

# **HENRICO 2010**

## **WORKING PAPER NUMBER 2: INFRASTRUCTURE ANALYSIS**

Henrico Planning Office  
Comprehensive Planning Division  
July 1994

**WORKING PAPER NUMBER 2:  
INFRASTRUCTURE ANALYSIS  
OUTLINE**

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## EXECUTIVE SUMMARY

The purpose of this working paper is to provide information on the County's utilities and transportation systems that will assist in updating the Comprehensive Plan. Developing sound land use plan recommendations involves analyzing possible constraints and opportunities for improving and expanding the County's infrastructure. With this information, the County can develop a plan that is in harmony with existing and future utilities and transportation systems.

This working paper is divided into two sections. The first section provides an overview of utility findings. This includes a general description of water and sewer services, a review of our current water and sewer system, how public water and sewer facilities are built, current initiatives, a summary of utilities' capital improvement program, water and sewer agreements, possible limitations for future growth and development, current requirements and policies, and discussion items.

The second section provides an overview of transportation findings. This includes a general review of the transportation system, how roadways get built, current initiatives, current transportation issues and a review of policies. Also included is a discussion and review of the County's Major Thoroughfare Plan and how it is proposed to be analyzed and updated through a transportation demand modelling/forecasting study. Some of the major issues currently affecting transportation planning are briefly discussed, and transportation policy implications are analyzed to explore whether new directions are needed to meet future challenges.

Whenever possible, concise "bullet" statements are used to focus on the main points under each section. Maps and figures are included after each section to provide further background material.

A summary of the major findings identified within each section is listed below. These summaries focus on those findings within the sections that may influence future growth and development.

### SUMMARY OF UTILITY FINDINGS:

- In general, areas east of I-295 in eastern Henrico were considered outside of the planning area for sewerage and therefore capacity to serve these areas was not included in the original design of the wastewater treatment plant. The impact of developing these areas on the capacity of the plant and the current service areas needs to be assessed.
- Our current sewerage service area is based on 30 million gallons per day wastewater treatment plant or serving an equivalent population of 300,000. Our 1993 equivalent population is estimated at 283,200 (see Appendix A).

- The existing sewerage treatment plant is being expanded to process 45 million gallons per day (MGD) of sewerage flow and to extend the current service area. This expansion will allow the treatment plant to handle an equivalent population of 450,000. The maximum capacity of the wastewater treatment plant is 60 MGD which will serve an equivalent population of 600,000. (Equivalent population is determined by using a people per acre factor for commercial and industrial uses).
- Approximately 6.5 MGD of the future 45 MGD wastewater capacity has been committed to Hanover and Goochland counties in the future.
- A field study on the sewer system is being done by Camp Dresser & McKee. The study's purpose is to suggest solutions to an undesirable inflow problem with the system (i.e., rainwater that enters the system through broken pipes, manholes, and roof drains). This will lead to a more efficient wastewater treatment system.
- Developing areas can be divided into areas that can be served by an existing or proposed pumping station and areas that will require new pumping stations and facilities.
- A majority of the areas requiring new pumping stations are located in Varina. As was the case in the western portion of the County, development in these areas will be facilitated by the construction of pumping stations and related facilities for larger developments. Developers will need to have sufficient resources to build pumping stations and related facilities to accommodate future growth in the Varina area.
- The areas surrounding Wyndham, Hunton and the Virginia Center developments have an identified land use density (people per acre) based on the capacity of existing and proposed sewerage pumping stations for drainage areas (see Appendix B).
- Several alternatives exist to provide sewer service to new developments. Factors that influence the alternative chosen include the area of the basin to be developed, the density of the development, the specific type of development, the downstream capacities of existing facilities and the cost of the facilities.
- Provided that a drainage area study has been completed and a new pumping station is required, the developer must build the gravity sewer to serve the entire area that will drain to his site. The developer must build a pumping station to serve his development. To be eligible for off-site credits, the developer must build a pumping station to serve the area identified as the sewershed that drains to his or her site.
- If development in outlying areas occurs, developers may put pressure on the County to improve facilities to serve their development. In addition, connection credits given to developers for building new pumping stations and facilities reduce the utility revenue flow from new development. Ultimately, the County pays for the pumping station and facilities to serve new developments outside the current service area through water and sewer credits to the developer.

- All developments must submit a Utility Study to determine what will be required to serve the proposed development. This includes how future development will impact the capacity of existing facilities. This study is required prior to the approval of utility service plans for the proposed development. All developers are required to plan and install facilities needed to serve the sewershed area that drains to their site. This plan must provide capacity and/or utility easements to allow for future "upstream" development. The study must include a plan for servicing the land uses planned in the drainage basin.
- Utility plans to serve specific areas are often modified based on the needs and sequencing of the development.
- Adequate water service for new development will provide for domestic demand and satisfy fire flow requirements for the development. Fire flow requirements for any given project are usually much larger than domestic requirements. Consideration of domestic demands, fire flow requirements and future development are used to determine the size and location of water lines to be built. Where future development is to be served by proposed lines, oversized lines may be required. The developer is eligible for credits for oversized lines as well as off-site extensions greater than 300 feet.

#### **Utility Issues That Need to be Examined:**

- An update to the 201 Wastewater Facilities Plan (1978) is needed to provide current information for future utility planning. This Plan projected the County's future wastewater needs and was used to design the current wastewater treatment plant.
- An evaluation of utility capacities and constraints is needed before making land use recommendations for developing and outlying areas.
- Encouraging growth to locate in existing utility service areas may need to be explored.
- Requiring all new subdivisions to be served by public utilities and encouraging and supporting water conservation programs may also need to be explored.

#### **SUMMARY OF TRANSPORTATION FINDINGS:**

- The County's transportation system has been fundamental in shaping growth and development within the County and the region.
- Recent federal regulations contained in the Americans with Disabilities Act (ADA) add greatly to the cost of providing transit service and have to be absorbed by transit providers.

- Short-range planning for roadway improvements in Henrico County takes place principally through the annual review and approval of the County's five-year CIP (for the Secondary System) and through annual review and approval of the regional TIP (Transportation Improvement Plan) for Primary and Interstate systems. Long-range planning occurs through updates and amendments to the Major Thoroughfare Plan and the regional 3-C process.
- The County's roadway system is planned and built through a cooperative effort among the State, the County, its citizens and the private development community.
- The County is in a unique position of owning and operating its own secondary road system. This allows the pattern of proposed future land uses to guide the construction of needed roadway capacity rather than being locked-in to a roadway network and then arranging land uses accordingly.
- A transportation consultant will be hired to assist in updating the Major Thoroughfare Plan. Consultant services are needed to take advantage of computer modelling and travel demand forecasting techniques that form the basis for state-of-the-art long range transportation plans.
- External mandates, principally related to federal legislation, are attempting to influence the patterns of future growth and development in a way which will reduce single-occupant automobile travel.
- The changing environment for private sector development, principally reflected in tight fiscal policy, limits the ability/willingness of the private sector to participate in transportation infrastructure improvements.
- The increasing burden of maintaining the existing infrastructure may affect resources for new road construction. Related to this is the need for different policy approaches for different areas of the County.
- The cumulative effect of numerous individual development policies can result in an inefficient use of transportation infrastructure capacity.
- The regional transportation planning process will no longer be as functional because of the external mandates that must be addressed; mandates that are not integrated, and may be opposed to, our traditional, successful policy approach.

# **SECTION ONE**

# **UTILITY FINDINGS**

## **I. GENERAL UNDERSTANDING OF WATER AND SEWER SERVICES:**

- The sewerage system includes gravity sewers, force mains, pumping stations and the wastewater treatment facility. Pumping stations use the force mains to push the sewage across ridge lines or from remote areas to a gravity trunk sewer.
- Sometimes there is room to expand pumping stations to increase the system's capacity. When the capacity of a sewer pumping station is increased, overall system capacity must be reviewed to determine if the downstream lines can handle the increase. If not, new parallel lines or "relief sewers" need to be built.
- Planning for sewer service is based on drainage areas; drainage areas can be modified or combined by increases in pumping station capacities and assurance that downstream capacity is adequate for the planned increase.
- Planning for water services is based on pressure zones. These zones are established by elevation differences and the location of supply flow from the City. Water facilities such as storage tanks and pumping stations help maintain adequate pressure throughout the zone.
- The County has both elevated and ground storage water tanks. These tanks are needed to meet peak hour water demands and for adequate fire protection.
- All new developments must be designed to meet adequate fire flows. The fire flow requirements are in addition to the flow needed to supply domestic water to the development. The water needs for non-residential uses are specific to each use and must be considered on a case by case basis.
- The County has approximately 20 million gallons in water storage facilities. The total capacity of the County's water storage facilities is planned to be increased by at least 6 million gallons in the future. This is needed to supply peak hour water demands and fire flows.
- The normal life of water and sewer lines is estimated at 50 years; however, they can and have lasted longer. The oldest facilities are located in Sandston and Highlands Springs.

## **II. REVIEW OF CURRENT INFRASTRUCTURE**

### **Wastewater:**

- The existing wastewater treatment plant is nearing its present capacity of 30 million gallons per day (MGD).



- When the regional sewer system was completed in early 1990, the wastewater treatment plant was processing approximately 26 million gallons per day (MGD) of wastewater. The plant is presently processing an average of 27 to 28 MGD of wastewater. The 1978 201 Wastewater Facilities Plan had projected flows of 28.6 MGD for the year 2005. A significant portion of the existing flow is the result of inflow of rainfall into the system.
- A 15 MGD expansion to increase the plant's capacity to 45 MGD is currently under construction and should be on line in June 1997. This expansion is designed to provide service to Henrico County and surrounding jurisdictions. Approximately 6 MGD of the existing and future capacity has been committed to Hanover and Goochland counties.
- The treatment plant can be expanded an additional 15 MGD to a total of 60 MGD. This can serve an equivalent population of 600,000. It takes at least five years to design and build a 15 MGD expansion.
- The design of the existing treatment plant was based on serving areas within the 1995 Phasing Line. In general, areas east of Interstate 295 in eastern Henrico were considered outside of the planning area and therefore capacity to serve these areas was not included in the original design of the wastewater treatment plant.
- Some portions of the County are still served by the City wastewater plant and some portions of the City are served by the County's plant (even exchange). Portions of Monument Avenue area and the Mechanicsville Road area is served by City sewerage facilities. Portions of the University of Richmond area are served by County sewer.

**Water:**

- Approximately 92 percent of Henrico's water supply is received from Richmond; 8 percent is supplied from groundwater resources located east of Interstate 95.
- Our groundwater supply is taken from 12 separate wells. Because of demands on the aquifer supplying our wells, anticipated future treatment cost and State Water Control Board regulations, this source of water is anticipated to be completely phased out by the year 2010.
- The new water treatment plant would best serve the County's future water supply needs by:
  - supplying an adequate quantity of water (to meet peak day water demands);
  - improving water quality;
  - increasing long-term reliability;
  - serving regional needs; and
  - reducing water treatment and distribution life-cycle cost.

- The new water treatment plant is still in the permitting phase; the permit from the Army Corps of Engineers is the most critical since it grants permission for withdrawal from the James River.
- The water treatment plant site has been purchased. Negotiations are in progress for obtaining the site for the river intake and the raw water pumping station site. Additional easements for the large distribution pipe leaving the plant site will be obtained after permits are obtained. The earliest the treatment plant could be on line is 1998.
- The water treatment plant's initial capacity is planned to be 35 MGD and will serve most of western Henrico. An additional 20 MGD is tentatively planned later to serve the remainder of the County. This may change in the future based on our future needs and the projected service demands from Goochland and Hanover counties.
- Approximately 23 businesses and subdivisions presently obtain water from privately owned waterworks. Most of these waterworks companies are supplied through private wells. Sydnor Waterworks gets some water from the County; however, some of their systems do not meet County standards (i.e., small lines, poor quality).

### **III. HOW PUBLIC WATER AND SEWER GETS BUILT:**

- The County is generally responsible for the construction necessary to maintain or improve service within the limits of our existing system. This includes treatment plants and the major transmission and trunk lines that make the service accessible to various parts of the County. The County also constructs and maintains storage facilities, pumping stations and existing lines to maintain service to our existing customers.
- The water and sewer lines to serve future development are built by developers.
- The developer is required to prepare a study of the system to determine what will be needed to serve the proposed development. This includes how it will impact downstream flows.
- Larger developments, such as Wyndham and Hunton, may be required to construct pumping facilities or oversize lines to serve both their developments and the current land use within their drainage basins or service areas.

### **IV. CURRENT INITIATIVES:**

- The County has been using a computerized water model for the past twelve years to ensure development proposals have adequate fire flows. A sewer model has recently been developed that will model the overall sewer capacity and aid in reviewing the adequacy of the system to serve proposed developments.

- A field study on the sewer system is being done by Camp Dresser & McKee. The study's purpose is to suggest solutions to an undesirable inflow problem with the system (i.e., rainwater that enters the system through broken pipes, manholes, and roof drains). This will lead to a more efficient system.

## **V. PUBLIC UTILITIES CAPITAL IMPROVEMENTS PROGRAM (FY 94 - FY 99)**

### **Objectives:**

- To address problems with water quality and quantity, including the rehabilitation of existing mains and constructing supply and transmission facilities to meet present and future demands for domestic and fire flows.
- To provide landfill improvements for safe, sanitary disposal of solid waste.
- To improve sanitary sewer projects, including existing pumping stations, replacement or rehabilitation of sanitary sewer mains.
- To upgrade and expand the Wastewater Treatment Facility.

### **Highlights:**

#### Landfill:

- To design and construct a Phase III landfill expansion; and
- To construct a final closure of Phase II Expansion Area at Springfield landfill, off Nuckol's Road.

#### Water:

- To rehabilitate water mains and water services within the Westham, Westhaven and Chamberlayne Farms subdivisions.
- To continue permitting design and construction of facilities necessary for the proposed water treatment plant.

#### Sewer:

- To design and construct effluent filtration facilities at the Wastewater Treatment Plant.
- To continue the sewer rehabilitation program.
- To design and implement improvements to existing sewer pumping stations.

**Funding Breakdown (FY94-95):**

| PROJECT AREA                  | PERCENTAGE OF FY 94-95 CIP |
|-------------------------------|----------------------------|
| New Water Facilities          | 6.7%                       |
| New Sewer Facilities          | 26.4%                      |
| Water Rehabilitation Projects | 23.4%                      |
| Sewer Rehabilitation Projects | 31.0%                      |
| Wastewater Treatment Facility | 0.8%                       |
| Operation Center              | 0.8%                       |
| Landfill                      | 0.6%                       |
| Other Rehabilitation Projects | 10.3%                      |
| <b>TOTAL</b>                  | <b>100.0%</b>              |

**VI. WATER AND SEWER AGREEMENTS (In million gallons per day)**

|                        | Hanover | Goochland | Total |
|------------------------|---------|-----------|-------|
| <b>Water:</b>          |         |           |       |
| Existing Agreement*    | 0.775   | 0.55      | 1.33  |
| Average Use            | N/A     | 0.08      | N/A   |
| Projected Needs - 1995 | 0.56    | 0.27      | 0.83  |
| Projected Needs - 2030 | 13.50   | 5.00      | 18.50 |
| <b>Wastewater</b>      |         |           |       |
| Existing Agreement*    | 3.0     | 0.55      | 3.55  |
| Average Use            | 1.61    | 0.12      | 1.73  |
| Projected Needs - 2005 | 3.70    | 0.55      | 4.25  |
| Projected Needs - 2030 | 5.40    | 5.00      | 10.40 |

\* Existing agreements with Hanover and Goochland are currently being revised. Henrico has agreed to accommodate 6.5 MGD with the upcoming wastewater plan expansion.

## VII. POSSIBLE LIMITATIONS FOR FUTURE GROWTH AND DEVELOPMENT

Prior to developing land use plan recommendations for the developing and outlying areas within the County, an evaluation of possible constraints and opportunities for improving and expanding the County's utility system should be completed. The findings below are divided by specific areas and countywide. The specific areas include the Wyndham, Hunton, Virginia Center and Elko Tract areas. In each of these area except for the Elko Tract, a comprehensive drainage area study has been completed that provides a current plan on how the area can be served by water and sewer. Appendix B in this section contains maps describing possible limitations for future growth of these specific areas and other developing and outlying areas.

### Specific Areas:

- The developers of Wyndham constructed a temporary 1 MGD sewage pumping station which is still being used. A proposed 7 MGD station is planned to serve the ultimate Allen's Branch drainage basin. The land uses planned with the Northwestern Henrico LUP Amendment can be accommodated with this proposed station. The developer of Wyndham have agreed to construct the ultimate 7 MGD station with 4 MGD of initial pumping equipment between 1996 and 1997.
- The future Hunton development will be required to construct a new 2 MGD pumping station to serve the densities rezoned as well as current land use within that basin. At the time of rezoning, the capacity of the downstream sewer system was evaluated to serve the planned land uses within the drainage basin. The 450 acres off-site from Hunton and within the drainage area have an identified land use of 10 people per acre. Several needed improvements to the downstream system have been identified.
- Water and sewer has been designed to accommodate The Virginia Center Development (present and future) as well as the current land use requirements for the drainage basin. The 578.9 acres that surround the development to the west have an identified land use of 8.3 people per acre.
- Conceptual plans have been reviewed for the Elko tract; however, a more detailed report will be required before it can be determined what facilities will be needed or the total impact on the existing system.

### Countywide:

- Both water and sewer plans have been developed to accommodate the Land Use Plan recommendations (current). Proposals that differ from this are required to do a drainage area study to determine what will be needed to accommodate the development.
- If the land use plan changes or zoning changes allow a more dense development, the water and sewer systems may not be adequately sized.

- The areas in eastern Henrico outside of the 1995 Phasing Line are not included in the service area for sewer services. Preliminary evaluations show that it would require as much as 14 MGD to sewer the Elko Tract and Wilton Farms when fully developed (7 MGD each). The impact of development of these areas on the capacity of the plant and the current service areas needs to be assessed.
- Developing areas can be divided into areas that can be served by an existing or proposed pumping station and areas that will require new pumping stations and facilities (see Appendix B).
- A majority of the areas requiring new pumping stations are located in Varina. Development in these areas will be facilitated by the construction of pumping stations and related facilities for larger developments. Developers will need to have sufficient resources to build pumping stations and related facilities to accommodate future growth in the Varina area.
- Several alternatives exist to provide sewer service to new developments. Factors that influence the alternative chosen include the area of the basin to be developed, the density of the development, the specific type of development, the downstream capacities of drainage basins and the cost of the facilities.
- Provided that a drainage area study has been completed and a new pumping station is required, the developer may build the facilities to serve the proposed development and a portion of the drainage basin, or build the facilities to serve the entire drainage basin. Large developers have incentive (connection fee credits) to build oversized facilities (pumping stations and lines) to serve the drainage basin.
- If development in outlying areas occurs, developers may put pressure on the County to improve facilities to serve their development. In addition, connection credits given to developers for building new pumping stations and facilities reduce the utility revenue flow from new development. Ultimately, the County pays for the pumping station and facilities to serve new developments outside the current service area through water and sewer credits to the developer.

## **VIII. CURRENT REQUIREMENTS AND POLICIES:**

### **Ordinance Requirements**

- All developers are required to install facilities needed to serve their development. Developers are required to install additional or larger facilities to accommodate future development within their sewer drainage basin or water service area.
- Off-site and oversized main credits will be allowed against the basic connection fee for any "off-site extension" in excess of 300 feet and line size in excess of 8 inches.

- If County-owned water supply or sewerage system is within 300 feet of new building or structure, the owner shall connect to the system.
- The County will extend local water and sewerage facilities for an individual homeowner at the homeowners expense.
- The Board of Supervisors has the authority to impose assessments for construction of water lines or sanitary sewer. Such an improvement may be ordered by a petition from not less than 60% of the land owners or by a 2/3 vote of all Board members.
- All new residential lots less than one acre in size must be connected to County water and sewer (exceptions include grandfathered lots less than one acre outside water and sewer service area).
- Residential developments with lots greater than 1 acre can be developed on well and septic. (This may be a problem in the future as more residents without public utilities will be demanding County services. The Director of Public Utilities recommends that all new subdivisions be served by County water and sewer or the developer be required to make a cash proffer to cover the estimate cost of the facilities on site to serve the development).
- All private sewerage disposal systems must be pumped out at least once every five (5) years.
- A reserved sewage disposal site with a capacity at least equal to that of the primary drainfield must be provided on each lot or parcel for new construction. This requirement does not apply to any lot or parcel recorded prior to October 1, 1989.

### **Policies**

- All developments must submit a Utility Study to determine infrastructure that will be required. This study is required prior to the review of utility service plans for the proposed development. This study must evaluate the entire drainage area and projected land uses.
- Developments outside of current service areas are required to do a comprehensive drainage area study. These developments will be required to build pumping stations and/or related sewerage facilities to serve their project and future development in the drainage area.
- The developer pays for installation of the necessary facilities to accommodate the required infrastructure improvements for any development. This includes facilities that mitigate the impact of the development on downstream sewer flows.

- Adequate water service for new development will provide for domestic demand and satisfy fire flow requirements for the development.
- Utility plans for new developments are approved provided that they have: no negative impact on downstream flows, oversized facilities (if necessary) for future developments as shown in the current land use plan, and the costs of the lines and facilities to serve the development are borne by the developer.

## IX. DISCUSSION ITEMS

Several issues and opportunities related to utility planning that may establish future policy directions need to be examined. The following items are presented as alternatives available for planning future growth and development.

### ■ **Updating the 201 Wastewater Facilities Plan (1978)**

A revised Plan will provide current information for future utility planning and determine the alternatives for addressing the County's future needs and the projected needs of the region.

### ■ **Planning Based on Utility Capacity and Constraints**

The existing Land Development Guide was, in part, based on the service area limitations. An updated Land Development Guide would provide the boundaries of current utility service area and show areas that would require new pumping stations and related facilities in order to fully develop (Outlying Areas).

Several options exist for making land use recommendations for Developing Areas and Outlying Areas. In Developing Areas, land uses can be limited to the capacity of existing pumping stations and lines or mapped without consideration of these limitations. The latter option would require developers to upgrade existing facilities to implement land use plan recommendations.

Based on the 201 Wastewater Facilities Plan (1978), Outlying Areas were planned at a density of 5.6 people per gross acre. Land Use Plan map recommendations can continue to show these areas for low density residential (Suburban Low Density Residential and Rural Residential). An alternative would be to include a "mixed use" provision in the Land Use Plan that allows for higher density developments in Outlying Areas. As was the case in the western portion of the County, development in Outlying Areas will require a developer with a large size project to have sufficient resources to build pumping stations and related facilities. Development in these areas may require significant County expenditures to make main transmission and trunk lines available to other proposed projects.



- **Encourage Growth to Locate in Existing Utility Service Areas**

This alternative could direct more attention to infill sites and redeveloping areas. New development in outlying areas may lead to a reduction in the wastewater treatment plant capacity to serve properties within existing service area. This alternative may also protect the rural character of the outlying area.

- **Require All New Subdivisions be Served by Public Utilities**

Presently, residential developments with lots greater than 1 acre can be developed on well and septic. This may pose a problem in the future as more residents without public utilities will be demanding County services. The Director of Public Utilities recommends that all new subdivisions be served by County water and sewer or the developer be required to make a cash proffer to cover the estimated cost of the facilities on site to serve the development.

- **Encourage and Support Water Conservation Programs**

This may lead to less water usage in the long run. New technology in construction should lead to more efficient use of water.

## Comparison of Estimated Wastewater Demands vs. 201 Study Projections

June 1994

| <i>Countywide</i> | Residential Population | Equivalent Commercial Population* | Equivalent Industrial Population** | Total Equivalent Population | Total Wastewater Flow (MGD)*** |
|-------------------|------------------------|-----------------------------------|------------------------------------|-----------------------------|--------------------------------|
| 1993 Population   | 230,729                | 47,686                            | 4,794                              | 283,209                     | 28.3                           |
| 2005 Projections  | 264,000                | 30,624                            | 4,752                              | 299,376                     | 29.9                           |
| 2030 Projections  | 369,000                | 42,804                            | 6,642                              | 418,446                     | 41.8                           |

Source: 201 Study; 1993 3-C Data Report

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\* Total commercial acres multiplied by a factor of 11.6 people per acre  
 \*\* Total industrial acres multiplied by a factor of 1.8 people per acre  
 \*\*\* Values shown are projected average daily flows based on a per capita rate of 100 gallons per day

**Appendix B**

**UTILITY EVALUATION OF  
DEVELOPING AREAS**

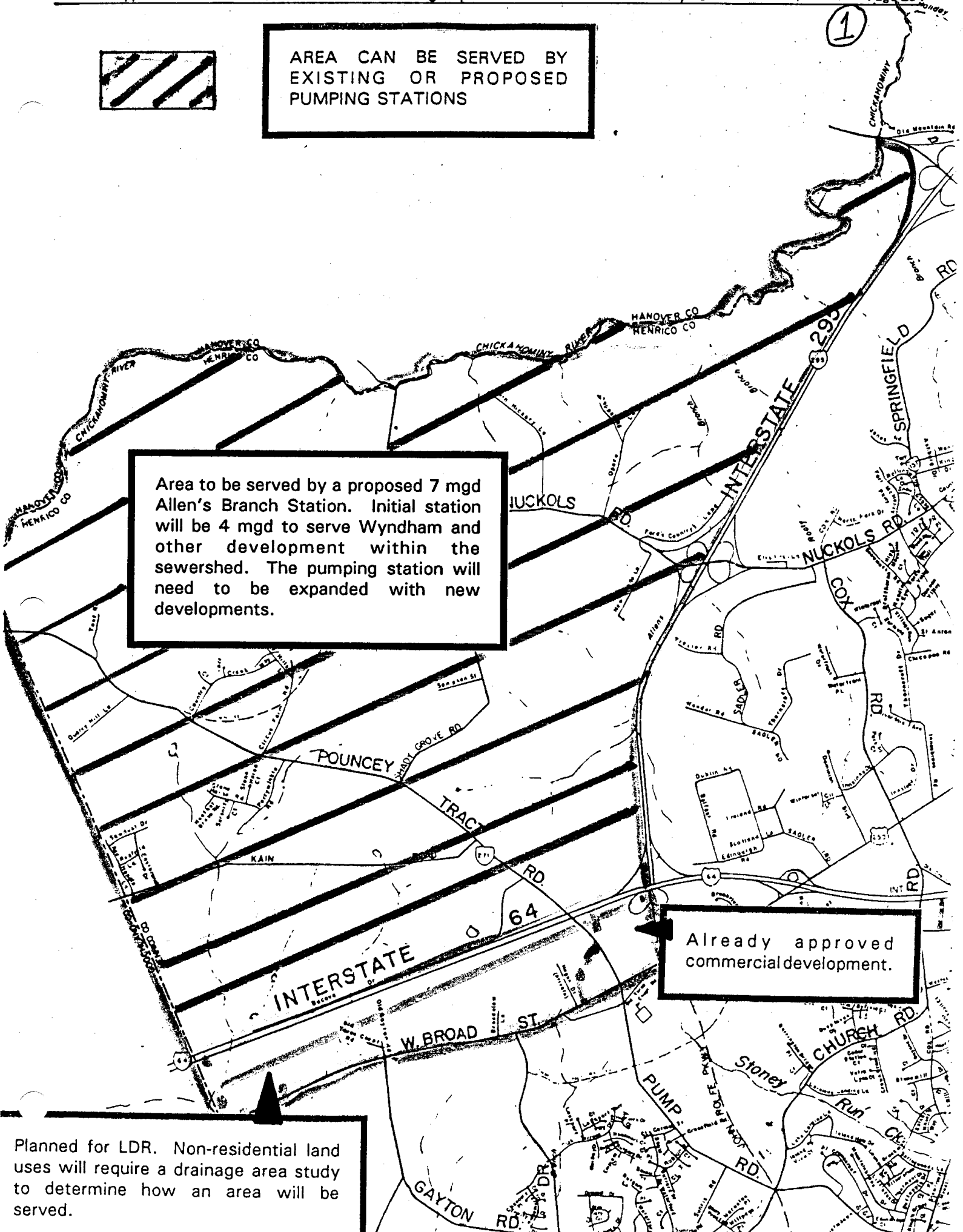


AREA CAN BE SERVED BY EXISTING OR PROPOSED PUMPING STATIONS

Area to be served by a proposed 7 mgd Allen's Branch Station. Initial station will be 4 mgd to serve Wyndham and other development within the sewershed. The pumping station will need to be expanded with new developments.

Already approved commercial development.

Planned for LDR. Non-residential land uses will require a drainage area study to determine how an area will be served.



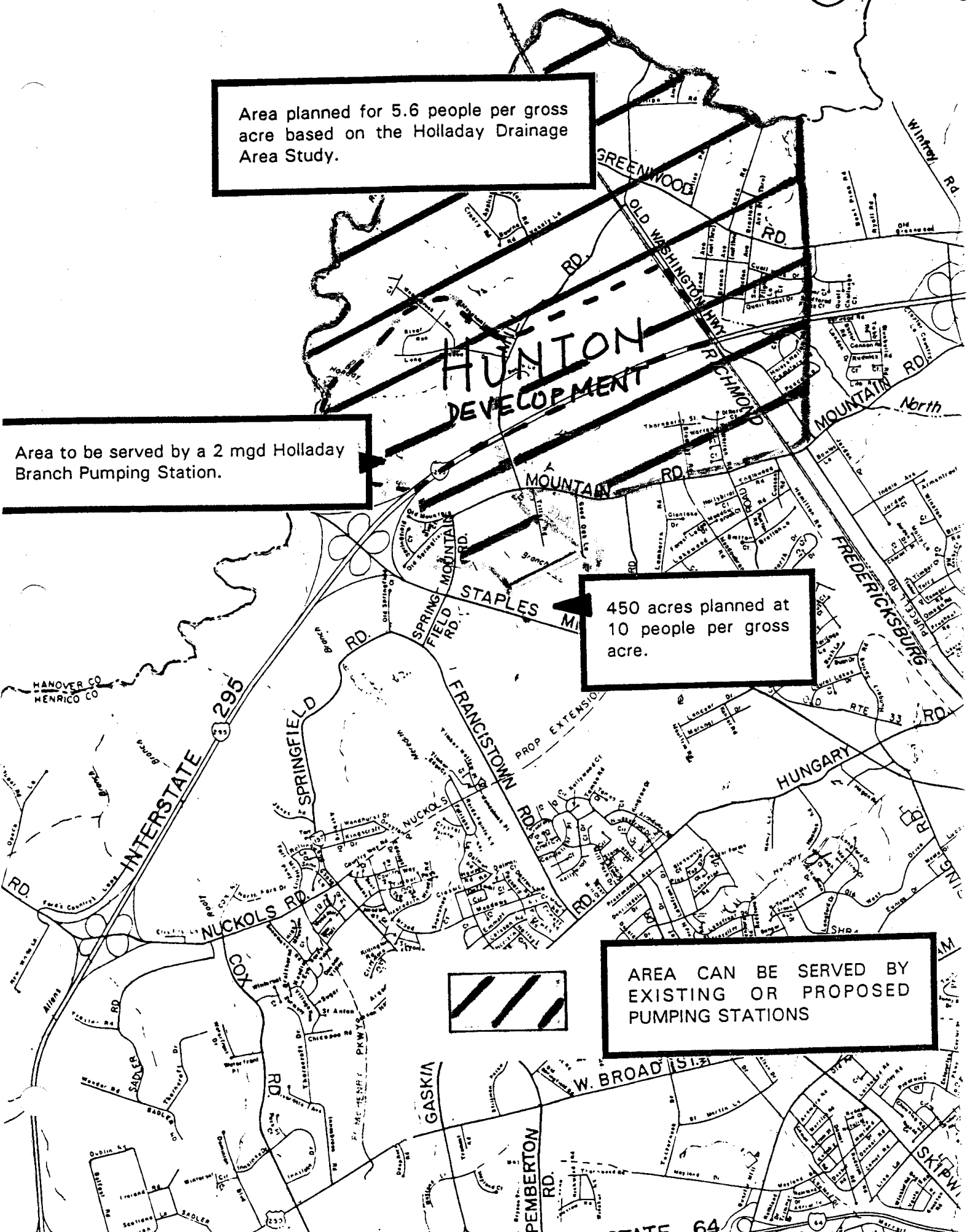
2

Area planned for 5.6 people per gross acre based on the Holladay Drainage Area Study.

Area to be served by a 2 mgd Holladay Branch Pumping Station.

450 acres planned at 10 people per gross acre.

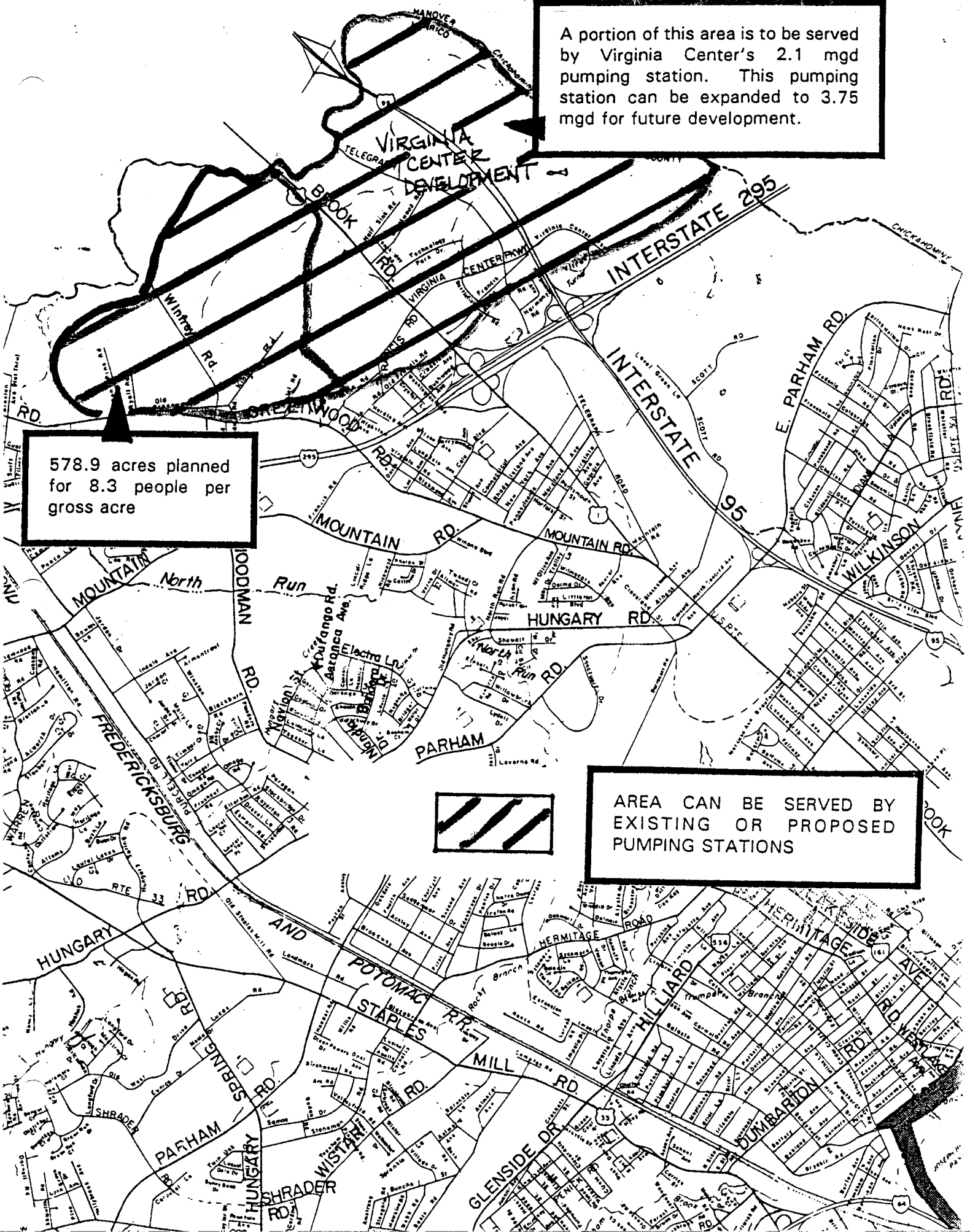
AREA CAN BE SERVED BY EXISTING OR PROPOSED PUMPING STATIONS

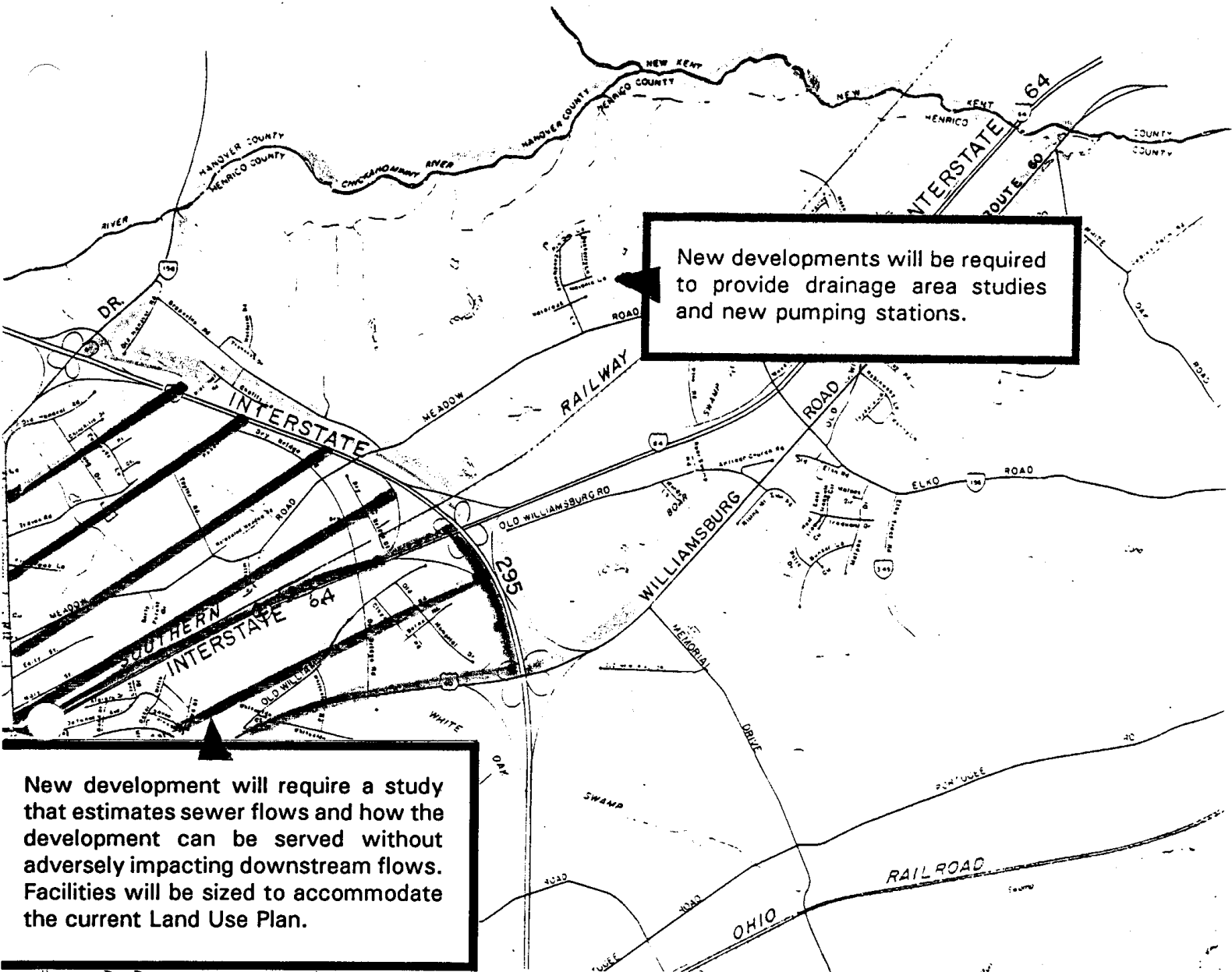


A portion of this area is to be served by Virginia Center's 2.1 mgd pumping station. This pumping station can be expanded to 3.75 mgd for future development.

578.9 acres planned for 8.3 people per gross acre

AREA CAN BE SERVED BY EXISTING OR PROPOSED PUMPING STATIONS

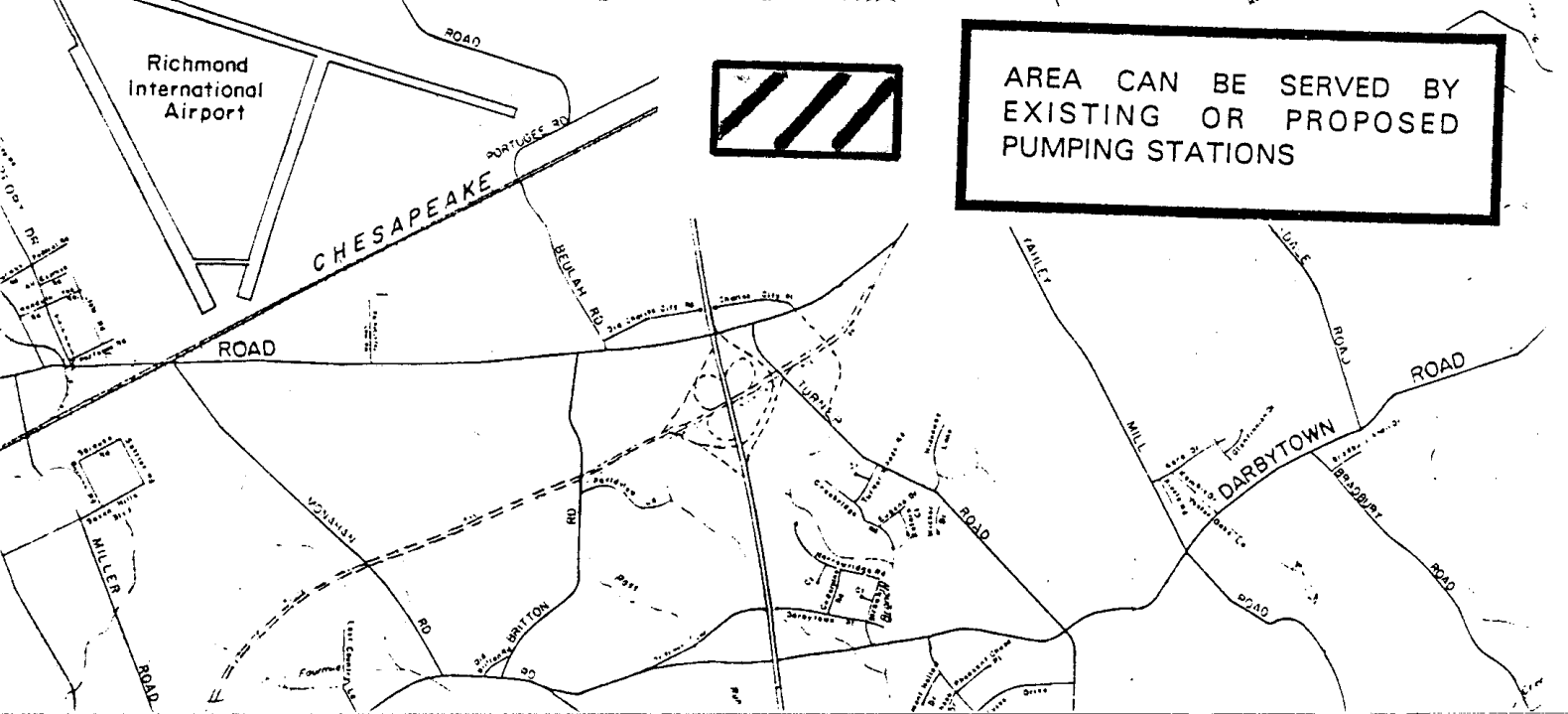




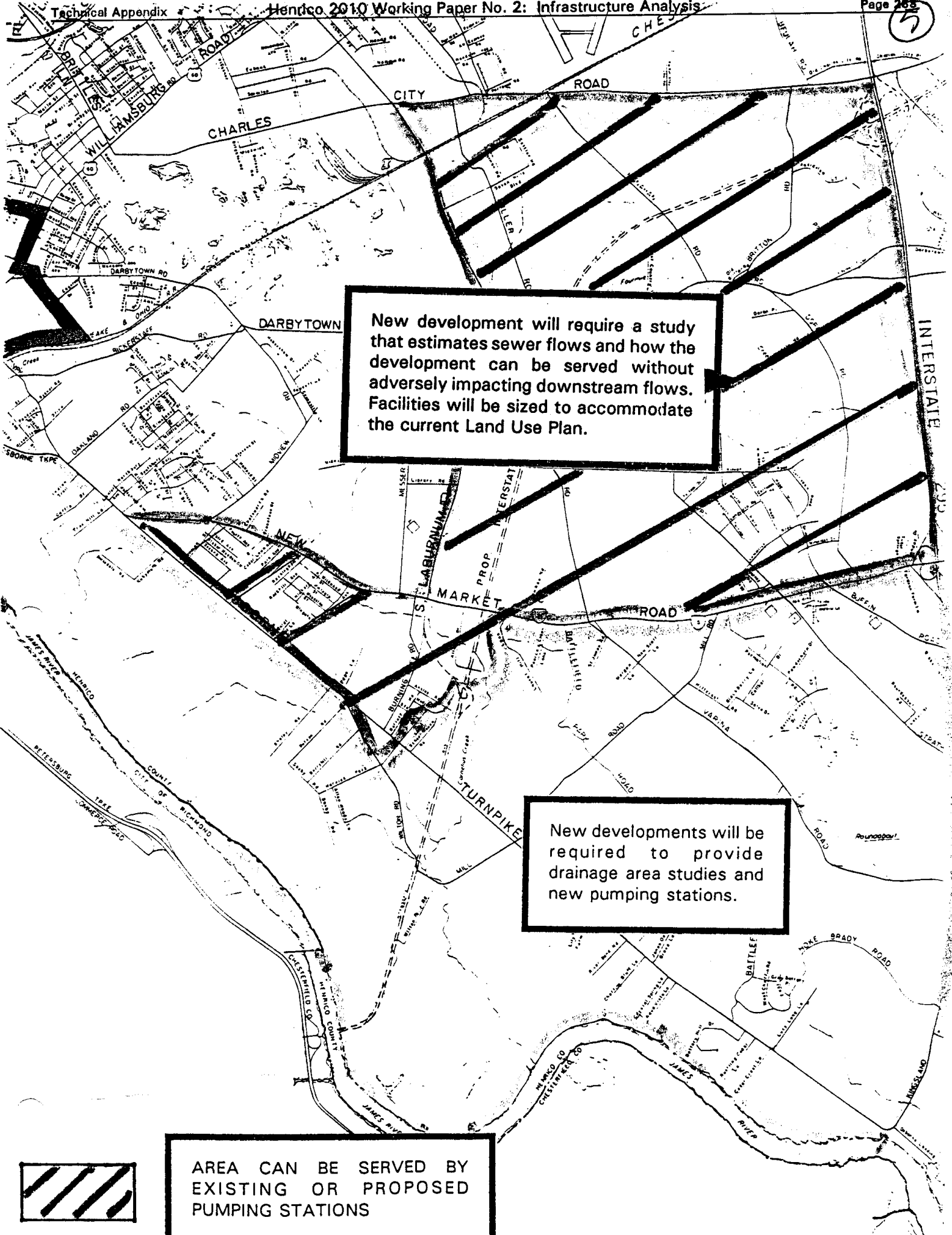
**New development will require a study that estimates sewer flows and how the development can be served without adversely impacting downstream flows. Facilities will be sized to accommodate the current Land Use Plan.**



**AREA CAN BE SERVED BY EXISTING OR PROPOSED PUMPING STATIONS**



5



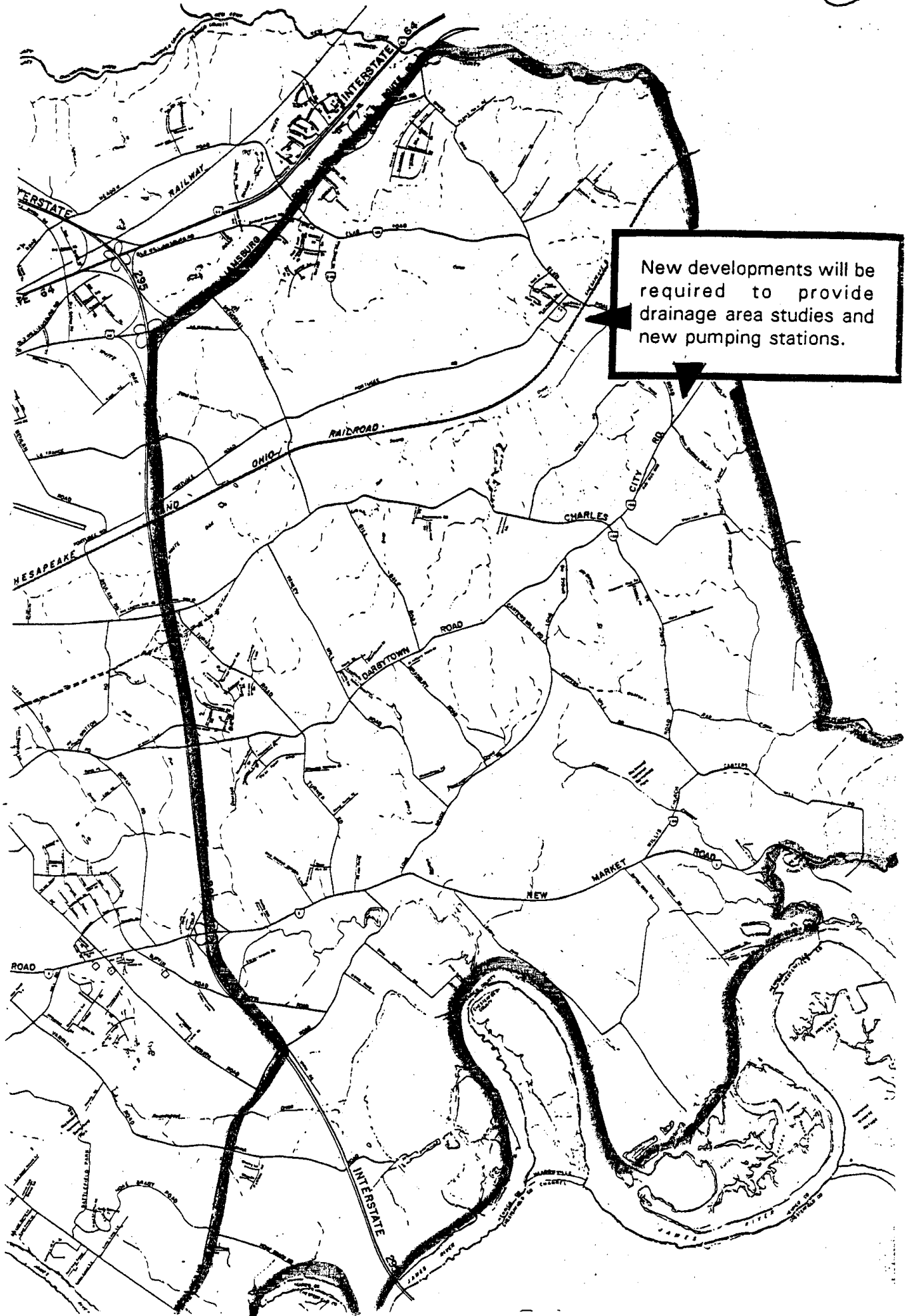
New development will require a study that estimates sewer flows and how the development can be served without adversely impacting downstream flows. Facilities will be sized to accommodate the current Land Use Plan.

New developments will be required to provide drainage area studies and new pumping stations.



AREA CAN BE SERVED BY EXISTING OR PROPOSED PUMPING STATIONS





# **SECTION TWO**

## **TRANSPORTATION FINDINGS**

## I. A GENERAL UNDERSTANDING OF THE TRANSPORTATION SYSTEM

### Administration/Funding -- Roadways:

- The roadway system in Virginia is classified into three basic categories: Interstate, Primary and Secondary. Henrico and Arlington counties are the only counties in Virginia that own, operate and maintain their own secondary road systems. Independent cities in Virginia are similar.
- Roads not owned and operated by the County include State Routes, U.S. Routes and Interstate Routes (see Table 1). These roads are operated and maintained by the Virginia Department of Transportation (VDOT). In addition, there are private roads in the County, as well as several roads owned by the National Park Service, and by the Airport authority.
- Funding for construction, operation and maintenance of the secondary system is provided by the state, through VDOT, to Henrico County. For fiscal year 1995, about \$12.6 million is being made available for maintenance, and about \$5.3 million for construction (see Table 2). The County is projected to receive, on average, approximately \$7.5 million per year from the state between 1995-2010 for secondary roadway construction (see Table 3).
- Roadway construction projects for the secondary system in Henrico are programmed (i.e., scheduled) in the County's five-year Capital Improvements Program (CIP) (see Table 4), however, secondary road system improvements often are acquired through the land development process with no direct funding by the County. For instance, from 1985 to 1992, almost 140 miles of roadway, built principally by the private sector, has been accepted into the County's system for operation and maintenance (see Appendix 1).
- Federal regulations require roadway system improvements to be shown in the regional Transportation Improvement Program (TIP) through a process referred to as the "3-C" (Continuing, Cooperative and Comprehensive) planning process. The Metropolitan Planning Organization (MPO) is the regional body set-up to carry-out this process under federal regulations. Approximately \$660,000 in federal "planning" funds is available in FY1995 for this purpose.
- VDOT consults and coordinates with the MPO on programming roadway improvement projects, however, funding decisions ultimately rest with the Commonwealth Transportation Board, appointed by the Governor. Approved projects, along with their funding schedule(s) are shown in VDOT's "Six-Year Program" for Primary and Secondary system improvements, which is revised annually.

HENRICO COUNTY - STATE/U.S./INTERSTATE ROUTES

TABLE 1

| State Routes                  |  | U.S. Routes                          |   | Interstate Routes |   |
|-------------------------------|--|--------------------------------------|---|-------------------|---|
| Airport Drive (S.R. 156)      | Williamsburg Road to Hanover Road                            | Broad Street                         | See West Broad Street                   | Interstate 64     | New Kent County Line to City to Goochland County Line                                       |
| Cary Street (S.R. 147)        | Corporate Line to Huguenot Bridge                            | Brook Road (U.S.R. 1)                | Corporate Line to Hanover County Line   | Interstate 95     | Corporate Line to Hanover County Line   |
| Charles City Road (S.R. 156)  | Elko Road to Willis Church Road                              | Chamberlayne Road (U.S.R. 301)       | Corporate Line to Hanover County Line   | Interstate 195    | Bryan Park Interchange I-95/I-64 to Corporate Line  |
| Elko Tract Road (S.R. 345)    | Elko Road to terminus  | Mechanicsville Turnpike (U.S.R. 360) | Corporate Line to Hanover County Line   | Interstate 295    | Interstate 64 West through Hanover County to Interstate 64 East to Chesterfield County Line |
| Gaskins Road (S.R. 157)       | Patterson Avenue to Quioccassin Road                         | Staples Mill Road (U.S.R. 33)        | Corporate Line to Hanover County Line   | Interstate 895    | Interstate 295 to Chesterfield County Line  |
| Hanover Road (S.R. 156)       | Airport Drive to Hanover County Line                         | West Broad Street (U.S.R. 250)       | Corporate Line to Goochland County Line |                   |   |
| Hilliard Road (S.R. 356)      | Staples Mill Road to Lakeside Avenue                         | Williamsburg Road (U.S.R. 60)        | Corporate Line to New Kent County Line  |                   |   |
| Hilliard Road (S.R. 161)      | Lakeside Avenue to Brook Road                                |                                      |   |                   |   |
| Lakeside Avenue (S.R. 161)    | Corporate Line to Hilliard Road                              |                                      |   |                   |   |
| New Market Road (S.R. 5)      | Osborne Turnpike to Charles City County Line                 |                                      |   |                   |   |
| Nine Mile Road (S.R. 33)      | Corporate Line to Williamsburg Road                          |                                      |   |                   |   |
| Old Osborne Turnpike (S.R. 5) | Corporate Line to New Market Road                            |                                      |   |                   |   |
| Osborne Turnpike (S.R. 5)     | Intersection Old and New Osborne Turnpike to New Market Road |                                      |   |                   |   |
| Parham Road (S.R. 73)         | Interstate 95 to Brook Road                                  |                                      |   |                   |   |
| Patterson Avenue (S.R. 6)     | Corporate Line to Goochland County Line                      |                                      |   |                   |   |
| Pemberton Road (S.R. 157)     | Quioccassin Road to Broad Street                             |                                      |   |                   |   |
| Pouncey Tract Road (S.R. 271) | Broad Street to Goochland County Line                        |                                      |   |                   |   |
| Quioccassin Road (S.R. 157)   | Gaskins Road to Pemberton Road                               |                                      |   |                   |   |
| Springfield Road (S.R. 157)   | Broad Street to Staples Mill Road                            |                                      |   |                   |   |
| Westwood Avenue (S.R. 197)    | North of Broad Street to Corporate Line                      |                                      |   |                   |   |
| Willis Church Road (S.R. 156) | Charles City Road to New Market Road                         |                                      |   |                   |   |

TABLE 2

## 1994-95 DEPARTMENT OF PUBLIC WORKS BUDGET SUMMARY

| REVENUE                               | 1993-94             | 1994-95             | DIFFERENCE       |
|---------------------------------------|---------------------|---------------------|------------------|
| Maintenance Payment                   | \$11,864,650        | \$12,577,590        | (\$712,940)      |
| Construction Funds                    | \$6,284,546         | \$5,255,723         | \$1,028,823      |
| License Fee                           | \$850,000           | \$850,000           | \$0              |
| Miscellaneous Payments                | \$494,485           | \$506,455           | (\$11,970)       |
| General Fund-Environmental Inspection | \$479,969           | \$511,438           | (\$31,469)       |
| General Fund - Transit Service        | \$823,006           | \$823,006           | \$0              |
| General Fund - Job Transit Service    | \$40,000            | \$40,000            | \$0              |
| <b>TOTAL REVENUE</b>                  | <b>\$20,836,656</b> | <b>\$20,564,212</b> | <b>\$272,444</b> |

| EXPENDITURES                 | 1993-94             | 1994-95             | DIFFERENCE       |
|------------------------------|---------------------|---------------------|------------------|
| Federal Aid Withheld         | \$2,312,713         | \$963,495           | \$1,349,218      |
| Bond Indebtedness            | \$1,088,823         | \$1,088,823         | \$0              |
| Capital Improvement Program  | \$3,133,410         | \$3,203,405         | (\$69,995)       |
| Administration Division      | \$588,694           | \$663,735           | (\$75,041)       |
| Construction Division        | \$946,162           | \$1,104,094         | (\$157,932)      |
| Environmental Division       | \$479,969           | \$511,438           | (\$31,469)       |
| Design Division              | \$1,157,095         | \$1,225,518         | (\$68,423)       |
| Mass Transit Division        | \$1,470,328         | \$1,499,253         | (\$28,925)       |
| Maintenance Division         | \$7,564,463         | \$8,060,834         | (\$496,371)      |
| Leaf Collection              | \$125,500           | \$125,500           | \$0              |
| Miscellaneous Drainage       | \$103,000           | \$103,000           | \$0              |
| Traffic Engineering Division | \$1,866,499         | \$2,015,117         | (\$148,618)      |
| <b>TOTAL EXPENDITURES</b>    | <b>\$20,836,656</b> | <b>\$20,564,213</b> | <b>\$272,444</b> |

**RICHMOND DISTRICT PRELIMINARY ALLOCATIONS  
PLANNING ESTIMATES FY 1995 TO FY 2015  
FOR RICHMOND MPO  
(IN THOUSANDS)**

|                             | <u>1995</u> | <u>1996</u> | <u>1997</u> | <u>1998</u> | <u>1999</u> | <u>2000</u> | <u>2001</u> |
|-----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>INTERSTATE/HS SYSTEM</b> | \$17,341    | \$21,648    | \$20,746    | \$21,160    | \$14,861    | \$14,861    | \$14,861    |
| <b>PRIMARY SYSTEM</b>       | \$28,004    | \$24,500    | \$25,129    | \$25,600    | \$26,883    | \$28,180    | \$29,419    |
| <b>SECONDARY SYSTEM</b>     |             |             |             |             |             |             |             |
| Chesterfield County         | \$4,934     | \$4,399     | \$4,523     | \$4,625     | \$4,746     | \$4,977     | \$5,197     |
| Hanover County              | \$2,021     | \$1,802     | \$1,853     | \$1,895     | \$1,944     | \$2,039     | \$2,129     |
| Henrico County              | \$6,466     | \$5,766     | \$5,928     | \$6,061     | \$6,220     | \$6,523     | \$6,812     |
| <b>UNPAVED SYSTEM</b>       |             |             |             |             |             |             |             |
| Chesterfield County         | \$51        | \$46        | \$47        | \$48        | \$49        | \$52        | \$54        |
| Hanover County              | \$261       | \$233       | \$239       | \$244       | \$250       | \$262       | \$273       |
| Henrico County              | \$0         | \$0         | \$0         | \$0         | \$0         | \$0         | \$0         |
| <b>URBAN SYSTEM</b>         |             |             |             |             |             |             |             |
| Richmond City               | \$10,695    | \$9,537     | \$9,805     | \$10,025    | \$10,288    | \$10,789    | \$11,267    |
| <b>CMAQ</b>                 | \$3,545     | \$3,556     | \$3,556     | \$3,556     | \$3,556     | \$3,556     | \$3,556     |
| <b>URBAN REGIONAL</b>       | \$5,270     | \$6,589     | \$6,552     | \$5,335     | \$5,335     | \$5,335     | \$5,335     |

Estimated allocations are for preliminary planning purposes only.

TOTAL 1995 - 2010 \$120,823,000  
(SECONDARY SYSTEM) Avg. Annual \$ 7,551,000/yr.

**RICHMOND DISTRICT PRELIMINARY ALLOCATIONS  
PLANNING ESTIMATES FY 1995 TO FY 2015  
FOR RICHMOND MPO  
(IN THOUSANDS)**

|                              | <u>2002</u> | <u>2003</u> | <u>2004</u> | <u>2005</u> | <u>2006</u> | <u>2007</u> | <u>2008</u> |
|------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>INTERSTATE\NHS SYSTEM</b> | \$14,861    | \$14,861    | \$14,861    | \$14,861    | \$14,861    | \$14,861    | \$14,861    |
| <b>PRIMARY SYSTEM</b>        | \$30,722    | \$32,090    | \$33,538    | \$35,057    | \$36,602    | \$38,226    | \$39,933    |
| <b>SECONDARY SYSTEM</b>      |             |             |             |             |             |             |             |
| Chesterfield County          | \$5,429     | \$5,673     | \$5,931     | \$6,202     | \$6,485     | \$6,782     | \$7,095     |
| Hanover County               | \$2,224     | \$2,324     | \$2,430     | \$2,541     | \$2,657     | \$2,779     | \$2,907     |
| Henrico County               | \$7,115     | \$7,435     | \$7,773     | \$8,128     | \$8,499     | \$8,888     | \$9,298     |
| <b>UNPAVED SYSTEM</b>        |             |             |             |             |             |             |             |
| Chesterfield County          | \$56        | \$59        | \$61        | \$64        | \$67        | \$70        | \$73        |
| Hanover County               | \$285       | \$298       | \$311       | \$325       | \$339       | \$354       | \$370       |
| Henrico County               | \$0         | \$0         | \$0         | \$0         | \$0         | \$0         | \$0         |
| <b>URBAN SYSTEM</b>          |             |             |             |             |             |             |             |
| Richmond City                | \$11,769    | \$12,297    | \$12,856    | \$13,444    | \$14,057    | \$14,702    | \$15,380    |
| <b>CMAQ</b>                  | \$3,556     | \$3,556     | \$3,556     | \$3,556     | \$3,556     | \$3,556     | \$3,556     |
| <b>URBAN REGIONAL</b>        | \$5,335     | \$5,335     | \$5,335     | \$5,335     | \$5,335     | \$5,335     | \$5,335     |

Estimated allocations are for preliminary planning purposes only.

**RICHMOND DISTRICT PRELIMINARY ALLOCATIONS  
PLANNING ESTIMATES FY 1995 TO FY 2015  
FOR RICHMOND MPO  
(IN THOUSANDS)**

|                               | 2009     | 2010     | 2011     | 2012     | 2013     | 2014     | 2015     |
|-------------------------------|----------|----------|----------|----------|----------|----------|----------|
| <b>INTERSTATE/INHS SYSTEM</b> | \$14,861 | \$14,861 | \$14,861 | \$14,861 | \$14,861 | \$14,861 | \$14,861 |
| <b>PRIMARY SYSTEM</b>         | \$41,727 | \$43,612 | \$45,594 | \$47,677 | \$49,867 | \$52,168 | \$54,587 |
| <b>SECONDARY SYSTEM</b>       |          |          |          |          |          |          |          |
| Chesterfield County           | \$7,424  | \$7,769  | \$8,132  | \$8,514  | \$8,915  | \$9,336  | \$9,780  |
| Hanover County                | \$3,041  | \$3,183  | \$3,332  | \$3,488  | \$3,652  | \$3,825  | \$4,007  |
| Henrico County                | \$9,729  | \$10,182 | \$10,658 | \$11,158 | \$11,683 | \$12,236 | \$12,817 |
| <b>UNPAVED SYSTEM</b>         |          |          |          |          |          |          |          |
| Chesterfield County           | \$76     | \$80     | \$83     | \$87     | \$91     | \$95     | \$100    |
| Hanover County                | \$387    | \$404    | \$423    | \$442    | \$462    | \$484    | \$508    |
| Henrico County                | \$0      | \$0      | \$0      | \$0      | \$0      | \$0      | \$0      |
| <b>URBAN SYSTEM</b>           |          |          |          |          |          |          |          |
| Richmond City                 | \$16,092 | \$16,841 | \$17,628 | \$18,456 | \$19,325 | \$20,239 | \$21,200 |
| <b>CMAQ</b>                   | \$3,556  | \$3,556  | \$3,556  | \$3,556  | \$3,556  | \$3,556  | \$3,556  |
| <b>URBAN REGIONAL</b>         | \$5,335  | \$5,335  | \$5,335  | \$5,335  | \$5,335  | \$5,335  | \$5,335  |

Estimated allocations are for preliminary planning purposes only.





**Administration/Funding -- Transit:**

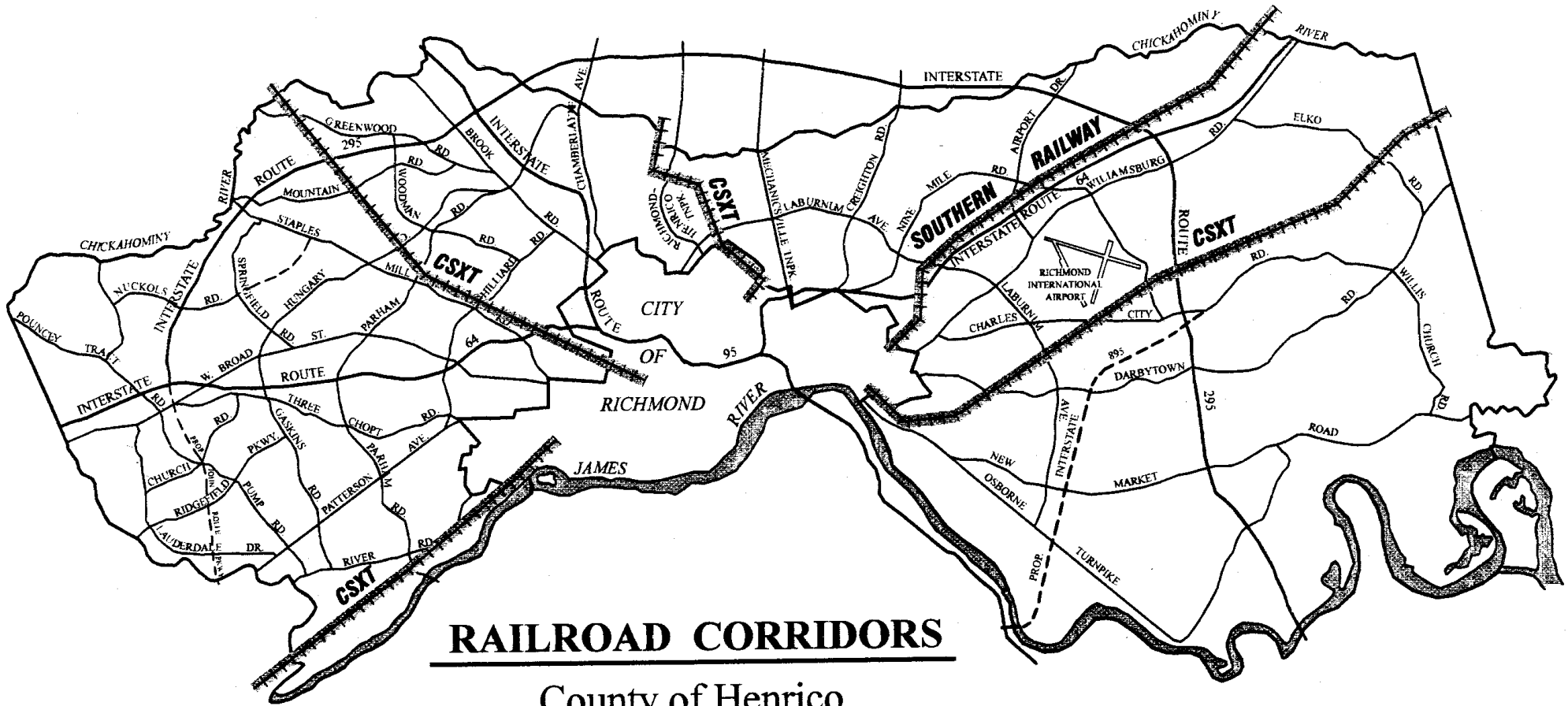
- Henrico County contracts with the Greater Richmond Transit Company (GRTC) to provide bus service in the County. An annual transit subsidy is required to make up the difference between operating costs and farebox revenues. Currently, this subsidy is approximately \$1.5 million/year and is expected to remain fairly constant for the foreseeable future.
- GRTC also receives federal grants for operating and capital assistance on an annual basis. GRTC's programmed project expenditures are shown in the TIP for the region.
- Recent federal regulations contained in the Americans with Disabilities Act (ADA) require transit companies to ensure the availability of services which meet the needs of disabled individuals. These regulations add greatly to the cost of providing transit service and have to be absorbed by transit providers; no additional federal funds were made available for this purpose. GRTC subcontracts with "STAR" transportation services to help meet this requirement.

**Administration/Funding -- Air Travel:**

- The Richmond International Airport, located in Henrico County, is administered by a regional body -- the Capital Region Airport Commission (CRAC) -- in accord with the State Code. Elected officials from local governments within the Richmond region are appointed as representatives on the CRAC.
- Capital and operating funds for the Airport are from a variety of sources, primarily State and Federal. Henrico County provides no direct funding for the Airport.

**Administration/Funding -- Rail Services:**

- Rail passenger service in Henrico County is administered and provided by the National Railroad Passenger Corporation (AMTRAK), a quasi-governmental agency of the Federal government. Rail passenger service is available at the AMTRAK station on Staples Mill Road. This is the most heavily-used AMTRAK station in Virginia.
- Rail freight service is provided along a number of routes through the County (see attached map). CSX Transportation, Inc. has acquired all but one of the rail lines through the County; the Norfolk/Southern Railroad System maintains ownership of one of the five corridors in the County. A major rail freight service yard (the ACCA yard) is located at the City/County line, off of W. Laburnum Ave.



**RAILROAD CORRIDORS**

County of Henrico  
Virginia

**Administration/Funding -- Other Services:**

- Taxicabs provide transportation services in Henrico County and are regulated according to provisions contained in the County Code. Taxicabs rely on private funding for capital, operating and maintenance costs (see attached flyer for additional information).
- Human services agencies, such as the Red Cross, provide transportation services for clients. Also, other public agencies, such as the County's Mental Health/Mental Retardation Services, contract for transportation services for their clients. Funding for these services comes from a variety of sources, including individual fares paid by clients.

**Short and Long-Range Transportation Planning:**

- Short-range planning for roadway improvements in Henrico County takes place principally through the annual review and approval of the County's five-year CIP (for the Secondary system) and through annual review and approval of the regional TIP (for the Primary and Interstate system).
- Short-range planning for bus service occurs through periodic Comprehensive Operations Analyses (COA) of GRTC's bus system. A COA analyzes the operational characteristics (e.g., ridership, route structure, farebox recovery ratio, marketing, etc.) of the regional bus system on a route-specific basis and makes recommendations for improving bus service efficiency.
- Long-range planning for roadway improvements in Henrico County occurs through periodic updates and amendments of the County's Major Thoroughfare Plan as well as through the regional 3-C process.
- The CRAC maintains a long-range master plan for the Airport's facilities.

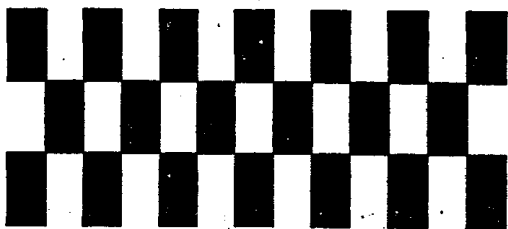
**II. REVIEW OF CURRENT TRANSPORTATION INFRASTRUCTURE**

Basic information regarding the County's transportation infrastructure is presented in Appendix 1. Trends over the last ten years are shown for the number of miles of public roadways owned by the County and the State. Also bus and rail ridership figures and the amount of subsidy paid by the County is shown. Highlights of these data are:

- 176 miles have been added to the County's inventory of roadways over the last 10 years. The State-owned roadway system in the County has increased by 15 miles in 10 years.
- Bus ridership has fluctuated over the last ten years; the peak year for ridership during this time was 1987.

RICHMOND REGIONAL

# TAXI SERVICE



"YOUR TRANSPORTATION CONNECTION"



Prepared By The

Capital Region Taxicab Advisory Board

October, 1992

## Welcome to the Richmond Region

Our goal is your personal travel **SATISFACTION** by providing you **QUALITY, SAFE TRANSPORTATION SERVICE** as you travel our region, including the City of Richmond, and the Counties of Henrico, Chesterfield, and Hanover.

Your certified professional **Taxi Driver** is happy to provide you with a safe and comfortable ride, answer your questions, give you an estimated trip cost and travel time, and even make a reservation for your next trip. *Trip receipts are available upon request.*

### Your Rights to Expert Service ...

- *To hail the taxicab you wish to hire that is traveling on any city or county street.*
- *To choose any taxicab you wish to hire from any city or county taxicab stand.*
- *To know that your taxicab driver is a licensed, certified professional that will provide a safe and comfortable ride.*
- *To receive a safe and comfortable ride in a full-size vehicle that is clean, safety inspected, and is certified to operate as a taxicab in this region.*
- *To see the taxicab driver's permit complete with number, driver's name, and photo I.D. properly displayed.*
- *To know the Regional Taxicab Meter Rates.*
- *To request and receive an estimated cost of fare before your trip and a written receipt upon your arrival.*

## Regional Taxicab Meter Rates

Taxicab meter rates are measured by distance traveled. Requested wait time is charged by the minute.

- \$1.50 drop fee (when you first start)
- .30 per additional 1/5 mile (\$1.50/mile)
- .30 per minute **WAIT TIME** (when requested)
- .50 surcharge between 9:00pm -6:00am (optional)

These rates shall apply and be recorded at all times while providing transportation services within the Richmond Region. Transportation *outside* of the Richmond Region is *not* affected by the meter rate.

### Special Services Rates

#### Elderly and Disabled Rates:

At the driver's discretion, riders 65 years of age and older are eligible for up to a 20% discount off the meter fare.

#### Share-Ride Rates:

When a *mutual agreement* is made between the taxicab driver and traveling passengers going to no more than *two different destinations*, the passengers may share the ride and fare. The amount each passenger will pay to the driver should be determined *before* the start of the trip.

#### Contract Service:

Service may be arranged with an independent taxicab operator or company for a *predetermined negotiated price*, and *specified time period* for which the service will be provided. A copy of the valid written contract must be with the independent driver's manifest.

**Thank you for traveling by taxicab in the Richmond Region!** For a list of Regional Taxicab Operators, please check the C&P Telephone Yellow Pages under "Taxi" or dial 411 for new listings.

- Paratransit ridership for the elderly and disabled has steadily increased over the years with the most recent figure being 57,000 passenger trips in 1993.

Appendix 1 also shows recent and projected operational data for the Richmond International Airport. Highlights of these data include:

- An increase of nearly 165 percent is forecast for the number of passengers at the Airport between 1992 and 2010.
- Well over a 200 percent increase is expected in air cargo tonnage over the same time period.

### **III. HOW ROADWAYS GET BUILT**

Henrico County's roadway system is planned and built through a cooperative effort among the State, the County, its citizens and the private development community. With the exception of local subdivision streets, the County's roadway system is depicted on the adopted Major Thoroughfare Plan.

Appendix 2 provides a presentation of the current status of the Major Thoroughfare Plan: amendments (i.e., additions and deletions) to the Plan since its adoption in 1985, and construction and improvement projects that are proposed, programmed and have been completed by the State and by the County. Maps of this information are available in the Planning Office showing the same information presented in Appendix 2.

The Major Thoroughfare Plan was developed and has been implemented in conjunction with the County's Land Use Plan. The need for roadways of various design, right-of-way width, and purpose -- the roadway functional classification system -- is based on existing and projected land uses. Flexibility is built into the Major Thoroughfare Plan, for example in the recommended range of rights-of-way for each type of roadway, to enable roadway design considerations to match specific land use characteristics.

To assist in the implementation of the Major Thoroughfare Plan, it is critical that there is confidence in the Plan's underlying assumptions; assumptions regarding the need for specific roads, their alignment and other design features. The following section of this report discusses the proposed update to the Major Thoroughfare Plan.

### **IV. CURRENT INITIATIVE -- TRANSPORTATION CONSULTANT**

The MTP is critical in providing for adequate roadway capacity in the County and for accommodating future growth and development. As a vital element of the County's overall Comprehensive Plan, the MTP is proposed to be updated in concert with the review and update of the County's Land Use Plan.

To accomplish the update to the MTP, it is necessary to procure consultant services for the requisite resources and expertise. The consultant study would analyze at least two possible growth rate scenarios and determine the transportation network needed to accommodate each of these potential scenarios. Details of this approach are included with the Scope of Services for the project, included as Appendix 3.

In addition to manpower, consultant services are needed to take advantage of computer modelling and travel demand forecasting techniques that form the basis for state-of-the-art long range transportation plans. In effect, this is taking the same approach with the same techniques as is done by VDOT in preparing long-range plans for the Richmond region and other urbanized areas within the State.

Funding for this project is made available under VDOT's "pass-through" agreement(s) for the utilization of Federal transportation planning (PL) monies. The update to the County's MTP is included in the FY1995 Unified Work Program (UWP) for the Richmond region, approved by the Metropolitan Planning Organization (MPO) on May 13, 1994. Approximately \$68,000 is available for this project, with a ten percent (10%) local match required from Henrico County (i.e., \$6,800).

Since the County is in the relatively unique position of owning and operating its own secondary road system, it is in a posture to let the pattern of proposed future land uses guide the construction of needed roadway capacity, rather than being more or less locked-in to a roadway network and then arranging land uses accordingly. In terms of the study to update the MTP, this means that proposed future land uses will be tested for their effect on a hypothetical roadway network which can be modified as needed to accommodate the travel demand. This approach is detailed in the Scope of Services included as Appendix 3.

## V. CURRENT TRANSPORTATION PLANNING STUDIES/ISSUES

### ISTEA and the Clean Air Act:

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) has been much discussed and written about in terms of its impact on transportation planning (both short- and long-range) and the resultant transportation system that is envisioned for the future of our country. Much of the impact and outcome of this significant federal act has yet to be determined, but it is apparent that this legislation encourages a major shift in national transportation policy that has direct implications for the patterns of future land use, growth and development in localities throughout the nation. Because of its link with federal legislation to affect air quality (i.e., amendments to the Clean Air Act), ISTEA has the "teeth" needed to force reductions in single-occupant automobile travel.

Implications: ISTEA indirectly encourages high density, concentrated, mixed-use development patterns to reduce the need for automobile trips and to promote ridesharing and mass transit. It also could result in redevelopment of older portions of urban areas to take advantage of existing transportation infrastructure.

### **Airport Master Plan and Noise Impact Studies**

The CRAC has funded two separate, but related, long-range planning studies for the Airport. Preliminary results from these studies have just been released in draft form and are being reviewed by the Airport Commissioners.

The Airport Noise Study identifies levels of noise called Day-Night Average Sound Level (DNL). The attached maps show the DNL noise exposure contours surrounding the Airport, both for existing operations and predicted future operations. Residential uses generally are not recommended within areas rated 65DNL or higher without special noise abatement treatment.

The long-range Master Plan includes significant upgrades to facilities at the Airport, including new parking structures and separation of the arrival and departure areas. In addition, the Master Plan identifies a potential need, depending upon demand, for the construction of new, parallel runways south of the existing Airport boundary. The airport consultant currently is analyzing this long-range possibility.

**Implications:** Long-range studies of the airport indicate areas where there is a need for restrictions on land use in accord with noise forecasts. Remedial soundproofing of homes, schools and other facilities may be needed. Also, new State legislation could be adopted to allow higher building code standards in noise areas. The long-range Master Plan suggests the need for restrictions on development within the area slated for possible future expansion of runways.

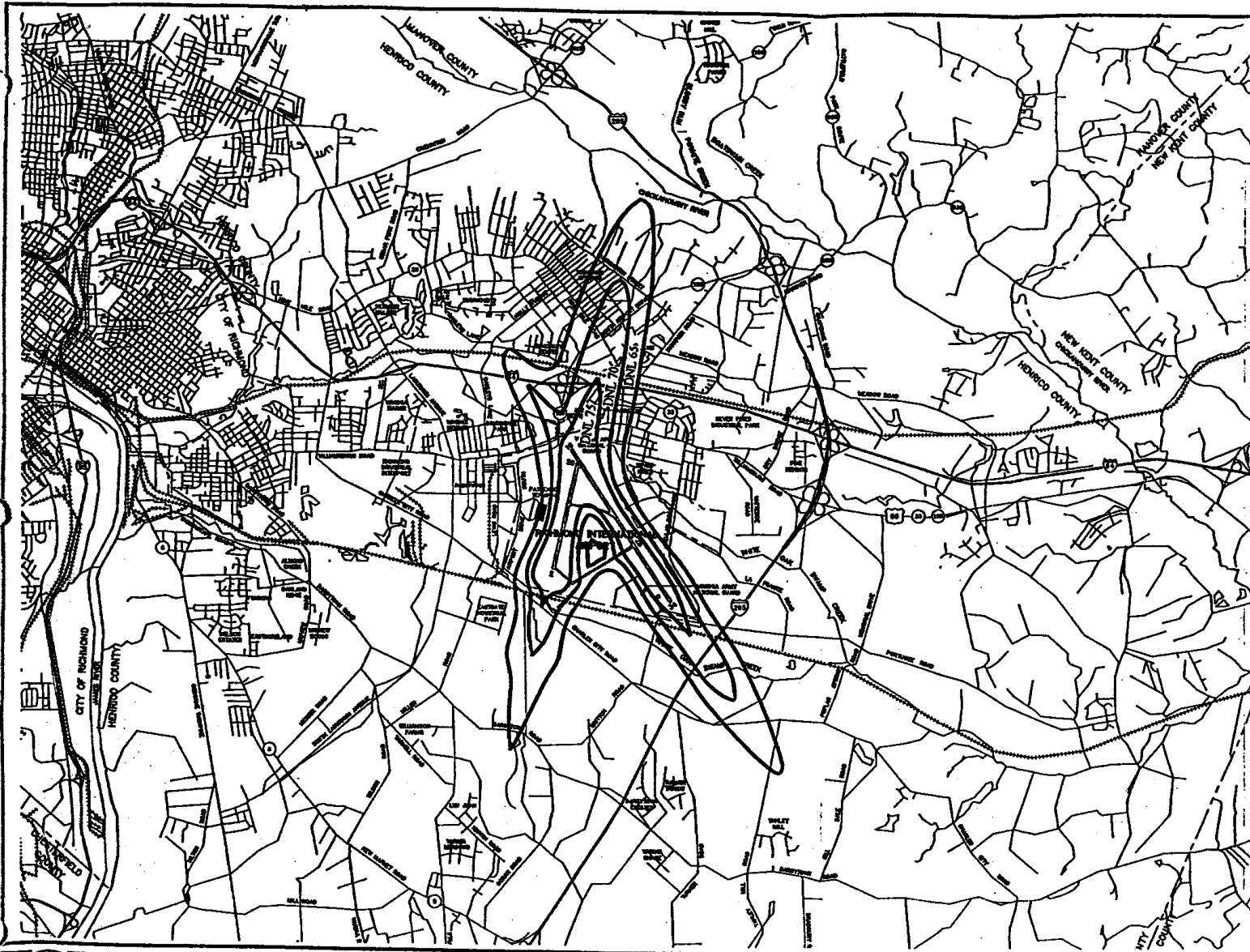
### **Multimodal Transportation Center**

ISTEA is the source of funds for an on-going consultant study being conducted for the City of Richmond. This study is analyzing the feasibility of using the old train station in downtown Richmond as a "multimodal transportation center." The idea is to provide a substantial level of rail passenger service by redirecting existing AMTRAK service to the downtown station. With enhanced parking and bus service, the downtown train station would be deemed to be a multimodal transportation center.

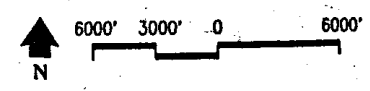
Henrico County has suggested possible study alternatives to the downtown site for a regional multimodal transportation center; specifically, in the vicinity of the ACCA Train Yard or by enhancing the existing station on Staples Mill Road.

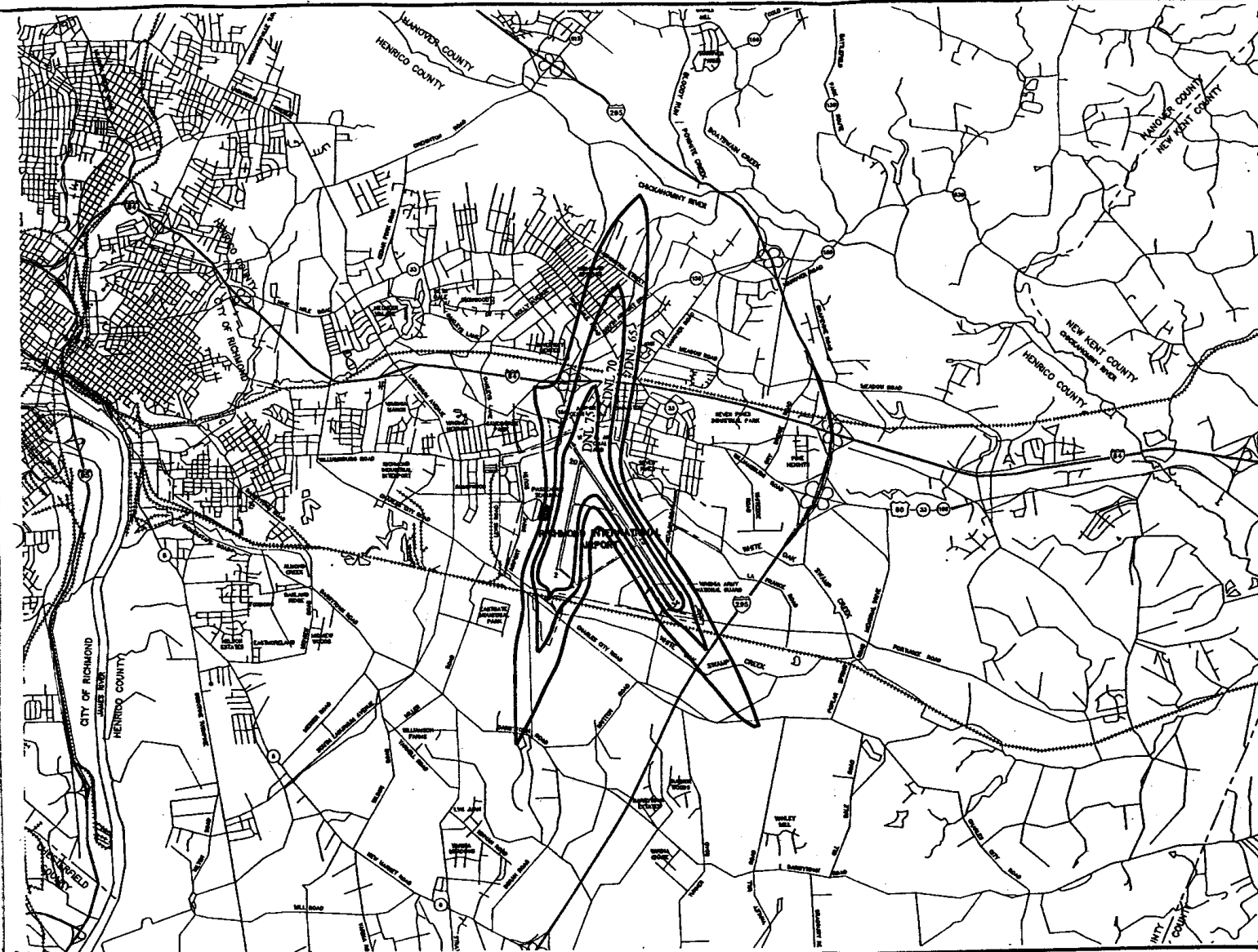
**Implications:** If a regional multimodal transportation center is developed in downtown Richmond, it may reduce the demand for service at the existing station on Staples Mill Road. The development of a multimodal transportation center at either of the alternative sites mentioned above would generate the need for additional parking facilities and could increase the demand for office and retail uses in proximity to the station.





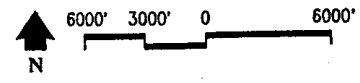
- LEGEND**
- AIRPORT BOUNDARY
  - - - POLITICAL BOUNDARY
  - STATE ROUTE
  - Ⓢ INTERSTATE ROUTE
  - Ⓡ FEDERAL ROUTE
  - ⋯ RAILROAD
  - MUNICIPAL ROAD





Runway extensions (minimal) included. Otherwise, no operational "mitigation" measures.

- LEGEND**
- AIRPORT BOUNDARY
  - - - POLITICAL BOUNDARY
  - STATE ROUTE
  - Ⓜ INTERSTATE ROUTE
  - Ⓜ FEDERAL ROUTE
  - ⋯ RAILROAD
  - MUNICIPAL ROAD



Richmond International Airport  
 FAR Part 150  
 Noise Compatibility Study

FUTURE BASELINE (1998)  
 NOISE EXPOSURE CONTOUR



EXHIBIT  
 5.4-1

### High Speed Rail

High speed, intercity rail service is one of the areas emphasized by ISTEA. Funding to conduct studies of the feasibility of high speed rail was provided in this legislation. A link between Richmond and Washington, D.C. is one of the corridors selected by the Federal Railroad Administration for study. In turn, the Virginia Department of Rail and Public Transportation has contracted with a consultant firm to study possible station locations in the corridor and assess land use implications.

Implications: The consultant study appears to be an explicit effort to locate high speed rail stations where there is a possibility of promoting new, transit-oriented mixed-use developments. This represents further emphasis on encouraging new patterns of high-density, compact development that can be served by transit.

### Long Range Public Transportation Plan

The GRTC has funded (with ISTEA money) a consultant study of long-range public transportation needs/opportunities in the Richmond region. A final version of this report will be presented to the MPO for approval in the near future. Based on an analysis of existing and forecasted conditions in the region, the feasibility of providing expanded public transportation (i.e., bus service) was examined. Factors such as the density of employment and housing were taken into account in determining the likelihood of future transit demand.

Implications: To encourage more efficient and expanded bus service, one possibility would be to direct new development to areas that have appropriate transit demand characteristics. Thus, the land use implication is further emphasis on high-density, compact, mixed-use development centers that can be served by transit.

## VI. TRANSPORTATION POLICIES

Like most suburban jurisdictions throughout the nation, Henrico County is heavily auto-oriented. The pattern of land use and development in the County practically necessitates the use of an automobile by every individual. Although there is no explicit policy in the County that supports single-occupant automobile travel as a preferred mode, the cumulative effect of many of our policies concerning land use and development virtually assures the continuance of an automobile-dominated living environment.

Shown below is a list of some of the County's policy characteristics that combine to support and maintain our automobile-oriented development pattern. They are a mix of some formal, informal or lack of policy; therefore, they are termed "policy characteristics" rather than policies.

It should be noted, and bears repeating, that most of the policy characteristics listed below probably are typical of suburban jurisdictions across the nation. Unlike many suburban jurisdictions of Henrico's size, however, roadway capacity generally has been able to keep pace with the County's growth; traffic congestion is not a significant issue for most people

here. This seems to be due to a unique combination of factors which includes: the presence of four Interstate highways; the County's control over the secondary system; an effective working relationship with VDOT; the pace of growth; and good planning efforts. One only needs to look at our nearest comparable neighbor -- Chesterfield County -- to realize how unique these factors are.

#### **Characteristics of Existing Policies in Henrico:**

- Reliance on private sector development initiatives to provide infrastructure
- Emphasis on roadway construction versus other modes
- Limited transit investment
- Limited provisions for pedestrians/bicycles (except near schools)
- Encourage low density development -- commercial and residential
- Limited or lack of provisions for mixed-use developments, especially residential/commercial mix
- Unrestricted free surface parking on-site -- minimum requirement standards for number of spaces
- Cul-de-sac subdivision streets versus grid pattern constricts traffic flow and encourages additional driving
- Lack of interparcel connection requirements leads to separate entrances, need for additional trips, and slower response time for emergency vehicles
- Encourage signalized intersections, protected left turn cycles -- emphasis on safety versus capacity
- No HOV lanes and limited ridesharing incentives
- No impact fees/cash proffers or off-site improvements

It is apparent from many of the current transportation issues that there is a strong impetus trying to reverse the policy characteristics that have contributed to our automobile-oriented society. This is most clearly manifested in the federal ISTEA legislation with its explicit links to national air quality standards. Because of our unique transportation features, however, the "one-size-fits-all," top-down approach represented by ISTEA is inappropriate for the transportation situation in Henrico County. The question then becomes, what should be our future transportation policy approach?

#### **Future Policy Direction:**

As mentioned before, there are many external forces bringing pressure to bear on changing the policy characteristics listed above. The hope is to reduce single-occupant automobile travel in particular, as well as overall vehicle miles of travel and vehicle hours of operation. This is intended to improve air quality.

Our regional transportation planning process, that has served well for Henrico, is the focus of these significant changes mandated by outside agencies. The changes in the regional planning process, however, are for purposes that don't really apply to our situation. For example, ISTEA requires us to devise a Congestion Management System for the region without building any additional roadway capacity for single-occupant vehicles. This approach runs counter to, and in fact is directly opposed to, the method the County and the region have

relied upon in the past. Further, Henrico County doesn't have the type of significant traffic congestion problems to warrant a Congestion Management System.

In analyzing the County's transportation infrastructure and policies, several opportunities were identified by staff. The first of these involves the use of a tool called the "official map." Basically, it is similar to the Major Thoroughfare Plan, except with more detail and more legal standing to enforce compliance as the County develops. There have been several recent legislative changes affecting the official map that may make this tool more attractive for our use. Some additional research will be needed to evaluate the benefits of the official map.

Staff also noted an opportunity to improve the status of pedestrian and bicycle facilities (i.e., sidewalks and bicycle lanes/trails). Although there is some doubt about the specific transportation benefits of these facilities, these improvements generally are provided along with road construction projects. While the County's adopted policy is to provide sidewalks in proximity to elementary schools, we could be more consistent in planning for, and acquiring these facilities in other locations, as well. There seems to be substantial public support for these facilities in selected locations.

Another opportunity is the concept of having the County assume responsibility for traffic signals on the Primary roadway system in the County. This would enable greater coordination (e.g., signal timing) and more responsive administration of the roadway infrastructure. This concept might require new legislation.

Lastly, staff identified a number of potential future capacity constraints on the roadway system, such as I-64 West in the evening peak period, I-95 North in the evening peak and Parham Road westbound in the evening. The consultant study to model/forecast traffic conditions should answer specific questions about these types of potential capacity constraints.

The overall conclusion about the County's transportation infrastructure is that certain steps may be required to ensure it does not pose a constraint to future growth and development. The main concern rests with the continuing status of the public/private partnership approach by which much of our roadway system has been constructed. The Major Thoroughfare Plan needs to be re-analyzed and supported with an in-depth study to help ensure that it can stand up to potential challenges. Also, we may have to rely more upon direct County financing (e.g., bond funds) to accomplish critically needed improvements in some locations.

The other principal area of concern relates to our transportation planning autonomy. The modelling/forecasting of transportation demand, to be conducted by the County's consultant, will answer questions about the future roadway network that will be needed to accommodate projected land uses. It seems clear, however, that the regional transportation planning process will no longer be as functional because of the external mandates that must be addressed; mandates that are not integrated, and may be opposed to, our traditional, successful policy approach. These external mandates represent a possible constraint on our growth and development, and they are certainly a significant assault on the County's autonomy to plan both for land use and transportation.

The policy response to this situation is not clear-cut. We certainly should continue to take the conservative approach to the external mandates for change. At the same time, we must comply with these mandates as best we can. Political/legislative avenues may be available to represent Henrico's interests and counteract some of the mandates. Also, we may need to find new approaches and new paradigms for accomplishing the same objectives in a different way. Most importantly, we need to effectively plan for growth and development to ensure that our transportation system does not deteriorate to match the severe congestion problems experienced elsewhere in the country.

Appendix 1

**TRANSPORTATION INFRASTRUCTURE  
FACTS and FIGURES\*  
Henrico County, Virginia**

| ITEM                       | 1984      | 1985    | 1986    | 1987    | 1988    | 1989      | 1990      | 1991      | 1992      | 1993      |
|----------------------------|-----------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|
| Public Road Miles:         |           |         |         |         |         |           |           |           |           |           |
| County                     | 946       | 988     | 1002    | 1027    | 1046    | 1065      | 1085      | 1109      | 1118      | 1141      |
| State                      | 154       | 154     | 154     | 159     | 159     | 159       | 159       | 159       | 169       | 169       |
| Total                      | 1033      | 1047    | 1089    | 1103    | 1128    | 1152      | 1191      | 1212      | 1226      | 1309      |
| County System Miles Added  | 9         | 14      | 14      | 25      | 19      | 19        | 20        | 24        | 18        | 14        |
| Miles Resurfaced or Sealed | 106       | 96      | 93      | 98      | 96      | 115       | 145       | 104       | 114       | 120       |
| Bus Routes                 | 8         | 8       | 8       | 11      | 11      | 12        | 12        | 12        | 12        | 12        |
| Bus Passenger Trips        | 947,000   | 974,000 | 924,000 | 960,000 | 905,000 | 959,000   | 930,000   | 924,000   | 858,000   | 685,000   |
| Paratransit                | —         | —       | 28,000  | 31,000  | 35,000  | 39,000    | 40,000    | 46,000    | 51,000    | 57,000    |
| Transit Subsidy            | \$387,000 | 471,000 | 615,000 | 779,000 | 950,000 | 1,213,000 | 1,500,000 | 1,500,000 | 1,500,000 | 1,500,000 |
| Rail Passenger Trips       | 92,000    | 133,000 | 173,000 | 190,000 | 219,000 | 224,000   | 236,000   | 235,000   | 208,000   | 216,000   |

\*Source: Henrico County Department of Public Works

APPENDIX 1

**RICHMOND INTERNATIONAL AIRPORT  
FORECAST SUMMARY\*  
PASSENGER, AIR CARGO, AND AIRCRAFT OPERATIONS**

| Item                           | YEAR    |           |           |           |           |           |           |           |
|--------------------------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                                | 1992    | 1995      | 2000      | 2005      | 2010      | 2015      | 2020      | 2030      |
| Annual Ops.                    |         |           |           |           |           |           |           |           |
| -Air Pass                      | 54,088  | 68,000    | 89,000    | 105,000   | 125,000   | 136,000   | 144,000   | 168,000   |
| -Air Cargo                     | 10,298  | 13,000    | 18,000    | 23,000    | 29,000    | 29,000    | 32,000    | 35,000    |
| -Gen Av                        | 61,043  | 68,000    | 68,000    | 68,000    | 68,000    | 68,000    | 68,000    | 68,000    |
| -Military                      | 23,291  | 24,000    | 24,000    | 24,000    | 24,000    | 24,000    | 24,000    | 24,000    |
| -Total                         | 148,720 | 173,000   | 220,000   | 244,000   | 257,000   | 257,000   | 268,000   | 295,000   |
| Aver Day Pk<br>Mnth Ops        | 466     | 542       | 624       | 689       | 765       | 805       | 840       | 924       |
| Peak Hr Ops                    | 35      | 41        | 47        | 52        | 58        | 61        | 63        | 70        |
| Annual Enpld<br>Passgrs        | 973,877 | 1,302,000 | 1,743,000 | 2,123,000 | 2,573,000 | 2,870,000 | 3,166,000 | 3,873,000 |
| Design Day<br>Enpld Passgrs    | 3,051   | 4,100     | 5,500     | 6,700     | 8,100     | 9,000     | 9,900     | 12,100    |
| Annual Air<br>Cargo<br>Tonnage | 52,331  | 66,761    | 99,453    | 134,326   | 176,261   | 212,563   | 256,853   | 354,135   |
| Genl Aviation<br>Based Acft.   | 117     | 120       | 120       | 120       | 120       | 120       | 120       | 120       |

\* Source: Master Plan Update, Richmond International Airport, May, 1994



## STATUS OF THE MAJOR THOROUGHFARE PLAN

### Henrico County, Virginia

#### MTP DELETIONS

| Amendment Number | Street                         | From                    | To                       | Functional Classification |
|------------------|--------------------------------|-------------------------|--------------------------|---------------------------|
| MTP-1-86         | September Drive                | Parham Road             | Roslyn Hills Subdivision | Minor Collector           |
| MTP-2-86         | Vawter Avenue                  | Laburnum Avenue         | Dill Avenue              | Minor Collector           |
| MTP-3-86         | Middleton Avenue/Shewalt Drive | Parham Road             | Hungary Road             | Minor Collector           |
| MTP-4-86         | Gunby Drive                    | North of Georges Branch | South of Georges Branch  | Minor Collector           |
| MTP-5-86         | September Drive                | Roslyn Hills            | Ziontown Road            | Minor Collector           |
| MTP-1-87         | Connecticut Avenue             | U.S. Route 1            | Mountain Road            | Minor Collector           |
| MTP-2-87         | Ranco Road                     | Hermitage Road          | Vernon Road              | Major Access              |
| MTP-1-88         | Turnbridge Drive               | Gayton Road             | Ridgefield Parkway       | Minor Collector           |
| MTP-2-88         | Concept Road 80-1              | N. Gaskins Road         | River Road               | Minor Collector           |
| MTP-3-88         | Concept Road 10-1              | Eubank Road             | Concept Road 9-1         | Major Access              |
| MTP-1-91         | Shrader Road                   | Olde West Drive         | Hungary Road             | Major Collector           |
| MTP-1-92         | Montclair Road                 | Neale Street            | Washington Street        | Minor Collector           |
| MTP-2-92         | Washington Street              | Creighton Road          | Mechanicsville Turnpike  | Major Collector           |
|                  | Neale Street                   | Montclair Road          | Creighton Road           | Minor Collector           |
| MTP-1-93         | Azalea Avenue                  | Carolina Avenue         | Mechanicsville Turnpike  | Minor Arterial            |

#### MTP ADDITIONS

| Amendment       | Roadway                             | From        | To             | Functional Classification |
|-----------------|-------------------------------------|-------------|----------------|---------------------------|
| Northwest Study | (See List of Proposed Improvements) |             |                |                           |
| MTP-2-92        | Concept Road 7-1 (Meadowview Lane)  | Harvie Road | Creighton Road | Minor Collector           |

**COMPLETED COUNTY PROJECTS (1987 to Present - Status Reports on Roads)**

| ROAD NAME                              | FROM                               | TO                  | COMMENTS                                |
|--|------------------------------------|---------------------|---|
| Gaskins Road                           | Patterson Ave                      | River Road          | Widening                                |
| Nuckols Road                           | Pouncey Tract                      | I-295               | Widen to 4 lanes and relocated          |
| John Rolfe Parkway                     | I-64/I-295                         | Tuckahoe Creek      | Preliminary engineering                 |
| Hungary Road/Woodman Road Intersection | N/A                                | N/A                 | Improve Intersection                    |
| Church Road                            | Gayton                             | Pump                | Widen to 4 lanes                        |
| Laburnum Bridge Replacement            | N/A                                | N/A                 | On S. Laburnum over CSX System Railroad |
| Pump Road                              | Gayton                             | Church              | Widen to 4 lanes                        |
| Ridgefield Parkway                     | Gayton                             | Pump                | Construction 4 lane divided             |
| Audubon Drive                          | Oakley's Lane                      | Airport Drive       | Construct 4 lane divided                |
| Creighton Road                         | Laburnum Avenue                    | Hanover County Line | Construct 4 lane divided                |
| Hungary Road                           | Springfield Road                   | Woodman             | Widen to 4 lanes                        |
| Three Chopt & Cox intersection         | N/A                                | N/A                 | Widen to 4 lanes                        |
| Parham Road                            | River Road                         | Derbyshire          | Widen to 4 lanes                        |
| Parham/Chippenham Connector            | N/A                                | N/A                 | Construction bridge and road section    |
| Buffin Road                            | Route 5                            | Kingsland Road      | Widen existing 2 lanes and relocation   |
| Mountain Road                          | Staples Mill                       | Greenwood           | Widen existing 2 lanes                  |
| Airport Access Road                    | Williamsburg Road at Airport Drive | Airport terminal    | Construct 4 lane divided                |
| Gaskins Road park & ride lot           | N/A                                | N/A                 | Constructed                             |
| Three Chopt Road                       | Forest Avenue                      | East Ridge          | Widen existing roadway                  |
| Quioccasin Road                        | Raintree                           | Gaskins Road        | Extension                               |
| Darracott/Hungary intersection         | N/A                                | N/A                 |   |

**COMPLETED STATE PROJECTS (1987 to Present - Status Reports on Roads)**

| Road Name                   | From                            | To                               | Comments  |
|-----------------------------|---------------------------------|----------------------------------|---|
| I-295                       | 1 mile south of I-64            | 1.5 miles south of Route 5       | New Construction  |
| I-295                       | James River Bridge with roadway | Route 10                         | New Construction  |
| Staples Mill                | Parham Road                     | Glenside Drive                   | Widen to 6 lanes  |
| Staples Mill                | Parham                          | I-295                            | Widen to 4 lanes  |
| Nine Mile Road              | .08 mile west of Masonic Lane   | Meadowspring Road                | Add fifth lane  |
| Gaskins                     | Patterson Avenue                | Quioccasin Road                  | Widen to 4 lanes  |
| Brook Road (Route 1)        | .10 miles north of Parham Road  | .10 miles north of Mountain Road | Widen to 6 lanes  |
| I-64 Interchange            | Laburnum Avenue                 | N/A                              | Modification  |
| Williamsburg Road           | Glen Alden Drive                | Sandston                         | Widen existing roadway  |
| Hilliard Road (Rt 161)      | Lakeside Avenue                 | Brook Road                       | Widen to 4 lanes  |
| I-64                        | Glenside Drive                  | I-295                            | Widen to 6 lanes  |
| Broad Street                | Pemberton/Springfield           | Dominion Blvd                    | Widen to 6 lanes  |
| Laburnum Bridge Replacement | N/A                             | N/A                              | S. Laburnum Avenue over the CSX System Railroad (combined State and County project) |

| PROGRAMMED IMPROVEMENTS (County CIP and VDOT 6-Year Plan) |  |   |  |
|---|--|---|--|
| Road Name   | From   | To  | Comments   |
| Hungary Spring Road                                       | Staples Mill   | Old Route 33  | Widen to 4 lanes divided   |
| Oakland Road  | Osbourne Turnpike                                      | 250 feet east of Bentbrook Drive  | Widen and Construct to 4 lanes undivided   |
| Meadowview Lane (Cedar Fork Road Extended)                | Intersection of Laburnum and Harvie                    | Existing Meadowview Lane at the new Eastern Fairfield Elementary School | Widen to existing Meadowview Lane to 4 lane undivided and construct new Meadowview Lane west of the new school |
| Richmond-Henrico Turnpike                                 | Azalea Avenue  | Hanover County Line   | Widen to 4 lanes with median   |
| Woodman Road  | Hungary Road   | Mountain  | Widen to 4 lanes with median   |
| Cox Road Extension  | Intersection of Cox Road and Hearthrock Court          | Intersection of Westek Drive and Church Road                            | Construct 4-lane roadway and 500-foot relocation of Church Road  |
| Seven Hills Boulevard Extension                           | Intersection of Settler Road and Seven Hills Boulevard | Charles City Road   | Construct 2 lanes on four-lane right-of-way  |
| Westover Avenue   | Nine Mile Road   | Third Avenue  | Widen from 16 feet to 24 feet  |
| Church Road   | Gayton   | Pump  | Widen to 4 lanes   |
| Francistown Road  | Hungary Road   | Springfield Road  | Widen to improve 2 lanes; under construction   |
| John Rolfe Parkway  | W. Broad Street  | Lauderdale Drive  | Preliminary engineering  |
| North Run   | Hungary Road   | Mountain Road   | Improved 2 lanes, under construction   |
| Pump Road   | Church Road  | W. Broad Street   | Improved 2 lanes/widen to 4 lanes, under construction  |
| Quioccasin Road   | Pemberton  | Blue Jay Lane   | Widen to 4 lanes   |
| Route 1 (Brook Road)                                      | Hanover County Line                                    | I-95  | Widen to 6 lanes (partially completed)   |
| 161 (Hilliard Road )                                      | Galaxie Road   | Hermitage Road  | Widen to 4 lanes   |
| Broad Street Road   | Goochland County Line                                  | I-64  | Widen to 6 lanes (partially complete)  |

| PROPOSED IMPROVEMENTS (2005 REGIONAL PLAN) |                         |                          |                   |
|--|-------------------------|--------------------------|-------------------|
| ROAD NAME                                  | FROM                    | TO                       | COMMENTS          |
| Brittles Lane                              | Gay Avenue              | Williamsburg Road        | Widen to 4 lanes  |
| Charles City Road                          | Williamsburg Road       | Gill Dale Rd             | Widen to 4 lanes  |
| Forest Avenue                              | Patterson Avenue        | Glenside Avenue          | Widen to 6 lanes  |
| Gayton Road                                | Lauderdale Road         | Chauncey Lane            | Widen to 4 lanes  |
| Glenside Drive                             | Horsepen Road           | I-64                     | Widen to 6 lanes  |
| Horsepen Road                              | Three Chopt Road        | Glenside Drive           | Widen to 6 lanes  |
| Hungary Springs Road                       | Skipwith Road           | Staples Mill Road        | Widen to 4 lanes  |
| Laburnum Avenue                            | New Market Road         | Laburnum Avenue Conn.    | Widen to 4 lanes  |
| Laburnum Avenue                            | Rte 360                 | Williamsburg Road        | Widen to 6 lanes  |
| Laburnum Avenue Conn.                      | Laburnum Avenue         | I-895                    | Construct 4 lanes |
| Masonic Home Lane                          | Nine Mile Road          | Gay Avenue               | Widen to 4 lanes  |
| Mountain Road                              | Springfield Road        | Route 1                  | Widen to 4 lanes  |
| River Road                                 | Gaskins Road            | Parham Road              | Widen to 4 lanes  |
| Shady Grove Road                           | Rte 271                 | Shady Grove Ext.         | Widen to 4 lanes  |
| Springfield Road                           | Staples Mill Road       | Mountain Road            | Widen to 4 lanes  |
| Three Chopt Road                           | Richmond City Limits    | Horspen Road             | Widen to 6 lanes  |
| Three Chopt Road                           | Three Chopt Ext.        | Parham Road              | Widen to 4 lanes  |
| Woodman Road                               | Hilliard Road           | Hungary Road             | Widen to 4 lanes  |
| Route 5 (New Market Road)                  | Richmond City Limits    | Charles City County Line | Widen to 4 lanes  |
| Route 6 (Patterson Avenue)                 | Goochland County Line   | Richmond City Limits     | Widen to 6 lanes  |
| Route 33 (Nine Mile Road)                  | Airport Drive           | Williamsburg Road        | Widen to 4 lanes  |
| Route 33 (Nine Mile Road)                  | I-64                    | Airport Drive            | Widen to 6 lanes  |
| Route 60 (Williamsburg Road)               | E. Richmond City Limits | Glen Alden Drive         | Widen to 4 lanes  |

**PROPOSED IMPROVEMENTS (2005 REGIONAL PLAN)**

| <b>ROAD NAME</b>             | <b>FROM</b>           | <b>TO</b>             | <b>COMMENTS</b>   |
|------------------------------|-----------------------|-----------------------|-------------------|
| I-64                         | Goochland County Line | I-295                 | Widen to 6 lanes  |
| I-64                         | I-295                 | Richmond City Limits  | Widen to 8 lanes  |
| I-64                         | Airport Drive         | New Kent County Line  | Widen to 6 lanes  |
| Route 73 (Parham Road)       | River Road            | Rte 1                 | Widen to 6 lanes  |
| I-95                         | Hanover County Line   | Richmond City Limits  | Widen to 8 lanes  |
| Route 147/Huguenot Bridge    | River Road            | Richmond City Limits  | Widen to 4 lanes  |
| Route 150/Willey Bridge      | Richmond City Limits  | River Road            | Widen to 6 lanes  |
| Route 157 (Springfield Road) | Francistown Road      | Staples Mill Road     | Widen to 4 lanes  |
| Route 695 (Nuckols Road)     | Elk Pass Lane         | Springfield Road      | Widen to 4 lanes  |
| John Rolfe Parkway           | I-64                  | Goochland County Line | Construct 4 lanes |
| Lauderdale Drive Ext.        | Rte 250               | Rte 271               | Construct 4 lanes |
| Nuckols Road Ext.            | Springfield Road      | Staples Mill Road     | Construct 4 lanes |
| Opaca Lane Ext.              | Shady Grove Road      | Francistown Road      | Construct 4 lanes |
| Opaca Lane Conn.             | Nuckols Road          | Opaca Lane Ext.       | Construct 4 lanes |
| Ridgefield Parkway           | Goochland County Line | Existing Ridgefield   | Construct 4 lanes |
| Shady Grove Ext.             | Shady Grove Road      | Nuckols Road          | Construct 4 lanes |
| Three Chopt Ext.             | Pump Road             | Three Chopt Road      | Construct 4 lanes |
| Woodman Road Ext.            | Greenwood Road        | Hanover County Line   | Construct 4 lanes |
| Edgefield Street Ext.        | 105-1                 | Edgefield Street      | Minor Collector   |
| Treva Road Ext.              | Treva Road            | Whiteside Drive       | Minor Collector   |
| Zulu Road                    | Stoney Run Parkway    | Brittles Lane         | Major Access      |
| Audubon Drive Ext.           | Laburnum Avenue       | Oakleys Lane          | Major Access      |
| Kara Drive Ext.              | Kara Drive            | Gill Dale Road        | Minor Collector   |
| Malpas Drive Ext.            | Malpas Drive          | Memorial Drive        | Minor Collector   |
| Monaco Drive Ext.            | Monaco Drive          | Elko Road             | Minor Collector   |

**PROPOSED IMPROVEMENTS (2005 REGIONAL PLAN)**

| <b>ROAD NAME</b>  | <b>FROM</b>               | <b>TO</b>                  | <b>COMMENTS</b>                 |
|-------------------|---------------------------|----------------------------|---------------------------------|
| Pin Oak Lane Ext. | Pin Oak Lane              | Grapevine Road/Meadow Road | Minor Collector                 |
| Concept Road 72-1 | Kain Road                 | Bacova Drive               | Minor Collector                 |
| 72-2              | Bacova Drive              | Pouncey Tract Road         | Minor Collector                 |
| 72-3              | North Gayton Drive        | Pouncey Tract Road         | Major Collector                 |
| 73-1              | Stone Horse Road          | Nuckols Road               | Minor Collector                 |
| 76-1              | Pouncey Tract Road        | Shady Grove Road           | Major Collector                 |
| 76-2              | Shady Grove Road          | 76-3                       | Major Collector/Minor Collector |
| 76-3              | Shady Grove Road          | I-295                      | Minor Collector                 |
| 77-1              | Nuckols Road              | 76-2                       | Minor Collector                 |
| 77-2              | Pouncey Tract             | 77-1                       | Minor Collector                 |
| 77-3              | 77-1                      | Nuckols Road               | Minor Collector                 |
| 78-1              | Three Chopt Road          | Broad Street Road          | Minor Collector                 |
| 102-1             | Woodman Road Ext.         | Brook Road                 | Major Collector                 |
| 104-1             | E. Parham Road            | Brook Road                 | Minor Collector                 |
| 105-1             | Eisenhower Drive          | U.S. Route 301             | Minor Collector                 |
| 4-2               | Wilkinson Road            | Richmond-Henrico Turnpike  | Minor Collector                 |
| 8-1               | Creighton Road            | Dabbs House                | Minor Collector                 |
| 8-2               | Dabbs House               | Laburnum Avenue            | Minor Collector                 |
| 8-3               | Laburnum Avenue           | Cedar Fork Road            | Minor Collector                 |
| 9-1               | Williamsburg Road         | Charles City Road          | Major Access                    |
| 11-1              | Oakleys Lane              | Site                       | Major Access                    |
| 13-1              | Cedar Fork Road           | W. Washington Street       | Minor Collector                 |
| 28-1              | Library Road/Midview Road | Laburnum Avenue            | Minor Collector                 |
| 26-1              | Varina Road               | Buffin Road                | Minor Collector                 |
| 30-1              | Miller Road               | Beulah Road                | Major Access/Minor Collector    |

**PROPOSED IMPROVEMENTS (2005 REGIONAL PLAN)**

| ROAD NAME | FROM                  | TO                          | COMMENTS        |
|-----------|-----------------------|-----------------------------|-----------------|
| 30-2      | Seven Hills Boulevard | Darbytown Road              | Major Access    |
| 40-1      | Darbytown Road        | New Market Road             | Minor Collector |
| 41-1      | Turner Road           | Yahley Mill Road/Kara Drive | Minor Collector |
| 48-1      | Yahley Mill Road      | Bradbury Road               | Minor Collector |



RFP #49-4\_\_\_-6CW

June 21, 1994

**REQUEST FOR PROPOSAL  
COMPREHENSIVE PLAN UPDATE  
COUNTY OF HENRICO, VIRGINIA**

Your firm is invited to submit a proposal to provide a comprehensive plan update for the County of Henrico. Submittals consisting of the original proposal and six (6) additional copies marked, "A Proposal for a Comprehensive Plan Update," will be received no later than 2:00 p.m., \_\_\_\_\_, \_\_\_\_\_, 1994 by:

County of Henrico  
Department of General Services  
Purchasing Office  
1590 E. Parham Road  
Richmond, Virginia 23228

OR

Mailing Address:  
P.O. Box 27032  
Richmond, Virginia 23273

Time is of the essence and any proposal received after 2:00 p.m., \_\_\_\_\_, \_\_\_\_\_, 1994, whether by mail or otherwise, will be returned unopened. The time of receipt shall be determined by the time clock stamp in the office of the Division of Support Services, Department of General Services. Proposals shall be placed in a sealed, opaque envelope, marked in the lower left-hand corner with the RFP number, title, and date and hour proposals are scheduled to be received. Offerors are responsible for insuring that their proposal is stamped by General Services personnel by the deadline indicated.

Nothing herein is intended to exclude any responsible firm or any way restrain or restrict competition. On the contrary, all responsible firms are encouraged to submit proposals. The County of Henrico reserves the right to accept or reject any or all proposals submitted.

The awarding authority for this contract is the Director of General Services.

Questions concerning this Request for Proposal should be directed to Mr. Guy L. Yolton, Planning, at (804) 672-4645.

Very truly yours,  
Paul N. Proto  
Director of General Services

Curtis L. Walsh, CPPO  
Assistant Director of General  
Services, Support Services

CLW:mw

REQUEST FOR PROPOSAL  
COMPREHENSIVE PLAN UPDATE  
COUNTY OF HENRICO

I. INTRODUCTION

The County of Henrico, Virginia is soliciting proposals from interested consulting firms or individuals who have experience in forecasting travel demand and analyzing the impact on existing and proposed transportation networks. The County seeks to employ a firm, group or qualified individuals, hereinafter referred to as "consultant" or "offeror", to conduct a study which will be the basis for updating the County's long-range transportation plan. The consultant will need to obtain a copy of the Richmond regional transportation demand forecasting model used by the Virginia Department of Transportation (VDOT) as the basis for this study. This will require the consultant to be licensed and knowledgeable in the use of MINUTP computer software. The study is provided for as a consultant work task in the Richmond Area Metropolitan Planning Organization's (MPO) FY 1995 Unified Work Program (UWP) and will require MPO approval or acceptance.

II. NON-DISCRIMINATION

During the performance of any contract pursuant to this RFP, the Consultant agrees as follows:

- A. The Consultant will not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin, except where as necessary to the normal operation of the contractor. The Consultant agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this non-discrimination clause.
- B. The Consultant, in all solicitations or advertisements for employees placed by or on behalf of the County or a sub-contractor, will state that such is an equal opportunity employer.
- C. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

III. DESCRIPTION

- A. Henrico County consists of approximately 245 square miles located immediately north of the City of Richmond in central Virginia. Portions of the County are mature, urbanized areas, while other portions of the County remain largely rural in character. The population has increased at an annual rate of one to two percent over the past thirty years. The 1990 Census indicated that the total population was 217,881, which made Henrico's the largest

population of any jurisdiction in the region, exceeding that of Chesterfield County and the City of Richmond.

- B. The Commonwealth of Virginia requires each locality to adopt a long-range plan -- the Comprehensive Plan -- showing recommended land uses and major public facilities. There currently are three elements that are part of Henrico County's Comprehensive Plan: the Land Use Plan, the Major Thoroughfare Plan and the Open Space Plan. The County presently is involved in a significant project called Henrico 2010 to update the Land Use and the Major Thoroughfare elements of the Comprehensive Plan. Assistance is being sought for the update of the Major Thoroughfare Plan.

#### IV. SCOPE OF SERVICES

- A. The consultant shall be under contract to perform a transportation study for the Henrico County Planning Office. The Planning Office will assign a Project Director for the update to the County's long-range transportation plan who will oversee the performance of the consultant under contract. The Project Director shall be the direct contact for all matters requiring communication.
- B. The source of funding for this study principally is through Federal Highway Administration (FHWA) Planning (PL) monies, with the County providing a local match amount. This study and source of funding is shown in the approved FY 1995 Unified Work Program (UWP) for the Richmond region. A Pass-Through Agreement for the use of these funds has been executed with the Richmond Regional Planning District Commission (RRPDC) which acts as the contracting agent for the Richmond area Metropolitan Planning Organization (MPO). Any contract to perform this study incorporates all provisions of this Pass-Through Agreement. Coordination with the MPO will be required throughout the study which ultimately must accept the consultant's final product(s) as work completed.
- C. The consultant shall perform each of the tasks as described in Section D., below. The tasks are grouped into three (3) phases. The following requirements apply to each phase, as appropriate:
  - 1. The consultant shall prepare text and graphics for each phase which clearly summarize the purpose and findings of that phase in a fashion that is understandable to the layman. All work shall be prepared in a manner satisfactory for presentation to the Project Director and for subsequent publication in a final report.
  - 2. Graphics showing analyses and recommendations shall be provided for both report and display purposes. The type, number and format of graphics shall be coordinated with the County's Project Director prior to finalization by the

consultant. The following graphics shall be provided at a minimum:

- a. Study Area/Transportation Analysis Area
  - b. Cordon lines, cut-lines/screen lines
  - c. Peak-hour volumes, capacities and V/C ratios
  - d. Network alternatives and recommended improvements
3. All assumptions, procedures and analyses that could be considered as detailed technical work should be included in a separate technical appendix.
  4. The consultant shall use the analytical techniques approved by the Project Director, whenever specified. All text, tables, charts and graphics shall be prepared on equipment compatible with the County's PC system and shall be appropriately referenced to indicated sources of information and methodology.
- D. The tasks and phases to be performed are as follows:
1. Phase I
    - a. Obtain from VDOT a copy of the existing regional transportation demand model and examine the adequacy of the zone and network structure for modelling purposes to produce travel forecasts of sufficient accuracy for review of the Comprehensive Plan.
    - b. Prepare recommendations for revising any elements of the zone and network structure which may be necessary as a result of the foregoing review.
    - c. Identify a base transportation network for future year testing.
    - d. Develop evaluation criteria for county-wide and sub-area level analyses using broad screenlines/cut-lines and regional traffic zone boundaries.
  2. Phase II
    - a. Using future land use data provided by the Planning Office, evaluate at least two (2) growth-rate scenarios countywide. In association with each growth-rate scenario, test at least three alternative networks, as needed, to accommodate the predicted travel demand. Particular emphasis shall be placed on the development and application of modelling procedures capable of addressing changes in overall travel demand, including transit and HOV vs. LOV. Changes in travel demand could result from Transportation System Management

(TSM) strategies and/or other potential changes in pricing and operating policies.

- b. Provide order-of-magnitude transportation costs associated with each of the growth scenarios/alternatives tested in the foregoing task. The consultant shall recommend a preferred alternative transportation network to accommodate predicted travel demand for each growth scenario.

### 3. Phase III

- a. Once a preferred transportation alternative for each growth scenario is selected (based both on the foregoing analysis and consultation with the County), detailed travel forecasts at the zone level shall be developed for the purpose of specifying particular revisions to the County's long-range transportation plan; e.g., road widenings, new alignments, grade separations. Similarly, transit facility needs and general costs also shall be determined.

## V. DELIVERABLES/DELIVERY/MEETING SCHEDULES

- A. Within seven (7) calendar days following contract start-up date, the consultant will provide to the Project Director five (5) copies of a final detailed work plan for all portions of the project. The work plan will be based on the preliminary work plan submitted with the technical proposal including any modifications made during proposal evaluation discussions. The work plan must contain detailed descriptions of all tasks to be performed, products to be delivered, time table for completing each task and any milestones. The consultant is expected to adhere to the timetable and the cost estimate for each phase, therefore, it is important the timetable be realistic in terms of cost estimates, projected completion dates for phase reports and final drafts.
- B. The consultant shall be available to discuss the work to be performed in each task with the Project Director and to present and discuss its work with the Planning Commission and Board of Supervisors. Upon completion of the work tasks comprising each phase described in Section D, the consultant shall prepare a report and make a presentation to the Project Director. A minimum of two (2) meetings per month are expected to be held with the Project Director and a minimum of two (2) meetings are expected to be held each with the Planning Commission and with the Board of Supervisors. In addition, the consultant shall be available to present a final report to the MPO Technical Advisory Committee (TAC), and to the full MPO.

- C. The consultant must complete each phase to the satisfaction of the Project Director before proceeding to the next phase, however, phases may be undertaken to occur simultaneously with the consent of the Project Director. The following sequence shall apply in every instance unless otherwise agreed to by the Project Director and the consultant.
1. The Project Director will have up to seven (7) working days to review a phase document and provide comments back to the consultant. The time frame includes the day the consultant presents the phase to the Project Director.
  2. The consultant will have up to seven (7) working days to submit one final copy of the phase document to the Project Director for final staff approval. This shall occur prior to payment for the work performed.
- D. The location of the staff/consultant meetings shall be at the convenience of the Project Director (usually at the Henrico County Government Center). The scheduling and location of all meetings with the Planning Commission and Board of Supervisors shall be the responsibility of the Project Director. At any meeting where the consultant makes a presentation to the Project Director on any portion of the work program, a total of five (5) copies of working papers shall be made available for review.
- E. Work shall be performed by the consultant for the specified County staff only. All contact by the consultant with any member of the County staff, VDOT or RRPDC staff on these matters shall be authorized through the Project Director. The consultant may contact the Project Director as needed.
- F. One camera-ready copy of the final report, consisting of the approved reports for each identified phase, including any technical appendices, shall be provided to the Planning Office. In addition, one camera-ready copy, and 50 copies of an executive summary shall be provided to the Planning Office.

## VI. PROPOSAL REQUIREMENTS

Offerors are to provide written proposals which present the offeror's proposed approach, estimated cost of services and qualifications to conduct such work. The proposal should include all information the offeror considers pertinent; at a minimum the following information should be provided:

- A. Name, address and phone number of the Consultant, including the identification of the office which will actually perform the work;
- B. Names of the firm's principals;

- C. Names of the project managers and key personnel responsible for the project, their work experience, length of time with the firm, resumes and expertise;
- D. List and description of similar projects, identification of project manager responsible for such similar projects; and names, addresses and phone numbers for clients who the County can contact regarding the firm's performance and capabilities;
- E. Presentation of the firm's proposed project management structure to conduct such work including proper coordination with County staff;
- F. Descriptions of work approach to each phase, including work tasks, work schedule, review of draft and final draft presentations and manning allotment by position and tasks (by days);
- G. A statement of the firm's familiarity with the work which is required and why the Consultant feels qualified to prepare the plan.
- H. Cost information itemizing labor costs by job classification, fringe benefits, costs and rates, travel expenses, sub-contracts, fees, supplies, materials and other anticipated costs.
- I. A statement of how the Consultant plans to coordinate the work with staff and County officials.

## VII. INSTRUCTIONS FOR SUBMITTING PROPOSALS

### A. SUBMISSION OF PROPOSALS:

1. The Purchasing Office will not accept oral proposals nor proposals received by telephone, FAX machine or telegraph.
2. All erasures, interpolations, and other changes in the Proposal shall be signed or initialed by the Offeror.
3. The Proposal must be signed in order to be considered. If the Offeror is a firm or corporation, the Offeror must print the name and title of the individual executing the proposal.
4. The Proposal, the proposal security, if any, and any other documents required, shall be enclosed in a sealed opaque envelope.
5. The envelope containing the proposal shall be sealed and marked in the lower left-hand corner with the number, title, hour, and due date of the proposal.

6. The time proposals are received shall be determined by the time clock stamp in the Purchasing Office. Offerors are responsible for insuring that their proposals are stamped by Purchasing Office personnel by the deadline indicated.

**B. OFFEROR'S REPRESENTATIONS:**

1. Each Offeror, by submitting a proposal in response to this Request for Proposal, represents that the Offeror has read and understands the Scope of Services and has familiarized itself with all federal, state and local laws, ordinances, rules and regulations that in any manner may affect the cost, progress or performance of the contract work.
2. The failure or omission of any Offeror to receive or examine any form, instrument, addendum or other documents, or to acquaint itself with conditions existing at the site, shall in no way relieve any offeror from any obligations with respect to its proposal or to the contract.
3. Exceptions to the terms and conditions of the RFP must be set forth under the offeror's letter of transmittal to warrant consideration. This RFP does not commit the County or the RRPDC to pay any costs incurred in the preparation of a response to this request or to procure a contract for services. The consultant should be familiar with VDOT contract requirements and procedures. This will include a preaward audit by VDOT.

**C. TRADE SECRETS/PROPRIETARY INFORMATION:**

Trade secrets or proprietary information submitted by an Offeror in response to this Request for Proposal shall not be subject to public disclosure under the Virginia Freedom of Information Act; however, the Offeror must invoke the protection of this section prior to or upon submission of data or materials, and must identify the data or other materials to be protected and state the reasons why protection is necessary (Section 11.52D of the Code of Virginia).

**D. MODIFICATION OF PROPOSAL:**

1. A proposal may be modified or withdrawn by the Offeror anytime prior to the time and date set for the receipt of proposals. The Offeror shall notify the Purchasing Office in writing of its intentions.
2. If a change in the proposal is requested, the modification must be so worded by the Offeror as to not reveal the original amount of the proposal.



3. Modified and withdrawn proposals may be resubmitted to the purchasing office up to the time and date set for the receipt of proposals.
4. No proposal can be withdrawn after the time set for the receipt of proposals and for sixty (60) days thereafter.

E. ACCEPTANCE OF PROPOSALS:

1. All proposals received in the Purchasing Office on time shall be accepted.
2. All late proposals shall be returned by the Purchasing Office unopened to the sender.
3. Proposals shall be open to public inspection only after award of the contract.

VIII. GENERAL CONTRACT TERMS AND CONDITIONS

A. AWARD OF CONTRACT:

1. The County reserves the right to reject any or all proposals.
2. The Successful Offeror shall, within fifteen (15) calendar days after prescribed documents are presented for signature, execute and deliver to the Purchasing Office the contract forms and any other forms or bonds required by the RFP.
3. The contract documents shall be subject to any regulations governed by the law of the Commonwealth of Virginia. Any dispute arising out of the contract documents, their performance, or their interpretation shall be litigated only in the Circuit Court of the County of Henrico, Virginia.
4. Any contract resulting from this RFP is not assignable.

C. OFFEROR'S PERFORMANCE:

1. The Offeror agrees and covenants that its agents and employees shall comply with all County, State and Federal laws, rules and regulations applicable to the business to be conducted under the contract.
2. The Offeror shall ensure that its employees shall observe and exercise all necessary caution and discretion so as to avoid injury to person or damage to property of any and all kinds.

3. The Offeror shall cooperate with County officials in performing the contract work so that interference with normal program will be held to a minimum.
4. The Offeror shall be an independent Consultant and shall not be an employee of either the County or the Personnel Department.

D. **COMPENSATION:**

The consultant shall be compensated on a quarterly basis for any phase(s) completed within that time period. The tasks outlined in each phase must be completed in a manner satisfactory to the Project Director. Ten percent (10%) of the total cost of the study shall be withheld by the RRPDC in the final payment. All monies withheld from payment shall be paid to the consultant at the completion and submission of the final report, executive summary, report originals, all supporting documentation, and covers (i.e., following MPO approval and acceptance, and VDOT and RRPDC authorizations).

E. **Minority and Women-Owned Businesses**

The County of Henrico actively solicits both minority and women-owned businesses to respond to all Invitations for Bids and Requests for Proposals, and if not already on the County's bidders/offerors mailing list, you may request application for inclusion on the list. Should you be interested, please contact the Purchasing office at (804) 672-5660 and request an application.

F. **Auditing:**

County personnel may perform in-progress and post-audits of Offerors, records as a result of a Contractor awarded pursuant to this Request for Proposal. Files would be available on demand and with out notice during normal working hours.

IX. **SELECTION CRITERIA**

- A. Selection of the successful firm will be based upon submission of proposals meeting the selection criteria. The minimum selection criteria will include:
  1. Evidence of qualifications to perform the services described in the scope of services. This will include the competence and experience of the project staff.
  2. Firm's performance in preparation of similar plans.

3. Firm's familiarity and sophistication in relating the several and diverse issues which are addressed in the scope of services.
  4. Firm's familiarity and experience in working with local government.
  5. Proposed technical and management approach for completion of the work.
  6. Familiarity and experience in working with the community in a similar project.
  7. Demonstrated ability to provide quality work in an expedient fashion.
  8. Cost of project.
- B. Selection shall be made of two or more offerors deemed to be fully qualified and best suited among those submitting proposals on the basis of the factors involved in the Request for Proposals. Negotiations shall then be conducted with each of the offerors so selected. Price shall be considered but need not be the sole determining factor. After negotiations have been conducted with each offeror so selected, the County shall select the offeror which, in its opinion, has made the best proposal and shall award the contract to that offeror. Should the County determine in writing and in its sole discretion that only one offeror is fully qualified or that one offeror is clearly more highly qualified than the others under consideration, a contract may be negotiated and awarded to that offeror.