permitted under the provisions of 23 U.S.C. 139 (a) and (c) and section 1105(e)(5)(A) of the Intermodal Surface Transportation Efficiency Act of l991 (ISTEA), Pub. L. 102-240, 105 stat. 1914, as amended." But, this language provides only that these segments are

eligible to become part of the Interstate System - not that Congress intends for them to become part of the Interstate System. Thus, should VDOT determine that upon consideration of a range of reasonable build alternatives, an Interstate standard design is ultimately selected for construction and is actually built to Interstate standards, then that constructed facility will be added to the Interstate System. Stating that an Interstate design is the preferred alternative is not based on any Congressional intent, but the apparent desire of VDOT to construct an Interstate facility and thus only consider Interstate designs as meeting the biased purpose and need statement VDOT prepared for this project. Not only does VDOT appear to misrepresent Congressional intent, but is attempting to eliminate from consideration other reasonable alternative build designs.

Response: *The language cited in the draft EIS comes from Mr. Fred Skaer, Director of FHWA's Office of National Environmental Policy Act Facilitation in Washington, D.C. in an electronic message to Ms. Rebecca Bier dated 1/22/99. He cited the "Interstate 73" designation by Congress and several laws enacted since ISTEA by which Congress strengthened the identification of I-73 as an Interstate highway. The draft EIS also acknowledges the flexibility afforded by Congress to the states. For this reason, the draft EIS states that even though Congress has provided the states with flexibility, they have expressed their intent through legislation and have provided states with the legal mechanism to designate the route as part of the Interstate system should they meet the conditions in the legislation. This is significant because the Interstate System as originally conceived has been completed and FHWA no longer has a funding category specifically for Interstate construction. Accordingly, the draft EIS identifies the Interstate design standard as the "preferred design alternative" for I-73 in Virginia in keeping with the documented purpose and need which includes congressional intent. Notwithstanding, the draft EIS further clarifies that the Interstate design is being used to assess impacts and compare alternatives for purposes of selecting a location, not a design; a worst-case scenario if you will. The actual design and design related features won't be approved until after final design which cannot be initiated under FHWA regulations until after a Record of Decision is issued. See responses below which address elimination of "other reasonable alternative build designs".*

The stated purpose of section 1105 of ISTEA was to include identified high priority corridors on the National Highway System (NHS), and to make these corridors eligible for assistance. In addition, 23 CFR 470(b)(4) states that "The National Highway System shall include all high priority corridors identified in section 1105(c) of the ISTEA. This indicates that the I-73 corridor as described in ISTEA is currently a part of the NHS. Section 1105(e)(1) states that "The Secretary, in cooperation with the affected State or States, may prepare a long-range plan for the upgrading of each corridor to the appropriate standard for highways on the National Highway System. "Not only is it not necessary to build a high priority corridor to interstate standards, the use of the phrase 'may prepare a long-range plan' instead of 'shall prepare a long-range plan' indicates that Congress doesn't even require that a designated corridor be brought up to NHS standards if it currently is not built to NHS standards. Bringing the corridor up to current NHS standards is certainly a desirable action, but this decision is left to the State, and the State must request that FHWA make high priority funds available if the State wishes to use those funds to upgrade the corridor.

Response: *Upgrading Route 220 or constructing Interstate 73 on new location would be eligible under a variety of FHWA funding categories, not just high priority funds. As documented above, VDOT requested $8 million in National Highway System funds and High Priority Demonstration funds for the development of the draft EIS.*

The NHS design standards given at 23 CA 625(f) also allow that exceptions to the NHS standards, may be granted "where conditions warrant that exceptions be made." Thus alternatives that don't comply with all of the NHS design standards but may be a reasonable alterative that should not be eliminated without some consideration in the DEIS. Any reasonable build option to upgrade the current corridor should be included among the DEIS alternatives to identify what (if any) exceptions may be required and if those exceptions would be warranted under the prevailing conditions. Route 220 is currently on the NHS, and clearly improvement to Route 220 to other than an Interstate standard or even NHS standard should be included in the set of reasonable

alternatives for consideration if exceptions are warranted.

Response: *FHWA regulations allow for design exceptions under certain circumstances. Generally speaking, design exceptions are requested for design speed, bridge width, lane width, shoulder width, structural capacity, horizontal clearance, horizontal alignment, stopping sight distance, superelevation, vertical clearance, vertical alignment, cross slope, grade, and access control. These design exceptions are limited in scope and are usually confined to a particular area or segment of a project. Design exceptions are not granted for entire projects unless the project itself, such as a bridge replacement, is limited in scope. Building a 70-mile long road to a design standard less than it is functionally classified for is not a design exception. That is a project decision which FHWA would not agree to or participate in. Design exceptions are an issue addressed during final design; it is not an issue addressed during preliminary engineering. Because of the liability associated with design exceptions, they are not granted as a matter of course; they are only granted after extensive review. In order to justify a request for a design exception, VDOT would need to demonstrate that safety isn't being unduly compromised and explain why it isn't reasonable or feasible to meet minimum AASHTO requirements. Consequently, decisions on a project of this magnitude are not made at the preliminary engineering stage based on the assumption that a design exception will be granted. A design exception only figures in to the decision making process during preliminary engineering if VDOT has already initiated the process to request a design exception and the request appears reasonable (i.e. this scenario would likely transpire on projects processed with a Categorical Exclusion or Environmental Assessment, not an EIS). Therefore, considering an alternative based on the assumption that extensive design exceptions will be granted is not reasonable and is in fact arbitrary.*

Implications of VDOT's misrepresentation of Congressional intent

By not including design alternatives other than building to Interstate standards, VDOT has not presented a reasonable range of alternatives for consideration in the environmental documentation process. The FHWA Technical Advisory T6640.8A that provides guidance on preparation of environmental documents states that "Both improvement of existing highway(s) and alternatives on new location should be evaluated. A representative number of reasonable alternatives must be presented and evaluated in detail in the draft EIS (40 CFR 1502.14(a)). For most major projects, there is a potential for a large number of reasonable alternatives. Where there is a large number of alternatives, only a representative number of the most reasonable examples, covering the full range of alternatives, must be presented." Technical Advisory T6640.8A is not regulatory, but the equivalent regulatory language is given at 40 CFR 1502.

VDOT has clearly failed to comply with the NEPA requirements at 40 CFR 1502.14(a) to consider reasonable alternatives and has not followed the FHWA guidance on preparation of a draft EIS provided in T 6640.8A. This shortcoming alone has biased significantly the results presented by VDOT.

Response: *See other responses, both above and below.*

Suggested Remedial Action

FHWA should instruct VDOT to develop and evaluate reasonable build alternatives other than Interstate standard designs and in addition to the required no-build and Transportation System Management (TSM) alternatives to meet the NEPA requirement on consideration of reasonable alternatives. VDOT should hold an additional public hearing and comment period on the revised DEIS prior to FHWA taking any action on the DEIS.

Response: *Based on the responses provided, FHWA sees no basis for the suggested remedial action.*

2.0 Alternatives

The introduction to the chapter on alternatives states that "The proposed action is the selection and construction of a new interstate highway between I-81 and the North Carolina state line in a corridor that a generally parallels I-581 and U.S. Route 220 through Roanoke, Botetourt, Bedford, Franklin and Henry counties." As noted in my comments on Chapter 1.0, consideration of only build alternatives that meet Interstate standards is inappropriate under both NEPA requirements and FHWA environmental documentation guidance.

VDOT states on page 2-7 of the I-73 DEIS that the only eligible design alternatives to be considered in this report are principal arterial or Interstate designs based on the purpose of the NHS as defined in ISTEA Section 1006(b)(1) [actually in 23 USC 103(b)(l) which was amended by ISTEA Section 1006(a)]. This section stated that "The purpose of the National Highway System is to provide an interconnected system of principal arterial routes which will serve major transportation centers, international border crossings, ports, airports, public transportation facilities, and other major travel destinations; meet national defense requirements and serve interstate and interregional travel."

But, in 1998 TEA-21 amended 23 USC 103(b) removing in total this language used by VDOT as the basis for determining its set of alternatives. The amended section 103(b) contains a very different description of the National Highway System than the description used by VDOT in deciding that only principal arterial or Interstate designs should be considered. In fact, upgrading Route 220 at other than an Interstate standard would qualify as a viable alternative for consideration in the DEIS, as Route 220 is currently a part of the NHS and upgrading a facility that is already part of the NHS doesn't appear contrary to any of the requirements of the high priority corridor program, or any other part of the Federal-aid highway program. Route 220 is shown as part of the NHS on the NHS map at the FHWA website http://www.fhwa.dot.gov/hep 10/data/maps/va.pdf.

The statutory language at 23 USC 103(b), as amended, is given in its entirety in ATTACHMENT 1 below and describes the NHS as a much broader system than only Interstates and principal arterials.

Response: *See response below following "Attachment 1".*

Implications of VDOT's Inappropriate Limitation on Design Standards

VDOT has eliminated a wide range of feasible alternatives, many of which would qualify as reasonable alternatives and must be considered in the DEIS to comply with NEPA and FHWA environmental documentation requirements. Given that Route 220 is currently on the NHS, and defined as part of the high priority corridor, it is not reasonable for VDOT to eliminate upgrading Route 220 to other than Interstate standards as a design alternative. Other build alternatives should also be reconsidered noting that VDOT eliminated inappropriately a large number of potential highway segments from consideration by indicating that they did not conform to Interstate standard for median width or other reason that was overly restrictive.

Response: *See response below following "Attachment 1". In addition, "a large number" of potential highway segments were not eliminated from consideration because they did not conform to interstate standards for median width. Individual highway segments were eliminated for reasons cited in Section 2.2.2 of the draft EIS.*

Suggested Remedial Action

FHWA should instruct VDOT to develop and evaluate additional reasonable build alternatives other than just Interstate standard designs for upgrading Route 220. Several alternative upgrade designs should be considered and representative alternatives should be evaluated to the same level of detail as the alternatives already considered by VDOT. Another public hearing and comment period should be required on the revised DEIS prior to FHWA taking any action on the DEIS.

Response: *Based on the responses provided, FHWA sees no basis for the suggested remedial action.*

ATTACHMENT 1

23 USC Sec. 103. Federal-aid systems

(b) National Highway System. -

(1) Description. - The National Highway System consists of the highway routes and connections to transportation facilities depicted on the map submitted by the Secretary to Congress with the report entitled "Pulling Together: The National Highway System and its Connections to Major Intermodal Terminals" and dated May 24, 1996. The system shall

(A) serve major population centers, international border crossings, ports, airports, public transportation facilities, and other intermodal transportation facilities and other major travel destinations;

(B) meet national defense requirements; and

(C) serve interstate and interregional travel.

(2) Components. - The National Highway System described in paragraph (1) consists of the following:

(A) The Interstate System described in subsection (c).

(B) Other urban and rural principal arterial routes.

(C) Other connector highways (including toll facilities that provide motor vehicle access between arterial routes on the National Highway System and a major intermodal transportation facility.

(D) A strategic highway network consisting of a network of highways that are important to the United States strategic defense policy and that provide defense access, continuity, and emergency capabilities for the movement of personnel, materials, and equipment in both peacetime and wartime. The highways may be highways on or off the Interstate System and shall be designated by the Secretary in consultation with appropriate Federal agencies and the States.

(E) Major strategic highway network connectors consisting of highways that provide motor vehicle access between major military installations and highways that are part of the strategic highway network. The highways shall be designated by the Secretary in consultation with appropriate Federal agencies and the States.

(3) Maximum mileage. - The mileage of highways on the National Highway System shall not exceed 178,250 miles.

(4) Modifications to NHS. –

(A) In general - The Secretary may make any modification, including any modification consisting of a connector to a major intermodal terminal, to the National Highway System that is proposed by a State or that is proposed by a State and revised by the Secretary if the Secretary determines that the modification -

(i) meets the criteria established for the National Highway System under this title; and

(ii) enhances the national transportation characteristics of the National Highway System.

(B) Cooperation. –

(i) In general. - In proposing a modification under this paragraph, a State shall cooperate with local and regional officials.

(ii) Urbanized areas. - In an urbanized area, the local officials shall act through the metropolitan planning organization designated for the area under section 134.

(5) Congressional high priority corridors. - Upon the completion of feasibility studies the Secretary shall add to the National Highway System any Congressional high priority corridor or any segment of such a corridor established by section 1105 of the Intermodal Surface Transportation Efficiency Act of l991 (l05 Stat. 2031 et seq.) that was not identified on the National Highway System described in paragraph (1).

(6) Eligible projects for nhs. - Subject to approval by the Secretary, funds apportioned to a State under section 104(b)(l) for the National Highway System may be obligated for any of the following:

(A) Construction, reconstruction, resurfacing, restoration, and rehabilitation of segments of the National Highway System.

(B) Operational improvements for segments of the National Highway System.

(C) Construction of and operational improvements for, a Federal-aid highway not on the National Highway System, and construction of a transit project eligible for assistance under chapter 53 of title 49, if-

(i) the highway or transit project is in the same corridor as, and in proximity to, a fully access-controlled highway designated as a part of the National Highway System;
(ii) the construction or improvements will improve the level of service on the fully access-controlled highway described in clause (i) and improve regional traffic flow; and
(iii) the construction or improvements are more cost-effective than an improvement to the fully access-controlled highway described in clause (i).
(D) Highway safety improvements for segments of the National Highway System.
(E) Transportation planning in accordance with sections 134 and 135.
(F) Highway research and planning in accordance with chapter 5.
(G) Highway-related technology transfer activities.
(H) Capital and operating costs for traffic monitoring, management, and control facilities and programs.
(I) Fringe and corridor parking facilities.
(J)Carpool and vanpool projects.
(K) Bicycle transportation and pedestrian walkways in accordance with section 217.
(L) Development, establishment, and implementation of management systems under section 303.
(M) In accordance with all applicable Federal law (including regulations), participation in natural habitat and wetland mitigation efforts related to projects funded under this title, which may include participation in natural habitat and wetland mitigation banks, contributions to statewide and regional efforts to conserve, restore, enhance, and create natural habitats and wetland, and development of statewide and regional natural habitat and wetland conservation and mitigation plans, including any such banks, efforts, and plans authorized under the Water Resources Development Act of 1990 (Public Law 101-640) (including crediting provisions Contributions to the mitigation efforts described in the preceding sentence may take place concurrent with or in advance of project construction; except that contributions in advance of project construction may occur only if the efforts are consistent with all applicable requirements of Federal law (including regulations and State transportation planning processes. With respect to participation in a natural habitat or wetland mitigation effort related to a project funded under this title that has an impact that occurs within the service area of a mitigation bank, preference shall be given, to the maximum extent practicable, to the use of the mitigation bank if the banks contains sufficient available credits to offset the impact and the bank is approved in accordance with the Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (60Fed. Reg. 58605 (November 28, 1995)) or other applicable Federal law (including regulations).
(N) Publicly-owned intracity or intercity bus terminals.
(O) Infrastructure-based intelligent transportation systems capital improvements.
(P) In the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands, any project eligible for assistance under section 133, any airport, and any seaport.

Response: *The construction of Interstate 73 or major improvements to Route 220 would need to be done to principal arterial standards, not because they would be located on the NHS system, but because the facilities themselves are functionally classified as principal arterial routes. The functional classification of roadways is required in all states. The functional classification of roadways is a process carried out by the state highway agency in rural areas and state highway agencies in coordination with Metropolitan Planning Organizations in urbanized areas. As the name implies, roads are functionally classified based on how they function when it comes to mobility and access. If we take your citation to 23 USC 103(b)(2) which describes and identifies the components of the NHS and eliminate everything that I-73 and Route 220 are not (i.e. subparagraphs (A), (C), (D) and (E)), all we are left with are urban and rural principal arterials (subparagraph (B)). Therefore, by default, I-73 and Route 220 would fall under subparagraph (B) – urban and rural principle arterials. When the NHS was developed in the early 90s, each state and MPO went through an exercise to identify routes functionally classified as principal arterial routes for inclusion in the NHS to satisfy the pre-1998 language of 23 USC 103(b)(1) which stated that the "purpose of the National Highway System is to provide an interconnected system of principal arterial routes..." Therefore, the NHS established as part of the NHS Designation Act of 1995 was composed primarily of principal arterial routes in keeping with the pre-1998 language. Accordingly, regardless of the current definition of the NHS, which dates to 1998, the NHS is composed of principal*

arterial routes because that was the condition that was in place when it was initially developed and designated by Congress. Therefore, Route 220 isn't classified as a principal arterial because it was included in the NHS, Route 220 was included in the NHS because it was already classified as a principal arterial route. So, exclusive of any reference to the NHS, I-73 and any major improvements to Route 220 would need to be constructed to principal arterial standards because of the functional classification of the roadways.

Although AASHTO has a separate design standard for roads classified as interstates, VDOT does not have a separate interstate design standard. Instead, interstates are covered by VDOT's "freeway" design standard which is a subcategory of the principal arterial design standard. The other subcategory is "other principal arterials". Both the "freeway" and "other principle arterials" design standard is further broken down into 'level', 'rolling', and 'mountainous' based upon the terrain where the facility would be located. This terrain-specific break down effects the design speed, maximum degree of curvature, and stopping sight distance; it is important to also point out that these terrain-specific standards are not design exceptions. However, the lane width, shoulder width, median width and clear zone width for both "freeways" and "other principal arterials" are the same. This is depicted in Figure 2.3-1 of the draft EIS to demonstrate that there is no appreciable difference between the "freeway" profile or the "other principal arterial" profile; both require a minimum right-of-way of 250 feet. As further documented in the draft EIS at page 2-13, whether I-73 is designed to freeway standards (i.e. interstate) or other principal arterial standards, there does not appear to be any discriminating advantage or disadvantage, environmentally, between the two standards.

Having already established the rationale for why the improvements must be constructed to principle arterial design standards (see responses above), your comment, along with similar comments made by others, have failed to demonstrate where an appreciable difference in impacts would occur if a non-freeway (or "other principle arterial") design standard was used. This would have to be done to make a case that there are other reasonable alternatives that have not been considered. Therefore, FHWA has not eliminated a wide range of feasible alternatives by basing the impact assessment on the principle arterial design standard for freeways. The impact of alternatives developed to "other principle arterial" design standards is adequately covered by the existing alternatives under consideration.

4.0 Environmental Consequences

4.1 Transportation

Forecasted traffic data does not appear to account for induced (also called generated) traffic. By building any of the current Interstate standard design alternatives (and other necessary but not included non-Interstate alternatives), induced traffic due to construction of a dramatically improved facility would add significantly to future traffic. In particular, heavy truck volumes would likely be much higher than volumes projected without accounting for induced traffic. This induced truck traffic would result in a much greater impact in the project area than presented in the DEIS throughout chapter 4. Induced vehicle traffic of 20 percent would not be an unreasonable estimate, although the increased rate of growth in traffic that is induced could result in even greater traffic levels in the design year. A significant portion of the induced traffic would likely be heavy trucks - especially in the Interstate standard build alternatives. Level of Service (LOS) would likely be inferior to LOS given in Tables 4.1-3 and 4.1-5. Also, this additional traffic would affect travel times, congested flow speeds, and VMT anticipated in the design year.

Implications of underestimated traffic volumes in the design year

Underestimation of future traffic that will likely be greatest in the Interstate standard design alternatives will bias the comparison among alternatives and result in the Interstate alternatives appearing relatively better than competing alternatives where induced traffic will be lower. As noted in my comments on Chapters 1.0 and 2.0, VDOT has introduced an inappropriate bias toward considering

only Interstate standard build alternatives. Underestimation of traffic levels will exacerbate that bias. NEPA requires that alternatives be compared without bias so that fair comparisons of the strengths and weaknesses among alternatives can be made prior to selection of a preferred alternative.

Response: *You have not provided any documentation to support your premise that induced traffic could be as high as 20% making it difficult to address the unsubstantiated claim. In the absence of an explanation of what is meant by induced traffic or induced travel, a few assumptions must be made regarding the comment. According to FHWA's website, the term "induced travel" is used to describe two phenomena. First, the term is used to describe the observed increases in traffic volume that occurs soon after a new highway is opened or a previously congested highway is widened. Travelers experiencing congestion on existing facilities will divert to the new facility, if convenient, to take advantage of reduced travel times. Sometimes, this diversion can be so great that the new facility experiences congested conditions well before forecasted. However, these conditions need to be understood within the context of the statewide and metropolitan planning processes.*

With respect to the statewide and metropolitan planning processes, there is a dynamic that takes place that must be recognized. When the state and MPOs develop long-range plans, the travel demand model assigns traffic to different roadway segments based on the land use and socioeconomic data forecasts made by the localities over a 20+ year period. From this travel demand and trip generation effort, the state and MPOs can determine the need for roadway improvements and program those improvements as funding allows. Therefore, a long range plan represents all of an area's fundable improvements which they plan to put in place in the next 20+ years to address planned land use and projected growth in households, employment, etc. in the region.

When FHWA develops one of those improvements as a Federal-aid project, we predict what the impact of the project will be on the environment in the design year. When we develop the traffic data for that improvement which allows us to define the design (# of lanes, interchanges vs. intersections, interchange configuration, etc.), we assume that all of the other improvements programmed in the long range plan for construction will be implemented by the design year. In that way, we can isolate the impact of the proposed improvement that is being considered on travel and the environment. When all of the improvements are in place, the network achieves an equilibrium with respect to the distribution of traffic as travelers seek out the least congested route. If the Federal-aid improvement is constructed while other improvements lag behind, travelers on the new facility will experience a reduced level of service before they were forecasted to because the other roads on the network have not been improved yet and don't carry a greater share of the traffic as forecasted in the planning process. Once those improvements are made, traffic will divert to them and a new equilibrium with respect to the distribution of traffic (consistent with the state and MPO's 20-year forecasts from the planning process) will be achieved on the network.

Therefore, induced travel can be considered a temporary redistribution of traffic on the network that results in a reduced level of service before anticipated because all of the assumptions used to develop the design (i.e. the full build out of the network and the assignment of traffic) have not come to fruition yet. Planners take a snap shot of the future 20+ years in the present. Unfortunately, that 20 year plan doesn't always come to pass due to changes in priorities, budgetary issues, litigation, etc. What may appear to be induced travel is really traffic that hasn't had the opportunity to distribute itself across the network because all of the programmed improvements for the network have not yet been made.

The second way the term "induced travel" is used is to describe the dynamic relationship that exists between a road and development. As development occurs adjacent to a roadway, it will attract travelers to that development. However, the relationship between transportation improvements and land development is extremely complex and even less well understood than its impact on travel behavior. While improved transportation accessibility in a corridor may indeed make land more attractive for development, other factors such as water and sewer lines, quality of schools and other public services, undevelopable land (e.g. wetlands, floodplains, parks, etc.), land acquisition and development costs, impact fees and zoning ordinances play major roles in shaping where development will take place, its

nature and its intensity. Recent empirical studies conducted in Ohio and North Carolina in 2003 concluded that local patterns of population growth are not highly correlated with increases in highway capacity (See Hartgen, D.T., *The Impacts of Highways and Other Major Roadway Improvements on Urban Growth in Ohio,* The Buckeye Institute, Columbus, Ohio, January 2003*; and* Hartgen, D.T.*, Highways and Sprawl in North Carolina,* The John Locke Foundation, Raleigh, North Carolina, September 2003*). Despite the complexity of the issue, it can be reduced to a review of whether the travel induced by development was accounted for in the travel demand forecasting modeling effort for the draft EIS. To answer that question, an explanation of that travel demand forecasting modeling effort is in order.*

The specific travel forecasting approach for the I-73 Location Study analysis utilized a three-phase demand, assignment and estimation process to determine future forecast traffic volumes along major roadways within the study area. In Phase I, the national interstate network and the urban area-to-urban area trip tables were used to estimate the interstate travel on I-73. For the base year (1997) the 1995 urban area-to-urban area trip table was assigned to the 1997 interstate system. The 1995 urban area trip table was adjusted (FRATARED) to meet 1997 estimated travel (using the 1995 and estimated 1997 population for the urban areas). Assignments were performed using both an all-or-nothing assignment technique and a stochastic (multi-path) assignment technique. The interstate system network was developed to include centroid connections for each urban area included in the urban area trip table. For the 1997 assignment, U.S. Route 220 was included in the network to see if any trips would be assigned to the present facility. The speeds on the interstate were the posted speed limits.

For further processing, the assignments from the interstate system were "sub-area" isolated. "Sub-area" isolated means that the trips on the interstates, at the Virginia boundaries, were summarized by interstate-to-interstate movements and by interstate movements to the urban areas of Virginia included in the trip table (Richmond and Norfolk regions). These movements can then be added to the statewide network in Phase 2. For future year applications, the full Build Alternative was included in the interstate system.

In Phase 2 the statewide assignments were made. In this phase the networks were the statewide network plus additional detailing in the U.S. Route 220 corridor and in the Roanoke area. The basic trip tables were taken from the statewide trip tables, and the interstate-to-interstate movements from Phase 1. In addition, it was important to add the local travel on U.S. Route 220. This local travel was determined by comparing the 1997 ground counts with the traffic assignments made using the statewide and interstate trip tables. The difference between the counts and the assignment is the local traffic. The distribution of this traffic was determined using the license plate survey conducted in 1997. Counties comprising the U.S. Route 220 corridor were stratified into census tracts or groups of census tracts as traffic assignment zones. Trips to and from these census zones were proportional to the population of the zones with the total trips for the county being equal to the statewide totals plus the trips required for the local travel. As with the interstate assignment, the statewide assignment was either stochastic or all-or-nothing. The highway network was coded in tenths of miles, instead of hundredths, in order to meet the requirements of the MINUTP software. Phase 2 provided the traffic assignments for all of the Build Alternative, except that portion within the Roanoke metropolitan area.

Phase 3 is the assignment procedure for the regional transportation planning model's Roanoke region. Since the Build Alternative would affect the traffic within the Roanoke region, Phase 3 used the Roanoke procedures, including the internal travel generated by these procedures. The difference between Phase 3 and the Roanoke study procedures is the generation of internal-external and external-external trips. In this study these trips came from the sub-area isolation analysis of Phase 2. The other difference is, of course, the coding of the Build Alternative into the Roanoke network for the future year(s). The first step in Phase 3 was to take the trip tables from the sub-area isolation analysis of Phase 2 and convert them to the external stations used in the Roanoke study, plus the I-73 external station(s). In this step the external-to-internal trips from Phase 2 also had to be "expanded" to the Roanoke zone system. Since the Phase 2 Roanoke zones were aggregations of the Phase 3 Roanoke zones, this simply required

calculating the proportion that each Roanoke study area zone is of the Phase 2 zone and applying this proportion in an "expansion" procedure. This was performed using the MINUTP program MATCON.

Once the Phase 2 trips were "formatted" into trip tables that can be used in the Roanoke study system, the procedures used to estimate internal-to-internal trips were applied and a total vehicle trip table, including external trips, were obtained. The assignment procedure used in Phase 3 was the assignment procedure used in the Roanoke study.

These "internal" Roanoke assignments were used to estimate the volumes on the Build Alternative inside the Roanoke region plus the impacts of the Build Alternative on other traffic in the study area. These internal Roanoke assignments to the Build Alternative were slightly different than the statewide assignments within the Roanoke area. Since the Phase 3 model has more detail than the information provided from the Phase 2 model, the Phase 3 assignments took precedence over the Phase 2 assignments within the Roanoke urban area.

A detailed investigation into commodity flows throughout the country was conducted as part of the I-73 Location Study Travel Forecasting Analysis. The commodity flow information, which was provided in the American Travel Survey Trip Tables, was utilized to estimate a state-to-state truck trip matrix. The truck trips were then assigned to urban areas within each state, and added to the personal vehicle trips in the interstate model analysis. This trip table analysis allowed for a more precise determination of truck movements through the study area in conjunction with the Build Alternative options. Additional details concerning the travel forecasting model and network analysis are contained in the Travel Forecasting Methods Memorandum, dated June 1998.

In areas where traffic volume information was not directly available from the travel forecasting model outputs, an estimation of the forecast traffic volumes was conducted. These estimations of the forecast traffic volumes were made by using existing traffic volume information and applying a factor based on the relationship with a matching volume count and model network traffic volume output location for that alternative. These calculated ADT volumes are noted throughout this memorandum with the inclusion of "(estimation)" after the value.

Generally, travel demand forecasting models account for induced travel. Typically, travel demand models include mode choice, trip assignment and trip distribution models in assigning trips to a network. The distribution of future land use, which is developed by the localities, is an input to the travel models. Future land use is the basis for identifying future trip generators and hence, the basis for induced travel. Therefore, unless one demonstrates that the distribution of future land use developed by the localities is grossly inaccurate or the modeling effort was grossly flawed, there is no basis for concluding that the travel demand forecasting modeling effort has underestimated traffic (i.e. traffic induced by future land use changes) by 20%.

Suggested Remedial Action

Traffic projections should be redone for the current alternatives to include induced demand. Future traffic demand for all additional alternatives should also include induced demand recognizing that induced demand will be greater in the Interstate standard design alternatives when compared to the TSM, and build alternatives at other than Interstate standard.

Response: *Based on the responses provided, FHWA sees no basis for the suggested remedial action.*

4.3 Air Quality [These comments are submitted in addition to other air quality comments to be submitted by Virginians for Appropriate Roads]

Roadside Carbon Monoxide (CO) impacts are the only air quality impacts modeled in the Air Quality section of the DEIS, although emission of ozone precursors will also be increased due to the increase in vehicles traveling in the region. Although the region is currently not in violation of the Clean

Air Act for any of the criteria pollutants. An increase in ozone and particulate matter resulting from this facility could bring the region into violation of current and pending clean air standards. Some assessment of the increased pollutant burden in the region over existing levels would be helpful in determining what relative impacts the various alternatives under consideration would have on regional air quality and attainment of National Ambient Air Quality Standards.

Response: *As already documented in Section 3.3 of the DEIS, all of the counties and localities in the study area are currently designated by EPA as being in attainment for the 1-hour standard for ozone, nitrogen dioxides, and particulate matter. EPA is not proposing to designate any new 1-hour ozone or PM10 areas. Recently, the EPA determined that the Roanoke area consisting of the City of Roanoke, City of Salem, Roanoke County and Botetourt County exceeded the 8-hour standard for ozone based on current monitoring data while being in attainment for the PM2.5 standard. However, instead of designating the area nonattainment under the 8-hour standard, EPA deferred the nonattainment designation because the area is proactively working to clean up the air through implementation of an Early Action Compact (EAC). If the area meets the required milestones prescribed for EAC areas and can submit three consecutive years of clean monitoring data, then the region will be reclassified as an attainment area in 2007. Interstate 73 would have no bearing on this effort since it would not be constructed or under construction by 2007. Notwithstanding, EPA's preamble to the 8-hour final rule states that conformity (in this case, we are speaking specifically of the preparation of a meso-scale analysis) is not a control measure to be used like the voluntary measures that are included in the EAC. Rather, conformity establishes a process in nonattainment areas for state and local governments to consider the broader emission impacts of their transportation decisions. In addition, the EAC protocol developed by EPA does not require the EAC area to meet the transportation conformity requirements since the conformity requirements only kick in one year after an area is designated nonattainment. Consistent with 40 CFR 93.102(d) and section 176(c)(6) of the Clean Air Act, conformity for the 8-hour standard (i.e. meso-scale analysis) does not apply in early compact areas provided the area meets all of the terms and milestones of its EAC. Failure to meet these terms or milestones will invoke the nonattainment designation requiring conformity for the 8-hour standard within one year of the designation.*

Further, as referenced above, the Clean Air Act Amendments of 1990 established a conformity process in nonattainment areas that recognizes that transportation-related air quality issues must be analyzed on a system-wide basis and be controlled through regional strategies in order to be effective. Consequently, projects in transportation plans and improvement programs are analyzed in the aggregate, rather than individually where assessment of regional impacts cannot be measured with any degree of accuracy. As such, analysis of the regional network through the conformity process establishes the context of the impact on regional emissions attributed to network improvements. For this reason, transportation conformity is performed on programs of projects, instead of individual projects, and the results compared to the State Implementation Plan (where one has been developed) or to a no-build analysis where the impact from the program of projects can be determined relative to regional emissions. Accordingly, determining the emissions burden attributed to I-73 would not be practical or productive for a couple reasons. First, In accordance with CEQ's regulations implementing NEPA, the significance of an impact cannot be determined apart from context. Conducting an ozone analysis as part of this study would be meaningless because it would have no context. Ozone is a regional pollutant. For this reason, EPA's conformity regulations are based upon the transportation planning processes that are in place in urbanized areas; that process provides the best mechanism for addressing the issue. Because ozone is a regional pollutant, EPA doesn't require that ozone be addressed on individual projects. Instead, EPA rightfully expects the issue to be addressed on the entire urbanized area roadway network through the metropolitan planning process. Addressing ozone on a single project may account for the impact from increases in traffic on that particular project, but it doesn't account for offsetting decreases in traffic elsewhere on the network. Hence the regional network approach. In addition, a mesoscale no-build/build analysis of the project may be able to determine the emissions burden attributable to the project, but it doesn't necessarily follow that an increase is an adverse impact unless it is viewed in the context of the overall network. Therefore, determining the emissions burden attributed to I-73 is meaningless unless an analysis was conducted through the

conformity process of all of the projects programmed for improving the regional network establishing the context of the results. Second, MPOs are responsible for performing ozone analyses to address the conformity requirements such as a regional analysis, and the Roanoke Area MPO is not currently set-up to perform such an analysis because the urbanized area they are responsible for transportation planning has not been designated nonattainment by EPA. Third, DEQ has not developed a State Implementation Plan (SIP) for the region because it has not been designated nonattainment by EPA, therefore, conformity cannot be demonstrated against budgets established in the SIP to determine if there would be a violation.

It is also important to point out that in the absence of Interstate 73, the area has recorded violations of the 8-hour standard for ozone. Accordingly, there is no basis for the statement that an increase in ozone resulting from this facility could bring the region into violation of current and pending clean air standards.

Experience in demonstrating conformity in Virginia's nonattainment areas since 1990 has shown that when considering the regional network, the consideration of individual projects to improve the transportation system has little impact on regional emissions. In Hampton Roads when the area was facing the prospect of a conformity lapse, an analysis was conducted to determine what impact removing seven of the largest regional projects from the areas long-range plan would have on regional emissions. The result was that removing those projects would have a negligible impact.

The CO analysis appears to underestimate significantly the roadside CO impacts. The analysis presented in the DEIS uses the VACAL model which is a combination of the MOBILE-5 emission model the CALINE-3 dispersion model. The vehicle fleet assumptions used in the VACAL model is that the distribution of vehicle types (passenger cars, medium trucks, heavy trucks, etc.) on the facility will be the same as the national average fleet. The anticipated traffic in the proposed alternatives will likely be very different from the national average fleet. The proportion of heavy trucks in the traffic stream anticipated in the I-73 corridor could have proportions of heavy trucks many times that of the national average fleet. Noting that the facility is intended to link to large commercial port facilities, and provide access to large industrial and commercial development, the heavy truck proportion of the traffic stream may be on the order of ten times that in the national average vehicle fleet when induced truck traffic is also included.

Response*: See comment above regarding induced travel. The vehicle fleet assumptions used in VACAL model are based on a national average vehicle fleet mix. The calculations and assumptions used in this model are similar to the models approved by FHWA (CALINE 3, MOBILE 5A) to conduct air quality analysis. The vehicle fleet assumptions used in these models are as follows:*

Design year fleet mix:

72% Light Duty Vehicles
25% Light Duty Trucks
3% Heavy Duty Trucks

These assumptions have been developed to model 'worst-case' conditions for Carbon Monoxide impacts. A higher percentage of Light Duty Vehicles is used since they emit more CO than most Heavy Duty Trucks, which in most cases are diesel powered. Anecdotal information aside, the comment does not provide any documentation for considering a different vehicle fleet mix.

Roadside CO levels that would be generated using the VACAL model with more realistic vehicle fleet assumptions would be significantly greater than the values reported in the DEIS. It is not clear if the more reasonable CO impact results would exceed the national CO standards, but it is inappropriate to use incorrect traffic assumptions as is done by VDOT in this case. The CO analysis should represent a worst case l-hour and 8-hour average concentration, but the incorrect fleet assumptions used by VDOT clearly do not provide realistic worst case CO estimates.

Response: *A quick review of Section 4.3 of the draft EIS demonstrates that the carbon monoxide concentrations that can be attributed to this project, if any of the build alternatives are implemented, is minor using 'worst-case" vehicle mix assumptions. Tables 4.3-2 and 4.3-3 bear this out numerically. These tables show that the overwhelming majority of carbon monoxide emissions that would be experienced at each receptor, when compared to existing levels, is due to background concentrations (96% is some cases), which themselves are overly conservative, and not due to the project. At some locations, carbon monoxide concentrations would decrease under some of the build scenarios.*

Suggested Remedial Action

The fleet assumptions used in the VACAL analysis should be revised to reflect the anticipated proportions of vehicle types anticipated for this project to account for the increased level of emissions expected compared to that for the national average fleet. A revised estimate of CO impacts should be determined and compared against the National Ambient Air Quality Standards (NAAQS) for CO.

Also, some consideration of the other air quality impacts of all alternatives should be carried out and reported. Ozone and Particulate Matter concentrations will be adversely affected and as stated in 40 CFR 1502.16, "any adverse environmental effects which cannot be avoided should the proposal be implemented" should be discussed in the Environmental Consequences section of the DEIS.

Response: *Based on the responses provided, FHWA sees no basis for the suggested remedial action.*

4.4 Noise

VDOT states that the noise impact levels estimated using the STAMINA 2.0 computer model are influenced by factors including ground absorption, roadway geometry, receptor distance, vehicle volume, operating speed, and volumes of medium trucks (vehicles with two axles/six tires) and heavy trucks (three axles or more). But, nowhere in the draft DEIS or in the Noise Technical Memorandum are the assumed values for these factors identified other than the distances from the proposed roadways to identified receptor sites. The values used in the computer analyses for all of the other factors will have a significant impact on reported results. In my experience with VDOT noise impact analyses, maximum ground absorption condition (acoustically soft ground) is assumed throughout the study area. This results in modeled noise levels being reported significantly lower than when acoustically hard ground conditions are included in the analysis. These acoustically hard ground conditions commonly occur where highway lanes are elevated above the surrounding terrain as is common on fill sections of the highway. Construction of a highway on rolling or mountainous terrain, as is the case for this project, will result in a large number of fill sections.

Acoustically hard ground results in a lower reduction in noise with distance from the roadway compared to acoustically soft ground. This difference is described in terms of Drop-Off Rate Per Doubling Distance. If acoustically soft ground is assumed where acoustically hard ground conditions apply, the error in estimating noise impacts at receptor sites can be very high. The underestimation of noise levels that would result from inappropriately using the acoustically soft ground assumption where hard ground exists is shown in TABLE 1 below. The criteria for selection of the appropriate Drop-Off Rate for use in the STAMINA 2.0 model is shown in TABLE 2 below.

TABLE 1: Error in dBA (decibels-A-weighted) due use of incorrect drop-off rate:

Site Distance from Roadway	Error in Noise Level
30 meters (100 ft.)	1.5 dBA
60 meters (200 ft.)	3.0 dBA
120 meters (400 ft.)	4.5 dBA
240 meters (800 ft.	6.0 dBA

The additional dBA to be added to noise estimates at receptor sites would extend the noise contours much further from the highway and thus the number of impacted sites could be much greater than the numbers presented in the DEIS in the vicinity of fill sections, and where hard ground conditions occur. VDOT's results indicate impacted receptor sites located in excess of 300 feet from the centerline of the proposed roadways. If the necessary additional dBA are added to correct in areas where hard ground assumption holds, sites located in excess of 600 feet from the centerline of the highway (and possibly as far as 1000 feet) could be in excess of the Federal noise abatement criteria and would have to be considered for noise abatement.

It should be noted that an increase of 3 dBA is the equivalent of doubling the noise at a receptor site. An increase of 6 dBA represents doubling the noise twice (i.e. multiplying the noise by a factor of 4).

Response: *This is incorrect. In accordance with FHWA policy and guidance, a 3 dB(A) increase in noise is barely perceptible under normal environmental conditions (i.e. non-laboratory), and a 10 dB(A) increase is equivalent to a doubling in noise levels. See the response below regarding soft and hard ground conditions.*

If, as suggested, VDOT's analysis underestimates some receptor sites by 6 dBA, the VDOT analysis would reflect only one fourth the noise that would be heard at that receptor site. This would be the equivalent of assuming that only one fourth of the peak hour traffic was being modeled in determining the noise level at that receptor site. It is quite possible that the estimated noise levels reported in the I-73 DEIS at receptor sites in the vicinity of proposed highway alternatives reflect errors of this magnitude. The information made available to the public in the DEIS and the Technical Memorandum is inadequate to determine the credibility of the results.

TABLE 2: Criteria for Selection of Drop-Off Rate Per Doubling Distance Source: "Federal Highway Traffic Noise Prediction Model," FHWA-RD-77-108,1978, page 14

Situation	Drop-Off Rate
1. All situations in which the source or the receiver are located 3 meters above the ground or whenever the line-of-sight averages more than 3 meters above the ground.	3 dBA
2. All situations involving propagation over the top of a barrier 3 meters or more in height.	3 dBA
3. Where the height of the line-of-sight is less than 3 meters and	
(a) There is a clear (unobstructed) view of the highway, the ground is hard and there are no intervening structures.	3 dBA
The view of the roadway is interrupted by isolated buildings, clumps of bushes, scattered trees, or the intervening ground is soft or covered with vegetation.	4.5 dBA

Trucks are the major noise emitters in highway traffic. No truck volumes are indicated for either heavy trucks or medium trucks in the DEIS or the Noise Technical Memorandum. Other facilities in Virginia similar to those proposed have very high truck volumes, but it is not clear what truck volumes (or traffic volumes in general) VDOT assumed in the reported analyses for this project. Underestimated truck levels will result in dramatically underestimated noise impacts at nearby residences, parks, schools, etc. Also, no indication of assumed vehicle speed used in the analysis is presented.

The combined effect of using unsuitable ground absorption, truck volumes, and operating speed assumption could result in significant error in estimating the number of impacted receptor sites, and the number of those sites that can be benefited using cost effective noise barriers.

Not providing the public with the model assumptions used in generating the noise impact results is inconsistent with involving the public in the project development process. Without this information, the anticipated impact results reported by VDOT in the DEIS are of little use in evaluating alternatives under consideration and other alternatives that should be added on the basis of their environmental consequences.

Response: *The I-73 noise analysis did assume soft ground conditions. Soft ground conditions result in a noise drop off rate of 4.5 per doubling of distance. The 400 scale orthophotos which were used in plotting the noise contours showed that most of the surface ground area is comprised mostly of either trees or grass - not concrete. As is noted in the FHWA table (Table 2), vegetation is a clearly an indication of soft ground conditions.*

The location of the 66 dBA contours were determined based on a very conservative approach. The noise analysis did not take into account additional attenuation due to dense tree strips and residential housing density. The presence of both of these conditions would have brought in noise contours closer to the road. Normally, accounting for these effects, which are very labor intensive modeling tasks, is restricted to a preliminary design phase where the chosen alternative is known, and not included in a study with so many alternatives still in consideration. In reality the noise impact zones are likely to be smaller than they are reported in this study - even under hard ground conditions. The assertion that considerable grading of the roadway would occur along the corridor in fill sections, resulting in hard ground conditions is incorrect. Hard ground conditions due to grading would be limited to within a few feet (less than 25 ft.) of the road- not the 800 feet error zone shown in Table 1. All of the receptor sites modeled for this study were more than 25 feet away from the road.

Information regarding traffic volumes and truck percentages were not included in the noise technical memorandum, however, the traffic information used in the noise model, including truck percentages, is included in the Traffic and Transportation Technical Memorandum on pages 4-13 and 5-9 – 5-34. Additionally, this same information is included on pages 3.1-6 and 4.1-2 – 4.1-4 of the DEIS. See the above response to "4.1 Traffic and Transportation" regarding reworking traffic numbers to include induced demand.

Suggested Remedial Action

Traffic projections should be developed to include induced traffic and proportions of vehicles by vehicle type in the peak noise hour of the design year should be estimated based on similar highways in Virginia. Noise results based on anticipated traffic flows that will result during the peak noise hour should be determined using acoustically hard ground assumptions where appropriate. A summary of all model parameters used in the noise analyses should be included in the Noise Technical Memorandum. The noise impact analyses should be redone to account for both hard ground and soft ground conditions as appropriate to determine the full range of receptor sites that will be impacted by traffic noise. Determination of cost effective noise barriers should be redone to be consistent with revised noise impact results.

Response: *Based on the responses provided, FHWA sees no basis for the suggested remedial action.*

Other Impacts Addressed in Chapter 4

Consideration of other than Interstate standard build alternatives will require that all of the environmental consequences given in the sections not addressed directly above (sections 4.2,and 4.5 - 4.16) be reworked to include the consequences of the additional build alternatives. The non-Interstate

alternatives should have lower levels of impacts than the Interstate designs and possibly meet the purpose and need for transportation improvements with significantly reduced impacts and at a lower total cost.

Response: *See previous comments. Although the "interstate design standard" is identified as the preferred design in the draft EIS, no decisions have been made on the design because the draft EIS is a location study, not a design study. As documented in the draft EIS, going with a less-than interstate design but one that still addresses the roads functional classification, will not materially result in a difference in environmental impacts since the horizontal footprint would be identical. As stated above, 600 foot corridors were used to evaluate environmental impacts, not the interstate design standard. Other than anecdotal information, commentors have not provided any evidence that considering the "other principle arterial" design standard (or "less than interstate") will appreciably change the assessment of environmental impacts.*

Suggested Remedial Action

Develop a set of reasonable non-Interstate build alternatives and provide appropriate impact levels for all of the consequences considered in the DEIS. The existing draft DEIS appears not to be in compliance with the NEPA requirement to consider all reasonable alternatives. Only through introducing a suitable set of additional alternatives and considering them to the same level of detail as the Interstate standard alternatives already considered will this DEIS be in compliance with NEPA.

Response: *Based on the responses provided, FHWA sees no basis for the suggested remedial action.*

CONCLUSION

The primary conclusion to be drawn from the comments given below is that VDOT has failed to meet the requirement of NEPA to consider all reasonable alternatives and determine adequately the environmental consequences of the proposed actions. VDOT's rationale for considering only Interstate standard alternatives is based on Congressional language provided in the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991 but that was removed in the Transportation Efficiency Act for the 21st Century (TEA-21) in 1998. Although it is clear that the DEIS should be revised to include additional alternatives to comply with NEPA, the revised DEIS should also provide documentation of model assumptions used in determining future traffic demand in section 4.1, and in estimating air quality and noise impacts in section 4.3 and 4.4. Only after adequate revision, and another opportunity for the public to comment on the revision should this document be considered for action by FHWA.

I-73: Weighing the Costs

An examination of highway economic
analysis and its application to the 1-73 project

Emily Manetta, University of Pennsylvania
January 12,2001

1. ABSTRACT:

The proposed 1-73 project, a new terrain interstate highway to be built through Southwestern Virginia, leaves local residents with a number of pressing questions. Residents are concerned about the way that such a large road could transform their region, and have a right to know about the potential impact of I-73 on the economy and quality of life of the Roanoke Valley and surrounding areas.

This report presents the information which is currently available on trends in highway economics across the nation. The steps which are used to calculate the economic potential of highway project are outlined and examined in detail. This close study of highway economics prompts the following question: Has enough economic analysis of the 1-73 project been performed to ensure area leaders that it is a viable investment? The answer appears to be no. Due to a nationwide trend of plummeting highway profitability, this report calls for a thorough benefit-cost analysis of the I-73 project before the region comes to any decision on the issue.

2. SOURCES:

The information on the highway economics of the past forty years came from three primary sources. The first was a review of infrastructure spending by the Congressional Budget Office (CBO) which sought to track the efficacy of various forms of infrastructure investment. The second source was an internal review of the Federal Highway Administration (FHWA) entitled "Contribution of Highway Capital to Output and Productivity Growth in the US Economy and Industries" performed by a New York University economist. Both of these studies were published

in 1998. The third primary source was a review essay on infrastructure investment published in the Journal of Economic Literature by economist Edward Gramlich, who is now a member of the Federal Reserve Board.

Additional sources include a reanalysis of a benefit-cost study performed by Indiana Department of Transportation on a proposed highway project. Information on employment figures came from a 1999 report entitled "Highway Capital and Economic Productivity" published by the, Surface Transportation Policy Project. The Draft Environmental Impact Statement (DEIS) recently released by VDOT was briefly examined, along with other VDOT statements. Finally, the economic analysis of I-73 commissioned by the City of Roanoke and performed by the Economic Development Research Group, was a source of limited economic information available specifically on the I-73 project. This analysis, entitled "Economic Impact of I-73 Alignments on the city of Roanoke" will be herein referred to as the EIR. For further information on sources and citations, please see the footnotes and works cited page.

3. HIGHWAY INVESTMENT AND ECONOMIC POTENTIAL 1960-2000:

This nation spends a great deal of money on our interstate highways. A number of economists, government offices, and concerned citizens have begun to scrutinize whether this money is being well spent. Using various statistical tools, analysts can determine how highway profitability is changing and what types of highway investment will spark the greatest economic development in the present and future.

3.1 Highway Spending

As it was originally designed, the Interstate Highway System (IHS) was scheduled to be near completion thirty years ago. However, real highway spending is currently increasing. In Figure 3.1.1 it is clear that highway investment initially dropped after the 1965 peak. Normally one. would expect this trend to continue until the spending flat-lined at a maintenance level. In the early 1980s, however, spending increased sharply, and this alarming trend has continued through the year 2000. Notice, also, that this trend is not echoed in the other sectors of infrastructure but is instead limited to highways alone.

Figure 3.1.1[1]

3.2 The Viability of Highway Investment

With the knowledge of the increasing resources which the nation devotes to highway spending, it is unsettling to discover that new highways no longer necessarily result in economic development in the regions where they are built. In fact, the amount of economic development brought by highways has decreased so sharply over the last thirty years that most investments in new highway construction cannot break even.

Figure 3.2.1 demonstrates this fact using an economic tool called an internal rate of return. A rate of return equates the present value of benefits with the present value of cost, including "opportunity cost" or gains which are forgone by not putting invested funds to their most attractive use. For example, if a rate of return for a particular project is 14%, then for every dollar invested in that project, $1.14 in benefits would result.

[1] CBO,1998

Figure 3.2.1 [2]

It is clear from Figure 3.2.1 that highway investments demonstrated a high rate of return in the 1950s and 1960s, during the first decades of the IHS. Since the completion of the IHS, however, the rate of return has precipitously and continuously declined. A number of interested parties have tended to tout the average rate of return to highway investment over the lifetime of the FHWA. It is obvious from Figure 3.2.1, however, that this would be both inaccurate and misleading. To claim that the average rate of return to highways from the l960's up to today is around 30% would not help someone interested in what the rate of return to highway capital is today. Today, the figure is between 20-25% below the average. From an economic point of view, to use the average of a statistic which has consistently and dramatically declined is uninformative and misleading.

It is not only important to know that the rate has declined, but also to know if the rate of return is efficient. That is, is enough economic development resulting from highway construction to justify the investment at all. There are two ways to measure the efficiency of highway capital. The first, used by the FHWA, stipulates that highway capital is oversupplied once the rate of return to highway capital drops below the rate of return to private capital. A second method, advocated by Edward Gramlich, is that highway investment is worthwhile only as long as the rate of return to

[2] FHWA.1996

highway capital exceeds the long term interest rate. Figure 3.2.2 compares the falling rate of return to highway capital from Figure 3.2.1 (the red series) with the rate of return to public capital (the blue series) and long term interest rate (the green series).

Figure 3.2.2 [3]

As is shown above, there is a comfortable margin between the rate of return to highway capital and to private capital through the 1960s and 1970s. In the 1980s, however, the rate of return to highway capital drops below the rate of return to private capital, indicating that highway capital is generally oversupplied according to the FHWA. This trend continues through 1991. Using Gramlich's method, there is again a significant margin between the rate of return to highway capital and the long term interest rate even in the 1980s, indicating that on average, some economic development is resulting from highway construction. By the l990s, however, the rate of return to highway capital and the long term interest rate have converged, demonstrating that continued investment in highway infrastructure may no longer be worthwhile.

A particular statistic about the status of highway capital in the 1980s seems to resurface

[3] FHWA,1996

during the 1-73 debate again and again, and that statistic should be addressed here. A number of individuals, both within VDOT and outside it, have claimed that in the 1980s, highway capital was neither under- nor over-supplied. There are two factors in Figure 3.2.2 which show that this statement is neither true nor informative. While Figure 3.2.2 does include the years 1990-1991 in its measure of rate of return for the decade of the 1980s, it is clear that the rate of return to highway capital dipped below the rate of return to private capital, indicating an oversupply according to the FHWA. Regardless of the fact that this disproves the claim that there was no national under-or over-supply, a statement simply about what was true in the 1980s is irrelevant at this time. It is how highway capital has performed most recently, in the 1990s, that we must examine. If we look at the trend of rate of return to highway capital over the lifetime of the FHWA, we see it fall dramatically. Moreover, looking at the most recent year for which we have data, l99l, we see that highway capital is oversupplied according to both the FHWA and Gramlich of the Federal Reserve Board. The rate of return to highway capital is expected to continue to diminish, and the data can indicate only one thing, a national oversupply of highway capital in the 1980s, the 1990s, and today.

Finally, local supporters of constructing a new terrain I-73 have suggested the following statistic (without a source, so one is unable to verify it): that $1 billion investment in transportation infrastructure" results in $2 billion in economic activity. We can see from Figures 3.2.1 and 3.2.2 that this statistic could never have been true for the interstate highway system alone, and certainly cannot be so today. Even in 1960, the rate of return to highway capital was only 54%; nothing like the 100% rate of return being suggested here. However, we must examine the statistic more closely. It claims such amazing rates of return for investment in "transportation infrastructure"; this includes, in addition to highways, transit and rail services. Research shows that investments in transit and rail services yield in economic development between four and five times the amount invested in them.[4] It is only when the poorly performing highway investments are averaged with the more lucrative transit and rail investments that such an astronomic rate of return can be cited. under the heading "transportation infrastructure".

3.3 The Economic Potential of Highway Maintenance Verses Highway Construction

Relying on data from the CBO, it is clear that highway maintenance is more efficient that new highway construction. This means that dollar for dollar, investment in maintenance projects

[4] Community Transportation, 2000

such as road resurfacing or widening contribute more to economic growth than new construction. This fact is clearly demonstrated by Figure 3.3.1, which compares the 1994 rate of return of four types of highway projects: maintenance of existing roadways, new urban construction, upgrading of below minimum sections, and new rural construction.

Figure 33.1[5]

While maintenance of existing highway infrastructure nets a very high 35% rate of return, urban construction produces less that half that. Upgrading below minimum sections of highway is still, lower, and lowest of all is new rural construction, whose rate of return is listed as negligible and could possibly be negative (Note that 1-73 is a rural highway project, not an urban one, since the vast majority of its length runs through rural areas). According to both the CBO and the FHWA, maintenance of exiting highways is more efficient and brings more economic development than any form of new construction. In addition, rural construction is the least efficient type of construction, meaning that the most money is spent resulting in the least economic gain, and possibly even economic loss.

Another analytic tool, the benefit-cost ratio, allows further examination of the efficiency of maintenance in Figure 3 3 .2. A benefit-cost ratio is the present value of all discounted current and

[5] Gramlich,1994.

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future benefits of a project divided by the discounted sum of all its costs. A ratio of l means that the project will break even, and the benefit-cost ratio for a given project is 2, then for every dollar invested in the project, $2.00 in benefits will result. This ratio frequently takes into account social costs and benefits. These are effects of a project which do not have obvious quantities, but can be quantified through the methodology of this type of analysis. For instance, increased air pollution would be a social cost, and increased park land would be a social benefit. Each would be quantified and included in a benefit-cost analysis.

Figure 33.2 gives the benefit-cost ratios of four types of maintenance: road alignment, resurfacing without shoulder work (1), resurfacing with shoulder work (2), and lane-widening. All of these maintenance projects exhibit acceptable, and some very advantageous, benefit-cost ratios.

Figure 3.3.2[6]

A final economic comparison of highway maintenance and new highway construction indicates that maintenance can employ up to 40% more individuals than a highway construction project. [7] Several business groups have claimed that the short term jobs created during construction of I-73 as a new terrain highway would be a boon to the regional economy, but it is clear from these

[6]CBO, 1998
[7]Dittmar, 1999

federal statistics that maintenance spurs more economic development and employs more individuals for every dollar spent than does new highway construction.

3.4 Summary

The information given above indicates that on average, new rural highway construction is inefficient, demonstrating little to no potential for economic development. A project of this type may even be built at a loss. It is efficient, however, to invest in maintenance of exiting highway infrastructure, and this type of investment provides greater potential for economic benefit to an area Two quotes, one from the FHWA and one from the CBO, clearly summarize this section:
FHWA: "Policymakers and economists have debated the cause for declining rates of return on highway investment. One view is that as interconnective, upper-level roads were built, commercial transportation needs were addressed and the rates of return for highway capital from the production side of the economy declined to more normal and sustainable levels". [8]
CBO: "Beyond a certain point, maintenance and management of existing infrastructure becomes more attractive than investment in additional capacity, which becomes more costly"[9].

4. IS THERE BENEFIT-COST DATA FOR THE I-73 PROJECT?

Given the overall inefficiency of new rural construction and the drop in economic benefit brought by highway investment nationwide, it is essential to examine whether I-73's potential to bring economic development is not also outweighed by its costs. Unfortunately, there is no up-to-date and thorough benefit-cost analysis or rate of return calculated for the various possible routes of I-73. In fact, much of the basic information necessary to do a benefit-cost calculation is not available. The following is an examination of the parameters for the benefit-cost analysis Neither VDOT nor the EIR has designated monetary figures for the simplest benefits and costs, much less the complex social and indirect elements.

4.1 The Steps to a Benefit Cost Analysis

According to Dr. Neal Johnson of the School of Public and Environmental Affairs at Indiana University, there are four steps to calculating a benefit-cost ratio for a project. The first is to

[8] FHWA, 1998.
[9] CBO, 1998.

identify the benefits and costs: direct, indirect, social. The analyst must not be limited to those which are easily quantifiable. The second step is to assign, through economic equations, monetary values to each benefit and cost. The third step is to discount those benefits and costs which accrue over time, and then the analyst may calculate the benefit-cost ratio. Sections 24 identify the benefits and costs of the 1-73 project and examine for which of these a monetary value has been calculated.

4.2 Identifying the Benefits and Costs

Benefits are broken into three categories. User benefits are the direct benefits to those individuals traveling on the new highway such as reduced travel time and improved safety. Tourism benefits are the benefits to an area through increased tourism brought by the highway, main. Productivity gains is the largest category of benefits, and include decreased cost of good production and business attraction and expansion. Costs are also of three types, project development, project maintenance, and environmental impact. Many of these costs are incurred before, during, and long after construction, so estimating the cost effectiveness of a project over the long term is essential.

4.3 What monetary values are so far assigned to these benefits and costs?

Benefits Under the category of user benefits, both VDOT's Draft Environmental Impact Statement (DEIS) and the EIR estimate what the reduced travel times might be from and to various points on the I-73 route, but neither estimate what savings that might bring to travelers. Improved safety is listed in the Purpose and Need statement of the DEIS and accident reduction is a theme throughout the report, however this benefit has not been quantified either. Furthermore, no estimates have been made in the changes in vehicle operating costs if I-73 is constructed.

In terms of tourism benefits, the EIR has estimated a possible annual $40 - 60 million in additional hotel and lodging revenues and $2-3 million in additional restaurant and hotel tax revenues. No estimates have been made of the travel cost savings as a result of the highway.

Under the final benefit category of productivity gains, the decreased cost of producing goods and services has not been estimated. Both VDOT and EIR have addressed the possibility of business attraction and expansion through job availability and have produced a range of different estimates for job increases from the hundreds into the thousands.

Costs.

VDOT has allocated a total of $15 million dollars for past and future planning and design of the I-73 project. Construction itself is estimated to cost $1.12-137 billion. The cost of long term maintenance of this highway was not given.

While the DEIS did address the environmental issues of air and water pollution, it did not estimate the costs of these impacts to the community. The effect of increased traffic congestion was also not measured in terms of additional cost.

Finally the EIR mentioned but did not quantify costs such as increased city investment in roads and public transit, and lost revenues from any possible decrease in downtown access. The DEIS did estimate that annual tax revenues lost from displaced business could be in the millions of dollars for some I-73 routes.

4A Incomplete Information

Out of the fifteen sample benefits and costs identified above, only four monetary figures were available for a benefit-cost ratio. Even those that are given may be outdated and are difficult to compare in some cases. A benefit-cost analysis of 1-73 could not yet be performed, because much of the supporting information and quantification is not available.

4.5 Conclusions.

Because of the precipitous drop in the efficiency of highway investment and the risk associated with investment in highway construction over highway maintenance, it is essential to scrutinize the economic potential of any new rural highway project. It seems, however, that the economic information is not yet available to allow area citizens and leaders to make an informed decisions about the costs and benefits of 1-73 and its alternatives. While the DEIS was not required to make such an analysis, the regulations concerning the implementation of the National Environmental Policy Act of 1969 suggest that it be incorporated if it is relevant to the decision making process. Many were hoping that the DEIS would contain a benefit-cost analysis, and now feel a lack of economic and comparative environmental information to allow them to choose the best option for the Roanoke area.

5. RECOMMENDATIONS:

This report recommends that several impartial benefit-costs analyses be completed for the routes and alternatives of the I-73 project which incorporate direct, indirect, and social costs and benefits in a quantitative manner. Furthermore, in light of the information contained in this report, the benefit-cost analyses must allow for comparison between the economic advantages of I-73 construction and maintenance of existing highway infrastructure.

6. WORKS CITED:

1. Congressional Budget Office: "The Economic Effects of Federal Spending on Infrastructure and Other Investments" June 1998.

2. Federal Highway Administration: "Contribution of Highway Capital to Output and Productivity Growth in the US Economy and Industries" by I. Nadiri, August 1998.

3. Edward Gramlich of the Federal Reserve Board: "Infrastructure Investment: A Review Essay" Journal of Economic Literature, September 1994.

4. Neal Johnson of School of Public and Environmental Affairs, IN “A Reevaluation of the Benefits and Costs of the Proposed Southwest Indiana Highway" May 1997.

5. Hank Dittmar of Surface Transportation Policy Project: "Highway Capital and Economic Productivity" February 1999.

6. Community Transportation: "Dollars and Sense: Executive Summary" January, 2001; http://63.111.177.36/ct/.

7. Economic Development Research Group: "Economic Impact of I-73 Alignments on the City of Roanoke" January, 2000. (herein EIR)

8. Virginia Department of Transportation: "Draft Environmental Impact Statement for the I-73 Project" Summer, 2000.

Response: *The development of public infrastructure has historically been questioned both in regards to the role of government in these type of decisions and the engineering economy of the investment decision. Transportation capital investment decisions are often made under the rationale of both. The role of government is often championed as the provider of services that privately can not be established under the criteria of return on investment. Thus, it is commonly accepted that in matters of defense, public works and education, the state and federal government have a primary role. In general, the private sector has neither the capital nor the patience to realize the slow rate of return that public infrastructure entails. One of the first acts of the US Congress was to appropriate funds to construct a lighthouse in Virginia to aid in the safety of shipping and to promote commerce. The capital cost and the on-going maintenance of the lighthouse were secondary to the contribution of the lighthouse to the general welfare of the population.*

The benefits and costs of transportation investment are both direct and indirect and have been extensively studied since the mid –nineteenth century. The sub-discipline has been known as engineering economics and has been in place institutionally long before MBA and business economic programs. This literature can be traced back to the mid-nineteenth century with the classic texts of W. M. Gillespie in 1848 and A. M. Wellington in 1887. Growing academic interests in the 1920's increased the body of literature on the economics of roadway investment. The American Association of State Highway and Transportation Officials (AASHTO) published the first discounted present value approach in 1952 and 1960. In 1977 AASHTO published A Manual on User Benefit Analysis of Highway and Bus Transit Improvements. The 1977 Manual is the seminal treatment of benefit cost ratio analysis for transportation projects. The DEIS, in section 4.12 (Secondary and Cumulative Impacts), references several large scale economic research endeavors that clearly and statistically link economic growth with highway transportation investment.

A recent VDOT/FHWA feasibility study for the TransAmerica corridor across the state, which would have an alignment that coincides with I-73 west of Blacksburg, clearly illustrated the economic and user benefit of transforming substandard rural arterial facilities to a higher standard. A benefit cost ratio analysis for the TransAmerica project resulted in robust B/C ratios and job growth impacts of approximately 69,000 full time equivalent jobs.

The conclusion that transportation investment in Interstate and other high end highways has less utility in terms of rate of return now than during the early 1960's should be no surprise to anyone. The same can be said of investment in computers, cell phones or cancer treatment technology. Declining rates of return on investment are expected as markets become saturated. Incremental increases under that scenario naturally exhibit a declining rate of return.

What is important is there is still a rate of return on highway capital investment. This is illustrated in Figure 3.2.1 as taken from the FHWA article "Contribution of Highway Capital to Output and Productivity Growth in the US Economy and Industries", by I. Nadiri, August, 1998. This figure compares rate of return on highway capital in ten year increments from 1960 to 1991. The fact that highway capital in

1991 realized just under a 10% return is remarkable. By definition, a public project that provides a positive return on investment not only adds value to public welfare but also exceeds the benefit cost ratio of unity, where the long term monetized benefit of the project exceeds the long term capital and maintenance cost of the project.

While capacity expansion of highway investment has slowed over the last decade the growth in demand has not. That trend, if not countered, has serious consequences on mobility, air quality and quality of life. It is important to note that VMT has historically increased in the last three decades at rates in excess of population or employment growth. This is a national trend and manifests itself statewide and locally and has no correlation with growth in roadway capacity. Nationally, VMT has increased 37% from 1984 to 1994. During the same period in Virginia, VMT increased 52%. During that same period, new construction adding roadway capacity has increased only 9% to 10%.

Nationally, VMT has increased 259% from 1960 to 1997, a pace that outstrips growth in fuel consumption, vehicle registration, population, and roadway capacity. The growth in VMT has occurred far ahead of roadway network capacity. From 1993 to 1999 in the Southeast, the 14 largest metropolitan areas exhibited an annual average growth rate in new roadway mileage of 1.3%. During that same period VMT grew at an annual average rate 3.4%.

Information acknowledged by EPA reinforces these trends. According to statistics referenced by EPA in Indicators of Environmental Impacts of Transportation, the U.S. population has grown by 30% the past 30 years, the number of licensed vehicles is up 87 percent and the number of vehicle miles driven has increased more than 125 percent. In contrast, new highway capacity has only increased 6 percent in that timeframe.

Addressing the decline in highway capacity to handle the growth in travel demand can not be accomplished with maintenance measures. This was measured in the I-73 Draft EIS during the evaluation of the No-Build and TSM alternatives, neither of which were responsive to the project purpose and need. Congress realized this in the passage of the Intermodal Surface Transportation Efficiency Act of 1991 and the Transportation Equity Act for the 21st Century in 1998 where I-73 was identified as a high priority corridor.

The decision to advance one I-73 alternative over the other is a complex issue whose consequences reach beyond the accounting exercise of balancing life cycle user benefits over discounted capital and maintenance costs. Notwithstanding, in order to address public comment, FHWA requested a benefit-cost analysis for the alternative approved by the CTB. This information is included in the appendices to the final EIS. Basically, the results of this analysis demonstrate that the benefit-cost of the facility in rural areas will be much lower than the benefit-cost of the facility in developed areas. This follows logically because traffic is greater in developed areas and it has the supporting infrastructure and population to more readily accommodate economic development than rural areas do. Therefore, the benefits are greater. Specifically, the benefit-cost analysis evaluated the direct user and non user benefits and compared these benefits to the capital and operating costs of I-73 over 30 years. Direct user and non user benefits include travel time savings, reductions in crashed, decline in vehicle operating costs, agency cost reductions and a diminishing of pollution costs. Capital costs include engineering, construction, environmental mitigation, and right-of-way elements. Operating costs include the cost of maintenance and minor repairs to the facility over time. The benefit-cost analysis indicates that the alternative selected by the CTB exhibits a positive net present value with benefits that exceed cost for all discount rates less than 6.6%. The 30-year Treasury bond yield on bonds sold in November 2004 by comparison was 4.84%.

Keep in mind that economic development is just one need identified for the project. Although the rural areas do not have as high an economic development potential, the proposed project will serve as a link in the I-73 high priority corridor from Michigan to South Carolina.

Finally, the EIS states, "Recent research by the U.S. Department of Transportation indicates that for every $1.0 billion invested in the National Highway System approximately 42,100 fulltime equivalent jobs are created." This research was conducted for the Office of Management and Budget to support Department of Transportation appropriation requests of Congress.