

# **Guide to County Assumption Of Secondary Roads (Devolution Guidebook)**



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# 1 Introduction

## 1.1 Background

The Byrd Road Act, enacted by the Virginia General Assembly in 1932, established the secondary system of State highways, but granted counties the option to maintain their own road systems and receive annual State funding to pay for these activities.<sup>1</sup> Four counties elected to opt out of the State system at that time – Henrico, Arlington, Warwick, and Nottoway. Of these, Warwick became Warwick City and merged with the city of Newport News, and Nottoway County petitioned for re-admittance to the secondary system of State highways. From time to time, some counties have discussed assuming secondary system responsibility and Fairfax County conducted a fairly extensive study on this issue in the early 1990s.<sup>2</sup>

In 2001, the Virginia General Assembly enacted the “Devolution Statute” (§33.1-84.1 of the *Code of Virginia*), which provides that the Board of Supervisors of any county that wishes to assume responsibility for any portion of the State secondary system of highways within such county’s boundaries for the purposes of planning, constructing, maintaining, and operating such highways, may request that the Commonwealth Transportation Commissioner enter into and implement an agreement to do so. No county has implemented this provision since it was enacted.

## 1.2 Purpose of Secondary Roads Study

To support counties in assessing the implications of assuming responsibility for the secondary roads within their boundaries, the Virginia Department of Transportation (VDOT) contracted with TransTech Management, Inc. to conduct a study entitled: *Feasibility Analysis for Assumption of the Secondary Road System of State Highways by Counties of the Commonwealth of Virginia* (the Secondary Roads Assumption Study). The products of the Secondary Roads Assumption Study include three primary elements:

1. **Devolution Guidebook (this document)** – a resource guide that defines different secondary system assumption options, identifies a wide range of issues counties may wish to evaluate in considering and planning for assumption of secondary system responsibilities, and provides a devolution “road map;”
2. **Feasibility Model for Secondary System Assumption by Virginia Counties (Secondary System Analysis Model)** – a tool for estimating the costs and institutional needs (staffing, equipment, and facilities needs) of assuming different sets of secondary system responsibilities for individual counties; and

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<sup>1</sup> Secondary highways are roads with route numbers of 600 and above.

<sup>2</sup> While the Fairfax Study was used as a resource for this study, the analysis is now dated and is based on both Fairfax County’s unique characteristics and a different set of takeover scenarios than are envisioned under the current Devolution Statute. As such, the analysis and conclusions from the Fairfax Study have limited applicability to today’s environment and to other counties across Virginia.

3. **Prototype Analyses** – detailed analyses of secondary system assumption options and implications for the two counties (Stafford and James City Counties) that participated in the Secondary Roads Assumption Study.

### **1.3 Study Process**

The Secondary Roads Assumption Study began in February 2006 and was guided through a series of monthly progress meetings with a technical advisory group. The *Devolution Guidebook*, *Secondary System Analysis Model*, and *Prototype Analyses* were completed in March 2007. The project was led by the VDOT Local Assistance Division and supported by staff from various VDOT organizations, as well as representatives from Stafford and James City Counties. Key study activities included the following:

- Interviews with VDOT field staff, including Assistant Residency Administrators (ARAs) for maintenance, and preconstruction/construction managers from across the State;
- Research on Henrico County’s current organizational structure and program delivery approach;
- Development of a historical maintenance and operations cost and staffing database through queries to VDOT’s Financial Management System (FMSII);
- Development of construction project data (cost and number of projects) based on the FY 2007 Secondary Six-Year Plan (SSYP);
- Establishment of a methodology for stratifying Virginia counties into six tiers for estimating purposes;
- Analysis of higher-level secondary system performance options (beyond current performance) using the VDOT Asset Management Division’s “Planning Module;”
- Identification of a core equipment complement a county would need in order to assume different combinations of secondary system responsibilities;
- Development of methodologies for estimating individual county staffing, facility, and equipment costs and/or needs;
- Development of a prototype and final versions of the Secondary System Analysis Model; and
- Identification of critical institutional and policy issues associated with county assumption of secondary system responsibilities.

### **1.4 Devolution Guidebook Overview**

This Devolution Guidebook was developed as a resource to help counties understand the complex array of issues they may need to consider and address as they make decisions related to the assumption of secondary road responsibilities. While the guide is not intended to establish formal VDOT policies on devolution issues, it does identify applicable State and federal laws and regulations.

The Guidebook is organized to allow users quick access to information and guidance on key devolution topics. **Chapter 2** defines the different options under devolution and provides a road map of the devolution process. **Chapters 3, 4, and 5** define maintenance, construction, and operations responsibilities under devolution (respectively) and identify a range of program, policy, and institutional considerations associated with assumption of these responsibilities. **Chapter 6** provides an overview of financial considerations associated with different devolution options and identifies potential approaches counties could use to raise additional revenues to enhance their secondary system programs. **Appendices A and B** provide a list of frequently used acronyms and project participants, respectively. **Appendix C** provides additional background information, including an overview of Henrico County's highway program. **Appendix D** provides a user's guide for the Secondary System Analysis Model.

## 2 Devolution Road Map

### 2.1 Overview

The decision by a county to assume some or all responsibilities for the secondary system of State highways within its jurisdiction is a complex and important choice with significant financial, administrative, political, and customer service implications. Counties considering assumption of secondary system responsibilities are encouraged to follow a deliberate process to gain a thorough understanding of the devolution options and the implications associated with each option. Counties also should recognize that the devolution of secondary road functions from VDOT will not occur overnight – to be successful, county executives and county Boards of Supervisors will need to carefully consider implementation plans and schedules that address considerations such as the need for staffing, facilities, equipment, and policies/procedures. Close coordination with VDOT throughout the entire devolution process will be essential to ensure a smooth transition of responsibilities from the State to a county.

This chapter defines the devolution options available to counties and identifies a logical sequence of steps counties can use for evaluating options, making decisions, negotiating a devolution agreement and memorandum of understanding (MOU) with VDOT, and transitioning to newly acquired roles.

### 2.2 Devolution Options

Based on the Devolution Statute, a county may determine if it wants to assume all or a portion of the responsibilities associated with the secondary system. VDOT has determined that a county's options for assumption of secondary system responsibilities analyzed within this study include the entire network within its jurisdiction and fall into four general categories:

- Maintenance only;
- Construction only;
- Maintenance and construction; and
- Maintenance, construction, and operations (full devolution and operational responsibility, similar to the arrangements currently in place for Henrico and Arlington Counties).

These options offer counties varying degrees of responsibility and control, but also come with corresponding levels of program delivery effort, administrative implications, and liability. In addition to addressing different program delivery functions, the devolution options can be differentiated with respect to the following administrative functions and policy considerations:

- **Planning, Programming, and/or Scheduling** – who has the decision-making authority to establish priorities, allocate resources, and determine when work will be performed?
- **Permitting** – who maintains the authority to approve, issue, and enforce permits associated with access to the secondary system? Permit areas include 1) allowing access to utilities located within the highway right-of-way (e.g., electric, telephone, and water)

and other requests to work within the right of way, 2) the addition of system access points (i.e., entrance permits), and 3) “subdivision connections” to the system.

- **Standards** – who determines design, maintenance, or other applicable standards to ensure a uniform level of secondary system quality and performance is maintained across the State, and how will the standards be enforced?
- **Project/Program Delivery** – what mandates and requirements (federal, State, and/or local) determine or influence how programs and projects must be administered (e.g., disadvantaged business enterprise (DBE) goals and environmental/public involvement requirements)?
- **Reporting** – what needs to be reported (e.g., financial data, performance results, etc.), to whom, and when?
- **Public Outreach** – what public outreach requirements apply and who is responsible for communicating with or responding to the public?
- **Funding** – how would the level of funding a county receives from VDOT be determined and under what terms will the funding be provided?
- **Liability** – what liabilities are associated with different devolution options and how will they (or could they) be shared with VDOT?

A final consideration that should be highlighted relates to system use, or whose laws and regulations govern how the system can be used (e.g., what types of vehicles are allowed on the roadway and what laws govern system users). Under all options, the use of secondary roads will remain governed by Title 46.2 (Motor Vehicles), Chapter 8 (Regulation of Traffic) of the *Code of Virginia*.

It is important to note that the following are general descriptions of devolution options and their implications; the actual scope and terms of a county’s secondary road responsibilities will be determined through a negotiated devolution agreement and MOU between VDOT and a county’s Board of Supervisors.

### *2.2.1 Maintenance Only*

A county may elect to assume responsibilities for just the maintenance of the secondary system within its jurisdiction. By statute (§33.1-23.02 of the *Code of Virginia*), maintenance is defined as including ordinary maintenance (activities to preserve roadway structures and facilities), maintenance replacement (activities to restore roadway structures and facilities to their originally constructed condition), and any other categories of maintenance which may be designated by the VDOT Commissioner.<sup>3</sup>

A county choosing the *maintenance only* option will be accountable for all maintenance activities related to the secondary system, but will not have responsibilities for the construction program

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<sup>3</sup> For purposes of devolution, “maintenance” includes activities related to several asset types in the “Traffic Devices” category that VDOT currently labels “operations” in its asset management and budgeting activities. It does not include activities related to traffic signals, traffic management systems, roadway tunnels or ferries.

or operations of the secondary system (unless otherwise negotiated with VDOT); actual ownership of the system will remain with VDOT. While greater details on responsibilities and the implications associated with assumption of maintenance activities are provided in **Chapter 3**, the following is a summary of the primary activities a county would need to perform:

- Vegetation control (mowing, brush cutting, etc.);
- Removal of roadside hazards;
- Surface repairs and resurfacing;
- Sign repair and replacement;
- Traffic control device maintenance and replacement( except traffic signals);<sup>4</sup>
- Shoulder maintenance;
- Guardrail repair/replacement;
- Ditch and drainage cleaning;
- Pavement marking repair/replacement;
- Roadside cleaning (removal of dead animals and litter);
- Snow and ice control;
- Landscaping;
- Bridge inspection, repair, and rehabilitation;
- Receiving and responding to customer calls; and
- Emergency/incident response.

The policy considerations and administrative functions associated with the *maintenance only* devolution option are as follows:

- **Planning, Programming, and/or Scheduling** – a county will have full control to determine maintenance priorities, allocate maintenance funding to different maintenance activities, and schedule recurring and non-recurring maintenance work.
- **Permitting** – since VDOT will maintain ownership of the system, all permitting responsibilities associated with the system will remain with VDOT.
- **Standards** – a county would need to maintain secondary roads in accordance with VDOT standards or VDOT approved local standards for road maintenance and federal standards for bridge maintenance.
- **Project/Program Delivery** – requirements for how maintenance activities are administered will be tied to the source of funding.<sup>5</sup> Thus, for State- or federally-funded

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<sup>4</sup> While the decision authority and approval of all new traffic control devices is part of operations, the upkeep, repair and replacement of these assets (except traffic signals) is considered part of maintenance for the purposes of devolution.

activities, counties will need to comply with all applicable Virginia and/or federal laws and regulations relating to eligible expenses, procurement, environmental review, civil rights, etc.

- **Reporting** – audit and reporting requirements would be tied to the source of funds. Similar to other localities receiving quarterly payments, counties would need to include the use of all funds in their annual audits. This information is subsequently reported to VDOT on an annual basis. For federal funds, a county would need to comply with reporting requirements of the Office of Management and Budget (OMB) Circular A-133. Additional reporting may be required to meet VDOT’s oversight requirements.
- **Public Outreach** – a county will be responsible for receiving and responding to public comments and complaints related to secondary system maintenance activities.
- **Funding** – a county will receive annual maintenance allocations from VDOT based on the work assumed. Those allocations would be based on the same approach identified in §33.1-23.5:1 of the *Code of Virginia* for counties which elect to assume responsibility for their secondary roads after 1986 and would be identified in the terms of a county’s devolution agreement and/or MOU with VDOT.<sup>6</sup> Payments from VDOT will be provided on a quarterly basis.
- **Liability** – a county will assume responsibility for maintenance-related liabilities (e.g., tort claims tied to work zone incidents) for work performed by or on behalf of the county and share other secondary system liabilities based on the terms of the devolution agreement.

### *2.2.2 Construction Only*

A county may elect to assume responsibilities for only construction activities on the secondary system within their jurisdiction. For purposes of devolution, “construction” is defined as the planning, design, and construction of projects that add new capacity, completely replace existing facilities, or significantly improve the functionality of existing facilities. It also may include selected countywide, operations-related functions that are funded through secondary construction allocations, such as private entrance pipe installation.

A county choosing the *construction only* option will be accountable for construction activities related to the secondary system based on the devolution agreement and/or MOU (a county will still need to comply with all applicable State and federal requirements), but will have no responsibilities for maintenance or operations of the secondary system (unless otherwise negotiated with VDOT) and ownership of the system will remain with VDOT.<sup>7</sup> While greater

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<sup>5</sup> Note – due to recent VDOT funding constraints, a higher ratio of federal to State funds is currently being committed to maintenance than has been in the past.

<sup>6</sup> This differs from the process currently used to establish annual secondary system funding allocations for Henrico and Arlington Counties; funding levels for these counties are established through a per lane miles amount that is established (and occasionally revised) by the Virginia General Assembly and codified in the *Code of Virginia*.

<sup>7</sup> Unless otherwise stated in the MOU, county performance of construction activities will need to be consistent with the requirements identified in the VDOT Guide for Locally Administered Projects, available at [http://www.vdot.virginia.gov/business/resources/LAP\\_Guide.pdf](http://www.vdot.virginia.gov/business/resources/LAP_Guide.pdf)

details on responsibilities and implications associated with assumption of construction activities are provided in **Chapter 4**, the following is a summary of the primary activities a county would need to perform:

Mandatory Activities

- Planning/six-year plan development;
- Environmental studies and permits;
- Public hearings;
- Design;
- Right-of-way acquisition, utilities, and permits;
- Project letting;
- General project management;
- Environmental inspection; and
- Construction, engineering, and inspection (CEI).

Optional Activities (Countywide items currently funded from construction funds):

- Private entrance pipe installation;
- Rural additions;
- Traffic calming;
- Traffic services; and
- Incidental engineering and surveying.<sup>8</sup>

Any county that assumes construction responsibilities will need to work closely with its VDOT residency if it wants the department to perform some of the optional county-wide activities. This discussion should include VDOT's availability/capacity to perform the work, and the funding to address those activities. When a county takes over maintenance and construction activities, the optional county-wide activities should also be assumed by the county.

The policy considerations and administrative functions associated with the *construction only* devolution option are as follows:

- **Planning, Programming, and/or Scheduling** – responsibility for developing and programming county projects in the SSYP will continue to be shared between a county and VDOT. A county will have full responsibility for the prioritization of construction projects and, if applicable, continue to coordinate with its metropolitan planning organization (MPO) to incorporate projects into the regional transportation improvement plan (TIP). Counties also will have full control and responsibility for scheduling work on all construction project phases.

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<sup>8</sup> This does not include survey work associated with specific construction projects, which a county would be required to assume as part of the construction function.

A significant portion of the secondary construction allocations is currently comprised of federal funds, which influences how these funds can be programmed. A county that assumes responsibility for the construction program will need to closely monitor the obligation of federal funds and coordinate through VDOT to receive federal authorization and changes in the obligation schedule (i.e., the State Transportation Improvement Plan (STIP)).

- **Permitting** – since VDOT will maintain ownership of the system, all permitting responsibilities associated with the system will remain with VDOT.
- **Standards** – design standards for construction projects will be tied to the source of funds, the category of a roadway, and the maintenance responsibility. Federally-funded projects on National Highway System (NHS) routes will need to conform to VDOT design standards, which exceed AASHTO standards. Federally-funded projects on non-NHS routes and State- or locally-funded projects (on non-federal routes) will need to conform to VDOT standards, American Association of State Highway and Transportation Officials (AASHTO) standards, or other standards that are developed by a county and approved by VDOT.
- **Project/Program Delivery** – requirements for how construction activities are delivered will be tied to the source of funding. Thus, for State- or federally-funded projects, counties will need to comply with all applicable Virginia and/or federal laws and regulations relating to eligible expenses, public involvement, procurement, environmental review, civil rights, etc. A county will have full discretion to deliver locally-funded construction activities in accordance with the laws and regulations that govern county activities.
- **Reporting** – financial reporting requirements will be tied to the source of funds. For State construction funds, a county will submit an annual audited statement accounting for the use of State funding. For federal funds, a county will need to comply with reporting requirements outlined in OMB Circular A-133.
- **Public Outreach** – a county will be responsible for complying with all applicable State and federal public outreach and review requirements (e.g. public comment periods) associated with the development and implementation of construction projects.
- **Funding** – the overall secondary construction allocation for a county is unchanged by devolution. The actual quarterly payments a county will receive from VDOT will include the State portion of the secondary allocation (less amounts for countywide construction functions that are not assumed or for projects that will be completed by VDOT). Since federal funds are only provided as a reimbursement for qualifying expenditures, the federal portion of a county’s construction allocation will be provided on a project-specific, reimbursement basis. A county will need to follow current processes for working with its local MPOs to identify opportunities and apply for federal funds that are allocated through MPOs (e.g., Congestion Mitigation and Air Quality (CMAQ) or Regional Surface Transportation Program (RSTP) funds).

- **Liability** – it is anticipated that a county will assume liability as a result of actual construction work performed by or for the county and VDOT will retain liability in general for the system. Thus, VDOT will assume liabilities for a highway once construction is complete and the project is accepted by the Department.

### *2.2.3 Maintenance and Construction*

A county may elect to assume responsibilities for maintenance and construction activities on the secondary system within its jurisdiction. Under this option, all of the responsibilities, policy considerations, and administrative functions listed above in the *maintenance only* and *construction only* sections will apply. A county choosing the *maintenance and construction* option will have no operational responsibility for the secondary system (unless otherwise negotiated with VDOT) and operational ownership of the system will remain with VDOT.

### *2.2.4 Maintenance, Construction, and Operations (All Functions)*

A county may elect to assume responsibilities for maintenance, operations, and construction activities on the secondary system within its jurisdiction. By choosing this option a county will assume full responsibility for all secondary system assets.<sup>9</sup> In addition to assuming the maintenance and construction responsibilities listed in the section above (mandatory and optional elements), a county also will take over all operational functions (e.g., traffic engineering, land development, and permitting) and control the facilities (e.g., conducting plan reviews, performing inspections, and issuing access permits). VDOT's oversight role would be much less than with the other options. Additional details on responsibilities and implications associated with assumption of all functions are provided in **Chapter 5**.

The policy considerations and administrative functions associated with the *maintenance, construction, and operations* devolution option are as follows:

- **Planning, Programming, and/or Scheduling** – a county will have full responsibility for prioritizing, programming, and scheduling the use of all maintenance, operations, and construction funds. As applicable, a county will still need to coordinate with MPO's and follow federally-mandated planning processes for the use of federal funds, as well as coordinate with VDOT for authorization of federal funds.
- **Permitting** – a county will assume all permitting responsibilities, including issuance and enforcement of utility permits, entrance permits, and “subdivision street connection” permits.
- **Standards** – design standards for construction projects will be tied to the source of funds, the category of a roadway, and the maintenance responsibility. Federally-funded projects on National Highway System (NHS) routes will need to conform to VDOT design standards, which exceed AASHTO standards. State- and locally-funded projects will need to conform to AASHTO standards, VDOT standards, or other standards that are approved by VDOT.

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<sup>9</sup> For purposes of devolution, system assets include roadways, right-of-way, and appurtenances. It does not include VDOT facilities (e.g., area headquarters and material yards), equipment, or supplies.

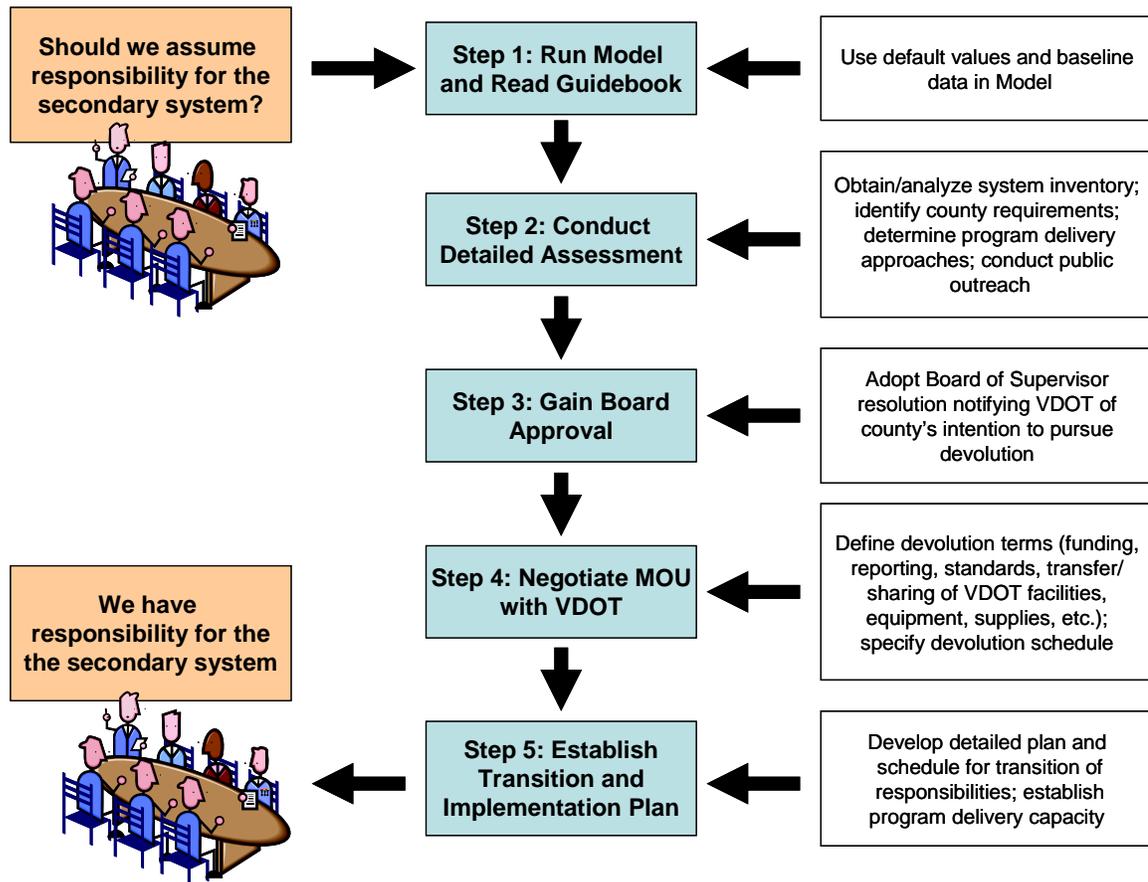
- **Project/Program Delivery** – the same conditions as with the *maintenance and construction* option apply with requirements tied to the source of funding. Thus, for State- or federally-funded projects and activities, a county will need to comply with all applicable Virginia and/or federal laws and regulations relating to eligible expenses, public involvement, procurement, environmental review, civil rights, etc.
- **Reporting** – even with full operational responsibility, financial reporting requirements remain tied to the source of funds. A county will submit an annual audited statement accounting for the use of State funding. For federal funds, a county will comply with reporting requirements outlined in OMB Circular 133.
- **Public Outreach** – a county will be responsible for all public outreach activities associated with the secondary system. This will include receiving and responding to citizen and stakeholder issues and complaints associated with the maintenance, construction and operations of the system, as well as complying with all applicable State and federal public outreach and review requirements associated with the development and implementation of construction projects.
- **Funding** – a county will receive annual allocations from VDOT for maintenance and operations based on the established methodology and terms of the devolution agreement and/or MOU, with funding provided on a quarterly basis. Funding for the construction program will be provided as described in the *construction only* section above.
- **Liability** – a county will assume all liabilities associated with the secondary system within its jurisdiction.

### **2.3 Devolution Process**

The path a county takes to assume responsibility for some or all secondary road functions within its jurisdiction will include several steps and will be evolutionary by nature. A suggested road map is illustrated in **Figure 1** and discussed in this section.

- **Step 1: Initial Assessment** – as a first step, a county should assess the magnitude of responsibilities, costs, and institutional needs (i.e., the staffing, facilities, and equipment) that they would assume under different devolutions options. The Secondary System Analysis Model provides a tool for conducting this assessment based on a wide range of default and user-selected assumptions. As part of this initial assessment, a county should consider clearly defining what it wants to achieve by assuming some or all secondary road responsibilities.
- **Step 2: Detailed Analysis** – a county that wishes to move to the next step in devolution decision-making should plan to conduct significant due diligence on both the system responsibilities it is considering assuming and its own capabilities and resources to deliver a transportation program. The Secondary System Analysis Model provides a useful tool for conducting much of this analysis. Key considerations a county might explore as part of this analysis include the following:

Figure 1: Devolution Process



⇒ **Public Outreach** – a county may wish to conduct public involvement to hear citizen and stakeholder concerns, issues, and expectations, and to gain public acceptance for a county devolution initiative. While the *Code of Virginia* is silent regarding requirements for public involvement as part of the devolution process, options range from open discussion at public meetings to formal, countywide referenda. A county should both consider the need for public outreach and plan for the time it will take to adequately conduct these efforts.

⇒ **System Assessment** – a county should plan to collect and analyze all readily available information on system conditions. Based on the strength of existing data, a county may then determine if it wishes to pursue the collection and analysis of additional system condition information.

⇒ **Resource Availability** – a county should evaluate how its existing government organization (e.g., procurement, human resources, and legal departments), staff, facilities (e.g. office space and maintenance yards), and equipment could be leveraged to support administration of a secondary roads program and help reduce costs.

⇒ **Program Delivery Approaches** – a county should explore the opportunities and implications, as well as its rationale and motivation, for delivering assumed responsibilities through different combinations of in-house staffing and outsourcing.

- **Step 3: Board Approval** – once a county has made the decision to pursue devolution of some or all secondary road responsibilities, its Board of Supervisors must adopt a resolution notifying VDOT of the county’s intent to enter into devolution negotiations. Similar to the process used with the Urban Construction Initiative, this resolution will need to be submitted no later than July 1<sup>st</sup> for potential assumption of responsibilities the following July 1<sup>st</sup> or some time after that.

- **Step 4: Negotiations** – after adopting a resolution, a county will then enter into discussions and negotiations with VDOT to develop a devolution agreement and MOU that will define the terms of a devolution arrangement. The agreement will include legal issues and responsibilities. A separate MOU can be used to address more specific details and coordination issues between VDOT and the county. A county should prepare for this negotiation by determining what it “wants” and what it will “accept” in return for assuming a specific set of secondary road responsibilities. Counties should recognize, however, that VDOT will need to consider broad policy issues, legislation, and/or efforts to ensure statewide consistency during the development of the devolution agreement and MOU terms; some items will not be negotiable. Key topics that will likely be addressed in preparation for the agreement include the following:

⇒ **County Responsibilities** – the agreement and/or MOU will define the specific activities a county will assume, including any unique activities that a county is not taking over (e.g., the optional countywide functions under construction).

⇒ **VDOT Responsibilities** – the agreement and/or MOU will identify responsibilities that will remain with VDOT and/or be shared with VDOT during both the transition period and once devolution is complete (e.g., plan review, permitting, etc.).

⇒ **Funding** – the agreement and/or MOU will identify the annual level of funding a county receives for maintenance and/or operations funding (construction funding will be determined by the SSYP), and identify the basis for increases in funding allocations due to inflation and system expansion.<sup>10</sup> The agreement and/or MOU also will identify any payments VDOT offers to a county to support start-up activities.

⇒ **Liabilities** – the agreement and/or MOU will define county, VDOT, and shared liabilities.

⇒ **Facilities and Equipment** – the agreement and/or MOU may identify any VDOT facilities (e.g., surplus area headquarters or chemical storage facilities) or equipment that will be transferred, sold, leased, or otherwise be available to/by a county and document the terms of these arrangements.

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<sup>10</sup> This will be a different process than is currently used to determine the annual highway allocations from VDOT to Arlington and Henrico Counties, which are defined in the *Code of Virginia*.

- ⇒ **VDOT Support and Information** – the agreement and/or MOU may define specific types, levels, and the duration of technical support and information that VDOT will provide a county.
- ⇒ **Standards and Reporting** – The agreement and/or MOU will identify how VDOT will oversee any applicable standards and define specific county reporting requirements.
- ⇒ **Timeframes** – the agreement and/or MOU will define the timeframe for a county assuming specific secondary system responsibilities.
- **Step 5: Transition and Implementation** – the final step in the devolution process will be the transition of functions to county responsibility and performance of those responsibilities by the county. The transition process can be expected to take at least one year. The agreement and MOU should be fully executed at least 60 days prior to the proposed implementation date. To ensure it is adequately prepared for this phase of devolution, a county should consider developing a detailed plan that, at a minimum, delineates an approach and timeline to address the following considerations:
  - ⇒ **Policies, Rules, and Standards** – areas where county-specific policies, rules, and standards will be required.
  - ⇒ **Information Systems** – identification and provisioning of system needs for administrative office functions (accounting, procurement, asset management, etc.).
  - ⇒ **Program Delivery Resources** – determination of how program responsibilities will be delivered (in-house vs. outsourcing) and hiring of staff, establishing on-call contracts, etc.
  - ⇒ **Equipment and Facilities** – determining the need for, and acquiring, equipment and facilities.
  - ⇒ **Public Information** – determining how public outreach and customer calls/complaints will be handled.

## 3 Assumption of the Maintenance Program

### 3.1 Overview

A county may assume responsibility for the maintenance of the secondary system of State highways within its jurisdiction as a stand-alone initiative or in conjunction with the assumption of construction or all secondary system functions (full responsibility for the secondary system). By assuming responsibility for maintenance, a county will gain control over setting higher performance standards, priority setting, scheduling, and program delivery approaches for all maintenance activities, and will become responsible for ensuring that needed maintenance is performed.

The assumption of maintenance responsibilities by a county represents a significant initiative. A county that does so will need to both develop the institutional capability to deliver a maintenance program and address a host of important policy and administrative considerations. This chapter describes the specific activities a county will need to perform through its maintenance program and provides information and/or guidance on considerations associated with the delivery of a maintenance program.

### 3.2 Maintenance Responsibilities

Counties that assume maintenance of the secondary system will be responsible for performing all of the asset management functions and activities currently conducted by VDOT as part of its secondary maintenance program.<sup>11</sup> The following is a description of the secondary system assets that will need to be addressed and/or the core functions and activities a county will need to perform in conjunction with a maintenance program. A detailed description of all highway system assets and maintenance activities can be found in the *VDOT Asset Management Best Practices Manual* (available upon request from the VDOT Asset Management Division).

- **Drainage Systems** – includes open channels (paved and unpaved), under drains, gutters, inlet and outlet structures, catch basins, drop inlets, manholes, storm sewers, and highway-related storm water management facilities. Drainage maintenance activities include inspection, preventive maintenance (planned cyclical activities performed in advance of a critical need for repair), and repair or replacement (due to regular deterioration or storms) to bring deficient facilities up to acceptable standards.
- **Roadsides** – applies to all right-of-way associated with the secondary system. Roadside maintenance includes turf control, tree and bush management, litter pickup, and fence repair. It also may include the operation of Adopt-A-Highway programs.
- **Traffic Devices** – includes highway elements that support traffic control and enhance the safety of highway facilities, such as signs, guardrails, pavement markings, impact attenuators, and lighting. Traffic device maintenance activities include inspection and repair/replacement of elements that have been damaged or become deficient.

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<sup>11</sup> For purposes of devolution, “maintenance” includes activities related to several asset types in the “Traffic Devices” category that VDOT currently labels “operations” in its asset management and budgeting activities. It does not include activities related to traffic signals, traffic management systems, roadway tunnels or ferries.

- **Pavements** – includes all roadway surfaces associated with highways, shoulders, turnouts, and attached bike/pedestrian facilities. Pavement maintenance activities include inspection, addressing emergency defects (e.g., potholes and depressions), preventive maintenance (e.g., crack sealing and rumble strip cleaning), patching, resurfacing, “pulling” shoulders, and imposing weight limits.
- **Structures** – include all bridges and pipes/box arch culverts having a gross opening of 36 square feet or greater. Structure maintenance activities include regularly scheduled inspections, preventive maintenance activities (e.g., cleaning and painting), and restorative maintenance/repair activities to address deficiencies in decks, superstructures, substructures, joints, retaining walls, etc.
- **Special Facilities** – includes miscellaneous facilities that are part of the highway system. On the secondary system (and for purposes of devolution), these include waysides/picnic areas, public boat ramps, park and ride lots, and stand-alone bicycle and pedestrian facilities. These special facilities do not exist on the secondary system in most counties. Special facility maintenance activities vary based on the type of facility, but generally include preventive maintenance, repair, and replacement.
- **Snow and Ice Removal** – includes operations related to the preparation for, and removal of, snow and ice. Activities include drift control, application of anti-icing chemicals and abrasives (i.e., sand), plowing, and post storm clean-up.
- **Emergency Activities** – includes non-recurring needs resulting from storms (e.g., major snowstorms and floods) and accidents that require immediate action. Emergency activities include repairs and replacement for the six asset groups listed above, disaster recovery, and hazardous material spill response.
- **Public Outreach** – includes public education and outreach related to transportation, as well as receiving and responding to public complaints, issues, and concerns related to maintenance of the secondary system.

### **3.3 Institutional Capacity**

The staffing, equipment, supplies, and facilities a county will require in order to deliver a secondary system maintenance program will vary considerably based on the characteristics of a county’s secondary system and how a county chooses to deliver its program. On one hand, a county may choose to outsource its entire maintenance function. In such instances, the county would likely require only a small staff to make policy/budgetary decisions and manage maintenance contracts. If a county were to select this approach the associated equipment and facility recommendations also would be very small (e.g., a few pick-up trucks, limited office equipment, and less than 1,000 square feet of office space). Conversely, a county could perform all maintenance responsibilities using in-house staff and county facilities/equipment.<sup>12</sup>

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<sup>12</sup> Henrico County currently outsources less than 10% of its secondary system maintenance and operations activities; VDOT outsources 30% to 60% of its maintenance and operations activities, depending on the District.

Depending on the size of a county and its secondary system, this approach could require a large staff and significant equipment and facilities investment.

In all likelihood, a county will elect a program delivery approach similar to that used by VDOT – one that combines outsourcing and the use of in-house resources. In determining the in-house vs. outsourcing mix, a county should consider the following:

- The availability and capacity of the private sector to perform different functions;
- The ability of a county to attract staff with the right skills and experience, and the willingness to add full or part-time employees;
- The full cost implications of in-house vs. outsourcing approaches and associated differences in performance and control;
- The degree of control and responsiveness needed for different maintenance functions; and
- The level of up-front human resource, facility, and equipment investments a county is willing to make.

The Secondary System Analysis Model provides a tool for estimating staffing, equipment, and facility needs based on VDOT's current in-house/outsourcing mix for the VDOT District where the county is located and the size of a county's system. The following is a description of the institutional elements that are analyzed in the model and a discussion of considerations associated with these elements. Lists of recommended staffing, facilities, and equipment needs for a prototypical county maintenance program, along with mechanisms for identifying the magnitude of needs, are provided at the end of this section.

### 3.3.1 Staffing

A county will require sufficient management and administrative staff to run its maintenance program, along with sufficient maintenance personnel to perform responsibilities that are being met through in-house resources. The following are the key positions and the associated responsibilities for a prototypical county maintenance department:

- **Transportation Director/Assistant Director for Maintenance** – responsible for overall management of a county's maintenance activities. Duties will include policy development, budgeting, programming, needs assessment, public outreach, inter- and intra-governmental coordination, and oversight of day-to-day maintenance operations. The position would either directly report to the county public works director, county executive/administrator, and/or the Board of Supervisors (*maintenance only* devolution option), or to an overall transportation director (*maintenance and construction* or *all functions* devolution options). Other staff positions include a possible reporting arrangement but each county will need to evaluate the reporting structure that best meets its needs.

- **Administrative Support** – provides clerical and administrative support for the maintenance director and other program management staff. The position would likely report to the maintenance director.
- **Contracts Administrator** – manages and conducts oversight of maintenance outsourcing contracts. The position would likely report to the maintenance director.
- **Business Administrator** – prepares bid packages for outsourcing contracts and materials/equipment purchases. The position would likely report to the maintenance director or provide a support function to the county transportation department, but be assigned elsewhere in the county government.
- **Human Resources Specialist** – conducts and/or manages all activities related to hiring, firing, benefits administration, and other human resource requirements. The need for this position will vary based on the size of a county’s required maintenance workforce and the availability of existing human resources staff to perform the needed functions. The position would likely report to the maintenance director or provide a support function to the county transportation department, but be assigned elsewhere in the county government.
- **Maintenance Superintendent** – directs day-to-day maintenance operations for an area headquarters (AHQ) office, including identifying needed work, scheduling and dispatching crews, managing materials and equipment, and providing oversight of maintenance crews. This position would likely report to the maintenance director.
- **Maintenance Supervisor** – manages up to 12 maintenance crewmembers. This position would report to the maintenance superintendent.
- **Maintenance Crew Members** – performs a wide range of maintenance functions including mowing, trimming trees, fixing potholes, installing signs, sealing cracks and other surface maintenance, cleaning/replacing drainage assets, plowing snow, etc. These positions would likely report to a maintenance supervisor.
- **Fiscal Assistant/Time Keeper** – maintains maintenance records related to timesheets, costs, work accomplished and inventories. The position would likely report to the maintenance superintendent.
- **Equipment Shop Staff** – performs repair and maintenance work on vehicles and equipment. Positions may include specialty personnel such as heavy equipment technicians, as well as a shop foreman. The positions would likely report to either the maintenance superintendent or a shop foreman if a supervisory shop position exists or is established.

### *3.3.2 Facilities*

A county will require both office space for maintenance management staff and maintenance yard facilities (i.e., AHQs) to house maintenance personnel, equipment, and supplies (e.g., sand and de-icing chemicals). At least one AHQ is needed for each county assuming maintenance responsibility but actual needs will vary based on geography, the size of the secondary system,

program delivery approach, and performance targets. As a general rule, additional AHQs are recommended (as needed) to ensure maintenance superintendent responsibilities do not exceed 800-lane miles.<sup>13</sup> In developing a strategy for meeting its facility needs, a county should consider the following:

- A prototypical AHQ site requires approximately nine acres of land. Finding a suitable site that is zoned appropriately, centrally located, and cost effective can be challenging, particularly in urban and high growth counties.
- Sites require significant investment to build-out (e.g., site preparations, construction of combination buildings and chemical storage facilities, etc.).
- VDOT is currently planning to reduce its number of maintenance facilities (AHQs, sub-AHQs, staging areas, and storage lots) and surplus facilities may be available for purchase or lease.
- A county may be able to negotiate a lease arrangement with VDOT for some maintenance facilities (e.g., chemical storage facilities) as may be available.
- A county should evaluate whether existing county facilities or land could be converted into AHQs to meet maintenance program facility needs.

### *3.3.3 Equipment*

A county's equipment needs will vary based on: 1) the level of outsourcing; 2) the nature of outsourcing contracts (e.g., a county may need to supply vendors with equipment); 3) geography and system characteristics; and 4) the prerogatives of the county maintenance management staff. In developing a strategy for meeting its equipment needs, a county should consider the following:

- The need or desire to have contractors use county equipment (as opposed to using their own equipment);
- The potential to negotiate arrangements to buy, lease, or transfer surplus equipment from VDOT as available;
- The tradeoffs between buying equipment up-front versus leasing;
- The maintenance and upkeep burden associated with different types of equipment; and
- The need for redundancy in case of breakdowns.

### *3.3.4 Supplies*

A county will need to establish and maintain a base inventory of required materials and supplies. While not exhaustive, the following is an initial list of the types of supplies/materials

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<sup>13</sup> The recent VDOT Area Headquarters Study assumed an upper threshold of 800 lane miles per maintenance superintendent, with one AHQ per superintendent. The Study also incorporated daily vehicle miles traveled (DVMT), response times, and storage needs into the analysis to adjust the threshold downward. These issues were not considered as significant for county secondary systems, so no adjustment was made to the 800 lane miles/AHQ threshold.

that a county may need to have on hand or have access to upon taking over maintenance responsibilities:

- Snow plow blades;
- Salt;
- Sand;
- Chemical abrasives;
- Stone (various sizes such as #8 and #26);
- Cold patch materials; and
- Work zone signs/stands

### 3.3.5 Institutional Recommendations Summary

This section provides a summary of the staffing, facilities, and equipment a county will likely need to deliver a secondary system maintenance program, and identifies considerations that determine the magnitude of need. The recommendations were developed through analysis of VDOT man-hour data and equipment inventories, the application of analytical methodologies that are consistent with the recent VDOT Area Headquarters Study, and consultation with senior VDOT field personnel.

**Table 1: Staffing and Facility Recommendations**

Requirement	Considerations for Determining Need
<i>General Management Staff</i>	
Transportation Director/ Assistance Director for Maintenance	A county maintenance division would likely be run by a Transportation Director if it chooses the <i>maintenance only</i> devolution option, or by an Assistant Director for Maintenance that reports to a Transportation Director under <i>maintenance and construction</i> or <i>all functions</i> devolution options.
Administrative Support	One per county.
Contracts Administrator	One per county.
Business Administrator	One per county; individual may report to other areas of county government.
Human Resources Specialist	One per county; individual may report to other areas of county government.
<i>Maintenance Field Staff</i>	
Maintenance Superintendent	One per AHQ.
Assistant Maintenance Superintendent	Not required; counties with large AHQ staffs may elect to add this position.
Maintenance Supervisor	One per maintenance crew (up to 12 crewmembers).
Maintenance Crew Members	Needs based on number of lane miles on the secondary system.
Fiscal Assistant/Time Keeper	One per AHQ.
Equipment Shop Staff	Needs based on size and nature of a county's vehicle and equipment complement.

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<i>Facilities</i>	
Area Headquarters (AHQs)	One AHQ per county with a maximum responsibility of 800 lane miles per maintenance superintendent.
Chemical Facilities	One per AHQ, however a county should determine its actual needs.
Office Space	100 square feet per office staff, plus 15% for common areas (based on American Institute of Architects guidelines).

**Table 2: Equipment Recommendations**

Equipment Description	Considerations for Determining Need
<i>Office Equipment</i>	
Computers	One for each general management staff, superintendent, assistant superintendent, supervisor, and fiscal assistant.
Telephones	Need same as number of computers, plus one per AHQ.
Copier/printer/etc.	One per AHQ.
Desks/Chairs/etc.	Need same as number of computers.
<i>Field Equipment</i>	
Air Compressors	One per county.
Arrow Signs (Trailer Mounted)	Two per county.
Asphalt Haulers	One per county.
Asphalt Kettles	One per county.
Backhoe & Attachments	One per county.
Brooms - Truck Attachment	One per county.
Brush Chippers	One per county.
Compactors	One per county.
Concrete Mixers & Mortar Mixers	One per county.
Ditching Trucks	One per county.
Dump Trucks – Large	One per AHQ.
Dump Trucks – Standard	One per every two crewmembers (less the number of large/small trucks).
Dump Trucks – Small	One per AHQ.
Excavators	One per county.
Generators	One per AHQ, minimum of 2 per county.
Graders	One per county. (More may be needed if there is a higher than average amount of unpaved road lane miles)
Loaders – Large	One per county.
Loaders - Small (Bobcat)	One per county.
Mowers - Small Riding	One per AHQ.
Mowers - Tractor Attachments	Two per AHQ.
Mowers - Walk Behind	One per county.
Pavement Breakers	One per county.
Pavers/Patchers	One per county.
Pickup Trucks	One per each supervisor and superintendent.
Rollers - 4 Ton / 6 Ton Tandem	One per county.

<b>Equipment Description</b>	<b>Considerations for Determining Need</b>
Snowplows	Needs vary based on geography and the level of outsourcing. (Calculated by multiplying the estimated number of dump trucks by the applicable VDOT District's current ratio of dump trucks to snowplows (based on VDOT statewide equipment inventory))
Sprayers - Chemical	One per maintenance crew.
Spreaders – Abrasive	Needs vary based on geography and the level of outsourcing. (Calculated by multiplying the estimated number of dump trucks by the applicable VDOT District's current ratio of dump trucks to spreaders (based on VDOT statewide equipment inventory))
Steam Cleaners/Pressure Washers	One per county.
Sweepers	One per county.
Tanks - Water Sprinkler	One per county.
Tractors w/ Misc. Attachments	One per maintenance crew.
Trailers (Other)	One per county.
Trucks (Bridge)	One per county.
Trucks (Bucket)	One per county.
Trucks (Crash Cushion Vehicle)	Two per AHQ.
Trucks (Utility Body & Crane)	One per county.
Vacuum Trucks	One per county.
Variable Message Signs	Two per AHQ.

### **3.4 Maintenance Program Administration and Delivery**

A county assuming responsibility for maintenance of its secondary roads (either independently or in conjunction with other functions) will have significant flexibility in how it delivers its program. To varying degrees, the choices a county makes about program delivery approaches will influence both the range of program administration considerations and the magnitude of institutional recommendations a county will need to address. This section identifies and discusses critical topics related to county administration and delivery of a secondary system maintenance program. Where applicable, the section also identifies the implications of different program delivery options.

#### *3.4.1 Asset Management*

A county assuming a maintenance devolution option will, upon request, receive available inventory information from VDOT for all highways and structures for which it will be responsible; this will likely be done in the early stages of the devolution process. This inventory, along with any available information about the condition of system elements, can serve as the basis for a county’s asset management activities. A county will then have the flexibility (subject to federal bridge inspection requirements) to determine how it monitors its system conditions to meet the asset management requirements (e.g., GASB-34 reporting<sup>14</sup> and legislative requirements) and to comply with VDOT reporting/certification requirements.

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<sup>14</sup> GASB-34 (Government Accounting Standards Board – Standard 34) establishes financial reporting requirements for state and local governments. See [http://www.apa.state.va.us/gasb34/local\\_government.htm](http://www.apa.state.va.us/gasb34/local_government.htm) for more information.

Under this option a county will still be required to provide VDOT with maintenance activity information in order to support VDOT's Asset Management inventory system.

A county will have flexibility to establish target levels of service for the maintenance of different system assets, allocate maintenance resources to achieve targets, and schedule work. In setting performance targets, making budget decisions, and establishing work schedules, a county may want to consider the following:

- The Secondary System Analysis Model provides the capacity to estimate needed expenditures for various assets and activities based on historical VDOT spending levels. The Model also enables counties to estimate the cost of obtaining a “higher level of service” to achieve optimum performance.
- A county that wishes to achieve a higher level of service for some or all assets will likely need to identify sources of additional funding beyond what is provided by VDOT.
- Since a county will be directly accountable to the public for secondary system conditions, it may wish to assess customer needs and the impact that short-term investment strategies may have on long-term customer expectations and satisfaction levels.

While a county may establish its own target levels of service for maintenance, it will need to certify that it is maintaining the secondary facilities sufficiently to meet the needs of the traveling public and demonstrate that minimum performance targets are being met. VDOT will still likely conduct annual and random inspections of any facilities being maintained under a devolution agreement. Some VDOT oversight will apply regardless of whether a county elects partial devolution or if a county assumes full responsibility for its secondary roads, but VDOT's oversight role will be higher when VDOT retains operational ownership and responsibility for the system.

A county will also need to comply with portions of §33.1-23.5:1 of the *Code of Virginia*, which imposes additional financial accountability and performance measurement requirements on local governments that receive maintenance and/or construction payments from VDOT. System performance will be evaluated on a statewide basis utilizing performance targets similar to those in place for Arlington, Henrico and urban localities.

Information related to local construction and maintenance expenditures must be reported annually through the *Weldon-Cooper Center Financial Survey*. Additional information on requirements associated with these provisions is available through the VDOT Local Assistance Division.

### *3.4.2 Administrative Functions*

The establishment and ongoing operation of a maintenance program will require administrative support functions in areas such as human resources, information technology, procurement, fiscal, real estate, and legal. For many counties, resources to conduct these functions are already part of their basic government infrastructure and may be sufficient to meet the needs of a secondary highway maintenance program. Counties that either do not have these resources in

their existing government infrastructure or do not have the capacity to support additional workload will need to explore how these functions can be provided through additional in-house staff or outsourcing.

### *3.4.3 Reporting and Accountability*

Reporting requirements will depend on the devolution option, but at a minimum (and in addition to the reporting requirements discussed above), a county will be required to submit an annual report (included in the annual county audit conducted by an independent certified public accountant) that accounts for its expenditure of State and federal maintenance funding and certifies that all of the funds designated for maintenance were spent on secondary system maintenance.

### *3.4.4 Funding*

A county will receive annual maintenance allocations from VDOT based on the terms of established methodology and as described in the devolution agreement and/or MOU. Establishing payment rates for maintenance of the secondary system will be based on the approach identified in §33.1-23.5:1 of the *Code of Virginia* which states that “the Commonwealth Transportation Board (CTB) will make payments to counties which elect to withdraw from the secondary system of state highways for maintenance activities based on a rate per lane-mile based on maintenance standards and unit costs used by VDOT to prepare its secondary system maintenance budget.” The payment rates will likely be adjusted annually in accordance with procedures established for adjusting payments to Henrico and Arlington County, and lane mileage will be adjusted annually to include streets and highways accepted for maintenance in the county system by the local governing body. Payments from VDOT for secondary system maintenance will be provided on a quarterly basis.

### *3.4.5 Liability*

A county will share maintenance-related liabilities based on the devolution agreement and MOU with VDOT. Specifically, a county would assume liability for work performed by or on behalf of the county. A county’s choice to deliver a maintenance program through in-house resources or outsourcing will have no impact on the assignment of liabilities (the agreement and/or MOU likely will require counties to ensure contractors carry sufficient liability insurance).

## 4 Assumption of the Construction Program

### 4.1 Overview

A county may assume responsibility for the construction of projects on the secondary system of highways within its jurisdiction as a stand-alone initiative, in conjunction with the assumption of maintenance, or assumption of full responsibility for the secondary system. By assuming responsibility for construction functions, a county will increase its influence in project selection and gain control over project planning, delivery and better coordinate construction activities with land use considerations.

A county assuming construction functions will likely need to develop or expand its institutional capability to deliver a construction program and will need to address a host of important policy and administrative considerations. This chapter describes the specific activities a county will need to perform in order to deliver a construction program and provides information and guidance on construction program delivery considerations.

### 4.2 Construction Responsibilities

Counties that assume construction functions will be responsible for the planning, design, and construction of all projects that add new capacity, completely replace existing facilities, or significantly improve the functionality of existing facilities. Counties that do not assume all secondary responsibility also will have the option to assume selected countywide, operations-related functions. The following provides a description of core construction program activities.

- **Planning and Programming** – includes all activities associated with the identification, prioritization, and selection of construction projects, such as traffic forecasts, feasibility studies, public outreach, cost estimation, intergovernmental coordination (e.g., directly with MPOs or with the Federal Highway Administration via VDOT), budgeting, and scheduling. Programming includes functions related to the current Secondary Six-Year Plan development process.
- **Preconstruction** – includes all elements of project development prior to the advertisement of a project for construction, including surveys, environmental studies and reports, design (roadway, structural, geotechnical, hydrological, etc.), public involvement, right-of-way acquisition, utility coordination, quality assurance/quality control reviews (QA/QC), and value engineering.
- **Construction** – includes project advertisement for bids, construction engineering and inspection, processing, approving and paying contractor invoices, claims processing, and acceptance of completed work.
- **Countywide Construction Functions** – includes general engineering and construction activities (i.e., activities not tied to specific route-numbered projects) that are specific to

the secondary system and mostly operational in nature.<sup>15</sup> Counties that do not assume all secondary responsibility will have the option to take over selected countywide construction functions as part of their construction program (assumption of these functions is mandatory if a county withdraws from the State system). These functions are as follows:

- ⇒ **Seeding and Fertilizing (mandatory as part of construction)** – turf development and landscaping activities for new construction projects.
- ⇒ **Pipe and Entrance (optional under partial devolution)** – the installation of pipes and other activities to accommodate private access to the secondary system.
- ⇒ **Traffic Calming (optional under partial devolution)** – the design and installation of devices (e.g., speed bumps and traffic signals) to reduce highway speeds and improve bike/pedestrian safety.
- ⇒ **Engineering and Survey (optional under partial devolution)** – work associated with the initial development of projects, such as traffic studies, feasibility analyses, and other preliminary work to determine cost estimates and scope before a construction project number is established
- ⇒ **Traffic Services (optional under partial devolution)** – installation of various traffic engineering-related devices. Activities under this cost center may include new sign installation, new traffic device installation (flashing lights/signals), new pavement markings, and work associated with spot improvements. Greater detail on these activities is provided in the operations chapter.

### 4.3 Institutional Capacity

A county secondary system construction program will create relatively limited resource needs for equipment, supplies, and facilities since most actual construction work is typically performed by contractors. A county's institutional needs will be determined by the approach it selects for meeting the human resource needs associated with planning, developing, and managing its construction program. If a county elects to construct roads using county forces, additional maintenance crew members/equipment operators may be needed depending on the magnitude of the work performed. In determining its approach to construction program delivery (i.e., in-house vs. outsourcing), a county may wish to consider the following:

- The availability and capacity of the private sector to perform planning, engineering, and construction management functions;
- The ability to attract needed staff and a county's willingness to add full- or part-time employees;
- The range of specialty disciplines and experience a county will require; and

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<sup>15</sup> Note: because some countywide construction functions are operational in nature and counties must assume responsibility for these activities under full devolution, they are cross-referenced in **Chapter 5** (Operations). These functions do not include any work relative to the primary or urban highway systems in a county.

- The size and number of county construction projects that are in various stages of development, and the associated consistency of work demands for specific positions.

The Secondary System Analysis Model provides a tool for estimating the equipment and facility needs for a construction program, as well as for identifying selected staffing recommendations. It also provides a framework for making decisions about the more variable construction staffing needs that do not lend themselves to modeling. The following is a description and discussion of the institutional elements associated with a construction program.

### 4.3.1 Staffing

A county will require in-house management and administrative staff to implement its construction program, as well as personnel with a variety of technical specialties that may be addressed through internal staffing or outsourcing. The following is a description of the positions a prototypical county construction program will likely want to fill with in-house staff:

- **Transportation Director/Assistant Director for Construction** (Construction Manager) – responsible for overall management of a county’s construction program. This position will likely need to be filled by a licensed, professional engineer (PE).<sup>16</sup> Duties will include policy development, budgeting, programming, needs assessment, public outreach, inter- and intra-governmental coordination, and oversight of day-to-day construction program activities. The position would either directly report to the county public works director, county executive/administrator, and/or the Board of Supervisors (*maintenance only* devolution option), or to an overall transportation director (*maintenance and construction* or *all functions* devolution options). Other staff positions include a possible reporting arrangement but each county will need to evaluate the reporting structure that best meets its needs.
- **Administrative Support** – provide clerical and administrative support for the maintenance director and other program management staff.
- **Business Administrator** – prepare bid packages for outsourcing contracts and materials/equipment purchases and conducts project-letting activities. The position would likely report to the construction manager. Counties with large programs may need to have a second position or a business administration assistant.
- **Human Resources Specialist** – conduct and/or manage all activities related to hiring, training, and other human resource issues. The position would likely report to the construction manager or provide a support function to the county transportation department but be assigned elsewhere in the county government.
- **Engineering Technicians/Designers (Techs)** – prepare project designs, oversees preconstruction functions such as survey, geotechnical, and hydrological work, and provides technical support for development of bid packages. The number of

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<sup>16</sup> While it is not mandatory for the manager of the construction program to be a licensed PE, a county will need to have at least one PE on its staff to make necessary certifications. One alternative is for at least one of the construction project managers to be a PE.

Engineering Techs a county will need will vary based on the number and complexity of projects that are in the project development phase each year. The positions would likely report to the construction manager.

- **Construction Program Manager** – conduct day-to-day oversight of construction projects. Duties including monitoring project progress, addressing claims, approving change orders, and accepting projects. The positions would likely report to the construction manager.

The following are positions where staffing level needs are highly variable based on program size and complexity, and are areas where a county is more likely to out-source the functions. These positions are not included in the model projections since they are likely to fluctuate and require a more detailed analysis based on proposed work and the particular phase of work being accomplished in a given year. Positions filled in-house would report to the construction manager:

- **Right-of-way (ROW) Specialists** – determine ROW needs, assess values, and conducts activities required to acquire ROW parcels, including condemnation proceedings and settlement negotiations.
- **Utilities Specialists** – determine utility relocation requirements, estimate costs, and coordinates/negotiates with applicable public and private entities.
- **Environmental Specialists** – perform or oversee necessary environmental analyses, conducts hearings, and prepares environmental documents.
- **Materials and Testing Specialists** – conduct materials testing as needed to support project development and construction management.
- **Traffic Engineers** – conduct traffic studies and design traffic management-related elements of project plans.
- **Inspectors (Junior and Senior)** – perform construction inspections to verify and document that projects are delivered in compliance with standards and contract terms.
- **County Force Construction Staff** - perform actual construction activities normally performed by contractors.

### 4.3.2 *Facilities*

The amount of office space required for a construction program will be determined by the number of construction staff. The Secondary System Analysis Model can be used to estimate the amount of needed space.

### 4.3.3 *Equipment*

Equipment needs for a construction program would normally be limited to a fleet of pick-ups for construction program staff and routine office equipment such as computers, copiers, telephones, desks, etc. The Secondary System Analysis Model can be used to estimate the amount of equipment needed. In addition, a county may wish or need to provide equipment to

contractors, such as computers with compatible inspection support software (VDOT currently does this when it outsources CEI (Construction Engineering Inspection) activities). If a county chooses to establish a county-wide construction crew, additional equipment may be necessary.

#### 4.3.4 *Supplies*

The supplies needed for the set-up and on-going operations of a construction program are limited basic office supplies.

#### 4.3.5 *Institutional Recommendations Summary*

This section provides a summary of the staffing, facilities, and equipment a county will likely need to deliver a secondary system construction program and identifies the considerations that determine the magnitude of needs. The recommendations were developed through consultation with senior VDOT field personnel.

**Table 3: Staffing and Facility Recommendations**

Requirement	Considerations for Determining Need
<b><i>Required Construction Staff</i></b>	
Transportation Director/ Assistance Director for Construction	A county construction division would be run by the transportation director if it chooses the <i>construction only</i> option or an assistant director for construction under <i>maintenance and construction</i> or <i>full</i> devolution options.
Administrative Support	One per county.
Business Administrator	One per county; may report to other areas of county government.
Human Resources Specialist	One per county; may report to other areas of county government.
Engineering Techs/Designers	Based on number and complexity of construction projects; rule of thumb is one for every five projects.
Construction Project Managers	Based on number and complexity of construction projects; rule of thumb is one for every five projects.
<b><i>Optional Construction Staff</i></b>	
Right-of-way Specialists	Need determined by county approach.
Utilities Specialists	Need determined by county approach.
Environmental Specialists	Need determined by county approach.
Materials and Testing Specialists	Need determined by county approach.
Traffic Engineers	Need determined by county approach.
Inspectors (Junior and Senior)	Need determined by county approach.
County Force Construction Staff	Need determined by county approach
<b><i>Facilities</i></b>	
Office Space	100 square feet per staff member, plus 15% for common areas.

**Table 4: Equipment Recommendations**

Equipment Description	Considerations for Determining Need
<i>Office Equipment</i>	
Computers	One for each staff member; may require additional computers for out-sourced inspectors.
Telephones	One for each staff member.
Copier/Printer/etc.	One set of standard office machinery.
Desks/Chairs/etc.	One for each staff member
<i>Field Equipment</i>	
Pickup Trucks	One for each construction manager, tech, and project manager. Additional needs for surveyors, inspectors, etc. will vary based on level of outsourcing.

#### **4.4 Construction Program Administration and Delivery**

A county assuming responsibility for construction functions will gain control over planning and project delivery, but will still need to meet federal and/or State requirements that are tied to the sources of project funding. The following is a discussion of the key construction program delivery considerations and requirements.

##### *4.4.1 Planning*

A county will be fully responsible for conducting all activities related to the identification and prioritization of short-term and long-term construction needs. This will include (if applicable) coordination with the county’s MPO to incorporate projects into the regional long-range plan. A county may continue to receive VDOT technical support for planning activities (e.g., traffic studies, corridor analyses, and project feasibility studies); provided funding and manpower resources are available.

##### *4.4.2 Programming*

For the most part, little about the programming process will change, regardless of whether or not a county elects to assume full responsibility for its secondary roads. Responsibility for developing and programming county construction projects in the Secondary Six-Year Plan will continue to be shared between a county and VDOT, although counties will gain full control and responsibility for scheduling project work on all construction phases. For federally- and State-funded projects, counties will follow the same process that is currently used to program projects in the Secondary Six-Year Plan and (if applicable) incorporate them into the State Transportation Improvement Plan and the applicable regional Transportation Improvement Plan. This process is documented in the *VDOT Guide to Secondary Six-Year Plan Updates*, available from the VDOT Programming Division.

For 100 percent locally-funded projects, a county may establish its own programming processes, provided it complies with any applicable county long-range planning recommendations and federal mandates, such as the need to conduct public involvement and coordinate with the

MPO to integrate projects into the regional Transportation Improvement Plan.<sup>17</sup> Also, VDOT recommends that counties submit locally-funded projects for inclusion in the Secondary Six-Year Plan to have an overall plan of scheduled improvements.

A significant portion of the secondary construction allocation is comprised of federal funds, which will influence how these funds can be programmed. A county that assumes responsibility for the construction program will need to closely monitor the obligation of federal funds and coordinate through VDOT to receive federal authorization and changes in the obligation schedule (i.e., the Statewide Transportation Improvement Plan).

#### *4.4.3 Pre-construction*

Design standards and development processes for construction projects will be tied to both the source of funds and the category of a roadway. Federally-funded projects on National Highway System (NHS) routes will need to conform to VDOT design standards.<sup>18</sup> Federally-funded projects on non-NHS routes and State- or locally-funded projects (on non-federal routes) will need to conform to VDOT standards, AASHTO standards, or other standards that are approved by VDOT for non-NHS routes. For all federally-funded projects, a county will need to coordinate with FHWA through VDOT to receive necessary federal approvals for various elements of the project development process (e.g., design, ROW acquisition, and environmental permitting).

A county that chooses to outsource some or all project development functions for federally- or State-funded projects will need to adhere to applicable federal and State requirements (these will likely be more stringent than local requirements) related to the procurement of professional services (e.g., the need for pre-award audits and VDOT review of consultant qualifications).

#### *4.4.4 Letting Processes*

Letting process requirements will be determined by the source of funds. Federally-funded projects will need to comply with all federal procurement requirements (e.g., civil rights, Davis Bacon rates, and Buy America) and the Virginia Procurement Act.<sup>19</sup> The letting of State- and locally-funded projects also will need to conform to the Virginia Procurement Act.

#### *4.4.5 Reporting*

Counties will need to comply with both federal and State reporting requirements for the expenditure of construction funds. For State funds, a county will need to submit an annual audited statement accounting for the use of State funding (this will likely be a part of a county's annual general financial statement). For federal funds, a county will need to comply with both the State reporting requirement cited above and federal reporting requirements defined by OMB Circular 133.

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<sup>17</sup> Regardless of funding source, a county must coordinate with its MPO to integrate all projects into the TIP that are of "regional significance" in designated air-quality non-attainment/maintenance areas.

<sup>18</sup> VDOT design standards for NHS routes exceed AASHTO standards.

<sup>19</sup> Further information on state and federal procurement requirements is available in the *VDOT Urban Construction Initiative Program Administration Guide*.

A county also will need to comply with reporting requirements identified in §33.1-23.5:1 of the *Code of Virginia*, which imposes additional financial accountability and performance measurement requirements on local governments that receive maintenance and/or construction payments from VDOT. Information related to local construction spending of State and federal funds must be reported through the *Weldon-Cooper Center Financial Survey*. Additional information on requirements associated with these provisions is available through the VDOT Local Assistance Division.

#### *4.4.6 Funding*

The overall secondary allocation for a county is unchanged by devolution. The actual payments a county will receive from VDOT will include the State portion of the secondary allocation (less amounts for countywide construction functions that are not assumed or for projects that will be completed by VDOT). Since federal funds are only provided as a reimbursement of qualifying expenditures, the federal portion of a county's construction allocation is provided on a project-specific reimbursement basis. In instances where adequate State or federal funding is not available in a given fiscal year, a county will have the option to defer projects or fund projects themselves and receive reimbursement in a subsequent fiscal year. A county may, in accordance with §33.1-23.4 of the *Code of Virginia*, set aside one-third of its annual secondary system allocation for reimbursement of costs incurred for debt service on bonds or for eligible project costs incurred in previous years on approved projects in the County's SSYP. Since a significant portion of the secondary construction allocation is comprised of federal funds, a county will need to be aware of the state funds available and of the routes that qualify for federal funding in their county.

A county will need to follow existing processes for working with its local MPOs to identify opportunities and apply for federal funds that are allocated through MPOs (e.g., Congestion Mitigation and Air Quality (CMAQ) or Regional Surface transportation Program (RSTP) funds).

#### *4.4.7 Liability*

If a county does not assume full responsibility for its secondary roads, the county only assumes liabilities resulting from actual construction work performed by or for the county, and VDOT will retain general liability for the State system (construction projects will need to be accepted by VDOT before they are considered complete). If a county elects to assume full responsibility for its secondary roads, it assumes all liabilities associated with the secondary system within its jurisdiction.

## 5 Full Assumption of Secondary System Responsibilities (including Operations)

### 5.1 Overview

A county may assume operational responsibility for the secondary system within its jurisdiction, but only in conjunction with assumption of maintenance and construction. By assuming the operational responsibility for the secondary system, a county would take over operational ownership of the facilities from VDOT and will gain control over policy and priority setting, scheduling, and program delivery approaches for all operational activities, including access control, permitting and land development transportation reviews. This added control and responsibility provides a county with greater opportunity for more coordinated and integrated decision-making. The following section identifies and discusses responsibilities, issues, and considerations that may accompany assumption of the additional secondary road responsibilities by a county when full devolution is desired.

### 5.2 Operations Responsibilities

The additional responsibilities that a county assumes by taking over operational responsibility include activities that control access and provide for the safety and mobility of those traveling the highway system. These responsibilities include all or portions of the following:

- **Permits** – involves approvals for all work on the secondary system right-of-way to provide for the safety of the traveling public. The activity includes the review and issuance of permits along with determination of associated requirements for roadway design, drainage, signage, and traffic control needs. Permitting preserves the integrity and functionality of the roadway, particularly as related to requirements associated with new entrances, street tie-ins, or modifications to an existing entrance. A permit also is required for utility work or any other work on or within a highway right-of-way.
- **Land Development/Subdivision Street Review** – includes evaluating the potential traffic impacts of development and identifying associated roadway improvement needs, reviewing site plans and subdivision construction plans, and conducting inspections to ensure performed work meets the appropriate standards. Control over land development and site plan review provides counties with greater ability to coordinate land use and transportation improvements. While this activity is currently shared between counties and VDOT, with VDOT having final decision-making authority, a county that assumes full responsibility for its secondary roads would take over sole responsibility for this activity. It should be noted that a county that has operational responsibility for the secondary system would still need to coordinate with VDOT regarding development that may impact primary or interstate roadways.
- **Traffic Engineering Activities** – performing studies to determine the appropriate traffic engineering measures necessary to address identified problems. A county assuming full operational ownership and responsibility for the system also will assume all traffic engineering functions. This will include:

- ⇒ **Speed Limits** – establishing speed limits through a study of the roadway geometrics, crash data, existing vehicle speeds, volumes, and existing traffic control devices.
- ⇒ **Through Truck Restrictions** – identifying the need for truck restrictions on segments of a secondary roadway; provided it will promote the health, safety, and welfare of the public without creating an undue hardship on any transportation user.
- ⇒ **Traffic Counts** – providing a basis for determining engineering considerations in the development of the highway system. The counts are used to support decision-making on future road improvements and land development issues and are an integral part of a County’s long range planning process.
- ⇒ **Traffic Signal Analyses and Operations** – performing reviews to determine if a location meets the warrants for traffic signal installation and operating and maintaining traffic signals.
- ⇒ **Warning Signs/Other Regulatory Signs** – performing reviews to determine if additional signs are warranted to address an identified issue.
- **Countywide Construction Activities** – as noted in **Chapter 4**, selected highway functions are operational in nature but are currently funded out of VDOT’s construction program under the category of “countywide cost centers.” While the assumption of some of these functions is optional under partial devolution scenarios, a county assuming operations, and thus full devolution must take responsibility for all of these activities. The following is a description of these functions:
  - ⇒ **Subdivision Plan Review** – this countywide cost center is often used to cover some of VDOT’s plan review-related costs for activities identified above under the Land Development/Subdivision Street Review activity.
  - ⇒ **Pipe and Entrance** – the installation of pipes and other items to accommodate private access to the secondary system.
  - ⇒ **Traffic Calming** – the design and installation of devices (e.g., speed bumps and traffic control devices) to reduce highway speeds and improve bike/pedestrian safety.
  - ⇒ **Engineering and Survey** – work associated with the initial development of projects, such as traffic studies, feasibility analyses, and other preliminary work to determine cost estimates and scope before a construction project number is established.
  - ⇒ **Traffic Services** – installation of various traffic engineering-related devices. Activities under this cost center may include new sign installation, new traffic device installation (flashing lights/signals), new pavement markings, and work associated with spot improvements.

### 5.3 Institutional Capacity

For the most part, the institutional needs for a county that assumes the operations function will be the combined institutional needs identified in **Chapter 3** (Maintenance) and **Chapter 4** (Construction), plus needs tied to the establishment of a traffic engineering section and additional land development staff to perform the operational functions. The level of institutional needs associated with full devolution of the secondary system will depend on the characteristics of a county's secondary system and how a county chooses to deliver its program. Any county considering assuming the additional operational responsibility should discuss the current workload for these types of activities with the VDOT residency and/or District and Regional Office to assist in addressing appropriate staffing needs. The following is a discussion of the likely institutional needs for delivery of a prototypical county operations program.

#### 5.3.1 Staffing

A county will likely need to hire or contract to fill the following operations positions:

- **Traffic Engineers** – responsible for managing a county's operational activities, including determination of roadway speed limits, conducting site plan reviews, design/approval/operation of traffic signals and associated systems, and conducting traffic studies and counts. The position would likely report to the county transportation director.
- **Traffic Engineering Technicians** - performs traffic engineering studies, reviews and associated work to support this function. The position(s) would likely report to the traffic engineer.
- **Subdivision/Permit Specialists** – responsible for reviewing and approving all access permit requests and monitoring permit compliance, reviewing subdivision construction plans, and inspecting subdivision street construction. It is assumed a county would already have some minimal land development staff based on existing land development responsibilities. The position(s) would likely report to either the traffic engineer, the county transportation director or land development manager if one exists.

#### 5.3.2 Facilities

Office space requirements for additional operational responsibilities would be slightly greater than under the maintenance and construction devolution option to accommodate additional operations section staff. The Secondary System Analysis Model can be used to estimate the additional office space needs.

#### 5.3.3 Equipment

Additional equipment needs for full devolution are limited to pick-up trucks for the traffic engineers and subdivision/permit specialists, and standard office equipment such as computers, copiers, telephones, desks, etc. The Secondary System Analysis Model can be used to estimate the amount of equipment needed.

### 5.3.4 Supplies

The additional supplies needed for the set-up and on-going performance for full devolution is limited to basic office products and is fairly minimal.

**Table 5: Staffing and Facility Recommendations.**

Recommended	Considerations for Determining Need
<i>Recommended Operations Staff</i>	
Traffic Engineer	Optional depending upon volume of development activity. A county transportation operations division could be managed by the transportation director.
Traffic Engineering Technician(s)	At least one per county; may be combined with Permit Specialist in low growth counties and increased for high growth counties
Subdivision/Permit Specialist	One per county; with increases based on development activity may report to other areas of county government
<i>Facilities</i>	
Office Space	100 square feet per staff member, plus 15% for common areas.

**Table 6: Equipment Recommendations**

Equipment Description	Considerations for Determining Need
<i>Office Equipment</i>	
Computers	One for each staff member; may require additional computers for out-sourced inspectors.
Telephones	One for each staff member.
Copier/Printer/etc.	One set of standard office machinery.
Desks/Chairs/etc.	One for each staff member.
<i>Field Equipment</i>	
Pickup Trucks	One for each additional staff member.

## 5.4 Operations Program Administration and Delivery

The decision by a county to assume all secondary system responsibilities means that the county will take over ownership of the secondary system and all of the associated responsibilities. While most of the program administration, reporting and delivery considerations identified in **Chapter 3** (Maintenance) and **Chapter 4** (Construction) are still applicable, it is important to identify additional considerations associated with the assumption of operations functions, and to clarify differences that apply if a county assumes full responsibility for its secondary roads. The following provides a discussion of both:

- **Permitting** – while counties will still need to comply with State and federal laws and regulations that govern the rights of public and private sector interests to access highway right-of-way, a county electing to assume full responsibility for its secondary roads will have the authority to develop its own policies, processes, and standards to

ensure its permitting activities are fair, effective, and consistent. Issues a county may wish to consider as it develops its permitting function include the following:

- ⇒ The ability of the county to monitor and enforce permit standards and requirements;
- ⇒ The cost of permitting activities and the potential for cost recovery through fees, fines, etc.; and
- ⇒ The impact of access policies on economic development, land use, land values, and customer satisfaction.

- **Countywide Functions** – a county electing to assume full operational responsibility for its secondary roads will have freedom to perform the various countywide functions as it deems appropriate, except where State and/or federal laws and regulation apply.
- **Funding** – payments to a county that elects to assume full responsibility for its secondary roads will be made on a quarterly basis consistent with §33.1-23.5:1 of the *Code of Virginia*, which will include amounts that would have been allocated to countywide cost centers. Federal funds or funds for work being performed by VDOT will be retained. Federal funds are reimbursed based on qualifying expenditures.
- **Liability** – a county assuming all functions will assume all responsibility and liabilities associated with the secondary system within its jurisdiction in a manner similar to Henrico and Arlington County.
- **Maintenance and Construction Under Full Devolution** – whether or not a county assumes full responsibility for its secondary roads will have a limited impact on how a county performs maintenance and construction activities. The major differences will be the expanded level of control a county has over the delivery of products and services, and the associated accountability and liability that goes along with this control. In practice, this means that a county will still need to comply with applicable standards in its maintenance and construction activities, but will have control over the scheduling of its activities and will control the conditions and requirements that determine who gains access to the secondary system, and when.

## 6 Financial Issues and Considerations

### 6.1 General Overview

This chapter provides a summary and guidance on funding and financial considerations associated with county assumption of secondary system functions. The chapter covers a range of financial topics, including funding levels, the flow of funding from VDOT to counties, the implications and requirements associated with different types of funding, financial reporting requirements, and county-level funding and debt financing options.

### 6.2 Payment Rates for Maintenance and Operations

Pursuant to §33.1-84.1 of the *Code of Virginia*, the amount of annual funding a county will receive for assumption of maintenance and/or operations will be based on a negotiated agreement between VDOT and the county. The determination of annual funding allocations will take into consideration available current funding levels, average historical VDOT expenditures for the assumed functions, and the size of the secondary road system in an individual county. The agreement also will identify the process and methodology that will be used to determine annual adjustments to funding levels and the process by which county allocations will be adjusted due to additions or reductions in the size of a county's secondary highway system. Future action by the Legislature may impact funding and payment rates.

### 6.3 Payment Rates for Construction

The annual allocation to a county that assumes responsibility for secondary system construction will be unchanged from the amount currently allocated to a county through the SSYP. The actual payments a county will receive from VDOT will include the State portion of the secondary allocation (less amounts for countywide construction functions that are not assumed or for projects that will be completed by VDOT). Since federal funds are only available as a reimbursement of qualifying expenditures, the federal portion of a county's construction allocation will be provided on a project-specific reimbursement basis. A county may, in accordance with §33.1-23.4 of the *Code of Virginia*, set aside one-third of its annual secondary system allocation for reimbursement of costs incurred for debt service on bonds or for eligible project costs incurred in previous years on approved projects in the County's SSYP. Reimbursements of this nature are normally specified in project-specific agreements.

### 6.4 Flow of Funds

The total VDOT allocation to a county for assumed functions will be determined no later than July 1 of each year, based on the terms of the devolution agreement. Payments for maintenance and operations, as well as the State portion of construction funding, will be made on a quarterly basis, on or before September 30, December 30, March 30, and June 30. Federal construction funding will be provided on a reimbursable basis for qualifying project costs once eligibility for reimbursement has been determined (net 30 days).

## 6.5 State and Federal Discretionary Funding

Counties that assume construction functions, regardless of whether or not they assume full responsibility for their secondary roads, may pursue selected State and federal discretionary funding for projects (many of these funding sources are already available to counties). Any funding obtained through these mechanisms would be in addition to, and would not reduce, a county's secondary road allocation, per the agreement. It is important to note, however, that federal funds typically require a 20 percent non-federal match, which may need to be provided by a local jurisdiction (varies by funding category). Potential discretionary sources include the following:

- **Congestion Mitigation and Air Quality (CMAQ) Funds** – federal funding for projects that help address air quality issues by eliminating capacity bottlenecks or reducing vehicle traffic (e.g., car pool facilities). These funds are allocated to MPOs in areas designated as air quality non-attainment or maintenance areas (i.e., Northern Virginia, Hampton Roads, and Richmond). A county will need to follow existing procedures for working through its MPO to secure CMAQ funding for eligible projects. Currently VDOT provides the required match for these funds off the top. A county may use regular allocations of State construction funds or local funds to meet the non-federal matching requirements for these funds if the funding is not already matched “off-the-top” by VDOT in future years.
- **Regional Surface Transportation Program (RSTP) Funds** – federal funding that is allocated by formula to MPOs in urbanized areas over 200,000 in population (i.e., Northern Virginia, Hampton Roads, and Richmond) for transportation studies and projects. A county will need to follow existing procedures for working through its MPO to secure RSTP funding for eligible projects. Currently, VDOT provides the required match for these funds off the top. A county may use regular allocations of State construction funds or local funds to meet the non-federal matching requirements for these funds if the funding is not already matched “off-the-top” by VDOT in future years.
- **Safe Routes to School (SRTS) Funding** – federal funding for studies and projects to improve the conditions for children to walk or bike to school. A county may apply for SRTS funding for eligible projects through VDOT's annual application process. SRTS grants provide 100% funding, meaning a county will not need to provide a non-federal match.
- **Enhancement Funding** – federal funding for projects that are related to transportation and meet at least one of the designated activity requirements, such as bike/pedestrian improvements, historic preservation, beautification or other qualifying activity. A county may apply for enhancement funding for eligible projects through VDOT's annual application process. Enhancement grants must be matched with local funds or in-kind services.
- **Highway Safety Improvement Program** – federal funding for activities such as highway safety improvement and highway/railroad grade crossing improvements. A county may apply for safety funding for eligible projects through VDOT's annual application

process. Currently VDOT provides the required match for these funds “off-the-top.” A county may use regular allocations of State construction funds or local funds to meet the non-federal matching requirements for these funds in future years.

- **Federal Off-system Bridge Program Funds** – federal funding for bridge projects. Beginning in FY 2010, bridge program funds will not be part of the secondary allocation and will be prioritized on a State-wide basis. A county may use regular allocations of State construction funds or local funds to meet the non-federal matching requirements for these funds if funds are provided for a qualifying bridge.
- **Federal Scenic Byways Program** – federal funding for projects on routes designated as “Virginia Byways” pursuant to §33.1-62 through §33.1-66 of the *Code of Virginia*. A county may apply for this funding for eligible projects through VDOT’s annual application process. A county may use regular allocations of State construction funds or local funds to meet the non-federal matching requirements for these funds.
- **Public Lands Highways: Forest Highways Program Funds** – federal funding available for public roads that are owned by State or local agencies and serve the National Forest System. Annual program allocations are provided to the State from FHWA based on statewide priorities. A county with designated “Forest Highways” may apply for these funds. Forest Highway program funds do not require a non-federal match since “100 percent” funding is provided.
- **Public Lands Highway: Discretionary (PLHD) Funds** – federal funding available for improvements to roads that are open to public travel and serve federal property such as National Forests, National Parks, nontaxable Indian lands, military installations, or other federal lands. Each year, the FHWA Federal Lands Highway Division issues a call for applications to fund candidate projects in the upcoming federal fiscal year. Applications must be submitted by VDOT to the FHWA Virginia Division. A county would be eligible to apply for these funds. PLHD funds do not require a non-federal match.
- **Revenue Sharing Program Funds** – State funding to construct, maintain, or improve the highway systems within a county. County funds would be matched with State funds, with statutory limitations on the amount of State funds authorized per locality. A county assuming responsibility for all or part of its construction program would be eligible to apply. Revenue Sharing funds are provided annually by the CTB. Requests for funds are made through an application process.
- **Economic Development Access Program Funds** – State funding available to finance the construction or improvement of roads to new or expanding qualified economic development sites. A county assuming responsibility for all or part of its construction program may apply for these funds. Applications for Economic Development funding are taken throughout the year. Similar processes apply to funds provided to construct or improve access roads to recreational areas and airports.

## 6.6 Existing Local Funding Options

Counties that assume some or all responsibility for the secondary highway system within their jurisdictions may seek to expand the size of their programs by allocating existing general fund resources or establishing new sources of revenue for transportation. Under current State law, Virginia counties are somewhat limited in the options available to them for increasing revenue. These options include the following:

- **Real Estate Taxes** – counties may increase the tax rates levied on personal and business properties to raise revenues for transportation purposes. This may include the establishment of special taxing districts to pay for transportation on either a pay-as-you-go basis or through debt financing. Real estate taxes are the primary mechanisms counties currently use to finance transportation initiatives.
- **Personal Property Taxes** – counties may raise their personal property tax rates and/or alter their assessment methodology to raise additional revenues for general purposes, including transportation investment.
- **Merchants' Capital Tax/Business, Professional, and Occupational License (BPOL)** – counties are authorized to levy a local Merchant's Capital or BPOL tax (but not both) on businesses operating within their jurisdiction. These taxes are charged as a number of cents per hundred dollars on gross receipts. Under current law, the maximum tax rate is 36 cents per hundred dollars.
- **Miscellaneous Fees and Fines** – counties may raise fees and fines for a variety of activities/infractions to raise funds, subject to any applicable restrictions in Virginia law.

## 6.7 Potential New Sources for Local Funding

As part of a long-term funding strategy, counties may wish to consider funding mechanisms that would require new statutory authority. While not an exhaustive list, the following are some of the more common local transportation funding mechanisms that are used throughout the country:

- **Local Income Taxes** – some states allow local governments to charge an additional income tax to fund local government activities. Taxes are typically imposed as a percentage of an individual's or businesses' adjusted federal gross income (AGI).
- **Tourism-related Taxes and Fees** – local governments often impose taxes and surcharges on a variety of tourism-related activities as either stand-alone mechanisms or as add-ons to state taxes. Examples include transient occupancy taxes, hotel and lodging excise taxes, rental car surcharges, recreational vehicle space surcharges, and parking fees.
- **Local Option Gas Taxes** – some states allow local governments to impose local option taxes on motor fuels as either an excise tax (additional cents per gallon) or sales tax (percent of gross receipts).
- **Local Vehicle Registration Fees** – several states allow counties to impose add-on registration fees or vehicle impact fees.

- **“Sin” Taxes** – counties could consider pursuing General Assembly approval to impose add-on taxes to items such as cigarettes and liquor.
- **Impact Fees** – several states allow local jurisdictions to impose impact fees on developers to cover the cost of transportation needs generated by development (this is in addition to fees for reviewing and approving site plans).

The establishment of new funding mechanisms for county transportation programs in Virginia would obviously represent a significant initiative. In developing strategies to establish new funding mechanisms for transportation, a county or counties will need to assess a broad array of considerations, including the following:

- **Adequacy** – the level of potential funds generated relative to the size of the anticipated need;
- **Volatility** – the ability of a mechanism to produce a stable and reliable revenue stream;
- **Administration** – the costs of administering a tax or fee (e.g., collection and management costs) relative to the amount of revenue it brings in;
- **Equity** – the applicability of a tax or fee to user/beneficiary pay philosophy and the potential impacts of the tax or fee on different categories of individuals or businesses;
- **Competitiveness** – the direct and indirect economic impacts a tax may have on a region; and
- **Implementation Issues** – the various legal, political, and organizational barriers to implementation; the need for, and ability to obtain, legislation as well as the legal capacity to capture and dedicate revenues; and the capital market’s view of the mechanism as a means for securing debt.

## **6.8 Financing Options**

Counties may elect to issue debt backed by different revenue streams to finance construction projects. Several counties, including Spotsylvania, Fairfax, Prince William, and Chesterfield have done so in recent years through transportation bond programs. Potential debt mechanisms include the following:

- **Tax Increment Financing (TIFs)** – a county may issue debt that is repaid with additional tax revenues that result from the project due to increased real estate assessments and associated real estate tax proceeds.
- **General Obligation and Revenue Bonds** – a county may issue debt backed by either its general fund or dedicated portions of new or existing county revenue mechanisms (e.g., through tax assessment districts).
- **Bonding Against Secondary Road Allocations** – a county may utilize a portion of its annual secondary highway allocation as reimbursement for debt incurred to pay for eligible project costs on approved projects. This is limited to one-third of the annual allocation and may be affected by the amount of State funds available.

Counties considering the use of debt to enhance their transportation programs will need to consider a variety of issues, such as the need to gain voter approval, the impact of the added debt on their credit rating, and the trade-offs between early delivery of transportation projects and the long-term costs of issuing debt.

## Appendix A: Commonly Used Acronyms

**AGI** – Adjusted Gross Income  
**AHQ** – Area Headquarters  
**ARA** – Assistant Residency Administrator  
**BPOL** – Business, Professional, and Occupational License  
**CMAQ** – Congestion Mitigation and Air Quality  
**DBE** – Disadvantaged Business Enterprise  
**FHWA** – Federal Highway Administration  
**FMSII** – (VDOT's) Financial Management System  
**LAD** – (VDOT) Local Assistance Division  
**MOU** – Memorandum of Understanding  
**MPO** – Metropolitan Planning Organization  
**NHS** – National Highway System  
**OMB** – Office of Management and Budget  
**ROW** – Right-of-way  
**RSTP** – Regional Surface Transportation Program  
**SRTS** – Safe Routes to School  
**SSYP** – Secondary Six-Year Plan  
**STIP** – State Transportation Improvement Plan  
**TIF** – Tax Increment Financing  
**TIP** – Transportation Improvement Plan  
**VDOT** – Virginia Department of Transportation

## Appendix B: Project Participants

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## Appendix C: Overview of the Henrico County Transportation Program

While many counties may look to Henrico County as a model for both what they would like to achieve through assumption of secondary system responsibilities and how they would like to structure their transportation programs, it is important to note a few caveats about Henrico County's highway program:

- The program is the product of more than 70 years of development and evolution;
- Richmond is a large metropolitan area that enables Henrico County to access labor skills that may not be available in other parts of the State;
- Henrico County has a (comparatively) large county government and Public Works Department, which enables the county to realize economies of scale with respect to staffing and administrative functions;
- The combined mission of the Henrico County Public Works Department (transportation and drainage) makes it difficult to compare Henrico County's highway program costs to VDOT secondary system expenditures on an apples-to-apples basis; and
- Henrico County adds significant funding to its transportation program (beyond the allocations the County receives from VDOT).

These caveats aside, information on Henrico County's transportation program may still be helpful to counties as they consider devolution options and/or plan for the assumption of secondary system responsibilities. The following is a brief overview of their program. For additional information see Henrico County's Department of Public Works' website at <http://www.co.henrico.va.us/works/>.

### Program overview

Henrico County currently maintains 3,248 lane miles of roadway and 57 bridges and structures, as well as several Park and Ride Lots. The County's transportation program is housed within the County's Department of Public Works, which is responsible for developing, improving, and maintaining, an efficient and safe transportation and drainage network. The Department has a total of 261 full time positions and is divided into the following six divisions:

- **Administration** – responsible for general administrative functions, such as procurement, fiscal services, and audit. This division has nine staff members and all work is performed in-house.
- **Construction Division** – responsible for management and inspection of capital improvement road and drainage projects, maintenance replacement projects, the tree removal program, permitting (issuance and enforcement), the inspection of road improvements resulting from commercial and residential construction; bridge and

structure inspection. This Division has 19 staff members (includes two Capital Projects coordinators).

- **Design Division** – responsible for developing plans and preparing construction documents (or review/ approve consultant-prepared plans) for County roadways and drainage projects. In addition, the Division reviews all proposed private development, subdivisions, plans of development and building permits to ensure they are in compliance with applicable County Code requirements and Department policy. This Division has 19 staff members (includes three GIS coordinators).
- **Engineering and Environmental Services** – responsible for performing various functions associated with protecting and preserving the natural environment, such as review of erosion and sediment control plans for construction sites, environmental certification of building sites, and implementation of Chesapeake Bay Preservation Area Designation and Management Regulations. The Division has 23 full time positions.
- **Road Maintenance Division** – responsible for performing a wide range of highway maintenance, construction, and operations activities, including road and drainage system maintenance, pavement resurfacing and resealing, roadside and median grass mowing, bridge repair, snow and ice removal, secondary street construction, and storm sewer and driveway culvert installation. The Division includes two sections (East and West), each of which have their own maintenance facilities (a.k.a., AHQs) and own/maintain significant equipment inventories. The Division has a total of 146 full time positions, 97 in the West Section and 59 in the East Section. Approximately eight (8) percent of the Road Maintenance Division’s work is outsourced.
- **Traffic Engineering Division** – responsible for determining roadway speed limits, as well as installing and maintaining traffic signals and signs. The Division also conducts traffic studies and traffic counts, installs and maintains pavement markings, and reviews development plans from a traffic aspect. In addition, the Division is responsible for the issuance of hauling permits for oversized loads that will be traveling on Henrico county maintained roads. The Division has 35 full time positions.

**Appendix D:**  
**User's Manual for the Feasibility Model**

# Feasibility Model for Secondary System Assumption by Virginia Counties (User's Manual)



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## 1 Introduction

The Feasibility Model for Secondary System Assumption by Virginia Counties (Secondary System Analysis Model or “the model”) was developed to provide Virginia’s counties with a tool for exploring the costs and institutional implications (staffing, equipment, and facility needs) of assuming secondary system responsibilities under four devolution options:

1. Maintenance only;
2. Construction only;
3. Maintenance and construction; and
4. Maintenance, construction, and operations (full devolution and operational responsibility, similar to the arrangements currently in place for Henrico and Arlington Counties).

To the extent possible, the model is designed to replicate what would be required to deliver a county-level secondary system program if a county mirrored VDOT’s current approach and service levels. Actual costs and resource demands a county would need to address under devolution may vary widely depending on the county’s unique characteristics, performance targets, and program delivery approach. The key capabilities of the model are as follows:

- **Cost Outputs** – the model provides a six-year forecast of costs under each of the devolution options. Cost estimates for maintenance and operations include direct costs (e.g., crewmen wages and costs for contracts, and supplies) and overhead costs (e.g., facility operation and general management costs). Overhead costs for construction are incorporated into the direct cost output. In addition, costs for countywide cost centers (for activities that are funded out of VDOT’s construction budget but are operational or non-project-specific in nature) are estimated for the operations and construction functions. The model also forecasts potential start-up costs for equipment and facilities under each devolution option.
- **Institutional Outputs** – the model identifies a recommended staffing and equipment complement, and estimates facilities requirements (e.g., the number of needed maintenance facilities).
- **Sensitivity Analysis** – the model provides users with the ability to adjust a wide range of considerations, including devolution start dates, service levels for various maintenance activities, overhead calculation methodologies, future system growth, inflation rates, and expanded construction programs (beyond what is in the 2007 Secondary Six-Year Program (SSYP)). The model also allows users to override default estimates and manually input staffing, equipment, and facility requirements.

It is important for users to understand that the model neither provides a definitive forecast of payment rates for maintenance and/or operations, nor does it reflect the actual terms of the

## Feasibility Model for Secondary System Assumption User's Guide

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memorandum of understanding (MOU) and/or devolution agreement a county would enter into with VDOT. Guidance on these matters is provided in the *Devolution Guidebook*.

## 2 Getting Started

While the model includes basic directions on the “Intro” page and is fairly self-explanatory to use, it is recommended that users read this entire manual before running the model. It is also recommended that users first read the *Devolution Guidebook* to familiarize themselves with the devolution options and the considerations associated with county assumption of secondary system responsibilities under each option.

### 2.1 System Requirements

Figure 1: System Requirements

System Component	Requirement
Operating System	Microsoft Windows 2000 with Service Pack 3 (SP3), Windows XP, or later version
Excel Version	Microsoft Excel 2000
Processor	Intel Pentium 233 MHz or faster
Memory	128 megabytes (MB) of RAM or greater
Hard Disk	150MB of available disk space or greater
Drive	CD-ROM or DVD-drive

### 2.2 Downloading the Model

Users should download a master version of the model to their hard drive or server. To do so, open the file entitled Secondary System Assumption Model v1.0 provided on VDOT’s website, click on “file,” then select “save as” and save the file under the appropriate folder (note: you may wish to create a separate file to save the master version and runs of the model).

### 2.3 Enabling Macros

Depending on your computer’s security settings, your computer may ask you if you want to enable macros, in which case you should click on the button labeled “Enable Macros.” If your computer informs you that macros have been disabled, click on the “Tools” menu, select “Macro,” and then “Security.” Check the box for “Medium,” close Excel, reopen the model file and click on the “Enable Macros” button.

### 2.4 User Information Requirements

A basic run of the model for an individual county can be completed without any additional data input from the user by selecting all of the model default options. More customized model runs will require users to provide inputs or select options for items such as future system growth, selection of countywide cost functions, the addition of construction projects, and preferences for addressing staffing, equipment, and facilities needs. Additional details on the user information requirements to address these inputs and options are described later in this document.

## **2.5 Model Overview**

The model uses common Microsoft Windows features such as dropdown menus and click boxes to enable the user to quickly select options and enter data. The core model is comprised of the following ten worksheets:

1. ***Intro Page*** – identifies general instructions for using the model; provides inputs for designating the user, file name for the analysis run, and the date of the analysis. The worksheet also includes macros for starting the analysis, saving the file run, printing the entire model output, and resetting the entire model to default values.
2. ***General Inputs*** – provides options to define the general parameters of the analysis run (e.g., county being analyzed, devolution scenario to be modeled, and devolution start year), input additional data on system growth and program size, and define user preferences for level of service and optional devolution functions.
3. ***Cost Outputs*** – summarizes the annual and one-time start-up costs for the selected devolution option.
4. ***Staffing Inputs*** – identifies recommended positions and staffing levels for the selected devolution option and enables the user to add or delete positions, adjust staffing levels, and provides options for how positions will be filled (i.e., through existing county resources or through outsourcing).
5. ***Staffing Outputs*** – summarizes the results from the options selected on the ***Staffing Inputs*** worksheet.
6. ***Facility Inputs*** – identifies a recommended number of maintenance facilities and/or office space needs and provides options for adjusting these needs.
7. ***Facility Outputs*** – calculates non-recurring facilities costs.
8. ***Equipment Inputs*** – identifies a recommended equipment complement for the selected devolution option and enables the user to add or delete items and adjust the number of items required.
9. ***Equipment Outputs*** – summarizes the results from the ***Equipment Inputs*** worksheet and calculates the associated cost.
10. ***2005 \$s Calculator*** – converts costs from a user-identified base year to constant 2005 dollars to assist users in entering financial inputs correctly.

The model worksheets all follow a consistent format. Each worksheet includes a uniform header that identifies the analysis parameters and provides a row of navigation bars; clicking on a navigation bar takes the user to the applicable worksheet. In addition, each page includes a forward and backward arrow that moves the user to either the previous or next logical worksheet in the analysis process. All input cells are highlighted in yellow with blue lettering; all other cells are protected and cannot be changed or accessed by the user. Information generated by the model is presented in cells with white background and black lettering. Additional information and/or guidance is provided in text boxes throughout the model and is

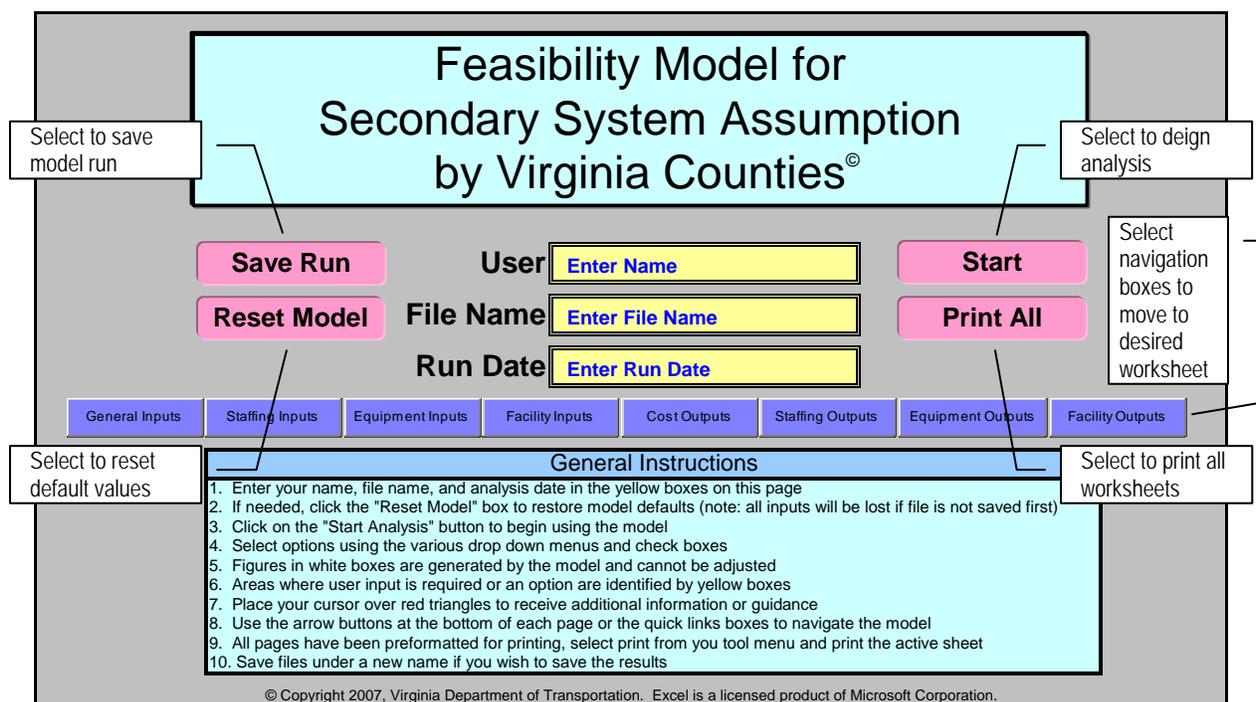
designated by a red triangle in the upper right-hand portion of the applicable cells. To reveal the text box, hold the cursor over the triangle. Users can print the entire model run by choosing the "Print All" button located on the *Intro Page*, or print individual worksheets by choosing the print button located at the bottom of each worksheet.

### 3 Instructions for Conducting Analyses

#### 3.1 Intro Page

The model should open up to the *Intro Page* worksheet pictured below in **Figure 2** (if not, click on the *Intro Page* navigation box at the top portion of the worksheet you are in). If you have opened a previous run of the model and want to reset the model to the original default values, click on the “Reset Model” button. Using the Reset Model function will erase all user inputs; ensure you have saved a version of the existing model run if you do not want to lose the prior analysis.

Figure 2: Intro Page



In the appropriate cells, enter your name (or the person/group name you want associated with the analysis run), and the name you want to give to the analysis. The model will automatically set the “Run Date” to the date you are conducting the analysis; type in specific date if you do not want the run date to change if and when you run the model on a subsequent date. Click on the “Save Run” button; a text box will appear asking if you want to save the file under the name you have entered. Clicking “Yes” will prompt the “Save As” box. Follow the basic Microsoft Windows protocol to save the file to a convenient location on your hard drive or server, then click on the “Start” button to move to the *General Inputs* worksheet and begin the analysis.

#### 3.2 General Inputs Tab

The *General Inputs* worksheet defines the basic parameters and other key considerations for the analysis. As illustrated in **Figure 3**, the first section of this worksheet requires the following inputs:

## Feasibility Model for Secondary System Assumption User's Guide

- A. **Select County** – use the scroll bar and click on the county for which the analysis is being conducted.
- B. **Select Secondary Road Functions** – click on the devolution option you wish to analyze.
- C. **Select Start Date** – click on the first year you want devolution to begin (must be at least one year after initial notification by a county of intent to negotiate a devolution agreement and MOU with VDOT).
- D. **Inflation Rate** – using the drop down menu, select whether you wish to use the model's default inflation rate (three percent) or input an inflation rate. If you select "Input Inflation Rate," a yellow cell will appear below the drop down menu – enter the inflation rate you want to use. Increasing or decreasing the inflation rate will have a corresponding impact on model cost outputs since the rate is used to adjust all model outputs to nominal (i.e. year-of-expenditure) dollars.

**Figure 3: General Inputs – Part I**

The screenshot shows the 'General Inputs' form with the following sections and callouts:

- Baseline Considerations:**
  - Select County:** Callout: "Select county to be analyzed". Options: None, Accomack, Albemarle, Alleghany, Amelia.
  - Select Devolution Option:** Callout: "Select the option you want to model". Options: None, Maintenance Only, Construction Only, Maintenance and Construction, Maintenance, Construction, and Operations.
  - Select Start Year:** Callout: "Select the first year of devolution". Options: FY 2007, FY 2008, FY 2009, FY 2010.
  - Inflation Rate:** Callout: "Select method for setting inflation rate". Input Values dropdown, 0.0% (yellow cell), Input inflation rate.
- Overhead Factors:**
  - Input Overhead Multipliers (% of Costs) dropdown.
  - Callout: "Select overhead calculation method".
- System Growth (optional):**
  - Input Future System Growth dropdown.
  - Additional Lane Miles.
  - Additional Structures.
  - Callout: "Input the number of lane miles and/or structures added each year".
- Maintenance and Operations:**
  - Maintenance: 0.0% (yellow cell).
  - Operations: 0.0% (yellow cell).
  - Callout: "Input overhead as a percentage of cost." with dollar input fields.
  - Callout: "Input overhead percentage or annual cost, as applicable".
  - Callout: "Select option to use historical system growth or to input future growth".
  - Table for years 2006-2015 with values 0.0 and 0 (yellow cells).
  - Callout: "Enter number of lane miles and bridges/structures added each year." below the table.

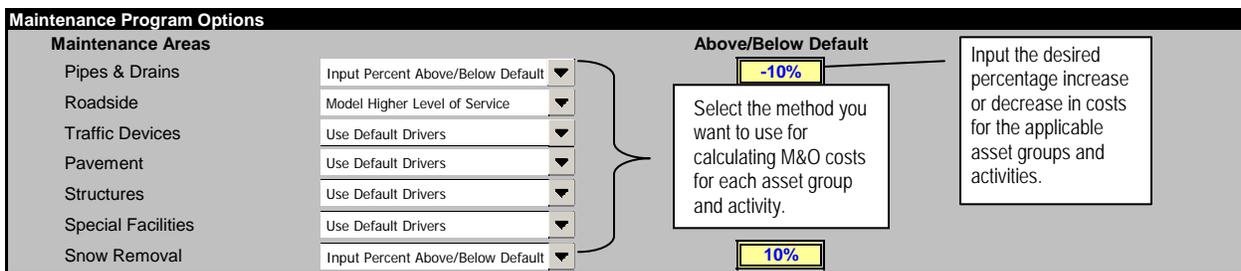
- E. **Overhead Rate** – using the drop down menu, select the overhead estimating approach you wish to use (this only applies to maintenance and operations functions). Selecting "Use default Overhead Multipliers" will cause the model to calculate program overhead costs based on VDOT's current (FY 2007) calculated overhead rates. If you select "Input Overhead Multipliers (% of Costs)" or "Input Overhead Amount (2005 \$s)," yellow cells will appear to the right of the menu for "Maintenance" and "Operations," (as appropriate, based on the devolution option you have selected). For the input overhead multiplier option, enter the overhead rates you want to use; these rates will be multiplied by the appropriate direct program costs to calculate program overhead costs. For the input overhead amount option, input the dollar value (in thousands of 2005 dollars) of anticipated overhead costs for each function. (Note: the *2005 \$s Calculator* worksheet can be used to convert figures to 2005 dollars).
- F. **System Growth** – using the drop down menu, select whether you wish to "Use Current System Inventory" or "Input Future System Growth" for the county you are analyzing.

The number of lane miles and/or structures added will affect the cost outputs for maintenance and operations, and may have an impact on estimated staffing, equipment, and facilities requirements. If you select the input future system growth option, a table will appear to the right of the menu with yellow input cells for 2006 through 2015 for additional lane miles and additional structures. Input the number of secondary system lane miles and/or structures you anticipate will be added for each year; these inputs will be added to the county's existing system inventory.

The next section of the *General Inputs* worksheet allows the user to adjust the level of service that a county wishes to provide for specific asset groups and activities (and estimate the associated cost and institutional requirements) under the *maintenance only*, *maintenance and construction*, or *maintenance, operations and construction* devolution options (this section is not applicable under the *construction only* devolution option). A detailed description of the asset groups and activities is provided in the *Devolution Guidebook*. As illustrated in **Figure 4**, the user can select "Use Default Values," "Model Higher Level of Service," or "Input Percent Above/Below Default" for each of the major maintenance asset groups and activities. The following is a description and directions associated with each option:

- **Use Default Value** – selecting this option for any or all asset groups and activities will cause the model to calculate program costs and institutional requirements based on historical VDOT expenditure data and current VDOT level of service.
- **Higher Level of Service** – selecting this option for any or all of the asset groups and activities will cause the model to estimate the program costs for attaining and maintaining an optimum level of performance. A detailed description of the higher level of service analysis methodology and definition of "optimum level of performance" is provided in the documentation section of this manual.
- **Input Percent Above/Below Default** – selecting this option for any asset group and/or activity will allow the user to adjust the level of service (and costs/institutional requirements) by a percentage of the default values. After you select this option, a yellow input cell will appear to the right of the applicable drop down menu; input a positive percentage figure or negative percentage figure, as appropriate. For example, to increase or decrease the level of service by 10 percent, enter 10 or -10, respectively. The level of service cannot be reduced by more than 100 percent.

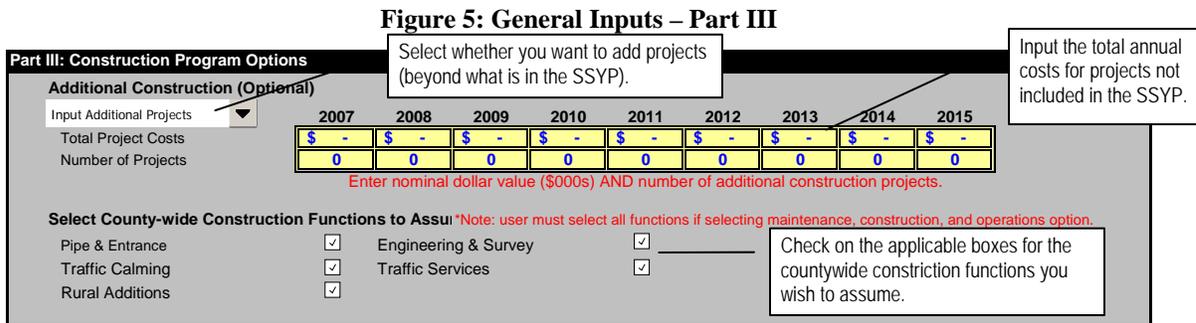
**Figure 4: General Inputs – Part II**



The final section of the *General Inputs* worksheet, shown in **Figure 5**, allows the user to input construction projects that are not in the 2007 SSYP and select the countywide construction functions to be assumed. A description of countywide construction functions is provided in the *Devolution Guidebook*. This section does not apply if you have selected the *maintenance only* devolution scenario.

Using the drop down menu, select “No Additional Projects” if you do not want to add projects, or select “Input Additional Projects” if you do. If you select the “Input Additional Projects” option, a table will appear to the right of the menu with yellow input cells for 2007 through 2015 for total project costs and number of projects. Input the total cost of projects **in nominal dollars** and the total number of projects added in each year. For projects that span more than one year, the anticipated annual costs should be input for each year, but the project should only be counted once (in the year it begins) for purposes of determining “number of projects.” Adding project costs will cause a corresponding increase in construction cost outputs, while adding “number of projects” may increase staffing, equipment, and facilities needs.

Under the *construction only* or *maintenance and construction* devolution options, a county may choose which countywide construction functions it wishes to assume. Check on the appropriate boxes to select the function you wish to assume. Selecting one or more of these functions will add the cost of performing these activities to the construction cost outputs. If you have selected the *maintenance, construction, and operations* devolution option, assumption of all countywide construction functions is mandatory; you must select all boxes.



Once you have completed the *General Inputs* worksheet, either click on the *Cost Outputs* navigation button (top of worksheet) to review results, or click on the right arrow at the bottom of the page to move to the *Staffing Inputs* worksheet.

### 3.3 Staffing Inputs Tab

The *Staffing Inputs* worksheet, illustrated in **Figure 6** allows the user to make adjustments to the default recommendation for staff positions and the associated number of full time equivalent (FTE) staffing levels.

Figure 6: Staffing Inputs

Staffing Inputs Page						
Percent Outsourced <input type="text" value="44%"/>		The default FTE requirement for maintenance/operations staff reflects VDOT's average historical in-house/outsourcing mix for the Richmond District.				
Position Description	Recommended Number of FTEs	Check to		Revised FTE Needs	Adjustments to Hiring Needs	
		Manually Set FTE Needs	Input Revised FTE Need		# of FTEs from Existing Co. Staff	# of FTEs Outsourced
<b>General Management</b>						
Transportation Director	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Administrative Support	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Chief Engineer (optional)	<input type="text" value="-"/>	<input checked="" type="checkbox"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Contracts Administrator	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Business Administrator	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Human Resources Specialist	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Other <input type="text" value=""/>	<input type="text" value="-"/>	<input type="checkbox"/>	<input type="text" value="-"/>	<input type="text" value="-"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Other <input type="text" value=""/>	<input type="text" value="-"/>	<input type="checkbox"/>	<input type="text" value="-"/>	<input type="text" value="-"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
<b>Maintenance Staff</b>						
Assistant Director - Maintenance/Operations	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Maintenance Superintendent	<input type="text" value="2"/>	<input type="checkbox"/>		<input type="text" value="2"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Superintendent	<input type="text" value="2"/>	<input type="checkbox"/>		<input type="text" value="2"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Members	<input type="text" value="14"/>	<input type="checkbox"/>		<input type="text" value="14"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Keeper	<input type="text" value="2"/>	<input type="checkbox"/>		<input type="text" value="2"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Equipment Shop Staff	<input type="text" value="3"/>	<input type="checkbox"/>		<input type="text" value="3"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Other <input type="text" value=""/>	<input type="text" value="-"/>	<input type="checkbox"/>	<input type="text" value="-"/>	<input type="text" value="-"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Other <input type="text" value=""/>	<input type="text" value="-"/>	<input type="checkbox"/>	<input type="text" value="-"/>	<input type="text" value="-"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
<b>Operations (Land Development) Staff</b>						
Traffic Engineer	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Jr. Traffic Engineer/Tech	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Permitting Specialist	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Other <input type="text" value="Jr. Permitting Specialist"/>	<input type="text" value="-"/>	<input type="checkbox"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
<b>Core Construction Staff</b>						
Assistant Director - Construction	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Engineering Techs/Designer	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Construction Project Manager	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
<b>User-defined Construction Staff</b>						
Surveyor	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
ROW Specialist	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Utilities Specialist	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Environmental	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Materials & Testing Specialist	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Traffic Engineer	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Senior Inspector	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Junior Inspector	<input type="text" value="1"/>	<input type="checkbox"/>		<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Other <input type="text" value=""/>	<input type="text" value="1"/>	<input type="checkbox"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
Other <input type="text" value=""/>	<input type="text" value="1"/>	<input type="checkbox"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="-"/>	<input type="text" value="-"/>
<b>Total Staffing</b>	<b><input type="text" value="34"/></b>			<b><input type="text" value="37"/></b>	<b><input type="text" value="-"/></b>	<b><input type="text" value="-"/></b>

\*Sum of input county and outsourced FTEs can not exceed FTE requirement/Input number of FTEs

At the top of the worksheet, the model identifies the level of maintenance and operations outsourcing that is used by the selected county's VDOT District. The level of outsourcing is reflected in the model's default FTE recommendation. Actual numbers of staff that a county may need to hire is dependent upon a county's actual outsourcing mix. Staff positions are divided into five categories: General Management, Maintenance Staff, Operations (Traffic Engineering/Land Development) Staff, Core Construction Staff, and User-defined Construction Staff. The following is a description of the adjustments that can be made on this worksheet:

- To add optional positions that are not pre-defined by the model, enter the name of the position in the "other" yellow input cells under the appropriate staffing category, then identify the number of FTEs you wish to add for each of the new positions under the column labeled "Input Revised FTE Need." For all staffing categories, changes to the default staffing needs will be reflected in the staffing outputs. In addition, changes to operations staffing levels will have an impact on operations cost estimates.

- To adjust the number of FTEs required for any or all positions (other than for positions you just added), click on the check box next to the applicable positions. A yellow input cell will appear next to the check box under the column labeled “Input Revised FTE Need.” Enter the number of FTEs you want to define for the associated position. The final FTE requirement for each position is then summarized in the column labeled “Revised FTE Need.”
- Once the final FTE requirements have been defined, the user may then adjust the number of FTE’s that need to be hired based on the availability of existing county staff to fill positions and expectations about outsourcing. To do so, input the number of FTEs that will be filled by existing county staff or outsourced into the appropriate yellow input cells under the columns labeled “# of FTEs from Existing Co. Staff” or “# of FTEs Outsourced.” If the combined number of outsourced and existing county FTEs exceeds the revised FTE needs, an error message will appear.

Once you have completed the *Staffing Inputs* worksheet, either click on the *Staffing Outputs* navigation button (top of the page) to review the results, or click on the right arrow at the bottom of the page to move to the *Facility Inputs* worksheet.

### **3.4 Facilities Inputs**

The *Facility Inputs* worksheet identifies the default facilities requirements for a county and allows the user to make adjustment to both the extent of facilities needs and the costs associated with meeting these needs. **Part I** of the worksheet, illustrated in **Figure 7**, which focuses on maintenance facilities needs and costs, includes the following sections (this section is not applicable if you are running a *construction only* devolution scenario):

- A. **Select Area Headquarters (AHQ) Driver** – use the drop down menu to select whether you want to use the “Default Number of Area HQs” or “Input Number of Area HQs” option. If you select the default option, the number of AHQs recommended by the model is provided for informational purposes under the column labeled “Number of AHQs.” If you select the input option, a yellow input cell will appear to the right of the menu; enter the number of AHQs you desire<sup>20</sup>.
- B. **AHQ Build-out Requirement** – use the drop down menu to select whether you want to use the “Assume All AHQs Need Build-out” or the “Input Number of AHQs Needing Build-out” option. If you select the former, no further action is required in this section. If you select the latter, a yellow input cell will appear to the right of the menu; input the number of required AHQs that will need to be built-out<sup>21</sup>.
- C. **Build-out Costs** – this selection allows the user to make adjustments to the cost basis for the basic components of maintenance facilities. Users can either accept the default number of elements and/or cost basis for each component (land, yard build-out,

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<sup>20</sup> AHQ is VDOT’s terminology for maintenance yards that house staff, equipment, supplies, and repair facilities.

<sup>21</sup> VDOT is planning a reduction in its number of maintenance facilities; counties should consult with VDOT to determine the availability and applicability of surplus AHQs, supply lots, etc.

buildings, and chemical facilities), or check the appropriate box under the “Change Cost Basis” column to input a cost. For checked items, a yellow input cell will appear to the right of the check boxes; input the number of components and/or cost you want to model for these items. Costs changes will affect the cost estimated for all AHQs needing build-out. To add “other” maintenance facility components, enter a description of the component, the cost per component, and the number of components in the appropriate yellow input cells. All cost inputs should be entered in **constant 2005 dollars**.

**Figure 7: Facility Inputs – Part I**

**Part I: Maintenance**

Select Area Headquarters (AHQ) Driver: Input Number of Area HQs

Input Number of Area AHQs: [2]

Check the applicable boxes to change the numbers of components needed.

AHQ Build-out Requirement\*: Input Number of AHQs Needing Build-out

# Needing Build-out: [1]

Build-out Costs:

	Default # of Elements	Adjust Need	Input Need	Default Cost Per Area HQ	Change Cost Basis	Input New Costs
Land Cost (9 acre lot)	[1]	<input type="checkbox"/>		\$ 911,662	<input checked="" type="checkbox"/>	\$ 750,000
Yard Build-out Cost	[1]	<input type="checkbox"/>		\$ 1,350,611	<input type="checkbox"/>	
Buildings Cost	[1]	<input type="checkbox"/>		\$ 804,739	<input type="checkbox"/>	
Chemical Facilities	[1]	<input type="checkbox"/>		\$ 258,867	<input type="checkbox"/>	
Other		<input type="checkbox"/>	[ ]		<input type="checkbox"/>	\$ -

Input description of "other" AHQ components.

**Part II** of the *Facilities Inputs* worksheet, illustrated in **Figure 8**, focuses on construction facility needs (this section is not applicable under the *maintenance only* devolution scenario) and includes the following sections:

- A. **Office Space Options** – use the drop down menu to select whether you want to use the “Use Existing County Space or Lease Space” or the “Purchase/Build All Required Space” option. If you select the former, no start-up office space costs will be calculated by the model and no further action is required by the user on the *Facilities Inputs* worksheet. If you select the purchase/build option, you must complete the next two steps.
- B. **Select Office Space Driver** – use the drop down menu to select whether you want to use the “Default Number of sq ft” or the “Input the Number of sq ft” option. If you select the default option, the default square footage requirement will appear under the column labeled “Number of sq ft Required.” If you elect to input the number of sq ft needed, a yellow input cell will appear to the right of the menu; input the number of sq ft you desire.
- C. **Office Space Cost** – use the drop down menu to select whether you want to use the “Default Cost Per sq ft” or the “Input Cost Per sq ft” option. If you select the default option, the default cost per square foot will appear under the column labeled “Default Cost Per sq ft.” If you elect to input the cost per square feet, a yellow input cell will appear to the right of the menu. All cost inputs should be entered in **constant 2005 dollars**.

Figure 8: Facilities Inputs – Part II

The screenshot shows the 'Part II: Construction Facilities (Office Space)' worksheet. It includes the following elements:

- Office Space Options:** A dropdown menu with 'Use Existing County Space or Lease Space' selected.
- Office Space Cost\*:** A dropdown menu for 'Input Cost Per sq ft'.
- Select Office Space Driver:** A dropdown menu for 'Input Number of sq ft'.
- Input Cost Per sq ft:** A text input field containing '\$ -'.
- Input Number of sq ft:** A text input field containing '195'.
- Input sq ft needed:** A text input field.
- Input cost per sq ft for office space:** A text input field.
- Note:** A red note at the bottom states: '\*Note: Enter costs in 2005 dollars; Office space input only applies if purchasing/building office space.'

Callout boxes provide additional instructions:

- 'Select whether you want to use existing space/rent or build an office.' points to the 'Office Space Options' dropdown.
- 'Select whether to use default or input sq ft needs.' points to the 'Select Office Space Driver' dropdown.
- 'Input sq ft needed.' points to the 'Input Number of sq ft' field.
- 'Input cost per sq ft for office space.' points to the 'Input Cost Per sq ft' field.
- 'Select whether to use default or input costs for office space.' points to the 'Office Space Cost\*' dropdown.

Once you have completed the *Facilities Inputs* worksheet, either click on the *Facilities Outputs* navigation button (top of the page) to review the results or click on the right arrow at the bottom of the page to move to the *Equipment Inputs* worksheet.

### 3.5 Equipment Inputs

The *Equipment Inputs* worksheet, illustrated in **Figure 9**, allows the user to make adjustments to the default recommendations for the types, number, and cost of vehicles and equipment (hereafter referred to as equipment) required for the selected devolution scenario. Equipment needs are broken into the following five categories:

1. **Recommended M&O Equipment** – the complement of equipment a county will likely need to deliver secondary system maintenance or maintenance and operations functions.
2. **Optional M&O Equipment** – specific equipment that a county may wish to add to the recommended complement (the default number of items recommended for these items is zero).
3. **Construction Equipment** – equipment a county will likely need to deliver a secondary system construction program.
4. **Office Equipment** – equipment such as computers and office furniture that a county will likely need to deliver the program(s) associated with the selected devolution option.
5. **Additional Equipment/Supplies** – vehicles, equipment, or other items that a county may wish to include in its start-up cost calculations, but are not included in the previous four sections.

Figure 9: Equipment Inputs

**Equipment Inputs**  
(Default Costs in 2005 \$\$/Enter All New Costs in 2005 \$\$)

	Default Need	Adjust Need	Input Need	Default Cost/Item	Adjust Cost	Input New Cost		Default Need	Adjust Need	Input Need	Default Cost/Item	Adjust Cost	Input New Cost
<b>Recommended M&amp;O Equipment</b>													
Air Compressors	1	<input checked="" type="checkbox"/>		\$ 23,600	<input checked="" type="checkbox"/>	\$ 20,000							
Concrete Mixers & Mortar Mixers	1	<input checked="" type="checkbox"/>		\$ 6,000									
Generators	1	<input checked="" type="checkbox"/>		\$ 16,800									
Pavers/Patchers	1	<input checked="" type="checkbox"/>		\$ 9,000									
Spreaders - Abrasive	1	<input checked="" type="checkbox"/>		\$ 108,425									
Steam Cleaners	1	<input checked="" type="checkbox"/>		\$ 3,055									
Sweepers	1	<input checked="" type="checkbox"/>		\$ 21,050									
Tanks - Water Sprinkler	1	<input checked="" type="checkbox"/>		\$ 1,365									
Tractors w/ Misc. Attachments	1	<input checked="" type="checkbox"/>		\$ 1,470									
Trailers - Other	1	<input checked="" type="checkbox"/>		\$ 255,700									
Trucks - Bridge	2	<input checked="" type="checkbox"/>		\$ 104,350									
Trucks - Bucket	4	<input checked="" type="checkbox"/>		\$ 78,975	<input checked="" type="checkbox"/>	\$ 80,000							
Trucks - Crash Cushion Vehicle	2	<input checked="" type="checkbox"/>		\$ 36,712									
Trucks - Utility Body & Crane	1	<input checked="" type="checkbox"/>		\$ 193,833									
Vac. All Trucks	2	<input checked="" type="checkbox"/>		\$ 5,300									
VMS - Trailer Mounted	1	<input checked="" type="checkbox"/>		\$ 128,333									
Miscellaneous	1	<input checked="" type="checkbox"/>		\$ 100,100									
	1	<input checked="" type="checkbox"/>		\$ 38,200									
	2	<input checked="" type="checkbox"/>		\$ 5,467									
	8	<input checked="" type="checkbox"/>		\$ 63,200									
	1	<input checked="" type="checkbox"/>		\$ 733									
	1	<input checked="" type="checkbox"/>		\$ 760									
	1	<input checked="" type="checkbox"/>		\$ 92,200	<input checked="" type="checkbox"/>	\$ 100,000							
	6	<input checked="" type="checkbox"/>		\$ 30,180									
	1	<input checked="" type="checkbox"/>		\$ 45,900									
	15	<input checked="" type="checkbox"/>		\$ 3,210									
	2	<input checked="" type="checkbox"/>		\$ 26,550									
	15	<input checked="" type="checkbox"/>		\$ 6,090									
	1	<input checked="" type="checkbox"/>		\$ 3,400									
	1	<input checked="" type="checkbox"/>		\$ 94,566									
	1	<input checked="" type="checkbox"/>		\$ 400									
	8	<input checked="" type="checkbox"/>		\$ 38,400									
	2	<input checked="" type="checkbox"/>		\$ 36,400									
	1	<input checked="" type="checkbox"/>		\$ 106,525									
	1	<input checked="" type="checkbox"/>		\$ 118,191									
	4	<input checked="" type="checkbox"/>		\$ 70,200									
	1	<input checked="" type="checkbox"/>		\$ 47,600									
	1	<input checked="" type="checkbox"/>		\$ 122,400									
	1	<input checked="" type="checkbox"/>		\$ 30,180									
	1	<input checked="" type="checkbox"/>		\$ 45,900									
	15	<input checked="" type="checkbox"/>		\$ 3,210									
	2	<input checked="" type="checkbox"/>		\$ 26,550									
	15	<input checked="" type="checkbox"/>		\$ 6,090									
	1	<input checked="" type="checkbox"/>		\$ 3,400									
	1	<input checked="" type="checkbox"/>		\$ 94,566									
	1	<input checked="" type="checkbox"/>		\$ 400									
	8	<input checked="" type="checkbox"/>		\$ 38,400									
	2	<input checked="" type="checkbox"/>		\$ 36,400									
	1	<input checked="" type="checkbox"/>		\$ 106,525									
	1	<input checked="" type="checkbox"/>		\$ 118,191									
	4	<input checked="" type="checkbox"/>		\$ 70,200									
	1	<input checked="" type="checkbox"/>		\$ 47,600									
	1	<input checked="" type="checkbox"/>		\$ 122,400									
	1	<input checked="" type="checkbox"/>		\$ 30,180									
	1	<input checked="" type="checkbox"/>		\$ 45,900									
	15	<input checked="" type="checkbox"/>		\$ 3,210									
	2	<input checked="" type="checkbox"/>		\$ 26,550									
	15	<input checked="" type="checkbox"/>		\$ 6,090									
	1	<input checked="" type="checkbox"/>		\$ 3,400									
	1	<input checked="" type="checkbox"/>		\$ 94,566									
	1	<input checked="" type="checkbox"/>		\$ 400									
	8	<input checked="" type="checkbox"/>		\$ 38,400									
	2	<input checked="" type="checkbox"/>		\$ 36,400									
	1	<input checked="" type="checkbox"/>		\$ 106,525									
	1	<input checked="" type="checkbox"/>		\$ 118,191									
	4	<input checked="" type="checkbox"/>		\$ 70,200									
	1	<input checked="" type="checkbox"/>		\$ 47,600									
	1	<input checked="" type="checkbox"/>		\$ 122,400									
	1	<input checked="" type="checkbox"/>		\$ 30,180									
	1	<input checked="" type="checkbox"/>		\$ 45,900									
	15	<input checked="" type="checkbox"/>		\$ 3,210									
	2	<input checked="" type="checkbox"/>		\$ 26,550									
	15	<input checked="" type="checkbox"/>		\$ 6,090									
	1	<input checked="" type="checkbox"/>		\$ 3,400									
	1	<input checked="" type="checkbox"/>		\$ 94,566									
	1	<input checked="" type="checkbox"/>		\$ 400									
	8	<input checked="" type="checkbox"/>		\$ 38,400									
	2	<input checked="" type="checkbox"/>		\$ 36,400									
	1	<input checked="" type="checkbox"/>		\$ 106,525									
	1	<input checked="" type="checkbox"/>		\$ 118,191									
	4	<input checked="" type="checkbox"/>		\$ 70,200									
	1	<input checked="" type="checkbox"/>		\$ 47,600									
	1	<input checked="" type="checkbox"/>		\$ 122,400									
	1	<input checked="" type="checkbox"/>		\$ 30,180									
	1	<input checked="" type="checkbox"/>		\$ 45,900									
	15	<input checked="" type="checkbox"/>		\$ 3,210									
	2	<input checked="" type="checkbox"/>		\$ 26,550									
	15	<input checked="" type="checkbox"/>		\$ 6,090									
	1	<input checked="" type="checkbox"/>		\$ 3,400									
	1	<input checked="" type="checkbox"/>		\$ 94,566									
	1	<input checked="" type="checkbox"/>		\$ 400									
	8	<input checked="" type="checkbox"/>		\$ 38,400									
	2	<input checked="" type="checkbox"/>		\$ 36,400									
	1	<input checked="" type="checkbox"/>		\$ 106,525									
	1	<input checked="" type="checkbox"/>		\$ 118,191									
	4	<input checked="" type="checkbox"/>		\$ 70,200									
	1	<input checked="" type="checkbox"/>		\$ 47,600									
	1	<input checked="" type="checkbox"/>		\$ 122,400									
	1	<input checked="" type="checkbox"/>		\$ 30,180									
	1	<input checked="" type="checkbox"/>		\$ 45,900									
	15	<input checked="" type="checkbox"/>		\$ 3,210									
	2	<input checked="" type="checkbox"/>		\$ 26,550									
	15	<input checked="" type="checkbox"/>		\$ 6,090									
	1	<input checked="" type="checkbox"/>		\$ 3,400									
	1	<input checked="" type="checkbox"/>		\$ 94,566									
	1	<input checked="" type="checkbox"/>		\$ 400									
	8	<input checked="" type="checkbox"/>		\$ 38,400									
	2	<input checked="" type="checkbox"/>		\$ 36,400									
	1	<input checked="" type="checkbox"/>		\$ 106,525									
	1	<input checked="" type="checkbox"/>		\$ 118,191									
	4	<input checked="" type="checkbox"/>		\$ 70,200									
	1	<input checked="" type="checkbox"/>		\$ 47,600									
	1	<input checked="" type="checkbox"/>		\$ 122,400									
	1	<input checked="" type="checkbox"/>		\$ 30,180									
	1	<input checked="" type="checkbox"/>		\$ 45,900									
	15	<input checked="" type="checkbox"/>		\$ 3,210									
	2	<input checked="" type="checkbox"/>		\$ 26,550									
	15	<input checked="" type="checkbox"/>		\$ 6,090									
	1	<input checked="" type="checkbox"/>		\$ 3,400									
	1	<input checked="" type="checkbox"/>		\$ 94,566									
	1	<input checked="" type="checkbox"/>		\$ 400									
	8	<input checked="" type="checkbox"/>		\$ 38,400									
	2	<input checked="" type="checkbox"/>		\$ 36,400									
	1	<input checked="" type="checkbox"/>		\$ 106,525									
	1	<input checked="" type="checkbox"/>		\$ 118,191									
	4	<input checked="" type="checkbox"/>		\$ 70,200									
	1												

## 4 Model Outputs

The results from the model are presented in four outputs worksheets. The *Costs Outputs* worksheet, shown in **Figure 10**, provides an assumptions summary, estimated annual costs for maintenance, operations, and construction (as applicable) for the 6-year period beginning with the devolution year, and non-recurring start-up costs. For informational purposes, the model also provides data on average emergency spending (a description is provided in the documentation section), the level of maintenance and operations outsourcing used by a county's applicable VDOT District, and the percentage of the secondary system in a county that is eligible to receive federal funding (some qualifying bridge repair/replacement costs on otherwise ineligible secondary roads may qualify for federal bridge funds).

**Figure 10: Cost Estimate Summary**

Program Cost Estimates												
Assumptions Summary												
<b>Out-year Inflation Rate</b>	<input type="text" value="3%"/>	<b>M&amp;O Program Service Options</b>					<b>Plus/Minus Default</b>					
<b>Overhead Rate/Amount</b>	<b>Amount (\$000s)</b>	Pipes & Drains	<input type="text" value="Current VDOT Performance"/>			<input type="text" value="20%"/>						
Maintenance	<input type="text" value="\$-"/>	Roadside	<input type="text" value="Defined Level of Service"/>			<input type="text" value="10%"/>						
Operations	<input type="text" value="\$-"/>	Traffic Devices	<input type="text" value="Higher Level of Service"/>			<input type="text" value="-5%"/>						
	<input type="text" value="\$-"/>	Pavement	<input type="text" value="Higher Level of Service"/>									
	<input type="text" value="\$-"/>	Structures	<input type="text" value="Defined Level of Service"/>									
	<input type="text" value="\$-"/>	Special Facilities	<input type="text" value="Current VDOT Performance"/>									
	<input type="text" value="\$-"/>	Snow Removal	<input type="text" value="Current VDOT Performance"/>									
	<input type="text" value="\$-"/>	Operations										
<b>System/Construction Assumptions</b>		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
System Growth - Lane Miles		-	-	-	-	-	-	-	-	-	-	
System Growth - Bridges & Structures		-	-	-	-	-	-	-	-	-	-	
Additional Construction Project Costs (\$000's)		N/A	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Number of Additional Projects		N/A	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>County-wide Construction Cost Center Functions Assumed</b>	<i>(Assumption required under the Maintenance, Construction, and Operations option)</i>											
Pipe & Entrance	<input type="text" value="Yes"/>	Engineering & Survey		<input type="text" value="Yes"/>								
Traffic Calming	<input type="text" value="Yes"/>	Traffic Services		<input type="text" value="Yes"/>								
Rural Additions	<input type="text" value="Yes"/>											
Annual Costs (Nominal Dollars)												
		2009	2010	2011	2012	2013	2014					
<b>MAINTENANCE</b>												
Direct Costs		\$ 3,974,134	\$ 4,093,358	\$ 4,216,159	\$ 4,342,644	\$ 4,472,923	\$ 3,414,043					
Overhead Costs		\$ 112,551	\$ 115,927	\$ 119,405	\$ 122,987	\$ 126,677	\$ 130,477					
<b>Total Maintenance</b>		<b>\$ 4,086,685</b>	<b>\$ 4,209,286</b>	<b>\$ 4,335,564</b>	<b>\$ 4,465,631</b>	<b>\$ 4,599,600</b>	<b>\$ 3,544,520</b>					
<b>OPERATIONS</b>												
Direct Costs		\$ 370,155	\$ 381,260	\$ 392,697	\$ 404,478	\$ 416,613	\$ 429,111					
County-Wide Cost Centers		\$ 10,000	\$ 5,000	\$ 5,000	\$ 10,000	\$ 10,000	\$ 10,000					
Overhead Costs		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -					
<b>Total Operations</b>		<b>\$ 380,155</b>	<b>\$ 386,260</b>	<b>\$ 397,697</b>	<b>\$ 414,478</b>	<b>\$ 426,613</b>	<b>\$ 439,111</b>					
<b>CONSTRUCTION</b>												
Numbered Project Costs		\$ 803,222	\$ 628,353	\$ 652,356	\$ 616,054	\$ 616,054	\$ 616,054					
County-Wide Cost Centers		\$ 40,000	\$ 44,177	\$ 43,535	\$ 32,900	\$ 32,900	\$ 32,900					
<b>Total Construction</b>		<b>\$ 843,222</b>	<b>\$ 672,530</b>	<b>\$ 695,891</b>	<b>\$ 648,954</b>	<b>\$ 648,954</b>	<b>\$ 648,954</b>					
<b>Total Annual Costs</b>		<b>\$ 5,310,062</b>	<b>\$ 5,268,075</b>	<b>\$ 5,429,153</b>	<b>\$ 5,529,064</b>	<b>\$ 5,675,167</b>	<b>\$ 4,632,586</b>					
<b>Analysis Notes:</b>												
1) Construction estimates for 2013 - 2015 assume no growth above 2012 levels from 2007 SSYP.												
2) Operations Costs - a portion of these costs should be recovered through fees.												
Non-Recurring Costs (Nominal Dollars)						County-specific Information						
Real Estate		<input type="text" value="\$ 3,830,000"/>					Average Annual Emergency Costs	<input type="text" value="\$ 135,678"/>				
Vehicles and Equipment		<input type="text" value="\$ 6,480,445"/>					Percent of M&O Outsourced	<input type="text" value="44%"/>				
Office Set-up		<input type="text" value="\$ 115,083"/>					Percent of System "Federal Eligible"	<input type="text" value="12%"/>				
<b>Total Up Front Costs</b>		<b>\$ 10,425,528</b>										

The user can click on the Print button at the bottom of the worksheet to print just this page, or click on the Right Arrow button to move to the *Staffing Outputs* worksheet.

**Feasibility Model for Secondary System Assumption User's Guide**

The *Staffing Outputs* worksheet, illustrated in **Figure 11**, provides the staffing needs forecast based on the selected devolution options and any adjustments the user may have made on the *Staffing Inputs* worksheet. For each applicable position, the forecast identifies the total number of FTEs required, the number of FTEs that will likely be filled by either county staff or through outsourcing, and the resulting additional staffing need that a county would need to address through new hires. The user can click on the Print button at the bottom of the worksheet to print just this page, or click on the Right Arrow button to move to the *Facilities Outputs* worksheet.

**Figure 11: Staffing Needs Forecast**

<b>Staffing Needs Forecast</b>				
<b>Position Description</b>	<b>FTEs Requirements</b>	<b>FTEs Filled w/ Existing Co. Staff</b>	<b>Outsourced FTEs</b>	<b>Additional Staffing Needs</b>
<b>General Management</b>				
Transportation Director	1	-	-	1
Administrative Support	1	-	-	1
Chief Engineer (optional)	1	-	-	1
Contracts Administrator	1	-	-	1
Business Administrator	1	-	-	1
Human Resources Specialist	1	-	-	1
Other <input type="text"/>	-	-	-	-
Other <input type="text"/>	-	-	-	-
<b>Maintenance Staff</b>				
Assistant Director - Maintenance/Operations	1	-	-	1
Maintenance Superintendent	2	-	-	2
Assistant Maintenance Superintendent	-	-	-	-
Maintenance Supervisor	2	-	-	2
Maintenance Crew Members	16	-	-	16
Fiscal Assistant/Time Keeper	2	-	-	2
Equipment Shop Staff	3	-	-	3
Other <input type="text"/>	-	-	-	-
Other <input type="text"/>	-	-	-	-
<b>Operations (Land Development) Staff</b>				
Traffic Engineer (ops)	1	-	-	1
Jr. Traffic Engineer/Tech	-	-	-	-
Permitting Specialist	1	-	-	1
Other <input type="text" value="Jr. Permitting Specialist"/>	2	-	-	2
<b>Core Construction Staff</b>				
Assistant Director - Construction	1	-	-	1
Engineering Techs/Designer	1	-	-	1
Construction Project Manager	1	-	-	1
<b>User-defined Construction Staff</b>				
Surveyor	-	-	-	-
ROW Specialist	-	-	-	-
Utilities Specialist	-	-	-	-
Environmental	-	-	-	-
Materials & Testing Specialist	-	-	-	-
Traffic Engineer	-	-	-	-
Senior Inspector	-	-	-	-
Junior Inspector	-	-	-	-
Other <input type="text"/>	-	-	-	-
Other <input type="text"/>	-	-	-	-
<b>Total FTEs</b>	<b>39</b>	<b>-</b>	<b>-</b>	<b>39</b>

The *Facilities Outputs* worksheet, illustrated in **Figure 12**, provides a summary of the non-recurring facilities costs based on the selected devolution options and any adjustments the user may have made on the *Facilities Inputs* worksheet. The user can click on the Print button at the bottom of the worksheet to print just this page, or click on the Right Arrow button to move to the *Equipment Outputs* worksheet.



model output can be printed by clicking on the "Print All" button. You should also re-save the run under the existing or a new name.

## 5 Model Documentation

This section provides a summary of the data sources and estimating methodologies that are used in the Secondary System Assessment Model.

### 5.1 System Inventory

The system inventory is based on information found in HTRIS (VDOT's highway inventory information system). The county-by-county lane mile data was imported into the model from a file entitled "2005 Miles Lane Miles by Functional Class (FC) & National Highway System (NHS)." Data on the number of structures, by county, was imported from the file entitled "Secondary\_Bridges and Culverts."

### 5.2 County Stratification

A stated objective during development of the Secondary System Assessment Model was to create the capacity to estimate the cost and institutional needs to deliver "typical" VDOT level of service on the secondary system. To address variances in VDOT's costs and program delivery from one county to another and from one year to another, it was determined that counties should be grouped into various strata to create a means for calculating selected cost and staffing drivers based on averages for counties with similar characteristics.

To develop the county stratification approach used in the model, historical cost data (FY 2000-2005) on VDOT secondary system maintenance and operations expenditures from VDOT's financial management system (FMS2) was used to determine average constant secondary system expenditures by county. To avoid skewing the results due to one-time events, emergency costs that were reimbursed by the Federal Emergency Management Agency (FEMA), FWHA Emergency Relief Grants, or special appropriations from the General Assembly (e.g., for flooding or major snow storms) were netted out of the county-by-county averages. Correlation analyses were then conducted to determine the relationship between county-by-county expenditures and other factors. It was determined that there were reasonable correlations between secondary road spending and both geography/demographics and average daily vehicle miles traveled (DVMT) per lane mile for counties based on defined strata.

Counties were then grouped into four strata categories: Northern Virginia, Urban/High Growth, Rural-Mountain, and Rural-Other based on geography and/or population density. The two rural categories were then divided into counties with high DVMT per lane mile (over 200) and low DVMT per lane mile (under 200). Categories were then slightly adjusted to address county anomalies (i.e., abnormally high or low costs/lane mile). The following is a listing of the final stratification:

***Rural Low – DVMT/Lane  
Mile Counties***

Appomattox  
Brunswick  
Buckingham  
Charlotte  
Cumberland  
Essex  
Halifax  
King & Queen  
King William  
Lancaster  
Lunenburg  
Mathews  
Mecklenburg  
Northampton  
Northumberland  
Nottoway  
Prince Edward  
Richmond  
Southampton  
Surry  
Sussex  
Westmoreland

***Rural Mountain - Low  
DVMT/Lane Mile Counties***

Bath  
Bland  
Botetourt  
Carroll  
Craig  
Dickenson  
Floyd  
Giles  
Grayson  
Highland  
Lee  
Madison  
Nelson  
Patrick  
Rappahannock  
Rockbridge  
Russell  
Scott  
Shenandoah  
Wythe

***Northern Virginia Counties***

Fairfax  
Loudoun  
Prince William

***Rural – High DVMT/Lane  
Mile***

Accomack  
Amelia  
Campbell  
Caroline  
Charles City  
Culpeper  
Dinwiddie  
Fluvanna  
Gloucester  
Goochland  
Greensville  
Henry  
Isle of Wight  
King George  
Louisa  
Middlesex  
New Kent  
Orange  
Pittsylvania  
Powhatan  
Prince George

***Rural Mountain – High  
DVMT/Lane Mile***

Albemarle  
Alleghany  
Amherst  
Augusta  
Bedford  
Buchanan  
Clarke  
Franklin  
Frederick  
Greene  
Montgomery  
Page  
Pulaski  
Rockingham  
Smyth  
Tazewell  
Warren  
Washington  
Wise

***Urban/High Growth Counties***

Chesterfield  
Fauquier  
Hanover  
James City  
Roanoke  
Spotsylvania  
Stafford

**5.3 Maintenance Cost Estimates**

Maintenance cost estimates include two components: direct costs (e.g., maintenance crew labor, contracts, vehicle/equipment rental, supplies etc.) and overhead costs (e.g., management and facilities costs). To estimate direct costs, a database of historical (FY 2000-2005) VDOT secondary system maintenance expenditures for each county was developed from FMS2 data. County expenditure data was further delineated by maintenance-related costs for the six VDOT asset groups (Group 100: Pipes & Drains, Group 200: Roadway, Group 300: Traffic Devices, Group 400: Pavement, Group 500: Structures, and Group 600: Special Facilities) and snow

removal. This data was then used to develop “costs drivers” for each asset group and snow removal (for each strata) based on average constant costs per lane mile or structure (total average costs for all of the counties in a strata are divided by the total lane miles and structures for the strata). For a given county, the cost drivers for the associated strata are then multiplied by the number of lane miles or structures and the results are summed to estimate total maintenance costs in constant 2005 dollars. This cost figure is then adjusted for inflation for each of the years in the model output.

Default maintenance overhead costs are calculated by multiplying estimated maintenance costs by VDOT’s combined general overhead and maintenance overhead multipliers for 2007 (see below for further documentation on overhead rates). Users also have the option to input either their own overhead rate or a flat dollar figure.

#### **5.4 Cost Estimates for Operational Responsibilities**

Operations costs include three components: direct costs, countywide costs, and overhead costs. Direct costs include two parts. The first part covers costs from selected operational cost centers. The costs for these elements for a given county are calculated in the same fashion as described in the maintenance cost estimate section above.

In addition, the model calculates the cost of the additional land development staff needed for this option based on salary and overhead assumptions for the personnel (\$55,000/year for a traffic engineer and \$45,000/year for a permit specialist (2005 dollars) and an overhead multiplier of 0.70). The sum of these two costs is then totaled and adjusted for inflation to the applicable years in the model output tables.

The countywide cost center costs that are included in operations relate to anticipated expenditures for plan review. Estimates for a given county are based on what is included for the county in each applicable year in the 2007 SSYP.

#### **5.5 Construction Cost Estimates**

Construction cost estimates are based on the sum of project costs for “route-numbered” projects each year, for each county, in the 2007 SSYP. For years beyond FY 2012 (the last year of the 2007 SSYP), costs are “flat-lined” at the 2012 program level (in nominal dollars). Costs for countywide cost centers in the 2007 SSYP are accounted for separately (see below), and cost for items such as “district secondary allocations” and “future budget items & plant mix” were excluded from the county-by-county cost data. Since costs in the SSYP should already be expressed in year-of-expenditure figures, the costs are not adjusted for inflation in the final output tables. The Construction cost output table does not include an overhead element since the cost to administer projects should already be included in the SSYP project cost figures.

#### **5.6 Countywide Cost Centers**

The costs for countywide cost centers are based on the line item amounts shown for each county wide cost center, for each county, for each year in the 2007 SSYP. For years beyond FY 2012 (the

last year of the 2007 SSYP), costs are “flat-lined” at the 2012 program level (in nominal dollars). The allocation of countywide cost center costs is as follows:

- “Seeding and Fertilizing” costs are not considered optional, thus if a county elects a devolution option that includes construction, any seeding and fertilizing costs in the 2007 SSYP automatically show up on the construction county cost center output line.
- The “Right-of Way Engineering” cost center is related to outstanding VDOT liabilities that will remain the responsibility of VDOT, thus these costs are not included in the estimates of countywide cost center costs.
- The “Subdivision Plan Review” countywide cost center is treated as an operations cost. If a county selects the *maintenance, construction, and operations* devolution option, the subdivision plan review costs for the applicable county in the 2007 SSYP automatically show up in the operations county-wide cost center line item in the cost outputs table.

The sum of a county's costs for the remaining relevant countywide cost centers (“Pipe & Entrance,” “Traffic Calming,” “Rural Additions,” “Engineering & Survey, and “Traffic Services”) are summed on the construction countywide cost center line of the cost outputs table. For the *construction only* and *maintenance and construction* devolution scenarios, the costs that appear are based on the costs for “Seeding & Fertilizing” plus the costs for countywide cost centers that the county wants to assume (i.e., by checking the appropriate boxes on the **General Inputs** worksheet). For the *maintenance, construction, and operations* devolutions scenario, the user must elect to assume all countywide cost center functions.

## **5.7 Inflation Rate**

The model uses 2005 dollars as the constant dollar baseline. The inflation rate used to either adjust historical costs to constant 2005 dollars or inflate constant 2005 dollars to nominal (i.e. year-of-expenditure) dollars is three percent per year. This is both a widely-used industry benchmark and consistent with the cost estimating practices used by the VDOT Asset Management Division's "Planning Module".

## **5.8 Overhead Cost Estimates**

Model overhead cost estimates capture the program delivery expenses that are not accounted for in the direct cost calculations. Examples of overhead costs include rent, utilities, management and administrative staff, research, etc. For maintenance and operations functions, the model uses the sum of VDOT's FY 2007 calculated overhead rates for highway system maintenance (9.6 percent) and general agency management (8 percent). The resulting rate (17.6 percent) is multiplied by the direct program cost for the applicable year to determine overhead costs. This information was provided by the VDOT Financial Planning Division in a file named “Overhead Rate per 2007 Budget - Illustration v2.” Users also have the option to input either their own desired overhead rate for maintenance and operations, or to input a flat dollar figure (dollar figures must be entered in 2005 dollars and are inflated to nominal costs for the applicable year).

## 5.9 Higher level of Service Analysis

The “higher level of service” portion of the model (illustrated in **Figure 15**) allows the user to estimate the costs and institutional needs associated with delivering a level of secondary maintenance and/or operations performance that is not constrained by VDOT’s current budgetary limitations.

**Figure 15: Higher Level of Service Analysis**

Maintenance Program Options		Above/Below Default
Maintenance Areas		
Pipes & Drains	Input Percent Above/Below Default ▼	-10%
Roadside	Model Higher Level of Service ▼	
Traffic Devices	Use Default Drivers ▼	
Pavement	Use Default Drivers ▼	
Structures	Use Default Drivers ▼	
Special Facilities	Use Default Drivers ▼	
Snow Removal	Input Percent Above/Below Default ▼	10%

The model uses two approaches to estimate higher level of service costs and institutional needs. For selected secondary system assets (i.e., cross pipes, pavement surfaces, and pavement markings), the VDOT Asset Management Division’s Planning Module was used to identify the annual spending at the VDOT district level that would be required to 1) achieve optimal performance levels over a five year period; and 2) maintain optimal performance levels in year six and beyond. These cost estimates were then compared to historical average costs to determine the percentage “spending gap” between current and optimal spending for each asset group, for each VDOT District, for a five-year catch-up period and a “maintain” year (year six) . These percentages are then multiplied by the applicable maintenance cost driver (see documentation on maintenance cost estimation) and the results are inflated to the applicable year to determine higher level of service costs. Based on the assumption that a high percentage of the work required to achieve a higher level of service would be outsourced, the staffing needs associated with individual asset groups or activities are adjusted by 40% of the percentage spending gap (i.e., if the higher level of service for pavement required an 80% increase in spending, the staffing driver associated with pavement would only be increased by 32%).

For other assets and recurring functions, such as roadside maintenance and snow/ice removal, higher level of service was defined as a “noticeable improvement in performance” by system users. The required percentage increase in spending needed to achieve a noticeable improvement for the applicable assets groups and functions (25 percent) was determined based on the expert opinion of senior VDOT field personnel. This percentage is then multiplied by the applicable maintenance and/or operations cost driver and the results are inflated to the applicable year to determine higher level of service costs. Staffing needs are adjusted in the same fashion as described above. Model users also have the option to manually increase or decrease annual expenditures and staffing needs for each asset group and function by a percentage of the default cost estimates.

### 5.10 Equipment Needs Estimates

The approach for determining field equipment needs was developed through a combination of data analysis and consultation with senior VDOT field personnel. As a starting point, the consultant team reviewed a statewide inventory of maintenance and operations equipment and vehicles to establish an initial list of needed equipment. The consultant team then worked with selected VDOT maintenance personnel to 1) establish a list of equipment that would likely be required or optional for delivery of a secondary system program at a county level, and 2) determine “equipment drivers” (i.e., estimating methodologies) to calculate the number of each required equipment item that a county would need. (Note: it is assumed that some equipment that VDOT currently maintains at a residency or district level would be rented by a county on an ad hoc basis; these items are not included on the required or optional equipment lists.) Costs for each required and optional equipment item were provided by the VDOT Asset Management Division.

The approach for estimating office equipment needs (items and equipment drivers) was established through consultation with VDOT personnel. The required and optional field and office equipment items and the associated equipment drivers are documented in **Figure 16**.

**Figure 16: Equipment Recommendations**

Equipment Estimating Methodology	
Equipment Description	Considerations for Determining Need
Air Compressors	One per county.
Arrow Signs (Trailer Mounted)	Two per county.
Asphalt Haulers	One per county.
Asphalt Kettles	One per county.
Backhoe & Attachments	One per county.
Brooms - Truck Attachment	One per county.

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Equipment Estimating Methodology (Continued)	
Equipment Description	Considerations for Determining Need
Brush Chippers	One per county.
Compactors	One per county.
Concrete Mixers & Mortar Mixers	One per county.
Ditching Trucks	One per county.
Dump Trucks – Large	One per AHQ.
Dump Trucks – Standard	One per every two crewmembers (less the number of large/small trucks).
Dump Trucks – Small	One per AHQ.
Excavators	One per county.
Generators	One per AHQ, minimum of 2 per county.
Graders	One per county, additional graders may be required if county has a high number of dirt road lane miles.
Loaders – Large	One per county.
Loaders – Small (Bobcat)	One per county.
Mowers - Small Riding	One per AHQ.
Mowers - Tractor Attachments	Two per AHQ
Mowers - Walk Behind	One per county.
Pavement Breakers	One per county.
Pavers/Patchers	One per county.
Pickup Trucks	One per each supervisor and superintendent.
Rollers - 4 Ton 6 Ton Tandem	One per county.
Snowplows	Needs vary based on geography and the level of outsourcing.- (Calculated by multiplying the estimated number of dump trucks by the applicable VDOT District's current ratio of dump trucks to snowplows (based on VDOT statewide equipment inventory)).
Sprayers – Chemical	One per maintenance crew.
Spreaders – Abrasive	Needs vary based on geography and the level of outsourcing. (Calculated by multiplying the estimated number of dump trucks by the applicable VDOT District's current ratio of dump trucks to spreaders (based on VDOT statewide equipment inventory))
Steam Cleaners	One per county.
Sweepers	One per county.
Tanks – Water Sprinkler	One per county.
Tractors w/ Misc. Attachments	One per maintenance crew.
Trailers (Other)	One per county.
Trucks (Bridge)	One per county.
Trucks (Bucket)	One per county.
Trucks (Crash Cushion Vehicle)	Two per AHQ.
Trucks (Utility Body & Crane)	One per county.
Vacuum Trucks	One per county.
Variable Message Signs	Two per AHQ.

### 5.11 Staffing Needs Estimates

As with the equipment needs, the approach for determining recommended positions and staffing levels was developed through a combination of data analysis and consultation with senior VDOT personnel. For delivery of maintenance programs, a recommended staffing complement was developed that roughly equates to the organizational structure (for

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maintenance) of a typical VDOT residency office. The number of recommended maintenance superintendents is based on an adaptation of the estimating methodology used in the recent VDOT AHQ Study. Recommended crew staffing levels are calculated by determining the average number of crewman per lane mile (i.e., staffing driver) for each county strata based on the system inventory and county-by-county 2005 VDOT man-hour data for the secondary system, and then dividing the selected county's lane miles by the applicable staffing driver.

The recommended construction and operations staff positions and the methodologies for determining staffing levels were developed through consultation with various VDOT Residency, District, and Central Office staff. The specific estimating methodology for each recommended staff position is summarized in **Figure 17**.

**Figure 17: Staffing Recommendations**

Requirement	Considerations for Determining Need
<b><i>General Management Staff</i></b>	
Transportation Director	One per county
Assistant Director for Maintenance	One per county under all but the <i>maintenance only</i> devolution option (assume this role would then be performed by the Transportation Director)
Assistant Director for Construction	One per county under all but the <i>construction only</i> devolution option (assume this role would then be performed by the Transportation Director)
Administrative Support	One per county.
Contracts Administrator	One per county.
Business Administrator	One per county; individual may report to other areas of county government.
Human Resources Specialist	One per county; individual may report to other areas of county government.
<b><i>Maintenance Field Staff</i></b>	
Maintenance Superintendent	One per AHQ.
Assistant Maintenance Superintendent	Not required; counties with large AHQ staffs may elect to add this position.
Maintenance Supervisor	One per maintenance crew (up to 12 crewmembers).
Maintenance Crew Members	Calculated by the number of secondary lane miles divided by average number of lane miles per crewman for the applicable strata.
Fiscal Assistant/Time Keeper	One per AHQ.
<b>Equipment Shop Staff</b>	Based on the number of secondary system lane miles in a county (3 staff for counties with 1,500 lane miles or less, 4 staff for counties with 1501 to 3,000 lane miles, 5 staff for counties with more than 3,000 lane miles).

<b>Requirement</b>	<b>Considerations for Determining Need (cont)</b>
<b><i>Operations Staff</i></b>	
Traffic Engineer	One for counties with 2.0 or more lane miles added in first year of devolution, zero for counties adding less than 2.0 lane miles
Junior Traffic Engineer/Tech	Varies based on county growth. One position for counties with population over 100K, plus an additional position for every additional 100K in population, plus one position if the annual number of lane miles added is greater than five and one additional position for every additional 5 lane miles. For counties where the number of lane miles added per year is <.7 miles, one position is proposed which assumes both the Traffic Engineer and Subdivision Permit Specialist Roles.
Permit Specialist	Varies based on county growth. One position per county; plus one position if the number of permits processed for a county exceeds 250; plus one position for every additional 250 permits; plus one position if the annual number of added lane miles is greater than five and one position for every additional 5 lane miles.
<b><i>Construction Staff</i></b>	
Engineering Techs/Designers	One per every five construction projects (based on first year of devolution).
Construction Project Managers	One per every five construction projects (based on first year of devolution).
Right-of-way Specialists	User-defined.
Utilities Specialists	User-defined.
Environmental Specialists	User-defined.
Materials and Testing Specialists	User-defined.
Traffic Engineers	User-defined.
<b>Inspectors (Junior and Senior)</b>	User-defined.

## **5.12 Maintenance Facility Requirements**

County requirements for maintenance facilities, also known as area headquarters (AHQs), are based on an adaptation of the methodology used to estimate the statewide need for AHQs in the recent VDOT AHQ Study, conducted by the Virginia Transportation Research Council. Specifically, it is assumed that all counties require at least one AHQ, and that the ratio of lane miles to AHQ should not exceed 800. In other words, the model divides the number of lane miles in a selected county by 800 and rounds up to get to the estimated number of AHQ required. This is consistent with the VDOT AHQ study, which assumed an upper threshold of 800 lane miles per maintenance superintendent, with one AHQ per superintendent. The AHQ Study also incorporated daily vehicle miles travel (DVMT), response times, and storage needs into the analysis to adjust the threshold downward. These issues were not considered as

significant for county secondary systems, so no adjustment was made to the 800 lane miles/AHQ threshold.

The facility requirements for an AHQ and the associated costs for different facility elements is based on a survey of county land prices, the VDOT AHQ Combo Building Prototype Report (1999) and data on recent AHQ build-outs in New Kent and Rappahannock Counties provided by the VDOT Administrative Services Division.

### **5.13 Office Space Needs**

Office space needs are calculated based on the estimated number of office personnel, American Institute of Architects guidelines for office space (100 square feet per person plus 15 percent for common space). Office space costs are based on the cost for "Class B" office space in small urban areas and were developed through consultation with a few commercial real estate brokers in Virginia.

### **5.14 Emergency Spending**

To determine average annual emergency spending, by county, the historical (2000-2005) maintenance and operations cost data from FMSII was queried to identify all maintenance and operations costs that were reimbursed through funds from either the Federal Emergency management Agency (FEMA), Federal Highway Administration, or special General Assembly appropriations. These amounts were then converted to constant 2005 dollars and averaged. The emergency figure shown in the outputs table is inflated to the first year of devolution