

ROANOKE VALLEY AREA
2020 LONG-RANGE TRANSPORTATION PLAN

Adopted August 24, 2000

ROANOKE VALLEY AREA
MPO METROPOLITAN
P L A N N I N G
ORGANIZATION

ROANOKE VALLEY AREA 2020 LONG-RANGE TRANSPORTATION PLAN

This report was prepared for the Roanoke Valley Area Metropolitan Planning Organization by the Roanoke Valley-Alleghany Regional Commission.

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Roanoke Valley-Alleghany Regional Commission
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Roanoke, Virginia 24010

August 2000

ROANOKE VALLEY AREA METROPOLITAN PLANNING ORGANIZATION (RVAMPO)

This document is produced as part of a continuing, comprehensive, cooperative (3-C) transportation planning process conducted by the Metropolitan Planning Organization (MPO) for the Roanoke Valley Area. As members of the RVAMPO, the following agencies and local governments have participated in the development of this document.

MPO Membership

Botetourt County

City of Roanoke

City of Salem

Roanoke County

Town of Vinton

Greater Roanoke Transit Company (Valley Metro)

Roanoke Regional Airport

Roanoke Valley-Alleghany Regional Commission

Virginia Department of Transportation

Virginia Department of Rail and Public Transportation (non-voting member)

Federal Highway Administration (non-voting member)

Federal Transit Administration (non-voting member)

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INTRODUCTION

The 2020 Long Range Transportation Plan is a relatively minor update of the 2015 Plan that makes some technical adjustments, extends the plan period to 2020, and adds no regionally significant projects. The reason for such a minor update was to insure that the federally mandated 5-year update cycle and 20 year plan horizon were maintained. If these mandates are not maintained in the Long Range Transportation Plan funding for transportation projects could be halted.

The primary focus for this update to the LRTP were the Land Use Data, Model Development, Highway Improvements, Planning Factors and Public Involvement sections. All other sections of the 2020 LRTP remain the same as they were in the 2015 LRTP. A major update to the LRTP with extensive public outreach to the region's business community and general public will begin in mid 2000 and is scheduled for completion in late 2001. This update will extent the horizon year for LRTP to 2025 and will address all aspects of transportation in the Roanoke Valley area.

BACKGROUND

Federal regulations implemented as a result of the Transportation Equity Act for the 21st Century (TEA-21) require urbanized area metropolitan planning organizations to develop and approve a financially constrained long range multimodal transportation plan. This plan was developed in response to and in accordance with those regulations. While the emphasis on multimodal planning is new, the long range transportation planning process dates back to 1962.

The passage of the Federal Highway Act of 1962, amended Chapter 1 of Title 23, United States code by the addition of a new section, 134. It required that urban areas of 50,000 or more in population have a **continuing, comprehensive and cooperative (3-C)** transportation planning process. To accomplish this objective, state and local agencies must develop long-range transportation plans and programs that are properly coordinated with plans for improvements in all phases of transportation. After July 1, 1965, the Secretary of Transportation could not approve any program of projects, unless this program was the result of a 3-C planning process.

In December 1963, Howard, Needles, Tammen and Bergendoff published the Major Arterial Highway Plan at the request of the Roanoke Valley Regional Planning Commission and the Virginia Department of Highways. The data used in this initial study was gathered by the Virginia

Department of Highways and consisted of roadside interviews at each local government's corporate limits and in the central business district of Roanoke.

In view of the 1962 federal requirement, the Roanoke Valley Regional Planning Commission (now designated the Roanoke Valley-Alleghany Regional Commission) and the Virginia Department of Highways (now designated the Virginia Department of Transportation), on April 15, 1965, established the continuing phase of the Roanoke Valley Regional Transportation Study. The Howard, Needles, Tammen and Bergendoff Study was expanded to include home interviews which provided trip production and attraction rates per zone. The expanded study also brought the area in line with other transportation studies in the state.

Accordingly, the Roanoke Valley Area Thoroughfare Plan was developed to include the Cities of Roanoke and Salem, the Town of Vinton, Botetourt County and Roanoke County. This Thoroughfare Study was completed in 1969 and, although not officially adopted by all localities, the local jurisdictions, the Planning District Commission, and the Virginia Department of Transportation used it as a guide in developing a transportation system.

In 1978 the department completed another update of the transportation plan. This Roanoke Valley Area Transportation Plan 1975-1995 was developed using newly projected socio-economic data produced by the Fifth Planning District Commission staff and the previously observed mathematical relationship between trips and socio-economic characteristics. The plan was officially adopted by each jurisdiction and by VDOT.

PURPOSE

A major feature of the 3-C urban transportation process is the continuing observation and reappraisal of the existing urban transportation plan. A routine review is carried out each year by monitoring planning data to learn if significant changes have occurred which deviate from original plans or thoughts of development.

Additionally, a major review is conducted on a periodic basis, ideally every five years in order to maintain a twenty year design period. This review takes into account changes in socio-economic and land use factors and trends. It also includes an evaluation of how well the travel demand forecasting process simulates actual travel. The final product is an updated Long Range Transportation Plan. This continuing review and update of the long range transportation plan is part of the 3-C planning process required in the federal code.

GOALS AND OBJECTIVES

In the update process the Transportation Technical Committee, with the aid of Citizen Advisory Committees, formulated the following goals and objectives to provide guidelines for the development of the Transportation Plan. With adoption of the transportation plan by the Roanoke Valley Area Metropolitan Planning Organization, the goals and objectives are found acceptable by the MPO.

Goals

- A transportation system which will complement and promote the social, economic, and environmental goals of the Roanoke Urbanized Area.
- A coordinated transportation system that will continually provide for the safe and efficient movement of people and goods within and through the area.

Objectives

Reduce congestion

Reduce Vehicle Miles of Travel (VMT)

Increase safety

Improve the efficiency of freight movement

Reduce pollution

Increase transportation opportunities for elderly and disabled and others traditionally under served by transportation

Increase public transit patronage and accessibility

Secure stable sources to sustain and expand public transit services

Increase bicycling activity and safety

Increase pedestrian activity and safety

Separate through and local traffic

Increase communication and cooperation between transportation and land use planners and the private sector

Revitalize Central Business Districts (CBD)

Reduce need for high cost construction

DESCRIPTION OF STUDY AREA

The Roanoke Valley Study Area is located between the scenic Allegheny and Blue Ridge Mountains approximately eighty miles southeast of the West Virginia coal fields and one hundred miles north of the North Carolina Industrial Crescent (See Figure 1).

The study area encompasses the City of Roanoke, the City of Salem, the Town of Vinton and portions of both Roanoke and Botetourt Counties.

Roanoke is the major interface for Southwestern Virginia, serviced by a major railroad, an interstate bus line, a number of large trucking firms and a municipal airport which provides commercial passenger and freight service. Highway access to the study area is provided by Interstates 81 and 581, U.S. Route 460 and U.S. Route 220. The thoroughfare system is supplemented within the area by U.S. Routes 221 and 11 and State Primary Routes 24, 101, 112, 115, 116, 117, and 118.

Roanoke Valley Area MPO Study Boundary

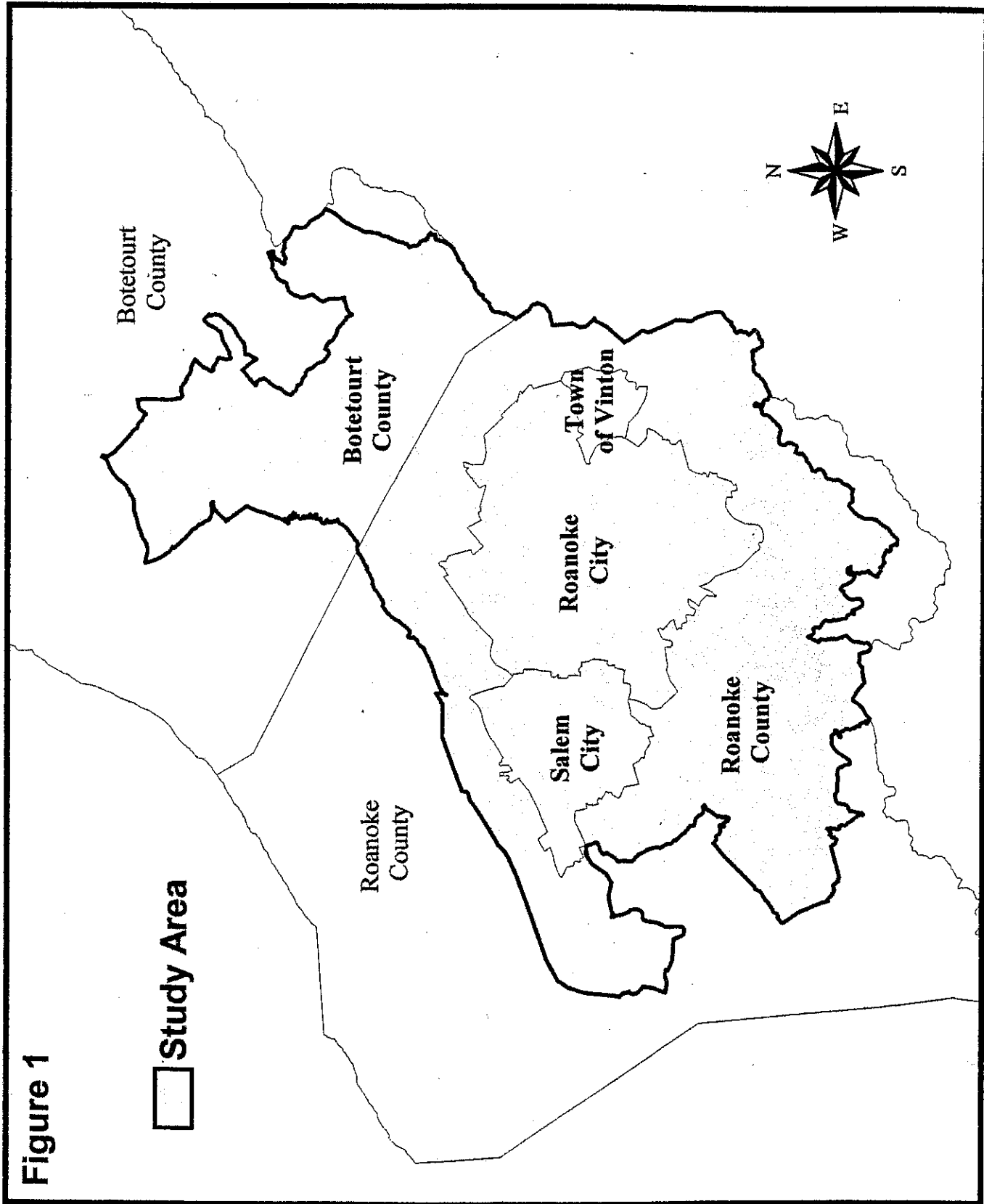


Figure 1

LAND USE DATA

INTRODUCTION

Trip productions and attractions within an urban area are directly related to the location and intensity of various types of land use, and to the socioeconomic characteristics of the area. It follows, therefore, that an accurate forecast of the location and intensity of such variables as population, land use, and economic activity, within an urban area is absolutely essential in the determination of future travel patterns in the area. The determination is necessary in the analysis of the system of streets, highways, and mass transportation which will be required to serve future development.

The variables selected for forecasting to 2020 for the Roanoke Valley Area Long Range Transportation Plan are employment, population, housing units, and automobiles. Base year (1995) data was compiled by the Regional Commission staff. Future conditions were also forecasted by the Regional Commission in coordination with VDOT and staff of the local jurisdictions. Following is a brief description of these planning data items for the base year and forecast year.

BASE YEAR

Population

Population is clearly a function of the number of housing units in an area and the average number of people that live in each housing unit. The population per housing unit was calculated for each Traffic Analysis Zone (TAZ) based on the 1990 Census Transportation Planning Package (CTPP) data. These ratios were then applied to the new 1995 housing unit estimates for each corresponding TAZ to estimate 1995 population. For example, a TAZ with 200 people and 100 housing units in 1990 had an average of 2 people per housing unit. If the TAZ had 300 housing units in 1995 it was estimated that the population was 600.

Employment

Virginia Employment Commission (VEC) records were obtained for 1990 and 1995. All businesses with more than 100 employees were examined. The time and resources required to examine smaller businesses was deemed too great for this study. It would be assumed that for the five-year period between 1990-1995, employment in businesses less than 100 employees

remained static. Each locality was given option to review the data and provide input on the increase or decrease of small businesses by TAZ.

Approximately 200 large businesses were examined to identify changes in employment. They were located in TAZs using address matching in a Geographic Information System (GIS). Some addresses were clarified by using a telephone directory. 1990 employment figures were compared with 1995 figures to identify a change in employment for each business in the five-year period. Businesses that were not located were given an employment change of zero. Likewise, some businesses had one listing for multiple locations (i.e. Burger King may have one VEC listing for multiple restaurants in the Roanoke area). These were also given a net change value of zero if assigning employees to multiple locations was determined to be too time consuming for this study. The one exception to the multiple location rule was government employment. Local government employment increased from 1990-1995 according to VEC records. This was allocated by applying 5 people for each school in the MPO area and adding 10-30 people at each government center or shop.

In about eight cases, an employment type for 1995 was estimated to have a negative total. These eight values were changed to zero since a negative number of workers is not possible.

Passenger Vehicles Available

The vehicles available variable (passenger vehicles under 7,500lbs) was calculated based on the 1995 housing unit estimates. As in the population estimates, the number of passenger vehicles per housing unit was calculated for each TAZ based on the 1990 data. These 1990 ratios were then applied to 1995 housing units to estimate the number of passenger vehicles available.

Housing Units

Building permits were used from the City of Salem, City of Roanoke, and Botetourt County to estimate the housing unit growth from 1990-1995 for each TAZ. New units were added and 10% of demolished units were subtracted. It was assumed that many of the demolished units (90%) were not occupied in the 1990 Census and should therefore not be counted. Using address matching in a Geographic Information System (GIS), each unit's address was located in a particular TAZ. The 1990 housing unit numbers were then updated using the unit changes from 1990-1995. Roanoke County already uses GIS technology and was able to supply a digital

map of new structures from 1990-1995. These were overlaid on a digital TAZ map and the appropriate TAZ number was assigned to each new unit. The number of units in new apartments was established by assistance from the Roanoke County Real Estate Office.

Base Year 1995

| Jurisdiction | Population | Employment | Vehicles | Housing Units |
|---------------------|-------------------|-------------------|-----------------|----------------------|
| City of Roanoke | 97,917 | 76,553 | 61,673 | 45,056 |
| City of Salem | 24,671 | 22,516 | 17,258 | 9,992 |
| Roanoke County* | 79,804 | 17,778 | 61,672 | 31,882 |
| Botetourt County** | 14,323 | 787 | 11,089 | 5,216 |
| 1995 TOTALS | 216,715 | 117,634 | 151,692 | 92,146 |

* Modeled Area Only (includes the Town of Vinton)

** Modeled Area Only

Forecast Year 2020

| Jurisdiction | Population | Employment | Vehicles | Housing Units |
|---------------------|-------------------|-------------------|-----------------|----------------------|
| City of Roanoke | 97,917 | 82,233 | 61,673 | 45,056 |
| City of Salem | 24,904 | 24,231 | 17,558 | 10,163 |
| Roanoke County* | 93,307 | 24,567 | 71,907 | 37,097 |
| Botetourt County** | 24,995 | 7,536 | 18,567 | 8,522 |
| 2020 TOTALS | 241,123 | 138,567 | 169,705 | 100,838 |

* Modeled Area Only (includes the Town of Vinton)

** Modeled Area Only

FORECAST YEAR

In forecasting data for the target year most socioeconomic variables are estimated using population forecasts. Population forecasts themselves are developed by jurisdiction by the Virginia Employment Commission. With these used as control totals, population was distributed to traffic zones by the Regional Commission staff with assistance from staff of each jurisdiction

based on past trends, proposed development and vacant land. Forecast population forms the base work on which other variables were linearly projected by TAZ.

The resulting projections were then reviewed by the appropriate officials of each jurisdiction. After revising the forecasts, in consultation with each jurisdictions representative, Regional Commission staff then allocated the forecast change to the appropriate traffic zone.

For a more detailed explanation of socio-economic data collection and projections and a listing of the individual zone data consult the 1995 Transportation Planning Data for the Roanoke Metropolitan Planning Area report prepared by the staff of the Roanoke Valley-Alleghany Regional Commission in May 1998.

MODEL DEVELOPMENT

Travel demand forecasts are developed using detailed computer simulation models that relate travel demand to the socioeconomic characteristics described in the previous section of this report. The computer simulation model subdivides the Roanoke study area into 221 subareas called traffic analysis zones (TAZs). For each TAZ, the socioeconomic data is used to predict the level of travel demand for that sub-area. This step in the modeling process is called trip generation and results in a prediction of the number of trips and the zonal location of the origins and destinations of the trips.

Trip ends are predicted for differing trip types or purposes. The trip purposes for the Roanoke study fall into five categories. The first is *home to work* (and back) where one trip end is at the home and the other at work. They include both the home to work and work to home trips. The second is *home to other* and includes trips with one end at home and are not to or from work. These include shopping, school, recreational, etc., trips. The third purpose is *non-home-based* where neither trip end is the family residence. These three trip types have both trip ends inside the study area.

The fourth purpose has one trip end inside the study area and the other trip end outside the study area. These are called *internal-external* (I-X) trips. The fifth purpose has both trip ends outside the study area and the trip passes through the area without stopping. These are called *external-external* (X-X) trips.

The second step in the modeling process is called trip distribution and is where the origin and destination ends of each trip link. This step results in a zone-to-zone table or matrix of number of trips for each purpose. The final step is traffic assignment where each zone-to-zone trip is assigned to the roadway network using the shortest path between the two zones. The shortest path follows the shortest travel time and considers travel speeds on different road segments and may also consider levels of congestion.

The computer model is calibrated by inputting 1995 socioeconomic data and comparing modeled volumes to actual traffic counts on the highway network. Parameters in the computer model are adjusted until the modeled volumes most closely match the actual traffic counts.

HIGHWAY IMPROVEMENTS

Using the calibrated computer model, trips forecasted for the year 2020 were assigned to the existing plus committed network. The resulting traffic distribution was then analyzed to determine at what level of service the traffic would operate. Recommendations were then made to eliminate existing and projected deficiencies.

In addition to traffic projections, factors such as the geometrics of existing roadways, safety features, environmental assessments, reduction in vehicle miles of travel, and the need as seen by each local jurisdiction, were considered by the Transportation Technical Committee in its final review and recommendation of the transportation plan to the MPO.

IMPLEMENTATION AND FUNDING

The TEA-21 requires that long range plans include a list of proposed projects that can reasonably be expected to be funded by the target year of the plan with funds projected to be available within that time period. For the Roanoke areas previous long range plan, VDOT's Financial Planning and Debt Management Division (FP&DMD) prepared the financial projections. They were based on funding shown by funding category in VDOT's 1995-1996 Six-Year Improvement Program and projected out assuming federal funding remained constant and State Transportation Trust Funds increased as an annual rate of 3-4%. These funds were then prorated by funding category based on the proportion of each category's roads falling within the study area. Due to the lack of manpower the FP&DMD was unable to calculate projections for the current update, leaving the Transportation Planning Division (TPD) to develop estimates. TPD used funding shown in the 1995-1996 and the 1999-2000 Six Year improvement Programs to develop an increase ratio for each funding category. These ratios were then used to factor up the financial projections from the previous study for the current study window (2000-2020). Table 2 on the following page shows the 20 year revenue projections by category.

Highway Needs were identified by funding category and prioritized. The top priorities, limited by projected revenues, are listed in Table 3 and shown on Figure 2. This list may be revised by the MPO through amendments or updates into this plan.

Table 2: 20 Year Construction Revenue Projection

| | |
|----------------------------|---------------|
| Interstate / NHS | \$320,000,000 |
| Primary | \$124,000,000 |
| Roanoke County Secondary | \$ 97,600,000 |
| Botetourt County Secondary | \$ 20,660,000 |
| City of Roanoke Urban | \$195,300,000 |
| City of Salem Urban | \$ 67,450,000 |
| Town of Vinton Urban | \$ 16,557,000 |

Interstate System / National Highway System (NHS)

| Jurisdiction | Facility Route # and Name | From: | To: | Recommended Improvement | Projected Cost | Previous Funding | Additional Funding Required |
|--|---------------------------|----------------------------------|---------------------------|---|--|----------------------|-----------------------------|
| --- | Proposed Interstate 73 | Roanoke | North Carolina State Line | Preliminary Engineering Study | 15,002,000 | 9,500,000 | 5,502,000 |
| Roanoke County & City of Salem | Interstate 81 | Milepost 136.4 | Milepost 144.3 | Widen to 8 lanes | 154,303,000 | 19,453,000 | 134,850,000 |
| Roanoke County & Botetourt County | Interstate 81 | Milepost 144.3 | Milepost 152.5 | Widen to 8 lanes | 110,439,000 | 21,789,000 | 88,650,000 |
| City of Roanoke | Interstate 581 | 1.5 km North of Hershberger Road | Liberty Road | Preliminary Engineering for collector-distributor roads | 1,500,000 | 0 | 1,500,000 |
| City of Roanoke | Interstate 581 | Orange Avenue | Elm Avenue | Widen to 8 lanes | 44,000,000 | 0 | 44,000,000 |
| City of Salem | Route 11 (Apperson Drive) | Electric Road (Route 419) | Keagy Road | Widen to 6 lanes | 11,400,000 | 0 | 11,400,000 |
| Miscellaneous, Bridge, Spot Improvements, Etc. | --- | --- | --- | --- | 32,000,000 | 0 | 32,000,000 |
| Total: | | | | | 368,644,000 | 50,742,000 | --- |
| | | | | | Total Additional Funding Needs: | \$317,902,000 | |
| | | | | | Projected Funding Available: | \$320,000,000 | |

Primary System

| Jurisdiction | Facility Route # and Name | From: | To: | Recommended Improvement | Projected Cost | Previous Funding | Additional Funding Required |
|--|--|--|--|-------------------------|----------------------|------------------|-----------------------------|
| Roanoke County | Route 221 | 1.9 mile south of Route 419 | Route 752 | Widen to 4 lanes | 11,700,000 | 0 | 11,700,000 |
| Roanoke County | Route 115 | Route 601 | Route 11 | Widen to 4 lanes | 17,500,000 | 0 | 17,500,000 |
| City of Roanoke | Route 220 | Wonju Street | Elm Avenue | Widen to 8 lanes | 36,700,000 | 0 | 36,700,000 |
| Roanoke County | Route 11/460 | West corporate limits of the City of Salem | North Route 612 | Widen to 5 lanes | 8,300,000 | 0 | 8,300,000 |
| Botetourt County | Route 11 | 0.21 mile north of Roanoke County line | 0.41 mile north of Roanoke County line | Widen to 4 lanes | 1,600,000 | 0 | 1,600,000 |
| Botetourt County | Route 11 | 0.41 mile north of Roanoke County line | 1.02 mile south of Route 220 | Widen to 6 lanes | 15,000,000 | 0 | 15,000,000 |
| --- | Miscellaneous, Bridge, Spot Improvements, Etc. | --- | --- | --- | 12,400,000 | 0 | 12,400,000 |
| Total: | | | | | 103,200,000 | 0 | --- |
| Total Additional Funding Needs: | | | | | \$103,200,000 | | |
| Projected Funding Available: | | | | | \$124,000,000 | | |

City of Roanoke Urban System

| Facility Route # and Name | From: | To: | Recommended Improvement | Projected Cost | Previous Funding | Additional Funding Required |
|--|---|--|-------------------------------|---------------------------------|------------------|-----------------------------|
| 10th Street | Gilmer Avenue | Andrews Road | Widen to 2 lanes | 7,600,000 | 4,782,000 | 2,818,000 |
| 10th Street | Andrews Road | Williamson Road | Widen to 2 lanes | 7,499,000 | 618,000 | 6,881,000 |
| 13th Street / Hollins Road | Dale Avenue | Orange Avenue | Widen to 4 lanes | 13,274,000 | 4,782,000 | 8,492,000 |
| Hershberger Road | Peters Creek Road | Cove Road | Widen to 6 lanes | 13,300,000 | 0 | 13,300,000 |
| Plantation Road | Liberty Road | Wingfield Avenue | Widen to 4 lanes | 3,700,000 | 0 | 3,700,000 |
| Brambleton Avenue | South corporate limits of the City of Roanoke | Brandon Avenue | Widen to 4 lanes | 15,900,000 | 0 | 15,900,000 |
| Brandon Avenue | Brambleton Avenue | Main Street | Widen to 6 lanes | 1,600,000 | 0 | 1,600,000 |
| Orange Avenue | 11th Street | East corporate limits of the City of Roanoke | Widen to 8 lanes | 49,100,000 | 0 | 49,100,000 |
| Colonial Avenue | South corporate limits of the City of Roanoke | 23rd Street | Widen to 4 lanes | 13,000,000 | 0 | 13,000,000 |
| Hershberger Road | Williamson Road | East corporate limits of the City of Roanoke | Widen to 8 lanes | 5,700,000 | 0 | 5,700,000 |
| King Street | Gus Nicks Boulevard | Orange Avenue | Reconstruct to 2-24 ft. lanes | 4,200,000 | 0 | 4,200,000 |
| Wonju Street | Brandon Avenue | Colonial Avenue | Widen to 4 lanes | 8,700,000 | 0 | 8,700,000 |
| Plantation Road | Liberty Road | 0.3 mile south of Liberty Road | Widen to 4 lanes | 2,300,000 | 0 | 2,300,000 |
| Plantation Road | 0.3 mile south of Liberty Road | Indiana Avenue | Widen to 4 lanes | 1,800,000 | 0 | 1,800,000 |
| Miscellaneous, Bridge, Spot Improvements, Etc. | --- | --- | --- | 19,530,000 | 0 | 19,530,000 |
| | | | | 167,203,000 | 10,182,000 | --- |
| | | | | Total Additional Funding Needs: | | \$157,021,000 |
| | | | | Projected Funding Available: | | \$195,300,000 |

City of Salem Urban System

| Facility Route # and Name | From: | To: | Recommended Improvement | Projected Cost | Previous Funding | Additional Funding Required |
|--|---|---------------------------|--------------------------|-------------------------------------|---------------------|-----------------------------|
| East Main Street | Thompson Memorial Boulevard | Kessler Mill Road | Widen to 4 lanes | 10,182,000 | 4,983,000 | 5,199,000 |
| East Main Street | Kessler Mill Road | Electric Road (Route 419) | Widen to 4 lanes | 3,679,000 | 3,679,000 | 0 |
| Green Ridge Road | Electric Road (Route 419) | Barnett Road | Widen to 3 lanes | 3,410,000 | 3,410,000 | 0 |
| Electric Road (Route 419) | South cooperate limits of the City of Salem | Apperson Drive | Widen to 8 lanes | 13,100,000 | 0 | 13,100,000 |
| Electric Road (Route 419) | Apperson Drive | Roanoke | Widen to 8 lanes | 10,400,000 | 0 | 10,400,000 |
| Apperson Drive | Intersection at Electric Road (Route 419) | --- | Intersection Improvement | 32,000,000 | 0 | 32,000,000 |
| Miscellaneous, Bridge, Spot Improvements, Etc. | --- | --- | --- | 6,750,000 | 0 | 6,750,000 |
| | | | | 79,521,000 | 12,072,000 | --- |
| Total Additional Funding Needs: | | | | | \$67,449,000 | |
| | | | | Projected Funding Available: | \$67,450,000 | |

Town of Vinton Urban System

| Facility Route # and Name | From: | To: | Recommended Improvement | Projected Cost | Previous Funding | Additional Funding Required |
|--|--------------|---|-------------------------|--|---------------------|-----------------------------|
| Hardy Road | Niagara Road | East corporate limits of the Town of Vinton | Widen to 4 lanes | 4,324,000 | 3,037,000 | 1,287,000 |
| Walnut Avenue | Roanoke | Pollard Street | Widen to 4 lanes | 6,200,000 | 0 | 6,200,000 |
| Washington Avenue | Preston Road | East corporate limits of the Town of Vinton | Widen to 6 lanes | 6,900,000 | 0 | 6,900,000 |
| Miscellaneous, Bridge, Spot Improvements, Etc. | --- | --- | --- | 1,700,000 | 0 | 1,700,000 |
| | | | | 19,124,000 | 3,037,000 | --- |
| | | | | Total Additional Funding Needs: | \$16,087,000 | |
| | | | | Projected Funding Available: | \$16,557,000 | |

Roanoke County Secondary System

| Facility Route # and Name | From: | To: | Recommended Improvement | Projected Cost | Previous Funding | Additional Funding Required |
|--|--|---|-------------------------------|----------------|---------------------|-----------------------------|
| Route 601 (Hollins Road) | Roanoke City corporate limits | 0.59 mile south of Route 627 (Shadwell Drive) | Widen to 4 lanes | 14,700,000 | 6,073,000 | 8,627,000 |
| Route 720 (Colonial Avenue) | Route 687 (Penn Forest Boulevard) | Route 419 (Electric Road) | Reconstruct existing 2 lanes | 2,750,000 | 773,000 | 1,977,000 |
| Route 687 (Penn Forest Boulevard) | Route 221 (Brambleton Avenue) | Route 720 (Colonial Avenue) | Reconstruct to 2-24 ft. lanes | 700,000 | 0 | 700,000 |
| Route 688 (Cotton Hill Road) | Route 221 (Brambleton Avenue) | 0.15 mile south of Route 934 (Shingle Ridge Road) | Reconstruct to 2-24 ft. lanes | 3,140,000 | 280,000 | 2,860,000 |
| Route 682 (Garst Mill Road & Manassas Drive) | Roanoke City corporate limits | Route 720 (Colonial Avenue) | Reconstruction | 1,300,000 | 0 | 1,300,000 |
| Route 613 (Merriman Road) | Route 1640 (Pine Acres Lane) | Route 904 (Starkey Road) | Reconstruct to 2-24 ft. lanes | 3,875,000 | 0 | 3,875,000 |
| Route 720 (Colonial Avenue) | Route 419 (Electric Road) | Roanoke City corporate limits | Widen to 4 lanes | 4,700,000 | 0 | 4,700,000 |
| Route 601 (Hollins Road and Shadwell Drive) | 0.6 mile south of Route 627 (Shadwell Drive) | Route 11 (Williamson Road) | Widen to 4 lanes | 5,300,000 | 0 | 5,300,000 |
| Route 687 (Penn Forest Boulevard) | Route 720 (Colonial Avenue) | Norfolk & Southern Railway overpass | Reconstruct existing 2 lanes | 3,200,000 | 0 | 3,200,000 |
| Route 904 (Starkey Road) | Route 679 (Buck Mountain Road) | 0.85 mile north of Route 679 (Buck Mountain Road) | Widen to 4 lanes | 6,500,000 | 0 | 6,500,000 |
| Route 634 (Hardy Road) | Town of Vinton corporate limits | Bedford County line | Widen to 4 lanes | 7,300,000 | 0 | 7,300,000 |
| Route 654 (Feather Road) | Route 24 (Stewartsville Road) | Route 634 (Hardy Road) | Widen to 4 lanes | 8,700,000 | | 8,700,000 |
| Route 628 (Greenridge Road and Woodhaven Road) | Route 780 (Cove Road) | Route 117 (Peters Creek Road) | Reconstruct to 2-24 ft. lanes | 5,900,000 | 0 | 5,900,000 |
| Miscellaneous, Bridge, Spot Improvements, Etc. | --- | --- | --- | 9,760,000 | 0 | 9,760,000 |
| | | | | 77,825,000 | 7,126,000 | --- |
| Total Additional Funding Needs: | | | | | \$70,699,000 | |
| Projected Funding Available: | | | | | \$97,600,000 | |

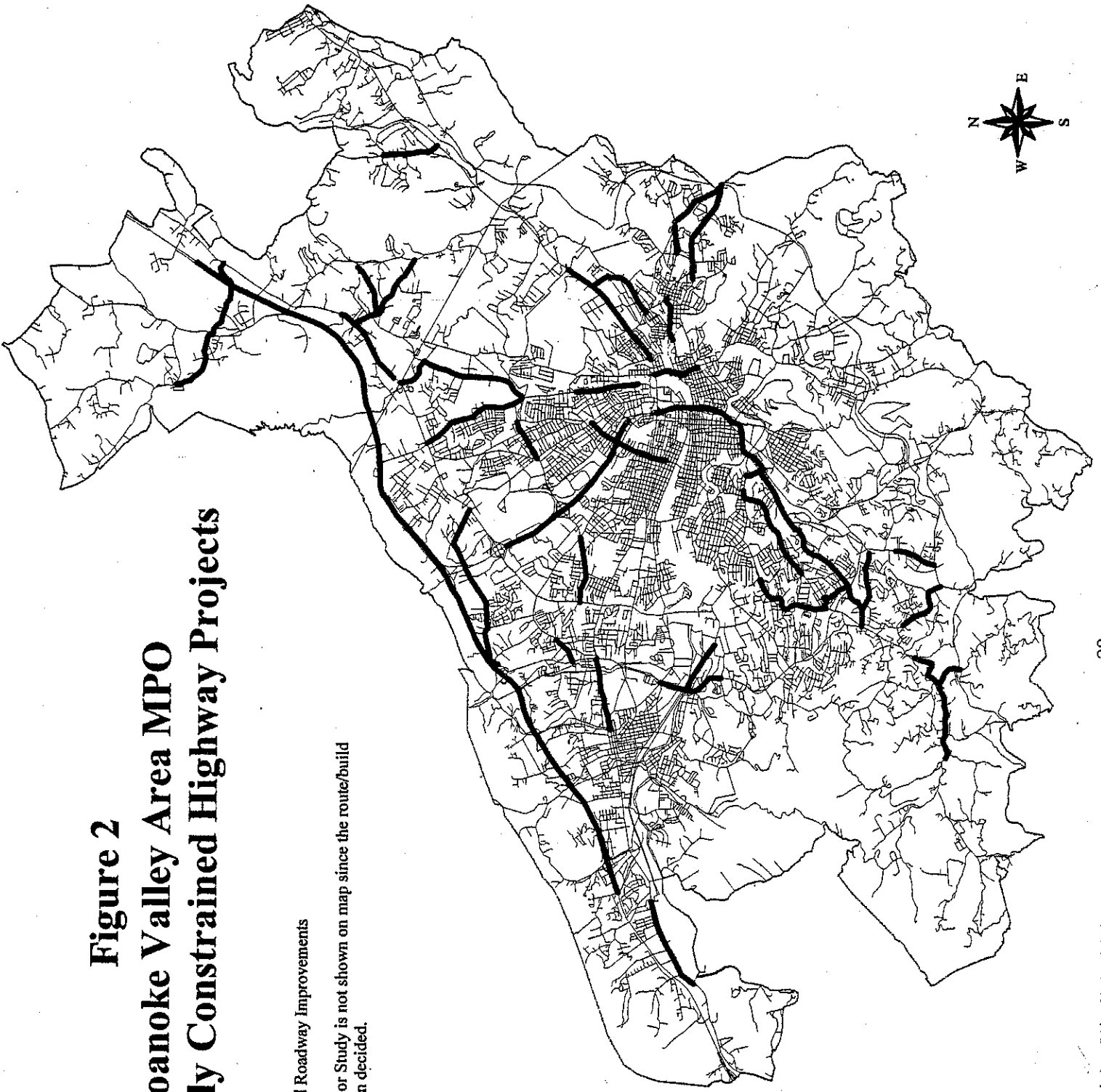
Botetourt County Secondary System

| Facility Route # and Name | From: | To: | Recommended Improvement | Projected Cost | Previous Funding | Additional Funding Required |
|--|----------------------------------|---------------------------------------|-------------------------------|-------------------------------------|------------------|-----------------------------|
| Route 654 (Read Mountain Road) | Route 11 (Lee Highway) | Alternate Route 220 (Cloverdale Road) | Widen to 4 lanes | 9,400,000 | 0 | 9,400,000 |
| Route 605 (Cougar Drive) | Route 654 (Read Mountain Road) | Alternate Route 220 (Cloverdale Road) | Reconstruct to 2-24 ft. lanes | 2,150,000 | 1,050,000 | 1,100,000 |
| Route 779 (Catawba Road) | Route 220 (Roanoke Road) | Route 675 (Glebe Road) | Widen to 4 lanes | 5,700,000 | 0 | 5,700,000 |
| Route 779 (Valley Road) | Route 220 (Roanoke Road) | Route 11 (Lee Highway) | Reconstruct to 2-22 ft. lanes | 1,700,000 | 0 | 1,700,000 |
| Route 659 (Laymantown Road) | Route 460 (Blue Ridge Boulevard) | Route 658 (Laymantown Road) | Reconstruct to 2-24 ft. lanes | 300,000 | 0 | 300,000 |
| Route 658 (Laymantown Road) | Route 659 (Laymantown Road) | Route 657 (Rainbow Forest Drive) | Reconstruct to 2-24 ft. lanes | 1,400,000 | 0 | 1,400,000 |
| Miscellaneous, Bridge, Spot Improvements, Etc. | --- | --- | --- | 2,060,000 | 0 | 2,060,000 |
| | | | | 22,710,000 | 1,050,000 | --- |
| Total Additional Funding Needs: | | | | | | \$21,660,000 |
| | | | | Projected Funding Available: | | \$20,600,000 |

Figure 2 Roanoke Valley Area MPO Financially Constrained Highway Projects

— Proposed Roadway Improvements

Notes: I-73 Corridor Study is not shown on map since the route/build option has not been decided.



PUBLIC TRANSPORTATION, ISTEA AND TEA-21

Note: In addition to the 1993 Transit Development Plan that looked at the existing transit system and at possibilities for expanding that system, the Greater Roanoke Transit Company hired a consultant in 1999 to produce a Service Evaluation and Short Range Transit Improvement Plan. Whereas the 1993 Transit Development Plan was used as a source of data and information for this section of the LRTP, the 1999 Service Evaluation and Short Range Transit Improvement Plan was not used to update the information in this section. The data and information provided in the 1999 Service Evaluation and Short Range Transit Improvement Plan will be used in the next update to the LRTP scheduled for completion in late 2001.

The Intermodal Surface Transportation Efficiency Act (ISTEA), clearly emphasized the importance of public transportation in developing a progressive national transportation system. The Transportation Equity Act for the 21st Century Public transportation is recognized as one of the most important avenues for creating a transportation system which is economically efficient, energy efficient, and environmentally sound. Through ISTEA, federal policy shifted away from an emphasis on new road construction and instead promotes the need for conservation and efficient use of existing facilities. Specifically with regard to the Long Range Transportation Plan, ISTEA mandated that the Plan will address (1) methods to expand and enhance transit services and to increase the use of such services; and (2) capital investment that would result in increased security in transit systems. In addition, ISTEA called for a multi-modal evaluation of the overall Plan, including the transportation, socioeconomic, environmental, and financial impacts.

The Transportation Equity Act for the 21st Century (TEA-21) emphasized balanced investment in highways, transit, intermodal projects and technologies while providing strong state and local flexibility in the use of funds.

ISTEA and TEA-21 provide flexible funding programs which allow funds to be transferred between federal highway and transit funding categories. For example, funding which would have been dedicated to new roadway construction under previous policies can now be used to purchase buses or rail cars. Other modes of travel can be funded as well, such as the construction of

sidewalks or bicycling facilities. This flexibility allows a variety of transportation solutions to be considered for a variety of circumstances. It also mitigates many of the funding constraints which have limited the progress of mass transit. In addition, federal funding authorizations have increased substantially for mass transit, which will assure increased investment in public transportation over the coming years. Thus far however, funds have not been appropriated at full authorization levels.

PUBLIC TRANSPORTATION IN THE ROANOKE VALLEY

The Greater Roanoke Transit Company (GRTC) or Valley Metro is the major public transportation provider in the Roanoke area. Operations began in 1975 when Roanoke City took over operations of what had been a privately-owned system. At the time, private divestment in public transportation was a common occurrence as the suburbanization of America, coupled with escalating fuel and waning ridership made profitable operations nearly impossible. All local governments in the Valley were approached to invest in the transit company. However, due to the existing trends of public transportation, and the accompanying responsibilities of ownership, only Roanoke City decided to purchase the transit company. Other localities would purchase services by contract as needed. To this date, Roanoke City is the sole owner of Valley Metro, and all decisions regarding service changes or operations are determined by the Board, which is composed of elected officials for Roanoke City. Incidentally, services are geared toward serving the City.

Currently, Valley Metro operates ten routes. Of these, three routes extend beyond Roanoke City. One route extends into Salem and one into Vinton. These services are contracted and paid for by the respective localities. The third route extends into Roanoke County to provide service to Tanglewood Mall. This route is mostly self-supportive, thus no contract is required of Roanoke County. Bus service is provided from 5:45 AM to 8:45 PM every hour during off-peak periods and every 30 minutes during peak periods. Hourly service is also provided on Saturdays. Valley Metro currently maintains a fleet of thirty-eight buses and is classified by the Federal Transit Administration as a small transit system.

Through a contractual agreement with the Unified Human Services Transportation System, Inc. (RADAR), Valley Metro provides transportation services in the GRTC service area for disabled persons who require specialized transportation. This service known as Valley Metro Star service is

also provided to comply with the Americans with Disabilities Act (ADA). In addition, Roanoke County contracts with RADAR to provide services to qualified elderly and disabled residents. This service is known as CORTRAN (County of Roanoke Transportation). RADAR is an official MEDICAID provider and contracts with many senior citizen agencies and other social service organizations. RADAR also serves other governmental organizations, church and civic groups, and private industry. Overall RADAR operates and maintains 42 vehicles to provide demand responsive service for over 80 programs.

Fortunately, the Roanoke Valley has not yet suffered many of the environmental and congestion related problems associated with many larger urban areas. Transit ridership has thus depended more on captive customers and service convenience, rather than on external factors which often force people to opt for public transportation. After Roanoke City purchased the transit system in 1975, ridership generally declined until the late 1980's. In 1988, ridership began picking up again, stabilizing in most recent years at rates comparable to those of the early 1980's (1.7 to 1.8 million passengers per year). These increases in ridership are attributed largely to major service changes implemented with the opening of the Campbell Court transportation center. RADAR's ridership greatly expanded with the implementation of the Americans with Disabilities Act of 1990; Valley Metro Star Service, for example, has more than quadrupled since the ADA was enacted.

OBJECTIVES

The Roanoke Valley Area Metropolitan Planning Organization, in conjunction with the Transportation Technical Committee and a Public and Specialized Transportation Citizens' Advisory Committee, has developed and adopted the following objectives with regard to public and specialized transportation for the Roanoke Valley Area Long Range Transportation Plan:

Increase public transit patronage and accessibility.

Increase transportation opportunities for the elderly and disabled, and others traditionally under served by transportation.

Secure stable funding sources to sustain and expand public transportation.

These objectives have been derived recognizing that:

- Without proper planning and preventive measures, the Roanoke Valley Area will continue to develop many problems associated with larger urban areas such as air quality and congestion problems. The Intermodal Surface Transportation Efficiency Act of 1991 emphasizes and invests more in public transportation for the betterment of all urban areas. This includes the very large urban areas as well as areas such as the Roanoke Valley which still have room for growth.

Note: While no jurisdiction in the Roanoke Valley has been classified as a "nonattainment area" for National Ambient Air Quality Standards (NAAQS), high levels of Total Suspended Particulates and Ozone have been recorded at monitoring sites, and are worthy of concern and attention.

- The benefits of public transportation cannot be measured by revenues alone, but the indirect benefits, such as air quality improvements, energy efficiency, reduced congestion, increased access to employment, increased mobility for all, etc., should be considered as well.
- Public subsidy of transit is appropriate given the belief that transit service benefits the entire community, not just the direct consumers (riders) of the transit service. Real estate

developers benefit from access to their properties. Merchants benefit from access to their retail establishments. Residents of high density areas benefit from reduced automobile congestion. As the benefits of public transit are shared by both users and nonusers, it is reasonable to expect payment for the cost of providing the service from both groups. The benefits of transit service are shared by all and thus the cost of providing the service should be similarly shared.

- While public transportation does provide a service to those who lack or are unable to use private forms of transportation, the primary function of public transportation is transportation. It should not be viewed solely as a social service.
- As in many communities, the average age of the population in the Roanoke Valley is increasing. An increase in the elderly population will place a greater demand on public transportation. The region should be prepared to respond to this demand or lose population due to relocation.
- Substantial increases in riders who are not transit dependent will not likely happen in the Roanoke Valley without improved and expanded services throughout the region. The system must be convenient in order to attract more people who would otherwise opt for the private automobile.
- A community should not rely on the private automobile as its sole method of transporting citizens. Inclement weather, natural disasters, energy shortages, etc. could prohibit their usage.

Available Funding Sources

GRTC, like many other transit systems, supports itself with a combination of user-fee revenues and grant funds. The revenues come from a number of different sources including passenger fares, advertising fees, federal grants, state grants, and local funds.

GRTC receives user-fee revenues in the form of cash fares, pre-paid passes and advertising. In general, recovery of the entire operating and capital costs through the fare box is extremely difficult for any transit system. In 1993, only 32% of total operating costs were recovered through user-fee revenues. Thus, sources other than user-fee revenues must be relied upon for funding the GRTC public transit service.

Different levels of government provide funding assistance. At the local level, the general funds from the City of Roanoke help to subsidize Valley Metro. The Commonwealth of Virginia is able to assist GRTC and all other transit properties in the Commonwealth from two sources, the Commonwealth Transportation Trust Fund and the State Highway Maintenance and Operating Fund. The financial assistance from the Commonwealth is administered by the Virginia Department of Rail and Public Transportation. The revenue source for a portion of the federal program which provides financial assistance to urban transit is the Mass Transit Account of the Highway Trust Fund. Of the nine cent per gallon federal motor fuel tax, one cent is allocated to the Mass Transit Account.

GRTC currently receives Federal Transit Administration (FTA) Section 3 funds which are competitively allocated for capital projects only. Other federal subsidies include (FTA) Section 9 funds which are an urban formula grant. Section 9 money is available for operating assistance, with the amount allocated by the discretion of the Commonwealth. The Metropolitan Planning Organization via the Fifth Planning District Commission is able to assist Valley Metro with the use of FTA Section 8 funds for planning and technical studies.

Thus far, general funds have been discussed. **A dedicated local funding source would better assure financial assistance.** Presently the local funding match required to receive state and federal funds is determined after the federal share and state share are known. This makes the application for and acquisition of federal assistance difficult. There are a number of ways to establish a dedicated funding source, including a parking surcharge, additional automobile decal fees, automobile property tax, etc. Funding stability is a top priority. A dedicated fund is a logical avenue to secure the proper operations of a transit property. Unfortunately, unstable local funding often leads to the kind of cutbacks which cause the public to lose faith in its transit system. Dependable sources of revenue are necessary to maintain reliable, convenient, quality service and to respond to a changing world.

Property and equipment purchase are funded primarily under the FTA capital grants to the Company. Additional matching requirements are met by the Commonwealth of Virginia which has typically paid 10% to 19% of the total funding (required as matching funds) as per the availability of funds, and the Greater Roanoke Transit Company has typically provided the remaining 1% to 17.5% to meet matching fund requirements. These funds have been provided by the City of Roanoke.

In return for services provided to Salem and Vinton, the localities reimburse GRTC for their portion of net operating costs based on passenger counts and service miles. Other financial operating assistance is received from FTA and the Commonwealth of Virginia.

Future Funding Assumptions

The Long Range Transportation Plan is required to be financially constrained. Therefore, certain assumptions must be made with regard to mass transit funding.

- 1) Federal policy will continue to emphasize multimodal and intermodal planning with consideration to public transportation a priority. Therefore **federal and state mass transit operating fund allocations will at a minimum remain at a level necessary to continue present service.**

- 2) Flexibility will continue to exist for transferring federal highway and transit funds among a variety of multimodal capital improvements. **Funds for capital expenditures necessary to maintain the current level of service (eg. replacement of buses, signage, storage facilities, etc.) will be provided.** If necessary, these funds will be derived from the transfer of Surface Transportation Program by the state, prior to sub-allocations to local jurisdictions, for mass transit capital improvements across the Commonwealth.

Note: In 1993, the Virginia Department of Transportation transferred \$2.3 million in Surface Transportation Program Funds to Section 9 funding in order for Valley Metro to replace 18 buses.

- 3) **Funding for capital and operating expenditures necessary to expand transit services in the Roanoke Valley will be available on a discretionary basis,** to be determined by federal, state, and local governments. Federal and state officials will determine if Section 3 or Section 9 funds are to be made available for expansions. The Commonwealth Transportation Board will determine if the transfer of National Highway System Funds (NHS) or Surface Transportation Funds (STP) at the state level is appropriate, prior to sub-allocations. Local governments via the Metropolitan Planning Organization, will decide if local allocations of NHS or STP funds should be transferred or if local funding sources are to be made available.

An update of the Plan is required at a minimum of every five years. This will allow for some flexibility in programming based on new projections of available funds. Amendments to the Plan can also be considered if priorities change or developments arise.

PRIORITIES FOR IMPROVEMENTS TO THE EXISTING SYSTEM

Based on the funding assumptions above, projected funding amounts for a financially constrained plan cannot assume that any discretionary funds will be made available for system expansions. Therefore, strategies should be developed to maximize the existing system within current funding limits. This may involve manipulating funds and resources controlled directly by the transit system. It may also involve influencing or manipulating external factors which are not controlled directly by the transit system.

The following strategies were recommended and informally ranked by the Public and Specialized Transportation Citizens' Advisory Committee. The number of "****" illustrates the relative emphasis the Committee placed on each strategy. It should be noted that all strategies for improvements to the existing system should be considered. Regardless of priority, there are those strategies that are more cost effective and easier to implement than others. Details of the strategies are explained along with specific examples of methods for implementation.

High Priority

- ***Educate the public (students, businesses, employers, civic groups, etc.) on the benefits of using public transportation. ********

At the very minimum, all of those agencies/governments/organizations which have vested interests in public transportation should actively participate in the promotion of public transportation. Greater investment in marketing and advertising the transit system may be necessary. Specifically, the public must be made aware of the many benefits of public transportation whether they are a user or a non-user. Air quality improvements, energy conservation, reduced congestion, increased access to employment and shopping, tax incentives, decreased demand for road improvements and parking lots are some of the benefits which must be communicated.

- ***Educate the public (students, businesses, employers, civic groups, etc.) on how to use public transit. *****

[NOTE: While this strategy was ranked lower by the Citizens' Advisory Committee, the MPO has ranked this strategy as a HIGH priority.]

While Valley Metro takes great strides in trying to inform the public about where and how the transit system can be accessed, many people remain unaware of how easy or convenient riding the bus can be. Purchasing a bus pass or making a transfer can be confusing to those who may be infrequent riders or otherwise unfamiliar with the bus

system. Promotional campaigns which offer hands on experience to potential riders can be offered to large groups as mentioned above, hopefully with a welcome reception. Education should also begin at a young age, in the schools if possible, so they too will be prepared and encouraged to ride public transit.

- ***Obtain employer support of transit programs. ********

Marketing efforts should target employers. An enormous potential for ridership exists among working commuters. Also, work trips tend to generate the most congestion due to their periods of concentration. Employers can play a strong role in whether employees opt to use public transit or not. There are certain benefits they may derive as well by offering incentives for employees to ride transit. For example, there are tax incentives to provide bus passes as an employee benefit. Also, providing bus passes versus free parking may be much cheaper. Other measures such as allowing flexible work hours can facilitate transit usage among employees.

- ***Promote the transfer of highway funds to public transit funding. ********

This should be done at all levels of government. In the allocation process, federal, state, and local governments via the MPO, have the opportunity to fund different transportation modes. In the FY 1995-1996 Six Year Improvement Program for Virginia, for every dollar allocated to mass transit, approximately \$29 were allocated for roadway construction and maintenance. While increased investment in mass transit may have to be at the expense of expanded roadway investments, in many cases mass transit may provide a more cost effective and efficient alternative to new pavement over the long range.

- ***Prioritize sidewalk construction and improvements, including ADA compliance activities, which connect to public transit routes. ********

Most transit riders must travel short distances to access a fixed route transit system. If that access is not provided or is not convenient, ridership obviously suffers. Sidewalk construction is largely the responsibility of localities, if not required by developers in new construction. As localities strive to comply with ADA, and more sidewalks are constructed or improved, current and proposed future transit route access should be considered.

Medium Priority

- ***Provide bicycle racks or other storage facilities on buses, and at key bus stops and/or transfer points. *******

Bicycling can be another viable form of access to the transit system if bicycle racks are provided either on the buses and/or at key locations along the routes. In this way, transit

access becomes more viable over a greater distance. Valley Metro has expressed a willingness to install racks on buses if they were supplied by interested businesses, bicycling groups, etc. However, the capital investment to provide them on every bus at their own expense is cost prohibitive with existing financial resources. Bus racks cost approximately \$500 each; for thirty-eight buses the total cost would be \$19,000. On the other hand, racks provided singly at key locations along routes might be donated by local jurisdictions, interested parties, etc. with relatively small investments required. Standard racks, for example, with twelve stalls, may be purchased for as little as \$200.

- ***Enlist support and participation from the business community for/in transit programs and activities. ******

The business community and mass transit can both benefit from a healthy relationship. Just as businesses benefit from parking spaces provided at their doors, transit can provide a direct liaison between a customer and the sale of a product or service. Businesses can attract transit customers by offering transit ticket discounts (versus or in addition to discounting parking tickets). Similarly, area chambers of commerce should look to transit as a tool for attracting businesses and customers, just as private automobile access is used as an incentive.

- ***Develop land use plans and controls that encourage transit oriented development. ******

Land use plans are developed by local jurisdictions with zoning ordinances used to enforce the proposed land use design. Unfortunately, many of the low-density, single use designs which have been preferred in the past are not conducive to mass transit route development or maintenance. As urban sprawl continues, so will the burdens on the transportation infrastructure, as well as other utilities. Well planned mixed use development with higher population densities and transit accessible roadways, sidewalks, etc. can be very attractive as well as a practical alternative. As the Roanoke Valley continues to grow, many of the problems larger urban areas experience can be averted if innovative land use planning techniques are incorporated to account for and serve growth.

- ***Establish park-and-ride lots in existing business or church parking lots with available space. *****

As an alternative to constructing new park-and-ride lots which are expensive and do not usually generate a direct return on investment, opportunities should be explored to share existing parking lots which have large vacancies. This has been done in other urban

areas with shopping center lots, church lots, etc. Issues must be addressed however, such as insurance liabilities for vehicles and clients using the lots.

- ***Create a more flexible, easy to use fare structure.*** ** Currently, Valley Metro offers a variety of fare payment methods, ranging from the cash fare that can be paid upon boarding a bus to weekly and monthly passes which can be bought for unlimited rides. While these options provide some flexibility, greater flexibility might be offered through discounts on multiple ride purchases (for example transit tokens) that do not expire.
- ***Color code buses to coordinate with bus route signs, maps, etc.*****
Color codes are a simple tool which can be implemented to help riders easily identify the buses and which route they are serving. An interchangeable color card placed on each bus (usually in the front window and on the side of the bus near the entrance) which corresponds to a color which has been assigned to each route, and is denoted by bus route maps, route signage, etc. is easy to interpret for those in a hurry, as well as anyone who may not be able to read customary bus signage.

Low Priority

- ***Discourage private automobile use.*** *
Incentives to ride public transit may increase the motivation to select public transit over the private automobile. However transit incentives coupled with disincentives to take a private automobile can have a much greater impact. In the Roanoke Valley where congestion problems are relatively small, parking is convenient and inexpensive, fuel prices are low, and many employers and businesses tend to cater to automobile usage, it is very difficult for transit to compete. Disincentives to use the private automobile such as higher parking fees can effectively make transit a more convenient and an appealing transportation alternative.
- ***Form a network of private transportation providers to coordinate services and pool resources.***
There are many social service agencies, churches, and organizations which own and operate vans and buses for their clients' use. However, these vehicles are often under utilized. Also, as a community service it would seem likely that such organizations might be willing to volunteer equipment or persons to provide transportation to those who are in need. These resources could be taken advantage of if providers are willing to work together and overcome issues such as insurance liabilities, vehicle maintenance and depreciation costs, driver training, etc.

- ***Produce and distribute a new bus route map which illustrates routes, schedules, fares, transfer points, bus stops, etc. in an easy to understand format.*** Valley Metro is currently exploring avenues of improving its route map and hopes to produce a more easy to interpret map in the near future.

- ***Regularly evaluate and restructure routes where necessary to improve efficiency.*** A Transit Development Plan is updated regularly by the Fifth Planning District Commission to review Valley Metro's services and make short-term recommendations for improvements. The last Transit Development Plan was completed in December 1993. The following recommendations for restructuring routes to serve areas with more potential ridership were presented in this plan :
 - 1) Alter Route 3D/3C (Crossroads Mall) to use Plantation Road instead of Hollins Road.

 - 2) Alter Route 2A/2B to serve Franklin Road instead of Avenham, 26th and Jefferson. This route could then also serve the Walmart Shopping Center on Route 220.

It should be noted that while restructuring implies that service changes can be made without additional operating expenses, there are substantive administrative expenses involved particularly if the restructuring is controversial. Valley Metro must adhere to a public participation process if any service changes are to be implemented. This includes surveys, public notices, informational meetings, and public hearings. Once a change is approved by the Board of Directors, signs must be moved, maps and schedules must be reprinted, and other promotional activities restructured. It should also be recognized that the opposition to changes in service is very often more vocal than those in favor of the adjustments and thus impedes the process.

- ***Improve and maintain an aesthetically pleasing and safe transit environment.*** Any efforts to improve the transit environment are worthwhile. In a survey of bus riders conducted in 1993, 95% agreed that Valley Metro's buses are clean. Similarly 97% agreed that buses are safe and 95% agreed that they are comfortable. It is evident that Valley Metro strives to maintain a good image by maintaining and enhancing its buses and facilities. These efforts should be continued.

PRIORITIES FOR EXPANSION

The need for improved or expanded public transportation in the Roanoke Valley has gained momentum in recent years. This can be attributed partially to the recognition of ISTEA and the opportunities it affords. Beyond that however, the public is growing increasingly aware of the impacts transportation can have on the growth (or decline) of a community and the quality of life a community can offer. The Public and Specialized Transportation Citizens' Advisory Group for this Plan has emphasized the overall need for a **well-functioning regional public transportation system**. Other groups, working under different auspices have drawn similar conclusions. Improved public transportation was identified as a top need in A Community Plan of Action developed cooperatively by over 200 Roanoke Valley human service providers and community leaders representing more than 60 different organizations. Also, in a strategic plan developed by the City of Roanoke to apply for federal designation of an Enterprise Community, public transportation was highlighted as the primary avenue to increase access to jobs for people in the Enterprise Community and to eliminate downtown automobile congestion.

While a financially constrained plan prohibits the programming of any proposed expansions to the transit system at this time, the objectives of this plan clearly call for improvements and increases in transit services. If additional funds should become available to the transit system within the period of this plan, the following priorities for improved or expanded services have been recommended by the Public and Specialized Transportation Citizens' Advisory Committee, and acknowledged by public transportation providers and the Metropolitan Planning Organization. The number of "****" illustrates the relative emphasis the Committee placed on each improvement.

High Priority

- ***Expand transit service throughout the region where needed, not limited by jurisdictional boundaries. ********

Valley Metro provides public transportation services primarily within Roanoke City. Salem and Vinton contract with Valley Metro to provide limited services (one route) to each of their jurisdictions. One other route serves Tanglewood Mall in Roanoke County. Although Roanoke County contracts with RADAR to provide specialized transportation services to elderly and disabled residents, the demand for these services is higher than what can be served. General public transportation is lacking in both Roanoke and Botetourt Counties.

The 1993 update of the Transit Development Plan identifies several areas in the Valley which have the potential for transit ridership. Expansion of existing routes or creation of additional routes are proposed below to serve these areas. Estimates of **net annual**

operating costs for implementing these projects are also provided. (These estimates do not include the cost of new capital equipment that may be required or the cost for expanded Valley Metro STAR service which must occur with any expansion of fixed route service. See p.15 for additional explanation.) Unless otherwise noted these estimates assume a current level of service, i.e. current days and hours of operation. These projects are presented in order of priority as determined by Valley Metro.

- 1) An additional route which serves Orange Avenue (Route 460) between Hollins Road and the Roanoke Center for Industry and Technology. The Town of Vinton along Ruddell Road and Mountain View Road might also be served by this route, however current roadway geometrics cannot accommodate buses. \$155,000
- 2) An additional route serving the area north of Hershberger Road between Plantation Road, Williamson Road, and Peters Creek Road. Hollins College might also be served by this route. \$155,000
- 3) An extension or restructuring of the Salem Express route to serve the area between East Main Street, Dalewood Avenue, Peters Creek Road, and Green Ridge Cove Road. This extension might also serve the Food Lion and Walmart shopping centers on West Main Street in Salem. \$113,000

Note: This extension has partially been implemented from Hershberger to Peters Creek Road and Melrose Avenue. Service has also been extended to Spartan Square on West Main Street.

- 4) An additional route which serves Salem south of the Roanoke River between Twelve O'Clock Knob and Franklin Road. \$155,000

• ***Increase service hours. ********

Valley Metro has recently increased its service hours to operate until 8:45 P.M. Previously, buses stopped running at 6:45 P.M. An additional extension of service until 11:45 P.M. would allow people to shop until retail centers close, provide access to second shift employment as well as other night time activities, for example recreation, studying, etc. This service would cost approximately \$113,000 per additional hour, per year assuming all routes operate on an hourly service.

- ***Increase frequencies of buses during peak hours. ********

Bus service is currently provided on an hourly basis during off-peak periods and on a half-hourly basis during peak periods. Ideally, service would be provided on a half-hourly basis during off-peak periods and every 15 minutes during peak periods (i.e. service is doubled). This service would cost approximately \$2,000,000 additionally each year.

It should be noted that additional capital equipment may be necessary to implement service extensions or expansions. Additional buses are the primary expense which cost as much as \$200,000 for a 35-foot coach. Also, when any fixed route bus service is extended or added, identical expansion of the Valley Metro STAR service must also be provided to comply with the Americans With Disabilities Act. Valley Metro currently contracts with RADAR to provide this service. Each additional trip costs \$10.90 of which less than \$2.00 is collected by fare. This service can be a large portion of expenses incurred with service expansion.

Medium Priority

- ***Color code buses with bus route signs, maps, etc. *******

(This recommendation is discussed above under Priorities for Improvements to the Existing System and can likely be implemented without major expense.)

- ***Aggressively market public transportation services. ******

Aggressive marketing campaigns can be very expensive. However, marketing can have a strong impact on ridership particularly in an area such as the Roanoke Valley where using transit is an option for the majority of the public, rather than a must. For FY 1995 Valley Metro will spend approximately 1.1% of their budget on marketing. Because public transit is a heavily subsidized activity, the benefits of marketing must be clearly illustrated to justify large expenditures.

- ***Provide bus shelters, benches, lighting, route guides, etc. at key locations on bus routes. ******

These amenities require large capital expenditures initially and maintenance costs thereafter. Often these items are subject to vandalism as well. Businesses and local governments should be encouraged to provide and maintain items such as benches and lighting at appropriate stops and/or transfer points. Bus shelters are a major expense and will likely not be constructed unless they are donated or ridership increases substantially system-wide.

- ***Provide Sunday service. *****
Of all proposed service expansions, Sunday service is the most expensive to implement, primarily because of labor issues involved. This service would cost approximately \$80,600 per year, per route assuming five routes operate hourly from 8:45 to 6:45 P.M.
- ***Provide bicycle racks or storage facilities on buses, and at key bus stops and/or transfer points. *****
(This recommendation is discussed above under Priorities for Improvements to the Existing System.)
- ***Create and /or provide more express routes. *****
Express routes can be particularly appealing to suburban commuters particularly if the trip time can be reduced to be more competitive with the automobile commute. Dense suburban development is most conducive to this type of route which makes few stops en route to the urban core. With the exception of those areas listed above which are proposed for expansion (and have a relatively high potential for transit ridership), most suburban areas could not currently support express routes.
- ***Provide door-to-door paratransit service. *****
RADAR is the primary demand responsive specialized transportation provider in the Roanoke Valley. RADAR currently provides curb-to-curb service for the majority of its clients. Understanding the many barriers that may exist for the disabled between a door and a parked vehicle at the curb, has prompted many social service agencies to request that this service be improved. Certain issues must be addressed, however, if door-to-door service is to become standard practice. Problems include increased trip cost due to additional time required, increased insurance liabilities for drivers or attendants, liabilities for unattended vehicles, physical barriers such as steps, etc. RADAR will examine requests for door-to-door service on a case by case basis.

Low Priority

- ***Construct new park-and-ride lots where needed. ****
Currently two park-and-ride lots exist in the Roanoke area primarily for those who car pool. Suburban transit routes and accompanying ridership will have to be established before new park-and-ride lots for transit users are justifiable.

- ***Provide bus service for special events. ****

Valley Metro and RADAR provide public transit services for special events on a contractual basis.

- ***Provide accessories to aid elderly and disabled clients. ****

The Americans With Disabilities Act has assured that public transit services will take into consideration the needs of elderly and disabled clients. Requests for optional accessories will likely be reviewed upon demand.

- ***Produce and distribute a new bus route map which illustrates routes, schedules, fares, transfer points, bus stops, etc. in an easy to understand format. ****

(This recommendation is discussed above under Priorities for Improvements to the Existing System.)

- ***Computerize paratransit services and ridesharing program for more efficiency.***

Both Valley Metro and RADAR are pursuing efforts to optimize operations through computer usage. RADAR has recently made a large investment in computer software which will assist in coordinating rider pick-ups and drop-offs, maximizing the use of each in-service vehicle. A computer matching program is used by Valley Metro to link rideshare applicants with who live and work in close proximity to one another.

FUNDING EXPANSION

The key issue for any expansion of transit services is funding. As mentioned previously, even when high ridership can be achieved, large federal, state, and local subsidies are usually necessary to operate successfully. Because of ISTEA, federal and state agencies will likely look more favorably on proposed transit projects which show promise of future success. Future success is often difficult to illustrate in an area such as the Roanoke Valley however, where ridership has consisted mostly of those who are transit dependent. More people must be convinced to select transit instead of their private automobile. This is unlikely to happen until the transit system is made more convenient and competitive with the automobile and the public becomes more aware of the benefits of using public transit. Making the system convenient and educating the public require investment prior to any demonstrated success. At some point, some "faith" must be placed in potential or latent demand which exists, but is difficult to predict and may not immediately respond to service improvements.

The best organization for a regional transit system is a regional transit authority in which all localities have joint ownership and decision-making authority. In 1975, an opportunity to establish a regional transit authority was passed up by local governments. Today, outlying jurisdictions express interest and in some cases contract for transit services; yet, paying for those services is often the topic of political controversy. Providing the 10% to 20% local match required to receive state and federal funding can be a substantial outlay for local governments with already heavily burdened budgets. Also, because the existing system is owned and operated by one locality (Roanoke City), decisions to invest in a system which extends beyond its own boundaries must be carefully weighed. Even if other localities are willing to pay or contract for those services, there should be some inherent benefits, or at least no detrimental effects, for the owning jurisdiction to assume the additional responsibilities.

A dedicated local funding source is desperately needed to ensure Valley Metro's stability in the future at existing or expanded levels of service. Roanoke City provides the local match necessary to continue services, but thus far has been unable to dedicate funds to the transit system. The Transit Development Plan recommends an additional source of revenues should be created for the sole purpose of supporting public transit. Additional revenues are usually derived from taxes (transit income tax, fuel tax, personal property tax, etc.) which are controversial methods for politicians to implement. Again, a regional forum might provide a better mechanism for taxing. Implementing jurisdictions would not be at a disadvantage by having higher or more taxes when compared with adjoining jurisdictions in the Roanoke Valley. Also, because the tax would be spread among a higher population, the absolute per capita increase would be less.

The challenges are formidable, but not insurmountable. If the citizens of the Roanoke Valley desire a successful regional transit system they must be willing to pay for it. This will also demonstrate to the state and federal governments the Valley's commitment to transit. This would directly impact their decisions to fund expansions and/or improvements. Otherwise, without local commitment, significant expansions to the present system is unlikely to occur and the stability of present services is not certain.

BICYCLE AND PEDESTRIAN TRANSPORTATION

Note: The new bicycle and pedestrian provisions provided in TEA-21 and the 1997 update to the Roanoke Valley Area Bikeway Plan were not used in the development of this section. The bicycle and pedestrian provisions provided in TEA-21 and the data and information provided in the 1997 Bikeway Plan update will be used in the next update to the LRTP scheduled for completion in late 2001.

BICYCLE AND PEDESTRIAN TRANSPORTATION AND TEA-21

The Intermodal Surface Transportation and Efficiency Act of 1991 (ISTEA) was the first transportation legislation with a vision beyond building the Interstate system, focusing on the efficient and convenient movement of people and goods rather than the simple accommodation of private automobiles. Also for the first time, this transportation law put an emphasis on developing a transportation network that is friendly to the environment and does not disrupt community cohesiveness and sensible land use strategies. As part of this broad vision of transportation, ISTEA emphasized the development of a national transportation network that includes all forms of transportation and strongly encouraged the development of bicycle and pedestrian facilities as part of the overall transportation network. In order to accomplish this, ISTEA required states and metropolitan areas to consider the bicycle and pedestrian modes as integral to the mission of providing the best means to move people and goods.

Specifically, ISTEA required both statewide and metropolitan area Long Range Transportation Plans to incorporate bicycle and pedestrian considerations. The Long Range Plans will then be used as a guide for future capital expenditures for all transportation facilities, including bicycle and pedestrian facilities. In this way, bicycle and pedestrian facilities will be incorporated into the future development of an overall transportation network and receive consideration in the implementation process.

In addition, States are required to create a position of bicycle and pedestrian coordinator within their departments of transportation. The objective is to promote and facilitate the increased use of nonmotorized modes of transportation. Activities should include developing or expanding pedestrian and bicycling facilities, public education, promotional and safety programs.

ISTEA also provides federal funding for bicycle and pedestrian activities from a number of newly created programs giving local communities and states the ability to place more serious emphasis on the development of bicycle and pedestrian infrastructure without having to neglect other areas of the transportation network.

OBJECTIVES

A citizen advisory committee was established in order to help develop objectives and strategies for the bicycle and pedestrian section of the Long Range Plan. The objectives developed by the Roanoke Valley Area Metropolitan Planning Organization, in conjunction with the Transportation Technical Committee and the Bicycle and Pedestrian Transportation Facilities Citizens' Advisory Committee, are as follows:

- **Increase bicycling activity and safety in the Roanoke Valley area.**
- **Increase pedestrian activity and safety in the Roanoke Valley area.**

Because of the new vision of transportation espoused by ISTEA, a National Bicycling and Walking Study was conducted by the Federal Highway Administration. Completed in early 1994, it established two modest goals to be achieved within no set time period. They are:

1. To double the percentage of total trips made by bicycling and walking in the United States - from 7.9 to 15.8 percent of all travel trips; and
2. To simultaneously reduce by 10 percent the number of bicyclists and pedestrians killed or injured in traffic crashes.

It is not unreasonable to suggest that these goals can be met in the Roanoke Valley and fostered by this Long Range Plan.

Further, the Bicycle and Pedestrian Transportation Facilities Citizens' Advisory Committee has developed a list of suggested strategies for achieving the above mentioned objectives. These strategies are not binding on local jurisdictions as requirements during the planning process. Rather, they are provided in this document as useful guides and as issues to consider during the planning process. The reader is encouraged to review these strategies in Appendix B.

FUNDING OPPORTUNITIES FOR BICYCLE AND PEDESTRIAN FACILITIES

ISTEA, unlike any previous transportation law, has a very high degree of flexibility in terms of funding allocation. In this manner, states and localities have more latitude in how they spend their funds for transportation infrastructure development. For example, money that might otherwise be spent on roadway construction may, if the jurisdiction wishes, be spent on a new pedestrian bridge or bicycle route. The following is a list of ISTEA funding sources which can be used for various modes of transportation including bicycle and pedestrian projects. It should be noted that none of these sources are dedicated funding sources for bicycle and pedestrian facilities, but may be used for such, as determined by a state or locality:

National Highway System (NHS): Funds (Section 1006) may be used to construct bicycle transportation facilities and pedestrian walkways on land adjacent to any highway on the National Highway System (other than the Interstate System). ;

Surface Transportation Program (STP): Funds (Section 1007) may be used for either the construction of bicycle transportation facilities and pedestrian walkways, or nonconstruction projects (such as brochures, public service announcements and route maps) related to safe bicycle use. Ten percent of STP funds are used for "Transportation Enhancements" which include the provision of facilities for bicyclists and pedestrians;

Congestion Mitigation and Air Quality Improvement (CMAQ): Program Funds (Section 1008) may be used for either the construction of bicycle transportation facilities and pedestrian walkways, or nonconstruction projects (such as brochures, public service announcements and route maps) related to safe bicycle use;

Federal Lands Highway Funds (Section 1032): Funds may be used to construct pedestrian walkways and bicycle transportation facilities in conjunction with roads, highways and parkways at the discretion of the department charged with the administration of such funds;

Scenic Byways Program Funds (Section 1047): Funds may be used to construct facilities along scenic highways for the use of pedestrians and bicyclists;

National Recreational Trails Fund (Section 1302): Monies may be used for a variety of recreational trails programs to benefit bicyclists, pedestrians and other nonmotorized and motorized users. Projects must be consistent with a Statewide Comprehensive Outdoor Recreation Plan required by the Land and Water Conservation Fund Act;

Section 402 Funding: Pedestrian and bicyclist safety remain priority areas for highway safety program funding. Title II, Section 2002, of the ISTEA addresses State and community highway safety grant program funds. The priority status of safety programs for pedestrians and bicyclists expedites the approval process for these safety efforts;

Federal Transit Funding: Title III, Section 25 of ISTEA, continues to allow transit funds to be used for bicycle and pedestrian access to transit facilities, to provide shelters and parking facilities for bicycles in or around transit facilities, or to install racks or other equipment for transporting bicycles on transit vehicles.

BICYCLE PLANNING IN THE ROANOKE VALLEY

The Roanoke Valley Area Metropolitan Planning Organization prepared the first Bikeway Plan for the Roanoke Valley Area in 1975. This plan sought to establish a network of bicycle trails and paths throughout the Roanoke Valley. An update of this original plan was prepared in 1981, 1991 and again in 1997.

These plans, while visionary in terms of their attempt to focus attention and develop support for the development of nonmotorized transportation facilities, have lacked attention during the implementation process. ISTEA changes this situation. ISTEA states that bicycle and pedestrian facilities should be identified in the Long Range Plan. The Commonwealth of Virginia will consider bicycle facilities in overall roadway construction if they are part of the Long Range Plan. To this extent the routes designated in the 1997 Bikeway Plan have been incorporated into this Long Range Plan as the basis for implementing bicycling accommodations. Updates of the Bikeway Plan will be incorporated into the Long Range Plan to reflect any changes in the bicycle network.

Definitions

As part of their effort to help localities develop Bicycle Facility Plans, the Virginia Department of Transportation has developed a guide which describes what a Bicycle Facility Plan should look like and how to prepare one. Among the most important concepts included in this guide are the concept of a "design cyclist".

The Design Cyclist - Cyclists are divided into three groups of users in order to identify the kinds of users who may be using each segment of the bicycle routes. For the purposes of establishing and satisfying design standards which will be capable of accommodating the needs of each of these various groups, three levels of "design cyclists" are defined as follows:

Group A - Advanced Bicyclists

Experienced riders who can operate under most traffic conditions, they comprise the majority of the current users of collector and arterial streets and are best served by the following:

- Direct Access to destinations usually via the existing street and highway system.
- The opportunity to operate at maximum speed with minimum delays.

- Sufficient operating space on the roadway or shoulder to reduce the need for either the bicyclist or the motor vehicle operator to change position when passing.

Group B - Basic Cyclists

Casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions for bicycles. Some will develop greater skills and progress to the advanced Group A level, but there will always be many millions of basic bicyclists. They prefer:

- Comfortable access to destinations, preferably by a direct route; either low speed, low traffic volume streets or designated bicycle facilities.
- Well-defined separation of bicycles and motor vehicles on arterial and collector streets (bike lanes or shoulders), or on separate bike paths.

Group C - Children

Pre-teen riders whose roadway use is often initially monitored by parents. Eventually they are accorded independent access to the roadway system. They and their parents prefer the following:

- Access to key destinations surrounding residential areas including schools, recreation facilities, shopping or other residential areas.
- Residential streets with low motor vehicle speed limits and volumes.
- Well-defined separation of bicycle and motor vehicles on arterial and collector streets, or on separate bike paths.

Another concept used in the preparation of a Bicycle Facility Plan is bicycle route classification. The Roanoke Valley Area Bikeway Plan uses the following classifications and definitions:

Bicycle Routes - The Bicycle Advisory Committee, as part of their 1997 update of the Bikeway Plan for the Roanoke Valley Area, identified the following bicycle facility classifications for use in project planning. These classifications are based on 1991 AASHTO standards but have been adapted so they more closely fit with the needs of the Roanoke Valley. Any route improvements identified in the tables can be included in one or more of these categories depending upon the specifics of the project.

Group A - Bike Trail or Path: Provides a completely separated right-of-way designated for the exclusive use of bicycles and pedestrians with cross flows by motor vehicles minimized.

Group B - Bike Lane: An on-road bikeway that has been designated by striping, signing, adequate pavement width and pavement markings for the preferential or exclusive use of bicyclists.

Group C - Widened Outside Lane or Paved Shoulder: A roadway with a widened outside lane or paved shoulder that is constructed with an additional 2 to 3 feet of pavement width in order to accommodate bicycles.

Group D - Restripe for Shared Roadway: A roadway designated for potential use by bicycles that is restriped to increase the width of the outside lane and decrease the width of the inside lane. This creates an outside lane with which bicycles may ride more safely and conflicts with passing vehicles is minimized.

Group E - No Improvement Necessary: A roadway that accommodates bicycle use without the need for additional improvements.

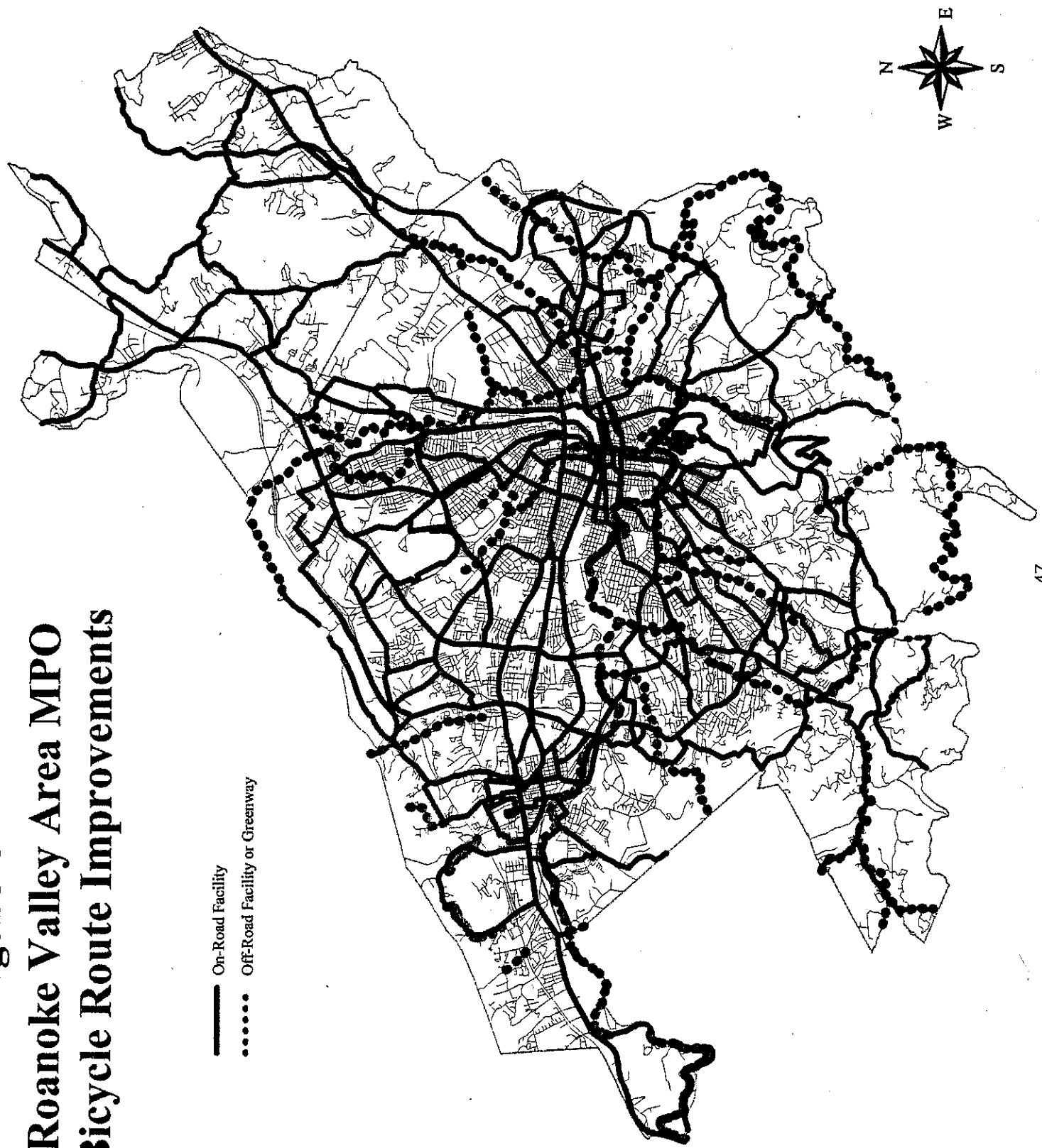
Note: For the bikeway map these categories are collapsed into "on-road" and "off-road" facilities. ***For bicycle accommodations to be considered as part of roadway improvements with Federal or State funds, the roadway must be on an approved bikeway plan.*** The jurisdiction still has the option to include the bicycle accommodation (extra width, striping, etc.) or not when the roadway project is initiated.

Bicycle Route Map

The designated bicycle routes from the 1997 update of the Bikeway Plan for the Roanoke Valley Area is represented on the attached map. The lines indicate the primary thoroughfares desired for bicycle travel in the Roanoke Valley.

Figure 4

**Roanoke Valley Area MPO
Bicycle Route Improvements**



PEDESTRIAN PLANNING IN THE ROANOKE VALLEY

While no pedestrian plan currently exists for the Roanoke Valley, the Fifth Planning District Commission will be developing an Open Space Plan for the Roanoke Valley Area as part of its Fiscal Year 1995 Work Program. This study will establish goals, objectives, criteria, as well as inventory existing facilities and examine locations for future walking and hiking trails for public pedestrian use. While ISTEA will fund only pedestrian facilities which supply pedestrian access for people and goods movement rather than solely for recreational purposes, clearly portions of the developed Open Space Plan will meet ISTEA criteria. As such, the Open Space Plan could provide a basis for pedestrian facility projects to be included in the Long Range Plan. The Long Range Plan can be amended and updated to take into account the recommendations of the finalized Open Space Plan.

Roanoke City has designated two pedestrian facilities as high priority projects. The City will take advantage of the flexible funding categories in ISTEA, by using some of its allotted Surface Transportation Program funds for the first project:

Pedestrian Bridge - a bridge connecting the Hotel Roanoke/Conference Center area to the Historic Market area. A contract for this project has already been awarded with a total cost estimate of \$5,326,181.

Phase I of the second project will be funded primarily with local funds derived from a bond issue. The City may opt to pursue Transportation Enhancement funds for portions of Phase II.

Railside Linear Park - a pedestrian facility linking the Virginia Museum of Transportation to the Historic Market area. The estimated cost for this project is \$1,500,000 for Phase I and \$1,034,500 for Phase II.

Perhaps more significant than ISTEA in terms of pedestrian planning is the Americans with Disabilities Act (ADA). The ADA is a broad-ranging law which basically requires that a conscientious effort be made to accommodate the needs of the physically disabled. This directly affects long range pedestrian planning in terms of the provision of adequate access to facilities, including transportation facilities such as a parking lot, street or bridge. The ADA requires that a public entity undertaking an alteration of an existing facility or constructing a new facility must, to the maximum extent feasible, be accessible to and usable by individuals with disabilities. The term "maximum extent feasible" has been defined to mean that all changes that are possible must be made. Curb-cuts in roadway

intersections and parking aisles wide enough to accommodate wheelchairs are only two examples of the many pedestrian accommodations which will need to be included in any planned transportation project. The requirements of the ADA need to be included in the transportation planning process and all projects included in this long range plan must be in compliance with ADA requirements.

FREIGHT MOVEMENT

FREIGHT MOVEMENT AND ISTEA

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) presents opportunities and challenges to the transportation community by incorporating the concept of intermodalism into the thinking of transportation officials and professionals. The words "intermodal" and "efficiency" in ISTEA offers a promising and challenging combination of planning concepts, requiring broad vision, tempered by wide expertise. The legislation reads, "The National Intermodal Transportation System shall consist of all forms of transportation in a unified, interconnected manner, including transportation systems of the future, to reduce energy consumption and air pollution while promoting economic development and supporting the Nation's preeminent position in international commerce". Personal mobility is now intertwined with goods mobility and the twin concepts demand equal attention.

Intermodal transportation includes movement of both passengers and freight. Traditionally intermodal transportation has not received sufficient attention at the state or MPO level, freight movement has been the most neglected aspect. Given the importance of the movement of freight to the economy and to a community's quality of life, one would expect the effective and efficient movement of goods to be one of the most important considerations in transportation planning. State transportation agencies and MPOs need to better incorporate freight considerations into transportation planning, not only in the problem identification stage of the planning process, but also in the goal setting and in the analysis and evaluation.

FREIGHT MOVEMENT IN THE ROANOKE VALLEY

The Roanoke Valley is part of the Great Shenandoah Valley that separates the Blue Ridge Mountains on the East and the numerous ranges of the Alleghenies to the west. This valley shares a rich history with the whole of western Virginia. In the early days native American tribes used the valley as a north-south passageway, but for the most part did not settle here. European settlers who first came to the area, arrived from Pennsylvania and Maryland using wagon trails which approximates modern day Route 11. The Virginia and Tennessee Railroad later established a rail line through the Valley along this same route. Soon after, Roanoke secured its position as a railroad center as the junction of the Shenandoah Valley Railroad and the Virginia and Tennessee Railroad (presently the Norfolk Southern Railroad). The result of having this second railroad line was a stimulus to greater development. Rapid expansion in territory,

industry, and population led to the incorporation of Roanoke as a city in 1884. Historically Roanoke has grown as a railroad center, and owes much to the railroads from both the physical and economical viewpoints.

In 1929, the City of Roanoke leased 136.37 acres for the Valley's first airport which was established in 1934. The first commercial service was initiated by American Airlines that same year. During the late thirties extensive improvements were made to the airport and in 1940, the Roanoke Airport was declared a national defense project. Since the early forties, numerous projects have been completed with federal, state, and city funds. Today, seven commercial airlines link the Roanoke Regional Airport with over 350 cities across the United States. These airlines while focusing on passenger service, function as air cargo carriers as well. The predominant amount of air freight is handled though by all-cargo air carriers. Roanoke Regional Airport has most recently benefited from major expansions of air freight services.

In addition to air and rail access, the Valley's proximity to two major interstates (I-81 and I-77), and other primary thoroughfares has contributed to a multimodal transportation system well suited for future growth. Freight movement in and through the Roanoke Valley has greatly benefited from this system and will likely continue to for many years to come.

AIR FREIGHT TRANSPORTATION

The primary aviation facility located within the Roanoke Valley Area is the Roanoke Regional Airport, an air carrier airport. The Roanoke Regional Airport is located just within the northern corporate limits of the City of Roanoke and east of Interstate 581. The airport is reached via Aviation Drive and Hershberger Road (Route 101) or via access roads from Airport Road (Route 118) connecting with Peters Creek Road (Route 117). Although, Roanoke Regional Airport accommodates a substantial amount of general aviation traffic, its primary role is a regional air carrier airport.

As compared to an airport's primary market area for passenger traffic, the geographic area that is conveniently served by air cargo is generally more extensive. In fact, an air cargo market area is often primarily determined by the air cargo operator based on cost considerations, rather than the shipper whose main interest is timely delivery of the shipment to its final destinations. Consequently there is a much greater degree of overlap among airport service areas for cargo than for passengers. Based on surveys of freight forwarders and carriers in Roanoke, the Roanoke Regional Airport generally services territories within about two hours of the airport. As a result of recent upgraded services, virtually all air cargo traffic originating in the Roanoke area

moves via the Roanoke Regional Airport. Since the early 1980's air freight traffic at the Roanoke Regional Airport has grown dramatically. Measured over a ten year period between 1979 and 1989 the average freight tons enplaned at the Roanoke Regional Airport grew from 6.4 tons to 8.7 tons daily, an average annual growth of 3.1%. Over the past decade all-cargo airlines have become increasingly important in serving the Roanoke area and enplanes more than 90% of the air freight enplaned at the Roanoke Regional Airport.

Projected Growth in Air Freight

There are primarily six all-cargo and small package delivery companies serving the Roanoke area based on 1994 data. They are Airborne Express, Burlington Air Express, DHL, Emery Worldwide, Federal Express and UPS. All these companies regularly operate all air cargo flights to the Roanoke Regional Airport. Notwithstanding the exceptionally high rates of traffic growth experienced in U.S. air freight markets in recent years, most industry forecasters are projecting more moderate growth for the future. The Federal Aviation Administration projects 5.0% annual growth in the domestic air freight market. The air freight forecast for the Roanoke Regional Airport for the period 1989-2010 projects a growth in freight from 2,269 tons enplaned in 1989, to 4,762 tons in the year 2000, to 8,713 tons in the year 2010, an average annual growth rate of 6.6%. Actual growth to date, however, has exceeded these projections considerably with the airport expected to enplane approximately 9,500 tons of air freight in 1994 alone. If realized, this figure would exceed 2010 projections by more than 700 tons for an average annual growth rate since 1989 of 7.1%.

Needed Facilities

As air cargo volumes continue to increase, it may become more economical and efficient for freight carriers to use larger aircraft. Depending on the type of aircraft, there may be a need to conduct a feasibility study of extending the runway. The Roanoke Regional Airport is limited however by lack of available land and surrounding topography.

There are two additional needs to accommodate the efficient movement of air cargo. First there must be ample air freight sorting and warehouse space. US Air and Burlington Air Express own and use an 8,107 square foot on-site air cargo building. Other cargo is handled at the old passenger terminal building or at off-site properties owned by air cargo companies such as United Parcel Service, Federal Express, Emery Worldwide, etc. The air cargo building facilities required for the Roanoke Regional Airport are projected to be an additional 38,869 square foot in 1995

(including the replacement of the old terminal building which is presently being used as a air cargo building), an additional 11, 443 in the year 2000 and an additional 36,122 in the year 2010.

There can be considerable variation in the utilization, amount and type of cargo facilities needed at an airport depending upon the type of cargo moved, the characteristics of the cargo operators, the average length of dwell time and other factors. However, a regression analysis encompassing over 40 major U.S. airports disclosed a reasonably predictable relationship between the amount of airport cargo facilities and the annual weight of air cargo handled. The sample airport had an average of 1.73 square foot of air cargo building facilities for each ton handled annually while the Roanoke Regional Airport has only 0.67 square foot indicating an existing shortage of space. Some of the additional air cargo storage space can be accommodated through future investment in on-site facilities. However, due to Roanoke Regional Airport's limited land area, it is particularly important for off-site properties near the airport that have the development potential for air-cargo warehousing to be preserved for those purposes.

In addition to the warehousing needs, facilities should be available for airside loading. There is no dedicated air cargo ramp at the Roanoke Regional Airport at the present time. The largest ramp requirement for the entire state is at the Roanoke Regional Airport which will need a new cargo ramp area of approximately 160,000 square feet. The Airport is planning the construction of a new ramp and support facility on Airport Road near the road tunnel. The cost of the ramp alone is estimated to be approximately \$6 million. The Roanoke Regional Airport is currently in the process of updating its master plan. The plan should be ready during the 1996 fiscal year.

Land use decisions regarding properties surrounding the airport will play an important role in the Airport's abilities to respond to potential demand in the air freight industry. The land around the Roanoke Regional Airport should be preserved to accommodate future expansions of airport support facilities including air cargo storage facilities (as stated above), etc. Compatible land uses should be encouraged and intense development prevented around the airport through proper land use and zoning policies.

Due consideration should be given to all areas of concern which will be identified in the Roanoke Regional Airport Master Plan which is currently being developed.

* *Portions of this section were derived from the Virginia Air Cargo System Plan, prepared by SH&E, Inc. for the Virginia Department of Aviation.*

RAIL FREIGHT TRANSPORTATION

The availability of reliable rail transportation service is essential for orderly economic growth and development in the Roanoke Valley. Rail freight service in the area is provided by Norfolk Southern. Over the years Norfolk Southern has played a major role in the development of local industries and businesses as well as providing a vital link with fossil fuel areas in southwest Virginia, West Virginia, and eastern Kentucky. The rail system is currently faced with certain issues and problems which deserve careful scrutiny. These issues have both a private and public dimension. For the railroads, financial rate of return tends to govern the decision making framework. Government also believes financial rate of return is important, but promotes the consideration of other factors such as the impacts on employment, impacts on economic growth, and the shifting of freight shipments to and from the highways. Several substantive rail issues are described below along with general background; specific issues involve intermodal facilities and restrictions, rail-highway bridges and grade crossings, and rail abandonments.

Rail Line Classification and Traffic Densities

The Commonwealth of Virginia classifies its rail lines to coincide with the Final Standards, Classifications, and Designation of Class I Railroads in the United States which was developed by the U.S. Secretary of Transportation. The Class I rail lines were evaluated according to the following standards:

- traffic density
- service to major markets
- appropriate levels of capacity
- national defense
- lines potentially subject to abandonment

Based on these evaluations, each of the rail lines were designated as being in one of the following categories:

- 1) **A-Mainline:** A line that qualifies by meeting any one of the following requirements:
 - Traffic density of 20 million or more gross tons annually.
 - Serves a market generating more than 75,000 carloads annually.
 - Required to provide a through rail route in corridors designated as essential in the Strategic Rail Corridor Network (STRAGNET) for National Defense.

- 2) **B-Mainline:** A line that qualifies if it is a through or feeder route that carries less than 20 million gross tons annually and qualifies neither for A-Mainline status on the basis of service to major markets nor as part of STRAGNET.
- 3) **A-Branchline:** A line that handles at least 1 million gross tons but less than 5 million gross tons and is not otherwise designated as an A-Mainline.
- 4) **B-Branchline:** A line that handles less than 1 million gross tons annually and is not otherwise designated a an A-Mainline.

All major rail lines within the Roanoke study area are classified as A-Mainline, with the exception of the B-Branchline Norfolk Southern spur line that runs from Roanoke County to Salem. This spur line is classified as Freight Traffic Density I, which means millions of gross tons, per mile of line, per year, is less than one.

In addition to the previously stated line designations, rail lines are classified according to traffic density. The density categories are listed in Table 4.

**TABLE 4
TRAFFIC DENSITIES**

| <u>Density</u> | <u>Million Gross Ton Miles of Freight Annually</u> |
|----------------|--|
| 7 | > 30 (No Data Available) |
| 6 | 20-30 |
| 5 | 10-20 |
| 4 | 5-10 |
| 3 | 3-5 |
| 2 | 1-3 |
| 1 | < 1 |

* Source:

Final Standards, Classification and Destination of Class I Railroads in the United States and the 1991 Virginia State Rail Plan

Intermodal Freight Movement

Innovations in intermodal rail movement have spawned tremendous growth in this sector of freight shipping. With access to some of the best seaports on the east coast, Norfolk Southern is striving to capitalize on this trend and increase its intermodal cargo shipping and marketing. "Intermodal" cargo as defined by the railroad refers specifically to containers or other devices which hold sorted and packed goods and can be transferred directly to trucks, ships, or aircraft. Trains may carry truck trailers with chassis commonly referred to as "piggy-back" trains, or may carry containers on flat cars, or specially designed well-cars which accommodate "double stack" (stacked two high) containers.

Successful intermodal freight shipment is dependent upon a railroad's height and weight restrictions. Car heights are generally restricted by tunnels and bridges while the type and condition of the track will restrict the weight of cars that can be safely handled. Norfolk Southern has been very successful in providing clearances for its intermodal shipments, connecting major intermodal facilities in Atlanta, Norfolk, and Chicago. NS presently has a route available for 20'-3" double stacks from Bristol, Virginia across the state to Norfolk. Also from Winston Salem, North Carolina to Hagerstown, Maryland via Roanoke, Waynesboro and Front Royal is currently available for 19'-3" double stack movement. Restrictions in Roanoke (Norfolk Southern tracks that run north and south only), Luray, Waynesboro and Buena Vista prevent 20'-3" double stacks. NS will continue efforts to alleviate restrictions particularly to improve double stack operations. Trackage improvements are also essential to operate trains at speeds competitive with truck hauls. Generally, rail shipment is more cost-competitive on long hauls, typically 400 miles or more.

Connecting with Conrail in the northeast and the Florida East Coast Railway in the South, Norfolk Southern is able to tap into the largest consumer markets in the eastern United States. Norfolk Southern relies heavily on partnerships with other railroads to take advantage of major markets. Approximately 45% of Norfolk Southern's shipments originate or terminate beyond NS lines. Norfolk Southern's ability to expand business will likely depend on continued good relations with neighboring carriers.

With the continued growth of intermodal rail shipping, the need for special facilities where containers can be transferred to/from other modes is increasing. As a key location on the Norfolk Southern network, there is a need for such a facility in or near the Roanoke Valley. A large number of trucking companies operating in the region currently use intermodal facilities in Greensboro, North Carolina due to the lack of a transfer facility in the Roanoke area.

Rail - Highway Crossings

Safe and efficient rail-highway crossings are essential for the continuous flow of rail freight. The Virginia Department of Rail and Public Transportation is continually monitoring the rail-highway grade crossings and their recommended safety improvements as necessary. Utilizing the update procedures of the National Railroad - Highway Grade Crossing Inventory and Numbering Project, field inspections and the cooperation of the various railroads, all crossings are analyzed to determine if additional safety measures are needed. Improvements are ranked according to expected accident rates and the cost-benefit ratios developed for various types of warning devices, so that available funds are directed to the most cost effective improvements. The Virginia Department of Transportation has installed advanced warning signs and pavement markings at all non-separated grade crossings on the State Highway System as required by the Manual on Uniform Traffic Control Devices (MUTCD). VDOT is working with the railroad companies to ensure that crossbuck signs are installed at every crossing as called for in the MUTCD. Corrective actions in a systematic manner is often difficult because needed improvements must compete with other road construction projects such as widening or paving of roadways in a given locality.

Ideally, emphasis should be on grade separation or elimination of crossings rather than improved protection devices. Also a thorough review of proposed new crossings should identify all potential safety or congestion problems before allowing construction. Analyses of grade crossings should continue to be updated to identify safety needs.

Rail Line Abandonment

Although not directly related to freight movement, the issue of railroad abandonment has a direct impact on the railroads and affected jurisdictions. The railroads serving Virginia are continuing to divest themselves of lines which, for various reasons, do not meet the criteria established by their overall plans of operation. Tracks and structures are dismantled for salvage and the right of way is converted to other uses. Local jurisdictions are deprived of a transportation resource that have been taken for granted as a marketing asset for industrial development. The Virginia Department of Rail and Public Transportation (VDRPT) analyzes all light density and marginally profitable lines and contacts the localities which might be affected by an abandonment of service. Also, major shippers are notified at the earliest possible date of the potential for abandonment. Abandonment is best prevented through early identification of potential problems, recognition of the consequences of abandonment and a concerted effort to retain service.

To enhance the viability of light density lines, planners in the Roanoke Area are encouraged to promote increased utilization of such lines in their industrial development and comprehensive planning efforts. Industries which receive multiple rail shipments at one time are the best candidates for direct rail access (e.g. feed mills, power plants, steel mills, etc.). Otherwise, intermodal movement is usually more cost effective. The Virginia Department of Rail and Public Transportation will report annually, through the State Rail Plan Updates on fluctuations in rail traffic over light density lines.

HIGHWAY FREIGHT MOVEMENT

Roanoke legacy has been that of a transportation hub, but its emphasis is increasingly shifting from iron rails to the highway system. Roanoke's geographical position astride an important highway network in the center of the east coast states, has attracted a variety of industry such as manufacturing, distribution, mail-order and trucking companies. These industries in turn have generated substantial amounts of truck traffic and place an increasing demand on the roadway network. Truck traffic traveling through the Roanoke area has increased substantially as well. This is illustrated by the high truck traffic volumes on Interstate 81 (22% and higher in some sections depending on the time of day) as it passes through Roanoke and surrounding areas.

Interstate 581 (I-581) provides a vital limited access corridor between the Roanoke urban area and Interstate 81 (I-81), the principal intercity highway for the Roanoke area. Additionally, several arterial highways which are not limited access provide vital through facilities to other areas. U.S. 460 heading east from Roanoke is a four lane divided facility which provides the most direct access to Lynchburg, Richmond, and the Tidewater urban areas. To the west, this facility links Roanoke with Salem and continues west into West Virginia. U.S. 220 heading south from Roanoke provides the most direct access to the Greensboro, North Carolina as well as other points to the south, and southeast.

Staff of the Roanoke Valley Area Metropolitan Planning Organization conducted a survey of trucking industries and/or other freight carriers serving the Roanoke area to identify problems faced by the freight transportation industry in the MPO area. The following recommendations are derived from the survey responses and are offered for consideration by local, state, and federal implementing agencies.

- Shaffer's Crossing below the Norfolk Southern railroad tracks between 24th street and Patterson Avenue physically restricts large tractor trailer trucks. Presently trucks picking up or delivering freight in this area must go to 10th Street to cross the railroad tracks. While the Peters Creek Road extension may alleviate some demand at this crossing, another trucking alternative may need to be provided.
- Additional loading zones or short term parking spaces in downtown areas of Roanoke City and Salem City are needed to accommodate freight delivery and pick-up trucks specifically in the market areas of both cities (Campbell Avenue, Luck Avenue, Salem Avenue, and Jefferson Street in Roanoke City, and Main Street in Salem).
- Road access to the Roanoke Regional Airport needs improvement to accommodate freight trucks operating from various freight distribution centers. Specifically, Peters Creek Road and Thirlane Road are used extensively by trucks to carry freight to and from the Roanoke Regional Airport. These roads, including turn lanes and traffic signals, need to be improved to provide for the quick and efficient movement of freight. Truck traffic in the vicinity of the airport is expected to increase substantially in the coming years with the increase in freight handled at the Roanoke Regional Airport.
- Special consideration should be given to trucks in the design and construction of improved exit and entrance ramps for I-81 and I-581. The interchange on I-581 at Orange Avenue is an example which needs to be improved to accommodate large truck volumes.
- The two lane sections of Route 115, Plantation Road between the Roanoke City limits and Liberty Road need to be widened to 4 lanes. (Portions of Plantation Road have been prioritized for roadway improvements in the highway section of this Plan.)
- Certain types of tractor trailers are restricted from using Alternate Route 220 between Route 11 and Route 460. This is a major truck route in the Roanoke Valley. The construction on this road needs to be completed as quickly as possible to eliminate restrictions on truck movement through this corridor.
- When new roads are built or improvements are made to major thoroughfares in the study area, the needs of large trucks need to be taken into consideration during the planning design and construction phases.

- The problem of congestion on Orange Avenue/Route 460 needs to be addressed. (Portions of Orange Avenue have been prioritized for roadway improvements in the highway section of this Plan.)
- When improvements are made to existing roads, and new traffic patterns are planned to accommodate construction, these plans should consider the movement of freight carriers through the construction zone.

INTERCITY PASSENGER MOVEMENT

AIR PASSENGER SERVICE

The Virginia Air Transportation Systems Plan classifies the Roanoke Regional Airport as a Commercial Service Airport. The Roanoke Regional Airport accommodates the current demand for air transportation services for a region including but not limited to the Roanoke Valley. The Roanoke Regional Airport's passenger service area covers an area which includes the Cities of Roanoke and Salem, the Counties of Roanoke, Montgomery, Pulaski, Giles, Craig, Botetourt, Alleghany, Rockbridge, Bedford, Franklin, Floyd and portions of West Virginia. For both passengers and cargo the amount and type of air services and the prices for the service largely determine the effective market area of the airport. Currently, seven certified air carriers offer passenger service between Roanoke and six major hubs with connections to over 1,200 flights world-wide (with a connect time of less than 90 minutes). Direct non-stop services are available to Atlanta GA, Baltimore MD, Charlotte NC, Cincinnati OH, Detroit MI, Norfolk VA, Pittsburgh PA, Raleigh/Durham NC, Richmond VA and Washington, DC. In 1993, Roanoke Regional Airport handled a total of 656,103 passengers, a 1.5% increase over 1992. Projections for 1994 point to a 16% increase in passengers to 761,000, the second highest count in the airport's history.

The Roanoke Regional Airport also offers complete general aviation services including service for corporate jets as well as charter service. Public ground transportation service to and from the airport is limited to taxicab and limousine service. There are a few heliports located in and around the study area. Although these heliports are important from a service and air traffic point of view, their impact on overall transportation planning in the Roanoke area is minor.

RAIL

There is presently no direct inter-city rail service available from the Roanoke Valley. However, rail service is available from the City of Clifton Forge (50 miles to the northwest of Roanoke). Clifton Forge is presently served by one Amtrak train, "The Cardinal". The Cardinal operates daily between Washington and Chicago with stops in Washington D.C., and Alexandria, Manassas, Culpeper, Charlottesville, Staunton and Clifton Forge in Virginia. The unmanned station in Clifton Forge is open to meet tri-weekly service for Cardinal Trains 50 and 51 which run on Sunday, Wednesday, and Friday. Table II shows the Cardinal's five-year ridership trend for Virginia.

TABLE 5
The Cardinal
Washington to Chicago
with stops at eight Virginia cities

| STATION | PASSENGERS | | | | |
|-----------------|---------------|---------------|---------------|---------------|---------------|
| | FY 89 | FY 90 | FY 91 | FY 92 | FY 93 |
| Alexandria | 6,165 | 5,176 | 4,866 | 4,569 | 4,461 |
| Manassas | 1,843 | 1,875 | 1,897 | 1,904 | 1,955 |
| Culpeper | 1,085 | 915 | 1,151 | 1,172 | 1,157 |
| Richmond | 3,613 | 3,557 | 4,248 | 4,867 | 170 |
| Charlottesville | 13,191 | 14,004 | 15,982 | 15,000 | 18,721 |
| Staunton | 3,770 | 4,051 | 4,495 | 4,604 | 4,396 |
| Clifton Forge | 2,754 | 2,540 | 2,724 | 2,310 | 6,175 |
| Roanoke | 995 | 2,542 | 2,755 | 2,888 | 460 |
| TOTAL | 33,416 | 34,660 | 38,118 | 37,314 | 37,495 |

* Richmond numbers reflect ticketed passengers using connecting bus service between Richmond and Charlottesville.

* Roanoke numbers reflect ticketed passengers using connecting bus service between Roanoke and Clifton Forge.

* FY 93 numbers vary considerably from FY 92 due to different data collection techniques.

Amtrak provides a bus service from the lobby of the Roanoke Airport Sheraton Hotel to the Amtrak Passenger station in Clifton Forge. This is an unadvertised service provided by indistinctly marked charter buses from a relatively secluded location. As a consequence, the existing service relies almost entirely on a local travel agency for patronage. In 1987, Campbell Court, a downtown intermodal transportation center, was opened which contains ticket counters for both Greyhound Bus Lines and Valley Metro (the local transit provider) as well as office space and a parking garage. Providing bus service from the Campbell Court transportation center to Clifton Forge via the Airport Sheraton will attract more passengers for Amtrak than the present bus service.

Adding connecting bus service to other rail stations serving other Amtrak lines would also serve the dual purpose of increasing Roanoke ridership and boosting boarding at these locations. Chief among these locations should be Lynchburg, 52 miles to the east of Roanoke, which is served

by one Amtrak Train "The Crescent" operating daily between New York and New Orleans via Washington, Charlottesville and Atlanta.

The Virginia Department of Rail and Public Transportation (VDRPT) and the local governments in the Roanoke Valley should continue their efforts to revive direct inter-city rail service from the Roanoke Valley to other cities in the nation. VDRPT is currently conducting a feasibility study to reinstitute passenger rail service in the Bristol-Washington, D.C. and Bristol-Richmond corridors which would both serve the Roanoke Valley. A report from Phase I of this study must be completed by January 1995. This report should document the demand for passenger rail service in these corridors.

ROAD

Intercity bus travel is afforded by Greyhound Bus Lines. The Greyhound terminal is located in downtown Roanoke at the Campbell Court intermodal transportation center. With the exception of Hawaii, the buses travel throughout every state and into Canada.

Interest has been expressed most recently in linking the Roanoke Valley with the New River Valley via public transportation. A vast number of intercity commuters traveling between Roanoke, Salem, Radford, Christiansburg, Blacksburg, etc. could be accommodated. This service would also relieve traffic congestion on Interstate 81 and Route 460. The feasibility and demand for such a service should be studied. The formation of a partnership between Blacksburg Transit, the Greater Roanoke Transit Company, and RADAR to provide this service should also be considered as a part of any feasibility study.

ENVIRONMENTAL OVERVIEW

LOCATION AND DESCRIPTION

The Roanoke Valley Area Long Range Transportation Plan Systems Level Overview includes portions of the counties of Botetourt and Roanoke; and, the Cities and Towns of Roanoke, Salem, and Vinton. Various routes within these jurisdictions were included as a part of this study.

PURPOSE

The proposed improvements will consist of the widening of some existing routes and the construction of other routes on new alignment. These improvements will provide the citizens of the area with an efficient transportation network. Each project will be programmed and evaluated more in-depth as the projects are scheduled for advertisement.

ENVIRONMENTAL IMPACTS

Social

The improvements recognized in the study plan are not anticipated to substantially effect the surrounding environment. Each project will be addressed for environmental concerns through state and federal environmental reviews. All projects will be in compliance with the applicable laws and guidelines.

The Virginia Department of Transportation (VDOT) in conjunction with the local government jurisdictions will post a willingness for a public hearing; conduct a hearing if requested; and, conduct information meetings for citizen input on all highway projects. All concerns will be addressed prior to the advertisement of the project.

Cultural Resources

The Roanoke Valley area is rich in cultural resources. Several surveys have been conducted to identify historic and archaeological sites that may be eligible for the National Register of Historic Places.

These sites are too numerous to list in this report. A site survey for Roanoke County is included in "Historical Architecture Reconnaissance Survey Report prepared by Frazier Associates in 1992." Again, each project must be reviewed on a project by project basis to determine if any cultural resources are located within the project limits.

Ecological - Agricultural - Recreational

No substantial adverse impacts are anticipated on natural, ecological or scenic resources of national, state, or local significance.

The projects will be reviewed with U.S.D.A Soil Conservation Service for compliance with the Farmland Protection Policy Act. The Virginia Department of Forestry and the National Park Service will review the project for impacts to their resources. The projects will also be reviewed in conjunction with the Virginia Natural Heritage Program and the U.S. Fish and Wildlife Service or the Virginia Department of Game and Inland Fisheries for unique, rare or endangered species.

Relocation

A Relocation Assistant Report will be prepared to determine the number of displacements for each project. Any relocations will be in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended.

Hazardous Waste/Materials

During our field reviews, several underground storage tank sites were identified. VDOT will conduct a site assessment for any such sites located within the designated project limits. These assessments will be part of the environmental clearance for each project.

The Department of Environmental Quality - Division of Waste Management will be contacted regarding any landfills or other hazardous waste/materials that may be located within the project areas.

Air

The proposed projects are not expected to be a major source of air pollution. No adverse impacts are anticipated from motor vehicle emissions. For projects with the design year average daily traffic of less than 20,000 vehicles per day, a detailed air analysis is not deemed necessary. For projects with over 20,000 vehicles per day or where additional travel lanes are constructed on existing alignment or new location, an air study will be necessary for federally funded projects.

The Roanoke Valley area is located in an area where the State Implementation Plan does not contain transportation control measures for air quality.

VDOT's Road and Bridge Specifications on air quality will be implemented on each project.

Noise

Substantial noise impacts are not expected to occur as a result of these projects. However, each project will be evaluated for noise impact studies on a project by project basis.

Water Quality

Our on-site review revealed that several locations would require a General Permit for stream crossings. A permit determination will be completed for each project and the applicable permits will be obtained prior to advertisement. The review also indicated that some wetlands may be impacted by these projects. In-depth wetland identification and delineation of wetlands will be conducted as the projects progress.

DOCUMENTS REQUIRED

All projects that are funded with federal funds will require an environmental document. These documents could range from a Categorical Exclusion, Environmental Assessment, to an Environmental Impact Statement. Any project involving a public owned park, wildlife refuge or recreational area or historic site will require a Section 4(f) Evaluation. Involvement with a park which was developed with Land and Water Conservation Funds will require coordination with the National Park Service and a Section 6(f) Evaluation. Section 6(f) involvement will mean the replacement of the land to be used for highway purposes.

Any projects involving the Blue Ridge Parkway (BRP) also require special attention. The Environmental Division will coordinate these projects with the BRP, a division of the National Park Service.

All projects will be reviewed for cultural resources. If cultural resources are impacted, a Section 106 clearance is required. A Memorandum of Agreement will be required outlining the mitigation measures to be taken to lessen the impact on the site.

The Environmental Division is responsible for preparing these documents.

FIELD REVIEW

While each project will be analyzed more in-depth for environmental impact as they are initiated, a field review was conducted to perform this environmental overview. Summarized in this section, the field notations are listed in the environmental technical report.

PLANNING FACTORS

As a result of the Transportation Equity Act for the 21st Century (TEA-21), the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) have proposed revised planning regulations governing the development of transportation plans and programs for urbanized areas. Part of this is seven factors that should be considered as part of the urban transportation planning process. Listed below are these seven factors.

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety and security of the transportation system for motorized and nonmotorized users;
3. Increase the accessibility and mobility options available to people and for freight;
4. Protect and enhance the environment, promote energy conservation, and improve quality of life;
5. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
6. Promote efficient system management and operation; and
7. Emphasize the preservation of the existing transportation system.

PUBLIC INVOLVEMENT

Public participation has been sought throughout the development of the Long Range Transportation Plan. This has been done so in accordance with the policies set forth in the *Public Participation Policy and Procedure Manual* adopted by the Roanoke Valley Area Metropolitan Planning Organization (MPO) in March 1994.

Public participation was initiated early in the planning process by holding a public meeting on March 18, 1999. This meeting was held prior to preparing any draft text or prioritizing projects in order to consider public input in developing the document. At this meeting, various handouts were presented to inform the public of the plan development and its significance. The public was able to talk one-on-one with staff from the Virginia Department of Transportation and the Roanoke Valley-Alleghany Regional Commission to facilitate open discussion. Comment forms were available to record written comments and oral comments were recorded on tape. Public input collected at this meeting was reviewed by staff and presented to the MPO for their consideration in developing the Plan.

A second public meeting was held on May 31, 2000 after developing a DRAFT Plan. The public was provided an opportunity to review the Plan and offer additional comments on proposed projects and policies incorporated into the Plan. Again, both oral and written comments were recorded. These comments were reviewed by staff and presented to the MPO for their consideration prior to adopting the Plan as final. No significant changes were made to the draft plan as a result of comments from this meeting.

The MPO has reviewed all comments and given them due consideration in developing the Long Range Plan. These comments will be reviewed again as necessary when changes are proposed or the Plan is updated. In some cases staff may respond to individual comments as directed by the MPO.

APPENDIX A

The Bicycle and Pedestrian Transportation Citizens' Advisory Committee has developed a list of suggested strategies for achieving the objectives of the Long Range Plan. These strategies are not binding on local jurisdictions as requirements during the planning process. Rather, they are provided in this document as useful guides and as issues to consider during the planning process.

SUGGESTED BICYCLING STRATEGIES

Facility Planning

Regularly update the Roanoke Area Bicycle Plan and obtain endorsements from member jurisdictions, and from appropriate state and federal agencies.

Incorporate the Bicycle Plan into the Long Range Transportation Plan, by amendment if necessary, to allow for updates and changing priorities.

Identify appropriate locations and routes to compose a complete bicycling system.

Encourage responsible agencies to evaluate bicycling accommodations with all major roadway improvements, including new roadways, major widening or paving of existing roads, new sidewalk construction, etc.; decisions not to include bicycling aspects should be justified.

Develop bicycle facilities in existing rights-of-way (such as alleys, utility easements, flood plains, abandoned railroads, etc.) where possible to avoid expensive right-of-way acquisition.

Identify appropriate locations for bicycle racks or other storage facilities.

Consider a wide range of bicycling facilities, including dedicated paths and shared facilities, in developing bicycle plans and in designing facilities.

Consider the variety of users, from young or novice riders to advanced cyclists in developing bicycle plans and designing facilities.

Create a bicycle system that connects residential areas with community facilities, such as, parks, schools, libraries, shopping centers, offices, etc..

Involve interested citizens and civic groups in the planning process, bicycle promotions, and educational activities.

Consider all bike types (touring, mountain, etc.) and path types (paved, dirt, etc.) when developing bicycle plans or designing bicycle facilities.

Encourage plans and land use controls that promote neighborhood designs with mixed use and compact development.

Facility Design and Construction

Provide bicycle racks on public transportation vehicles, at appropriate transfer facilities or stop locations, and at park-and-ride facilities.

Appeal to employers to provide bicycle racks, showers, and other amenities for employees to bicycle to work.

Provide bicycle access to all residential areas and particularly to areas traditionally underserved by the transportation system.

Consider signs along bicycle routes to alert motorists of shared roadways, and to direct cyclists along designated facilities.

Develop road surface design and maintenance standards for transportation facilities with a goal of eliminating bicycling obstacles, such as, poor pavement, wide grates, and uneven gutter-to-road seams.

Consider cyclists in roadway design and maintenance, and neighborhood development. Specific considerations should include lane markings, lane widths, providing lighting, providing signs, providing mountable curbs, etc..

Education and Public Relations

Educate students about bicycling; include training in the drivers' education program for high school students.

Hold special events to encourage bicycling as a form of transportation; schedule events with other high profile activities.

Educate the public on the benefits of bicycling as a viable, alternate form of transportation.

Educate the public on intangible benefits, such as improved physical fitness, lower insurance rates (both auto and health), less automobile congestion, improved air quality, etc..

Prepare and distribute an understandable Roanoke Valley Area Bicycle Route Map, based on the Roanoke Valley Area Bicycle Plan.

Seek participation and support from bicycle shops, parks and recreation departments, police departments, schools, bike clubs, and other potential support groups in promotional and educational activities.

Educate both motorists and cyclists on "sharing the road" safely.

Educate road designers and engineers on the needs and design standards for bicycling.

Miscellaneous

Discourage exclusive automobile use.

Include a bicycle element in the Department of Motor Vehicles (DMV) tests for a drivers license.

Encourage cyclists to wear helmets and other safety equipment.

Enforce bicycling and traffic regulations, for both motorists and cyclists.

Discourage motor vehicle traffic from cutting through neighborhoods, making local streets safer for bicycling.

Maintain bicycling facilities that are shared with roadways.

SUGGESTED PEDESTRIAN STRATEGIES

Facility Planning

Encourage pedestrian connections between residential areas with community and public facilities, such as, schools, parks, shopping centers, offices, etc..

Consider the planning and provision of safe pedestrian access along new roads and bridges.

Examine whether planned pedestrian facilities are adequate for proposed development.

Encourage pedestrian access to park-and-ride facilities.

Promote the continuity of sidewalks in heavily travelled areas.

Facility Design and Construction

Encourage developers to construct pedestrian facilities (including sidewalks or paths, crosswalks, lighting, etc. where appropriate) in developments.

Create informal pedestrian facilities such as paths, if cement sidewalks are not appropriate for the area.

Improve and develop mass transportation facilities that are accessible to/by pedestrian travel.

Consider the impacts of utility poles, signage, and other devices on sidewalks that may obstruct pedestrian movement.

Incorporate markings, signals, etc., for pedestrians at potential high conflict areas, such as intersections and roadway segments near commercial, public, and employment facilities.

Ensure both existing and proposed pedestrian paths/sidewalks conform to the Americans with Disabilities Act (ADA).

Provide adequate lighting on pedestrian facilities which are used, or have potential to be used, frequently at night.

Maintain pedestrian facilities.

Education and Public Relations

Educate students on the rules of pedestrian travel.

Promote walking to school as an alternative to taking the bus or having parents drive.

Promote special events to encourage walking as a form of transportation.

Miscellaneous

Coordinate activities with major employers and businesses to help identify and address pedestrian problems.

Enforce pedestrian rules and regulations as they apply to both automobiles and pedestrians.

Discourage motor vehicle traffic from cutting through neighborhoods, making local streets safer for pedestrians.

Institute "neighborhood watch" programs and/or have public safety officials patrol areas if necessary to ensure a safer community.

