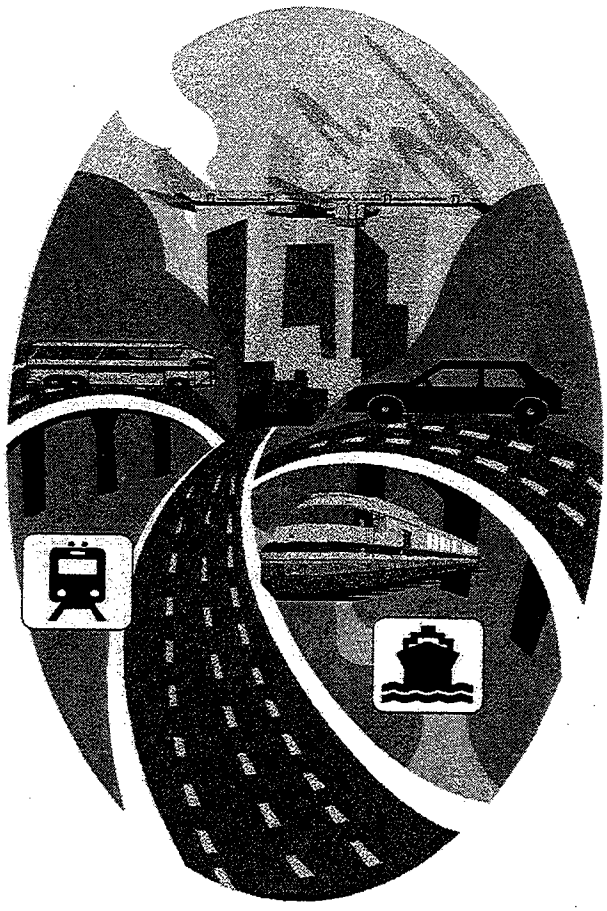
Taking the Politics Out of Planning

A New Statewide Model for Prioritizing Transportation



by

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mix. In this way a transportation project can be reviewed, analyzed and compared with others based upon the benefit to the overall state transportation network, to the economy, and to the commuters.

The focus of this report is the methodology used to develop the prioritization model. This model offers a way to more realistically analyze transportation projects. *The ratings used in Appendix B are for illustrative purposes only. They should not be viewed as support of specific projects.* But they do show how a prioritization method would assist Virginia in more effectively spending the limited resources available for transportation.

Three well-known transportation experts were involved in this report: Stephen Blake of the Center for Transportation Training, Planning and Education who coordinated this report for the Thomas Jefferson Institute; Alan Pisarski, a nationally-known and respected transportation consultant; and Gabriel Roth, renowned transportation expert who has worked with the World Bank and many individual countries.

The criteria developed in this report were used to design a model that can produce a more business-like, long-term transportation plan for Virginia. This report then reviews and analyzes many statewide and regional transportation projects. The facts presented in these various studies are taken at face value and used to design a rating system in order to compare the "worth" of one project to another. Then these projects are evaluated using this "rating system" and a priority listing is created.

Without a method to prioritize the transportation needs in Virginia, this state will continue to spend its limited resources in areas where "political clout" may speak louder than the "actual worth" of a project. Virginia should concentrate its resources, along with those it receives from the federal government and from public-private partnerships, on a prioritized list of projects developed through a methodology like the one in this report. With a set of approved priorities, resources could then be channeled to these projects based upon true need rather than perceived or political need – both of which tend to dilute the impact of the available transportation dollars.

This report shows what can be done when a realistic and sensible process is crafted to prioritize transportation projects in Virginia. Those who worked on this report have no preconceived biases as to what transportation projects should take priority. But the method they designed for prioritizing these projects shows where the greatest needs are in our state. By prioritizing the transportation projects into three categories, these experts show how our limited financial resources could be better allocated. By creating a list of priorities, Virginia can move forward to develop a better and more creative transportation system that is intermodal, forward looking and more realistic based upon our limited resources. If our transportation monies can be managed so that the greatest needs are handled first, then the overall transportation system will significantly improve over the next twenty years. Like any business plan in the private sector, a priority listing needs to be reviewed, analyzed, and up-dated as circumstances require. And the proposed model developed in this report, or any model developed for use in prioritizing transportation projects, needs to be re-evaluated and up-dated on a regular basis.

This report is presented to the Virginia Chamber of Commerce and the Commonwealth Transportation Alliance in the expectation that it will generate a necessary discussion on the need to better prioritize transportation needs in our state. It is further hoped that this report will be used as the basis for analyzing current and future transportation projects and for developing a true transportation vision for our commonwealth. It will take courage by our elected leaders to stand behind a formula for "rating" various transportation projects. But once that decision is made, our state can move forward in a more united and dedicated fashion knowing that there is finally "A Strategic Transportation Plan for Virginia" that takes the politics out of the planning process.

Michael W. Thompson
Chairman and President
Thomas Jefferson Institute for Pubic Policy
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Foreword

This report provides to the Virginia Chamber of Commerce and its Commonwealth Transportation Alliance a model and methodology by which transportation projects can be prioritized in accordance with a set of value criteria. While each area of the state develops goals reflecting local desires, these goals should be compatible with an overall statewide strategy for providing a comprehensive and efficient transportation system as cost effectively as possible.

The public debate on transportation is often focused on various lists of state and regional needs that are sometimes characterized as lacking a consistent and rigorous assessment. This report provides an integrated, multi-modal approach to needs analysis that will lead to greater efficiencies and more "bang for the buck." This approach is essential given that financial resources and the capacity for timely construction and maintenance of transportation infrastructure will always be limited. In addition, the model provides a means of judging the relative merit of proposed projects outside the current political process.

The model and methodology contained in this report provides eight (8) criteria for assessing the relative merits of a particular transportation project. Numerical values are given for each of these criteria and the total of these dictate the ranking of a particular project. By assessing the relative merits of projects, this model can be used in the formulation of a comprehensive, long-term strategic transportation plan for the commonwealth. The first section of this report explains the model and the criteria used in the assessments.

The second section describes the need for a "New Vision" in transportation planning. As we enter the next century, it is clear that government and the private sector need to work together if the

transportation needs of the Commonwealth are to be met in a reasonable and efficient manner. We simply cannot solve the transportation problems of the future if we are limited to the thinking of the past. Exciting new ideas and approaches to transportation are available and must be considered by responsible leaders in the public, private and non-profit sectors of our society.

The Appendices to this study subject thirty-five (35) selected projects to the model that was developed. The projects were selected from lists developed by regional and state entities at a given period of time, using the data available. Both the analyses of the projects based upon the criteria and the resulting rankings are provided for illustration only (see Appendix B). These rankings are not intended to be anything other than an example of how this model can add significantly to the decision making process. Additional data may change the ranking of any project as would the subjection of additional projects to the model.

Most importantly, the model can be used to compare the relative strengths and weaknesses of transportation projects here in Virginia, comparisons that can then be used to design a strategic transportation plan for the commonwealth. Such a plan is essential if Virginia is to meet the competitive demands of the 21st Century to move people and goods more efficiently, to strengthen the economy more effectively, and to support a high quality of life that our citizens demand and deserve.

Part I DEVELOPING A MODEL

Background

Transportation is vital to our economy and quality of life. It is the mechanism for local, regional, and international movement of people and goods. It provides access to economic opportunities and the vast cultural, educational, and recreational resources of our Commonwealth. Mobility in the next century, as in the past century, will provide the means for fulfilling the many social, cultural, and economic aspirations of our citizens.

Transportation is an integral part of a dynamic economy. It contributes to the economic vitality of both businesses and individuals and is a key determinate in the success or failure of economic enterprises. The Commonwealth of Virginia, along with the rest of the nation, faces a series of challenges in the field of transportation that must be met to ensure continued mobility for its citizens and continued economic growth and prosperity for the state. These challenges affect the ability of the Commonwealth to maintain and provide a quality of life that encourages business expansion and investment and attracts new businesses and good jobs to the state.

The transportation needs in Virginia vary by geographic region and degree of development. The recent shift in population from rural to urban areas has exacerbated regional differences and accentuated the disparate views of the role of transportation. In the high growth urban areas of Northern Virginia, Richmond, and Hampton Roads transportation projects are needed to reduce congestion, improve the quality of life, and enhance economic vitality. In Western Virginia, it is clear that the aging I-81 must be improved for mobility and safety reasons. This aging highway is critical

to the economic well being of our state. In rural communities connections to employment and population centers are a critical need. Opening these communities to well-planned economic development will allow the Commonwealth to grow and prosper over the coming decades. In both urban and rural areas transportation infrastructure must be used to encourage and enhance economic vitality. Transportation is an essential element to:

- **Promote Economic Vitality**

  Transportation is a vital force in creating economic vitality. The ability to generate income and wealth is largely dependent on the ability to move goods and people in an efficient and timely manner. Evidence of the economic impact of transportation can be seen in the Northern Virginia, Richmond, and Hampton Roads areas.

- **Ensure Regional and International Competitiveness**

  Transportation improvements provide the Commonwealth with increased business productivity. This rise in productivity generates new concepts in service delivery and allows for a more rapid movement of goods and people to and from production and labor markets.

- **Provide the Platform for Job Creation**

  Infrastructure investments stimulate economic growth and job creation. The transportation industry itself is a major provider of employment in Virginia.

- **Provide Market Access for Goods and Services**

  The transportation system provides businesses and people with direct access to markets for manufactured goods, farm products, and services. The transportation system is the link to state, regional, national, and international markets for the Commonwealth.

- **Maintain and Enhance the Quality of Life**

A safe and effective transportation system is key to maintaining and enhancing the quality of life for the citizens of Virginia. The mobility supplied by the transportation system provides the opportunity for people to access the economic, cultural, educational, and recreational resources of the Commonwealth.

Virginia has an impressive array of transportation infrastructure including 54,000 miles of interstate, primary, and secondary roads. Virginia's rail network, excluding yards and sidings, totals approximately 3,295 miles. Intercity rail passenger service is provided by AMTRAK which operates eight trains with scheduled stops in Virginia. The Virginia Railway Express (VRE) operates from Fredericksburg and Manassas to Washington, DC. There are also 13 airports with commercial service to over 600 worldwide destinations. Virginia also has one of the finest natural ports in the world, the Port of Virginia. Finally, a heavy rail transit system serves the citizens of northern Virginia.

Nonetheless, Virginia is still plagued by unmet transportation needs and several regions within the state suffer from severe traffic congestion. Congestion degrades air quality and the resulting pollutants exacerbate health problems. Business suffers from lost productivity and the quality of life is compromised. Northern Virginia has the second worst traffic congestion of any major metropolitan area in the nation and the Greater Hampton Roads area has a unique set of transportation challenges to meet as we move into the 21st century. These problems could sap the economic vitality of both regions resulting in a dramatic impact on the economy of the state.

Other areas of Virginia are faced with equally significant transportation issues. The Richmond area is concerned about servicing new and expanding business and industry. It needs to accommodate a growing population while offering easier access to the economic powerhouses of Northern Virginia and Hampton Roads. Interstate 81, which runs through the Shenandoah Valley, carries an ever increasing number of trucks and automobiles through the state. This major highway is in need of reconstruction to keep goods and produce flowing efficiently and to improve the safety of the facility

for those who use it. The southwestern area of Virginia needs a new or expanded regional airport to encourage economic expansion. Other localities in the central, southern and western regions need improved transportation facilities in order to enhance their economies and raise their standards of living.

Virginia's substantial transportation needs have been amply identified by various regional initiatives and by the Commission on the Future of Transportation. However, Virginia lacks a transportation model that can be used to prioritize specific projects. A prioritization model can form the basis for developing a strategic transportation plan to better use the available financial resources to meet the transportation demands facing the state. Prioritization models are being used in other by other states, these include Wisconsin, Missouri, Vermont and Washington state. These states have developed processes that allow them to prioritize transportation projects, in light of limited financial resources, that will provide them with a transportation system that meets the mobility needs of their citizens. This is part of their strategic planning process. Without a strategic plan for transportation of the sort that all successful businesses and organizations employ, Virginia will find itself inadequately prepared for the future.

In order to develop a strategic plan, Virginia must first determine what outcome is being sought from the transportation system. Second the state must analyze and evaluate existing projects. And finally the state must develop a mechanism for prioritizing these projects. This mechanism must provide an integrated approach that ensures that solutions are cost effective and can be implemented in a timely manner. The priority listing developed from this model will provide a list of projects based on objective analysis and not subject to regional politics that often diverts scarce resources to less productive usages.

What This Project Does

This project provides a model and methodology by which transportation projects can be prioritized and ranked in accordance with a set of value criteria. This study also offers "A New Vision for the 21st Century" that outlines seven areas that need to be considered as a long-term strategic plan is crafted for transportation in Virginia.

As an illustration of how the model works, a number of projects are subjected to the methodology and ranked accordingly (see Appendix B). These projects were selected from transportation plans and reports previously formulated by various state and regional entities. The only data employed by the study was that provided in the various plans and proposals. The individual project evaluations and the resultant rankings are provided in the Appendix for illustrative purposes only. The authors did not examine unidentified needs, proposed additional projects, or evaluate the projected results contained in these various plans.

The model can be used to re-evaluate various projects with additional and more detailed data. The model can also be used to evaluate additional projects around Virginia. These exercises would likely result in a repositioning of projects on a priority basis. This model does provide the leaders in Virginia a business-like approach for evaluating proposed transportation projects. The use of a model such as this, along with a broader and creative vision for transportation, will give Virginia an improved capability to craft a long-term transportation plan.

Criteria for Prioritization

The Intermodal Surface Transportation Efficiency Act of 1991 and its successor, the Transportation Equity Act for the 21st Century, both provide for the funding of federal transit and federal highway projects. They provide state and local governments with more intermodal flexibility in developing solutions to transportation problems, whether transit or highway. Unlike earlier federal rules, these acts emphasize mulitmodal transportation projects.

The goal of the Commonwealth of Virginia is to develop an integrated intermodal transportation system that is economically efficient, environmentally sound, provides the foundation to compete in the global economy, and will move people and goods in an energy efficient manner. The primary goals of any transportation system are: mobility, safety, efficiency, and connectivity. The state includes several additional values in its planning processes that are applied to the transportation system: economic vitality, equity, environmental responsibility, and community livability.

While each area of the state develops goals reflecting local desires, these goals should be compatible with an overall strategy for providing a comprehensive and efficient transportation system for the state. The process described below presents a set of multimodal transportation criteria by which all transportation improvements can be evaluated and prioritized.

The goal of this study is to design a model that can be used to prioritize transportation projects that have been identified through transportation improvement programs (TIPs), by private sector organizations (i.e. Chambers of Commerce), by local officials (Metropolitan Planning Organizations) and by the state Department of Transportation. This model can be used to prioritize transportation projects that will most effectively serve the 21st Century needs of the state of Virginia. The criteria and ranking system used to evaluate projects is not an end in itself. Rather, this model and its methodology should be considered a guide to be used to assess a project's contribution to the overall

transportation system.

The development of the transportation prioritization model takes into account the needs of rural, small urban, and urban areas of the state. The transportation projects in these areas are divided into four groups that characterized the role of each project. These four groupings are: national service, state service, regional service, and local service. This characterization is used to demonstrate how a project may fit into the state transportation system and, and at the same time, provide a crucial element that benefits the nation. This same determination was made for regional and local service.

The methodology used in prioritizing transportation projects across all modes is discussed below. The intent of this study is not to provide a discussion of future transportation needs but only to provide a tool that can be used to evaluate and prioritize them.

Criteria Used in Developing the Model

The first step in developing this transportation planning model was to determine a way to divide proposed projects by the overall impact they will have on the statewide transportation system. To do this, the study had to identify the projects that should be included in developing and testing this model. This was accomplished by contacting Chambers of Commerce, Metropolitan Planning Organizations, the Virginia Department of Transportation, the state legislative committees interested in transportation and other transportation groups for documents that contained lists of transportation projects.

The projects are divided into rural, small urban and urban projects. Next they are classified as national service, state service, regional service, or local service. There are cases where a project falls

into all of the above categories. For example, widening Interstate 81 would serve all of the interests.

In addition to these criteria the model takes into consideration the overall impact a project willhave on the state's transportation system. Each project, therefore, is rated based on whether it had a high, low or medium impact on the overall transportation system. Examples of how this part of the model was developed are outlined below:

Road Projects:

1. High Impact - New arterial streets/highways, HOV lanes, addition of general purpose lanes, signal interconnect system for a significant part of the metropolitan area, gap closure with system-wide benefit, new interchange and traffic operations system improvements.
2. Medium Impact - Auxiliary lanes, left-turn lanes, intersection improvements, park and ride lots and new signal installation.
3. Low Impact - Minor traffic signalization enhancement.

Transit/Rail Projects:

4. High Impact - Significantly reduces transit vehicle crowding, significant increases in service capacity, significant increases in service reliability, interconnect or fare coordination project, bus turnouts, intermodal facility that accommodates significant transfers and significantly reduces travel time (including transfer time).
5. Medium Impact - Increases service reliability in a minor fashion, reduces load factor of system, increases service capacity of system, and achieves minor reductions in travel time.
6. Low Impact - Increase in passenger comfort or convenience.

Airport/Seaport Projects:

7. High Impact - Airport serves an international market, establishment of a hub airport and a seaport significantly increases shipping capacity.
8. Medium Impact - Regional airport and minor improvements in capacity at seaports.
9. Low Impact - General airport improvements and general seaport improvements.

Other:

10. High Impact - Bike path/lane or sidewalk that will primarily serve commuters, sidewalks along principal arterials where none currently exist, projects that interconnect across jurisdictional boundaries and full implementation of Intelligent Transportation System architecture.
11. Medium Impact - Bike path/lane with mixed commuter or other non-recreation use or connects to system, usable sidewalk segments and modest application of Intelligent Transportation System to transportation problems.
12. Low Impact - Bike path/lane or sidewalk that is primarily for recreational travel or not on the system, signage and limited use of technology in addressing transportation problems.

Criteria for Evaluating Projects

This document provides a transportation planning model that can be applied across all transportation modes. Although there are various funding sources for transportation projects, this model allows a prioritization process to be developed with the idea of eventually applying it to all transportation investments regardless of funding sources and selection authority. The Chamber and the Alliance are interested in the enhancement of mobility of people and goods. The criteria used in the development

of this transportation planning model are based on the need to improve mobility. A measure of which is, how many opportunities A (jobs, shopping, entertainment, etc.) are available within a given transportation time period. The criteria used in developing this model for prioritizing transportation projects includes the following:

- congestion relief
- multimodality
- safety
- efficiency
- connectivity
- economic vitality
- environmental enhancement
- other

Each of these elements is discussed in greater detail below.

1. **Congestion relief.** This criterion is based on an assessment of existing congestion problems and the impact a proposed project may have in reducing such problems. Existing congestion is evaluated across all modes by looking at the volume of traffic, travel speed, or the number of people affected by the congestion. For example, changes in volume to capacity ratio (V/C) is one possible measure for a roadway project, while service capacity reliability is used for transit projects. These projects are divided into high impact, medium impact, and low impact categories.
   An example of this type of project would be I-95/495/395 in Northern Virginia.

2. **Safety and security**. This factor is based on an assessment of an existing safety and security problem and the extent the proposed project will reduce such problems on

the regional transportation system. Accident statistics and standards are utilized in consideration of roadway and bicycle projects, while safety and security aspects of passengers and employees are considered for transit projects. It is recognized that parts of a roadway project can also affect the safety aspects of the transit system. Failure to invest properly in safety and security can lead to systems failures that impact the integrity of the entire transportation system.

An example of this type of project is I-81.

3. **Cost Effectiveness**

3.1 Preserves existing system. This factor rewards those projects that strive to preserve the existing transportation infrastructure.

An example of this is the I-64 project.

3.2 Supports efficient land use patterns. This factor rewards those projects that promote an increase in density (households/acre or employees/acre), serve areas of mixed land uses, and reduce auto dependence where practical.

An example of this project is the Dulles corridor project.

3.3 Transportation corridor preservation. This factor recognizes the preservation or protection of corridors or other land parcels for future transportation uses regardless of the transportation mode.

An example of this is the Woodrow Wilson bridge project which provides right of way for rail.

With respect to cost effectiveness, most of these projects will be subject to a cost effectiveness analysis performed by the planning organization in their area. This study does not engage in an independent cost effectiveness analysis in the purest form, instead it relies on the cost information

provided by the plans reviewed to provide a measure for cost effectiveness.

5. **Multimodality.** This factor recognizes and rewards projects that accommodate more than one mode of travel. Projects that provide for more than two modes receive a high score, projects which provide for two modes a medium score and projects that provide for only one mode a low score.
An example of this is the Main Street Station in Richmond.

6. **Intermodal Connectivity**. This factor provides credit to those projects that provide for an interconnection with other modes. It should be noted that each "mode transfer" point must accommodate at least two modes.
An example of this is the 3rd Crossing in Hampton Roads it connects the port and highways.

5. **Economic viability**. This factor assesses the positive impact a transportation project will have on the economic vitality of an area.
An example of this is light rail in Norfolk.

7. **Quality of Life Issues**

7.1 Air pollution reduction. This factor addresses the air quality impacts of a project. Road projects that are expected to reduce system-wide auto emissions (e.g., transportation control measures) are given a higher relative score than those that do not. Transit projects that are expected to significantly increase ridership (particularly from Single Occupancy Vehicle travel) are given higher scores under this criterion.
An example of this is the expansion of HOV lanes in Northern Virginia.

7.2 Energy conservation. Road projects furthering energy conservation goals include HOV projects and highway projects that accommodate transit, bicycles and pedestrians. In addition, road projects that improve traffic flow are given a higher score under this criterion unless it is shown that the project will significantly increase system-wide vehicle miles of travel.

An example of this would be the expansion of public transit in Richmond.

8. **Other**

Complexity of project preparation. Some projects of merit may be on the waiting list for several years due to their complexity. Some consideration is provided by this factor in terms of equity. A complex project having been in development for over 5 years would receive a high score, 2 to 5 years a medium score and 0 to 2 years a low score.

Application of Model Criteria

The eight criteria used in applying this model, along with the designation of types of transportation projects are used to develop two matrices of projects. The first matrix (Appendix A)identifies projects by rural, small urban, and urban. The second matrix (Appendix A) categorizes these projects as national service, state service, regional service, or local service. This information is used to develop a rating of transportation projects (Appendix B). Then this rating is used to generate map overlays (Appendix C) that provide a visual of the prioritized transportation system that is represented by these rankings.

The model is based on a point system. The total possible points for a project is one hundred (100).

Existing Transportation Corridors

Up to thirty (30) points are assigned to a project that maintains or improves the existing transportation system. The thirty points are assigned as follows:

1.	**Congestion relief**	10	(see page 12 for definition)
2.	**Safety and security**	10	(see page 12 for definition)
3.	**Cost effectiveness**	10	(see page 13 for definition)

Transportation System Efficiency

Up to twenty (20) points are given to projects that are multimodal in nature or provide intermodal connectivity for the transportation system.

4.	**Multimodality**	10	(see page 14 for definition)
5.	**Intermodal Connectivity**	10	(see page 14 for definition)

Economic Vitality

Economic vitality is included to "rate" the impact a project will have on the state and regional economy. This criterion is worth fifteen points.

6.	**Economic Vitality**	15	(see page 14 for definition)

Quality of Life

Twenty-five (25) points are assigned to external impacts such as air quality improvement, land use policy support, and energy conservation. Projects with positive air quality impacts are awarded up to the ten (10) points. A project is also awarded up to eight (8) points if it supports land use policies that foster a mode shift away from single occupant vehicle trips on regional facilities. Up to seven

(7) points are awarded for projects with demonstrable energy conservation benefits.

7. **Quality of Life Issues** 25 (see pages 14-15 for definition)

Other

The final criteria is "other"and includes the complexity of the projects, this is intended to be an equity determination. That is, points given in the "other" category recognize the length of time a project is in development or the complexity of the political decision making process that has been engaged in before bringing a project online. This criteria receives up to ten10 points.

8. **Other** 10 (see page 15 for definition)

Summary

This report designed a model that can be used to determine the relative "worth" of various transportation projects. Criteria were selected and designed that can be used in an impartial manner and a numerical rating is then possible for each of the criteria and for the overall project.

It is important to stress that the criteria suggested in the process are not static and are expected to change over time as experience is gained through each iteration of the process. Further, emphasis areas stressed by the federal government or special preferences by local units of government will also change over time and inevitably lead to the addition of new factors and the elimination of others.

The model can be applied to transportation projects across Virginia, now and in the future. It provides state policy-makers with an objective tool to better allocate limited transportation resources. It also provides a system that allows politics to be taken out of the transportation planning process - or at least minimized. A more cost effective transportation system should be the result of using this model.

Scoring Breakdown

	Significant Impact	**Moderate Impact**	**Minimum Impact**	**No Impact**
Congestion	8-10	5-7	2-4	0
Safety and Security	8-10	5-7	2-4	0
Cost Effectiveness	8-10	5-7	2-4	0
Multimodality	8-10	5-7	2-4	0
Intermodal Connectivity	8-10	5-7	2-4	0
Planning/Econ Dev.	11-15	6-10	1-5	0
Quality of life issues (air quality/land use/energy conservation	20-25	15-19	1-5	0
Other	8-10	5-7	2-4	0

PART II A New Vision for The 21st Century

Virginia needs a new and exciting vision for transportation that provides a safe, coordinated, intermodal, and comprehensive transportation system that effectively integrates all modes and establishes efficient connections among them. Virginians should be able to move more efficiently from their automobiles to mass transit. We need more efficient access to our international airports and be able to receive cargo more efficiently at our state-of-the-art ports. The political and business leaders in Virginia should work together to develop a balanced transportation system that provides a broad range of viable transportation choices. This will help form a strong intermodal transportation network serving as a catalyst for further economic development and growth. This will require transportation planning that defines problems and solutions in terms of a coordinated, comprehensive, and continuous transportation system. A new transportation vision should take into account the changes in lifestyle of the citizenry from rural to urban to suburban and exurban. It must also develop mechanisms for implementing the new technology that is rapidly coming on line in the field of transportation. Virginia Polytechnic University is at the forefront of research in the area of new technology with its "Smart Highway" research project. This project will establish the parameters for "radar" enhanced braking, use of satellite technology to provide traffic control information, and the use of technology to ameliorate the impacts of severe weather conditions on highway surfaces.

The new transportation system cannot focus exclusively on the movement of automobiles and trucks, although this is critically important. It must also take into consideration land use policies that impact the provision of transportation. These policies should contribute to the creation of a transportation system that provides the best "mobility" for the citizens of the Commonwealth.

In order to accomplish the transition to a future-oriented and more dynamic transportation system, there are seven key areas that should be addressed in this visioning process.

1. **Privatization**. The privatization of transportation planning, design, construction and maintenance will enhance the efficiencies and effectiveness of the government sponsored transportation system. This can be accomplished through innovative financing mechanisms, particularly the development of public-private partnerships and privatization initiatives that move the financial burden away from sole dependence on government to a sharing of financial responsibility between government and the private sector. The current privatization legislation needs to be strengthened to provide incentives for the transportation industry to assume greater responsibility and for the Virginia Department of Transportation to yield more responsibility to the private sector. The adequacy of the private sector to provide this assistance must be addressed as the role of the public sector is reduced. Opportunities to privatize government activities should be pursued. An example of this is the California Private Transportation Company which has built a four lane stretch of highway in Orange County, CA that is used by 24,000 commuters a day. The effort has been so successful they are exploring opportunities to build similar roads in other areas of the state. This is one example of how privatization works. Other examples include, the contracting out of maintenance functions by VDOT (e.g. snow removal, pothole repair, landscaping, etc.) and bus service that is now provided through contracts with private transportation management companies in Fairfax County and the City of Alexandria. Investment in special projects such as the "Smart Highway" at Virginia Polytechnic can create centers of economic growth and attract both private sector and Federal funding. The "Smart Highway" project applies and tests technology developed in the intelligent transportation systems field under actual road conditions. It will demonstrate the practical utilization of new and advanced technologies for controlling traffic flow, monitoring traffic conditions, and making adjustments to ensure a free flow of traffic.

2. **Deregulation.** To enhance productivity, regulatory and administrative barriers that contribute to the inefficient operations of transportation systems should be removed. Except where the safety of the traveling public is an overriding concern, state regulatory requirements should not exceed those of the federal government. For example, over the past few years many state motor carrier requirements that do not affect safety have been reviewed and eliminated by Virginia.

3. **Economic Competitiveness.** Providing a high quality transportation system in a prioritized manner is important in the effort to compete on a national and international basis. Improving the transportation infrastructure is a critical step in developing a secure economic future. It will allow the Commonwealth to attract major new industries and expand existing ones. Generally the transportation projects in this study promote economic vitality. These include, but are not limited to: the addition of two lanes to Interstate 81, the development of a regional airport in southwestern Virginia, the development of a more efficient transportation infrastructure to support the Port of Hampton Roads, and improving traffic conditions in Northern Virginia. These are examples of transportation projects that will enhance economic vitality.

4. **Market Orientation**. A market based approach to the provision of mobility must be developed. This approach would use the marketplace to determine what transportation investments will be made. This method will allow for decisions to be measured in terms of the potential for economic development, the reduction in congestion costs, the improvement in mobility and the long-term viability of the project. An example of this approach is the Dulles/Greenway project. The private sector determined a need for the facility, projected the impact on potential economic vitality, and justified the cost by the rate of return expected over 30 years. This project is an example of the market oriented transportation approaches

that need to be encouraged in order to provide the Commonwealth with the most efficient transportation system possible.

5. **Technological Leadership and Safety**. To improve productivity, quality of service and reduce costs, state-of-the-art technology research must be utilized. The emphasis on "intelligent transportation systems" must move from the research arena into actual use. Virginia must become a leader in this research area and in the actual implementation of this technology to improve safety and mobility, increase the capacity of the infrastructure, and as a tool to improve economic viability. This may be the most crucial element for transitioning to a new improved transportation system. Examples of technology include ramp-metering, real-time traffic monitoring using satellite technology, vehicle tracking using geo-positioning satellite technology, and in vehicle computer systems that provide drivers with information on road conditions, alternative routes, and special services such as ATM machines, restaurants, shopping, etc.

6. **Intermodalism.** The old way of viewing the transportation system as separate modal entities is no longer valid. Improvements in the connectivity of different modes will improve the efficiency and effectiveness of the transportation system. A full range of modal alternatives for passengers and freight should be developed. Key intermodal centers, such as Dulles Airport and the Port of Hampton Roads, should be studied so that their elements can be used to create intermodal centers in other geographic regions of Virginia.

7. **Planning and Research.** A key role for the Commonwealth in facilitating the changes necessary to move forward is to provide funding for research and planning the new transportation system. This should include investments from the private sector that match and supplement the investment made by the public sector. The economic benefit to both the public and private sector should be carefully studied and become a major element in

determining the projects that will be funded. Specific transportation projects to research would be the development of an international airport in the Hampton Roads/Norfolk area and the development of light rail in the City of Richmond. These and other projects that are currently in the transportation improvement plans of Virginia's urban areas need to be carefully examined and used to develop a comprehensive statewide, multimodal transportation plan for the Commonwealth.

These seven key areas should form the foundation for creating the transportation vision for the next twenty years. They provide the framework for identifying significant challenges and opportunities for Virginia's transportation system. They also form the basis for prioritizing a list of actions necessary to achieve the vision of a truly integrated and technologically advanced system that enhances economic prosperity.

Transportation Needs

Virginia must use the seven principles identified above to address transportation needs. The changes in population throughout the Commonwealth, the creation of "edge cities" and the relocation of jobs to suburban and exurban areas requires a change in the manner and methodology of addressing transportation issues.

In the Hampton Roads/Norfolk area there is a need for an international airport to match the international nature of the port and enhance transportation opportunities. The same is true for the western sector of the state where a truly regional consolidated airport would provide the basis for major economic expansion. In the Northern Virginia area there is a need to utilize technology to relieve congestion thereby freeing capacity and allowing for additional economic development. This technology may include the introduction of light-rail to the area, the coordination of traffic through satellite technology, real-time traffic control systems linked to ramp-metering, and the construction

of alternatives to Interstate 95 for moving traffic around the Northern Virginia area rather than through it.

The state needs to upgrade and maintain the infrastructure that is in place even as it looks forward to meeting the needs of the next century. The system of highways, freeways, arterials, and streets that serve the Commonwealth must be preserved and protected. New pavement materials, new pavement designs and a program of reconstruction and rehabilitation must be developed and implemented to protect the investment that has been made to date and continue its status as one of the nation's best maintained transportation system. In addition Virginia needs to give more authority to localities to address their transportation needs.

Conclusions

Virginia's transportation infrastructure is among the largest and best maintained in the nation. However, changing travel patterns, economic development needs, and limited federal investment will require the Commonwealth to rethink its approach to providing transportation services. There will be a need for greater public/private partnerships, such as the Dulles/Greenway project, the light rail system to Dulles airport (under consideration in Northern Virginia), and the Richmond Car and Truck Rental project, to meet the demands for mobility.

Virginia is at a crossroads. An opportunity exists for Virginia to adopt an effective new approach to address transportation challenges based upon an unbiased analysis of the transportation system as a whole to determine how to create a seamless transportation system for the Commonwealth. This opportunity must be pursued, grasped and wrestled into existence for the Commonwealth to effectively, efficiently and cost-effectively meet the challenges that face the towns, the cities, the state of Virginia.

APPENDIX A

MATRICES

Matrices

Below are the two matrices discussed earlier in the study (page 13). These matrices form a framework for categorizing transportation projects. The first matrix identifies projects by rural, small urban, and urban categories. The second matrix categorizes these projects as national service, state service, regional service or local service. This categorization is used to identify the mix of projects being prioritized.

The blank boxes in the matrix below indicate no impact on that category.

MATRIX I

PROJECT	RURAL	SMALL URBAN	URBAN
I-895			High Impact
Route 288	High Impact	High Impact	Medium Impact
Route 360	Medium Impact	Medium Impact	
Richmond Int. Airport	Low impact	Low Impact	High Impact
Main Street Station			High Impact
High Speed Rail	High Impact	High Impact	High Impact
Public Transit		Medium Impact	High Impact
I-64 East	Medium Impact	Medium Impact	High Impact
Outer Connector (Stafford & Spotsylvania	High Impact	High Impact	

PROJECT	RURAL	SMALL URBAN	URBAN
Spotsylvania Parkway	High Impact	High Impact	
Interchange I-95/Route 17	Medium Impact	Medium Impact	
White Oak Road and Butler Road Corridor	Medium Impact	Medium Impact	
Germanna Highway (Route 3) Spotsylvania	High Impact	High Impact	
HOV Prince William/Stafford County Line	High Impact	High Impact	
Layhill Road/Forbes Street	Medium Impact	Medium Impact	
Mine Road Extension	High Impact	High Impact	
I-73	High Impact	High Impact	High Impact
I-81 Improvements (9 projects)	High Impact	High Impact	High Impact
TransAmerica Corridor	High Impact	High Impact	High Impact
Design of Bypasses (U.S. 29) Lynchburg, Madison Heights and Danville	Medium Impact	Medium Impact	Medium Impact
U.S. route 58	High Impact	Medium Impact	

PROJECT	RURAL	SMALL URBAN	URBAN
Northern Virginia I-395/495/95			High Impact
Woodrow Wilson Bridge			High Impact
Fairfax County Parkway		High Impact	High Impact
Rapid Transit Bus Service in the Dulles Corridor			Medium Impact
Route 123			Medium Impact
Western Transportation Corridor		High Impact	High Impact
Route 1 Alexandria to Prince William County		Medium Impact	Medium Impact
Rail West Falls Church to Dulles Airport			Medium Impact
Hampton Roads Southeastern Expressway		High Impact	High Impact
Virginia Beach, Chesapeake, Norfolk Light Rail		High Impact	High Impact

PROJECT	RURAL	SMALL URBAN	URBAN
I-64 Hampton Roads		Medium Impact	
York and James City Route 199 Widening	Medium Impact	Medium Impact	
Hampton &Norfolk 3rd Crossing	High Impact	High Impact	High Impact
Chesapeake Great Bridge Bypass	Medium Impact	Medium Impact	

MATRIX II

PROJECT	NATIONAL	STATE	REGIONAL	LOCAL
I-895	√	√	√	√
Route 288			√	√
Route 360			√	√
Richmond Int. Airport	√	√	√	√
Main Street Station		√	√	√
High Speed Rail	√	√	√	√
Public Transit	√	√	√	√
I-64	√	√	√	√

PROJECT	NATIONAL	STATE	REGIONAL	LOCAL
Outer Connector (Stafford & Spotsylvania		√	√	√
Spotsylvania Parkway		√	√	√
Interchange I-95/Route 17			√	√
White Oak Road and Butler Road Corridor			√	√
Germanna Highway (Route 3) Spotsylvania		√	√	√
HOV Prince William/Stafford County Line		√	√	√
Layhill Road/Forbes Street				√
Mine Road Extension				√
I-73	√	√	√	√

PROJECT	NATIONAL	STATE	REGIONAL	LOCAL
I-81 Improvements (9 projects)	√	√	√	√
TransAmerica Corridor	√	√	√	√
Design of Bypasses (U.S. 29) Lynchburg, Madison Heights and Danville			√	√
U.S. route 58		√	√	√
Northern Virginia I-395/495/95	√	√	√	√
Woodrow Wilson Bridge	√	√	√	√
Fairfax County Parkway			√	√
Rapid Transit Bus Service in the Dulles Corridor				√
Route 123			√	√

PROJECT	NATIONAL	STATE	REGIONAL	LOCAL
Western Transportation Corridor	√	√	√	√
Route 1 Alexandria to Prince William County			√	√
Rail West Falls Church to Dulles Airport				√
Virginia Beach and Chesapeake Southeastern Expressway		√	√	√
Virginia Beach, Chesapeake, Norfolk Light Rail		√	√	√
Route 464 Widening			√	√
York and James City Route 199 Widening				√

PROJECT	NATIONAL	STATE	REGIONAL	LOCAL
Hampton &Norfolk 3rd Crossing	√	√	√	√
Chesapeake Great Bridge Bypass		√	√	√

Appendix B

HOW THE MODEL WORKS

PROJECT DESCRIPTIONS

PROJECT RANKINGS

How the Model Works

The model and methodology described in this report establishes a set of multimodal transportation criteria against which all transportation projects can be evaluated and prioritized. The use of the criteria and ranking system described herein is not an end in itself. Rather, the model should be used as a guide for assessing a project's contribution to the overall transportation plan in Virginia and for comparing one project with another.

The criteria developed for this model were then applied to the various transportation plans that were provided for this report. These results were used to create a ranking of transportation projects to illustrate how a state transportation planning model like the one provided herein can be used in Virginia.

An examination of similar prioritization efforts in Wisconsin, San Francisco, Vermont, Missouri, and Washington state provided examples for developing the methodology used herein. The Wisconsin model divided projects into high impact, medium impact and low impact projects. These were then assigned scores of 6 points for high impact, 4 points for medium impact, 2 points for low impact, and 0 points for very little or no impact. The reviewed document did not provide a rationale for the selection of these scores. The Wisconsin study did state that, "it should be noted that the allocation of points to the various projects will require a certain degree of professional judgment with many of the criteria, and the actual point values awarded may differ for similar projects considered in different urbanized areas. For example, an intersection improvement in one urbanized area may have a significant impact on traffic flow, and hence congestion relief, where in another urbanized area the impact on congestion could be minimal."

The multimodal priority setting process used in San Francisco provided a different set of numbers for ranking projects. In this city the various factors were grouped into four large categories. These

were: maintain the metropolitan transportation system; improve the efficiency and effectiveness of the transportation system; expand the transportation system; and external impacts. This last criterion was used for taking into account factors such as land use, clean air and the Americans with Disabilities Act. It then established these weights for the four categories: 30 points for maintenance (Category 1); 30 points for improved efficiency (Category 2); 15 points for expansion (Category 3) and 25 points for external impacts (Category 4). This provided a possible 100 points per project.

The approach in this study combines those used by Wisconsin and San Francisco to develop eight (8) value criteria and a 100 point ranking system. Many of the concerns examined in San Francisco and Wisconsin were used in the criteria for this model including: congestion relief, air quality, land use, and economic vitality. There is also similar terminology used in setting high, medium and low impacts for the transportation projects and a similar assessment for these designations. Selected projects are analyzed on the following pages and a ranking is prepared that illustrates how a prioritized transportation plan can be developed from a model such as this.

Projects

This section provides the scoring for projects contained in the various reports reviewed.

Project Description:

Northern Virginia

I-395/495/95 Interchange (The Mixing Bowl). This project will improve mobility and reduce congestion at the point where I-95, I-395 and I-495 merge.

Criteria

1. Congestion Relief. **10 points -** **This project will significantly relieve congestion in the I-95/495/395 corridor.**

2. Safety and Security. **10 points -** **The project improves safety by upgrading the existing transportation system.**

3. Cost Effectiveness. **9 points -** **This project contributes to the efficiency of the transportation system by improving the existing transportation infrastructure.**

4. Multimodality. **0 points -** **None**

5. Intermodal Connectivity. **3 points -** **Improves access to Metrorail train station in Springfield, VA.**

6. Planning/Economic

	Vitality. **7 points -**	**This project will minimally promote development in the corridor.**
7.	Quality of life issues: Air quality/land use/ energy conservation. . **20 points -**	**This project will moderately enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality and energy conservation.**
8.	Other. **10 Points -**	**This project is a complex engineering effort that has taken almost twenty years to design and approve.**

Total score: 69

Project Description:

Northern Virginia

Woodrow Wilson Bridge replacement. A new bridge will be built that will handle the increasing volumes of traffic along this corridor.

Criteria

1. Congestion Relief. **9 points - This project will significantly reduce congestion in the I-95 corridor.**

2. Safety and Security. **10 points - The project significantly improves safety by upgrading the existing transportation system.**

3. Cost Effectiveness. **8 points - The current design for the replacement bridge is a cost effective and efficient structure that would serve the transportation needs of Northern Virginia.**

4. Multimodality. **0 points - None**

5. Intermodal Connectivity. **0 points - None**

6. Planning/Economic Vitality. **7 points - This project will promote development in the corridor.**

7. Quality of life issues: Air quality/land use/

	energy conservation.	**20 points -**	**This project will significantly enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**
8.	Other.	**10 Points -**	**This project is a complex project that has been delayed due to the need to coordinate the efforts of three political jurisdictions. It has also been delayed by citizens groups in opposition to the accepted plan. Further a lawsuit forcing the Federal Highway Administration to conduct an environmental review of the project provides additional complexity.**

Total score: **64**

Project Description:

Northern Virginia

Completion of Fairfax County and Franconia Parkways. These parkways will provide east to west access in the county.

Criteria

1. Congestion Relief. **9 points - This project provides additional commuting alternatives for Fairfax county. It significantly relieves congestion on arterials in the county. It provides a new route for people moving from the southeastern to the northwestern part of the county.**

2. Safety and Security. **7 points - The project improves safety by constructing a new roadway with higher standards.**

3. Cost Effectiveness. **7 points - This project contributes to the efficiency of the transportation system by improving the transportation infrastructure.**

4. Multimodality. **0 points -**

5. Intermodal Connectivity. **5 points - Provides a link to the Springfield/Franconia Metrorail station and the VRE Express.**

6. Planning/Economic Vitality. **8 points - This project will moderately promote development all along the corridor.**

7. Quality of life issues: Air quality/land use/ energy conservation. **15 points - This project will significantly enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**

8. Other. **0 Points - None**

Total score: 51

Project Description

Northern Virginia

Rapid Transit Bus Service in the Dulles Corridor

Criteria

1. Congestion Relief. **9 points - This project will relieve congestion by providing an alternative to the automobile in the Dulles corridor.**

2. Safety and Security. **7 points - The project improves safety by removing vehicles from the roadway.**

3. Cost Effectiveness. **6 points - This project contributes to the efficiency of the transportation system by improving the transportation infrastructure.**

4. Multimodality. **5 points - This project will link bus and rail service in the Dulles corridor.**

5. Intermodal Connectivity. **5 points - This project will provide an interface for bus, heavy rail and automobile.**

6. Planning/Economic Vitality. **5 points - This project will promote development in the corridor.**

7.	Quality of life issues: Air quality/land use/ energy conservation.	**15 points -**	**This project will reduce vehicle emissions by providing and alternative to the automobile, thereby improving air quality and reducing energy consumption.**
8.	Other.	**0 Points -**	**None**

Total score: 52

Project Description:

Northern Virginia

Widening of Route 123, from Burke Lake Road to the Occoquan River.

Criteria

1. Congestion Relief. **9 points - This project will significantly relieve congestion in the corridor.**

2. Safety and Security. **8 points - The project improves safety by upgrading the existing transportation system.**

3. Cost Effectiveness. **7 points - This project contributes to the efficiency of the transportation system by improving the existing transportation infrastructure.**

4. Multimodality. **0 points -**

5. Intermodal Connectivity. **0 points -**

6. Planning/Economic Vitality. **6 points - This project will moderately promote development in the corridor.**

7. Quality of life issues:
   Air quality/land use/
   energy conservation. **15 points -** **This project will enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**

8. Other. **0 Points -** **None**

Total score: 45

Project Description:

Northern Virginia

Western Transportation Corridor, west of I-95 from the Stafford County line to the Maryland state line.

Criteria

1. Congestion Relief. **9 points - This project will significantly relieve congestion in the I-95 corridor.**

2. Safety and Security. **8 points - The project improves safety by upgrading the existing transportation system by rerouting a high percentage of truck traffic off I-95.**

3. Cost Effectiveness. **7 points - This project contributes to the efficiency of the transportation system by improving the existing transportation infrastructure.**

4. Multimodality. **0 points -**

5. Intermodal Connectivity. **0 points -**

6. Planning/Economic Vitality. **4 points - This project will not significantly promote development in the corridor.**

7.	Quality of life issues: Air quality/land use/ energy conservation.	**15 points -**	**This project will significantly enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**
8.	Other.	**Points -**	**This project has been in the planning process for over twenty years. Citizens concerned with the impacts of the project on the environment as well as the impact of opening that section of the state for additional development have complicated the implementation of this project.**

Total score: 51

Project Description:

Northern Virginia

Rail from Vienna Metro to Centerville

Criteria

1. Congestion Relief. **9 points - This project will significantly contribute to congestion relief by providing an alternative to the automobile.**

2. Safety and Security. **5 points - The project improves safety by offering an alternative to the automobile.**

3. Cost Effectiveness. **7 points - This project contributes to the efficiency of the transportation system by improving the existing transportation infrastructure.**

4. Multimodality. **0 points -**

5. Intermodal Connectivity. **5 points - This project provides a connection between rail, automobile and bus.**

6. Planning/Economic Vitality. **5 points - This project will promote moderate development in the corridor.**

7.	Quality of life issues: Air quality/land use/ energy conservation.	**15 points -**	**This project will significantly enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**
8.	Other.	**0 Points -**	**None**

Total score: 46

Project Description:

Northern Virginia

Widen Route 1 from Alexandria to Prince William County

Criteria

1. Congestion Relief. **9 points - This project will significantly relieve congestion in the corridor.**

2. Safety and Security. **9 points - The project significantly improves safety by upgrading the existing transportation system.**

3. Cost Effectiveness. **7 points - This project contributes to the efficiency of the transportation system by improving the existing transportation infrastructure.**

4. Multimodality. **0 points -**

5. Intermodal Connectivity. **0 points -**

6. Planning/Economic Vitality. **6 points - This project will moderately promote development in the corridor.**

7.	Quality of life issues: Air quality/land use/ energy conservation.	**15 points -**	**This project will moderately enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**
8.	Other.	**0 Points -**	**None**

Total score: 46

Project Description :

Northern Virginia

Outer Connector, Northwest Quadrant (Stafford and Spotsylvania Counties)

This project is a multi-lane, median-divided access controlled highway. The road will potentially connect with the new I-95 interchange project near Route 627 in Stafford County with an estimated length of approximately 14 miles. The Outer Connector project will accomplish multiple objectives. It will provide improved access from I-95 to Route 3 west, lessen congestion along Route 3 west of the I-95 interchange and provide mulitmodal connections linking the Leeland Road Commuter Rail Station, the proposed Stafford County Regional Airport and existing commuter parking lots.

Criteria

1.	Congestion Relief. . **9 points -**	**The NW Quadrant of the Outer Connector is expected to reduce regional congestion, especially the traffic congestion experienced on Route 17 and Route 3 immediately west of their respective I-95 interchanges.**
2.	Safety and Security. **7 points -**	**The project improves safety by constructing a multi-laned, median-divided and restricted access road.**
3.	Cost Effectiveness. **7 points -**	**This project contributes to the efficiency of the transportation system by preserving the existing transportation infrastructure.**

4. Multimodality. **0 points -** **None**

5. Intermodal Connectivity. **6 points - The project provides a connection to the Leeland Road Commuter Rail Station and the proposed Stafford County Regional Airport.**

6. Planning/Economic Vitality. **8 points - This project is expected to facilitate the movement of people and goods within and through the region.**

7. Quality of life issues:
   Air quality/land use/
   energy conservation. **15 points - The project will improve air quality and reduce energy consumption.**

8. Other. **0 points-** **None**

Total score: 52

Project Description :

Northern Virginia

Spotsylvania Parkway/Outer Connector

A four lane divided highway is envisioned for this facility. It would be designed as a controlled or limited access roadway with interchanges at Routes 3, 208, 1 and Interstate 95. This roadway serves the major purpose of relieving congestion on the existing road network by providing a linkage to an additional interchange on I- 95, as well as, by connecting major radial roads emanating from the city of Fredericksburg and eliminating the need for traffic to be funneled into the existing Route 3 and Massaponax interchanges with I-95. This corridor serves a regional contribution by completing a portion of the circumferential roadway around the city helping to relieve traffic congestion within the area and increasing mobility.

Criteria

1.	Congestion Relief. .	**8 points -**	**This new roadway will prevent congestion from occurring in the future by offering an alternative route to the heavily congested primary and secondary roadways within the county.**
2.	Safety and Security.	**7 points -**	**The project improves safety by constructing a multi-laned, median-divided, restricted access road.**
3.	Cost Effectiveness.	**7 points -**	**This project contributes to the efficiency of the transportation system by preserving the existing**

transportation infrastructure

4. Multimodality. **0 points -** **None**

5. Intermodal Connectivity. **0 points - None**

6. Planning/Economic Vitality. **10 points -** **This project will serve as the boundary between the Primary Settlement Area and the Rural Development Area of the county. Intensive development is encouraged within the Primary Settlement Area by the provision of services (i.e., water, sewer, public facilities), while efforts are made to preserve the rural environment.**

7. Quality of life issues: Air quality/land use/ energy conservation. **5 points -** **The project will moderately improve air quality and reduce energy consumption.**

8. Other. 0 points- **None**

Total score: 37

Project Description:

Northern Virginia

Interchange I-95/Route 17

This interchange serves a regional contribution by completing a portion of the circumferential roadway around the city, helping to relieve traffic congestion within the area and increasing mobility.

Criteria

1. Congestion Relief. . **6 points -** **The interchange will help prevent congestion from occurring in the future by offering an alternative route to the heavily congested primary and secondary roadways within Spotsylvania County.**

2. Safety and Security. **7 points -** **The project improves safety by relieving traffic congestion within the area and increasing mobility.**

3. Cost Effectiveness. **7 points -** **This project contributes to the efficiency of the transportation system by preserving the existing transportation infrastructure.**

4. Multimodality. **0 points -** **None**

5. Intermodal Connectivity. **0 points - None**

6. Planning/Economic Vitality. **5 points -** **This project will provide additional access to business and residential areas.**

7. Quality of life issues: Air quality/land use/ energy conservation. **8 points -** **The project will improve air quality and reduce energy consumption.**

8. Other. **0 points-** **None**

Total score: 33

Project Description:

Northern Virginia

White Oak Road (Route 218) and Butler Road (route 212) Corridor.

This project will alleviate congestion on White Oak Road at the rail overpass, improve access to the Leeland Road Commuter Rail Station, and provide relief to Falmouth Bridge traffic on Route 1 by facilitating alternative access across the Rappahannock River. It will also provide a strategic link to Jefferson Davis Highway (US 1) and I-95.

Criteria

1.	Congestion Relief. . **7 points -**	**This project will provide an improved river crossing alternative, thereby relieving congestion problems on the Falmouth Bridge. It will also serve to minimize congestion problems currently experienced throughout this corridor.**
2.	Safety and Security. **7 points -**	**The project improves safety by relieving traffic congestion within the area and increasing mobility.**
3.	Cost Effectiveness. **7 points -**	**This project contributes to the efficiency of the transportation system by preserving the existing transportation infrastructure.**
4.	Multimodality. **0 points -**	**None**

5. Intermodal Connectivity. **4 points - The project provides improved access to the Leeland Road Commuter Rail Station.**

6. Planning/Economic Vitality. **5 points - This project will provide improved access to White Oak Road and the Leeland Road Commuter Rail Station and provide improved access to commercial centers and businesses in the corridor.**

7. Quality of life issues: Air quality/land use/ energy conservation. **8 points - The project will improve air quality and reduce energy consumption.**

8. Other. **0 point- None**

Total score: 38

Project Description:

Northern Virginia

Primary System: Germanna Highway (Route 3) Spotsylvania County

Widen roadway to 6 lanes and improve intersections with appropriate turn lanes as required. Unsignalized crossovers will be closed and others realigned with certain intersection improvements. Route 3 is the only east-west primary link between Culpepper and Fredericksburg, and Interstates 64 and 95. It serves a major regional function in moving traffic and freight.

Criteria

1. Congestion Relief. . **7 points -** **This project preserves and improves an existing roadway while providing congestion relief.**

2. Safety and Security. **7 points -** **The project improves safety by widening the roadway and providing congestion relief.**

3. Cost Effectiveness. **7 points -** **This project contributes to the efficiency of the transportation system by preserving the existing transportation infrastructure.**

4. Multimodality. **0 points -** **None**

5. Intermodal Connectivity. **0 points - None**

6. Planning/Economic

	Vitality. **10 points -**	**Germanna highway is a major freight distribution route for the FAMPO region and the state as a whole and connects Spotsylvania County to Orange County to the west and the City of Fredericksburg to the east. The project enhances the efficient movement of freight throughout the region.**
7.	Quality of life issues: Air quality/land use/ energy conservation. **8 points -**	**The project will moderately improve air quality and reduce energy consumption.**
8.	Other. **0 points**	**None**

Total score: 39

Project Description:

Northern Virginia

HOV Prince William/Stafford County Line

This project would extend HOV lanes between Prince William/Stafford County line to Route 3 in Fredericksburg

Criteria

1. Congestion Relief. **9 points -** **This project would greatly reduce peak period congestion along the I-95 corridor.**

2. Safety and Security. **9 points -** **The project improves safety by reducing congestion and providing an alternative roadway for carpools, vanpools and buses.**

3. Cost Effectiveness. **9 points -** **This project contributes to the efficiency of the transportation system.**

4. Multimodality. **5 points -** **This project also facilitates the movement of buses and carpools.**

5. Intermodal Connectivity. **0 points - None**

6. Planning/Economic Vitality. **13 points -** **This project will lessen the commuting time between the Fredericksburg Area Metropolitan Planning Organization region and the Washington, DC**

metropolitan area. This new roadway will improve access to potential industrial areas in northeast Spotsylvania County as well as improve the movement of people and goods between King George County and I-95.

7. Quality of life issues: Air quality/land use/ energy conservation. **20 points -** **With the construction of HOV lanes, the increased use of carpools, vanpools and buses will result in air quality benefits through the elimination of some single occupancy vehicle (SOV) trips.**

8. Other. **0 points-** **None**

Total score: 65

Project Description:

Northern Virginia

Stafford: Layhill Road/Forbes Street (Route 627), Morton Road (Route 624) and Leeland Road (Route 626)

This project provides improved access to Leeland Road and the Leeland Road commuter Rail Station. The purpose of this project will be to enhance the capability of the existing transportation facility.

Criteria

1.	Congestion Relief. **5 points -**	**This project will enhance the capability of existing transportation facilities. Energy conservation goals will be addressed by improving traffic flow and access to the Leeland Commuter Rail Station.**
2.	Safety and Security. **5 points -**	**The project improves safety by reducing congestion.**
3.	Cost Effectiveness. **5 points -**	**This project contributes to the efficiency of the transportation system.**
4.	Multimodality. **2 points -**	**The project provides a more efficient connection to the Leeland Road Commuter Rail Station.**
5.	Intermodal Connectivity. **3 points -**	**This project provides and intermodal connection**

between rail and highway.

6. Planning/Economic Vitality. **12 points -** **This project will provide improved access to services and rail transportation, thereby enhancing accessibility to services in the Washington, DC area.**

7. Quality of life issues: Air quality/land use/ energy conservation. **20 points -** **The improvements to Harrell road will enhance the use of the Leeland Road Commuter Rail Station, which will reduce congestion and enhance the environmental benefits of the commuter rail station.**

8. Other. **0 points.** **None**

Total score: 52

Project Description:

Northern Virginia

Stafford: Mine Road Extension

This project will provide an alternate north-south route to Jefferson Davis Highway (Route1) with access to four existing and planned I-95 interchanges. Additionally, Mine Road will provide access to the Stafford Regional Airport and Outer Connector.

Criteria

1. Congestion Relief. **6 points - This project will help relieve traffic congestion experienced on I-95 and Jefferson Davis Highway (Route 1).**

2. Safety and Security. **5 points - The project improves safety by reducing congestion.**

3. Cost Effectiveness. **5 points - This project contributes to the efficiency of the transportation system.**

4. Multimodality. **0 points - None**

5. Intermodal Connectivity. **3 points - Provides access to the airport**

6. Planning/Economic Vitality. **10 points - This project will provide necessary linkages between several neighborhoods and other areas of the county.**

			This project will also provide access to commercial activity and additional access to I-95 for commercial and industrial establishments.
7.	Quality of life issues: Air quality/land use/ energy conservation.	**10 points -**	**The improvements to Harrell road will enhance the use of the Leeland Road Commuter Rail Station, which will reduce congestion and enhance the environmental benefits of the commuter rail station.**
8.	Other. **0 points-**		**None**

Total score: 39

Project Description **:**

Greater Richmond Area

I-895- Interstate 895 has long been identified as a needed facility to connect I-85 and I-95. In 1972, the approved interstate change shifted I-95 (then designated as I-295) from the Richmond Petersburg Turnpike (RPT) to a new location east of the RPT, providing an I-85/I-95 (I-295) connecting link south of Petersburg. The I-85/I-95 link was provided by existing I-95 to the new I-295. Travelers had to go south then north to use I-295. The connecting link, I-895, was deferred at that time (the Chippenham to Laburnum 95/295 connector).

Criteria

1.	Congestion Relief. **9 points-**	**This project is estimated to provide 758,000 hours per year in real commuter time savings. It will contribute significantly to reliving congestion by providing a link between I-85 and I-295.**
2.	Safety and Security. **9 points -**	**This project will contribute to the safety of the system by providing a direct link between I-85 and I-295. The safety measures realized comes from reducing travel time for drivers, providing a less circuitous route for motorists, and upgrading the facility used by motorists to interstate standards, thereby providing additional safety features.**

3. Cost Effectiveness. **8 points- This project contributes to efficiency of the transportation system by preserving the existing transportation infrastructure.**

4. Multimodality. **0 points- None**

5. Intermodal Connectivity. **0 points- None**

6. Planning/Economic Vitality. **10 points - It is anticipated that this project will create a significant number of new jobs, attract jobs to the region from other parts of the country, provide an increasing gross regional product, and provide new sources of state and local tax revenue.**

7. Quality of life issues: Air quality/land use/ energy conservation. **20 points- This project will significantly reduce vehicle emissions. There will be no adverse environmental impacts.**

8. Other. **0 points - None**

Total score: 56

Project Description :

Greater Richmond Area

Route 288 from Route 76 to Interstate 64 is a 17 mile section of road, 4 lane divided, limited access facility. Interstate funds will be used as the primary funding source for this project. The project will be constructed in phases. Phase one has been completed and there are portions currently under construction and bids are out on additional sections.

Criteria

1.	Congestion Relief. **8 points -**	**This project is estimated to provide 700,000 hours per year in real commuter time savings.**
2.	Safety and Security. **8 points -**	**The construction of a four lane, limited access facility upgrades the safety of the system.**
3.	Cost Effectiveness. **5 points -**	**This project improves the efficiency of the transportation system. It also creates and attracts new jobs to the area. This generated job growth coupled with reductions in congestion make this a cost effective project.**
4.	Multimodality. **0 points-**	**None**
5.	Intermodal Connectivity. **0 points- -**	**None**
6.	Planning/Economic	

Vitality. **12 points-** **It is anticipated that this project will create new jobs, relocate jobs to the area, and contributes significantly to the annual gross regional product, and create new sources of state and local taxes.**

7. Quality of life issues: Air quality/land use/ energy conservation. **15 points -** **This project will reduce vehicle emissions by more than 148 tons per year.**

8. Other. **0 points** **None**

Total score: 48

Project Description :

Greater Richmond Area

This project is to expand Route 360 from two lanes to four lanes in the Mechanicsville area of Hanover County. This project runs from I-295 to Walnut Grove Road in Hanover County.

Criteria

1.	Congestion Relief. . **7 points -**	**This project provides access to prime vacation travel sites on the water. The impact on local traffic congestion is significant.**
2.	Safety and Security. **6 points -**	**Upgrading a two lane facility to four lanes improves the overall safety of the system.**
3.	Cost Effectiveness. **7 points -**	**The project attracts jobs to the area and relieves congestion during the vacation season.**
4.	Multimodality. **0 points-**	**None**
5.	Intermodal Connectivity. **0 points-**	**None**
6.	Planning/Economic Vitality. **2 points -**	**The project creates 1300 new jobs and relocates 794 existing jobs to the region. It will generate an 81.5 million increase in annual gross regional product and**

add 1.1 million in new sources of state and local tax revenue.

7. Quality of life issues:
   Air quality/land use/
   energy conservation. **10 points -** **The project contributes marginally to environmental improvements.**

8. Other. 0 points- **None**

Total score: 32

Project Description :

Greater Richmond Area

Richmond International Airport. This project will fund the expansion of RIC in the following areas: runway extension; expansion of terminal facilities, including double decking roadway for arrivals and departures; additional jetways (passenger gates); extension of Airport Drive; expansion of air cargo ramps; land acquisition.

Criteria

1.	Congestion Relief. .	**3 points -**	**This project has a minimal impact on congestion.**
2.	Safety and Security.	**9 points -**	**The proposed project will enhance the overall safety of airport operations.**
3.	Cost Effectiveness.	**10 points -**	**The project contributes to the creation of an intermodal facility that enhances the efficiency of the transportation system.**
4.	Multimodality.	**10 points-**	**This project will facilitate the development of the airport as an intermodal transportation facility.**
5.	Intermodal Connectivity.	**5 points -**	**Provides connections for passenger and freight movement from air to highway and rail.**
6.	Planning/Economic Vitality.	**7 points -**	**The project will create new jobs and generate an**

increase in annual gross regional product and in new sources of state and local tax revenue.

7. Quality of life issues: (Air quality/land use/ energy conservation). **5 points - The project contributes marginally to environmental improvements.**

8. Other. **0 points - None**

Total score: 49

Project Description :

Greater Richmond Area

Main Street Station. This project will restore train service to downtown Richmond. It is a multi-phased project. Phase I will build a platform on the east side of the station to allow trains to Newport News and Washington, DC to stop. Phase II will make improvements that allow two daily trains to originate in Richmond for other destinations. Phase III constructs a second platform allowing additional service. The ultimate plan is for the creation of a multi-modal facility with rail, regional transit, airport limousines, shuttle service and taxicabs.

Criteria

1.	Congestion Relief.	**None**
2.	Safety and Security. **5 points-**	**The proposed project will enhance the overall safety of train operations.**
3.	Cost Effectiveness. **5 points -**	**This project will increase passenger usage of rail transportation.**
4.	Multimodality. **10 points-**	**This project will facilitate the development of the rail station as a multi-modal facility that will serve various transportation needs of the users.**
5.	Intermodal Connectivity. **10 points -**	**This project provides for connectivity between several modes of transportation.**

6.	Planning/Economic Vitality. **8 points -**	**The project will create new jobs and relocate existing jobs. It will generate an increase in annual gross product and in new sources of state and local tax revenue.**
7.	Quality of life issues: (Air quality/land use/ energy conservation). **5 points -**	**The project contributes marginally to environmental improvements.**
8.	Other. **-0 points**	**None**

Total score: 43

Project Description :

Greater Richmond Area

High Speed Rail Service - This project is a multi-phased construction and rehabilitation project that would be phased over six years. The project would provide high speed rail from Richmond, VA to Washington, DC.

Criteria

1.	Congestion Relief.	**10 points-**	**This project will provide a savings of 1.27 million commuter hours per year.**
2.	Safety and Security.	**8 points -**	**By providing an alternative to the automobile for commuting between Richmond and Washington there will be a reduction in the number of accidents on the highways.**
3.	Cost Effectiveness.	**5 points -**	**This project will increase passenger usage of rail transportation.**
4.	Multimodality.	**8 points-**	**This project will facilitate the usage of multimodal facilities by commuters.**
5.	Intermodal Connectivity.	**7 points -**	**This project provides for connectivity between several modes of transportation.**

6. Planning/Economic Vitality. **5 points -** **The project will create new jobs. It will generate a significant increase in annual gross product and in new sources of state and local tax revenue.**

7. Quality of life issues: (Air quality/land use/ energy conservation). **15 points -** **The project contributes significantly to a reduction in emissions from vehicles by offering an alternative.**

8. Other. **-0 points** **None**

Total score: 58

Project Description :

Greater Richmond Area

Expansion of Public Transit. This project would extend transit service to Henrico and Chesterfield counties. It would also include local collector and feeder service within Henrico and Chesterfield counties providing access to corridor service and local circulation within each county.

Criteria

1. Congestion Relief. **8 points- Regional transit provides an opportunity to move people out of single occupancy vehicles and into more efficient transit. This project will have a significant impact on relieving congestion.**

2. Safety and Security. **5 points - The safety and security issues are difficult to determine. Reduction in SOV will enhance the overall safety of the transportation system. How many vehicles will be removed from the system has yet to be determined.**

3. Cost Effectiveness. **5 points - The project will be responsive to population and employment growth trends and will provide direct economic impacts, traveler savings, air quality improvements and congestion mitigation.**

4. Multimodality. **9 points- This project will facilitate the usage of**

multimodal facilities by commuters.

5. Intermodal Connectivity. **7 points - This project provides for connectivity between several modes of transportation.**

6. Planning/Economic Vitality. **9 points - The project will create 25,400 new jobs. It will generate a $1.5 billion increase in annual gross product for the state, region and locality.**

7. Quality of life issues: (Air quality/land use/ energy conservation). **20 points - The project will reduce air quality emissions by approximately 207 tons per year.**

8. Other. **-0 points None**

Total score: 63

Project Description :

Greater Richmond Area

Expansion of I-64 from Richmond to Hampton Roads. This project will expand the current two lane facility to three lanes between Richmond and Norfolk, VA.

Criteria

1. Congestion Relief. **8 points- This project will have a significant impact on relieving congestion.**

2. Safety and Security. **6 points - The project improves safety by upgrading the existing transportation system.**

3. Cost Effectiveness. **5 points - This project contributes to the efficiency of the transportation system by improving the existing transportation infrastructure.**

4. Multimodality. **0 points- None**

5. Intermodal Connectivity. **3 points - This project provides for connectivity between several modes of transportation.**

6. Planning/Economic Vitality. **7 points - The project will create jobs and will generate an increase in annual gross product for the state, region and locality.**

7. Quality of life issues:

	(Air quality/land use/ energy conservation). **7 points -**	**The project will reduce air quality emissions.**
8.	Other. **-5 points**	**This project will impact tourism in the Williamsburg and Jamestown area by providing an increase in mobility for tourists accessing their facilities.**

Total score: 46

Project Description:

Hampton Roads

Southeastern Expressway, Oak Grove Connector. (Corridor preservation).

Criteria

1. Congestion Relief. **9 points - This project will significantly relieve congestion in the corridor.**

2. Safety and Security. **8 points - The project improves safety by upgrading the existing transportation system.**

3. Cost Effectiveness. **7 points - This project contributes to the efficiency of the transportation system by improving the existing transportation infrastructure.**

4. Multimodality. **0 points -**

5. Intermodal Connectivity. **0 points -**

6. Planning/Economic Vitality. **5 points - This project will moderately promote development in the corridor.**

7. Quality of life issues: (Air quality/land use/ energy conservation). **15 points -** **This project will significantly enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**

8. Other. **0 Points -** **None**

Total score: 44

Project Description:

Hampton Roads

Virginia Beach/ Norfolk Light Rail

Criteria

1. Congestion Relief. **9 points - This project will significantly contribute to congestion relief by providing an alternative to the automobile.**

2. Safety and Security. **6 points - The project improves safety by upgrading the existing transportation system.**

3. Cost Effectiveness. **5 points - This project contributes to the efficiency of the transportation system by providing and alternative to the automobile.**

4. Multimodality. **6 points - This project offers an alternative mode of transportation that can be used in place of the automobile and bus.**

5. Intermodal Connectivity. **6 points - The project provides a connection between modes of transportation.**

6. Planning/Economic Vitality. **5 points - This project will moderately promote development in the corridor.**

7. Quality of life issues: (Air quality/land use/ energy conservation). **15 points -** **This project will enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**

8. Other. **0 Points -** **None**

Total score: 52

Project Description:

Hampton Roads

Route 64 -Newport News & Hampton widen from 6 to 8 lanes, from Rout 17 east to east Hampton Roads Center Parkway, 4 miles.

Criteria

1. Congestion Relief. **9 points - This project will significantly relieve congestion in the corridor.**

2. Safety and Security. **7 points - The project improves safety by upgrading the existing transportation system.**

3. Cost Effectiveness. **5 points - This project contributes to the efficiency of the transportation system by improving the existing transportation infrastructure.**

4. Multimodality. **0 points -**

5. Intermodal Connectivity. **0 points -**

6. Planning/Economic Vitality. **5 points - This project will promote moderate development in the corridor.**

7. Quality of life issues: (Air quality/land use/

energy conservation). **15 points -** **This project will significantly enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**

8. Other. **0 Points -** **None**

Total score: 41

Project Description:

Hampton Roads

York and James City

Route 199 Widen from 4 to 6 lanes, from Route 99 to New Kent County line, 18 miles.

Criteria

1. Congestion Relief. **9 points - This project will significantly relieve congestion in the corridor.**

2. Safety and Security. **7 points - The project improves safety by upgrading the existing transportation system.**

3. Cost Effectiveness. **9 points - This project contributes significantly to the efficiency of the transportation system by improving the existing transportation infrastructure.**

4. Multimodality. **0 points -**

5. Intermodal Connectivity. **0 points -**

6. Planning/Economic Vitality. **5 points - This project will promote development in the corridor.**

7.	Quality of life issues: (Air quality/land use/ energy conservation).	**15 points -**	**This project will significantly enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**
8.	Other.	**0 Points -**	**None**

Total score: 45

Project Description:

Hampton Roads

Hampton & Norfolk

3rd Crossing. This would be the third tunnel and/or bridge across the Chesapeake Bay. This project is on the TEA 21 high priority list.

Criteria

1. Congestion Relief. **9 points - This project will significantly relieve congestion in the corridor.**

2. Safety and Security. **8 points - The project improves safety by providing another crossing of the Chesapeake Bay thereby relieving congestion.**

3. Cost Effectiveness. **8 points - This project contributes to the efficiency of the transportation system by improving the transportation infrastructure.**

4. Multimodality. **0 points -**

5. Intermodal Connectivity. **2 points - This project provides a connection to the Port of Virginia.**

6. Planning/Economic Vitality. **5 points - This project will promote moderate development in the corridor.**

7. Quality of life issues: (Air quality/land use/ energy conservation). **15 points - This project will significantly enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**

8. Other. **10 Points - This project is on the TEA-21 list of high priority projects.**

Total score: 57

Project Description:

Hampton Roads

Chesapeake Battlefield Blvd from Great Bridge Bypass to the North Carolina state line, 10.4 miles.

Criteria

1. Congestion Relief. **9 points - This project will significantly relieve congestion in the corridor.**

2. Safety and Security. **7 points - The project improves safety by upgrading the existing transportation system.**

3. Cost Effectiveness. **7 points - This project contributes to the efficiency of the transportation system by improving the transportation infrastructure.**

4. Multimodality. **0 points -**

5. Intermodal Connectivity. **0 points -**

6. Planning/Economic Vitality. **5 points - This project will moderately promote development in the corridor.**

7. Quality of life issues: (Air quality/land use/

	energy conservation). **15 points -**	**This project will significantly enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**
8.	Other.**0 Points -**	**None**

Total score: 43

Project Description:

Southside Virginia

Design of Bypasses

Design and construction of Lynchburg, Madison Heights and Danville bypasses (U.S. Route 29).

Criteria

1. Congestion Relief. **9 points - This project will re-route traffic and relieve congestion in the cities of Lynchburg, Madison Heights and Danville.**

2. Safety and Security. **5 points - The project improves safety by upgrading the existing transportation system.**

3. Cost Effectiveness. **5 points - This facility would open up the corridor for economic development, generating additional tax revenue and justifying the cost of construction**

4. Multimodality. **0 points - None**

5. Intermodal Connectivity. **0 points - None**

6. Planning/Economic Vitality. **5 points - This project will promote development in the vicinity of the bypasses.**

7.	Quality of life issues: (Air quality/land use/ energy conservation) **15 points -**	**This project will enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**
8.	Other. **0 Points-**	**None**

Total score: 39

Project Description:

Southside Virginia

U.S. Route 58

Completion of corridor development program along the entire Route 58 corridor.

Criteria

1. Congestion Relief. **7 points - This project will widen and relieve congestion in the corridor.**

2. Safety and Security. **5 points - The project improves safety by upgrading the existing transportation system.**

3. Cost Effectiveness. **5 points - This project contributes to the efficiency of the transportation system.**

4. Multimodality. **0 points - None**

5. Intermodal Connectivity. **0 points - None**

6. Planning/Economic Vitality. **5 points - This project will promote moderate development in the corridor.**

7.	Quality of life issues: (Air quality/land use/ energy conservation).	**15 points -**	**This project will enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**
8.	Other.	**0 Points-**	**None**

Total score: 37

Project Description:

Western Virginia

I-73

This project would construct an interstate highway from Roanoke to the North Carolina State line. This facility would be located east of I-81.

Criteria

1. Congestion Relief. **9 points - This project will help relieve traffic congestion by moving traffic from state routes to an interstate route.**

2. Safety and Security. **8 points - The project improves safety by upgrading the transportation system in the I-73 corridor.**

3. Cost Effectiveness. **8 points - This facility would open up the corridor for economic development, generating additional tax revenue and justifying the cost of construction.**

4. Multimodality. **0 points - None**

5. Intermodal Connectivity. **0 points - None**

6. Planning/Economic Vitality. **10 points - This project will promote development for the Roanoke area and the I-73 corridor.**

7.	Quality of life issues: (Air quality/land use/ energy conservation) .	**15 points -**	**This project will enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**
8.	Other.	**0 points-**	**None**

Total score: 50

Project Description:

Western Virginia

I-81 improvement(There are nine projects in this corridor, all received the same score). The projects run the entire length of the I-81 corridor.

Criteria

1. Congestion Relief. **9 points - This project will help relieve traffic congestion by expanding an existing system.**

2. Safety and Security. **8 points - The project improves safety by upgrading the transportation system in the I-81 corridor.**

3. Cost Effectiveness. **8 points - This facility would open up the corridor for economic development, generating additional tax revenue and justifying the cost of construction.**

4. Multimodality. **0 points - None**

5. Intermodal Connectivity. **3 points - This project provides access to the in-land port that serves as a transfer facility for the movement of freight.**

6. Planning/Economic Vitality. **9 points - This project will promote development for the Roanoke area and the I-81 corridor.**

7. Quality of life issues: (Air quality/land use/ energy conservation). **15 points -** **This project will enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**

8. Other. **0 points-** **None**

Total score: 52

Project Description:

Western Virginia

TransAmerica Corridor

This project would follow a corridor from West Virginia to Hampton Roads. This corridor parallels Interstate 64 from West Virginia to Route 220 (southbound) to Route 460 (eastbound) to Hampton Roads

Criteria

1. Congestion Relief. **9 points - This project will expand the existing system.**

2. Safety and Security. **5 points - The project improves safety by upgrading the transportation system .**

3. Cost Effectiveness. **5 points - This facility would open up the corridor for economic development, generating additional tax revenue and justifying the cost of construction.**

4. Multimodality. **0 points -**

5. Intermodal Connectivity. **0 points -**

6. Planning/Economic Vitality. **9 points - This project will promote development the entire length of the corridor.**

7. Quality of life issues:
(Air quality/land use/
energy conservation). **15 points -** **This project will enhance the flow of traffic and reduce vehicle emissions, thereby improving air quality.**

8. Other. **0 points-** **None**

Total score: 43

Rankings

The table below provides and illustration of how the methodology described above can be applied to prioritize projects. The list divides the projects into three tiers. These tiers, first, second, and third, provide a view of where the state might concentrate its funding in order to construct an efficient and effective transportation system for moving people and goods throughout the state of Virginia. This illustration is not an attempt to make public policy, but is simply illustrative of the application of the methodology.

Rank	SCORE	PROJECT	AREA	Page
1. First Tier	69	I-95/395/495	Northern VA	38
2. First Tier	65	HOV	Northern VA	64
3. First Tier	64	Woodrow Wilson Bridge	Northern VA	40
4. First Tier	63	Expansion of Public Transit	Greater Richmond	82
5. First Tier	58	High Speed Rail	Greater Richmond	80
6. First Tier	57	3rd Crossing	Hampton Roads	94
7. First Tier	56	I-895	Greater Richmond	70
8. First Tier	53	Fairfax County Parkway	Northern VA	42
9. First Tier	52	Outer Connector (Stafford/Spotsylvania)	Northern VA	54
10. First Tier	52	Light Rail	Hampton Roads	88
11. First Tier	52	Dulles Corridor	Northern VA	44
12. First Tier	52	Layhill Road	Northern VA	66
13. First Tier	52	I-81	Western VA	104
14. First Tier	51	Western Bypass	Northern VA	48

15. First Tier	50	I-73	Western VA	102
16. Second Tier	49	Richmond International Airport	Greater Richmond	76
17. Second Tier	48	Route 288	Greater Richmond	72
18. Second Tier.	47	Route 1	Northern VA	52
19. Second Tier	46	I-64 East	Greater Richmond	84
20. Second Tier	46	Spotsylvania Parkway	Northern VA	56
21. Second Tier	46	Vienna/Cntrvle Metro	Northern VA	50
22. Second Tier	45	Route 123	Northern VA	46
23. Second Tier	45	Route 199	Hampton Roads	92
24. Second Tier	44	Southeastern Expressway	Hampton Roads	86
25. Second Tier	43	Great Bridge Bypass	Hampton Roads	96
26. Second Tier	43	Trans America Corridor	Western Virginia	106
27. Second Tier	43	Main Street Station	Greater Richmond	78
28. Second Tier	41	I-64	Hampton Roads	90
29. Second Tier	40	Route 58	Southwestern VA	100
30. Third Tier	39	Bypasses	Southwestern VA	98
31. Third Tier	39	Germanna Highway	Northern VA	62
32. Third Tier	39	Mine Road	Northern VA	68
33. Third Tier	38	White Oak Road	Northern VA	60
34. Third Tier	33	I-95 Interchange	Northern VA	58
35. Third Tier	32	Route 360	Greater Richmond	74

Appendix C

MAPS

Rank	SCORE	PROJECT	AREA	Page
1. First Tier	69	I-95/395/495	Northern VA	38
2. First Tier	65	HOV	Northern VA	64
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13. First Tier	52	I-81	Western VA	104
14. First Tier	51	Western Bypass	Northern VA	40
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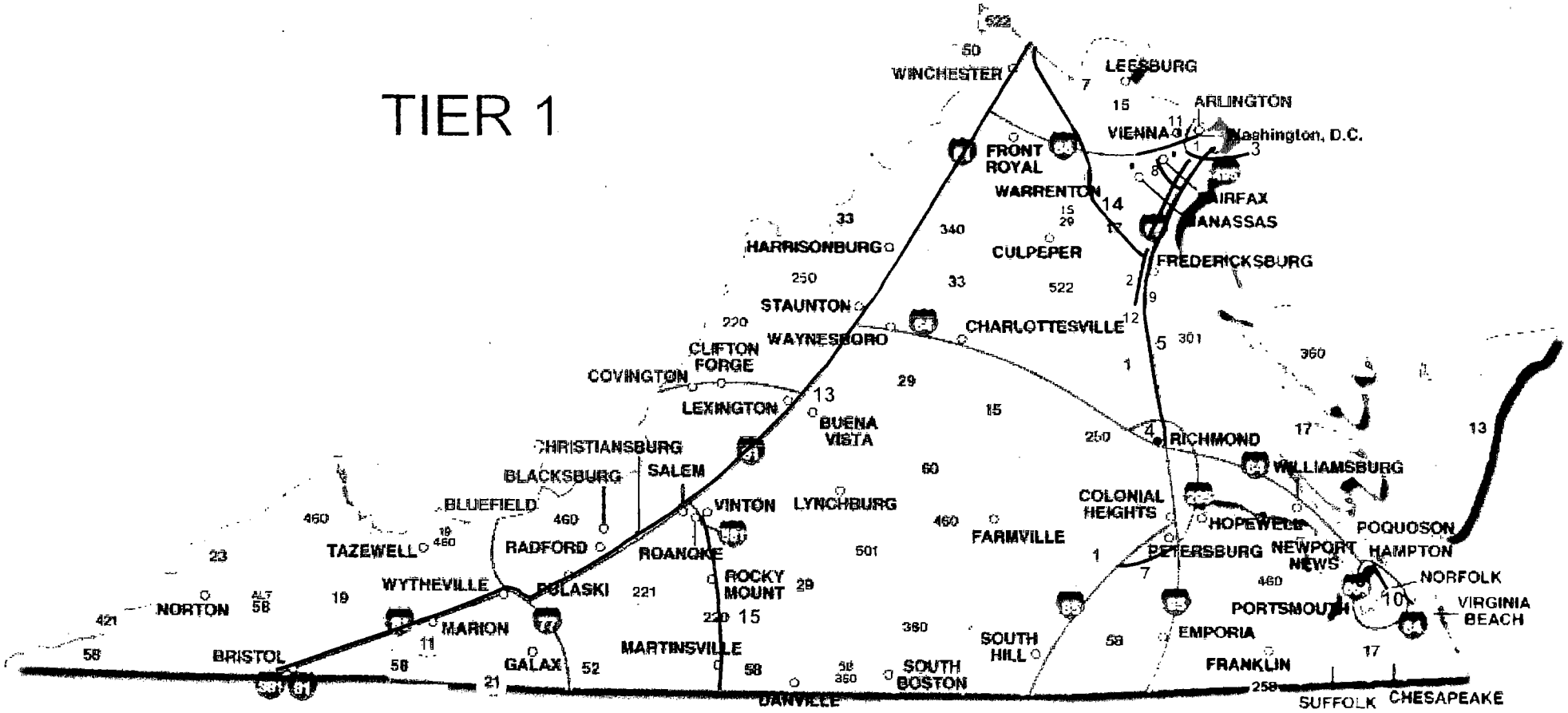
TIER 1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VIENNA
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FRONT ROYAL
WARRENTON
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FREDERICKSBURG
STAUNTON
CHARLOTTESVILLE
WAYNESBORO
CLIFTON FORGE
COVINGTON
LEXINGTON
BUENA VISTA
CHRISTIANSBURG
BLACKSBURG
SALEM
BLUEFIELD
VINTON
LYNCHBURG
RICHMOND
WILLIAMSBURG
COLONIAL HEIGHTS
HOPEWELL
POQUOSON
TAZEWELL
RADFORD
ROANOKE
FARMVILLE
PETERSBURG
NEWPORT NEWS
HAMPTON
NORFOLK
WYTHEVILLE
PULASKI
ROCKY MOUNT
PORTSMOUTH
VIRGINIA BEACH
NORTON
MARION
MARTINSVILLE
SOUTH HILL
EMPORIA
BRISTOL
GALAX
SOUTH BOSTON
FRANKLIN
DANVILLE
SUFFOLK
CHESAPEAKE

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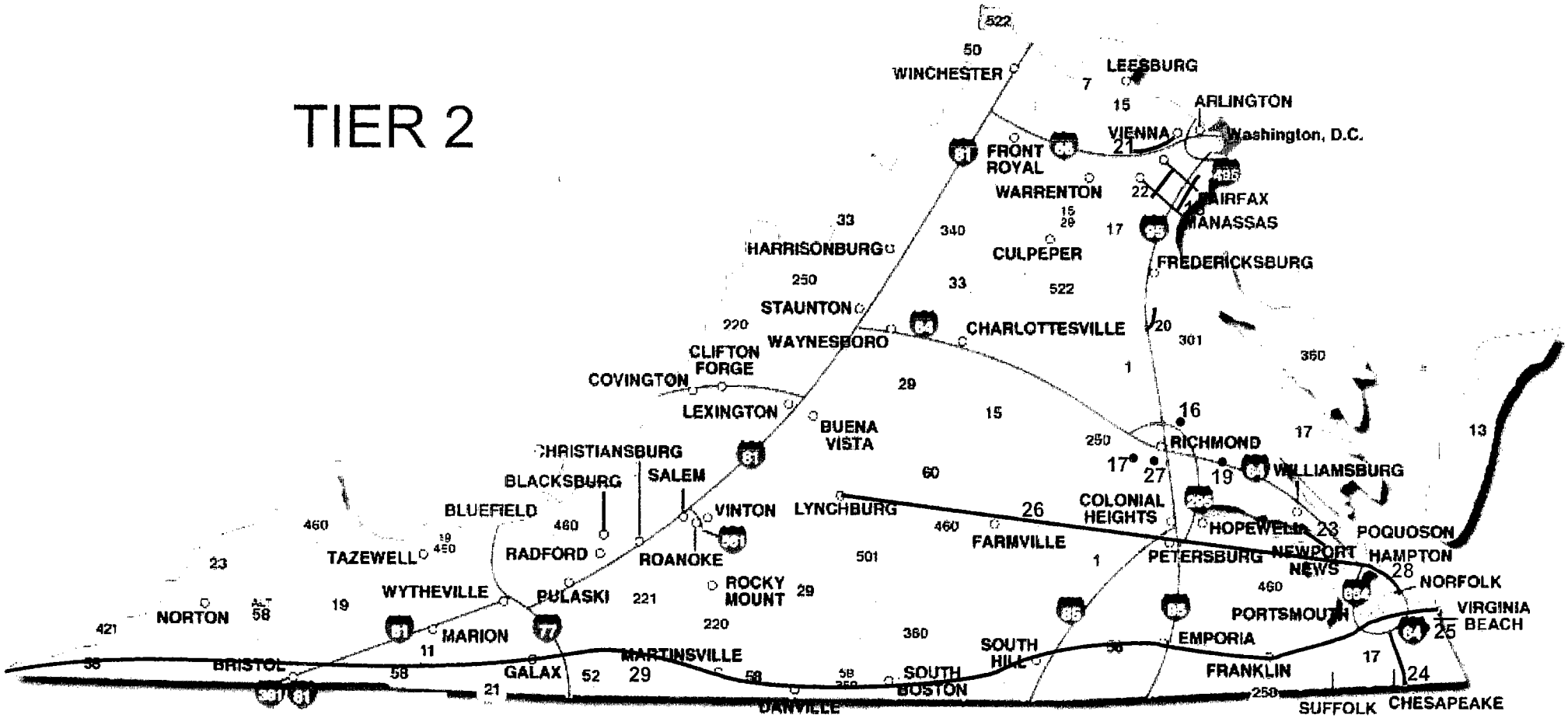
29. Second Tier	40	Route 58	Southwestern VA	100

TIER 2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CHARLOTTESVILLE
WAYNESBORO
CLIFTON FORGE
COVINGTON
LEXINGTON
BUENA VISTA
RICHMOND
CHRISTIANSBURG
BLACKSBURG
SALEM
WILLIAMSBURG
BLUEFIELD
VINTON
LYNCHBURG
COLONIAL HEIGHTS
HOPEWELL
POQUOSON
TAZEWELL
RADFORD
ROANOKE
FARMVILLE
PETERSBURG
NEWPORT NEWS
HAMPTON
WYTHEVILLE
PULASKI
ROCKY MOUNT
NORFOLK
NORTON
MARION
PORTSMOUTH
VIRGINIA BEACH
MARTINSVILLE
SOUTH HILL
EMPORIA
BRISTOL
GALAX
DANVILLE
SOUTH BOSTON
FRANKLIN
SUFFOLK
CHESAPEAKE

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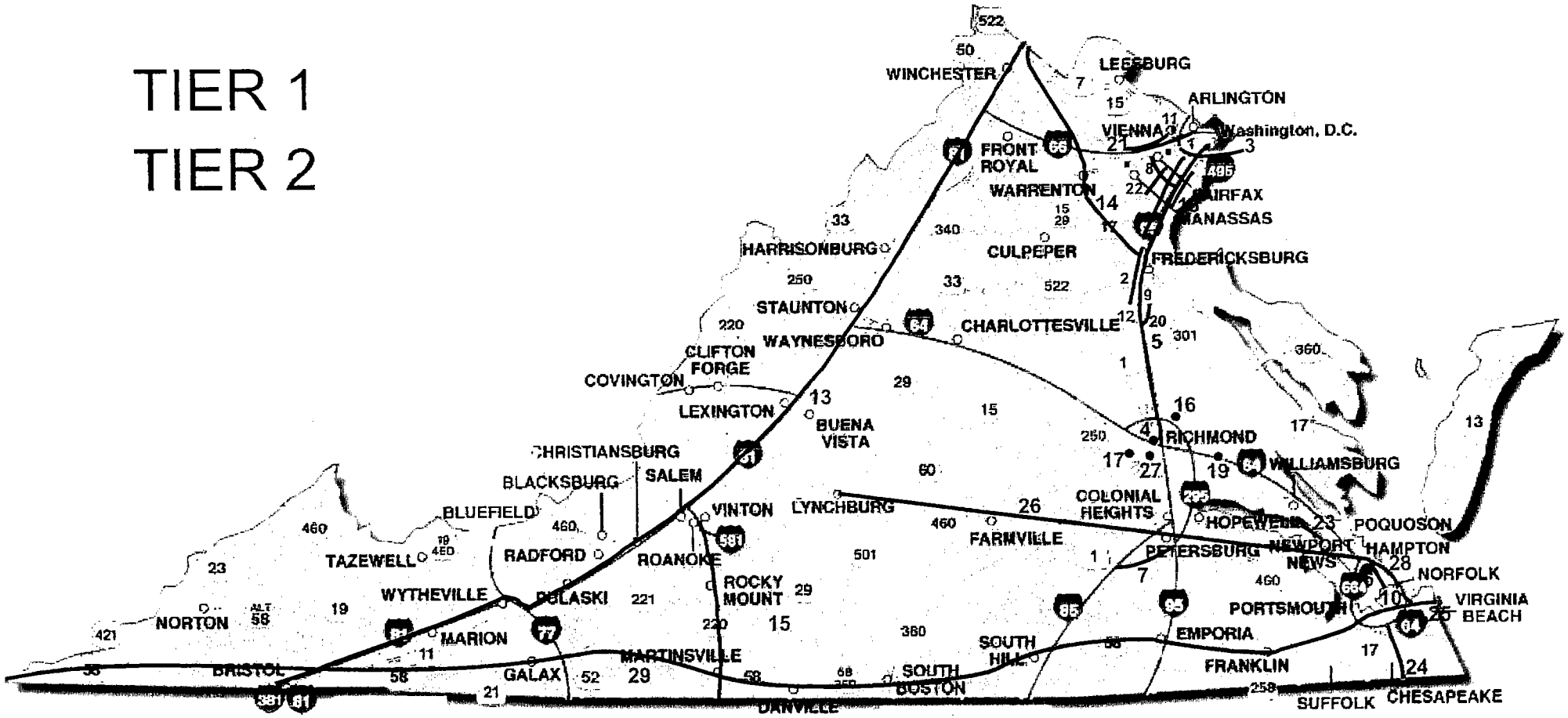
TIER 1

TIER 2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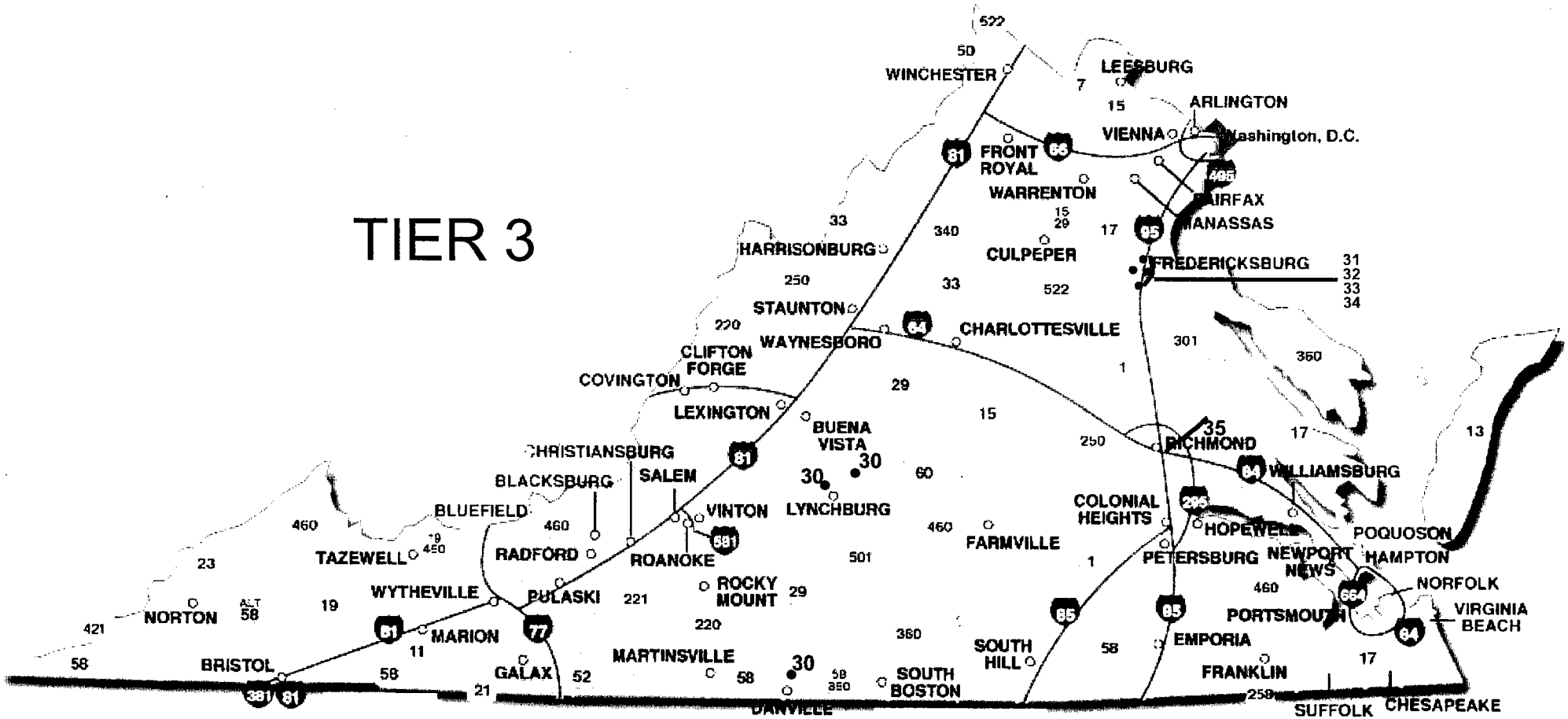
MANASSAS
HARRISONBURG
CULPEPER
FREDERICKSBURG
STAUNTON
CHARLOTTESVILLE
WAYNESBORO
CLIFTON FORGE
COVINGTON
LEXINGTON
BUENA VISTA
RICHMOND
WILLIAMSBURG
CHRISTIANSBURG
BLACKSBURG
SALEM
BLUEFIELD
VINTON
LYNCHBURG
COLONIAL HEIGHTS
HOPEWELL
POQUOSON
FARMVILLE
PETERSBURG
NEWPORT NEWS
HAMPTON
TAZEWELL
RADFORD
ROANOKE
ROCKY MOUNT
NORFOLK
WYTHEVILLE
PULASKI
PORTSMOUTH
VIRGINIA BEACH
NORTON
MARION
EMPORIA
SOUTH HILL
MARTINSVILLE
FRANKLIN
BRISTOL
GALAX
SOUTH BOSTON
DANVILLE
SUFFOLK
CHESAPEAKE

30. Third Tier	39	Bypasses	Southwestern VA	98
31. Third Tier	39	Germanna Highway	Northern VA	62
32. Third Tier	39	Mine Road	Northern VA	68
33. Third Tier	38	White Oak Road	Northern VA	60
34. Third Tier	33	I-95 Interchange	Northern VA	58
35. Third Tier	32	Route 360	Greater Richmond	74

TIER 3


WINCHESTER
LEESBURG
ARLINGTON
VIENNA
Washington, D.C.
FRONT ROYAL
WARRENTON
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FREDERICKSBURG
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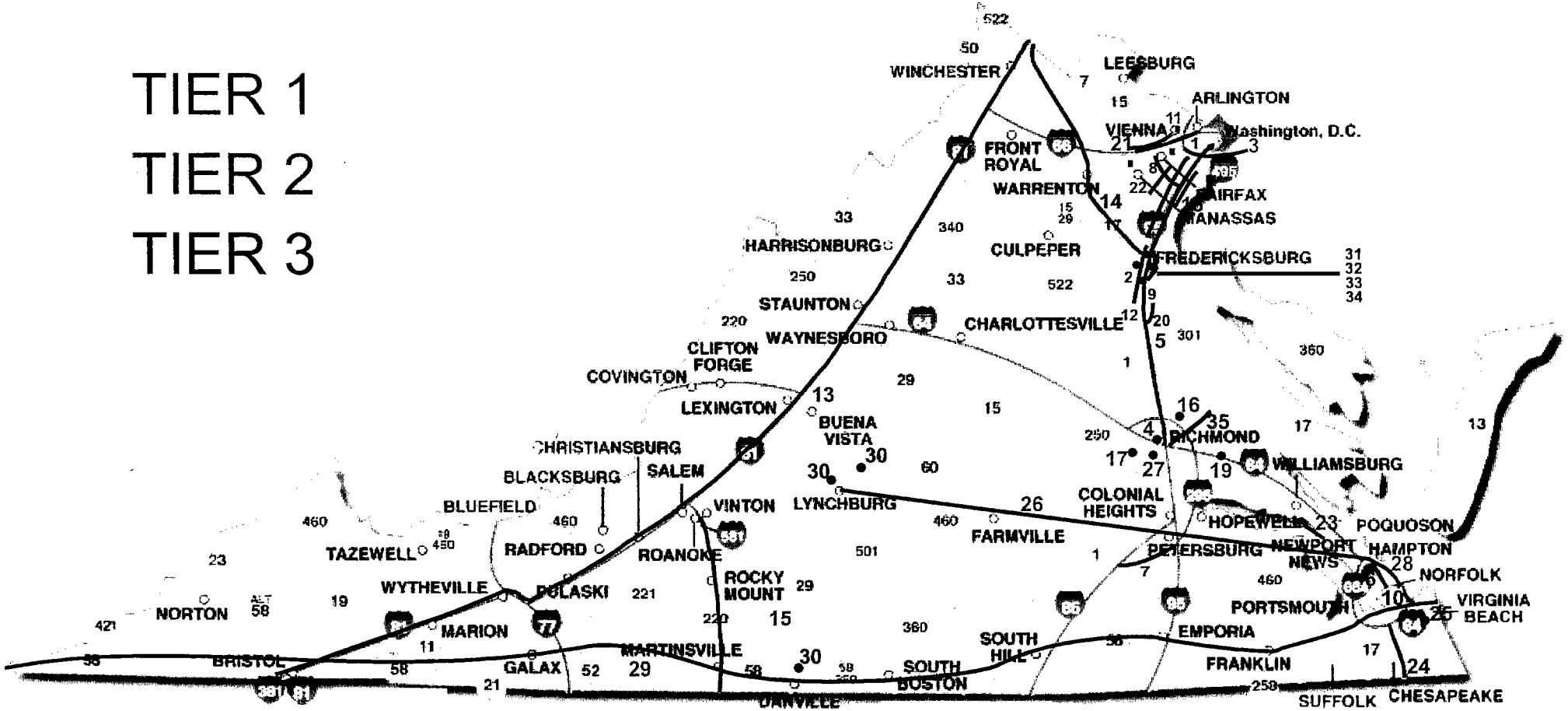
MARION
WYTHEVILLE
PULASKI
ROCKY MOUNT
BRISTOL
NORTON

Rank	SCORE	PROJECT	AREA	Page
1. First Tier	69	I-95/395/495	Northern VA	38
2. First Tier	65	HOV	Northern VA	64
3. First Tier	64	Woodrow Wilson Bridge	Northern VA	40
4. First Tier	63	Expansion of Public Transit	Greater Richmond	82
5. First Tier	58	High Speed Rail	Greater Richmond	80
6. First Tier	57	3rd Crossing	Hampton Roads	70
7. First Tier	56	I-895	Greater Richmond	94
8. First Tier	53	Fairfax County Parkway	Northern VA	42
9. First Tier	52	Outer Connector (Stafford/Spotsylvania)	Northern VA	54
10. First Tier	52	Light Rail	Hampton Roads	88
11. First Tier	52	Dulles Corridor (Transit)	Northern VA	44
12. First Tier	52	Layhill Road (Stafford)	Northern VA	66
13. First Tier	52	I-81	Western VA	104
14. First Tier	51	Western Bypass	Northern VA	48
15. First Tier	50	I-73	Western VA	102
16. Second Tier	49	Richmond International Airport	Greater Richmond	76
17. Second Tier	48	Route 288	Greater Richmond	72
18. Second Tier.	47	Route 1	Northern VA	52
19. Second Tier	46	I-64 East	Greater Richmond	84
20. Second Tier	46	Spotsylvania Parkway	Northern VA	56
21. Second Tier	46	Vienna/Cntrvle Metro	Northern VA	50
22. Second Tier	45	Route 123	Northern VA	46
23. Second Tier	45	Route 199	Hampton Roads	92
24. Second Tier	44	Southeastern Expressway	Hampton Roads	86
25. Second Tier	43	Great Bridge Bypass	Hampton Roads	96
26. Second Tier	43	Trans America Corridor	Hampton Roads	106
27. Second Tier	43	Main Street Station	Greater Richmond	78
28. Second Tier	41	I-64	Hampton Roads	90
29. Second Tier	40	Route 58	Southwestern VA	100
30. Third Tier	39	Bypasses	Southwestern VA	98
31. Third Tier	39	Germanna Highway	Northern VA	62
32. Third Tier	39	Mine Road	Northern VA	68
33. Third Tier	38	White Oak Road	Northern VA	60
34. Third Tier	33	I-95 Interchange (Stafford)	Northern VA	58
35. Third Tier	32	Route 360	Greater Richmond	74

TIER 1

TIER 2

TIER 3



Appendix D

REPORTS

Reports

1. Commonwealth of Virginia, "Revised Six-Year Improvement Plan", Fiscal Years 1998-1999 Thru 2003-2004.
2. "Transportation Improvement Program (TIP)" Fiscal Years 1999-2001, Roanoke Valley Area Metropolitan Planning Organization.
3. "Transportation Improvement Program (TIP)" Fiscal Years 1999-2001, Fredericksburg Area Metropolitan Planning Organization.
4. Fairfax County Chamber of Commerce, various transportation papers.
5. "Transportation Improvement Program (TIP)" Fiscal Years 1999-2001, Washington Metropolitan Council of Governments.
6. "Study of the Future of Transportation in Southwestern and Southside Virginia", Final Report, December 1996, Roanoke Regional Chamber of Commerce.
7. "Washington-Richmond Rail Corridor Study", prepared for the General Assembly.
8. "Report of the CEO Regional Transportation Summit", Regional Transportation Advocacy Board of the Greater Richmond Chamber of Commerce.
9. 'Report of the Commission on the Future of Transportation in Virginia", House Document No. 12. Commonwealth of Virginia, 1998.

Appendix E

Resumes

Stephen E. Blake
7817 O'Dell Street
Springfield, VA 22153
(703) 866-5575

EDUCATION:

1973-1974	UNIVERSITY OF NORTH CAROLINA, CHAPEL HILL, NC Masters program in Political Science
1969-1973	NORTH CAROLINA A&T STATE UNIVERSITY, GREENSBORO, NC Bachelor of Science Degree in Political Science

EXPERIENCE:

1995-1997	Basic Technologies International, Director, Transportation Group; Responsible for projects in the transportation planning, engineering and analysis areas; responsible for establishing contacts with the Federal Department of Transportation, state and local transportation agencies; serve as Team Leader for staff of six; PI on projects with the Federal Highway Administration and Federal Transit Administration.
1993-Present	President, Center for Transportation Training, Education and Research, Inc.; Responsible for development and operations of the corporation.
1990-Present	President, SEB Associates; Responsible for research, funding and operations of the firm. Clients have included; the U.S. DOT, the Transportation Research Board; Project Action of the National Easter Seals Society; SAIC, AMTRAK, and CompuCon Inc..
1994-1995	IVHS Consortium, Director of Federal Programs, Managed the federal contract to establish partnerships between minority educational institutions and the private sector in the area of intelligent vehicle highway systems research.
1993-1994	Transportation Research Board, Senior Program Officer NCHRP Program; Responsible for managing $4 million dollars of contracts in the planning, environmental and economics fields of transportation, established panels, selected contractors, monitored research and provided staff support for publication of research results.
1990-1992	Expert consultant to the Department of Transportation, Office of the Secretary, University Transportation Centers Program and the Federal Highway Administration.
1987-1990	Director of Research and Special Projects, National Association of Regional Councils. Responsible for developing and obtaining funding for all research activities engaged in by NARC in the areas of Transportation, Economic Development, Housing, Job Training, Financial Planning and Environment and Intergovernmental Policy.
1986-1987	Senior Program Officer, National Academy of Sciences, Transportation Research Board. Responsible for activities in Intergovernmental Relations and Policy Processes; Citizen Participation in Transportation Planning; New Transportation Systems and Technology; Air Quality; Noise Mitigation; Environmental Review; Expert Systems; Energy Conservation; Social and Economic Impacts of Transportation; and Transportation for the Transportation Disadvantaged.

1983-1986	Environmental Specialist, National Academy of Sciences, Transportation Research Board. Responsible for Environmental Quality and the Conservation of Resources area of research; assisting state and local personnel in defining research issues and disseminating research results.
1977-1983	Research Assistant, National Academy of Sciences, Transportation Research Board. Responsible for developing TRB's Environmental Activities and assisting staff in the areas of transportation and transit planning and administration.
1974-1977	Research Associate, National Academy of Sciences, Transportation Research Board. Responsible for developing TRB's activities in the Energy Conservation field. Assisted staff in manpower management activities.
1972-1973	Research Associate, North Carolina A&T State University, Transportation Institute. Responsible for research in the politics of transportation and transportation energy conservation.

SCHOLARSHIPS, AWARDS AND HONORS:

1997	North Carolina A&T State University, Transportation Institute, Distinguished Alumni Award
1987	TRB Staff Award for Outstanding Performance in the conduct of the Summer Intern Program
1987	DOT Outstanding Service Award from the Office of Civil Rights at UMTA, for Summer Intern Program, Summer 1986.
1973	University Graduate Fellowship to attend UNC-Chapel Hill

AFFILIATIONS:

Past Chairman, Entrepreneurial Services Council

Member, American Planning Association

Member, Committee on Intergovernmental Relations and Policy Processes, Transportation Research Board

Member, Steering Committee on Transportation Planning, Transportation Research Board

Member, Committee on Accessible Transportation and Mobility

APPOINTMENTS:

Member, Transportation Safety Board, State of Virginia, Appointed by the Governor

Past Member, Transportation Advisory Commission, Fairfax County, Virginia, Appointed by the Chairman of the Board of Supervisors

PUBLICATIONS AND PAPERS:

1997	"Preliminary Assessment of Options for Increasing Participation of Historically Black Colleges and Universities (HBCUs) in the Federal Railroad Administration Research and Development Program" January 1997
1996	"Zero-Based Regulatory Analysis of the Federal Motor Carrier Safety Rgulations", December 1996
1993	"Ranking Transportation Research Projects", Transportation Research Board, December 1993
1993	"Public Participation a Project Action Perspective", Project Action, NESS, April 1993
1993	"Facilitating the Implementation of Research Findings", Transportation Research Board, Spring 1993
1992	"Report on The Summer Intern Program for Diverse Groups"; Department of Transportation, February 1992
1991	"Examples of Exemplary Programs to Promote the Employment of Minorities and Women in Transportation"; Research and Special Programs Administration, January 1991
1990	"Evaluation of the Call 'N' Ride Demonstration Program for the District of Columbia"; for the District of Columbia, Office on Aging; September 1990
1990	"Intercity Minority Transit Needs in Accessing Suburban Employment Centers"; for the U.S. Department of Transportation, Urban Mass Transportation Administration, Office of Civil Rights, August 1990
1989	"Populations at Risk: Alleviating Social and Economic Disparities in Metropolitan Regions" study for the Ford Foundation; August 1989
1988	"Financial Planning for Transit Agencies and the Role of Metropolitan Planning Organizations"; for the U.S. Department of Transportation, Urban Mass Transportation; March 1988
1987	Public Private Partnerships in Transportation; for the U.S. Department of Transportation, Urban Mass Transportation Administration; Dec 1987
1986	Alternative Fuels for Transportation, TR News, No. 123, March-April 1986
1983	"Venturing into Uncharted Waters: Summer Minority Under-Graduate Intern Program in Transportation at TRB" TRNEWS No. 108, Sept.-Oct. 1983
1978	Transportation for Elderly and Handicapped Persons: National Research Council Report, 1978

PROJECTS MANAGED

PROJECT LIST

Zero-Based Analysis of the Federal Motor Carrier Safety Regulations

Macroeconomic Analysis of the Linkages Between Transportation Investment and Economic Performance

Measuring the Relationship Between Freight Transportation Services and Industry Productivity

Tourism Travel Contributions to Economic Development

Transportation Investment and Economic Productivity Research

Economic Trends and Transportation Requirements

Characteristics and Changes in Freight Transportation Demand

Long Term Availability of Multimodal Corridor Capacity

Innovations in Multimodal Transportation Planning

Multimodal Transportation Planning: Framework for a Performance-based Process

Integration of Land Use Planning with Multimodal Transportation Planning

Develop and Maintain Partnerships for Multimodal Planning

Transportation Investment and Economic Expansion: Case Studies

Support for Implementing the Clean Air Act Amendments of 1990

Development of a Multimodal Framework for Freight Transportation Investments

Guidelines for the Development of Wetland Replacement Areas

Remote Sensing and Other Technologies for the Identification and Classification of Wetlands

Improving Transportation Data for Mobile Source Emissions Estimates

Impact of Highway Capacity Improvements on Air Quality and Energy Consumption

Estimating the Indirect Effects of Proposed Transportation Projects

Modal Emission Factor Development

ALAN E. PISARSKI

BUSINESS AND PROFESSIONAL EXPERIENCE

EXPERIENCE

Current Activities: For the last 12 years Mr. Pisarski has served as an independent consultant. Services are provided to public and private clients in areas related to travel behavior, transport policy, tourism analysis and data development. Many of his studies have proven to be landmark events guiding national policy and legislative change. Significant undertakings have included:

- Support to the Office of the Secretary, U.S. DOT, in the evolution and development of the National Transportation System initiative of Secretary Peña, current.
- Preparation of a performance indicators data set for the Office of Technology Assessment of the U.S. Congress to assist in a review of U.S. national policy issues in Metropolitan transportation.
- Preparation of a review of the finanical investment and revenue condition of the nation's transportation system for AASHTO to address upcoming national legislation in the Congress.
- Preparation of a study of the demographic factors relating to future Intelligent Transportation Systems alternatives for the Intelligent Transportation Society of America, 1995 .
- Principal in the preparation of the Trucking Industry Size Study for USDOT, a study establishing the statistical basis for defining the size and character of the trucking industry, 1995.
- Assistance in design and preparation of the first, second and third Transportation Statistics Annual Report to Congress mandated by ISTEA., 1993-1994 and 1995.
- Design and content advisor for the 1995 National Personal Transporation Survey, NPTS, current.
- Design and content advisor for the 1995 American Travel Suvey, the first public national travel survey since 1977 current.
- Design and content advisor to the U.S. DOT and Bureau of the Census regarding the 1993 Commodity Flow Survey, CFS.
- Preparation of a study of comparative mobility characteristics for the U.S. and other countries; for the Federal Highway Administration contribution to the Permanent International Association of Road Congresses, PIARC. Sept. 1994
- Preparation of a set of Transportation Performance Indicators for the World Tourism Organization, WTO, for adoption by the United Nations to mandate world-wide reporting., July 1994
- Preparation of a broadly-distributed document "Emerging Travel Trends" for U.S. DOT, FHWA, 1994
- Preparation of a review and recommendations for transportation needs in the year 2000 Census, TRB, 1994. This is the third decennial review prepared for TRB starting with the 1970 Census.
- Conduct of a review and report of site visits to major European Travel Survey activities including England, France, Germany, Netherlands, Denmark and Sweden.
- Content advisor to a 4 hour major national public television series on transportation history, trends, and future prospects. June 1994 .
- Preparation of a study on the character of the National Highway System for the Competitiveness Policy Council. June 1994
- Preparation of a study, based on the NPTS, of the aging of the U.S. vehicle fleet, Feb. 1994

6501 Waterway Drive • Falls Church, Virginia 22044 • USA • (703) 941-4257 • Fax (703) 941-5086

- Preparation of *"An Introduction to Urban Goods Movement Planning Issues,"* for FHWA, National Association of Regional Councils, and the American Trucking Associations, 1993.
- Preparation of *"A Review of Contemporary Transportation Infrastructure Studies,"* for the Competitiveness Policy Council, a congressionally mandated agency, 1992.
- Member of NCHRP research team establishing tourism planning requirements and recommendations for State-wide planning, 1992-present.
- Advisor and facilitator for a Wisconsin DOT business community conference on State Freight Planning Needs and Goals, to support the State Plan 1992
- Preparation of *"Travel Behavior Issues in the 90's,"* a review and analysis of key findings of the 1990 NPTS, National Personal Transportation Survey, for FHWA, 1992.
- Preparation of *"New Perspectives in Commuting"* based on early data from the decennial census, for FHWA, 1992.
- Advisor to the National Academy of Sciences, Transportation Research Board Task Force on Strategic National Data Requirements for the U.S. DOT. Their report, *Special Report 234*, has had significant bearing on the formation of the Bureau of Transportation Statistics in the ISTEA legislation, January 1992.
- Preparation of the intercity transportation chapter for the planning manual of the Institute of Transportation Engineers, 1992.
- Preparation of the design for a world standard statistical classification of tourism activities, linked to the International Standard Industrial Classification, ISIC, for the World Tourism Organization. Presentation of recommendations to 91 country delegations at World Tourism Statistical Congress, Ottawa Canada, May 1991. After briefing United Nations' Regional Commissions preparatory to presentation to the U.N. Statistical Commission in 1992, this document was approved by the Commission in February 1993, and is now a world standard on a provisional basis pending final completion.
- Consultant to the U.S. Bureau of the Census preparing broad scale comments and recommendations on all survey matters related to transportation data collection within the agency.
- Preparation of *"Travel Demand in the 1990's"* for the Highway Users Federation. Jan. 1991. Presented in testimony to the United States Senate in hearings on the renewal of surface transportation legislation, ISTEA February 1991.
- Preparation of *"Commuting in America,"* a study of changing metropolitan commuting patterns, for a consortium of public interest associations, published by the Eno Foundation. The study brings together data from past decennial censuses on national population, employment and commuting trends, 1988. *"Commuting in America II"* is currently in development.

1983-1990 - Consulting Activities

- Participation in the National Transportation Policy Study Team of the U.S. DOT in the preparation of the Secretary's Statement of National Transportation Policy. Preparation of chapters on national demand for travel and international comparisons in supporting document *"National Transportation Strategic Planning Study,"* Feb. 1990.
- Preparation of *"The Bottomline,"* an assessment of surface transportation investment requirements, for the American Association of State Highway and Transportation Officials as part of the 2020 Transportation Consensus Program.
- Preparation of *"Highways, Streets and Bridges,"* an analysis and recommendations concerning national highway needs, financing and policies. For the National Council on Public Works Improvement as input to their Congressional recommendations.
- Role as advisor, policy and statistical consultant to the Eno Transportation Foundation, Inc. Prepared an annual review of transportation policy issues, managed the automation process for their annual statistical report, chaired a blue ribbon committee that prepared recommendations for future resource allocation and program priorities of the Foundation.

- Preparation of a summary and recommendations document for making improvements to national urban congestion monitoring capability, based on the activities of a workshop group assembled by FHWA, Sept. 1990.
- Preparation of a study of urban transportation's relationship to economic development and productivity, for the Transportation Research Board, NRC, NAS.
- Preparation of recommendations on the redesign of the 1990 Decennial Census to enhance its transportation applications. For the Transportation Research Board, National Research Council, National Academy of Sciences.
- Development of recommendations for a long range highway policy planning process for a major transportation association.
- Consulting assistance to the city of Shanghai, China, under the auspices of the U.S. Department of State, in developing a long range comprehensive transportation planning program.
- Management of an annual conference to review the preceding year in travel and tourism for the Travel and Tourism Research Association.
- Preparation of an inventory of available tourism-related statistical sources, with accompanying identification of opportunities for improvements in data coverage and quality, for the U.S. Travel and Tourism Administration. Updated and expanded with assistance of the European Tourism Commission and now in U.S. publication.
- An assessment of statistical agency changes in recent years for a Congressional Research Service Congressional Committee Report. Agencies covered were the Interstate Commerce Commission, Civil Aeronautics Board, and National Highway Traffic Safety Administration.
- Preparation of research recommendations on urban design, land development, and transportation relationships. For the Urban Land Institute.
- An evaluation of transportation service sector data availability and requirements, focused on the changes brought about by deregulation. Findings and Recommendations were prepared as part of an overall assessment of the service sectors of the economy, prepared for the Bureau of the Census by the Committee on National Statistics, NRC, NAS.
- A series of studies of world-wide truck taxation policies for a major transportation association. Truck taxation methods were examined in terms of their relationship to economic principles of allocation of road costs to users. Weight-Distance taxation methods in several countries were highlighted. The capability of new technologies, e.g. on-board vehicle monitoring systems, road-side systems for classifying and weighing trucks in motion, and electronic systems for identifying trucks in motion were examined.
- An assessment of present methods for surveying and forecasting employment for the airline transportation equipment manufacturing industry. New surveying and forecasting methods have been recommended to improve accuracy and quality.
- Reconnaissance of research policy issues and development of a work plan for the Strategic Transportation Research Study (STRS) of the Transportation Research Board, NRC, NAS. The purpose of the undertaking was to establish a policy framework for identifying high payoff research opportunities in the transportation sector.

1979-1983: Vice President and Manager of the Washington, D.C. office of Gellman Research Associates, a division of Harbridge House. Among the major activities undertaken at GRA were the following:

- A statement of national transportation policy for the National Chamber Foundation of the U.S. Chamber of Commerce entitled *"Transport Tomorrow: What Must Be Done."*
- A compilation and analysis of freight transportation investment requirements bringing together disparate investment needs projections for all freight modes. For the U.S. DOT.
- A study of the ability of U.S. international air carriers to compete in foreign markets in the light of foreign restrictive trade practices. For a major association.
- An assessment of the economics and cost structure of coal slurry pipelines construction and operation. For a major association.

- A reconnaissance of national infrastructure needs and issues. Prepared for the Transportation Research Board, NRC, NAS.
- An assessment of the comparative energy characteristics of alternative transit investments for the Colorado State Legislature.

1978-1979: Deputy Director for Policy Integration in the National Transportation Policy Study Commission, a joint Presidential -Congressional Commission preparing policy recommendations for the nation's transportation system through the year 2000. Served as leader of the urban policy team, intercity passenger policy team, and member of the national policy team. Prepared the chapters in the Commission's final report on: the supply of transport services; the transportation policies of other countries; future capital requirements; the future price of transportation; and emerging transportation issues, as well as other products of the Commission.

1969-1978: Served in positions of increasing responsibility in the Office of the Assistant Secretary for Policy and International Affairs, Office of the Secretary, U.S. Department of Transportation.

- While Deputy Director, Office of Transportation Planning, the major product of the Office was the publication, *National Transportation: Trends & Choices*, described as the first comprehensive national transportation planning document in U.S History. Responsibilities included all passenger and urban aspects of the program.
- As Chief of the Information Division, and later as Special Assistant for Information Policy to the Assistant Secretary, responsible for providing statistical information to all Secretarial Officers for support of policy decision-making. Coordinated the Department's activities in the design and development of a comprehensive statistical program.

1966-1969: Chief of Data Collection and Analysis, Metropolitan Washington Council of Governments. Designed and completed a full battery of urban travel surveys of passenger and freight activity, demographic and land use inventories as input to the regional plan.

1962-1966: Assistant to the Technical Director, Tri-State Transportation Commission. Organized and managed large scale passenger and freight survey operations.

Education

1965: Queens College,City University of New York, B.A., Joint Degrees in Sociology and Economics

1967: BPR Urban Planning Certificate

Teaching Experience

Guest Lecturer, Transportation Executive Institute, Univ. of Va., Charlottesville, annual
Guest Lecturer, School of Travel & Tourism, Geo. Wash. Univ.
Instructor, Graduate Program In Urban Planning, Univ. of Virginia
Guest Lecturer, School of Engineering, Geo. Wash. Univ.
Guest Lecturer, Seminar in Transportation, Princeton Univ.
Guest Lecturer, Graduate School of Engineering, Univ. of Va.

Honors

Secretary's Superior Achievement Award, 1977
Secretary's Distinguished Service Award, 1975
Assistant Secretary's Special Achievement Award 1974
Honors Program in Human Ecology, Queens College 1965

Professional Activities

Member, Division A Council National Academy of Sciences, TRB, present

Chairman, Group 5 Council, National Academy of Sciences, TRB, present

Member, Group 5 Council, National Academy of Sciences, TRB, 1991-1995

Chairman, Task Force on Scenic Highways and Tourism, National Academy of Sciences, TRB, 1988 -1994.

Member, TCRP Panel- Understanding Transit Markets of the future 1994 - present

Member, TCRP Panel Transit Involvement in Suburb to Suburb Commuting 1994 - present

Member, National Academy of Sciences, Committee on TRB Travel Behavior and Values

Panel member, Expert Task Group, Traffic Data Collection, SHRP, 1990 - present.

Chairman, National Academy of Sciences, TRB Comm. on Transportation Information Systems and Data Requirements 1982-1990.

Chairman, National Academy of Sciences, NCHRP Panel on Forecasting the Inputs to Transportation Planning, January 1989-1990.

Chairman, The Travel and Tourism Research Association, Washington DC Chapter, 1987

Chairman, National Academy of Sciences, TRB Steering Committee on Transportation Data Needs, 1979-1981

Member, Transport Policy Committee, American Planning Association, 1978-1982

Transportation Representative, National Academy of Sciences, Assembly of Behavioral and Social Sciences, AD-Hoc Group on Population Problems, 1977

Member, National Academy of Sciences, TRB Task Force on Urban Data Requirements, 1976

Member, American National Standards Institute, Committee on Geographic Codes and Standards, 1971-1976

Member, Population Research Committee, National Institute of Health, 1973-1977

International Activities

- Lecturer in the conduct of a seminar in tourism statistics for Middle Eastern nations; attended by 7 countries. Damascus 1995
- A statistical reconnaisance and recommendations regarding border statistics and the tourism statistical system of the Kingdom of Jordan Oct. 1995
- Lecturer in the conduct of a seminar in tourism statistics for Central and Eastern European nations; attended by 17 countries. Warsaw 1995
- Preparation of a set of Transportation Performance Indicators for the World Tourism Organization, WTO, for adoption by the United Nations to support world-wide reporting., July 1994
- Preparation of a study of comparative mobility characteristics for the U.S. and other countries; for the Federal Highway Administration contribution to the World Road Association , Permanent International Association of Road Congresses, PIARC. Sept. 1994
- Lecturer in the conduct of a world seminar in tourism accounts in national systems of accounts, Vienna, June 1994
- Conduct of a review and report of site visits to major European travel survey activities including England, France, Germany, Netherlands, Denmark and Sweden, 1994.
- Comparative review of world road investment policies, contrasting six selected nations approaches to U.S. policies, 1994.
- Representative of the World Tourism Organization in meeting of U.S., Mexico, and Canada to consider NAFTA issues of border crossing statistics and balance of payments, 1993, Aguascalientes, Mexico .
- Prepared design for a world standard classification of tourism activities, linked to the International Standard Industrial Classification for the World Tourism Organization. Presentation of recommendations to 91 member country delegations at World Tourism Statistical Congress, Ottawa Canada, May 1991. Current advisor to World Tourism Organization regarding implementation of standard approved by the United Nations' statistical commission in 1993. Implementation will involve world-wide seminars and development of a tracking system.
- Advisor to Shanghai Metropolitan transportation planning agency regarding planning capabilities and institutional development. For the World Bank
- Preparation of a survey of world taxation methods to support surface transportation, NCHRP.
- "The U.S. Highway System in an International Context," article in Routes/Roads magazine, Permanent International Association of Road Congresses, PIARC. March 1992
- Participation as member of U.S. delegation to Ditchley Foundation seminar on international transportation issues, Oxford, U.K. Nov. 1991.
- Preparation of chapter entitled "International Comparisons" in supporting document National Transportation Strategic Planning Study, as part of the U.S. DOT National Transportation Policy Study, Feb. 1990.
- Initiation of a world-wide transportation performance measurement system for the World Bank, 1988
- Preparation of a report on data sources regarding U.S. travel activity for the European Tourism Commission, 1988
- A chapter on international experience in forming national highway policies in the study Highways, Streets and Bridges for the Council on Public Works Improvement, 1987
- Assistance in the design of a comprehensive transportation planning process for the Shanghai metropolitan area, 1986
- A paper and speech presented to the National Conference on Highway Finance covering the highway finance processes of major countries, 1986

- A Survey of World Taxation Policies Toward Trucking, 1983
- A Study of European Modal Split Policies in Transportation, 1978
- A Survey of Selected European Transport Policies, 1977
- U.S. Delegation, United Nations ECE, Ad-Hoc Meeting on Transport Development Trends, 1978
- U.S. Delegation, Chairman, United Nations, ECE Group of Experts on Transportation Statistics, 1970-1977
- Main Rapporteur, Chairman, United Nations, ECE Group of Rapporteurs on Energy Statistics for National Transport System, 1975-1977
- Address to Spanish National Academy of Sciences, "Transportation Policy Change in the U.S.", 1976
- Project Designer and Manager - U.S. National Academy of Sciences, program to establish potential for international cooperative research in energy use in transportation, including a reconnaissance of European transport energy policies, 1975
- Transportation Representative to Interagency Committee on International Cooperation in Research and Development; Bureau of International Scientific Affairs, U.S. Department of State, 1973- 1975
- U.S. AID Urban Plan and Investment Study for Santiago, Chile, 1969

Recent Publications, Papers, and other Media

MEDIA

Content advisor to International television series on world transportation for a consortium of public television agencies, current.

Content advisor to a 4 hour major national public television series on transportation history, trends, and future prospects. June 1994 .

Appearances on ABC's "Nightline" and CBS's 20/20 regarding national commuting problems, 1987

Numerous speeches, press conferences regarding national transportation issues. Work has appeared and been quoted in all major national newspapers and magazines.

Radio appearances on NPR, other national networks and individual stations regarding national transportation problems

Twenty or more radio talk shows regarding the fifty-five mph national speed limit.

MAJOR PUBLICATIONS

"*Commuting in America II*" for a consortium of public agencies and associations, forthcoming

"*Comparative Mobility*" for the Permanent International Association of Road Congresses, Special issue, 1995

"*The Demography of the Automobile*" for U.S. DOT, FHWA, Aug. 1995

"*An Introduction to Urban Goods Movement Planning Issues,*" for FHWA, National Association of Regional Councils, and the American Trucking Associations, 1993.

"*A Review of Contemporary Transportation Infrastructure Studies,*" for the Competitiveness Policy Council, a congressionally mandated agency, 1992.

"*Travel Behavior Issues in the 90's,*" a review and analysis of key findings of the 1990 NPTS, National Personal Transportation Survey, for FHWA, 1992.

"*New Perspectives in Commuting*" based on early data from the decennial census, for FHWA, 1992.

Preparation of the intercity transportation chapter for the planning manual of the Institute of Transportation Engineers, 1992.

Travel Demand in the 1990's, Highway Users Federation, January 1991.

Introduction and Overview to: Special Report 231 Transportation, Urban Form, and the Environment, Trans. Res. Board, NAS/NAE, 1991

"*Transportation Investment and Metropolitan Economic Development*" A Reconnaissance of Research Availability and Requirements, Trans Res. Board, October 1990

National Urban Congestion Monitoring - Summary and Recommendations FHWA, September 1990

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United States Outbound Travel Statistics Sourcebook, Runzheimer International, 1988

"*Keeping America Moving - The Bottomline,*" American Association of State Highway and Transportation Officials, 1988

"Commuting in America", ENO Foundation 1987

The Nation's Public Works: Report on Highways, Streets, Roads and Bridges, National Council On Public Works Improvement, 1987

"Transportation Planning in Shanghai", TR NEWS #129, 1987

"A Look Ahead At Transportation Issues", AASHTO Quarterly, Vol 64, Number 4, Oct. 1985

"Deep-six 55", REASON Magazine, November 1985

"Recommendations and Summary", Proceedings of the National Conference on Decennial Census Data for Transportation Planning, Special Report 206, TRB, December, 1985

"Critical Data Issues and Opportunities", TR News, No. 115, TRB, November-December 1984

"A Survey of World Experience with Truck Weight-Distance Taxation Systems", AASHTO QUARTERLY, Vol. 63, July 1984

Transportation Chapter, The Federal Statistical System, 1980 to 1985, Congressional Research Service, Committee on Government Operations, U.S. Congress, 1984

Statistics for Transportation, Communication, and Finance and Insurance, National Academy Press, Committee on National Statistics, 1984

Transport Tomorrow: What Must Be Done, Published by the National Chamber Foundation, U.S. Chamber of Commerce, 1982 - Radio appearance on WAMU talk show regarding *Transport Tomorrow*.

Transportation Chapter, *The Annals: America Enters the Eighties: Some Social Indicators*, Annals of the American Academy of Political and Social Science, Vol. 453, Jan. 19 January 1981

Changes in the U.S, International Market 1970-1980, Chapter in *Airline Economics*, Lexington Books, 1981

"European Modal Split Policies", Staff Working Paper No. 23, NTPSC, 1979

"Selected Transport Policies of Developed Countries", Staff Report No. 5, NTPSC, 1979

"Institutional Impediments to Comprehensive Data Collection", Prepared for TRB Committee on Data Requirements, 1978

"Preserving Mobility in an Energy Scarce Society", Invited Paper, Transportation Seminar, Graduate School of Planning, Princeton University, October 1977

(With Arthur L.Webster III and Staff), *National Transportation: Trends And Choices*, U.S. DOT, 1977

(With Niels DeTerra), "Transport Energy Demand In Europe and America", Issue No. 4, International Journal of Transportation, 1975

(With Wilbert Cantey) "Data Required for Railroad Research", *Railroad Research Study* Background Papers, National Academy of Sciences, July 1975

"Transportation Data Requirements for Energy Planning" Invited paper for 19th Meeting of Group of Experts on Transport Statistics, ECE, UN, English, French, and Russian, January 1975

(With James R. Murray, et al) "Evolution of Public Response to the Energy Crisis", *Science Magazine*, Special Energy Issue, April 1974

"Urban Data Requirements", Conference on Urban Planning, Office Of Management and Budget, White House, 1972

"Recommendations and Summary", *Census Data and Urban Transportation Planning*, Special Report 145, National Academy of Sciences, TRB, 1973

(With G.V. Wickstrom) "The use of Longitudinal Information Systems in Transportation Planning", CDC Journal, 1970

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CIVIL ENGINEER AND TRANSPORT ECONOMIST
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PROFESSIONAL OBJECTIVE

To explore the relative roles and potentials of the public and private sectors in societies seeking economic growth.

QUALIFICATIONS

B.Sc.(Hons.)(Engineering), Imperial College, London, 1948.

M.A.(Hons.)(Economics), University of Cambridge, 1954.

Member of the Institution of Civil Engineers.

Member of the Chartered Institute of Transport.

EMPLOYMENT

Consultant on private sector roles in development: assignments included:

- In 1989, **review for the Urban Mass Transportation Administration of the possibilities of private financing of public transport in US cities;**
- In 1989, study, for The World Bank, on the status of privatization research;
- In 1989, review, for The International Center for Economic Growth, of the prospects for privatizing infrastructure services in Argentina;
- In 1990, review, for USAID, of the prospects for the privatization of infrastructure and utilities in Thailand;
- In 1990-91, **participation in seminars in Poland, financed by the UNDP, on the private provision of bus public transport** and other public services.
- In 1990-92, review and preparation of two "Occasional Papers", for the Inter-American Development Bank, of privatization of transport services in Latin America, with special reference to privatization activities in roads, railroads and ports in Mexico and Argentina;
- In 1992, review, for USAID, of the possibilities of privatizing the maintenance of road maintenance equipment in Indonesia.
- In 1993, review, for the International Institute, USDA Graduate School, of possibilities of upgrading economics courses at the Tashkent State University for Economics, Tashkent, Uzbekistan.
- In 1994, participation in a B-O-T workshop in Hanoi, financed by UNIDO and UNDP, advising staff of the State Committee for Co-operation and Investment how to attract private capital for the improvement of public infrastructure.

  review, for the Government of New Zealand, proposals to commercialize road systems in New Zealand.

  review, for the Government of Sri Lanka, of the operations of private and 'Peoplised' buses in Sri Lanka.

  review, for USAID, of the progress of infrastructure privatization in Sri Lanka.
- In 1995, Assist in a review, for the Inter-American Development Bank, of infrastructure in ten Caribbean countries, and the possibilities of improvement, using private sector forces.
- In 1996, Advise on the preparation, by Louis Berger International, of the economic evaluation for the proposed 35-mile bridge to connect Uruguay to Argentina.

President of The Services Group. a non-profit consultancy specializing in market-oriented approaches to economic development. **Specific responsibility for work in the transportation sector, which included assistance to US local authorities to enable independent transit operators to group together to provide route service**; economic advice to World Bank financed Study on Vehicle Fleet Modernisation and Road Use Charges in India (including a review of experience with operation of Heavy Vehicles in the USA); assistance to Government of Jordan to privatize and reorganize bus services in Amman; and participation in the development of non-stop toll collection in the Washington, D.C. area. (1986 to 1989).

Economist in the Studies Division of the Economic Development Institute of the World Bank. engaged in writing a book on "**Private Provision of Public Services in Developing Countries**", the services covered being education, electricity supply, health, telecommunications, **urban transport** and water supply. (1984 to 1986).

Lecturer in the Economic Development Institute of the World Bank. organized and directed its first course on urban transport; Teaching and directing courses and seminars for officials from developing countries in Washington DC, Kenya, Sri Lanka, Thailand and Turkey. (1979 to 1983).

Transport Economist in World Bank specializing in pricing, regulation, forecasting and urban issues; working on (inter alia) transport sector reviews in Bangladesh, Korea, Nigeria, and Papua New Guinea; and **Urban transport in Bangkok, Bogota, Caracas, Kuala Lumpur, Manila, and Singapore.** The urban transport work included design and supervision of a road pricing study for Caracas, comparisons of mass transport modes in Bangkok and Singapore, and the development of simplified procedures (pioneered by Yacov Zahavi) to forecast modal splits. (1967 to 1979).

Transport Economics Consultant, advising bus companies, urban planners, the British Road Federation, and (as a member of the team reviewing the transport sector in the Eastern Region of India) the World Bank. (1963 to 1967).

Research Officer at the Department of Applied Economics, University of Cambridge, investigating the Economics of Car Parking. Served on a Ministry of Transport Committee investigating the economic and technical possibilities of pricing the use of congested urban roads. (1959 to 1963).

Rees Jeffreys Fellow at the UK Road Research Laboratory, investigating the Economic Benefits from Road Improvement. (1956 to 1959).

Engineer in the Dock and Harbour office of Sir William Halcrow & Partners, Consulting Civil Engineers, London. (1952 to 1956).

PROFESSIONAL AFFILIATIONS

Founder and first chairman, Workgroup on *Private Sector Roles in Development*, Society for International Development, Washington DC Chapter.

Board Member, Local Government Center of the Reason Foundation, Los Angeles, California.

Adjunct Scholar, the Independent Institute, Oakland, California.

Honorary Corresponding Member, Academia de Ciencias, Invencion, Ingenieria e Investigacion. Mexico.

PRINCIPAL PUBLISHED WORKS OF GABRIEL ROTH

1965 "Paying for Parking". *Hobart Paper* No. 33, Institute of Economic Affairs, London.

1966 "A Self-Financing Road System". *Research Monograph* No. 3, Institute of Economic Affairs, London.

1967 "Paying for Roads: The Economics of Traffic Congestion". Penguin Books Ltd., Harmondsworth.

1969 "The Pricing of Road Transport Services in Developing Countries". *Highway Research Record* No. 296, Highway Research Board, Washington DC.

1970 "Traffic Congestion as a Source of Revenue". Traffic Quarterly, Eno Foundation, Saugatuck, Conn., April 1970.

1973 "The Regulation of Buses in Cities". *Highway Research Record* No. 476, Highway Research Board, Washington DC.

1977 "World Bank Lending for Urban Transport: Illustrated by an Urban Transport Project in Kuala Lumpur, Malaysia". *Traffic Engineering & Control*, London, January, 1977.

1979 "Economics of a Unified Transportation Trust Fund". *Transportation Research Record* No. 731, Transportation Research Board, Washington DC.

1980 (With Y. Zahavi) "Measuring the Effectiveness of Priority Schemes for High-Occupancy Vehicles". *Transportation Research Record* No. 770, Transportation Research Board, Washington DC.

1981 (With Y. Zahavi) "Travel Time 'Budgets' in Developing Countries". *Transportation Research*, January 1981.

1982 (With George Wynne) "Free Enterprise Urban Transportation". Volume 5 in the series *Learning from Abroad*, Council for International Urban Liaison, Washington DC.

"Road Pricing and Financing". Chapter contributed to *Roads and the Private Sector*, Adam Smith Institute, London.

(With Eamonn Butler) "Private Road Ahead - Ways of Providing Better Roads Sooner". Adam Smith Institute, London.

1983 (With John Semmens) "The Road to Privatization of Highway Facilities". Proceedings - Twenty-fourth Annual Meeting, *Transportation Research Forum*, Volume XXIV, No. 1, Richard B. Cross Company, Oxford, Indiana.

1984 "Improving the Mobility of the Urban Poor". Chapter contributed to *Basic Needs and the Urban Poor*, International Labour Office, Geneva.

1985 "The Overseas Experience". Chapter contributed to *The Private Challenge to Public Transportation*, Pacific Institute for Public Policy Research, San Francisco.

"The Role of the Private Sector in Providing Water in Developing Countries". *Natural Resources Forum*, Vol.9, No.3, August 1985, United Nations, New York.

1987 (With Ian Catling) "Electronic Road Pricing in Hong Kong - an Opportunity for Road Privatization?" Paper presented to the Transportation Research Board conference on "Roles of Private Enterprise and Market Processes in the Financing and Provision of Roads", *Transportation Research Record* No. 1107, by the Transportation Research Board, Washington DC).

"Private Sector Alternatives in Urban Transportation". Report No. 125, National Center for Policy Analysis, Dallas, Texas, January 1987.

"The Private Provision of Public Services in Developing Countries". Oxford University Press (New York) for the World Bank, Washington DC, March 1987.

"Airport Privatization". Contribution to *Prospects for Privatization*, edited by Steve H. Hanke for the Academy of Political Science, New York, October 1987.

1988 "Private Provision of Government Services", paper delivered at the Cato Institute and Fudan University conference *Economic Reform in China: Problems and Prospects*, Shanghai, September 1988. Proceedings published by the University of Chicago Press. 1990.

"Private Sector Roles in Urban Public Transport". Contribution to *Private Innovation in Public Transit*, edited by John C. Weicher, American Enterprise Institute, Washington, D.C.

1989 "Privatization of Public Services in Latin America". Paper presented to the International Privatization Forum in Bogota, April 1989.

"The Private Provision of Public Roads". Selected Proceedings of the Fifth World Conference on Transport Research (Yokohama, July 1989), Western Periodicals Company, Ventura, California.

1990 "The Private Provision of Public Services". Paper for the 1990 International Privatization Congress, Saskatoon, Saskatchewan, May 1990.

"Perestroika for U.S. Highways: Managing Roads for a Free Society". Reason Foundation *Policy Insight* No. 125, Los Angeles, California, November 1990.

1991 "Pricing, Financing and Ownership of Roads in a Free Society". Paper for the 2nd International Conference on Privatization and Deregulation in Passenger Transportation, Tampere, June 1991.

1992 (With John Hibbs) "Tomorrow's Way: Managing Roads in a Free Society". Adam Smith Institute, London.

"Port Regulations: Are they really necessary?" Paper presented at Seminar on Deregulation Policies, Instituto Tecnologico Autonomo de Mexico, Mexico City, March 1992.

1995 (With John Diandas) "Alternative approaches to improving route bus services in Sri Lanka". Paper for the 4th International Conference on Competition and Ownership in Land Passenger Transport, Rotorua, July 1995.

"Should the Federal Highway Trust Fund be Reauthorized?", *Transportation Quarterly*, Vol. 49, No.4, Fall, pp 5-14, Eno Transportation Foundation, Lansdowne, VA.

1996 "Roads in a Market Economy", Ashgate Publishing Ltd., Brookfield, Vermont, January.

"... a wise and frugal government, which shall restrain men from injuring one another, shall leave them otherwise free to regulate their own pursuits of industry and improvement, and shall not take from the mouth of labor the bread it has earned. This is the sum of good government, and this is necessary to close the circle of our felicities."

Thomas Jefferson

1801

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