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Supplementary Notes				
Abstract The site plan review procedures of the Virginia Department of Transportation (VDOT) were evaluated. The objectives of the evaluation were to recommend (1) a set of site plan review procedures including a checklist, (2) definitions of the roles and responsibilities of the field and central office divisions involved in site plan review, and (3) an outline for a traffic impact study. These recommendations were to facilitate effective, uniform, and consistent site plan review activities throughout the VDOT and to be responsive to the unique needs of the VDOT field offices and the counties. Data were collected through written surveys of district and residency offices of VDOT and county government representatives and interviews with central office divisions and selected field offices. The data analysis resulted in identification of problems in the site plan review procedure. A procedural guide was developed to present the items recommended as part of the study objectives and to resolve some of the problems. Recommendations were made to resolve other problems that were not addressed by the procedural guide.				

SI CONVERSION FACTORS

To Convert From	To	Multiply By
Length:		
in	cm	2.54
in	m	0.025 4
ft	m	0.304 8
yd	m	0.914 4
mi	km	1 . 609 344
Area:		
in ²	cm ²	6.451 600 E+00
ft ²	m ²	9.290 304 E-02
yd ²	m ²	8.361 274 E-01
mi ²	Hectares	2.589 988 E+02
acre (a)	Hectares	4.046 856 E-01
Volume:		
oz	m ³	2.957 353 E-05
pt	m ³	4.731 765 E-04
qt	m ³	9.463 529 E-04
gal	m ³	3.785 412 E-03
in ³	m ³	1.638 706 E-05
ft ³	m ³	2.831 685 E-02
yd ³	m ³	7.645 549 E-01
Volume per Unit Time: NOTE: 1m ³ = 1,000 L		
ft ³ /min	m ³ /sec	4.719 474 E-04
ft ³ /s	m ³ /sec	2.831 685 E-02
in ³ /min	m ³ /sec	2.731 177 E-07
yd ³ /min	m ³ /sec	1.274 258 E-02
gal/min	m ³ /sec	6.309 020 E-05
Mass:		
oz	kg	2.834 952 E-02
dwt	kg	1.555 174 E-03
lb	kg	4.535 924 E-01
ton (2000 lb)	kg	9.071 847 E+02
Mass per Unit Volume:		
lb/yd ³	kg/m ³	4.394 185 E+01
lb/in ³	kg/m ³	2.767 990 E+04
lb/ft ³	kg/m ³	1.601 846 E+01
lb/yd ³	kg/m ³	5.932 764 E-01
Velocity: (Includes Speed)		
ft/s	m/s	3.048 000 E-01
mi/h	m/s	4.470 400 E-01
knot	m/s	5.144 444 E-01
mi/h	km/h	1.609 344 E+00
Force Per Unit Area:		
lbf/in ² or psi	Pa	6.894 757 E+03
lbf/ft ²	Pa	4.788 026 E+01
Viscosity:		
cS	m ² /s	1.000 000 E-06
p c	Pa·s	1.000 000 E-01

$$\text{Temperature: } (^\circ\text{F}-32) \frac{5}{9} = ^\circ\text{C}$$

FINAL REPORT
EVALUATION OF SITE PLAN
REVIEW PROCEDURES

by

B. H. Cottrell, Jr.
Research Scientist

(The opinions, findings, and conclusions expressed in this report are those of the author and not necessarily those of the sponsoring agencies.)

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ABSTRACT

The site plan review procedures of the Virginia Department of Transportation (VDOT) were evaluated. The objectives of the evaluation were to recommend (1) a set of site plan review procedures including a checklist, (2) definitions of the roles and responsibilities of the field and central office divisions involved in site plan review, and (3) an outline for a traffic impact study. These recommendations were to facilitate effective, uniform, and consistent site plan review activities throughout the VDOT and to be responsive to the unique needs of the VDOT field offices and the counties.

Data were collected through written surveys of district and residency offices of VDOT and county government representatives and interviews with central office divisions and selected field offices. The data analysis resulted in identification of problems in the site plan review procedure. A procedural guide was developed to present the items recommended as part of the study objectives and to resolve some of the problems. Recommendations were made to resolve other problems that were not addressed by the procedural guide.

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INTRODUCTION

A site plan is a schematic representation of a proposed site to be developed or redeveloped and includes the existing and proposed roadways that will provide access to the site. At the county's discretion or as required, the site plan may be submitted to the Virginia Department of Transportation (VDOT) for review. Frequently, site plans are submitted in two stages: (1) a preliminary site plan, which is frequently included in the rezoning application, and (2) a (final) site plan, which is also called a "plan of development." The preliminary site plan focuses on the general features of the development. The site plan emphasizes specific design details in addition to the general features of the development.

In the site plan review process, VDOT personnel examine the site plan to determine if the development plans provide designs adequate to accommodate traffic generated by the proposed site without adversely impacting state roads. Comments on the site plan are given to the local jurisdiction with the authority to approve the site development. As part of the site plan review process a traffic impact study for a proposed site development or redevelopment may be prepared (if requested by the county and/or VDOT) to describe how the traffic generated by the proposed site will be served by an existing or future road network. Particular emphases are determining the resulting traffic impacts and providing solutions.

Since there are numerous land development and redevelopment activities throughout Virginia, the VDOT has a substantial site plan review workload. Currently, it does not have a set of procedures defining how developers' site plans should be reviewed. There are no guidelines for preparing a site plan or a traffic impact study. Moreover, the extent of involvement in the process varies among residencies and among districts. Consequently, there are no means to regulate uniform and consistent standards of quality in these documents. Because the residencies and districts and the Transportation Planning, Location and Design (L & D), and Traffic Engineering Divisions are all involved in the site plan review process, there is a need to define the roles and responsibilities of each party clearly. The absence of a clearly defined set of procedures and roles has resulted in an inconsistent and nonuniform application of the site plan review process throughout the state.

OBJECTIVES

The objectives of this evaluation were (1) to evaluate the site plan review process used by VDOT, (2) to recommend a set of site plan review procedures including a checklist, (3) to recommend definitions of the roles and responsibilities of the field and central office divisions involved in site plan review, and (4) to recommend an outline for a traffic impact study.

This project was requested by the Transportation Planning Division.

SITE PLAN REVIEW ACTIVITIES OF VDOT

Information on VDOT's site plan review activities was obtained from departmental manuals and through interviews, telephone conversations, meetings, and written surveys of the residency, district, and central office divisions.

Definitions

The definitions of subdivisions, development and site plans in the Code of Virginia are (1):

Subdivision, unless otherwise defined in a local ordinance adopted pursuant to Section 15.1-465, means the division of a parcel of land into three or more lots or parcels of less than five acres each for the purpose of transfer of ownership or building development, or, if a new street is involved in such division, any division of a parcel of land. The term includes resubdivision and, when appropriate to the context, shall relate to the process of subdividing or to the land subdivided and solely for the purpose of recordation of any single division of land into two lots or parcels, a plat of such division shall be submitted for approval in accordance with Section 15.1-475.

Development means a tract of land developed or to be developed as a unit under single ownership or unified control which is to be used for any business or industrial purpose or is to contain three or more residential dwelling units. The term development shall not be construed to include any property which will be principally devoted to agricultural production.

Site plan means the proposal for a development or a subdivision including all covenants, grants or easements and other conditions relating to use, location and bulk of buildings, density of development, common open space, public facilities and such other information as required by the subdivision ordinance to which the proposed development or subdivision is subject.

The distinctions between a subdivision and a development are that a subdivision consists of many individually owned lots or buildings of limited size whereas a development is a single unit under single ownership or unified control and is primarily for commercial use. The term site plan is a generic identifier for any proposed building plan for a location that includes a subdivision or development plan. However, VDOT's requirements and involvement are different for a subdivision and a development plan.

VDOT as Regulator and Advisor

The VDOT plays important regulatory and advisory roles in the site development process.

Regulator of Activities Within the Right-of-Way

According to the general rules and regulations of the State Transportation Commission, a permit is required from VDOT for work to be performed on or crossing any right-of-way under the jurisdiction of VDOT (2). Types of permits that are of interest in land development are shown in Table 1. Therefore, VDOT is authorized to control and regulate entrances to state highways and the installations within the right-of-way that are necessary for land development.

Table 1

Typical Permits Related to Site Plan Review

- A. Surface Work
 - 1. Entrances
 - a. commercial
 - b. median crossovers
 - 2. Steps, Sidewalks, Curb and Gutter, Etc.
 - 3. Grading, Landscaping, Tree Planting on Right-of-Way
 - 4. Street or Road Tie-Ins
- B. Overhead Installations
- C. Underground Installations
- D. Street Lighting
- E. Minor Drainage Installations

Source: (2).

Regulator of Secondary System

VDOT also has subdivision street requirements that provide the administrative procedures and standards for the acceptance of

subdivision streets into the state-maintained secondary system (3). The administrative procedure requires that VDOT review the subdivision plans to determine if streets that are intended to be added to the secondary system meet the applicable requirements.

Advisor to the County on Land Development Impacts

Since the county government regulates land use, VDOT, when requested, advises the county on the impact of commercial developments on the state highway system in the rezoning and site plan review stages.

VDOT's participation as advisor facilitates the design, construction, and permit approval phases by resolving potential problems in the early phases of the proposed project. As a result, VDOT, the county, and the developer may benefit.

Manuals Used in Site Plan Review

Some of the manuals used by VDOT in site plan review activities are:

1. "Land Use Permit Manual," Maintenance Division (2)
2. "Minimum Standards of Entrances to State Highways," Traffic Engineering Division (4)
3. "Subdivision Street Requirements," Secondary Roads Division (3)
4. "Road Design Manual," Location and Design Division (5)
5. "Road and Bridge Standards," Location and Design Division (6)
6. "Drainage Manual," Location and Design Division (7)
7. "Road and Bridge Specifications," VDOT (8)
8. Manual on Uniform Traffic Control Devices (MUTCD), Federal Highway Administration (9)
9. Virginia Supplement to the MUTCD, Traffic Engineering Division (10)
10. A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials (AASHTO) (11)
11. "Guidelines for Lighting by Permit on State Right of Way," Maintenance Division (12)
12. Highway Capacity Manual, Transportation Research Board Special Report 209, Transportation Research Board (13)
13. "Guidelines for Planting Along Virginia's Roadways," Environmental Division (14).

Survey of Resident Engineers

Resident engineers were surveyed through a written format to obtain information on the site plan review process. Of the 42 residencies involved in site plan review, 39 (93%) responded to the survey. (The three residencies in the Northern Virginia District are not involved in

site plan review.) The results of the survey are shown in Appendix A, Figure A-1.

The residencies that receive plan review requests from the county government or developer are approximately equal in number, 33 (85%) and 35 (90%), respectively. Twenty (51%) also receive site plans from other sources, primarily engineering firms representing the developer. Most residencies receive site plans from more than one source.

Nine residencies (23%) have a documented procedure for site plan reviews: five of these use a subdivision and site plan review checklist that was recently developed by the Suffolk District. Three residencies (Abingdon, Chesterfield, and Hillsville) developed their own procedures, including a subdivision checklist. The Sandston Residency, in conjunction with Henrico County, developed a weekly meeting procedure for site plan review.

Six residencies (15%) (including the Sandston Residency) formally coordinate site plan review activities through regularly scheduled meetings with the counties. The Culpeper, Fredericksburg, Harrisonburg, and Warrenton residencies meet monthly with one county in their area (Culpeper, Stafford, Rockingham, and Fauquier counties, respectively) to coordinate site plan reviews. The Charlottesville Residency meets two times per month with Albemarle County. Thirty residencies (77%) informally coordinate with the counties on an as needed basis. The methods of coordination include correspondence, telephone calls, meetings, and joint field reviews. It is suspected that other residencies also meet regularly with counties in their area. However, because of incomplete responses, it is difficult to verify the extent of such coordination.

Four residency positions are primarily responsible for site plan review activities. In order of decreasing frequency of responses, the positions were assistant resident engineer, highway construction inspector B (permit inspector), resident engineer, and contract administrator.

Twelve residencies (30%) send all site plans to the district office for review. Among these are four residencies each in the Suffolk and Staunton districts. Ten residencies (25%) send site plans for large developments to the district office. Nine residencies (23%) send the site plans to the district office if there are questions on the site plan and the residency is uncomfortable with its review. Other reasons for involving the district office in the review include the inclusion of subdivision plans (4, or 10%), drainage items (4, or 10%), complex drainage (4, or 10%), and controversial developments (2, or 5%) and if plans do not meet standards (2, or 5%).

Thirty-five residencies (90%) never send site plans to the central office for review. Four (10%) send site plans to the central office. Each of the following conditions was identified by one residency (except where noted): (1) when a traffic impact study is done, (2) when there is a large development (two residencies), (3) when the residency and

district offices disagree, and (4) when the developer disagrees with the field offices.

The mean response time for site plan review is approximately the same for both rezoning applications and site plans. It takes about one week for the residency to complete a review. When the district is involved in the review, the mean response time is about two weeks. When the central office is involved, the mean response time is slightly more than three weeks. The standard deviations indicate wide variations in the mean response time.

Five problems are frequently encountered by residency offices: (1) incomplete plans and lack of information (16, or 40%), (2) plans not designed to meet standards (12, or 30%), (3) heavy workload/insufficient time for review (8, or 20%), (4) inadequate sight distance (8, or 20%), and (5) inadequate drainage (5, or 13%). Problems 4 and 5 are specific cases of problem 2. Other problems are listed in Appendix A, Figure A-1 along with suggestions for improving the site plan review.

A ranking of site plan review activities by residency is given in Table 2. The ranking is based on the number of rezoning applications and subdivision and site plans received during April, May, and June 1987. The five top ranking residencies (12% of those responding) received 42% of the plans and applications. The top ten ranking residencies (24%) received 61% of the plans and applications. Consequently, the majority of site plan review activities are concentrated in about one-fourth of the residency offices.

In summary, the residency offices perform similar site plan review activities in a variety of ways. The site plan review workload also varies widely. These variations are expected to a large degree because of the different economic and land development conditions across the state. Similar problems are encountered by the residency offices involving the quality of the plans reviewed.

Survey of District Traffic/Transportation Planning Engineers

The nine district offices were surveyed through a written format. Eight (89%) responded to the survey. The results are shown in Appendix A, Figure A-2. The survey was completed by district traffic engineers in seven districts and by the district transportation planning engineer in Northern Virginia, the only district with a planning section and a sizeable staff for site plan review.

All eight districts receive site plan review requests from the residency offices. Two also receive plans directly from the developer or his consultant. The district L & D section sends the plans to the district traffic section in two districts. The Northern Virginia District receives plans directly from three of the four counties they serve via carriers and from the Leesburg Residency.

Two districts, Suffolk and Northern Virginia, have a documented procedure for site plan review. Both use a subdivision and a site plan

review checklist. Four districts meet with residencies on specific site plans, and five meet regularly or frequently with the residencies on site plan reviews. All districts coordinate with residencies on joint field review through correspondence and telephone calls.

Three districts coordinate their reviews with county government representatives. In the Culpeper District, bimonthly meetings are held by the district traffic and residency staff and an Albemarle County engineer. The Richmond District traffic staff hold monthly meetings individually with Chesterfield and Henrico County staff. The Northern Virginia District staff has continual coordination with the counties in that jurisdiction including staff meetings and joint meetings with the developer.

Four respondents indicated four methods of coordination; the remaining four indicated no coordination within the district.

Plans are sent to the Traffic Engineering Division by four districts when a policy change is needed or entrance design standards are not met. Two districts send plans for major developments to the Transportation Planning Division. Two other districts very seldom or never send plans to the central office. Plans for a major development on roads with congestion or a major road improvement plan are sent to the Transportation Planning Division by one district. Since the Northern Virginia District does not have an L & D section, it coordinates major reviews with the L & D Division.

The mean response time for rezoning applications was 9 days when the district was involved and 21 days when the central office was involved. For site plan review, the mean response times for the district and central office review were about 17 and 39 days, respectively. When compared with response time data received from the residency survey, the rezoning application review time is slightly less and the site plan review time is more.

Five districts (Richmond, Suffolk, Northern Virginia, Lynchburg, and Culpeper) suggested that the requirement of a traffic impact study should depend not only on the type and size of development but also on the existing level of service on the impacted roadways. Two of these districts (Northern Virginia and Suffolk) stressed the importance of engineering judgment in determining the need for a traffic impact study. The remaining three districts stated that a traffic impact study should be required for major traffic generators that include all types of large developments.

Table 2
 Ranking of Residency Offices by Site

<u>Residency</u>	<u>Number of Plans/Applications</u> ¹	<u>Ranking</u>
Chesterfield	186	1
Williamsburg	169	2
Suffolk	141	3
Ashland	127	4
Fredericksburg	112	5
Salem	85	6
Charlottesville	70	7
Saluda	65	8
Warrenton	60	9
Christiansburg	54	10
Staunton	54	10
Culpeper	53	12
Edinburg	44	13
Chatham	35	14
Luray	34	15
Appomatox	25	16
Louisa	25	16
Rocky Mount	25	16
Sandston	25	16
Wise	25	16
Amherst	24	21
Harrisonburg	24	21
Lebanon	24	21
Bedford	19	24
Warsaw	19	25
Abingdon	18	26
Accomac	15	27
Petersburg	15	27
Bowling Green	8	29
Hillsville	8	29
Waverly	5	31
Franklin	3	32
Halifax	2	33
Jonesville	2	33
Lexington	1	35
Dillwyn	0	36
Martinsville	0	36
South Hill	0	36
Tazewell	0	36
Total	1,748	

¹ The ranking is based on the number of rezoning applications and subdivision and site plans received during April, May, and June 1987.

Four districts (Fredericksburg, Culpeper, Lynchburg, and Staunton) noted that counties without site plan ordinances pose a problem. Frequently, site plans in these counties are reviewed in the permit stage with construction already underway, and subsequently, major problems occur if substantial changes are required. Thus, a review of site plans in the early stages is very beneficial. The heavy site plan review workload and the long time required to review plans thoroughly are a problem for three districts: Northern Virginia, Richmond, and Suffolk. Incomplete site plans were also noted as a problem by three districts: Northern Virginia, Suffolk, and Bristol. Two districts (Richmond and Northern Virginia) acknowledged a need for more cooperation with counties and developers. The Richmond and Suffolk districts have a need for training of residency personnel (also district personnel for Suffolk) and a need for a district transportation planning section.

Six districts stated how their site plan review activities are different from most districts, including the extent of site development activities and the level of involvement in the review process. Table 3 displays the ranking of the number of rezoning applications and subdivision and site plans received in each district's jurisdiction during April, May, and June 1987.

While Northern Virginia's statistics represent the number of plans and applications received by the district, the other districts show the number received by all residencies within each district based on the residency survey. Therefore, the other district offices did not necessarily receive all of the plans from the respective residencies.

Table 3

Ranking of Site Plans and Rezoning Applications
Received by Residencies Within the District¹

<u>Ranking</u>	<u>District</u>	<u>Number of Applications and Plans</u>	<u>Percentage of All Plans</u>
1	Northern Virginia	1,063	37.8
2	Richmond	439	15.6
3	Suffolk	332	11.8
4	Fredericksburg	276	9.8
5	Culpeper	218	7.8
6	Salem	191	6.7
7	Staunton	157	5.6
8	Lynchburg	86	3.1
9	Bristol	49	1.7
	Total	<u>2,811</u>	<u>100.0</u>

¹ For Northern Virginia the plans and applications were received by the district. For the other districts the numbers are based on the residency survey for all residencies in the district.

The Northern Virginia and Richmond districts accounted for 53.4% of all site plan review activities during the 3-month period. The top four districts accounted for 75% of all site plan review activities.

In summary, the same similarities and differences noted at the residency level are carried over at the district level. Five districts agree on the importance of determining the need for a traffic impact study based on the type and size of development and the existing level of service on the impacted roadways. Frequently occurring problems include the need for a county site plan ordinance, the heavy workload for site development review, and incomplete plans.

SURVEY OF COUNTY GOVERNMENTS

County governments were surveyed through a written format: 57 counties (59%, including the City of Suffolk, which functions as a county for VDOT) responded to the survey sent to 96 county governments. The results are shown in Appendix A, Figure A-3.

Only five counties (9%) have guidelines for a traffic impact study. A traffic impact study is required by seven (12%) for large developments and by five (9%) when the development involves transportation issues. Eight counties (14%) rarely or never require a traffic impact study.

Forty-one counties (72%) have rezoning applications (or preliminary plan process) and site plan requirements. All of the counties have a subdivision ordinance as required by the Code of Virginia. The comprehensiveness of the site plan requirements and subdivision ordinances varies widely. In general, urbanized counties give more attention to detail and have a larger staff than do rural counties. Ten counties (18%), and possibly 16 counties (28%), including the no responses, do not have rezoning applications and site plan requirements. These 26 counties are rural counties.

Twenty-nine counties (51%) have a documented site plan review procedure that is generally included in the site plan requirements. A checklist and/or brochures combined with time schedules were provided by eight (14%).

Fifty-four counties (94%) thoroughly review subdivision and site plans.

Twenty-one counties (37%) routinely request a review of a rezoning application by VDOT; 11 counties (19%) request a review as needed, primarily based on the potential traffic impact. The remaining 44% either rarely or never request a review or do not have a zoning ordinance.

The responses for when requests are made by the counties for VDOT review of site plans are similar, with 22 counties (39%) routinely requesting reviews and 10 (17%) requesting them as needed.

Twenty-seven counties, nearly 50% of the respondents, indicated either no problems or a good relationship with VDOT. The most common problem noted by 10 counties (18%) was a long review time. Four counties (7%) noted a need for better communications and coordination. Three counties (5%) each noted the following four problems:

1. A distinction between and policies for recommendations and requirements is needed.
2. Inconsistency in review results in a need for a clear review policy.
3. Rezoning reviews leave issues unresolved until the site plan stage.
4. Requirements are inappropriate.

Other issues, each raised by two counties (4%), included a need for written review comments routinely, conflicts between county and VDOT standards, a need for a VDOT staff person with authority available to resolve issues, and VDOT review of items outside the right-of-way.

The most frequent comment (three counties) was that VDOT needs additional staff for site development review.

In summary, the wide variation in land development activity across the state is reflected in the administration of site plan review activities by the counties both in degree and method. While nearly 50% of the counties indicated no problems, a long review time was a common problem for 10. This, in addition to other problems previously noted, indicates the need for improvements in the site plan review process.

EVALUATION ASSESSMENT OF SITE PLAN REVIEW ACTIVITIES

Based on the results of the VDOT and the county surveys, the strengths and weaknesses of site plan review activities for VDOT were identified. They, along with ways to improve the weaknesses or resolve the problems, are discussed in the following section.

In the author's opinion, VDOT is getting the job done admirably and fairly effectively given the available resources and the phenomenal demand for site plan review activities. The residency, district, and central offices have made adjustments and, with some innovations, have accomplished much in site plan review. Acknowledging the benefits of cooperation, some VDOT and county offices have established methods of coordinating reviews. Nearly 50% of the counties indicated either no problems or a good relationship with VDOT concerning site plan review.

Nevertheless, based on the results of the surveys, four areas need improvement: site plan content, timeliness of the review, quality of the review, and coordination with the counties.

Site Plan Content

Incomplete plans and plans below design standards were the two major problems in site plan content. Both problems result in VDOT staff noting the deficiencies, correcting the deficiency or requesting the plan to be corrected, and recommending a resubmittal. A well-prepared site plan decreases the time and effort required in the review process. A site plan checklist recommended to resolve this problem is discussed later in this report.

Timeliness of the Review

A long review time for VDOT's site plan review was the major problem indicated by the counties. There are several reasons for this. One explanation could be that VDOT's residency, district, and central offices do not have the resources to accommodate more expediently the site plan review workload generated in areas of high development. A contributing factor could be that VDOT's site plan review staffing level has remained constant while the site plan review workload has increased substantially. The results were that either more person-hours were spent on site plan review at the expense of VDOT's operational activities or the person-hours spent on site plan review did not change, the backlog of site plans increased, and the amount of time the plans were held by VDOT increased. In the former case, VDOT activities are adversely affected; in the latter case, the counties and developers involved are adversely affected. Most VDOT offices have not developed guidelines defining an acceptable or desirable review time.

Several recommendations to consider for improving the timeliness of the review are listed in Table 4. Although Table 4 is by no means complete, it serves as a starting point to improve the timeliness of the review.

Quality of the Review

From the survey of the counties, seven problems reflected on the quality of the review: (1) the need for a distinction between and policies for recommendations and requirements; (2) inconsistency in reviews; the need for a clear review policy; (3) rezoning reviews leave issues unresolved until the site plan stage; (4) inappropriate requirements; (5) written review comments are needed routinely; (6) vague responses; and (7) new comments are added at final submittal.

Table 4

Considerations for Improving Review Timeliness

1. Increase VDOT's site plan review resources by:
 - a. adding a Transportation Engineer A with a planning background in the districts where there is a heavy demand to review site plans, excluding Northern Virginia
 - b. contracting with consultants to perform site plan review activities (the Northern Virginia District is currently doing this)
 - c. using engineer trainees who are awaiting assignments for site plan review activities.
2. Define the time period considered to be an acceptable review time. In some cases, the review time period is mandated by county law. VDOT should make an effort to adhere to the mandated review time period. When the time period is unreasonable, the county involved may agree to extend its acceptable review time. Therefore, the expected VDOT review time, giving consideration to which VDOT office will conduct the review, would be realistic and attainable.
3. Permit the counties involved to assume additional responsibility in the site plan review process. The responsibilities include:
 - a. ensuring that the site plans submitted to VDOT are in compliance with the site plan checklist
 - b. reviewing for final approval second submittals for compliance with minor and possibly major changes requested by VDOT. This review should be done by the county upon VDOT's recommendation
 - c. reviewing all development plans (including subdivisions) for conformance to VDOT's requirements, thereby eliminating review by VDOT. Fairfax County and VDOT have such an agreement.
4. Expedite transmittal of the site plan from the county to the residency, then from the residency to the district to the central office, when appropriate.
5. Examine the potential time savings from the use of microcomputer software for the reviews. This suggestion requires further study.

Recommendations vs. Requirements

The VDOT design requirements, or standards, are considered minimal. In keeping with its mission to provide a safe, efficient, and effective ground transportation system, VDOT is obligated to make recommendations that exceed the minimum standards where it is deemed necessary and in VDOT's best interest. Three conditions are suggested to distinguish recommendations and requirements:

1. When a VDOT reviewer discusses compliance with minimum standards, it should be stated that the design feature is required.
2. When a design proposed by VDOT exceeds the minimum standards to resolve safety or capacity problems, then it should be stated that the design is required with an explanation. For example, a right-turn lane may be required although not justified by the minimum standards if (a) inclusion of a right-turn lane would be the most desirable way to increase sight distance to an acceptable level or (b) inclusion of a right-turn lane would improve the level of service to the through movements to an acceptable level.
3. When a design feature proposed by VDOT exceeds the minimum standards, then it should be stated that the design feature is "recommended" or, if appropriate, "highly recommended."

To distinguish between recommendations and requirements, requirements should be used for compliance with minimum standards and safety and capacity considerations, and recommendations should be used when the design exceeds the minimum standards.

Inconsistency in Reviews

Inconsistency in reviews by VDOT for a single county may result for several reasons. Site plan review is not an exact science: reviewers do not get the same answer. The design standards serve as the reference points where all VDOT reviewers begin. Then, the reviewers' comments will differ because of their varied professional experiences, abilities, and perceptions of the unique conditions of the site plan. Therefore, there may be variations in the review of similar plans or even the same plan if the plans are reviewed by different offices, i.e., the residency, district, or central offices. An even more important reason for perceived inconsistencies is that the entrance and road design needs depend on the traffic conditions on the state highways to be entered from the development. The existing levels of service, operating speed, and the presence of nearby intersections or entrances are examples of the site-specific factors that must be examined in the review. For these reasons, a degree of perceived inconsistency in reviews can be reasonably expected.

However, inconsistencies in reviews may also be attributable to poor reviews, which may be resolved through training, thorough reviews in lieu of hasty reviews to meet a deadline, and use of the site plan review checklist discussed later in this report.

Rezoning Reviews

When rezoning reviews leave issues unresolved until the site plan stage, an opportunity to eliminate conflicts among VDOT, the county, and

the developer is missed. This problem can be resolved through improved communications between the county and VDOT staff reviewers. It is highly desirable for all parties involved to resolve problems as early as possible.

Inappropriate Requirements

If the county believes that VDOT's standards are excessive, it is suggested that the county gain a better understanding of VDOT's standards through communication. If the county believes that VDOT's

standards are not stringent enough, the county should be encouraged to develop its own standards. County requirements would prevail where the county's standards were more stringent than VDOT's standards.

Written Review Comments and Vague Responses

Clearly written review comments should be the final product of every review. The comments should be clear, direct, and specific. Problems should be clearly defined, and actions to be taken to resolve the problem should be stated. The review comments should also be organized.

New Comments Added at Final Submittal

Some problems may be overlooked until the final submittal. However, a thorough review of the first submittal should identify most problems. The use of a site plan review checklist should aid as a check for a thorough review.

Coordination With the Counties

The need for better communication and coordination between VDOT and the counties was second to a long review time in the number of counties that noted this problem. The implementation of the district roundtable meetings on a continuing basis is one step in maintaining open lines of communication. Several counties have site plan review committees that serve as an ideal forum for communication and coordination on issues specific to site plan review. Any means of coordination tailored to the needs of the county and VDOT are strongly encouraged and should be considered a requirement.

Moreover, site plan review activities may be improved by (1) the adoption of a site plan ordinance by each county that does not have such an ordinance, and (2) the inclusion of the site plan checklist in the ordinance. A site plan ordinance would require a review of the plan prior to the permit stage, thereby eliminating potential problems with inadequate designs revealed after construction has begun. Most counties have a site plan ordinance, and several have site plan checklists. The checklists discussed later in this report are designed to be

comprehensive and to serve as a model checklist. VDOT and the counties can coordinate by using the same checklist.

Other Problems

Five other problems and suggestions for their resolutions are:

1. One county expressed a need for its residency office to communicate directly with the developer; another county considered such direct communication a problem. The lines of communication among the county, residency, and developer should be determined locally.
2. Training VDOT staff, especially at the residency level, in site plan review should provide substantial benefits and satisfy a need in at least one district. The procedural guide discussed later and the VDOT design manuals should serve as course materials. Such training may serve to implement the procedural guide and improve site plan review skills.
3. Two counties expressed a need for the availability of an authorized VDOT employee for site plan review matters. It is important that authorized VDOT staff for site plan review be designated at the residency level to serve as a liaison with the county.
4. Central office divisions expressed a need to channel the movement of site plans through VDOT in a uniform and consistent manner. Currently, site plans and/or traffic impact studies are sent to the several different divisions and one director in the central office from counties, residencies, or district offices. Formalized channels for the movement of site plan review are defined in the roles of VDOT offices in site plan review, which is discussed in the procedural guide.
5. An issue revealed through interviews with VDOT staff was the need for VDOT to adopt a policy or guide to specify the design year for site plans and traffic impact studies. Currently, the design year, often determined by the developer or his engineering firm, is commonly the build out year, that is, the year the construction is completed and the site is operational. Occasionally, the design year will be 5, 10, or 20 years after the project's completion. For consistency and fairness, VDOT should have some input in the selection of a design year since the traffic impact is measured and the plan designed for the design year. One faction suggests that using the build out year as the design year is fair to the developer in that the developer should be asked to match the current level of service on the roadways. Another faction believes the developer should accommodate the traffic growth attributed to his development for the next X number of years, X being between 2 to 10 years depending on the development and the traffic impacts. For example, the New Hampshire DOT's design

year depends on the amount and type of traffic generated and the traffic volume on the intersecting state highway. In general, a design year of 10 years is used for traffic signals and minor improvements and 20 years for major improvements. This information was taken from a survey of state DOTs' traffic impact studies, which is summarized in Appendix A. This issue requires further study.

PROCEDURAL GUIDE

A procedural guide for site plan review is presented in Appendix B. The guide has five parts:

1. Checklists for site plan completeness: A preliminary site plan, frequently part of the rezoning application, and site plan checklists are useful for encouraging the submittal of complete plans. The checklist for preliminary site plan completeness was developed from checklists or requirements for Stafford and Prince William counties. The checklist for site plan completeness was based on the checklist of the VDOT Suffolk District Office and was expanded to address additional concerns. The instructions and comments are applicable for both checklists.
2. Site plan review checklists: The site plan review checklist outlines specific elements to be reviewed. The road design and traffic elements were primarily adapted from the guidelines from the Connecticut DOT, and the drainage elements were obtained from the VDOT L & D Division and the district drainage engineering staffs of the Richmond, Salem, and Northern Virginia districts. This checklist provides a format for uniform, consistent, and comprehensive reviews.
3. Guidelines for a traffic impact study: The guidelines for a traffic impact study were adopted from "Guidelines for Traffic Impact Study" prepared for VDOT (15) and "Guidelines for Traffic Impact Studies in James City County" (draft) (16). An outline for a traffic impact study is provided along with a discussion of the study's contents. The guidelines should aid in improving the quality of traffic impact studies, the uniformity of studies throughout the state, and the effectiveness of the studies. The guidelines should also be used for reviewing traffic impact studies.
4. Roles of VDOT offices in site plan review: Roles and responsibilities of each VDOT office are described. The residency serves as a clearing house and log-in point for all site plans, except in Northern Virginia where site plans are sent directly to the district office by Fairfax, Arlington, and Prince William counties and by the Loudoun Residency. The residency and district offices determine if the site plan is to be forwarded to the district and central offices, respectively. It is helpful for the sending office to flag, that is, point out, special concerns for the reviewing office. Traffic impact studies should be reviewed by the district or central office. The flow charts illustrate the path of the site plan through VDOT and the subject of the review.

5. Coordination with county governments in site plan review: Because cooperation with the county governments in site plan review is essential for both VDOT and the counties, the need for coordination requires attention. The importance of coordination and suggestions for improving coordination are discussed.

CONCLUSIONS

1. Site plan review activities of VDOT: VDOT has two roles in site plan review: regulator and advisor. The regulator role includes (a) regulating permits for work performed within VDOT's right-of-way (including entrances to state highways), and (b) regulating subdivision street requirements for streets to be included in the secondary system. The advisor role includes advising county governments concerning the transportation impacts of proposed land use development that the county must approve as land use regulator.

The residency offices perform similar site plan review activities in a variety of ways. The site plan review workload varies widely, and the residency staff is primarily responsible for the review and the coordination with the counties involved. Thirty percent of the residencies send all site plans for large developments or plans about which the residency staff has questions to the district office for review. The mean time for site plan review is one week by the residency, two weeks by the district, and three weeks by the central office, with wide variations from the mean. The three problems encountered most frequently were incomplete site plans, plans designed below standards, and the heavy workload/insufficient time for reviews. The majority of site plan review activities are concentrated in about one-fourth of the residencies that are involved in reviews.

The same similarities and differences noted by the residencies are carried over to the district level. All districts coordinate with the residencies but at varying degrees. Plans are sent to the central office when a policy change or exception to a standard is needed (to the Traffic Engineering Division) or for review of major developments (to Transportation Planning and L & D divisions). The majority of districts suggested that a traffic impact study should be required depending on the type and size of development and the existing level of service on the impacted roadways. Common problems included site plan review for counties without site plan ordinances that require review in the early stages of the project development, the heavy site plan review workload and long time required for a review, and incomplete site plans..

2. County governments and site plan review: Seventy-two percent of the counties have site plan ordinances and 51% have a documented procedure for site plan review. Approximately 38% of the counties routinely request VDOT to review rezoning applications and site plans; about 18% make such requests as needed. Nearly 50% of the counties either encounter no problems with VDOT in site plan review activities or have a good relationship with VDOT. Common problems included the long review time, the quality of the review, and a need for better coordination.

3. Procedural guide for site plan review: A procedural guide for site plan review is needed.

RECOMMENDATIONS

1. VDOT should adopt the procedural guide for site plan review presented in Appendix B.
2. VDOT should improve the timeliness of site plan reviews by considering the following:
 - a. defining the time period considered to be an acceptable review time considering the office that will review the plan and a realistic and attainable time period
 - b. increasing the site plan review resources in the residencies and districts where there is a heavy demand for site plan review
 - c. permitting the counties to assume additional responsibility in the site plan review process
 - d. expediting transmittal of the site plan by offices within VDOT
 - e. examining the potential time savings from the use of microcomputer software for site plan reviews

Additional study is required for all of these considerations and others through joint efforts of VDOT offices involved in site plan review and county governments.

3. VDOT should consider (a) encouraging counties without a site plan ordinance to adopt one (this effort would be aided through the preparation of a model site plan ordinance), and (b) encouraging all counties to include in their site plan ordinance or review guidelines the site plan checklist in the procedural guide or a comparable checklist to eliminate submittal of incomplete site plans.
4. VDOT should identify and accommodate training needs related to site plan review. The procedural guide for site plan review and related VDOT manuals should serve as course materials.
5. VDOT should consider adopting a policy or guide to specify the design year for site plans and traffic impact studies to provide consistency and fairness.

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APPENDIX A

Results of Surveys

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RESULTS OF THE SURVEY OF VDOT
RESIDENCIES ON SITE PLAN REVIEW

The results of the survey of the VDOT residencies on site plan review are given in Figure A-1.

Figure A-1. VDOT residencies site plan review survey results.

1. Who sends site plan review requests to your office?

33 (85%) county government
35 (90%) developer
20 (51%) other (representatives of the developer)

2. Do you have a documented procedure for the review of a site plan?

9 (23%) yes (5 of the 9 use the Suffolk District checklist)
30 (77%) no

3. How are your reviews coordinated with the various county planners?

6 (15%) formal coordination
30 (77%) informal coordination as needed
3 (8%) no answer

4. Indicate the titles of the persons primarily responsible for the following:

	Asst. Res.Eng.	Permit Insp.	Res. Eng.	Contract Admin.	N/A
Rezoning application review*	<u>10(48%)</u>	<u>7(33%)</u>	<u>3(14%)</u>	<u>1(5%)</u>	
Site plan review	<u>18(47%)</u>	<u>11(29%)</u>	<u>7(18%)</u>	<u>2(5%)</u>	<u>1(3%)</u>
Subdivision plan review	<u>22(56%)</u>	<u>14(36%)</u>	<u>1(3%)</u>	<u>2(5%)</u>	

*Percentages are based on the total of 21 responses for this item.

5. When do you send a site plan to the district office for review?

12 (30%) all site plans are sent
10 (25%) large developments
9 (23%) there are questions on the site plan
4 (10%) all subdivision plans
4 (10%) all drainage items
4 (10%) complex drainage
2 (5%) controversial plans
2 (5%) plans do not meet standards
2 (5%) traffic improvements proposed

6. When do you send a site plan to the central office for review?

35 (90%) never
4 (10%) for certain conditions (each condition was identified by one residency): (a) traffic study done, (b) residency and district disagree or the developer disagrees with field, (c) large shopping centers larger than 100,000 ft², (d) development larger than 150,000 ft²

7. Provide the following information on response time for site plan review:

	Response Time, days		
	Mean	Standard Deviation	Number of Responses
Rezoning application			
Residency only	8.3	7.0	17
District involved	13.7	10.3	12
Central office involved	23.1	11.2	7
Site plan review			
Residency only	7.0	6.1	28
District involved	13.4	8.8	25
Central office involved	23.6	13.7	15

8. What problems are commonly encountered in your rezoning applications, site plan, and/or entrance permit application reviews?

16 (41%) incomplete plans/lack of information
12 (30%) plans not designed to standards
8 (20%) heavy workload/insufficient time for review
8 (20%) inadequate sight distance
5 (13%) inadequate drainage
3 (8%) developer expects immediate review and responses near submittal deadline
4 (10%) incomplete permit applications
3 (8%) no problems
2 (5%) district staff not available for review
1 (3%) need training
1 (3%) lack of coordination in reviews
1 (3%) plans first reviewed at permit stage

9. Recommendations/Suggestions

Standardize plan for submitting preliminary plans (1)
 Reduce time for transactions (1)
 Urban residencies need permit subdivision section with an assistant resident engineer (1)
 Subdivision and site plan review person of technical classification and inspectors to handle field reviews and subdivision inspection (1)
 Design package of different entrance standards (1)

RESULTS OF THE SURVEY OF THE VDOT DISTRICT
OFFICES ON SITE PLAN REVIEW

The results of the survey of the VDOT district offices are given in Figure A-2.

Figure A-2. VDOT district office site plan review survey results.

1. Who sends site plan review requests to your office?

7 residency
1 county government
2 developer or his consultant
2 other (district L & D section)

2. Do you have a documented procedure for the review of a site plan including the traffic impact?

2 yes
6 no

Suffolk District has a subdivision and a site plan review checklist. Northern Virginia has a checklist.

3. Are your reviews coordinated with any county government representative?

3 yes
5 no

Culpeper and Albemarle County, bimonthly meetings; Northern Virginia, all four counties; Richmond and Chesterfield and Henrico counties, monthly meetings

4. How are your site plan reviews coordinated within the district office, especially with the Location and Design section?

1 Plans sent to L & D section from residency. L & D forwards plans to Traffic section. Traffic sends response directly to the residency.
1 Subdivision plans sent to L & D section. L & D coordinates with Traffic and Materials sections as needed to compile response. Commercial plans are sent to the Traffic section, which coordinates with L & D as needed, then responds.
1 Plans sent to Assistant District Engineer, Maintenance, who sends a set of plans to L & D and Traffic sections. However, to expedite the review, plans are now sent directly to L & D and Traffic sections. Responses are sent directly to the residencies.
1 Joint field reviews between L & D and Traffic sections.

5. When do you send a site plan to the central office for review?
Please indicate which division(s) it is sent to.

- 4 Plans are sent to Traffic Engineering Division when a policy change is needed or standards are not met.
- 2 Plans for major developments (such as a regional shopping center) are sent to the Transportation Planning Division.
- 2 Very seldom or never.
- 1 Plans for major developments on roads with congestion or major improvements planned are sent to Transportation Planning Division and occasionally to Traffic Engineering Division.
- 1 L & D.

6. Provide the following information on response time for site plan review and entrance permit applications:

	Response Time		
	Mean, days	Standard Deviation, days	Number of Responses
Rezoning application			
District involved	<u>9.0</u>	<u>5.6</u>	<u>3</u>
Central office involved	<u>21.0</u>	<u>21.0</u>	<u>1</u>
Site plan review			
District involved	<u>16.8</u>	<u>15.0</u>	<u>8</u>
Central office involved	<u>38.5</u>	<u>24.9</u>	<u>4</u>

7. When should a traffic impact study be required?

- 5 depends on type and size of development and existing level of service on impacted roadways
- 3 major traffic generations are proposed

8. What problems are commonly encountered in your rezoning applications, site plan, and/or entrance permit application reviews?

- 4 Counties without site plan ordinances do not require site plan review. Therefore, site plans are not reviewed until the permit stage unless the developer requests a VDOT review. Often construction is underway before site plan review, and major problems occur if substantial changes are required.
- 3 Heavy workload and long time required for thorough review.
- 3 Incomplete site plans.
- 2 More cooperation with counties and developers needed.
- 1 Need training of residency permit inspectors and a Richmond District planner.

9. How are your site plan review activities different from most districts?

Northern Virginia: A transportation planning section; high site development activity; site plan review by consultants.

Richmond: More site development than in most districts.

Suffolk: Reviews most of the site plans that are submitted to the residencies.

Fredericksburg: Involved only with major developments.

Culpeper: More emphasis is placed on access.

Lynchburg: Involved only where obvious problems exist.

RESULTS OF THE SURVEY OF THE COUNTIES
ON SITE PLAN REVIEW

The results of the survey of the counties on site plan review are given in Figure A-3. The list of respondents to the survey by district is provided in Table A-1.

Figure A-3. County site plan review survey results.

1. a. Do you have guidelines for the preparation of a traffic impact study for new developments?

5 (9%) yes
52 (91%) no

- b. When do you require a traffic impact study?

8 rarely or never
7 large developments (1-3,000+ vpd; 1-10,000+ vpd)
5 transportation issues involved
4 when requested by county board or planning commission
3 all rezonings
2 as needed
2 planned developments
1 rezonings of 50+ acres
1 road improvement needed or more than one plan is involved
1 development in congested areas

2. Please check the appropriate spaces.

	<u>Yes</u>	<u>No</u>	<u>No Response</u>
Rezoning application or preliminary site plan process	<u>41 (72%)</u>	<u>10 (18%)</u>	<u>6 (10%)</u>
Site plan requirements	<u>41 (72%)</u>	<u>10 (18%)</u>	<u>6 (10%)</u>
Subdivision ordinance	<u>57 (100%)</u>	<u>0 (0%)</u>	<u>0 (0%)</u>

3. Do you have a documented procedure for site plan review? (Emphasis is on items reviewed, time schedules, coordination with other county agencies, participation of other agencies, especially the Virginia Department of Transportation.)

29 (51%) yes
19 (33%) no
9 (16%) no response
8 (14%) checklists and/or brochures
8 (14%) time schedule (maximum mean time for review = 52.3 days; standard deviation = 25.6 days, range = 7-90 days)

4. Does your staff thoroughly review subdivision and site plans?

54 (94%) yes
2 (4%) no, we rely on the Virginia Department of Transportation
1 (2%) no response

5. a. When do you request a rezoning application review by the Virginia Department of Transportation?

21 (37%) routinely 5 (9%) never
11 (19%) as needed 8 (14%) not applicable
12 (21%) rarely

- b. How do you determine when the Virginia Department of Transportation should review a rezoning application?

19 (33%) all are reviewed
15 (26%) potential traffic impact (7 of these consider development type and size)
2 (4%) requested by the county board or planning commission
2 (4%) all involving state highways (Arlington and Henrico counties)
19 (33%) never, not applicable, or no answer

6. a. When do you request a site plan review (excluding subdivision plans) by the Virginia Department of Transportation?

22 (39%) routinely 1 (2%) never
10 (17%) as needed 2 (4%) not applicable
14 (24%) rarely 8 (14%) no answer

- b. How do you determine when the Virginia Department of Transportation should review a site plan?

21 (37%) all are sent
8 (14%) potential traffic impact (4 of these consider development type and size)
3 (5%) requested by the county
2 (3%) all state highways (Arlington and Henrico counties)
1 (2%) new entrances
1 (2%) impact on drainage in R/W
21 (37%) never, not applicable, or no answer

7. What problems are commonly encountered with the Virginia Department of Transportation in your site development review activities? Please include suggested solutions where possible.

<u>17 (30%)</u>	no problems
<u>10 (18%)</u>	good relationship
<u>10 (18%)</u>	long review time
<u>3 (5%)</u>	inappropriate requirements (too loose or excessive)
<u>4 (7%)</u>	need better communications and coordination
<u>3 (5%)</u>	need distinction between and policy on recommendations and requirements
<u>3 (5%)</u>	inconsistency in reviews; need clear review policy
<u>3 (5%)</u>	rezoning reviews leave issues unresolved until site plan stage
<u>2 (4%)</u>	written review comments needed routinely
<u>2 (4%)</u>	conflicts between county and VDOT standards
<u>2 (4%)</u>	need VDOT staff person with authority to be available to resolve issues
<u>1 (2%)</u>	vague responses
<u>1 (2%)</u>	need VDOT to consider direct contact with developer
<u>1 (2%)</u>	new comments added at final submittal
<u>6 (10%)</u>	no response

8. Additional comments.

<u>3 (5%)</u>	VDOT needs more staff for site development review at residency level
<u>1 (2%)</u>	recommend policy handbook
<u>1 (2%)</u>	recommend informational meetings between VDOT and county
<u>1 (2%)</u>	county requests permission to perform final reviews for minor changes

Table A-1

List of Respondents for the County Survey by District

<u>Bristol</u>	<u>Richmond</u>	<u>Fredericksburg</u>	<u>Staunton</u>
Smyth	Mecklenburg	Gloucester	Rockbridge
Russell	Amelia	Lancaster	Augusta
Wythe	Nottoway	Northumberland	Rockingham
	Lunenburg	Westmoreland	Frederick
<u>Salem</u>	Dinwiddie	Spotsylvania	Shenandoah
	Chesterfield	Stafford	Clarke
Carroll	Powhatan	King George	Warren
Floyd	Charles City	Caroline	
Montgomery	Henrico	Essex	<u>Northern Va.</u>
Pulaski	Goochland	King William	
Henry	Hanover		Fairfax
Franklin		<u>Culpeper</u>	Arlington
Roanoke	<u>Suffolk</u>		Prince William
Botetourt		Albemarle	Loudoun
	Greensville	Culpeper	
<u>Lynchburg</u>	Southampton	Madison	
	Sussex	Fauquier	
Halifax	James City	Rappahannock	
Buckingham	Isle of Wight		
	City of Suffolk		
	Accomack		
	Northampton		

RESULTS OF THE SURVEY OF STATE DOTs ON TRAFFIC IMPACT STUDIES

A survey on traffic impact study review was sent to 49 states, excluding Virginia. Responses were received from 37 states (75.5% response rate). A summary of the survey responses is shown in Figure A-4.

For the 16 state DOTs (43%) with guidelines for a traffic impact study, the guidelines range from a brief list of four items to detailed discussions on study content. The basic content for the impact study is the same for most of the state DOTs with the differences being in the attention given to details.

Twenty-seven state DOTs (73%) do not have a documented procedure for the review of traffic impact studies. Six of the 10 state DOTs that have a documented procedure use the same guidelines for preparation of a traffic impact study as for reviewing such studies. Two state DOTs have a procedure that emphasizes the administration of the review by the division of the state DOT. One state DOT's procedure consists of a series of questions on the adequacy, reliability, and acceptability of the elements of the study and compliance with design standards. One state indicated that the review procedure focuses on conformance to entrance design standards.

Nineteen DOTs (51%) stated that their review procedure for the traffic impact study is used by the respective DOTs throughout the state. On the other hand, 11 state DOTs (30%) do not use the same procedure statewide. The remaining 7 state DOTs (19%) either indicated that the question was not applicable or provided no answer.

For 11 state DOTs (30%), the central office handles the review of traffic impact studies. In 10 state DOTs (27%), the field office, usually a district/regional office, is responsible for the review. If desired or needed, it may request assistance from the central office in the review. The field and central offices jointly review traffic impact studies in 4 (11%) state DOTs. In 3 state DOTs (8%), the field offices supply the data for central office review. Five state DOTs (13%) have no involvement in traffic impact study review, and 4 (12%) did not respond to this question. The 9 state DOTs (25%) that answered "no" to the first three questions are not involved in traffic impact study review.

Additional information that was sent included site plan review requirements, checklists, a field inspection checklist, and sections of state codes governing site development. The Ohio DOT noted success in requesting that a group of developers jointly sponsor a traffic impact study on a section of highway where many independent developments are planned.

Figure A-4. State DOTs' review of traffic (or site) impact studies for site developments.

1. Do you have guidelines for the preparation of a traffic impact study?

<u>16</u> (43%)	yes
<u>21</u> (57%)	no

2. Do you have a documented procedure for the review of a traffic impact study?

<u>10</u> (27%)	yes
<u>27</u> (73%)	no

3. Is your procedure for the review of a traffic impact study used by your Department of Transportation throughout the state?

<u>19</u> (51%)	yes	<u>3</u> (8%)	no answer
<u>11</u> (30%)	no	<u>4</u> (11%)	not applicable

4. What are the roles and responsibilities of your central office divisions and field offices in the procedure? Unless otherwise stated, the review agency is listed below.

<u>11</u> (30%)	central office
<u>10</u> (27%)	field [and, if needed, central office (8 of the 10)]
<u>4</u> (11%)	field and central office jointly
<u>3</u> (8%)	field supplies data for central office review
<u>5</u> (13%)	no involvement in review
<u>4</u> (11%)	no answer

5. Additional information.

Ohio: joint impact of individual developers

APPENDIX B

Procedural Guide
for Site Plan Review

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PROCEDURAL GUIDE FOR
SITE PLAN REVIEW

I. Checklists for Site Plan Completeness

- A. How to Use the Checklists
- B. Checklist for Preliminary Site Plan/Rezoning Application Completeness
- C. Checklist for Site Plan Completeness

II. Site Plan Review Checklist

III. Guidelines for a Traffic Impact Study

- A. Purpose
- B. Responsibilities for Traffic Impact Studies
- C. Determining the Need for a Traffic Impact Study
- D. Traffic Impact Study Contents

IV. Roles of VDOT Offices in Site Plan Review

- A. Residency Office
- B. District Office
- C. Central Office
- D. Site Plan Review Process Through VDOT

V. Coordination with County Governments in Site Plan Review

I. CHECKLISTS FOR SITE PLAN COMPLETENESS

A. How to Use the Checklists

A Preliminary Site Plan/Rezoning Application Checklist and a Site Plan Checklist are provided.

The site plan should be checked for completeness by the appropriate county staff, then by the VDOT residency staff (except in Northern Virginia where the district staff should check it). To be most effective, complete site plans based on the checklist should be mandated by a county site plan ordinance. The checker should review the site plan to determine if every applicable item on the checklist is contained in the plan.

After the check for completeness, the checker will determine whether or not all the information necessary for a site plan review is available in the plan. If complete, the site plan is ready for review. If incomplete, the site plan should be returned for resubmittal.

B. Checklist for Preliminary Site Plan/Rezoning Application Completeness

Check each item that is included in the site plan.

I. PROJECT IDENTIFICATION

- a. _____ Date.
- b. _____ Project name.
- c. _____ Name/address of applicant and land owner.
- d. _____ Magisterial district, county, state.
- e. _____ Map and parcel number.
- f. _____ Type of use.
- g. _____ Total acreage.
- h. _____ Current zoning.
- i. _____ Name of engineer/surveyor.

II. GENERAL SITE INFORMATION

- a. _____ Vicinity map (scale 1 in = 2000 ft).
- b. _____ Site plan (scale 1 in = 50 ft or larger).
- c. _____ North point on maps.
- d. _____ One reproducible plus ___ copies of plan.
- e. _____ Adjacent property identification
 - _____ Name of owner _____ Current zoning
 - _____ Location _____ Current use
- f. _____ Location and total acreage of land uses.
- g. _____ Topographic map (5-ft interval or less).
- h. _____ Boundary survey with source and title.
- i. _____ Locations, names, and dimensions of proposed streets, entrances to existing highways, alleyways, building lines, easements, rights-of-way, interior travel ways, parking lots, and pedestrian system.
- j. _____ Flood plain limits, if applicable.
- k. _____ Locations, names, and dimensions of existing roads _____, easements _____, utility lines _____, rights-of-way _____, streams _____, and drainage ways _____.
- l. _____ Preliminary sketch plans indicating provision for all utilities including but not limited to
 - _____ Drainage (including stormwater management)
 - _____ Water supply _____ Sewage disposal
- m. _____ Typical street sections.

III. STATEMENTS

- n. _____ Proposed development conforms to the provisions of all applicable ordinances, regulations, and adopted standards (or note specific waivers sought).
- o. _____ Public improvements both on- and off-site that are proposed for dedication and/or construction and an estimate of timing of providing such improvement.
- p. _____ Proposed development schedule.

C. Checklist for Site Plan Completeness

Circle the number or letter of items included.

I. GENERAL INFORMATION (Identification)

- A. Title of project and name of applicant.
- B. Names of engineer, architect, landscape architect, and/or surveyor and plan certification.
- C. Vicinity map with scale (no less than 1 in = 2,000 ft).
- D. Direction of north.
- E. Plan scale.
- F. Type and size of development.
- G. Right-of-way line, centerline, departing lot lines, lot numbers, subdivision limits, and limits of construction.

II. GEOMETRICS

A. General

- 1. Typical section designation. Where special typical section is approved, provide detail on plan.
- 2. The edge of proposed street surface or the face of curb (as the case may be) and the full length of all streets.
- 3. The width of right of way, width of surface, or distance between curb faces and relation to center line.
- 4. All temporary turnaround construction, with easement as indicated on the preliminary plat.
- 5. Centerline curve data, including delta, radius, arc, chord, tangent, and profile data.
- 6. Radius of all curb returns to face of curb and on streets where curb and gutter are not required; radius to edge of bituminous treatment.
- 7. Stations at every 100 feet at even stations on centerline; stations at points of curve and tangent at the beginning and end of all returns, at centerline intersection, and at subdivision or section limits, and turnaround radius.
- 8. State route number and or city or town street name on all existing streets to which connection is to be made. Indicate proposed street name where appropriate.
- 9. Any notes necessary to explain the intent and purpose of plans or profile.

B. Roads

- 1. Existing entrances, entrances of planned developments that are committed, street connections, crossovers, etc. that are located along existing roadway that may be affected by the proposed development.
- 2. Where proposed streets or entrances connect with existing roads or streets, indicate both edges of existing pavement, surface, or curb and gutter for a minimum of 100 ft or the length of connection, whichever is the greater distance.

3. Symmetrical transition of pavement at intersection with existing street.
4. Lengths of acceleration lanes and left and right turn lanes and tapers.
5. Crossover spacing and sight distance.
6. Sight distance profiles at all proposed street intersections and entrances, and landscaping, sign placement, and all obstructions that may obstruct or affect sight distance. Dedication of easements for improving sight distance.
7. Functional classification and design speeds for proposed public roadway improvements.
8. Existing roadway geometrics and pavement markings.

C. Other

1. Guard rail where required.
2. Location of handicapped ramps where appropriate.
3. Dedication of easements for future improvements in the comprehensive plan, state projects, or road bond programs.
4. Sidewalks and trails.

III. DRAINAGE

A. Systems

1. Contour map showing complete coverage of the total contributing drainage area.
2. Locations and dimensions of all existing or proposed drainage easements.
3. Direction of drainage flow for all proposed streets, storm sewers, valley gutters, subdrains, and the like, and all existing streams.
4. All storm sewers and appurtenances. Identify storm sewer appurtenances by type and a number. Station on plan must conform to stations shown on profile. Indicate the top and invert elevation of each structure. Tabulation in the plan view may be permitted.
5. Complete drainage calculations for all proposed facilities and all affected existing facilities, as required in VDOT's Drainage Manual.
6. Profiles on outfall ditches, pipe, etc.; indicate natural drainage and label if applicable.
7. Protection for erosion control.
8. A design for adequate storm water management with calculations and appropriate data where necessary.
9. Any notes necessary to explain the intent and purpose of the proposed drainage plan.

B. Drainage Structures

1. The size of all driveway entrance culvert, i.e., 15 or 18 in, according to computed size, for each lot.
2. The contributing area in acres at all culvert pipe, curb inlets, and other entrances, exclusive of driveway pipes.

3. Type or class of pipe to be installed both in right-of-way and outside right-of-way.

C. Ditches

1. Proposed drainage ditches for full length in all easements. Furnish detailed typical section and type of stabilization to be provided.
2. Paved ditches and easements at toe of fills.
3. Paved roadside ditches.

D. Streams

1. The location of all streams or drainageways related to the street construction.
2. Proposed stream relocations. Show existing and proposed locations. Furnish detailed typical section and type of stabilization.

IV. UTILITIES

A. General

1. All proposed water mains, their sizes, valves, and fire hydrants.
2. All proposed sewer lines.
3. All existing utilities; if within limits of proposed right of way, provide details as to location and typical sections.
4. Where security lighting is proposed, indicate the following:
 - a. Distance of pole from edge of pavement.
 - b. Distance of pole from proposed right-of-way.
 - c. Distance from pole to center of luminaire.
 - d. Height of luminaire above centerline of roadway.
 - e. Level of illumination.
5. Any notes necessary to explain the intent and purpose of proposed utilities or adjustment of existing utilities.

V. TRAFFIC ANALYSIS

Developer will be responsible for supplying sufficient information for VDOT to determine entrance and road design features to serve the existing roadway and the proposed development adequately. The information may include:

1. Traffic analysis for site development on existing and proposed facility used to determine design of entrances, including trip generation and traffic assignment.
2. On-site circulation patterns for potential impact on existing roadway.
3. Intersection analysis including need for signalization, channelization, turn lanes, and modification of existing signals.
4. Existing and proposed traffic control devices such as signs and pavement markings.

5. Recommendations for roadway improvements to accommodate traffic generated by proposed development, including proposed signal phasing plans.
6. Any notes necessary to explain the intent and purpose of the proposed traffic analysis.

VI. COMMENTS

A. Design

1. Site plans and subdivision plans shall be designed in accordance with the appropriate manuals of the Virginia Department of Transportation:
 - a. "Minimum Standards of Entrances to State Highways," Traffic Engineering Division.
 - b. "Subdivision Street Requirements," Secondary Roads Division.
 - c. "Road and Bridge Standards," Location and Design Division.
 - d. "Drainage Manual," Location and Design Division.
 - e. "Land Use Permit Manual," Maintenance Division.
 - f. "Guidelines for Lighting by Permit on State Right of Way," Maintenance Division.

These design standards are considered minimal. In keeping with its mission to provide a safe, efficient, and effective ground transportation system, VDOT is obligated to make recommendations that exceed these standards where it is deemed necessary and in VDOT's best interest.

2. Where a county has adopted standards higher than VDOT standards, the higher standards of the county should prevail.

B. Resubmittal

A written description of all plan revisions must accompany all revised plans submitted for reevaluation and approval. The description should state each problem and its resolution. If the resolution does not concur with state and county recommendations, an explanation must be given. The changes should be clearly illustrated on the plans.

II. SITE PLAN REVIEW CHECKLIST

VDOT reviews site plans for a wide range of types and sizes of land development. There are specific elements that are a part of all reviews. However, each review should be tailored to meet the site-specific conditions for the area and the proposed project. To the extent practical, short-, medium-, and long-range implications should be considered. A substantial amount of engineering judgment may be used.

Circle the number or letter of items that are acceptable.

I. ACCURACY AND COMPATIBILITY

- A. Verify the location and dimensions of existing roadway elements of the plan.
- B. Examine the compatibility of the site plan with the six-year road improvement plan, the county master plan, and VDOT's statewide highway plan. Examine all available sources to eliminate discrepancies.

II. INTERNAL CIRCULATION PATTERN

- A. Review proposed internal circulation patterns to determine if their traffic flow patterns allow for vehicular circulation to take place on-site and not on the street system.
- B. Review driveway location(s) relative to intersections and other driveways and adjacent property lines.
 - 1. Check spacing from other drives for potential interference.
 - 2. Check spacing from signalized drives or intersections to determine if traffic queue will block proposed drive.
 - 3. Check access spacing to determine if the spacing from other signals will be conducive to a signal system if the proposed driveway(s) are signalized.
 - 4. Check projected queues for interference with traffic operations.

III. INTERSECTION GEOMETRICS (Proposed Entrances and Affected Intersections)

Verify that geometrics satisfy the appropriate design standards. Check the entrance of intersection designs, especially the radii and angle of intersection with the existing roadway.

IV. INTERSECTION SIGHT DISTANCES

- A. Check for intersection sight distances and compliance with the design requirements.

- B. Check for consideration of the numbers of buses and type and frequency of trucks entering and exiting the facility in determining sight distance needs.

V. AUXILIARY LANES

- A. Left-turn lanes.
 - 1. Check the need for and dimensions of a left-turn lane based on volume and traffic operations.
 - 2. Note that left-turn lanes are generally provided at median openings.
 - 3. Consider severe horizontal and/or vertical geometry, driver expectancy, accident experience, the effect of turning vehicles on through traffic, and observations.
- B. Right-turn lanes.
 - 1. Check the need for and dimensions of a right-turn lane.
 - 2. Consider severe horizontal and/or vertical geometry, driver expectancy, accident experience, the effect of turning vehicles on through traffic, and observations.
- C. Additional through lanes: Check the need for and dimensions of additional through lanes.

IV. PEDESTRIANS

- A. Estimate the volume of pedestrians and their needs.
- B. Review existing and proposed sidewalks and paths in the area and the need for sidewalks.

VII. SIGNALIZATION

- A. Verify that signalized intersections are studied as shown in the 1985 Highway Capacity Manual.
- B. Determine if signals are required as warranted by the MUTCD.
- C. Review signal phasing and the need for certain phases such as protected and/or permissive phasing.
- D. Review adjacent signals and determine if signal coordination is needed.
- E. Consider preferred locations of signals for efficient signal systems.

VIII. SIGNING AND PAVEMENT MARKINGS

- A. Verify that signing and pavements markings are compatible with proposed traffic operations.

- B. Verify that signs and pavement markings located in both the driveway and internal areas are installed and maintained by the developer.
- C. Review existing and proposed signing and pavement marking.
- D. Verify that all signing is in accordance with the MUTCD and the Virginia Supplement to the MUTCD.

IX. FENCING

Check VDOT policy (when property abuts a limited access roadway). Consider fencing when an unusual need is present, e.g., railroad line.

X. ROADSIDE OBSTACLES

Review proposal to determine if traffic is being moved closer to fixed objects or roadside hazards and what, if anything, should be considered in accordance with VDOT's "Road and Bridge Standards."

XI. ROADWAY LIGHTING

Review roadway lighting to be installed by the developer pursuant to "Guidelines for Lighting by Permit on State Right of Way," Maintenance Division.

XII. RIGHT-OF-WAY

Determine if right-of-way denotation or easements are needed.

XIII. DRAINAGE

- A. Perform a spot check of drainage calculations for:
 1. Proper/applicable design methods and procedures.
 2. Completeness and accuracy.
 3. Change in flow patterns and diversions.
- B. Review drainage that would have a direct effect on the roadway.
 1. Check for adequate pavement drainage and proper placement of drainage structures.
 2. Check the location and method by which pavement drainage is conveyed away from the travelway.
- C. Review drainage structures.
 1. Check existing structures (storm sewers, ditches, etc.) for adequacy to convey the runoff that will come to them in conformance with applicable criteria/requirements.
 2. Check hydraulic design of proposed drainage facilities for conformance with applicable criteria/requirements.

3. Check for proper treatment at ends of drainage facilities (riprap, paved ditches, etc.).
 4. Check detention facilities for required hydraulic performance, proper outfall, and adequate roadway protection.
- D. Review erosion control.
1. Check for current and potential erosion and siltation problems.
 2. Check for impact of the development.
 3. Check for the adequate placement of erosion control devices.
- E. Check involvements with regulatory flood plains and/or the 100-year flood zone.
- F. Check to ensure that all necessary drainage easements have been designated.

XIV. REVIEW COMMENTS

- A. Prepare written review comments. The comments should be well organized, clear, direct, and specific. Problems should be clearly defined and, when desired, actions to be taken to resolve each problem should be stated.
- B. Recommendations and requirements.
1. For compliance when minimum standards are involved, state that the design feature is required. Design features that exceed minimum standards but are required to resolve capacity or safety problems should be stated as required with an explanation.
 2. For design features that exceed the minimum standards, state that the design is recommended or, if appropriate, highly recommended.

III. GUIDELINES FOR A TRAFFIC IMPACT STUDY

A. Purpose

A traffic impact study assesses the impact of a proposed development, zoning change, or special use approval on the transportation system. Its purposes are (1) to ensure that proposed developments or zoning changes do not adversely affect the transportation network, (2) to identify any traffic problems associated with access from the site to the existing transportation network, (3) to delineate solutions to potential problems, and (4) to present improvements to be incorporated into the proposed development.

The traffic impact study guidelines contained herein are subject to modification by VDOT and the county as necessary. They will be reviewed periodically and updated with state-of-the-art technical information. These guidelines have been developed in order to provide for consistent preparation of traffic impact studies. The guidelines will greatly enhance the efficiency of staff review and, at the same time, will provide the applicant with "accepted" technical procedures and methodologies. VDOT and the county will review each development application on a case-by-case basis and may make recommendations that differ from the guidelines.

B. Responsibilities for Traffic Impact Studies

The primary responsibility for assessing the traffic impacts associated with a proposed development rests with the applicant, with the county and VDOT serving in a review capacity. This is consistent with the approach followed for other civil engineering aspects of zoning and subdivision applications. The county and VDOT should specify whether a traffic impact study is required, the extent of the study area, and any specific issues that should be addressed (i.e., safety, accidents, truck traffic). This determination should be made in the rezoning application or preliminary site plan stage.

If a traffic impact study is required, the applicant will be responsible for submitting a formal traffic impact report. The applicant will also be responsible for all data collection efforts required in preparing a traffic impact study, including current peak period turning movement counts. Current peak period turning movement counts is defined as those counts that have been collected within one year of the zoning or subdivision application. The county or VDOT, at its discretion, may request the applicant to adjust the peak hour turning movement counts in order to account for seasonal variations in traffic or other localized factors. In addition, the applicant will be responsible for ensuring that any submitted site plans meet the minimum state and local standards for geometric design. The study should be conducted only by an individual or firm that could be qualified as an expert in traffic engineering.

Upon submission of a draft traffic impact analysis report, the county and VDOT will review the study data sources, methods, and

findings and provide comments. The applicant will then have the opportunity to incorporate necessary revisions prior to submitting a final report to public officials. Accompanying the applicant's submission will be written comments of local and state staff. This information will then be used to reach a decision regarding the proposed development.

C. Determining the Need for a Traffic Impact Study

The reviewing agencies should have the discretion to determine when a traffic impact study is needed. The need for a traffic impact study should be evaluated based on conditions surrounding the individual development. The site specific conditions that should be considered include:

1. The potential impact upon the local and regional road networks.
2. The capacity and level of service of the existing roadways to be entered.
3. Roadway geometrics.
4. The type and size of the proposed development.
5. Traffic operations of one or more intersections.
6. Issues of safety and/or traffic operation within the public right-of-way.

VDOT and the county should consider requesting that a group of developers jointly sponsor a traffic impact study on a section of highway where many independent developments are planned.

D. Traffic Impact Study Contents and Specifications

The contents were primarily adopted from VDOT "Guidelines for Traffic Impact Study--Final Report," prepared by Simpson and Curtin, April 1979, and "Guidelines for Traffic Impact Studies in James City County."

1. Format

A traffic impact study prepared for a specific site proposal should follow the chapter format shown in Table B-1. Wherever additions or modifications are appropriate for a specific site, they should be made.

2. Capacity and Level of Service Analyses

- a. Use of the Highway Capacity Manual

All capacity analyses shall be conducted utilizing the procedures in the 1985 Highway Capacity Manual (Special Report 209), Transportation Research Board.

Table B-1
Traffic Impact Study Contents

1. INTRODUCTION
 - A. Site and Study Area Boundaries
 - B. Existing and Proposed Site Uses
 - C. Existing and Proposed Nearby Uses
 - D. Existing and Proposed Roadways and Intersections
2. ANALYSIS OF EXISTING CONDITIONS
 - A. Daily and Peak Hour(s) Traffic Volumes
 - B. Capacity Analyses at Critical Points
 - C. Levels of Service at Critical Points
3. ANALYSIS OF FUTURE CONDITIONS WITHOUT DEVELOPMENT
 - A. Daily and Peak Hour(s) Traffic Volumes
 - B. Capacity Analyses at Critical Points
 - C. Levels of Service at Critical Points
4. TRIP GENERATION
5. TRIP DISTRIBUTION
6. TRAFFIC ASSIGNMENT
7. ANALYSIS OF FUTURE CONDITIONS WITH DEVELOPMENT
 - A. Future Daily and Peak Hour(s) Traffic Volumes
 - B. Capacity Analyses at Critical Points
 - C. Levels of Service at Critical Points
8. RECOMMENDED IMPROVEMENTS
 - A. Proposed Recommended Improvements
 - B. Capacity Analyses at Critical Points
 - C. Levels of Service at Critical Points
9. CONCLUSION

For capacity analysis and level of service determinations, the most recent Federal Highway Administration software package should be used for the different types of analysis required (e.g., signalized intersections, freeways, ramps). CAPCALC 85 may also be used for analyzing intersections. Regardless of which software package is used, the results should be reviewed for reasonableness. Other software, if approved by the county and VDOT in advance, may be used.

Consultants may use any of a number of software packages available for capacity analysis. They should provide the input data as well as the results of the capacity analysis so that VDOT may check the results with its own analysis. Where a great number of intersections or road sections are analyzed, a sample of those should be checked by performing

the analysis and comparing results. Where differences occur, the consultant should be required to explain the differences, and all road sections and intersections should be reviewed closely.

b. Level of Service

Level of Service C will be the design objective, and under no circumstances will less than Level of Service D for all approaches of an intersection be accepted for on-site and off-site traffic. This criterion, however, may be modified by the county and VDOT on a case-by-case basis, depending on traffic conditions in the proposed site vicinity.

c. Use of Results of Level of Service Studies

1. The primary function of a level of service study is the determination of the geometrics required to provide a desired level of service in a design year.
2. The number of lanes required on either a through road or at an intersection can be determined, and the need for auxiliary lanes, as well as their length, can be established.
3. The need for signalization can be determined from the projected traffic volumes and the signal warrants in the Manual on Uniform Traffic Control Devices for Street and Highways (MUTCD).
4. The level of service study can indicate where on-street parking will have to be eliminated or restricted in order to achieve a desired level of service.
5. When a development in a given area is projected to be phased over a long period of time, stage construction should be considered and a level of service study used to determine when the various stages must be completed.

3. Narrative

A brief narrative for each chapter of the traffic impact study follows.

Chapter 1. Introduction

A. Site and Study Area Boundaries

Include a brief description of and a map displaying the size of the land parcel, the general terrain features, and the location within the jurisdiction and region. In addition, identify the roadways that afford access to the site and are included in the study area. The exact limits of the study area should be based on engineering judgment and an understanding of the existing traffic conditions in the site vicinity. In all instances, however, the study area limits will be discussed with the applicant and his traffic

engineer and will be determined by the county and VDOT staff. The definition of the study area should result, subsequent to the initial staff review of a developer's rezoning application or preliminary site plan, at which time a traffic impact study will be required. If the project is being completed in phases, describe the total project and the phases. The study should address the appropriate phase.

- B. Existing and Proposed Site Uses
Identify the existing and proposed uses of the site in terms of the various zoning categories. In addition, identify the number and the type of residential units, and type and amount of commercial, industrial, or office uses in accordance with ITE trip generation categories.
- C. Existing and Proposed Nearby Uses
Include a complete description of the existing land uses in the vicinity of the site, as well as their current zoning. Also state the proposed developments of adjacent land using the county's comprehensive land use plan. This is especially important where large tracts of underdeveloped land are in the vicinity of the site and are within a prescribed study area.
- D. Existing and Proposed Roadways and Intersections
Describe and provide diagrams of the existing roadways and intersections (including road geometrics, lane usage, traffic control, and intersection condition diagrams) within the study area as well as improvements contemplated by the county and state. This includes the nature of the improvement project, its extent, the implementation schedule, and the agency or funding source responsible.

Chapter 2. Analysis of Existing Conditions

- A. Daily and Peak Hour(s) Traffic Volumes
Present diagrams depicting daily and peak hour traffic volumes for roadways within the study area. Present turning movement and mainline volumes for the three peak hour conditions (a.m., p.m., and site-generated). Present only mainline volumes to reflect daily traffic volumes. Also present the source and/or the method of computation for all traffic volumes.
- B. Capacity Analyses at Critical Points
Utilizing techniques as described in the 1985 Highway Capacity Manual, assess the relative balance between roadway volumes and capacity. Analyze existing conditions (roadway geometrics and traffic signal control) for all peak hours.
- C. Level of Service at Critical Points
Based on the results obtained in the previous section, determine and present levels of service (A through F). Include a description of typical operating conditions at each level of service.

Chapter 3. Analysis of Future Conditions Without Development

Describe the anticipated traffic volumes in the future and the ability of the roadway network to accommodate this traffic without the proposed zoning or subdivision request. The future year(s) for which projections are made will be specified by the county or VDOT staff and will depend on the timing of the proposed development.

- A. Future Daily and Peak Hour(s) Traffic Volumes
Indicate clearly the method and assumptions used to forecast future traffic volumes so that the county and VDOT staff can replicate these calculations.
- B. Capacity Analyses at Critical Locations
Describe the ability of the existing roadway system to accommodate future traffic (without site development) for all peak hours using the 1985 Highway Capacity Manual. If roadway improvements or modifications are committed for implementation, present the capacity analysis for these conditions.
- C. Levels of Service at Critical Points
Based on the results obtained in the previous section, determine the levels of service (A through F).

Chapter 4. Trip Generation

Present and diagram the amount of traffic generated by the site for daily and three peak hour conditions. Trip generation rates to be used should be those presented in Trip Generation, 4th ed, Institute of Transportation Engineers. Deviation from these rates must be justified and documented to the satisfaction of the county and VDOT.

Chapter 5. Trip Distribution

Present and diagram the direction of approach for site-generated traffic for the appropriate time periods. The basic method and assumptions used must be clearly stated so that the county and VDOT can replicate these results.

Chapter 6. Traffic Assignment

Describe the utilization of study area roadways by site-generated traffic. Combine the proposed traffic volumes with the anticipated traffic volumes from chapter 3 to describe and diagram mainline and turning movement volumes for future conditions with the site developed as proposed. Clearly state the basic method and assumptions used.

Chapter 7. Analysis of Future Conditions With Development

- A. Future Daily and Peak Hour(s) Traffic Volumes
Present and diagram mainline and turning movement volumes for the highway network in the study area, as well as driveways and internal circulation roadways for all time periods.
- B. Capacity Analysis at Critical Points
Perform a capacity analysis for all peak hours for future conditions with the site developed as proposed using the 1985 Highway Capacity Manual.
- C. Levels of Service at Critical Points
As a result of the capacity analysis, compute and describe the level of service on the study area roadway system.

Chapter 8. Recommended Improvement

In the event the analysis indicates that unsatisfactory levels of service will occur on study area roadways, describe the improvement proposed to remedy deficiencies. The proposals would identify committed projects by the county and state that were described in chapter 1 and reflected in the analysis contained in chapters 2 and 3.

- A. Proposed Recommended Improvements
Clearly describe and diagram the location, nature, and extent of proposed improvements to ensure sufficient roadway capacity. Accompanying this list of improvements should be preliminary cost estimates, source of funding, timing, and likelihood of implementation.
- B. Capacity Analysis at Critical Points
Describe the anticipated results of making these improvements.
- C. Levels of Service at Critical Points
As a result of the revised capacity analyses presented in the previous section, present the levels of service for the roadway system with improvements.

Chapter 9. Conclusion

The last chapter of the report should be a clear, concise description of the study findings. This concluding chapter should serve as an executive summary.

IV. Roles of VDOT Offices in Site Plan Review

A. Residency Offices

(This description is not applicable for residencies in Northern Virginia where the district office is the primary entry point for site plans.)

1. Log in all preliminary site plans and rezoning applications and site plans from the county. In counties without an engineering or planning staff, the residency may receive plans from the developer or his representative. The residency office is a clearinghouse for site plans and traffic impact studies. Any site plans sent directly to the district or central office should be returned to the appropriate residency.
2. Check the site plan for completeness using the appropriate checklist, either the checklist for the preliminary site plan or for site plan completeness.
3. Return incomplete site plans to or contact the sender noting the deficiencies to be corrected.
4. For completed site plans, determine if the plan should be forwarded to the appropriate district office section for either drainage or traffic review or both. The factors considered in this determination include:
 - a. The capabilities of the residency staff.
 - b. The size of the development.
 - c. The level of service on the existing highways that will provide access.
 - d. The complexity of the drainage system design.
 - e. The residency staff has questions on the site plan.
5. Perform the site plan review using the site plan review checklist and prepare written review comments, or forward the site plan to the appropriate district office section(s) for review with issues of particular concern noted. If both areas are reviewed, jointly address both review persons in the cover letter. Wait to receive their comments.
6. Forward all traffic impact studies to the district traffic engineering section.
7. Forward the review comments to the county staff or developer or his representative.
8. Coordinate site plan review activities with the county and, if appropriate, with the district.

B. District Offices

1. Log in the rezoning applications and site plans received from the residency.
2. If appropriate, coordinate activities between the district sections reviewing the plan, primarily the hydraulics and traffic engineering section.
3. Determine if the application or site plan should be forwarded to the central office for a partial or complete review, or not at all. The factors considered in this determination include:
 - a. The size of the development.
 - b. The level of service on the existing highways that will provide access.
 - c. Impact on an interstate road.
 - d. The complexity of the road and drainage designs.
 - e. The development impacts on roads with major improvements planned.
 - f. A policy change is needed.
 - g. The district staff has questions on the plan.
4. For plans to be reviewed in the central office:
 - a. For a complete review, forward the plan to the head of the Location and Design Division, indicate the divisions that should review the plan, and flag issues of special concern.
 - b. For a partial review, forward the plan to the head of the division that should review the plan and flag issues of particular concern. Send a copy of the letter to the head of the Location and Design Division. Wait to receive their comments.
5. Perform the site plan review using the Site Plan Review Checklist and prepare written review comments.
6. For a traffic impact study:
 - a. Check for adherence to the guidelines for a traffic impact study.
 - b. If the study does not satisfy the guidelines, return it to the initial sender, either the county or the preparer of the study.
 - c. If the study is acceptable, determine if the study should be reviewed by the Transportation Planning Division. The factors to be considered are outlined in item 3 above for the district office.
 - d. Perform the review and prepare written comments or forward the review to the Transportation Planning Division, flagging issues of concern, and wait for their comments.

7. When comments on a plan or traffic impact study are received, review the comments, then forward the review comments to the residency, including any comments from the district and a note stating which office should review the revised site plan when it is submitted.

C. Central Office

1. Log in rezoning applications and site plans from the district offices.
2. For complete plan reviews by the central office, the Location and Design Division will coordinate the review with the related divisions as requested by the district office. The Location and Design Division is responsible for forwarding the plans to the appropriate divisions, compiling the review comments from the divisions, and forwarding the comments to the district offices.
3. For partial reviews by the central office, the reviewing division receives the plan from the district office and reviews the plan using the Site Plan Review Checklist, and other references deemed appropriate by the division, and prepares a written response that is forwarded to the district. The areas of site plan review responsibility for the divisions are:

Location and Design: (a) reviews road geometrics and entrance designs, (b) reviews drainage designs, and (c) examines how the proposed site may impact planned road projects.

Transportation Planning Division: (a) reviews plans for traffic impact on existing roads and planned road improvements, especially the capacity analysis, and (b) reviews traffic impact studies.

Traffic Engineering Division: evaluates unusual proposals or extenuating circumstances for compliance with the subdivision street requirements.

Secondary Roads: evaluates unusual proposals or extenuating circumstances for compliance with the subdivision street requirements.

Maintenance Division: serves as a clearinghouse for complaints of betterment when a developer who views VDOT's requirements as excessive submits a request to the Commission to review his complaint.

Materials Division: (a) occasionally reviews pavement structures, and (b) reviews the geotechnical plans of roadway dams.

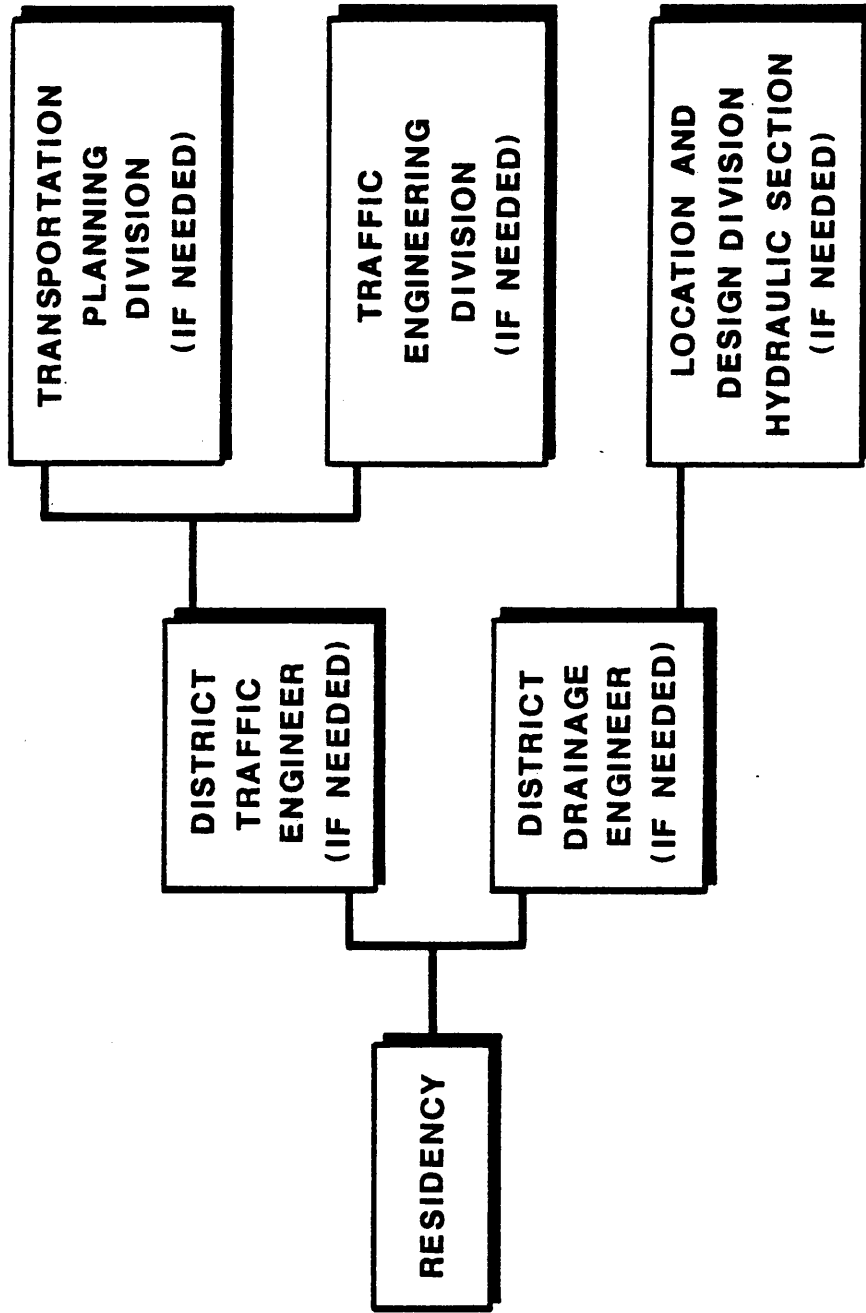
On rare occasions, other divisions may be requested to review a particular aspect of the site plan that involves their areas of responsibility.

D. Site Plan Review Process Through VDOT

Figures B-1 and B-2 illustrate the flow of site development plans and subdivision plans, respectively, through the VDOT. In both cases, all plans should be submitted to the residency to initiate VDOT review (except for Northern Virginia where the district is the entry point).

Figure B-1 shows the plan flow through VDOT for partial site plan reviews. Figure B-2 shows the flow for complete reviews by the next level.

Figure B-3 is from the draft of "Subdivision Street Requirements."



*Either the District Drainage Engineer or the Traffic Engineer may forward the plan to the Central Office, but not both.

Figure B-1. Partial site plan review process.

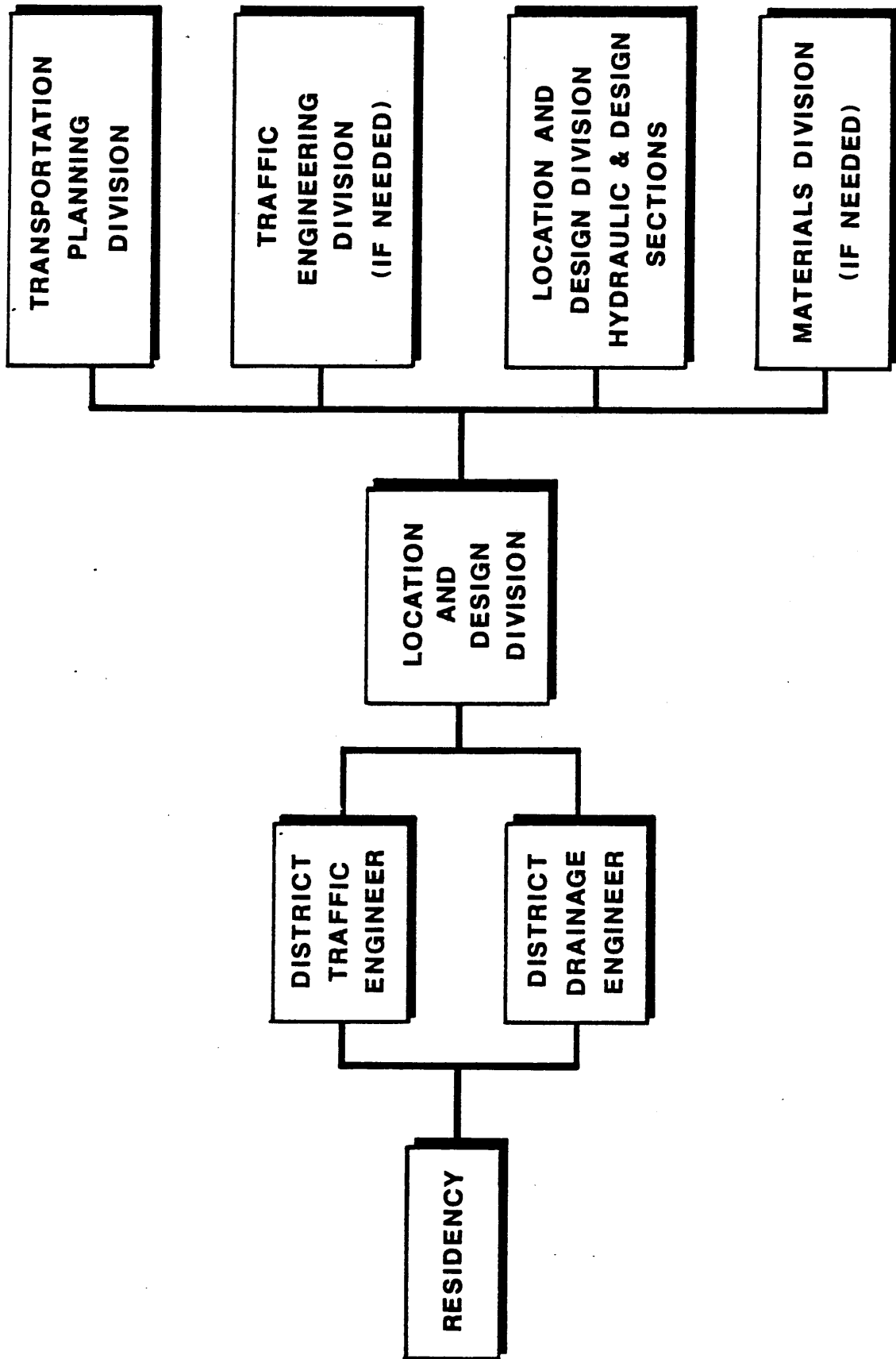
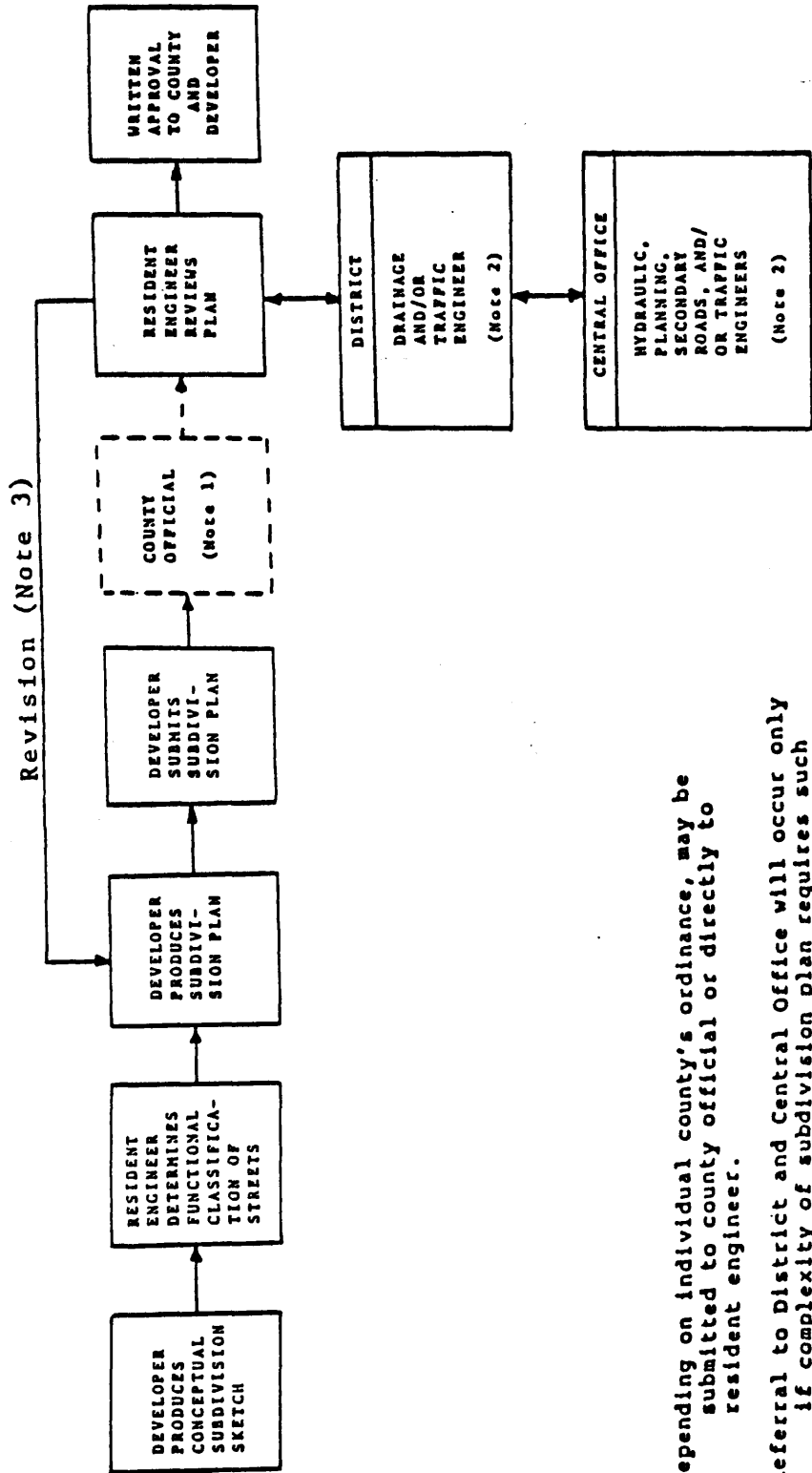


Figure B-2. Complete site plan review process.



Notes:

1. Depending on individual county's ordinance, may be submitted to county official or directly to resident engineer.
2. Referral to District and Central Office will occur only if complexity of subdivision plan requires such review.
3. Plan will be returned to developer if revision is required (for minor revision, revised plan will receive priority review upon resubmission).

Figure B-3. Subdivision street plan review procedure.

V. COORDINATION WITH COUNTY GOVERNMENTS IN SITE PLAN REVIEW

The previous sections of the guide emphasized site plan review activities within VDOT. Coordination and communication with the county governments are strongly encouraged and should be responsive to the needs of the county and the respective residency and/or district offices. Communication between VDOT and the counties is important in facilitating site plan review activities and in resolving problems and misunderstandings. Agreement on county and VDOT interaction with the developer should be obtained. With the exception of Northern Virginia, a VDOT residency staff person should be designated to serve as a liaison with the county.

The field offices and counties are strongly encouraged to document their site plan review process. In this way, the process will be clearly outlined on paper to facilitate mutual understanding and expectations of the site plan review process. The process of developing the document will provide opportunities to resolve problems and misunderstandings. Updates or revisions of the process should be made as needed.

The field offices and counties should each have updated copies of all of the other's documents pertinent to site plan review.

