Final Report VTRC 07-R20

Virginia Transportation Research Council

research report

Identification of Potential Fee Structures for Land Development Reviews by the Virginia Department of Transportation

http://www.virginiadot.org/vtrc/main/online_reports/pdf/07-r20.pdf

MATTHEW C. GRIMES, P.E.
Research Scientist

ROGER W. HOWE
Research Associate

Virginia Transportation Research Council, 530 Edgemont Road,
Charlottesville, VA 22903-2454, www.vtrc.net, (434) 293-1900

Standard Title Page - Report on Federally Funded Project

1. Report No. FHWA/VTRC 07-R20	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Identification of Potential Fee Structures for Land Development Reviews by the Virginia Department of Transportation		5. Report Date February 2007 6. Performing Organization Code
7. Author(s) Matthew C. Grimes, P.E., and Roger W. Howe		8. Performing Organization Report No. VTRC 07-R20
9. Performing Organization and Address Virginia Transportation Research Council 530 Edgemont Road Charlottesville, VA 22903		10. Work Unit No. (TRAIS) 11. Contract or Grant No. 83152
12. Sponsoring Agencies' Name and Address Virginia Department of Transportation 1401 E. Broad Street Richmond, VA 23219 FHWA P.O. Box 10249 Richmond, VA 23240		13. Type of Report and Period Covered Final 14. Sponsoring Agency Code
15. Supplementary Notes		

16. Abstract

This report describes an effort to determine the costs incurred by the Virginia Department of Transportation (VDOT) when reviewing land development proposals, such as traffic impact studies, comprehensive plan amendments, rezonings, and subdivision and site plans. Cost estimates were derived from a survey of land development staff from VDOT's districts and residencies who perform the reviews on a regular basis.

The VDOT reviewers who participated in the survey were shown actual land development proposals taken from the archives of VDOT's Culpeper District Office and asked to provide an estimate of how long it would take to review each proposal. The resulting estimates suggest that a review of even a relatively simple land development proposal will cost more than $1,000, which at the time of this writing is the statutory fee cap.

The report, therefore, recommends that $1,000 be used as the fee for review of a land development proposal. The report also recommends that additional studies be conducted to develop a fee schedule that is fair and easy to administer and that recovers most of the costs VDOT incurs in performing reviews of land development proposals.

17 Key Words	18. Distribution Statement
Land development review, land use, traffic impact studies	No restrictions. This document is available to the public through NTIS, Springfield, VA 22161.

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	69	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

FINAL REPORT

IDENTIFICATION OF POTENTIAL FEE STRUCTURES FOR LAND DEVELOPMENT REVIEWS BY THE VIRGINIA DEPARTMENT OF TRANSPORTATION

Matthew C. Grimes, P.E.
Research Scientist

Roger W. Howe
Research Associate

Virginia Transportation Research Council
(A partnership of the Virginia Department of Transportation
and the University of Virginia since 1948)

In Cooperation with the U.S. Department of Transportation
Federal Highway Administration

Charlottesville, Virginia

February 2007
VTRC 07-R20

DISCLAIMER

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Virginia Department of Transportation, the Commonwealth Transportation Board, or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

EXECUTIVE SUMMARY

Introduction

During the 2006 Session, Virginia's General Assembly enacted Chapter 527 of the 2006 Acts (see Appendix A), which was designed to improve the coordination of state and local transportation planning. The new provisions are part of an effort to compel more coordination between localities and the Virginia Department of Transportation (VDOT). The act requires that localities submit comprehensive plans, rezonings, traffic impact statements (TISs), site plans, and subdivision plats to VDOT for review if they will have a substantial impact on state-controlled highways.

Chapter 527 also requires that fees be imposed by VDOT for the reviews:

> The Department [VDOT] shall impose fees and charges for the review of applications, plans and plats . . . and such fees and charges shall not exceed the actual cost to the Department, or $1,000, whichever is less, for each review.

This study was undertaken in response to the Virginia General Assembly's requirement in Chapter 527 of the 2006 Acts that VDOT "submit a report to the Governor and the General Assembly by December 1, 2006, identifying the costs of conducting the reviews required by this act and recommending a reasonable fee schedule for such reviews."

The purpose of this study was to determine the cost to VDOT of reviewing individual land development proposals. This study attempted to determine the cost to VDOT of each type of land development review now mandated by the General Assembly in Chapter 527 and to recommend appropriate fees for carrying out the reviews. Although TISs are of particular importance to VDOT, this study did not focus exclusively on TISs, but rather on VDOT's role in the entire land development review process. However, the attempt to determine the costs of reviews of individual land development proposals proved to be a challenge. A preliminary search for data on the cost of performing the reviews failed to turn up sufficiently complete data to allow for a determination of the cost. These reviews are performed at VDOT's districts and residencies, and VDOT staff at the residency and district offices have not been required to keep sufficiently detailed or sufficiently complete records of the number of hours spent doing the reviews of individual land development submissions to allow the actual cost of performing the reviews to be determined. Therefore, in the absence of credible cost accounting data sufficiently detailed to determine the actual costs of the reviews, the researchers undertook a survey of VDOT employees who perform the reviews on a day-to-day basis in an attempt to obtain reasonable *estimates* of VDOT's costs.

The researchers asked VDOT reviewers from throughout the state—i.e., VDOT employees who *regularly* review land development proposals—to examine seven actual proposals from the Culpeper District's archives and to estimate the amount of time that would be required to review them (see Table ES1). The results of the survey turned out to be somewhat problematic. There was wide variation in the estimates of the time required to conduct the reviews. The researchers have no conclusive explanation for the variation in the estimates; however, many of the individuals who participated in the survey remarked to the researchers that

it was very difficult to estimate accurately the time that would be required to conduct reviews of the sample proposals, and many expressed a lack of confidence in the accuracy of their estimates.

It is, of course, possible that the variation in the estimates simply reflects the difficulty of accurately estimating the time required to carry out a review. The researchers noted one possibly illuminating pattern in the results: For five of the seven proposal samples used in the survey, the Northern Virginia (NOVA), Hampton Roads, and Fredericksburg districts had the three lowest estimates for the time required to conduct the reviews, and for the other two samples, two of these districts had the lowest estimates and the third was also near the lower end of the estimates. These three districts have staff that are largely dedicated to conducting land development reviews, although, here and there, there are individuals in the other districts who, for the most part, work solely on reviewing land development proposals. In contrast, some of the individuals who perform the reviews in the other districts often have other duties, and the effects of these multiple—and simultaneous—demands on their time may have significant consequences in their ability both to perform the reviews quickly and to provide accurate estimates of the amount of time it would take them to perform the reviews.

Some of these reviewers told the researchers that they are seldom able to devote a large block of time to focusing on a review. Their reviews are frequently interrupted by the need to do other tasks, including trips into the field for any number of reasons. So, for example, although a reviewer whose job is largely focused on reviewing land development proposals may be able to devote a block of time to the review and get it done in a matter of a day or two, the reviewers in the districts in which there are not dedicated staff devoted to conducting land development reviews may take a week or longer to finish the same review, not because it takes that many hours to perform the review but because with all of the interruptions of the review process, it takes that long to get it finished. Obviously, having the review process constantly interrupted is almost certainly going to mean that it will take longer to finish, and it will also make estimating just how long the different types of reviews take much harder. More research would be needed to justify a conclusion of this sort about variations in the review process, but it would not be unreasonable to expect that individuals who can devote large blocks of their time solely to conducting reviews would be more efficient at it and also better able to provide accurate estimates of the time it takes them to conduct the reviews.

Although this study focused on VDOT's role in the entire land development process, the researchers were aware that TISs are, for obvious reasons, of particular interest to VDOT; consequently, three TISs were included in the samples that were used in the statewide survey. The three TISs chosen for use as samples were of different levels of complexity. The aggregation of the estimates from the survey (shown in Table ES1) shows that the review of any TIS is going to cost VDOT more than $1,000, and in the case of a complex TIS, a $1,000 fee will recoup only a small percentage of the cost to VDOT of doing the review.

Statewide Survey of VDOT Reviewers

The procedure used for carrying out this survey was as follows:

1. Seven actual land development proposals from the archives of the Culpeper District Office were selected as samples (see Table ES1). These proposals were selected because they represented a variety of typical proposals with different levels of complexity. The assumption was that complexity was the most critical factor that affected how long a review would take. There were three TISs: one simple, one moderately complex, and one complex. There were also proposals for two site plans and two subdivisions. The simple TIS was submitted for a rezoning that was proposed for an Eckerd Pharmacy; the moderately complex TIS was submitted for a comprehensive plan amendment for a student housing complex; and the complex TIS was submitted for a mixed-use town center. *The proposals for the site plans and subdivisions did not include TISs.*

2. Copies were made of the selected proposals, and meetings were arranged for the individuals who currently perform the reviews to meet at their district office on a particular day to examine the samples and estimate how long it would take to perform a review of each. Each participant was asked to fill out a survey form for each sample. The form had fields for estimating the time needed to log in the document, review it, and compose the response letter. Fields were provided for the time needed for specialized review steps, such as drainage, pavement marking, visits to the site to view field conditions, and meetings or telephone calls regarding the document.

3. The time estimates for the steps in the review of each document were aggregated in such a way as to model the land development review processes in VDOT's nine districts, and the time and cost estimates for reviewing land development proposals were calculated.

Results of the Survey

The aggregate results of the average time spent reviewing the sample land development proposals and the total cost of this time are provided in Table ES1. *The time estimates for the subdivisions and site plans do not include the additional time that would be needed to review a TIS for these types of proposals should one be required.*

The aggregation process took the time estimate for each document considered by each participant and multiplied it by the loaded (includes overhead and additives) hourly rate of the participant. The participant's time and cost estimates were then averaged with other time and cost estimates from staff at the same level (e.g., manager, engineer, or engineer technician) in the organizational structure in the participant's section, such as location and design, land development review, or a residency. The estimates of the average time and cost for the manager, engineer, or engineer technicians in each section were then added together to produce a time and cost estimate for that section that approximated the normal work flow (usually, employees from each of the three aforementioned classifications of employees would spend some time on a given land development project, particularly a complicated one). The estimates of the time and cost for each of the sections were then added together to produce an estimate of the total time and cost

that would be needed to review the land development document. The total time and cost estimates for each district were then averaged, and the mean time estimates calculated.

Table ES1. Average Time Spent Reviewing Land Development Documents and Total Cost (Including Overhead and Additives) of This Time

Document	Average Hours	Average Cost
Simple TIS *Eckerd Pharmacy* (Rezoning)	50	$2,680
Moderately Complex TIS *Sandy Lane Residential Village* (Comprehensive Plan Amendment)	110	$6,030
Complex TIS *Albemarle Place Town Center* (Rezoning)	190	$11,570
Simple Site Plan *Wheels for Less*	50	$2,970
Complex Site Plan *CVS Pharmacy No. 01554*	120	$6,620
Simple Subdivision *Chestnut Ridge*	90	$4,740
Complex Subdivision *Wickham Pond*	210	$11,750

Conclusions

The samples of land development proposals chosen for the survey undertaken during this study ranged in complexity from the simple to the complex; however, they do not compare in complexity to the exceedingly complex proposals that are often submitted in Northern Virginia and the other major urban areas in the state. As can be seen from the "Average Cost" column in Table ES1, even though the samples came from the lower end of the range of complexity for typical submissions, the estimates of the cost to conduct the reviews were all above $1,000. (It is worth noting that the $1,000 limit covers only about 16.5 hours of labor at the average loaded rate of those individuals who took part in the survey, which is $60.31.)

As noted in the "Introduction" section of this Executive Summary, there is quite a large variation in the estimates from one district to the next, and the researchers cannot explain this variation; however, notwithstanding the issues discussed in the "Introduction" related to the difficulties of making the estimates required of the survey participants, it is important to note that if the data from the survey are aggregated to the district level and the lowest and highest estimates for each sample are removed, then the lowest estimate remaining for *any* of the samples is 29 hours, which at $60.31 per hour would cost VDOT $1,748.99.

Recommendations

Fee Recommendations

The provision of an acceptable fee schedule for the review of land development proposals is currently limited by the requirements of Chapter 527; i.e., the fee charged for reviews "shall not exceed the actual cost to the Department, or $1,000, whichever is less, for each review." Thus, the following fee recommendations are offered:

1. *Until a better—and more commensurate—schedule of fees is developed, it would be appropriate for VDOT to charge $1,000 for each review.* However, a fee this low will make it possible for VDOT to recover only a small proportion of its costs.

2. *For those proposals that are submitted for review but are rejected for one reason or another and not reviewed, it would be appropriate to charge a fee to compensate VDOT for 2 to 4 hours of time to do everything necessary for the submittal to be examined with sufficient care to determine whether it should be accepted for review or rejected.* The General Assembly has clearly indicated that up to a limit of $1,000, VDOT's fee for each review should be commensurate with its costs. A number of reviewers who took part in the survey indicated that checking in a proposal, evaluating it, and writing a rejection letter takes 2 to 4 hours. If this is averaged to 3 hours and multiplied by the average loaded salary rate of those who participated in the survey, which is $60.31, then a fee of $180 would be approximately commensurate with VDOT's costs.

Other Recommendations

Since VDOT needs to take steps to be in a position to set fees for reviews of land development proposals that will be commensurate with the actual costs of the reviews, the following recommendations are offered:

3. *VDOT should investigate what elements of individual site plans, rezonings, etc., contribute to their complexity. All individuals who regularly review or have a hand in the review of land development submittals should be gathered together for a focus session devoted to determining the elements that affect the complexity of a submittal and thus the time required to review it.*

4. *Once the different levels of complexity for each type of submittal are agreed upon, VDOT should track the actual costs of performing the reviews for a fixed period of time—perhaps 6 months or 1 year.*

Costs and Benefits Assessment

The stipulation in Chapter 527 that the fee charged for reviews of land development proposals "shall not exceed the actual cost to the Department, or $1,000, whichever is less, for

each review" requires that the actual cost of the individual reviews be known. The evidence provided by the survey of VDOT reviewers in this study provisionally supports a review fee of $1,000 for each review of land development proposals. Although it is possible that a $1,000 fee will in some cases exceed the actual cost to VDOT, the estimates provided by the participants in this study's survey suggest that in by far the vast majority of cases, the $1,000 fee will be insufficient to recoup VDOT's actual costs; however, charging such a fee will go some way toward recouping these costs. For example, the researchers were told by members of the NOVA staff that about 4,000 reviews of all the types discussed in this report are conducted in Northern Virginia each year. At present, VDOT recovers some of its costs on a small number of these reviews. If a flat $1,000 fee is charged for each of these reviews, then VDOT will recover up to $4 million in costs for Northern Virginia alone. This suggests that the potential for *statewide* recovery of costs for these reviews is many millions of dollars. If, as this report suggests, the $1,000 fee in many cases recoups only a small portion of VDOT's costs, then when a fee is finally set that is actually commensurate with VDOT's costs, the actual amount recovered statewide will be much greater.

FINAL REPORT

IDENTIFICATION OF POTENTIAL FEE STRUCTURES FOR LAND DEVELOPMENT REVIEWS BY THE VIRGINIA DEPARTMENT OF TRANSPORTATION

Matthew C. Grimes, P.E.
Research Scientist

Roger W. Howe
Research Associate

INTRODUCTION

Chapter 527 of the 2006 Acts

During the 2006 Session, Virginia's General Assembly enacted a bill (Chapter 527 of the 2006 Acts) (see Appendix A) designed to improve the coordination of state and local transportation planning. The intent of the bill was "to amend and reenact § 5.2-2223 of the Code of Virginia, and to amend the Code of Virginia by adding a section numbered 15.2-2222.1, relating to the coordination of state and local transportation planning." The new section is part of an effort to compel more coordination between localities and the Virginia Department of Transportation (VDOT). The act requires that localities submit comprehensive plans, rezonings, traffic impact statements (TISs), site plans, and subdivision plats to VDOT for review if they will have a substantial impact on state-controlled highways.

> A. Prior to adoption of any comprehensive plan pursuant to § 15.2-2223, any part of a comprehensive plan pursuant to § 15.2-2228, or any amendment to any comprehensive plan as described in § 15.2-2229, the locality shall submit such plan or amendment to the Department of Transportation for review and comment if the plan or amendment will substantially affect transportation on state controlled highways as defined by regulations promulgated by the Department. The Department's comments on the proposed plan or amendment shall relate to plans and capacities for construction of transportation facilities affected by the proposal. Within 30 days of receipt of such proposed plan or amendment, the Department may request, and the locality shall agree to, a meeting between the Department and the local planning commission or other agent to discuss the plan or amendment, which discussions shall continue as long as the participants may deem them useful. The Department shall make written comments within 90 days after receipt of the plan or amendment, or by such later deadline as may be agreed to by the parties in the discussions.
>
> B. Upon submission to, or initiation by, a locality of a proposed rezoning under § 15.2-2286, 15.2-2297, 15.2-2298, or 15.2-2303, the locality shall submit the proposal to the Department of Transportation within 10 business days of receipt thereof if the proposal will substantially affect transportation on state-controlled highways. Such application shall include a TIS if required by local ordinance or pursuant to regulations promulgated by the Department. Within 45 days of its receipt of such TIS, the Department shall either (i) provide written comment on the proposed rezoning to the locality, or (ii) schedule a meeting, to be held within 60 days of its receipt of the proposal, with the local planning commission or other agent and the rezoning applicant to discuss

potential modifications to the proposal to address any concerns or deficiencies. The Department's comments on the proposed rezoning shall be based upon the comprehensive plan, regulations and guidelines of the Department, engineering and design considerations, any adopted regional or statewide plans and short and long term traffic impacts on and off site. The Department shall complete its initial review of the rezoning proposal within 45 days, and its final review within 120 days, after it receives the rezoning proposal from the locality.

C. When a locality receives a subdivision plat pursuant to § 15.2-2258 or 15.2-2260, or a site plan or plan of development pursuant to subdivision A 8 of § 15.2-2286, the locality shall submit such plat or plan to the Department of Transportation in accordance with § 15.2-2260 within 10 business days if the plat or plan substantially affects transportation on state-controlled highways as defined by regulations promulgated by the Department. Such plat or plan shall include supplemental traffic analysis if required by local ordinance or resolution or pursuant to regulations promulgated by the Department. Within 30 days of its receipt of such plat or plan, the Department shall either (i) provide written comment on the plat or plan, or (ii) schedule a meeting, to be held within 60 days of the Department's receipt of the plat or plan, with members of the local planning commission or other agent of the locality to discuss potential modifications to the plat or plan to address any concerns or deficiencies. The Department's comments on the plat or plan shall be based upon the comprehensive plan, regulations or guidelines of the Department, engineering and design considerations, any adopted statewide or regional plans and short and long term traffic impacts on and off site. The Department shall complete its final review within 90 days after it receives such plat or plan from the locality. The submission of the application to the Department shall toll all times for local review set out in this article until the locality has received the Department's final comments.[1]

The act requires that fees be imposed by VDOT for the reviews:

E. The Department shall impose fees and charges for the review of applications, plans and plats pursuant to paragraphs A, B, and C, and such fees and charges shall not exceed the actual cost to the Department, or $1,000, whichever is less, for each review.[2]

Chapter 527 also required VDOT to "promulgate regulations by December 31, 2006, to carry out the provisions of this act" and to "submit a report to the Governor and the General Assembly by December 1, 2006, identifying the costs of conducting the reviews required by this act and recommending a reasonable fee schedule for such reviews." This report is the fulfillment of that requirement.

A Brief Introduction to VDOT's Land Development Review Process

Most of this study was focused on trying to come up with a reasonable estimate of the cost to VDOT of performing the reviews of land development proposals. In order to clarify the nature of the land development review process, this section provides brief descriptions of the process of reviewing comprehensive plans, rezonings, TISs, site plans, and subdivision plats.

Comprehensive Plan Review

After the formal submission of a proposed plan or plan amendment for review, VDOT may request a meeting with the locality to discuss the plan or amendment. The request must be made within 30 days of receipt of the proposal, but the discussions may continue as long as necessary. VDOT must provide written comments to the locality within 90 days of the receipt of

the plan or amendment. Once VDOT provides comments, the locality must ensure that the comments are included in the official public record, but the locality does not have to abide by any recommendations that are part of VDOT's comments.

A written response from VDOT is required. This response is generally prepared by the residency administrator or the district planning manager, but the response should be coordinated with the following offices:

- Residency Administrator
- Transportation and Mobility Planning Division (TMPD)
- Environmental Quality Division/District Environmental Office
- Department of Rail and Public Transportation
- Regional Traffic Engineer.

These offices are to be provided a copy of the proposed plan or amendment, and they are permitted a 3-week review period. VDOT's review would be expedited if the local jurisdiction had participated in the development of and adopted transportation recommendations from a Metropolitan Planning Organization (MPO) Constrained Long-Range Plan, a Small Urban Area Transportation Study, or a Regional Long-Range Plan in which VDOT had participated.

When the local transportation plan in a locality's comprehensive plan is reviewed, the following criteria are to be used to determine whether it is adequate and complies with the provisions of § 15.2-2223 of the Code of Virginia.

- *Inventory (written or graphic) of the existing transportation network.* The inventory should include at a minimum all roadways in the Federal-Aid Highway System that are classified as a collector or above. Additional roads may be included at the discretion of the locality.

- *Assumptions.* Future growth assumptions should be detailed as part of the transportation plan since they directly impact the performance of the transportation system. Population growth, employment growth, and the location of critical infrastructure such as water and sewer facilities, among others, are examples of growth assumptions that should be included.

- *Assessment that comprises an evaluation of the multimodal transportation system(s).* In its most basic form, a transportation assessment would be a written or graphic representation of facility performance and/or condition. This assessment would identify specific deficiencies.

- *Recommendations for proposed improvements or additions to the transportation infrastructure.* Recommendations should be specific enough that the location and nature of the proposed improvement are clear and understandable. Localities are encouraged to include pedestrian, bicycle, and other multimodal recommendations as they deem appropriate. The transportation plan must include a map showing road and other transportation improvements, including cost estimates for the year of

completion. Estimates should be consistent with VDOT's cost-estimating procedures and be calculated for the year of project completion.

Localities in an identified MPO study area or those designated as part of an air quality non-attainment region have additional requirements not described here.

Rezoning

Rezoning is the point in the development process at which TISs are most commonly conducted and the TISs are written. This is because the rezoning step is the part of the development process at which the negotiations with the developer to contribute improvements to community infrastructure are most effective. VDOT and local planning staff review the conceptual development plan and the TIS of the rezoning application. The conceptual development plan is not required by all localities, but when required, it affords VDOT and local staff an opportunity to recommend changes to the applicant's plan so as to be more consistent with the community's vision. For example, some counties require that a detailed plan of development be submitted with the rezoning application. At this stage, the placement of buildings with respect to the highway and transportation connections to adjacent parcels can be modified more easily than during the site plan review because the applicant can be more flexible and because localities have more latitude for rezoning denial than for site plan or subdivision denial.

TIS Scoping

These steps are not necessarily performed for all projects by staff in all districts. Although scoping meetings are required for very large development proposals (1,000 vehicles per hour or more), they are optional for the smaller proposals. In spite of the optional nature of scopings, they are highly recommended. The steps that VDOT staff undertake as part of scoping are as follows:

1. Perform a scoping review of available advance information, including maps and development proposals provided by the locality or applicant.

2. Conduct a field meeting with county and residency staff (not necessary for all situations).

3. Perform field reconnaissance of existing conditions of links, intersections, proposed access points desired, signals and their timing, directional distribution, travel patterns, transit facilities, bicycle facilities, geometric characteristics, and functional classification of roadways. Some of this information can be gathered from the geographic information system (GIS) integrator and other online data repositories.

4. Collect existing traffic data (for the previous year) or research or request information regarding approved projects, pending projects, and proposed projects that are adjacent to or near the development in question.

5. Identify in the study the improvements that will be built by others by the time of the opening day (e.g., will a VDOT project be completed by the time the development opens?).

6. Determine existing traffic growth rates applicable to affected roadways.

7. Determine trip generation rates to be applied to the proposed development.

8. Determine pass-by trip rates and internal capture rates (% reductions) that may be used and transportation demand management trip reduction strategies if required. The internal capture and pass-by trip reduction rates can be a source of significant contention if the applicant wishes to use marginally substantiated rates that are radically different from VDOT's procedures in the *Land Development Manual.*[2]

9. Schedule and meet with the developer or the developer's consultant, residency, and county staff (if necessary) for the scoping requirements of the study. At the meeting, discuss the information mentioned in the previous items including field conditions, existing traffic and operation conditions, and parameters for conducting the analyses to be documented in the TIS.

TIS Review

When reviewing a TIS, VDOT staff will typically do the following:

- Perform administrative tasks such as logging in the documents and distributing them to specialists as needed.

- Review all new vehicle trips and person trips that will be generated by all proposed land uses. This includes checking the trip generation rates or equations to make sure the correct ones are used. In addition, if the development is proposed to be constructed in phases, the reviewer should determine whether the trip generation is consistent with the proposed phasing.

- Review all maps and figures reflecting existing and projected traffic volumes (including turning movements), roadway geometry (including lane requirements and lengths), and signal requirements.

- Review figures, maps, and tables that document the trips generated and their distributions and assignments.

- Review the acceptability and completeness of all submitted traffic software program inputs and outputs. This includes checking the analysis methodology to ensure that methods from the *Highway Capacity Manual*[3] are used, rather than other methods that are the default in some software applications. It also includes a review of the *Highway Capacity Manual* inputs to ensure that default values and false assumptions are not used instead of realistic inputs.

- Evaluate the impacts on the existing transportation system, which include level of service; delay; and, if applicable, signal warrant analyses of existing conditions, cumulative conditions, and full build-out conditions. This also includes a *Highway Capacity Manual* analysis of future conditions without proposed development, commonly called background conditions.

- Review proposed mitigations, proffers, estimates, and geometrics and provide comments, advice, or recommendations. This includes distinguishing improvements that can be required as entrance or land use permit conditions (such as turn lanes, sight distance improvements, other safety improvements, and operational requirements) from capacity improvements proffered to ameliorate the operational degradation the proposed development will cause.

Communicate Findings

Once VDOT staff has reviewed the TIS, they will take some or all of the following steps to communicate their findings to the locality:

- Perform a final review and analysis of the TIS and coordinate with the submitting engineer any changes, required additional information, and subsequent re-submission(s). Discuss recommended proffers and required improvements. Provide the final letter to the applicant, county, and/or residency.

- Attend a public meeting or hearing of the board of supervisors and present the findings of the TIS review in person so that the locality can ask the VDOT representative questions and obtain explanations of technical issues.

- Meet with county planning staff and provide input on how the rezoning affects the adjacent roadways, transportation facilities, thoroughfares, and the community and how it may affect the urban travel demand model.

- Provide a letter to the planning commission and/or board of supervisors summarizing the impact of rezoning.

Site Plan and Subdivision Plat Review

A site plan is an engineering design plan prepared by a professional engineer or land surveyor that can be used to prepare the site physically for constructing the building(s). This preparation includes grading, stormwater management, landscaping, parking lot layout, sidewalks, the internal circulation pattern, and the entrance design. Site plan acceptance and approval is an administrative function, so site plans generally do not need to be reviewed by the local planning commission. Local planning staff review the site plan in accordance with documented engineering design standards and require changes if the site plan is not consistent with the locality's design standards.

The principal purpose of VDOT's site plan and subdivision plat review is to prevent the construction of an unsafe entrance. It is primarily a process that allows VDOT staff to require safety and maintenance improvements, such as auxiliary lanes; entrance relocations; entrance improvements; site distance improvements; and proper grading, drainage, and pavement design. The review consists of an examination of plans and plats that should be prepared by a professional engineer or land surveyor. At this point in the review process, there is little need for communication with the locality or applicant other than to communicate the results of the review. However, the principal reviewers often need to share the site plan or subdivision plat with drainage or utility experts.

Accuracy, Completeness, and Compatibility

The initial review assesses whether the plan or plat is accurate, complete, and compatible with other plans. The initial review process answers the following questions:

1. Is more information needed in order to review the plan?

2. Is a master plan showing the overall proposed development needed for this review?

3. Is the subdivision plat/site plan compatible with the following:

    - the county's Comprehensive Plan and Zoning Ordinance (this step is also performed by the local staff)

    - the Regional Transportation Plan

    - VDOT's Statewide Highway Plan

    - VDOT's Six-Year Transportation Improvement Program

    - proffered improvements

    - adjacent developments.

Internal Circulation

Once VDOT staff have determined that the site plan or subdivision plat is accurate, complete, and properly compatible, they check the internal circulation. This is important because a poorly designed development could make it difficult for vehicles to move from the state highway to a parking area or drive-through. This could cause other vehicles to obstruct the public right of way by waiting on the state roads, exposed to a collision, until they can enter the site. The location of drive-through queuing areas with respect to the state road is a critical part of this review.

Staff will review internal circulation by determining whether:

- the functional classification of the internal streets should be revised and designed in accordance with the *Subdivision Street Requirements*[4]

- the internal street layout and design should be revised

- a new TIS is required for the site

- the internal streets have continuity of design throughout and provide for inter-parcel connections

- the pavement design is adequate.

Intersection Geometrics and Existing Road Improvements

The entrance design proposed on the site or subdivision plan must be checked against the entrance designs in VDOT's *Road Design Manual*.[5] In this step, VDOT staff review the site plan and the proposed entrance(s) by answering the following questions:

- Is the sight distance for the proposed entrance adequate?

- Is the design of the entrance and its ancillary structures (drainage, signals) and improvements compatible with planned highway improvements?

- Are the entrance radii adequate or should they be revised?

- Is the spacing of the entrance from other intersections or entrances adequate or should the entrance be moved elsewhere on the property frontage so as to increase the spacing?

- Should the existing roadway be widened to provide turn lanes for the proposed entrance?

- Are there too many proposed entrances onto the roadway?

- Should the entrances be controlled access such as "right in and right out" only?

- Should the existing roadway be reconstructed to provide adequate traffic safety for the proposed entrance?

- Should additional through lanes be provided across the frontage of the development?

- Does capacity analysis indicate that geometric improvements are needed?

- Does capacity analysis show the need for a new traffic signal and/or existing traffic signal improvements?

- Should the plan be revised to remove any fixed obstacles from the clear zone?

- Are all of the signs and pavement markings in accordance with the *Manual on Uniform Traffic Control Devices* (MUTCD)[6] and the *Virginia Supplement to the MUTCD*[7]*?*

- Are bicycle and pedestrian access into the site and along the roadway included?

Drainage

Drainage review is sometimes conducted by district drainage experts. The review consists of answering two questions:

1. Does the hydraulic design comply with VDOT requirements?

2. Are the drainage structures properly sized and placed to accommodate the anticipated runoff?

Right of Way and Utilities

The review of utilities is sometimes conducted by district experts. The review consists of answering the following three questions:

1. Are the existing and proposed right-of-way lines clearly shown on the plans?
2. Are the utility easements shown on the plans?
3. Should utilities be moved outside the right of way?

Once the plan review is complete, the VDOT reviewer communicates the required and recommended changes to the locality in a letter. In some districts, this letter is sent to both the applicant and the local planning staff, but in most cases it is sent only to the local planning staff. The land development review staff at the locality then send the VDOT letter and their own comment letter to the applicant. In many cases, a meeting of VDOT, local planning staff, and applicants is held to discuss the comments on the plan and resolve any misunderstandings.

The permit process involves the submission of detailed plans showing the changes required after the site plan or subdivision review. It also requires a financial surety of a value great enough to cover the cost of restoring the right of way in the event the applicant does not complete the construction of the entrance(s). Once the work is completed and inspected by VDOT staff, the surety is released.

PURPOSE AND SCOPE

The purpose of this study was to provide reasonable estimates of the costs VDOT incurs when it performs the land development reviews required by Chapter 527 (see Appendix A). The

estimates developed were for *individual* reviews and not for the total cost to VDOT of performing all of the reviews. Since Chapter 527 calls for the provision of a fee commensurate with the cost of performing the reviews, it was necessary to determine the cost of individual reviews in order to provide support for the fee to be assessed for each review. The scope of this study was limited to estimating the costs to VDOT of performing the individual reviews and to recommending a reasonable fee schedule for the reviews.

METHODS

Chapter 527 requires VDOT to identify "the costs of conducting the reviews required by this act" and to recommend "a reasonable fee schedule for such reviews." A preliminary search for data on the cost of performing the reviews failed to turn up sufficiently complete data to allow a determination of the cost. These reviews are performed at VDOT's districts and residencies, and VDOT staff at the residency and the district offices have not been required to keep sufficiently detailed or sufficiently complete records of the number of hours spent doing the reviews of individual land development submissions to allow the cost of performing the reviews to be determined. Therefore, the researchers undertook a survey of the actual VDOT employees who perform the reviews on a day-to-day basis to obtain reasonable estimates of the cost, which were then used as a basis for setting a reasonable interim fee schedule.

Specifically, the following tasks were carried out to achieve the study objectives:

1. Seven actual land development proposals from the archives at the Culpeper District Office were selected as samples. There were three TISs: one simple, one moderately complex, and one complex. There were also two site plans and two subdivisions. The simple TIS was submitted for a rezoning that was proposed for an Eckerd Pharmacy; the moderately complex TIS was submitted for a comprehensive plan amendment for a student housing complex; and the complex TIS was submitted for a mixed-use town center. The site plans and subdivisions did not include TISs, and the time estimates did not include the additional incremental time needed to review a TIS for these proposals should one be needed.

2. Copies were made of the selected proposals, and meetings were arranged for the individuals who currently perform the reviews to meet at their district office on a particular day to examine the samples and estimate how long it would take them to perform a review of each of the samples.

3. The time estimates for the steps in the review of each document were aggregated in such a way as to model the land development review processes in VDOT's nine districts, and the time and cost estimates for reviewing land development proposals were calculated.

Land Development Proposals Used as Samples in the Survey

The following proposals were selected because they represented a common range of typical proposals with different levels of complexity. The assumption was that complexity was the most critical factor that affected how long a review would take. Before the samples were selected, the researchers contacted a variety of VDOT employees in VDOT's Central Office and in the districts and residencies who had experience with land development reviews to ascertain what elements of a proposal increased its complexity. The seven samples selected reflected the input of these individuals.

TISs

Simple TIS: Eckerd Pharmacy Rezoning

This traffic statement was submitted to identify the traffic that would be generated if a parcel were rezoned such that a drive-through pharmacy could be approved by Albemarle County. At this location, U.S. 250 runs from northwest to southeast, with a cross street (Rolkin Road, which at the time was not in the state system) running from northeast to southwest. This segment of U.S. 250 is classified as an urban principal arterial. It has four travel lanes, turn lanes at the traffic signal, and a raised concrete median. In 2003 when the rezoning application was submitted, the traffic volume was approximately 33,000 vehicles per day. The parcel itself, 1.752 acres, lies at the eastern corner of this signalized intersection of U.S. 250 and Rolkin Road. On U.S. 250 opposite the site there are office and retail uses, including a shopping center anchored by a supermarket. On Rolkin Road opposite the site, there is a private school, and behind the site is a large tract of land under development for single-family homes.

The TIS for the site was limited to one signal at the intersection of U.S. 250 and Rolkin Road. It predicts that the site will generate 1,260 trips per day. Unfortunately, when the traffic study was submitted, the preparer did not properly assign the traffic to the intersection approaches.

If this submission had been correctly prepared, it would have been a simple submission. For this study, the researchers corrected the flawed portions and collated the report such that it would be a simple TIS. Although the pharmacy was proposed for the corner of a signalized intersection, the development did not cause the traffic to exceed the signal's capacity. At the time the application was submitted, the signal operated as isolated and semi-actuated. There was only one proposed use on the site and little need to coordinate with adjacent developments.

Moderately Complex TIS: Sandy Lane Residential Village Comprehensive Plan Amendment

The *Sandy Lane Residential Village Traffic Impact Analysis* is a TIS for a comprehensive plan amendment selected for use in this study. This project was proposed for a 69.4-acre tract in Albemarle County, near the University of Virginia and adjacent to the border with the City of Charlottesville. When the TIS used in this study was submitted in April 2002, the Albemarle County Comprehensive Plan designated the tract for neighborhood density and the tract was zoned R-1 (1 residential unit per acre). This land development proposal would change the

agricultural land use of the tract into a premier student housing complex with 884 residential units. Services such as laundry, dry cleaning, restaurants, and student centers were also included in the plan. There would be a total of 20,000 square feet of commercial space.

The southern border of the site is I-64, and a Norfolk-Southern rail line forms the northern border. Access to the site would be through two entrances on state roads. One of these, Route 782 (Stribling Avenue Extended), is an unpaved road, functionally classified as a local road, which passes through a one-lane railroad underpass on a significant skew, which blocks sightlines completely. The other access is on Route 781 (Sunset Avenue Extended), and traffic from this entrance would have to cut through established city neighborhoods to reach the university.

Although TISs are not required for comprehensive plan amendments under the regulations promulgated in accordance with Chapter 527 of the 2006 Acts, in this case there were sufficiently detailed planning, access, and capacity issues for Albemarle County to require that a TIS be developed for the comprehensive plan amendment. The TIS indicated that the site would generate more than 9,300 daily trips at full buildout, which assumes significant trip reductions for the use of buses, carpools, and bicycles. It recommended installing an additional three-legged signal at the intersection of Route 781 and Business 29 (Fontaine Avenue), which would be less than 400 feet from an existing signal. The TIS analyzes 11 intersections with *Highway Capacity Software,* including 3 with existing traffic signals and the proposed signal at the intersection of Route 781 and Business 29. The TIS also analyzes two I-64 interchanges and their ramps.

The fact that this site is on the border of two jurisdictions, is bounded by a railroad, has constraints on the road access, and was submitted while a regional study was underway among the citizens of both localities makes this a relatively difficult comprehensive plan amendment with a moderately complex TIS. However, the parcel is not large, and the proposed development is not complex. If the site's access to the state highways had fewer constraints and if there were not a concurrent regional study encompassing this parcel, the comprehensive plan amendment would have been relatively simple to review. In summary, this TIS had technical (access, railroad) and nontechnical (concurrent regional planning study) complications.

Complex TIS: Albemarle Place Town Center Rezoning

The Albemarle Place Town Center proposed development is a 62.4-acre, regional scale, mixed-use development located at the corner of U.S. 29 and Route 743 in Albemarle County. The parcel is bounded by Route 743 to the south (functionally classified as an urban minor arterial); existing townhouses and small scale commercial development to the west; an industrial site to the north; and U.S. 29 to the east (functionally classified as an urban principal arterial). There is one exception to the eastern boundary of U.S. 29, however. The parcel was an undeveloped part of an industrial complex used by a defense contractor, and the proposed development surrounds the main complex, which was retained by the defense contractor and remains in use. Because the parcel that remains under the control and ownership of the defense contractor is adjacent to U.S. 29, the proposed Albemarle Place Town Center development will actually have limited frontage on U.S. 29. The parcel is adjacent to the northern boundary

between the County of Albemarle and the City of Charlottesville. Thus, all traffic heading north to the site must pass through the city, thereby impacting city streets and signals.

At this location in 2002, when the TIS was submitted, U.S. 29 carried 61,000 vehicles per day, and Route 743 (Hydraulic Road) carried 20,000 vehicles per day. The intersection of U.S. 29 and Route 743 is signalized, and the signal controller is the master controller for a signalized corridor approximately 3.4 miles long. The developers of the Albemarle Place Town Center desired an additional signalized entrance on U.S. 29 and hired consultants to demonstrate that it would be feasible; however, VDOT tried to prevent the addition of another signal, which would be merely 800 feet away from the existing upstream and downstream signals.

The site itself was complicated because it proposes truly mixed uses. There would be new private streets lined with two- and three-story buildings. These buildings would have retail on the ground floor, office space on the second floor, and loft apartments and condominiums on the top floor. Parking would be in structures or parallel on-street. Some big-box anchor stores, a multiplex, and public spaces are proposed, but these are integrated with the smaller scale boutiques, offices, and residences so as to create a neo-traditional town center. The integration of uses and the walkability of the proposed development suggest that it will have a high percentage of internally captured trips, far higher than allowed in the *Land Development Manual*.[2] Therefore, the TIS included a separate trip generation study to demonstrate the internal capture reductions. After the complex internal capture reductions had been taken into consideration, the site was still predicted to generate approximately 35,000 trips per day, which is more than half of the existing traffic on U.S. 29 at the site location.

In summary, this development and its TIS were complicated by the following issues:

- There is a diverse mix of integrated uses, and there is a high internal trip capture rate.
- The TIS studied 15 existing intersections, 3 proposed intersections, and 1 interchange.
- The parcel has road frontage only on segments that are over capacity.
- The applicants desired approval for an additional signal at a location with inadequate spacing.
- The trip generation of the site worsens conditions that are already oversaturated.
- Traffic generated by the site significantly impacts a coordinated corridor of signals.
- Transportation improvements proffered by the developer were to be made mostly in the city, rather than in the county in which it is located.
- The county staff and politicians were strongly supportive of the development despite its transportation impacts.
- Traffic generated by the site significantly impacts an adjacent jurisdiction.

- The proposed development is located on one of the primary access corridors to the University of Virginia, which means that it experiences significant seasonal and special event traffic volume fluctuations.

In addition, the applicants wanted VDOT to accept the streets into the state system but were unwilling to design them in accordance with the *Subdivision Street Requirements.*[4] Thus, meetings among VDOT, the developers, and the county were needed to discuss the issue of street standards.

Site Plans

Simple Site Plan: Wheels for Less

This is a site plan for a 2.75-acre parcel, fronting on U.S. 29, northbound, in Greene County. The proposed use is that of a used car lot. The parcel is located near a crossover on U.S. 29, which, at this location, is a four-lane principal arterial with a depressed grassy median. When the site plan was submitted, the average daily traffic on this segment of U.S. 29 was approximately 27,000 vehicles. When this site plan was submitted, the land development review staff required turn lanes and tapers at the site entrance and at the crossover with the pavement on the turn lanes being designed and constructed to the full strength of the mainlines of U.S. 29 so that the turn lane could be incorporated into a future widening. This requirement was based on the expected 100 vehicles per day at the site entrance, the drivers of which would need to reduce their speed from 55 mph to approximately 15 mph in order to make the turn. Such speed differentials are a safety concern, especially on regional primary roads, and the turn lanes would provide a place for the decelerating traffic to exit the travel lane safely. However, the developers appealed the requirement to construct the southbound left-turn lane and taper at the crossover and were granted a reprieve by the district administrator. Altogether, this was a simple site plan. The parcel was small, the county did not have a sophisticated review process, and no signals were involved.

Complex Site Plan: CVS Pharmacy #01554

The site plan for CVS Pharmacy #01554 was submitted while Albemarle County was considering a rezoning for the adjacent parcels on the southwest and northwest sides of this parcel. The southeast side of the parcel is U.S. 29, with the southeast corner of the parcel being at an existing traffic signal.

At the time this site plan was submitted, U.S. 29 at this location had four mainline lanes divided by a depressed grassy median. Because the site is adjacent to an intersection and approximately 0.2 mile southwest of another signalized intersection, there are several auxiliary lanes in the vicinity, which are shown on the site plan. The signalized intersection to the northeast is at U.S. 29 and Route 649. At the time the CVS site plan was submitted, the northwest approach to this nearby signal was part of a secondary road project, which intersected U.S. 29 and which was in the right-of-way acquisition phase. This meant that the utility relocations needed for the VDOT project had to be coordinated with the utility relocations that

Albemarle County required of the developers of this CVS site and the adjacent multi-use development.

When the site plan was submitted, the traffic signal at the corner of the parcel had only three approaches: U.S. 29 being the main line on the northeast and southwest approaches and the third southeast leg, Route 1721 (Timberwood Boulevard), being the entrance to a shopping center and a large neighborhood of single-family homes. The adjacent development, a regional scale town center development with a net trip generation of approximately 35,000 vehicles per day, was already committed to construct the fourth leg of this intersection (also Timberwood Boulevard), which would become the northwest approach. However, the developers of this CVS desired to be open for business before the adjacent developer would complete the improvements, so they submitted a traffic study and plan for adding the fourth leg of the signalized intersection. The CVS, like the Eckerd, was expected to generate approximately 1,200 trips per day.

This site plan was exceedingly complicated because of the need for coordination between the developers and VDOT. In addition to the utility relocations, it was necessary for the developers to coordinate with regard to the following issues that also involved VDOT:

- Grading the site to facilitate inter-parcel access between this CVS site and the adjacent development. Inter-parcel access also had to be coordinated with the adjacent small shopping center to the north.

- Designing the western approach to the signal at U.S. 29 and Route 1721, particularly as the adjacent developers would build the road while the CVS developers built the fourth leg of the intersection.

- Designing the entrance to Timberwood Boulevard, which would be constructed only after the rezoning and site plans for the adjacent regional-scale development were approved.

In summary, this was a relatively small site, but it was technically complicated because of the need to add a fourth approach to an existing signal on a principal arterial and the need to design the access and interparcel access with adjacent developments pending approval. The site plan and the adjacent regional scale development also had to coordinate utility relocations with a VDOT secondary road project. These technical issues required many meetings to resolve, which also increased the site plan's complexity and thus the time needed to process it.

Subdivisions

Simple Subdivision: Chestnut Ridge

Chestnut Ridge is a rural subdivision in Albemarle County. The location of the proposed subdivision is Route 663, a two-lane rural major collector that carried approximately 6,000 vehicles per day when the subdivision plan was submitted.

The subdivision plan shows 19 lots and a preservation tract for a total of approximately 200 acres. The plan shows approximately 0.6 mile of subdivision streets. These are designed with an 18-foot-wide rural cross section (ditches and shoulders on both sides of the road) and a 20-mph design speed. A 100-foot turn lane with a 100-foot taper was needed at the subdivision entrance. According to the Institute of Transportation Engineers' *Trip Generation*[8] the subdivision would generate approximately 190 vehicle trips per day when fully occupied. The lots are not served by public water or sewer.

This plan is a relatively simple example of a subdivision. There is only one land use, single-family detached homes, and all the lot driveways are on proposed subdivision streets. The state road to which the subdivision has access has adequate capacity for the subdivision's traffic, and there was no need for a formal TIS.

Complex Subdivision: Wickham Pond

Wickham Pond is a suburban subdivision near the unincorporated town of Crozet. The location of the proposed subdivision is Route 240, a two-lane rural minor arterial that carried approximately 6,300 vehicles per day when the subdivision plan was submitted.

The subdivision shows 35 lots for single-family detached dwellings and 72 townhouse/condominium units on a tract approximately 20 acres in size. The plan shows approximately 0.64 mile of subdivision streets. These are designed with a 28-foot-wide urban cross section (curb and gutter on both sides) with parallel parking on one side and design speeds of 20 to 30 mph. The site is served by public water and sewer, and the applicants initially proposed to install the water and sewer lines beneath the streets, which were to be accepted into the state system. The longitudinal installation of sewer lines under the pavement is typically not allowed. The sewer lines, therefore, had to be redesigned by the development team.

Overall, Wickham Pond was more complicated than Chestnut Ridge. However, when considered in the context of all subdivisions VDOT reviews, especially in the Northern Virginia, Fredericksburg, Richmond, and Hampton Roads districts, Wickham Pond is a relatively small and uncomplicated subdivision. However, it includes approximately the same street mileage for inclusion into the secondary system as does Chestnut Ridge, the less complicated subdivision used in the survey, and therefore allows a good comparison between rural (ditch and shoulder) and urban (curb and gutter) designs.

VDOT Staff Survey

At the meetings held in each district, the seven sample land development documents were arranged on tables, with room provided for the staff to review them. Each participant was asked to fill out a survey form (see Figure 1) for each sample for which he or she provided an estimate. The form, which each person filled out for each document he or she would normally review, had fields for estimating the time needed to log in the document, review it, and write comments. Fields were provided for the time needed for specialized review steps, such as drainage, pavement marking, visits to the site to view field conditions, and meetings or telephone calls

regarding the document. All participants in all districts used the same survey form. The individuals who participated were asked to provide estimates only for the types of proposals they would normally review. As a consequence, not all participants reviewed all of the samples. The participants were allowed to discuss the samples with other participants, but each participant provided an estimate for each sample on his or her own; there were no group decisions about what the estimate should be. (The dates and locations of the meetings and the titles of the participants are provided in Appendix B.)

Cost of Land Development Review Study for Legislature

Identifying Information

Reviewer | Project Name

Time Estimates (low, medium, high)

Receive preliminary submission			
Review preliminary submission			
Prepare preliminary comments			
Receive first submission			
Review first submission			
Prepare first comments			
Receive second submission			
Review second submission			
Prepare acceptance letter			
Total meeting time			
Number of meetings			
Field review total time			

Time Estimates (low, medium, high) that DO NOT APPLY to all documents

TIS scoping			
Review signal plans			
Review foundation plans			
Review MOT plans			
Review pavement			
Review drainage			
Review pavement marking			

Note: If any of these steps are normally part of the document review, but you cannot estimate how long it would take, please write "unsure" in the box.

Additional Comments

Figure 1. Form Used in Survey Meetings

Data Aggregation and Time and Cost Estimates

The time estimates for the steps in the review of each sample were aggregated in such a way as to model the land development review processes in VDOT's nine districts. The estimates that were calculated for each district were averaged to produce estimates of the time and cost of reviewing the land development documents.

The aggregation process essentially took the time estimate for each document considered by each participant and multiplied it by the loaded (includes overhead and additives) hourly rate of that participant. VDOT's Fiscal Division provided the following formula for calculating the cost per hour to VDOT: The base salaries of the individuals who participated in the survey were multiplied by 1.7715 to provide the loaded salary rate, and that product was multiplied by 1.176 to provide the total per hour cost including overhead. For example, a base salary rate of $30.00/hr multiplied by 1.7715 would be $53.14 (which is the loaded hourly rate), and $53.14 multiplied by 1.176 would be $62.49 for the total hourly cost to VDOT (Email from Stacy McCracken, VDOT Fiscal Division).

The participant's time and cost estimates were then averaged with the other time and cost estimates by staff at the same level in the organizational structure (e.g., manager, engineer, or engineer technicians) in the participant's section, such as location and design, district land development review, or a residency. The estimates of the average time and cost of engineer technicians, engineers, and managers in each section were then added together to produce a time and cost estimate for the particular section that approximated the work flow processes (usually each of the three aforementioned classifications of employees would spend some time on a given land development project, particularly if it was complicated). The estimates of time and cost for the sections were then added together to produce an estimate of the total time and cost the district would need to review the land development document. The total time estimates for each district were then averaged, and the mean time estimates calculated.

RESULTS

Table 1 shows the number of district staff members surveyed for this project, their average hourly salary, and the way land development review is shared among the sections of technical specialty at each district. The time estimates each participant provided for each document he or she considered are provided in Appendix C. The time and cost estimates for each district are provided in Appendix D.

The aggregate results of the survey are provided in Table 2. The time estimates for the subdivisions and site plans do not include the additional incremental time that would be needed to review a TIS for these documents. The mean number of hours required by the Bristol District for the review of the moderately complex TIS in Row 1 may be used as an example of how the data were aggregated. For the Bristol District, two types of personnel are required for a moderately complex TIS review: (1) those with technician skills (e.g., data collection, site verification, and possibly a site visit) and (2) those with traffic engineering skills (e.g., capacity

Table 1. Number and Average Hourly Rate of Participants Organized by District and Section

District	Division/Residency/Section	Participants	Average Hourly Rate
Bristol	Location & Design	2	$23.74
Bristol	Residency	5	$19.47
Bristol	Traffic Engineering	1	$31.39
Culpeper	Planning & Land Development	3	$33.27
Culpeper	Location & Design	1	$28.32
Culpeper	Residency	4	$29.20
Fredericksburg	Land Development	3	$26.20
Fredericksburg	Location & Design	1	$29.47
Fredericksburg	Planning	1	$36.04
Hampton Roads	Location & Design	1	$33.46
Hampton Roads	Materials	1	$29.63
Hampton Roads	Planning	3	$26.57
Hampton Roads	Residency	3	$28.53
Hampton Roads	Traffic Engineering	1	$23.12
Lynchburg	Location & Design	3	$27.54
Lynchburg	Materials	2	$30.25
Lynchburg	Planning	1	$36.14
Lynchburg	Residency	5	$24.73
Lynchburg	Right of Way	1	$21.06
Lynchburg	Traffic Engineering	1	$20.31
NOVA	Land Development	10	$37.57
NOVA	Traffic Engineering	3	$34.71
Richmond	Location & Design	3	$26.75
Richmond	Planning	3	$30.17
Richmond	Residency	9	$28.45
Richmond	Traffic Engineering	4	$23.46
Salem	Location & Design	1	$29.03
Salem	Residency	7	$28.29
Salem	Traffic Engineering	1	$20.31
Staunton	Location & Design	2	$36.76
Staunton	Planning	1	$34.38
Staunton	Residency	4	$23.25

analysis, planning, and possibly forecasting). Bristol had two participants who could provide estimates for the technician skills: one suggested an average time of 20 hours, and the other suggested an average time of 23 hours. Thus, for the Bristol District, an average of 21.5 hours of technician time is required for the review. Bristol's one participant who could provide an estimate for the traffic engineering skills suggested that 86 hours were required to review the moderately complex TIS. Thus, overall, it can be said that Bristol staff suggested that a total of 86 + 21.5 = 107.5 hours of review time are needed for the moderately complex TIS, as shown in the first row of Table 3. A similar process was followed for each district, such that nine districtwide moderately complex TIS review times were determined. The average of these nine estimates was 105.43, as shown in Table 3. The values in Table 2 are rounded to the nearest 10, and in the first row of Table 2, the average time estimate appears as 110. A similar process was followed for the other planning documents (e.g., TISs, subdivision reviews, etc.).

Table 2. Estimates of Average Time Spent Reviewing Land Development Documents and Total Cost (Including Overhead and Additives) of This Time, Rounded to Nearest 10

Document	Average Hours	Average Cost
Simple TIS *Eckerd Pharmacy (Rezoning)*	50	$2,680
Moderately Complex TIS *Sandy Lane Residential Village* (Comprehensive Plan Amendment)	110	$6,030
Complex TIS *Albemarle Place Town Center* (Rezoning)	190	$11,570
Simple Site Plan *Wheels for Less*	50	$2,970
Complex Site Plan *CVS Pharmacy #01554*	120	$6,620
Simple Subdivision *Chestnut Ridge*	90	$4,740
Complex Subdivision *Wickham Pond*	210	$11,750

Table 3. Explanation of the Computation of the Time Estimates in Table 2

District	Estimated District Mean Hours Required for Moderately Complex TIS Review
Bristol	107.5[a]
Culpeper	89.4
Fredericksburg	30
Hampton Roads	33.5
Lynchburg	223
Northern Virginia	32.18
Richmond	183.75
Salem	137.25
Staunton	112.25
Statewide Average[b]	110

[a]In Bristol, this is based on estimated values of 21.5 hours (technician work) + 86 hours (engineering/ architecture work).
[b]This was rounded to the nearest 10.

DISCUSSION

Comments on Character of the Review Process

There is no consistent organization of land development review staff among the nine districts; however, in all districts except Northern Virginia and Fredericksburg, the staff at the residencies review comprehensive plan amendments, TISs, site plans, and subdivision plats and plans to the full extent of their technical competence. (Each district has three to six residencies, and each residency is the point of contact between VDOT and one to three counties.) If a land

development document or a portion of a document, such as drainage computations, is beyond the technical competence of the residency staff, it is sent to the experts at the district who review it and communicate their recommendations to the residency. Most of the residencies send portions of land development documents to the experts at the district, especially for the review of drainage computations and traffic signal modification or installation and the detailed review of TISs.

The review of TISs is typically performed by staff that (prior to July 1, 2006) were in the traffic engineering section of each district. However, VDOT's Traffic Engineering Division was recently reorganized as part of the regionalization of systems operations into five regions and each district no longer has its own traffic engineering section. Now, staff from one region sometimes review traffic studies from more than one district. In this study, traffic engineering staff members were grouped with the district for which they review TISs.

Land development review is organized differently in VDOT's Northern Virginia and Fredericksburg districts. The Northern Virginia District has a land development section of 15 staff members, and no land development document review is performed at the residencies. The land development section of the Fredericksburg District was originally the section for the Fredericksburg Residency, but their workload was expanded to the entire Fredericksburg District. There are 7 staff members in the Fredericksburg District land development review section, and as with the Northern Virginia District, the other residencies in the Fredericksburg District do not review land development documents.

The tracking of submissions is handled differently across the state. The land development section of the Northern Virginia District has a special tracking system for land development documents, which is integrated with their email system and their geographic information system. The Fredericksburg District section tracks their land development reviews with a spreadsheet that is stored on a server, which means that all of the section staff can access it. The Hampton Roads District also has a land development review tracking spreadsheet, but most of the other districts do not have a districtwide tracking system. However, several residencies developed their own spreadsheets and databases as the need for tracking arose.

The Fredericksburg District was the only district that did not have a survey participant who currently reviews TISs in the district. However, prior to 2005, the transportation planner in the Fredericksburg District reviewed most TISs submitted in the district, and he provided the time estimates for the TIS reviews at the survey meeting. Table 1 shows that staff from the location and design section of the Fredericksburg District were present at many of the district meetings. The reason for this is that for most districts, drainage review is typically performed by specialists in the location and design section, and drainage review is a critical step in reviewing land development proposals, particularly site plans and subdivision plats and plans. Other technical specialties represented at some of the meetings were materials (for review of pavements in subdivisions and improvements to exiting roads); right of way (which handles the transfer of property from landowners to the Commonwealth); and planning (which coordinates large projects with relevant MPOs and in some districts, such as Culpeper and Staunton, usually reviews TISs).

Conducting the Survey

The seven sample documents used in the survey meetings had actually been submitted to VDOT in the past and represented a range of complexity that spanned typical submissions in most districts; however, none represented geographically large activity centers, such as Tysons Corner in Fairfax or Central Park in Fredericksburg/Spotsylvania. Further, none of these documents presented or studied multiple phases of development to be constructed over many years, and the site plans and subdivisions did not include bridges, multiple large box culverts, or complete traffic signal installations. For these reasons, the results of this study cannot be extrapolated to the review of a development with a significant number of technically complex issues.

The survey form (Figure 1) was created with the assistance of VDOT staff who regularly conduct the land development reviews. Two problems arose because only one form was used for all the documents and because the land development review processes were different for each district:

1. Participants crossed out the name of fields on the survey form and added their own.

2. Participants gave time estimates for review steps that had fields on the form but were not relevant to the review of the particular document for which they were providing an estimate (e.g., drainage review time estimates for the TISs).

These problems were addressed by the researchers as the data were being entered into the database and when the data were aggregated. For example, on forms in which the field names had been retitled, the researchers interpreted the time estimate as being part of an appropriate step on the form. The researchers selectively tallied the time estimates to address the issue of time estimates being provided for irrelevant review steps, e.g., drainage review time estimates provided for the TISs. In some cases, participants misunderstood the instructions given to them by the researchers at the beginning of each meeting. This introduced the following problems:

- Some participants did not estimate the time required to review the sample document if it was the kind of document they would normally reject; instead they provided only the time needed to reject the proposal by following the proper processes, including a proper response letter.

- Some participants who were managers estimated time as though they would be the principal reviewer of the document rather than the manager of the staff reviewing the document.

These issues were generally addressed in the aggregation of the time estimates by assigning a rank to the participants that was commensurate with the time estimates provided and the researchers' knowledge of the participant's actual role in the district's land development review process. The participants who provided time estimates for the time needed to reject a document inadvertently provided the researchers a time estimate for rejecting a document, which was something that had not been requested.

Cost of Participants' Time for Reviewing Proposals

At each meeting, the researchers asked the participants to sign an attendance sheet and write their title. The researchers intended to use the titles to determine an appropriate hourly rate for each individual. However, VDOT employees often have numerous titles, one for their role in the organization and one from a standard list of titles promulgated by the Virginia Department of Human Resource Management and others. But many of the participants did not write their title as it would have been listed in the payroll system. Therefore, the researchers had to look up each one in the payroll system.

When this was accomplished, the researchers found that the job title that many of the participants had in the payroll system did not reflect their role in land development review. For example, many participants have titles as a manager of sorts, but they review land development documents rather than, or in addition to, managing staff that review documents. A final complication was that many of the titles from the payroll system were artificially distinct with respect to the participant's role in land development review. For example, there were multiple instances of participants with the title of Architect/Engineer 2 and many others with the title of Architect/Engineer 1. But participants of both titles would each review documents in the same fashion. In order to mitigate the complexities caused by the titles used in the payroll system, the researchers added a rank for each participant, which dissolved the distinctions. For example, Architect/Engineer Mgr 1, Architect/Engineer Mgr 2, General Administrative Manager 1, and General Administrative Manager 2 were all given the rank of Manager in the database used to calculate the averages of time estimates and costs.

The review of TISs is typically performed by staff of one of the systems operations regions. Since there are only five such regions, the staff of these regions must review TISs that are submitted in more than one district. At the survey meeting in the Lynchburg District, the participant who provided estimates for the TIS review stated that he also reviewed TISs for the Salem District but that he was unable to attend the forthcoming survey meeting in the Salem District. The researchers, therefore, duplicated his time estimates and used one of the duplicates for the Lynchburg District calculations and another for the Salem District calculations.

Aggregating the Data

Table 2 shows time estimates aggregated over the nine districts and among the sections of technical specialty in each district. The raw data, i.e., the time estimates each participant provided for each document he or she considered, are provided in Appendix C. But these data are unwieldy, and they are somewhat misleading in that they do not reflect the fact that in most districts, one person does not conduct the entire document review. Thus, the data do not answer in a straightforward way the question of how much time is needed to review a land development document. The review of most site plans and subdivision plats and plans includes a review of the physical plan; a review of the drainage computations; and reviews of the pavement strength, pavement markings, and sign/signal installation. The review of a TIS involves more staff than those assigned to a systems operation region; therefore, it is necessary to aggregate the time from all sections involved in the review. The tables with the estimates for each district (see Appendix

D) represent the averages of staff at a particular level (e.g., engineer or manager) added together to produce an estimate of the time needed for the document review in that district. To present these district results succinctly, the researchers averaged them to produce Table 2.

Variations on this approach were required to complete Table 2. First, the site plans and subdivisions would need staff with different technical specialties, particularly drainage and materials. Second, each district might not have the same division of labor; for example, in the Fredericksburg District, until recently, one individual performed many of these steps.

Significance of the Results

The results in Table 2 show that the estimated average time to review even the simplest of the samples used in the survey meetings requires more than $1,000 worth of staff time. The reader should remember that the survey collected time estimates for the necessary communication (among VDOT, the locality, and the applicant), time estimates for field visits, and time estimates for specialized technical reviews such as drainage, all in addition to the time needed to review the actual proposal.

The Fredericksburg District land development section provided estimates for the time needed to reject a document properly, following all necessary procedures. They provided a time estimate of 3 hours to log the document into their tracking system, examine the document, and compose a rejection letter justifying why the document was rejected and what the applicant must do to amend it. Many of the individuals who participated in the review sessions at the districts estimated that 1 hour would be needed to receive a document, which would mean logging the document into their tracking system, setting up digital and paper file folders for the document's correspondence, assigning the document an identification name/number, and distributing it with the requisite cover letters to the necessary technical specialists in the district office. In summary, even the simplest reviews take a fair amount of time, and the time needed just to get a document into the queue of other documents to be reviewed is approximately 1 hour in all districts.

CONCLUSIONS

- *The stipulation in Chapter 527 that the fee charged for reviews of land development proposals "shall not exceed the actual cost to the Department, or $1,000, whichever is less, for each review" requires that the actual cost of the individual reviews be known.* Since VDOT has not been tracking the costs of individual reviews, there are almost no available data sufficient to determine the costs to VDOT of performing the reviews; as a consequence, this study has provided only estimates of that cost. This absence of data needs to be remedied if VDOT is to be able to determine the actual costs of performing these now legislatively mandated reviews. Once the actual costs are determined, it will be possible for VDOT to set up a fee schedule that will be reasonably commensurate with these actual costs.

- *Several types of reviews are now mandated by the legislature: TISs, comprehensive plans, rezonings, site plans, and subdivision plats and plans. Complexity appears to be very important in determining how long these reviews will take, and there is at present no standard for judging the complexity of individual proposals.* It would, of course, be possible to track the actual costs of performing each of these four types of reviews and then set one flat fee for each type. The problem with that method is that some site plans (for example) may take 10 times longer to review as others, and thus a flat fee for each type of review would not be commensurate with the actual costs of reviewing all the individual proposals that fall under one type.

- *The samples of land development proposals chosen for the survey undertaken in this study ranged in complexity from the simple to the complex, but they did not begin to represent the exceedingly complex proposals that are often submitted in Northern Virginia, Fredericksburg, Richmond, and Hampton Roads. For this reason, the results of this study cannot be extrapolated to the review of a land development document comprising a significant number of technically complex issues. However, even though the samples came from the lower end of the range of complexity for typical submissions, the estimates of what it cost to conduct the reviews were all above $1,000.* (It is worth noting that the $1,000 limit covers only about 16.5 hours of labor at the average loaded rate of those individuals who took part in the survey, which is $60.31.)

- *There is quite a large variation in the estimates from one district to the next, and the researchers cannot explain this variation; however, notwithstanding the difficulties of making the estimates required of the survey participants, it is important to note that if the data from the survey are aggregated to the district level and the lowest and highest estimates for each sample are removed, then the lowest estimate remaining for any of the samples is 29 hours, which at $60.31 per hour, would cost VDOT $1,748.99.*

RECOMMENDATIONS

Fee Recommendations

1. *Until a better—and more commensurate—schedule of fees is developed, it would be appropriate to charge $1,000 for all reviews.* However, a fee this low will make it possible for VDOT to recover only a very small proportion of its costs.

2. *For those proposals that are submitted for review but rejected for one reason or another and not reviewed, it would be appropriate to charge a fee to compensate VDOT for 2 to 4 hours of time to do everything necessary for the submittal to be examined with sufficient care to determine whether it should be accepted for review or rejected.* The General Assembly has clearly indicated that up to a limit of $1,000, VDOT's fees for reviews should be commensurate with its costs. A number of survey participants indicated that checking a proposal in, evaluating it, and writing a rejection letter takes 2 to 4 hours. If this is averaged to 3 hours and multiplied by the average loaded salary rate of those who participated in the

survey, which is $60.31, then a fee of $180.00 would be approximately commensurate with VDOT's costs.

Other Recommendations

Since VDOT needs to take several steps to be in a position to set fees for reviews of land development proposals that will be commensurate with the actual costs of the reviews, two additional recommendations are offered. They assume that the fees will be assessed up front and paid before the review is performed, which means that there must be a way to assess quickly the character and complexity of the proposal in order to determine the appropriate fee. The following recommendations focus on setting up a system of fees that are reasonably commensurate with the actual cost of performing the reviews and that use the time required to perform the review as the principal factor determining the actual cost of the review.

3. *VDOT should investigate what elements of individual site plans, rezonings, etc., contribute to their complexity. All individuals who regularly review or have a hand in the review of land development submittals should be gathered together for a focus session devoted to determining the elements that affect the complexity of a submittal and thus the time required to review it.* The assumption here is that increases in complexity will normally require increases in the amount of time required to complete a review, and increases in time obviously are related to increases in the cost to VDOT. Thus, to create a fee schedule that is reasonably commensurate with VDOT's costs, the complexity of each submittal would need to be assessed. Consequently, the cost of the review and thus the fee for the review would be tied to general distinctions in complexity, and this would eliminate the need to track the actual cost of each review using a system of accounts receivable.

   The lines between the levels of complexity are obviously going to be fuzzy. VDOT can choose to draw the lines just about anywhere it wishes; for example, for site plans, it may be reasonable to try to provide criteria for three levels of complexity; however, it may be the case that site plan submittals can naturally be broken down into five levels of complexity—all of which can be distinguished by specific criteria that reflect the level of complexity and thus the time it takes to perform the review. To some extent, the number of levels of complexity would be contingent on the typical character of site plan submittals. The criteria for making these distinctions in complexity are important because they must accurately distinguish submittals that will require different amounts of time to review. Once it is possible to distinguish reliably the different levels of complexity within each type of submittal, the costs of each level of complexity of each type of submittal can be tracked accurately. It will take experienced reviewers to define these levels of complexity. As a general rule, it is probably safe to say that the greater the number of levels, the greater the commensurability with actual costs. Since it is essential that it be possible to determine without any great difficulty the level of complexity to which a submittal belongs, there would have to be a balancing of commensurability and efficiency of use. This would lead to a system that is relatively simple and efficient to use while at

the same time providing a fee schedule that is reasonably commensurate with the actual costs of the reviews.

Many localities (and also VDOT in its *Subdivision Street Requirements*[4]) charge fees that are based on characteristics of the proposed development. Thus, the fee charged for reviewing a land development proposal would be based (for example) on the number of signalized intersections, unsignalized intersections, entrance movements, etc. This system for setting fees and the one described above use the same characteristics of proposed developments but in different ways. Whereas in the above system the characteristics of the development are used to create what might be called a stepwise system of levels of complexity, the system described here is linear. Rather than comprising a set of steps or levels, the individual elements of the development are used to determine a fee *directly* rather than being used to determine a level of complexity, which is then used to determine a fee. In order for a linear fee schedule such as this to be commensurate with the cost of conducting the reviews, it would have to be calibrated. The calibration of a linear system would require the correlation of data such as the time spent on the review of individual land development proposals and information about the proposals such as the number of proposed entrances on state highways, the number of proposed traffic signal modifications, etc. Mathematical techniques could then be used to determine an appropriate fee per entrance, traffic signal, etc., such that when the cost is calculated, it approximates the actual cost of a review.

Making the correlations between the characteristics of proposed developments and levels of complexity is an important part of developing a fee schedule that is commensurate with the actual costs of the reviews. No one is better placed than the individuals who regularly perform the reviews to determine the appropriate characteristics that distinguish the different levels of complexity that require different fees to be charged in order for VDOT to recover its costs.

4. *Once the different levels of complexity for each type of submittal are agreed upon, VDOT should track the actual costs of performing the reviews for a fixed period of time—perhaps 6 months or 1 year.* This should not be done until the criteria for distinguishing the different levels of complexity within the types of submittals have been determined because the tracking process should take into account these distinctions. VDOT could arrange this in a variety of ways as long as the end result is a substantial amount of data on the costs of doing the reviews. After the data are collected, it should be possible to gather the data from around the state and make a reasonable determination of the actual costs of the reviews. Once the actual costs are known, it would be possible to set up a fee schedule that would be reasonably commensurate with these actual costs.

COSTS AND BENEFITS ASSESSMENT

The stipulation in Chapter 527 that the fee charged for reviews of land development proposals "shall not exceed the actual cost to the Department, or $1,000, whichever is less, for each review" requires that the actual cost of the individual reviews be known. The evidence provided by the survey of VDOT reviewers in this study provisionally supports a review fee of $1,000 for all reviews of land development proposals. Although it is possible that a $1,000 fee will in some cases exceed the actual cost to VDOT, the estimates provided by the participants in this study's survey suggest that in by far the vast majority of cases, the $1,000 fee will be insufficient to recoup VDOT's actual costs; however, charging such a fee will go some way toward recouping these costs. For example, the researchers were told by members of the NOVA staff that about 4,000 reviews of all the types discussed in this report are conducted in Northern Virginia each year. At present, VDOT recovers some of its costs on a small number of these reviews. If a flat $1,000 fee is charged for each of these reviews, then VDOT will recover up to $4 million in costs for Northern Virginia alone. This suggests that the potential for *statewide* recovery of costs for these reviews is many millions of dollars. If, as this report suggests, the $1,000 fee in many cases recoups only a small portion of VDOT's costs, then when a fee is finally set that is actually commensurate with VDOT's costs, the actual amount recovered statewide will be much greater.

ACKNOWLEDGMENTS

The principal researchers, Matthew Grimes, P.E., and Roger Howe, thank the 91 VDOT land development reviewers from throughout the state who took time from their busy schedules to provide data for this project at the survey meetings in the districts. The researchers also thank the study coordinators in the nine VDOT districts: Jeff Kessler, Matt Dana, John Giometti, Susan Hammond, Dennis Harris, Paul Kraucunas, Margaret Niemann, Mark Riblett, Debbie Shinstine, and Bradley Weidenhammer. The members of the steering committee, some of whom attended the survey meetings or helped organize them, are also owed a special debt of gratitude. The steering committee also provided useful comments and suggestions for improving the report. The members of the steering committee are Bob Childress, Paul Kraucunas, Marsha Fiol, John Giometti, Robin Grier, Rob Hofrichter, and Murali Rao.

The researchers also thank the following members of VTRC's Safety, Planning, and Legal Team who reviewed the report and made suggestions for improving it: Associate Director Wayne Ferguson and researchers John Miller and Cheryl Lynn. Three researchers from other VTRC teams also contributed comments and suggestions: Ilona Kastenhofer, Jim Gillespie, and Gene Arnold. Linda Evans edited this report. Ann McDaniel prepared this report for publication. Finally, the researchers thank Ryland Kuper and Donna Cognata of VTRC's Administrative Team for their assistance in calculating the salary additive and overhead costs of the individuals who participated in the survey.

REFERENCES

1. Virginia General Assembly. *Chapter 527 of the 2006 Acts of Assembly*. Virginia Legislative Information Services, Richmond, 2006. http://leg1.state.va.us/cgi-bin/legp504.exe?061+ful+CHAP0527.

2. Virginia Department of Transportation. *Land Development Manual.* Richmond, 1995.

3. Transportation Research Board. *Highway Capacity Manual.* National Academy of Sciences, Washington, DC, 2000.

4. Virginia Department of Transportation. *Subdivision Street Requirements.* Richmond, 2005. http://www.vdot.virginia.gov/business/ssr.asp.

5. Virginia Department of Transportation. *Road Design Manual.* Richmond, 2006.

6. Federal Highway Administration. *Manual of Uniform Traffic Control Devices.* U.S. Government Printing Office. Washington, DC, 2003.

7. Virginia Department of Transportation. *Virginia Supplement to the Manual of Uniform Traffic Control Devices.* Richmond, 1980.

8. Institute of Transportation Engineers. *Trip Generation.* Washington, DC, 2003.

APPENDIX A

CHAPTER 527

An Act to amend and reenact § 15.2-2223 of the Code of Virginia, and to amend the Code of Virginia by adding a section numbered 15.2-2222.1, relating to coordination of state and local transportation planning.

[S 699]
Approved April 4, 2006

Be it enacted by the General Assembly of Virginia:

1. That § 15.2-2223 of the Code of Virginia is amended and reenacted and that the Code of Virginia is amended by adding a section numbered 15.2-2222.1 as follows:

§ 15.2-2222.1. Coordination of state and local transportation planning.

A. Prior to adoption of any comprehensive plan pursuant to § 15.2-2223, any part of a comprehensive plan pursuant to § 15.2-2228, or any amendment to any comprehensive plan as described in § 15.2-2229, the locality shall submit such plan or amendment to the Department of Transportation for review and comment if the plan or amendment will substantially affect transportation on state controlled highways as defined by regulations promulgated by the Department. The Department's comments on the proposed plan or amendment shall relate to plans and capacities for construction of transportation facilities affected by the proposal. Within 30 days of receipt of such proposed plan or amendment, the Department may request, and the locality shall agree to, a meeting between the Department and the local planning commission or other agent to discuss the plan or amendment, which discussions shall continue as long as the participants may deem them useful. The Department shall make written comments within 90 days after receipt of the plan or amendment, or by such later deadline as may be agreed to by the parties in the discussions.

B. Upon submission to, or initiation by, a locality of a proposed rezoning under § 15.2-2286, 15.2-2297, 15.2-2298, or 15.2-2303, the locality shall submit the proposal to the Department of Transportation within 10 business days of receipt thereof if the proposal will substantially affect transportation on state-controlled highways. Such application shall include a TIS if required by local ordinance or pursuant to regulations promulgated by the Department. Within 45 days of its receipt of such TIS, the Department shall either (i) provide written comment on the proposed rezoning to the locality, or (ii) schedule a meeting, to be held within 60 days of its receipt of the proposal, with the local planning commission or other agent and the rezoning applicant to discuss potential modifications to the proposal to address any concerns or deficiencies. The Department's comments on the proposed rezoning shall be based upon the comprehensive plan, regulations and guidelines of the Department, engineering and design considerations, any adopted regional or statewide plans and short and long term traffic impacts on and off site. The

Department shall complete its initial review of the rezoning proposal within 45 days, and its final review within 120 days, after it receives the rezoning proposal from the locality.

C. When a locality receives a subdivision plat pursuant to § 15.2-2258 or 15.2-2260, or a site plan or plan of development pursuant to subdivision A 8 of § 15.2-2286, the locality shall submit such plat or plan to the Department of Transportation in accordance with § 15.2-2260 within 10 business days if the plat or plan substantially affects transportation on state-controlled highways as defined by regulations promulgated by the Department. Such plat or plan shall include supplemental traffic analysis if required by local ordinance or resolution or pursuant to regulations promulgated by the Department. Within 30 days of its receipt of such plat or plan, the Department shall either (i) provide written comment on the plat or plan, or (ii) schedule a meeting, to be held within 60 days of the Department's receipt of the plat or plan, with members of the local planning commission or other agent of the locality to discuss potential modifications to the plat or plan to address any concerns or deficiencies. The Department's comments on the plat or plan shall be based upon the comprehensive plan, regulations or guidelines of the Department, engineering and design considerations, any adopted statewide or regional plans and short and long term traffic impacts on and off site. The Department shall complete its final review within 90 days after it receives such plat or plan from the locality. The submission of the application to the Department shall toll all times for local review set out in this article until the locality has received the Department's final comments.

D. The review requirements set forth in this section shall be supplemental to, and shall not affect, any requirement for review by the Department of Transportation or the locality under any other provision of law. Nothing in this section shall be deemed to prohibit any additional consultations concerning land development or transportation facilities that may occur between the Department and localities as a result of existing or future administrative practice or procedure, or by mutual agreement.

E. The Department shall impose fees and charges for the review of applications, plans and plats pursuant to paragraphs A, B, and C, and such fees and charges shall not exceed the actual cost to the Department, or $ 1,000, whichever is less, for each review.

§ 15.2-2223. Comprehensive plan to be prepared and adopted; scope and purpose.

The local planning commission shall prepare and recommend a comprehensive plan for the physical development of the territory within its jurisdiction and every governing body shall adopt a comprehensive plan for the territory under its jurisdiction.

In the preparation of a comprehensive plan, the commission shall make careful and comprehensive surveys and studies of the existing conditions and trends of growth, and of the probable future requirements of its territory and inhabitants. The comprehensive plan shall be made with the purpose of guiding and accomplishing a coordinated, adjusted and harmonious development of the territory which will, in accordance with present and probable future needs and resources, best promote the health, safety, morals, order, convenience, prosperity and general welfare of the inhabitants, including the elderly and persons with disabilities.

The comprehensive plan shall be general in nature, in that it shall designate the general or approximate location, character, and extent of each feature shown on the plan and shall indicate where existing lands or facilities are proposed to be extended, widened, removed, relocated, vacated, narrowed, abandoned, or changed in use as the case may be.

~~The~~ *As part of the* comprehensive plan*, each locality* shall ~~include~~ *develop* a transportation ~~element~~ *plan* that designates a system of transportation infrastructure needs and recommendations that *may include the designation of new and expanded transportation facilities and that support the planned development of the territory covered by the plan and* shall include, as appropriate, but not be limited to, roadways, bicycle accommodations, pedestrian accommodations, railways, bridges, waterways, airports, ports, and public transportation facilities. *The plan should recognize and differentiate among a hierarchy of roads such as expressways, arterials, and collectors.* The Virginia Department of Transportation shall, upon request, provide localities with technical assistance in preparing such transportation ~~element~~ *plan.*

The plan, with the accompanying maps, plats, charts, and descriptive matter, shall show the locality's long-range recommendations for the general development of the territory covered by the plan. It may include, but need not be limited to:

1. The designation of areas for various types of public and private development and use, such as different kinds of residential, including age-restricted, housing; business; industrial; agricultural; mineral resources; conservation; recreation; public service; flood plain and drainage; and other areas;

2. The designation of a system of community service facilities such as parks, forests, schools, playgrounds, public buildings and institutions, hospitals, nursing homes, assisted living facilities, community centers, waterworks, sewage disposal or waste disposal areas, and the like;

3. The designation of historical areas and areas for urban renewal or other treatment;

4. The designation of areas for the implementation of reasonable ground water protection measures;

5. An official map, a capital improvements program, a subdivision ordinance, a zoning ordinance and zoning district maps, mineral resource district maps and agricultural and forestal district maps, where applicable;

6. The location of existing or proposed recycling centers; and

7. The location of military bases, military installations, and military airports and their adjacent safety areas.

The plan shall include: the designation of areas and implementation of measures for the construction, rehabilitation and maintenance of affordable housing, which is sufficient to meet

the current and future needs of residents of all levels of income in the locality while considering the current and future needs of the planning district within which the locality is situated.

2. That the Department of Transportation shall promulgate regulations by December 31, 2006, to carry out the provisions of this act. Such regulations shall become effective on July 1, 2007, and shall include reasonable exemptions from the requirements of subsections A, B, and C of § 15.2-2222.1.

3. That the Department shall not be subject to the requirements of the Administrative Process Act (§ 2.2-4000 et seq.) as may be necessary to carry out the provisions of the second enactment of this act.

4. That the Department shall submit a report to the Governor and the General Assembly by December 1, 2006, identifying the costs of conducting the reviews required by this act and recommending a reasonable fee schedule for such reviews.

5. That the provisions of the first enactment of this act shall become effective on July 1, 2007.

APPENDIX B
LIST OF ATTENDEES AT SURVEY MEETINGS

This appendix contains the attendance lists for each of the nine district survey meetings. Each list includes the date of the meeting, the location of the meeting, and the years of experience and job title the participants provided when they signed in. The names have been redacted.

BRISTOL, OCTOBER 24, 2006

Reviewer	Years of Experience	Job Title (supplied by participant)
	22	Permits Specialist
	1	Permits/Subdivision Specialist Senior
	5	Engineer I
	10	Permit & Subdivision Specialist Senior
	5	Engineer I
	1	Permit & Subdivision Specialist
	10	Operational Analysis & Enhancement Engr.
	5	Assistant Residency Engineer

CULPEPER, OCTOBER 19, 2006

Reviewer	Years of Experience	Job Title (supplied by participant)
	25	Senior Transportation Engr.
	1	Res. Program Mgr.
	21	Residency Program Manager
	8	Planning and Land Development Mgr.
	22	Transportation Planner
	31	Land Development Engineer
	25	Arch/Engr Manager
	17	Highwy. Prmts. Sub. Spec. Sr.

FREDERICKSBURG, OCTOBER 18, 2006

Reviewer	Years of Experience	Job Title (supplied by participant)
	35	Per. & Subd. Spec. Supv.
	12	Transportation Engineer
	12	Engineering Tech VI
	28	Engr. Tech VI
	18	District Transportation Planner

HAMPTON ROADS, OCTOBER 16, 2006

Reviewer	Years of Experience	Job Title (supplied by participant)
	21	Transp. Engineer Sr. Hydraulics
	15	Assistant Residency Administrator
	10	Assistant Resident Engineer
	7	Assistant Residency Administrator
	8	Engineering Tech. IV
	6	Engineer I
	15	Asst. Dist. Materials Engineer
	20	Trans. Engineer
	3	Trans. Engineer Sr.

LYNCHBURG, OCTOBER 13, 2006

Reviewer	Years of Experience	Job Title (supplied by participant)
	15	Engineer I
	2	Associate Engineer
	7	District L&D Manager
	30	Trans. Assist. Resident Engineer
	6	Hwy. Permits & Subdiv. Spec. Sr.
	15	Architect/Engineer Manager I
	3	Engineer I
	19	Tans. Resident Engineer
	14	Engineering Tech. IV
	27	District Planner
	30	Hwy. Permits & Subdiv. Spec. Sr.
	10	Assistant Resident Engineer
	19	Architect Engineer I

NORTHERN VIRGINIA, OCTOBER 26, 2006

Reviewer	Years of Experience	Job Title (supplied by participant)
	20	Transportation Engineer
	15	Work Zone Officer
	3	Transportation Engineer Sr.
	5	Transportation Engineer
	35	Land Development Section Manager
	6	Transportation Engineer
	20	Transportation Engineer
	20	Transportation Engineer
	20	Transportation Engineer
	18	Transportation Engineer Sr.
	1	Transportation Engineer
	27	Transportation Engineer Sr.
	20	Transportation Engineer Sr.

RICHMOND, OCTOBER 27, 2007

Reviewer	Years of Experience	Job Title (supplied by participant)
	6	Arch/Eng Manager I
	19	Quality Control Engineer
	7	Engineering Tech III
	19	Transportation Engineer
	28	Traffic Operations Manager III (TOM III)
	7	Engineer Tech IV
	21	District River Mechanics Engineer
	1	Transportation Planning Engineer
	12	Engineer Analyst Sr.
	41	Plan Reviewer
	8	Engineer I
	21	District Planning Engineer
	18	Hydraulics Engineer
	26	Assistant Residency Engineer
	3	Engineer Tech IV
	15	Transportation Planning Engineer
	21	Resident Administrator
	8	Hwy & Subdiv Permits Supervisor
	5	Residency Staff Engineer

SALEM, OCTOBER 20, 2006

Reviewer	Years of Experience	Job Title (supplied by participant)
	7	Transportation Engineer
	2	Associate Engineer
	1	Land Development Engineer
	12	Asst. Residency Administrator
	6	Staff Engineer
	2	Assistant Residency Administrator
	19	Land Development Engineer
	15	Staff Engineer
	4	Staff Engineer

STAUNTON, OCTOBER 23, 2006

Reviewer	Years of Experience	Job Title (supplied by participant)
	20	District Transportation Planner
	13	Engineer Tech III
	20	Engineer Manager I
	9	Engineer I
	4	Engineer Tech III
	17	Staff Engineer
	2	Engineer I

APPENDIX C
TIME AND COST ESTIMATES PROVIDED BY SURVEY PARTICIPANTS

This appendix contains the time and cost estimates that each participant provided for each of the sample land development documents that they reviewed. The names of the reviewers have been redacted.

BRISTOL

Reviewer	Description	Total Est. Review Time (Hours)	Total Est. Cost
	TIS, Complex	30	$1,484.34
	TIS, Moderately Complex	20	$989.56
	Site Plan, Simple	42.5	$2,102.81
	TIS, Simple	13.5	$667.95
	Site Plan, Complex	37	$1,830.69
	Subdivision, Complex	102	$5,046.76
	Subdivision, Simple	60.5	$2,993.42
	TIS, Moderately Complex	23	$671.78
	Site Plan, Complex	38	$1,109.89
	Site Plan, Simple	36	$1,051.48
	Subdivision, Simple	32	$934.64
	TIS, Complex	62	$1,810.87
	Subdivision, Complex	94	$2,745.52
	TIS, Simple	19	$554.95
	Site Plan, Complex	40	$1,862.46
	Subdivision, Simple	46	$2,141.82
	Subdivision, Complex	112	$5,214.88
	Site Plan, Simple	28	$1,303.72
	Site Plan, Simple	0	$0.00
	Subdivision, Simple	0	$0.00
	Site Plan, Complex	0	$0.00
	Subdivision, Complex	0	$0.00
	Site Plan, Simple	11.5	$601.82
	Subdivision, Complex	45	$2,354.94
	Site Plan, Complex	39	$2,040.95
	Subdivision, Simple	22.5	$1,177.47
	Site Plan, Simple	27	$1,132.29
	Subdivision, Complex	115.75	$4,854.15
	Site Plan, Complex	51.5	$2,159.73
	Subdivision, Simple	45.25	$1,897.63
	Subdivision, Complex	185.5	$12,130.64
	Subdivision, Simple	6	$392.37
	Site Plan, Complex	51.5	$3,367.81
	TIS, Simple	32	$2,092.62
	TIS, Complex	443	$28,969.67
	TIS, Moderately Complex	86	$5,623.91
	Site Plan, Complex	47.25	$2,191.17
	Site Plan, Simple	27.25	$1,263.69
	Subdivision, Complex	101.5	$4,706.95
	Subdivision, Simple	45.25	$2,098.42

CULPEPER

Reviewer	Description	Total Est. Review Time (Hours)	Total Est. Cost
	TIS, Moderately Complex	78	$5,310.37
	TIS, Complex	189	$12,867.45
	TIS, Simple	26	$1,770.12
	Subdivision, Complex	26	$1,770.12
	Site Plan, Complex	9.34	$639.00
	TIS, Moderately Complex	5.65	$386.55
	Subdivision, Simple	12.3	$841.51
	Site Plan, Simple	6.66	$455.64
	Subdivision, Complex	13.7	$937.29
	Subdivision, Complex	34.54	$2,016.94
	Subdivision, Simple	28.25	$1,649.64
	Site Plan, Simple	26.25	$1,532.85
	Site Plan, Complex	34	$1,985.41
	Site Plan, Simple	1	$80.71
	Subdivision, Complex	1.5	$121.06
	TIS, Simple	2	$161.41
	TIS, Complex	10.5	$847.42
	Site Plan, Complex	3	$242.12
	Subdivision, Simple	0.5	$40.35
	TIS, Moderately Complex	4	$322.83
	TIS, Moderately Complex	81.5	$4,821.97
	Subdivision, Complex	67	$3,964.07
	TIS, Simple	52	$3,076.59
	TIS, Complex	0	$0.00
	Site Plan, Complex	45	$2,662.44
	Subdivision, Complex	29	$1,710.96
	Site Plan, Complex	5	$294.99
	Site Plan, Simple	9	$530.99
	Subdivision, Simple	11	$648.98
	Subdivision, Simple	21.75	$1,541.49
	Site Plan, Simple	18.25	$1,293.44
	Subdivision, Complex	45.25	$3,207.02
	Site Plan, Complex	31.25	$2,214.79
	Site Plan, Complex	27.25	$1,243.25
	Site Plan, Simple	19.5	$889.67
	Subdivision, Simple	28.5	$1,300.28
	Subdivision, Complex	39.25	$1,790.74

FREDERICKSBURG

Reviewer	Description	Total Est. Review Time (Hours)	Total Est. Cost
	TIS, Moderately Complex	10	$647.90
	Subdivision, Complex	23	$1,490.17
	Site Plan, Simple	3	$194.37
	Site Plan, Complex	13.5	$874.67
	Subdivision, Simple	15.5	$1,004.25
	Subdivision, Complex	70	$4,297.61
	Subdivision, Simple	30	$1,841.83
	Site Plan, Complex	2	$122.79
	TIS, Moderately Complex	4	$181.75
	Subdivision, Simple	14.5	$658.83
	Site Plan, Simple	2.5	$113.59
	Subdivision, Complex	22.5	$1,022.32
	Site Plan, Complex	12.5	$567.96
	Subdivision, Complex	23.5	$1,257.22
	Site Plan, Simple	2.5	$133.75
	Site Plan, Complex	15	$802.48
	TIS, Moderately Complex	10	$534.99
	Subdivision, Simple	14.5	$775.73
	TIS, Moderate	22	$1,651.79
	TIS, Complex	71.5	$5,368.33
	TIS, Simple	6.5	$488.03
	Subdivision, Complex	2	$150.16

HAMPTON ROADS

Reviewer	Description	Total Est. Review Time (Hours)	Total Est. Cost
	Site Plan, Complex	11.5	$801.63
	Subdivision, Simple	30	$2,091.20
	Site Plan, Simple	13.5	$941.04
	Subdivision, Complex	41	$2,857.97
	Site Plan, Simple	5.75	$289.53
	TIS, Complex	15.75	$793.06
	Site Plan, Complex	14.75	$742.71
	Subdivision, Simple	6.75	$339.88
	Site Plan, Simple	16	$941.98
	Subdivision, Simple	19.5	$1,148.04
	Site Plan, Complex	18	$1,059.72
	Subdivision, Complex	22.5	$1,324.66
	Subdivision, Complex	6.5	$449.17
	Subdivision, Simple	1.5	$103.65
	Site Plan, Simple	2.75	$190.03
	TIS, Complex	6	$414.62
	Site Plan, Complex	10	$691.03
	TIS, Moderate	5	$345.51
	TIS, Moderate	8	$403.66
	TIS, Simple	8	$403.66
	Site Plan, Simple	10	$504.57
	TIS, Complex	11	$555.03
	Subdivision, Simple	10	$504.57
	Site Plan, Complex	15	$756.86
	Subdivision, Complex	18	$908.23
	TIS, Moderate	12.5	$602.07
	Site Plan, Simple	3	$144.50
	Site Plan, Complex	16	$770.65
	TIS, Complex	47	$2,263.78
	TIS, Simple	13.5	$650.23
	Subdivision, Simple	14.5	$895.05
	Subdivision, Complex	23	$1,419.74
	Site Plan, Simple	17	$1,049.37
	Site Plan, Complex	13.75	$848.76
	Subdivision, Complex	19	$1,104.74
	TIS, Simple	7	$407.01
	TIS, Moderately Complex	8	$465.16
	Site Plan, Complex	17	$988.46
	Site Plan, Simple	10	$581.44
	TIS, Complex	12	$697.73
	Subdivision, Simple	10	$581.44
	Subdivision, Simple	11.5	$660.52
	Site Plan, Simple	4.5	$258.46
	TIS, Moderately Complex	8	$459.49
	TIS, Simple	7	$402.05
	Subdivision, Complex	14	$804.11
	TIS, Complex	17.5	$1,005.13
	Site Plan, Complex	12.5	$717.95

LYNCHBURG

Reviewer	Description	Total Est. Review Time (Hours)	Total Est. Cost
	Site Plan, Complex	92.5	$5,804.24
	TIS, Simple	47	$1,988.64
	Subdivision, Simple	7.5	$317.34
	TIS, Complex	194	$8,208.43
	Site Plan, Complex	38.5	$1,628.99
	Subdivision, Complex	47	$1,988.64
	TIS, Moderately Complex	117	$4,950.45
	Subdivision, Simple	0	$0.00
	Subdivision, Complex	0	$0.00
	Site Plan, Simple	0	$0.00
	Site Plan, Complex	0	$0.00
	TIS, Moderately Complex	4	$238.08
	Subdivision, Simple	5	$297.60
	Subdivision, Complex	8	$476.16
	Site Plan, Complex	5	$297.60
	Site Plan, Simple	3.5	$208.32
	TIS, Complex	4.5	$267.84
	Subdivision, Complex	3	$106.62
	Site Plan, Complex	3	$106.62
	Subdivision, Simple	0	$0.00
	Site Plan, Simple	5.99	$437.13
	Subdivision, Complex	5.99	$437.13
	Site Plan, Complex	3.98	$290.45
	Subdivision, Simple	5.99	$437.13
	Site Plan, Complex	100.5	$4,252.31
	Subdivision, Simple	39	$1,650.15
	Site Plan, Complex	2.5	$182.60
	Subdivision, Complex	7	$511.28
	Subdivision, Simple	2	$146.08
	Subdivision, Complex	18.75	$822.64
	Site Plan, Simple	19.75	$866.51
	TIS, Simple	13.25	$581.33
	TIS, Complex	7	$527.03
	TIS, Simple	0.5	$37.64
	TIS, Moderately Complex	4	$301.16
	Site Plan, Complex	50	$1,953.08
	Subdivision, Simple	38	$1,484.34
	Subdivision, Complex	78	$3,046.80
	Subdivision, Complex	34	$1,714.83
	Subdivision, Simple	34	$1,714.83
	Site Plan, Complex	35	$1,765.27
	Site Plan, Simple	18	$907.85
	TIS, Simple	24	$1,210.47
	TIS, Moderately Complex	98	$4,942.76
	Subdivision, Simple	9	$477.55
	Subdivision, Complex	12.5	$663.27

NORTHERN VIRGINIA

Reviewer	Description	Total Est. Review Time (Hours)	Total Est. Cost
	Site Plan, Simple	21	$1,643.21
	Subdivision, Simple	32.5	$2,543.06
	TIS, Complex	27	$2,112.70
	Subdivision, Complex	71	$5,555.62
	Site Plan, Complex	35.75	$2,797.37
	Subdivision, Complex	7.5	$493.58
	Site Plan, Complex	7.25	$477.13
	Subdivision, Simple	7.5	$493.58
	Site Plan, Simple	5.25	$345.51
	Site Plan, Complex	37	$3,071.70
	TIS, Complex	25.75	$2,137.74
	Subdivision, Complex	18	$1,494.34
	TIS, Simple	10.75	$892.45
	TIS, Moderately Complex	18.75	$1,556.60
	TIS, Moderately Complex	20	$1,498.71
	Subdivision, Complex	38.75	$2,903.76
	Site Plan, Simple	21	$1,573.65
	Site Plan, Complex	27	$2,023.26
	TIS, Complex	5	$374.68
	TIS, Simple	6.5	$487.08
	Subdivision, Simple	17	$1,273.91
	Site Plan, Simple	2.25	$225.89
	Subdivision, Complex	7	$702.75
	TIS, Complex	6	$602.36
	TIS, Moderately Complex	1.25	$125.49
	TIS, Simple	2.25	$225.89
	Site Plan, Complex	6	$602.36
	Subdivision, Simple	27	$1,760.02
	TIS, Complex	20.5	$1,336.31
	TIS, Moderately Complex	12.5	$814.82
	TIS, Simple	12.5	$814.82
	Site Plan, Simple	27	$1,760.02
	Subdivision, Complex	48.5	$3,161.52
	Subdivision, Simple	54	$3,815.91
	Site Plan, Complex	50.5	$3,568.58
	Subdivision, Complex	68	$4,805.22
	Site Plan, Simple	37.5	$2,649.94
	TIS, Simple	42	$2,967.93
	TIS, Complex	23.5	$1,660.63
	TIS, Simple	10.75	$782.27
	TIS, Complex	21	$1,528.15
	Subdivision, Complex	29	$2,110.30
	TIS, Moderately Complex	10	$727.69
	Site Plan, Simple	17.25	$1,255.27
	Site Plan, Complex	20.75	$1,509.96
	Subdivision, Simple	22.75	$1,655.50
	Site Plan, Simple	28.5	$2,288.85
	Subdivision, Simple	40	$3,212.42
	TIS, Moderately Complex	35.5	$2,851.03
	TIS, Complex	23.5	$1,887.30
	Site Plan, Complex	43	$3,453.36
	Subdivision, Complex	58.5	$4,698.17
	TIS, Simple	30.5	$2,449.47

TIS, Complex	11	$975.31
TIS, Simple	7.75	$687.15
Subdivision, Complex	24	$2,127.95
TIS, Moderately Complex	25	$2,216.61
Site Plan, Complex	19	$1,684.63
Subdivision, Simple	12.5	$1,108.31
Site Plan, Simple	12	$1,063.97
TIS, Moderately Complex	11	$749.13
TIS, Simple	8.25	$561.85
Subdivision, Complex	15	$1,021.54
TIS, Complex	12	$817.23
Site Plan, Simple	15.5	$1,257.41
TIS, Moderately Complex	3	$243.37
Subdivision, Simple	24	$1,946.95
TIS, Complex	5	$405.62
Subdivision, Complex	25	$2,028.08
TIS, Simple	13	$1,054.60
Site Plan, Complex	20.5	$1,663.02
Subdivision, Simple	20	$1,408.30
Subdivision, Complex	27	$1,901.20
TIS, Complex	27.5	$1,936.41
Site Plan, Complex	25	$1,760.37
TIS, Moderately Complex	6.4	$450.66
TIS, Simple	18.5	$1,302.68
Site Plan, Simple	22	$1,549.13

RICHMOND

Reviewer	Description	Total Est. Review Time (Hours)	Total Est. Cost
	Subdivision, Complex	116	$7,841.90
	Site Plan, Simple	21.5	$1,453.46
	Subdivision, Simple	35.75	$2,416.79
	TIS, Moderately Complex	40	$2,704.10
	TIS, Simple	25.75	$1,740.77
	Site Plan, Complex	58.5	$3,954.75
	Subdivision, Simple	74	$4,231.77
	Site Plan, Simple	15.5	$886.39
	Subdivision, Complex	254	$14,525.28
	Site Plan, Complex	90.5	$5,175.35
	TIS, Complex	10	$383.95
	TIS, Simple	12.5	$479.94
	Site Plan, Complex	32.5	$1,247.84
	Site Plan, Simple	26	$998.27
	TIS, Moderately Complex	10	$383.95
	Subdivision, Simple	33	$1,267.03
	Subdivision, Complex	39.5	$1,516.60
	TIS, Complex	35.5	$1,973.90
	TIS, Simple	29.5	$1,640.28
	TIS, Moderately Complex	35.5	$1,973.90
	Subdivision, Complex	43	$2,390.92
	Site Plan, Simple	3	$166.81
	Subdivision, Simple	0.5	$26.54
	Subdivision, Complex	1.5	$79.62
	Site Plan, Simple	0.75	$39.81
	Site Plan, Complex	0.75	$39.81
	TIS, Simple	0	$0.00
	Subdivision, Complex	102	$4,770.51
	Subdivision, Simple	32.5	$1,520.02
	Subdivision, Complex	107	$5,860.34
	Site Plan, Simple	38.5	$2,108.63
	Subdivision, Simple	60	$3,286.17
	Site Plan, Complex	51	$2,793.25
	TIS, Complex	2	$86.12
	TIS, Moderately Complex	0.5	$21.53
	TIS, Simple	2.5	$107.65
	TIS, Moderately Complex	41.5	$1,769.76
	TIS, Complex	35.5	$1,513.89
	TIS, Simple	29.5	$1,258.02
	Site Plan, Complex	15	$639.67
	Subdivision, Simple	11	$469.09
	Subdivision, Complex	41.5	$1,769.76
	Site Plan, Simple	3	$127.93
	TIS, Moderately Complex	27	$1,676.77
	Site Plan, Complex	35	$2,173.59
	Subdivision, Simple	27	$1,676.77
	TIS, Complex	23	$1,428.36
	Subdivision, Complex	74	$4,595.60
	TIS, Simple	8	$496.82
	Site Plan, Simple	15	$931.54
	Subdivision, Simple	24.25	$1,114.97
	Site Plan, Simple	29.5	$1,356.35
	Site Plan, Complex	23.25	$1,068.99
	Subdivision, Complex	29.3	$1,347.16

TIS, Simple	34.5	$2,739.09
TIS, Complex	39	$3,096.36
TIS, Moderately Complex	55	$4,366.67
Site Plan, Simple	19.5	$1,077.35
Subdivision, Complex	51.5	$2,845.31
Subdivision, Simple	49	$2,707.19
Site Plan, Complex	27.5	$1,519.34
Site Plan, Simple	11.5	$814.32
Site Plan, Complex	31	$2,195.14
Subdivision, Simple	18	$1,274.59
Subdivision, Complex	64.5	$4,567.30
TIS, Moderately Complex	0	$0.00
Site Plan, Simple	0.75	$33.12
Subdivision, Simple	1	$44.17
TIS, Complex	0	$0.00
Subdivision, Complex	2	$88.33
Site Plan, Complex	0.5	$22.08
TIS, Simple	11	$727.13
TIS, Complex	136	$8,989.95
TIS, Moderately Complex	31	$2,049.18
Subdivision, Complex	16	$1,057.64
TIS, Complex	4.5	$387.65
Subdivision, Simple	23.25	$2,002.84
Site Plan, Simple	12.75	$1,098.33
TIS, Moderately Complex	4.5	$387.65
Site Plan, Complex	14.5	$1,249.09
Subdivision, Complex	44.25	$3,811.86
Site Plan, Complex	21	$985.66
Subdivision, Complex	72.75	$3,414.62
Subdivision, Simple	13.5	$633.64
Site Plan, Simple	12.75	$598.44
Subdivision, Complex	23	$1,579.78
Site Plan, Complex	31	$2,129.26
Site Plan, Simple	10	$686.86
Subdivision, Simple	3	$206.06

SALEM

Reviewer	Description	Total Est. Review Time (Hours)	Total Est. Cost
	Site Plan, Complex	24	$1,451.47
	Subdivision, Simple	16.85	$1,019.05
	Site Plan, Simple	24	$1,451.47
	Subdivision, Complex	38.5	$2,328.39
	TIS, Moderately Complex	117	$4,950.45
	Subdivision, Complex	47	$1,988.64
	Site Plan, Complex	38.5	$1,628.99
	Subdivision, Simple	7.5	$317.34
	TIS, Complex	194	$8,208.43
	TIS, Simple	47	$1,988.64
	Subdivision, Complex	62.75	$3,221.09
	Site Plan, Complex	30.57	$1,569.22
	Subdivision, Simple	46.9	$2,407.48
	Site Plan, Simple	11.36	$583.13
	Subdivision, Simple	17	$999.79
	Site Plan, Complex	20	$1,176.22
	Site Plan, Simple	14	$823.36
	TIS, Moderately Complex	9	$529.30
	Subdivision, Complex	30.5	$1,793.74
	Site Plan, Complex	37.25	$2,511.21
	Site Plan, Simple	22.25	$1,499.99
	Subdivision, Complex	56.75	$3,825.81
	TIS, Complex	31.25	$2,106.72
	Subdivision, Simple	12.5	$842.69
	Site Plan, Complex	14.75	$661.28
	Site Plan, Simple	8.25	$369.87
	Subdivision, Complex	65.25	$2,925.31
	Subdivision, Simple	27.25	$1,221.68
	Subdivision, Complex	20	$1,098.72
	Subdivision, Simple	40	$2,197.45
	Site Plan, Complex	32	$1,757.96
	Site Plan, Simple	10	$549.36
	Subdivision, Complex	58.07	$4,105.94
	Site Plan, Simple	6.49	$458.89
	Site Plan, Complex	8.82	$623.63
	Subdivision, Simple	51.15	$3,616.65
	Site Plan, Simple	7.14	$460.67
	TIS, Moderately Complex	11.25	$725.84
	Subdivision, Simple	12.25	$790.36
	Subdivision, Complex	40.25	$2,596.90
	TIS, Complex	20.25	$1,306.52
	Site Plan, Complex	12.5	$806.49

STAUNTON

Reviewer	Description	Total Est. Review Time (Hours)	Total Est. Cost
	Subdivision, Complex	17	$1,217.60
	TIS, Moderately Complex	39.5	$2,829.12
	TIS, Simple	17	$1,217.60
	TIS, Complex	99	$7,090.71
	Site Plan, Complex	30.5	$1,510.35
	Site Plan, Simple	20	$990.39
	Subdivision, Complex	71.5	$3,540.66
	Subdivision, Simple	26.5	$1,312.27
	TIS, Moderately Complex	53.25	$4,145.64
	Subdivision, Simple	27	$2,102.01
	TIS, Simple	12.5	$973.15
	Site Plan, Simple	32.5	$2,530.20
	TIS, Complex	41	$3,191.95
	Site Plan, Complex	77	$5,994.63
	Subdivision, Complex	133.75	$10,412.75
	Subdivision, Simple	27.5	$1,503.87
	TIS, Moderately Complex	19.5	$1,066.38
	Site Plan, Simple	15	$820.29
	Site Plan, Complex	34	$1,859.33
	TIS, Complex	22.5	$1,230.44
	Subdivision, Complex	63	$3,445.23
	Site Plan, Complex	43.5	$1,680.15
	Subdivision, Complex	42	$1,622.21
	Site Plan, Simple	23	$888.35
	Site Plan, Complex	14.5	$738.58
	Subdivision, Complex	47	$2,394.01
	Subdivision, Simple	10	$509.36
	Site Plan, Complex	5.5	$414.21
	Subdivision, Complex	9	$677.80
	Subdivision, Simple	8	$602.49
	Site Plan, Simple	9	$677.80

APPENDIX D
AGGREGATE TIME AND COST ESTIMATES FOR EACH VDOT DISTRICT

This appendix contains an aggregate time and cost estimate for each VDOT district. The researchers aggregated the time and cost estimates the participants in each district provided to produce nine time estimates and cost estimates.

BRISTOL

Site Plan, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$1,951.70	40
Residency	$3,891.27	89
Traffic Engineering	$3,367.81	52
Sum	**$9,210.78**	**180**

Site Plan, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$952.77	20
Residency	$2,692.55	62
Sum	**$3,645.32**	**82**

Subdivision, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$3,784.91	79
Residency	$8,922.43	205
Traffic Engineering	$12,130.64	186
Sum	**$24,837.98**	**469**

Subdivision, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$1,659.65	34
Residency	$4,040.32	91
Traffic Engineering	$392.37	6
Sum	**$6,092.33**	**131**

TIS, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Residency	$1,647.61	46
Traffic Engineering	$28,969.67	443
Sum	**$30,617.27**	**489**

TIS, Moderately Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Residency	$830.67	22
Traffic Engineering	$5,623.91	86
Sum	**$6,454.58**	**108**

TIS, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Residency	$611.45	16
Traffic Engineering	$2,092.62	32
Sum	**$2,704.07**	**48**

CULPEPER

Site Plan, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$2,904.56	48
Location & Design	$294.99	5
Residency	$4,655.56	82
Sum	**$7,855.11**	**135**

Site Plan, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$80.71	1
Location & Design	$530.99	9
Residency	$3,297.06	58
Sum	**$3,908.76**	**68**

Subdivision, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$2,988.16	48
Location & Design	$1,710.96	29
Residency	$5,879.84	103
Sum	**$10,578.95**	**180**

Subdivision, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$40.35	1
Location & Design	$648.98	11
Residency	$4,141.42	74
Sum	**$4,830.76**	**85**

TIS, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$13,714.86	200
Sum	**$13,714.86**	**200**

TIS, Moderately Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$5,389.00	84
Residency	$386.55	6
Sum	**$5,775.54**	**89**

TIS, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$2,584.77	41
Sum	**$2,584.77**	**41**

FREDERICKSBURG

Site Plan, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$748.37	14
Location & Design	$122.79	2
Sum	**$871.16**	**16**

Site Plan, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$147.24	3
Sum	**$147.24**	**3**

Subdivision, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$1,256.57	23
Location & Design	$4,297.61	70
Planning	$150.16	2
Sum	**$5,704.34**	**95**

Subdivision, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$812.94	15
Location & Design	$1,841.83	30
Sum	**$2,654.77**	**45**

TIS, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Planning	$5,368.33	72
Sum	**$5,368.33**	**72**

TIS, Moderately Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$454.88	8
Planning	$1,651.79	22
Sum	**$2,106.67**	**30**

TIS, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Planning	$488.03	7
Sum	**$488.03**	**7**

HAMPTON ROADS

Site Plan, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$801.63	12
Materials	$848.76	14
Planning	$1,610.06	30
Residency	$831.15	14
Traffic Engineering	$770.65	16
Sum	**$4,862.24**	**85**

Site Plan, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$941.04	14
Materials	$1,049.37	17
Planning	$924.52	17
Residency	$473.85	8
Traffic Engineering	$144.50	3
Sum	**$3,533.28**	**59**

Subdivision, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$2,857.97	41
Materials	$1,419.74	23
Planning	$1,862.65	35
Residency	$886.91	15
Sum	**$7,027.28**	**113**

Subdivision, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$2,091.20	30
Materials	$895.05	15
Planning	$1,125.55	21
Residency	$530.52	9
Sum	**$4,642.33**	**75**

TIS, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Planning	$1,406.46	26
Residency	$603.84	11
Traffic Engineering	$2,263.78	47
Sum	**$4,274.08**	**84**

TIS, Moderately Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Planning	$865.98	16
Residency	$345.51	5
Traffic Engineering	$602.07	13
Sum	**$1,813.56**	**34**

TIS, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Planning	$808.19	15
Traffic Engineering	$650.23	14
Sum	**$1,458.42**	**29**

LYNCHBURG

Site Plan, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$5,028.27	97
Materials	$290.45	4
Residency	$3,035.22	65
Traffic Engineering	$1,628.99	39
Sum	**$9,982.93**	**204**

Site Plan, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Materials	$437.13	6
Residency	$1,116.17	22
Right of Way	$866.51	20
Sum	**$2,419.82**	**47**

Subdivision, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Materials	$1,100.40	18
Residency	$3,785.26	82
Right of Way	$822.64	19
Traffic Engineering	$1,988.64	47
Sum	**$7,696.94**	**166**

Subdivision, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$1,650.15	39
Materials	$914.69	15
Residency	$3,421.01	76
Traffic Engineering	$317.34	8
Sum	**$6,303.18**	**137**

TIS, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Planning	$527.03	7
Residency	$267.84	5
Traffic Engineering	$8,208.43	194
Sum	**$9,003.30**	**206**

TIS, Moderately Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Planning	$301.16	4
Residency	$5,180.84	102
Traffic Engineering	$4,950.45	117
Sum	**$10,432.44**	**223**

TIS, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Planning	$37.64	1
Residency	$1,210.47	24
Right of Way	$581.33	13
Traffic Engineering	$1,988.64	47
Sum	**$3,818.09**	**85**

NORTHERN VIRGINIA

Site Plan, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$2,909.93	36
Traffic Engineering	$3,548.83	44
Sum	**$6,458.76**	**80**

Site Plan, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$1,897.16	25
Traffic Engineering	$345.51	5
Sum	**$2,242.67**	**30**

Subdivision, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$3,957.40	50
Traffic Engineering	$1,751.52	24
Sum	**$5,708.92**	**74**

Subdivision, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$2,080.49	28
Traffic Engineering	$493.58	8
Sum	**$2,574.07**	**35**

TIS, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$1,959.82	24
Traffic Engineering	$1,477.48	19
Sum	**$3,437.30**	**43**

TIS, Moderately Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$1,383.05	17
Traffic Engineering	$1,152.87	15
Sum	**$2,535.91**	**32**

TIS, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Land Development	$1,544.14	20
Traffic Engineering	$727.15	10
Sum	**$2,271.29**	**29**

RICHMOND

Site Plan, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$3,162.64	56
Residency	$5,170.51	86
Traffic Engineering	$370.69	9
Sum	**$8,703.84**	**151**

Site Plan, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$1,357.45	25
Residency	$2,861.73	51
Traffic Engineering	$287.15	6
Sum	**$4,506.34**	**81**

Subdivision, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$7,743.64	138
Planning	$1,057.64	16
Residency	$10,682.18	179
Traffic Engineering	$3,399.59	66
Sum	**$22,883.06**	**399**

Subdivision, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$3,408.38	61
Residency	$3,975.98	68
Traffic Engineering	$283.17	7
Sum	**$7,667.53**	**136**

TIS, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Planning	$10,581.20	157
Residency	$2,199.96	38
Traffic Engineering	$3,487.79	71
Sum	**$16,268.95**	**265**

TIS, Moderately Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Planning	$4,243.28	59
Residency	$2,962.03	48
Traffic Engineering	$3,743.66	77
Sum	**$10,948.98**	**184**

TIS, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Planning	$2,150.50	30
Residency	$1,598.73	29
Traffic Engineering	$2,898.31	59
Sum	**$6,647.54**	**118**

SALEM

Site Plan, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$1,451.47	24
Residency	$2,497.85	43
Traffic Engineering	$1,628.99	39
Sum	**$5,578.31**	**105**

Site Plan, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$1,451.47	24
Residency	$1,477.01	25
Sum	**$2,928.47**	**49**

Subdivision, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$2,328.39	39
Residency	$4,756.03	81
Traffic Engineering	$1,988.64	47
Sum	**$9,073.07**	**167**

Subdivision, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$1,019.05	17
Residency	$2,845.84	49
Traffic Engineering	$317.34	8
Sum	**$4,182.22**	**73**

TIS, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Residency	$1,706.62	26
Traffic Engineering	$8,208.43	194
Sum	**$9,915.05**	**220**

TIS, Moderately Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Residency	$1,255.14	20
Traffic Engineering	$4,950.45	117
Sum	**$6,205.59**	**137**

TIS, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Traffic Engineering	$1,988.64	47
Sum	**$1,988.64**	**47**

STAUNTON

Site Plan, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$3,204.42	41
Residency	$2,894.20	61
Sum	**$6,098.62**	**103**

Site Plan, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$1,604.00	21
Residency	$1,759.67	37
Sum	**$3,363.67**	**57**

Subdivision, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$5,545.27	71
Planning	$1,217.60	17
Residency	$5,501.05	112
Sum	**$12,263.92**	**200**

Subdivision, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$1,352.25	18
Residency	$2,318.89	45
Sum	**$3,671.14**	**63**

TIS, Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$3,191.95	41
Planning	$7,090.71	99
Residency	$1,230.44	23
Sum	**$11,513.09**	**163**

TIS, Moderately Complex

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$4,145.64	53
Planning	$2,829.12	40
Residency	$1,066.38	20
Sum	**$8,041.14**	**112**

TIS, Simple

Division/Residency/Section	*Estimated Cost of Review*	*Estimated Review Time (Hours)*
Location & Design	$973.15	13
Planning	$1,217.60	17
Sum	**$2,190.75**	**30**