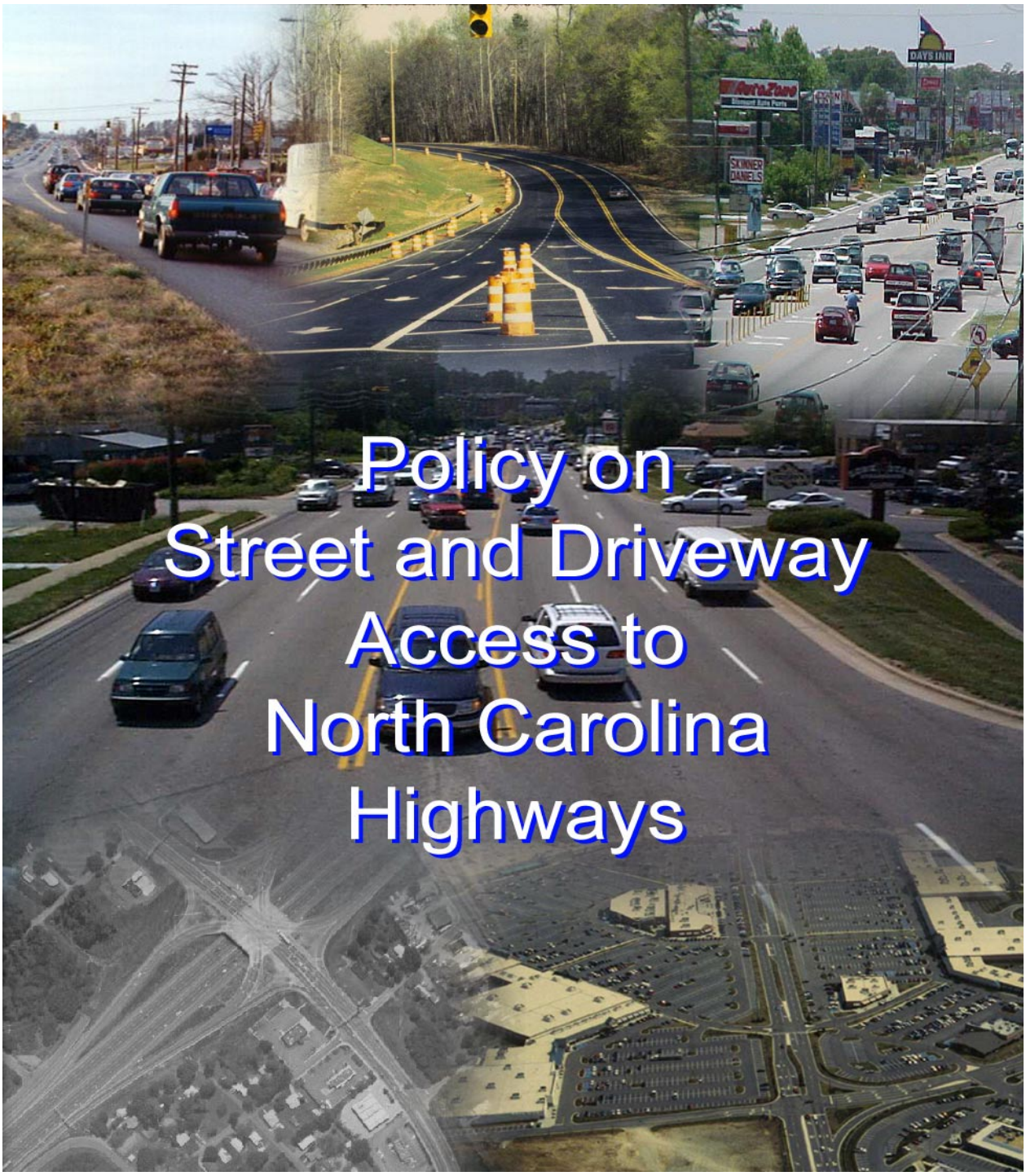
North Carolina Department of Transportation

July 2003



POLICY ON STREET AND DRIVEWAY ACCESS

TO NORTH CAROLINA HIGHWAYS

Published by the

North Carolina Department of Transportation

Division of Highways

July 2003

TABLE OF CONTENTS

Appendices

Exhibits

FOREWORD

One of the primary concerns of those responsible for North Carolina's vast highway system is to provide for the safe and efficient movement of people and goods. As an aid in achieving this, the NCDOT "POLICY ON STREET AND DRIVEWAY ACCESS TO NORTH CAROLINA HIGHWAYS" establishes requirements for the location, design, and construction of street and driveway access connections to the State Highway System. The Policy includes the legal basis for the exercise of this authority and sets forth procedures to be followed when applying for a Street and Driveway Access Permit.

North Carolina Department of Transportation

Board of Transportation Ordinance

Policy on Street and Driveway Access to North Carolina Highways

WHEREAS, GS 136-18(5) and GS 136-93 grants the Board of Transportation authority to make rules, regulations, and ordinances for use on the State highways; and including street and driveway access to State highways; and

WHEREAS, in furtherance of public safety and welfare, it is deemed necessary to regulate street and driveway access; and

WHEREAS, the State Traffic Engineer and the Chief Engineer – Operations have recommended the adoption of street and driveway access regulations hereinafter referred to, based upon engineering studies and recommendations of the traffic engineers and Highway Division Engineers; and the State Highway Administrator has reviewed and concurs in the recommendations; and the Secretary of Transportation has determined that these regulations should be adopted by the North Carolina Department of Transportation.

NOW, THEREFORE, BE AND IT IS HEREBY ORDAINED that from after July 10, 2003, the "POLICY ON STREET AND DRIVEWAY ACCESS TO NORTH CAROLINA HIGHWAYS – July 2003 Edition" shall be in effect and copies of the same will be placed on file in the office of the Secretary of the Board of Transportation in Raleigh, NC, in the office of the Division Engineers of the several divisions, and in the office of the District Engineers of the several districts.

J. Don Goins, P.E.
Chief Engineer – Operations

Troy A. Peoples, P.E.
State Traffic Engineer

Len A. Sanderson, P.E.
State Highway Administrator

Adopted the 10th day of July, 2003

Lyndo Tippett
Secretary of Transportation

Sworn to and subscribed before me this
the 16th day of July, 2003

Notary Public

Commission Expires: 7-18-04

INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is responsible for regulating the location, design, construction, and maintenance of street and driveway connections on the State Highway System. Incumbent with this is the obligation to ensure protection of the transportation infrastructure, economy of maintenance, preservation of proper drainage, safe and efficient movement of vehicles and pedestrians thereon, and full accountability of the transportation investments bestowed by the citizens of North Carolina upon the NCDOT.

The NCDOT recognizes landowners have certain rights of access consistent with their needs. However, access connections are a major contributor to traffic congestion and poor roadway facility operations. Indiscriminate roadside development and unregulated access connections can result in decreased highway capacity, driver and pedestrian confusion, and increased safety hazards. Most roadside interference can be attributed directly to vehicular traffic entering, leaving, and parking adjacent to accesses for residential developments, business establishments and commercial roadside developments. Studies have shown that driveway connections are a leading cause of vehicle crashes. During 2000, there were over 15,500 driveway-related crashes in North Carolina resulting in over 110 fatalities. Associated costs to citizens exceeded $800 million.

The NCDOT "POLICY ON STREET AND DRIVEWAY ACCESS TO NORTH CAROLINA HIGHWAYS" establishes uniform criteria regulating the location, design, and operation of access streets and driveways, and balances the needs and rights of property owners and roadway users. When an existing roadway is reconstructed, existing street and driveway connections must be altered to conform to the regulations set forth in this Policy. Street and driveway connections must also be brought into compliance with current requirements when the use of a property is modified or expanded. The NCDOT may allow site-specific deviations from the requirements established herein based on sound engineering principles and an engineering investigation for unique conditions. Appendix 1, page 65 provides a brief overview of the Street and Driveway Access Permit Process.

CHAPTER 1

PROCEDURES FOR PREPARING AND SECURING A STREET AND DRIVEWAY ACCESS PERMIT

A. General

A Street and Driveway Access Permit (referred to as "PERMIT") is issued by the NCDOT District Engineer (See Appendix 2, page 68 for list of Division and District Offices) and is for street and driveway connections to the State Highway System. Some locations may require local government approval. The applicant is responsible for determining and adhering to local government requirements when the proposed development is within a local government's jurisdiction. In the case of joint jurisdiction, concurrent reviews should be coordinated by the applicant between officials from the local government and the NCDOT in order to avoid conflicts between requirements and to streamline the review process. On larger developments, the applicant is encouraged to arrange a pre-submittal conference with the District Engineer and local jurisdiction prior to formally submitting an application.

Approval of site specific development plans by local government does not confer any obligation on NCDOT to allow the number, location, or design of any access or traffic control measure shown on that plan.

The applicant is responsible for all applicable environmental permits (i.e., erosion control, water quality, and wetlands) required for construction within the highway right-of-way resulting from the development.

An application for a PERMIT (Appendix 3, page 69) should be submitted in the early planning stages of the development. Completed applications will be accepted only from property owners or their legally authorized agent. Certification of legal ownership or authorized agency may be required. Upon approval of the application by the District Engineer, the PERMIT will be issued to the applicant stipulating the conditions of the approval.

When construction of any new connection or alteration of any existing connection is to be performed on the State Highway System by entities other than the NCDOT, the PERMIT must be secured prior to beginning the work. The PERMIT must also be secured prior to the change or alteration of existing or proposed

property use. Failure to secure required PERMITS prior to construction or change in property usage may result in the removal of the driveway or street connections at the property owner's expense.

PERMITS will normally not be required for a single residence. However, the property owner is encouraged to contact the District Engineer to identify safety and design issues, coordinate with construction projects affecting the proposed driveway, and to arrange for installation of driveway pipe.

Application for a PERMIT shall be made on a form provided by the NCDOT. All required signatures and seals of approval must be included on the application upon submittal to the District Engineer. Present and proposed property usage for which access is requested must be disclosed on the application including all intended uses of the access in conjunction with adjacent property, whether owned by the applicant or by others, or to be purchased or sold by the applicant or others. Any appropriate private access agreements must also be submitted.

Approval of the application is subject to compliance with this Policy, NCDOT standards and specifications, and all special provisions deemed necessary by the NCDOT. If the property owner fails to construct driveway and street connections to the satisfaction of the District Engineer, the NCDOT may, upon written notice to the property owner, barricade the connection from further use until necessary corrections are made.

Completed PERMIT application and plans are reviewed by the District Engineer's office. Generally four weeks should be allowed for most review submittals. If significant changes to the submittal are necessary, additional review time may be required. A development that is anticipated to generate large volumes of traffic or impact operational capacity, design, safety of the roadway, drainage, or utilities may require the District Engineer to solicit comments from other NCDOT units. In this case, an additional review time should be allowed for the review process. The District Engineer will notify the applicant when a review by other NCDOT units is necessary.

B. Evaluation of Moderate to Large Developments

Moderate to large developments can have a significant impact on the public transportation infrastructure. Therefore, a more in-depth review of the development plan and associated traffic impacts to the adjacent public roadway system will be required. If the site has the potential to generate total build out traffic volumes of 15,000 vehicles per day (vpd) or greater during an average

weekday, the District Engineer will forward the PERMIT application with plans to traffic engineering staff (Division Traffic Engineer, Traffic Engineering and Safety Systems Branch) for review and recommendations. This does not preclude the District Engineer from requesting traffic engineering review of applications that fall under this threshold. Traffic volumes must be based on the trip generation as outlined in the latest edition of the "Trip Generation Manual" by the Institute of Transportation Engineers (ITE). For purposes of determining the requirement to forward the PERMIT application to the traffic engineering staff, no adjustments such as modal split, pass-by trips, and internal capture rates will be allowed to the site traffic calculation. Examples of land uses that may meet or exceed this volume threshold are:

- Regional Malls
- Community Size Shopping Centers (300,000 sq. ft. or more)
- Large Business/Office Developments (1,000,000 sq. ft. or more)
- Large Residential Developments (1,600 single family units or more)
- Large Mixed Use Developments

C. Location of Property

Location of the property to which access is requested shall be clearly identified on the application to allow the site to be located in the field by NCDOT personnel. The applicant should identify the location on a segment of the NCDOT county map or any other suitable map that adequately identifies the site. NCDOT county maps are available at the District Office where the application is submitted.

D. PERMIT Classifications

The applicant will identify the PERMIT classification on the application. PERMITS are classified as Commercial, Residential/Subdivision, Traditional Neighborhood Development, Educational Facility, or Emergency (EMS/Fire) Services. Definitions of each classification are:

- **Commercial** - This classification is for developments that are commercial in nature. Examples of property usage include, but are not limited to shopping centers, single commercial business, light industrial and manufacturing establishments, small service business, service organizations, churches, major

recreational facilities, large office buildings, hospitals, large industrial developments, landfills, airports, civic centers and mixed use developments.

- **Residential Subdivision** – This classification is for developments that are residential facilities. Examples of property usage include, but are not limited to residential subdivisions, homebuilder speculation houses, apartment complexes, mobile home parks, and condominium developments.

  North Carolina General Statute (G.S.) 136-102.6 requires that in instances where a PERMIT application is made for a new subdivision street connection to the State Highway System, a disclosure statement shall fully and completely disclose the status (whether public or private) of the street upon which the houses or lots front. If the street is designated by the applicant for public use and it is intended to petition for state maintenance, the applicant shall dedicate the required right-of-way to the public and agree to construct the street in accordance with the standards contained in the "Subdivision Roads, Minimum Construction Standards" manual published and adopted by the NCDOT. A subdivision road is one that serves a parcel or tract of land that is subdivided into two or more lots, building sites or other divisions for sale or building development for residential purposes where such subdivisions include a new road or change in an existing road. A new street that fails to meet minimum Subdivision Road Standards will not be accepted by the NCDOT onto the State Highway System. The approval of subdivision street construction is separate from the PERMIT process.

- **Traditional Neighborhood Development (TND)** - This classification is for developments meeting the requirements defined in the latest edition of the NCDOT's "Traditional Neighborhood Development Street Design Guidelines." If the development is classified as a TND, the procedures outlined in the TND guidelines shall be followed.

- **Educational Facilities** - This classification is for both, public and private school systems. Examples of property usage include, but are not limited to elementary, middle, high school, and college or technical schools.

  G.S. 136-18 (29A) requires that upon acquiring land for new schools or for relocating/expanding an existing school, all public and private school systems shall coordinate with the NCDOT's local Division Engineer on an evaluation of the driveway access and traffic operational and safety impacts to the State Highway System resulting from the development of the proposed site. The Division Engineer will provide written recommendations to the school system

based on the NCDOT's findings. The school system should consider these recommendations prior to proceeding with site development.

School systems are encouraged to coordinate with the NCDOT prior to acquiring land for future school sites to avoid placing facilities in areas that may result in operation and safety issues.

- **Emergency (EMS/Fire) Services** – This classification is for all officially recognized emergency services organizations, profit and non-profit. Site selection should be coordinated with the NCDOT to avoid placing facilities in areas that may result in operation and safety issues.

E. Temporary Street and Driveway Access Permits

The District Engineer may issue Temporary Street and Driveway Access Permits (TEMPORARY PERMIT) for the construction and operation of access connections to the State Highway System for a specific time period. TEMPORARY PERMITS will clearly indicate that the access connections are temporary and are to be removed by the applicant at the end of the specified time period. Performance and indemnity bonds may be required to ensure the proper removal of the access and restoration of the highway right-of-way. Examples of types of TEMPORARY PERMITS include but are not limited to grading operations, utility operations, site construction accesses, on-site drainage, and logging operations.

Temporary accesses should meet required design, sight distance, and placement criteria. The applicant will be financially responsible for any damage caused to the pavement, loop detectors, guardrail, signing, landscaping, or other State Property.

CHAPTER 2
PROJECT COORDINATION

A. Coordination with Local Government Agencies

The applicant shall coordinate with appropriate local government agencies to identify possible conflicts with local, state or federal regulations and plans, including but not limited to local zoning regulations, land-use plans, transportation plans, overlay districts, and planned urban developments.

In areas where city or county government agencies have site plan or driveway access approval processes for developments, the PERMIT should be processed and approved concurrently with the local government agency's approval process to avoid conflicting requirements of the applicant. In general, there is a recognized mutual understanding between local government agencies and the NCDOT to withhold building permits until approval of the PERMIT, and withhold certificates of occupancy until all work is completed in compliance with the approved PERMIT.

Some local government agencies charge a traffic impact fee based on the size of a development or the projected traffic generated by the proposed development. Such fees do not release the applicant from fees and improvements required by the NCDOT. Fees may include inspections and pipe installation. When a local government agency requires a development to widen the abutting State Highway System roadway to a width compatible with an ultimate transportation plan section, the NCDOT may require construction of additional improvements to assure the safety and capacity of the proposed entrances.

If local government agency regulations are more restrictive than NCDOT requirements, the local regulations will govern. However, this does not imply the NCDOT is obligated to approve entrance designs that are too constrictive to allow smooth and safe traffic flow. The ultimate authority to approve the PERMIT rests with NCDOT.

B. Coordination with Transportation Improvement Projects (TIP)

TIP Planning/Design Stage

When it is determined that a proposed access connection may impact a planned TIP or maintenance project, the District Engineer coordinates with other NCDOT

planning and design staff to determine the extent of potential conflicts. The District Engineer will notify the applicant of these potential conflicts. Requests for access on a TIP project may require additional review time for project coordination and conflict resolution.

On TIP projects, where a parcel has one or more existing driveways, one driveway will be designed for reconnection so as to maintain at least one access point on uncontrolled frontage. Additional driveways may be designed for reconnection, whether or not a PERMIT had been previously issued, if they are in conformance with NCDOT design and safety standards and are in conformity with the current NCDOT access management regulations. The intent of this provision is to allow property owners reasonable access to their property where there is no legal control-of-access frontage while protecting the traveling public and providing safe, effective design standards in the planning, design, and construction of highways. If a new curb cut or turnout is designed as part of a TIP project, any change in property usage or access connection will require a new PERMIT application depending on the extent of TIP involvement and the impact of the planned development. The applicant may be required to enter into legal agreement with the NCDOT to ensure that all access conditions are appropriately resolved. For further information, refer to "Guidelines for Agreement Process and Reimbursement to NCDOT by Municipality/Developer."

Where there is no existing driveway to property along the property's road frontage and the parcel is vacant or unimproved, no curb cut or driveway turnout will be designed until the District Engineer has approved a PERMIT.

All driveway "curb cuts," "driveway turnouts," and driveway re-connections are subject to the NCDOT's regulatory "police powers" and shall not be misconstrued as "contract access points."

TIP Construction Stage

Where it is determined that a proposed access connection may impact a TIP project that is under construction, the District Engineer coordinates with NCDOT Construction Unit personnel to determine the extent of potential conflicts. Close coordination with the Resident Engineer responsible for the TIP project is required, and additional review time may be necessary for coordination with construction and resolution of conflicts.

Requests for access points (including curb cuts or driveway turnouts) not shown on the construction plans that are submitted prior to completion of construction must

be received through an application to the District Engineer. Generally, no additional access points will be approved without an approved site plan for the specific use. Requests are subject to the approval of the District Engineer through coordination with the Resident Engineer, and approved access points will require a revision of the construction plans.

On TIP projects, no new curb cuts or turnouts to vacant or undeveloped parcels will be constructed without an approved site plan and PERMIT application. The site plan is necessary to determine proper access configuration and placement. If a new curb cut or turnout is constructed as part of a TIP project, any change in property usage or access connection will require a new PERMIT application depending on the extent of TIP involvement and the impact of the planned development. The applicant may be required to enter into legal agreement with the NCDOT to ensure that all access conditions are appropriately resolved. For further information, refer to "Guidelines for Agreement Process and Reimbursement to NCDOT by Municipality/Developer."

C. Coordination with Other Developments

In the event that other new developments are in the vicinity of the proposed development, the applicant should coordinate with local jurisdictions or other applicants to identify conflicting or overlapping access issues. Applicants are encouraged to combine access points and provide connectivity through shared property access.

CHAPTER 3

CONDITIONS AND LIMITATIONS OF STREET AND DRIVEWAY ACCESS PERMITS

A. General

All work performed on the State Highway System under the terms of a PERMIT is subject to the special provisions on the PERMIT and all accompanying plans, drawings, and attachments.

The applicant shall not hold the Department of Transportation and its duly appointed agents, officers, and employees liable for any claim arising from willfulness or negligence of the applicant, or any person or entity operating on the applicant's behalf, in operations covered by the PERMIT.

B. Approvals

Once transportation infrastructure needs of the development have been identified by the NCDOT and local government agencies with jurisdiction, access points will be approved via a PERMIT after final plans are submitted, reviewed, and approved. Upon approval of the PERMIT application by the NCDOT, the District Engineer will sign the PERMIT. The PERMIT with all attachments will serve as the applicant's notification of any special provisions and requirements pertaining to access for the proposed site.

The applicant should be aware that the NCDOT may at any time, when deemed necessary for safety, mobility and efficiency of the roadway, modify, remove, or relocate any access point, and may redesign the roadway including any medians, auxiliary lanes and turning movement restrictions.

Access connections and building construction must start within one year after the approval date of the PERMIT and be in accordance with the approved land use permit. At the discretion of the District Engineer, an extension of time not to exceed 90 days may be granted. Time frames for driveways built under an agreement with NCDOT in conjunction with a TIP project will not be subject to the requirements above. The applicant shall provide written notification to the District Engineer when construction starts and when it is completed.

Upon completion of construction, final approval by the District Engineer is required prior to opening the access connection for public use.

C Construction Inspection

NCDOT has the authority for final approval of all construction within public right-of-way along the State Highway System. All work and materials used within the right-of-way shall meet or exceed the minimum requirements of the "North Carolina Standards and Specifications for Roads and Structures." The District Engineer may specify material or construction methods needed to accomplish the work.

The NCDOT reserves the right to periodically inspect the work being performed by the contractor to assure compliance with the PERMIT and the approved plan. The District Engineer or authorized representative can perform these inspections at the NCDOT's discretion.

The District Engineer may require the applicant to provide NCDOT with verification certifying that improvements meet the approved plan and NCDOT standards. Verification may include inspection reports, testing reports, or any supporting documentation and calculations. Verification may cover, but is not limited to, pavement structure, drainage, and traffic control items. All documentation must be dated and initialed by the contractor and given to the District Engineer along with a certification memo that has been signed and sealed as appropriate under G.S. 89C-16 by a North Carolina Professional Engineer or Professional Land Surveyor (Appendix 4, page 72). If the NCDOT determines that the materials or the work does not meet NCDOT standards and the approved plan, all costs incurred in removing or correcting defective materials or workmanship shall be borne by the applicant.

D. Bond Requirements

The applicant or contractor shall provide Performance and Indemnity Bonds in the amount specified by the Division Engineer or designated representative for proposed roadway improvements within the State Highway System right-of-way. Performance and Indemnity Bonds may be waived if a local government agency has a system in place that would require a bond for the improvements proposed on the approved PERMIT. These bonds must indemnify NCDOT for damages within State Highway System right-of-way caused by construction.

Performance and Indemnity Bonds may be in the form of a Corporate Surety Bond, Continuing Indemnity Bond, certified or cashier's check, or Irrevocable Letter of Credit. Where Surety Bonds are furnished, an authorized agent of the Surety Company who must be a resident of North Carolina must sign them and a Power of

Attorney authorizing him to sign must be attached to the bond. For bonds of $500.00 or less, certified or cashier's checks made payable to "North Carolina Department of Transportation" are preferable to Surety Bonds. Bonds in the form of personal checks or cash will not be accepted.

The Division Engineer or designated representative will retain Performance and Indemnity Bonds until such time as the Bonds are released. Certified or cashier's checks will be immediately forwarded to the Controller in Raleigh upon receipt and will not be retained by the Division Engineer.

The applicant shall notify the District Engineer in writing upon completion of the access connection and roadway improvements. The District Engineer will coordinate final inspection with the appropriate NCDOT staff. If the construction does not meet the requirements of the approved PERMIT, the NCDOT may, upon written notice, suspend a PERMIT and order closure of the access point until corrections are made. When closure of the access would constitute an undue hardship on access users other than the applicant, and the NCDOT or local authorities have been unsuccessful in obtaining compliance with the PERMIT, the bonds may be used to correct the deficiencies.

The Division Engineer will release Performance and Indemnity Bonds one year following satisfactory completion of the work. The applicant shall be responsible for notifying the bonding company after the one year and providing a copy of the PERMIT to the bonding company. The bonding company must submit a request for release of the Bond with a copy of the PERMIT to the Division Engineer. These requirements will be incorporated into the PERMIT letter of authorization.

E. Conditions of the PERMIT

The applicant shall be responsible for performing all construction covered by the PERMIT. A single PERMIT may be issued for both driveway work and any other required work at the same location (such as backslope grading, widening for left and right turn lanes, or other similar work.) In accordance with the NCDOT's "Policies and Procedures for Accommodating Utilities on Highway Rights of Way," utility work requires an Encroachment Agreement.

At those locations where it is determined by NCDOT that a street or driveway connection requires improvements to existing highway facilities to provide for safe and efficient traffic operation, the applicant may be fully responsible for roadway improvements. These improvements may include, but are not limited to, separate turn lanes, deceleration lanes, acceleration lanes, lane tapers and transitions, right-

of-way to contain new widening, and traffic signals. Generally, these improvements are necessitated by the development and will be used primarily by traffic destined for establishments within the development, or traffic affected by the development. It is the responsibility of the applicant to ensure use of the access to the property is not in violation of the PERMIT'S terms and conditions under which the PERMIT was granted.

The NCDOT will make every reasonable effort to ensure that street and driveway connections to the State Highway System conform to the regulations, standards, criteria, and requirements as set forth in this Policy. Alterations, deviations, deletions, or additions to the approved PERMIT must be submitted in writing by the applicant and must be specifically approved in writing by the District Engineer prior to any field modifications. All requirements of the PERMIT should be made prior to the municipality/county issuing the Certificate of Occupancy. Where multi-phase developments are proposed, all requirements of the PERMIT for each phase must be completed prior to beginning the next phase.

As directed by the District Engineer, the applicant shall replace all curb, curb and gutter, curb and sidewalk, drainage facilities, traffic control devices, pavement markings, landscaping, and all other State property damaged during construction. The applicant shall remove, to an area outside the State Highway System right-of-way, all debris including, but not limited to surplus materials and excavation unless otherwise provided for by the PERMIT.

The applicant shall take necessary precautions to prevent injury to persons or damage to property from operations covered by the PERMIT. In accordance with G.S. 136-30, all traffic control devices (signs, pavement markings, signals, etc.) placed on the State Highway System right-of-way shall be in conformance to the "Manual on Uniform Traffic Control Devices" (MUTCD) and the "North Carolina Supplement to the MUTCD" (NCMUTCD). The applicant shall use flaggers, warning signs, and other safety devices in accordance with the MUTCD and NCMUTCD when performing work within the State Highway System right-of-way. A detailed traffic control plan may be required for the proposed work in or affecting the NCDOT right-of-way. Commercial signs, permanent fixtures, parking areas, or other objects will not be allowed on or over the State Highway System right-of-way.

The portion of improvements located on public right-of-way will be considered the property of the NCDOT and may be utilized in any manner deemed necessary by the NCDOT. The applicant will not be entitled to any claims of reimbursement

from NCDOT for applicant funded construction expenditures on public right-of-way.

Once access connections and improvements have been inspected and approved by NCDOT and any local government agencies with jurisdiction, the District Engineer may require a plan-of-record along with the PERMIT and any associated stipulations be recorded in the local courthouse at the applicant's expense. Examples of reasons to record these documents include, but are not limited to future TIP projects, sight distance issues, protected driveway stems, phased development, restrictions to outparcels/flag parcels, conveyance of conditions of access to potential and future land owners, and changes in land use under the same landowner. The applicant shall provide verification of recordation to the District Engineer.

The entire cost of constructing and maintaining an approved private street or driveway access connection will be borne by the property owner, the applicant, and their grantees, successors, and assignees.

CHAPTER 4

STUDIES AND SITE PLANS

A. General

All applications for PERMITS shall be accompanied by complete and detailed site plans.

The applicant may be required by the District Engineer to submit studies based on, but not limited to the parameters outlined herein. If study requirements of the local government agency are more restrictive than the NCDOT requirements, then local government requirements will govern. However, this does not imply that the NCDOT is obligated to approve entrance designs that are too constrictive to allow smooth and safe traffic flow. All studies, including but not limited to Traffic Impact Studies (TIS), traffic signal studies, and drainage studies, must be prepared under the direct charge of and sealed by a North Carolina licensed Professional Engineer.

Failure to submit completed site-specific studies with all necessary information will result in the return of the application. The NCDOT will not begin the review process on incomplete applications.

B. Site Plan

Unless otherwise requested by the District Engineer, a minimum of four completed site plans must accompany each PERMIT application. Site plans should be drawn to engineering scales of either 20, 30, 40, or 50 feet per inch. Non-scaled photographs are not acceptable in lieu of a site plan but may accompany the site plan for illustrative purposes. Freehand sketches are not acceptable. The following information, as applicable to the specific location, must be included on the site plan:

- A description of the property to be served by the PERMIT, together with a description of the adjoining land owned or controlled (owned, optioned, leased, etc.) by the applicant. This description should include all phases of the proposed development including any future plans for adjacent land uses.
- Right-of-way lines, easements and restrictions, highway control-of-access, if present, and property lines.
- Driveway approaches and roadway alignment.

- Parking, interior drives, channelization, traffic flow pattern, traffic control devices, pavement markings, internal truck, service and delivery routing, emergency vehicle access, etc.
- Buildings with Gross Leasable Area, utilities and utility easements, streams, bridges, retaining walls, signs and other fixed objects such as trees and utility poles.
- Distance of intersecting roads, streets, driveways, signals, railways or crossovers within five hundred (500) feet of the property line of the proposed development.
- Width of rights-of-way and sight distance areas.
- Width and type of adjacent road surface.
- Width, radii, and lane use of existing and proposed driveways or streets.
- Existing/proposed speed limits.
- Necessary and existing pipe, tile, or other drains, stating types and sizes.
- Width of property frontage.
- Distance from right-of-way to gasoline service island.
- Distance from right-of-way to all buildings.
- Distance between driveways being requested.
- Distance between driveway and nearest property line.
- Distance between edge of pavement and right-of-way.
- Pavement design of driveways, streets and approaches.
- All proposed turning radii with ramps for the handicapped pedestrian.
- Proposed treatment of right-of-way area adjacent to and between approaches.
- Rate of slope or grade of approaches and driveways.
- Proposed commercial lighting within 200 feet of the highway right-of-way.
- All parcels intended for use with requested access.
- Location of sidewalks, crosswalks, modal intersections, railroads, bus stops, greenways, trails and any other relevant transportation facility in the development area.
- North arrow.
- Date of plan and most recent revision.
- Vicinity map.
- Other pertinent information as identified by the District Engineer.

C. Traffic Impact Study (TIS)

The TIS is a specialized study that evaluates the effects of a development's traffic on the surrounding transportation infrastructure. It is an essential part of the development review process to assist developers and local government agencies in

making land use decisions involving annexations, subdivisions, rezonings, special land uses, and other development reviews. The TIS helps identify where the development may have a significant impact on safety, traffic and transportation operations, and provides a means for the developer and government agencies to mitigate these impacts. Ultimately, the TIS can be used to evaluate if the scale of development is appropriate for a particular site and what improvements may be necessary, on and off the site, to provide safe and efficient access and traffic flow. Mitigation measures may involve strategies other than roadway construction or other physical improvements such as changes to traffic signal timing or phasing, and transportation management strategies.

A TIS may be required for developments with an estimated trip generation of 3000 vehicles per day or greater during an average weekday based on a five day national average as defined in the Institute of Transportation Engineers (ITE) Trip Generation Manual. The trip generation of a proposed development is the sum of the number of inbound and outbound vehicle trips that are expected for the type and size of the proposed land use. For purposes of determining the requirement to submit a TIS, no adjustments such as modal split, pass-by trips, and internal capture rates will be allowed to the site traffic calculation.

A TIS will vary in range and complexity depending on the type and size of the proposed development. When mutually agreed by the NCDOT, the applicant, and any local government agency with jurisdiction, the basic requirements for the TIS (as described in Chapter 5) may be modified. The need for a TIS may be waived by the Division Engineer.

A TIS may also be required for proposed accesses within 1000 feet of an interchange, in the vicinity of a high accident location, on a major arterial roadway, involvement with an existing or proposed median crossover, highway improvements that are in the Transportation Improvement Program, involvement with an active roadway construction project, or at the discretion of the District Engineer.

D. Traffic Signal Study

Approval of the PERMIT does not constitute approval for proposed traffic signal improvements, nor approval for proposed new traffic signals. The District Engineer will coordinate final traffic signal recommendations with the Division Operations Engineer and the applicant will be required to pursue a Traffic Agreement with the NCDOT. Traffic signal submittals are required to comply

with the NCDOT's "Traffic Signals Review and Approval Process for Private Developments."

A traffic signal study may be required to evaluate the impact of the proposed development on existing traffic signals and traffic signal systems within the vicinity of the property. The applicant will be required to identify improvements to minimize safety and operational deficiencies caused by the proposed development on existing traffic signal systems, and to identify proposed traffic signal locations. The study shall use NCDOT approved methods and input parameters, and be of sufficient scope and detail to allow the NCDOT to evaluate the impact of the proposal and the need for roadway capacity, operational and safety improvements resulting from the proposed development.

The study may require investigation of all intersections within the vicinity of the project to determine warrants for possible traffic signal upgrades (operational and equipment changes), new traffic signals (temporary and permanent), and traffic signal systems. Where there is an existing traffic signal system, the study may require identifying the impact of the new traffic signals and traffic signal upgrades on the corridor established by the existing system timing data. The analysis should identify all railroad/highway at-grade crossings that may require railroad crossing signals and all traffic signals that may require railroad preemption or vehicle preemption systems. Proposed new traffic signals must meet traffic warrant criteria as outlined in the MUTCD in order to be considered for installation of the traffic signal. Meeting warrants does not necessarily justify the installation of a traffic signal. Final approval for a new traffic signal installation on the State Highway System will be made only by the NCDOT.

E. Drainage Study

The applicant may be required to submit a drainage study justifying the proposed drainage system with retention and/or detention pond, pipe and/or storm sewer sizes to be used as a result of the proposed development. Drainage studies are required to meet the NCDOT's "Guidelines for Drainage Studies and Hydraulic Design."

CHAPTER 5

TRAFFIC IMPACT STUDY GUIDELINES

A. General

When required by the NCDOT, a Traffic Impact Study (TIS) is used to review the potential impacts of proposed or revised developments on the State Highway System. The TIS covers safety, capacity, and access issues. It is used by the NCDOT to determine required improvements to the State Highway System within the vicinity of the development necessary to mitigate potentially undesirable impacts.

The District Engineer will determine the basic parameters of the TIS. When mutually agreed by the NCDOT, the applicant, and any local government agency with jurisdiction in a pre-submittal conference, the basic requirements and parameters for the TIS may be modified.

The TIS shall be prepared under the direct charge of and sealed by a licensed North Carolina Professional Engineer with expertise in traffic engineering. All work shall be in accordance with NCDOT approved methods and input parameters, and of sufficient scope and detail to allow the NCDOT to evaluate the impact of the development with the need for roadway capacity, and operational and safety improvements.

In general, the TIS report should conform to the following outline:

1. Table of Contents
2. Introduction
   a. Explanation of project
   b. Area map showing development site location
   c. Complete project site plan, with buildings identified as to proposed use
   d. Project schedule, and stages, if applicable
3. Base Conditions
   a. Existing Roadway network in vicinity of project, including lane configurations
   b. Availability of alternate modes of travel in study area
   c. Existing traffic volumes for all significant and pertinent modes of travel in study area
   d. Existing traffic signal phasing and timing information.

   e. Safety information
   f. Traffic capacity analysis
4. Background Conditions
   a. Growth in traffic volumes to full build-out year, or stages of developments, if appropriate
   b. Traffic volume generated by other approved developments in area, if applicable
   c. Transportation improvement projects (State, local or private) in project study area
   d. Background traffic volumes (base + growth + approved developments)
   e. Traffic capacity analysis
5. Project Conditions
   a. Traffic generated by proposed development (site traffic) at build-out, or stages of developments, if appropriate
   b. Project traffic volumes (background + project)
   c. Project traffic analysis
   d. Impact to alternate modes of travel
   e. Proposed roadway network improvements
   f. Project traffic analysis with proposed roadway improvements
6. Conclusions/Recommendations
7. Appendix
   a. All work sheets, traffic counts and other pertinent documents

B. Base Roadway Network

All roadways in the vicinity of the development shall be included as part of the TIS analysis. Analysis of intersections or roadway segments not immediately adjacent to the development may be required by the District Engineer if significant site traffic could be expected to impact the intersection or roadway segment. If intersections impacted by the development are within a coordinated traffic signal system, then the entire traffic signal system shall be analyzed. However if the traffic signal system is large, a sub-section of the system may be analyzed if approved by the District Engineer.

C. Safety Information

The initial submittal may be required to include recent crash experience in the study area. Where proposed access points are in the vicinity of high crash locations or where safety may be impacted, additional safety studies may be required.

D. Traffic Volumes

Traffic turning movement counts shall be taken at each existing intersection in the project area. Existing traffic counts may be used if taken within twelve months of the TIS submittal. At some intersections, counts older than one year may be used if adjusted to current year. The use of these older counts will be evaluated on a case-by-case basis by the NCDOT. In general, AM and PM peak hour counts should be used. Other peak hour period counts, such as lunch and weekend periods, may be required if appropriate for the development. Counts shall not be taken on a holiday unless specifically needed for the particular analysis. The effects of school, seasonal variation and special event traffic shall be noted as appropriate.

E. Traffic Capacity Analysis

All capacity analysis shall be performed using methodology and software based on the Highway Capacity Manual procedures or as approved by the District Engineer. All software shall be the latest version available unless otherwise approved by the District Engineer.

If signalized intersections impacted by the project are within a coordinated traffic signal system or may be included in a system because of changes to the network by the applicant, then they shall be analyzed as a system rather than as isolated intersections. Where available and appropriate, existing timing information shall be used.

All analyses shall include level of service determination for the entire network and individual intersections and roadway segments, as appropriate. Intersection analyses shall include level of service determinations for all approaches and movements. Intersection analyses shall include queue analysis.

F. Growth-to-Background Traffic Volumes

Growth-to-background traffic volumes are factors of increases in annual traffic volumes generated outside the project area. These factors shall be applied to the existing traffic before adding any approved developments in the area. As deemed appropriate, the volume shall be compounded to the proposed build-out years or completion of development stages. In general, these factors will be determined from local or statewide data.

G. Approved Development Traffic

Approved development traffic is defined as traffic generated by all developments approved by local jurisdictions or submitted to the local jurisdiction for approval within the development vicinity at the time of the TIS submittal.

H. Background Analysis

Background (no build) analysis shall include existing traffic, traffic signal phasing and timing, background growth, and all approved developments. The analysis shall take into consideration any improvements to the roadway network that will be in place by the build-out year, or staged build-out in development, as appropriate. An analysis shall be performed for each staged build-out year as necessary. This analysis shall be performed for the proposed build-out year of the development or other year as identified by the local jurisdiction and approved by the District Engineer.

I. Project Conditions

Site traffic is the traffic that will be generated by the proposed development. Trip generation rates shall be based on trip generation methodology in the latest version of the "Trip Generation Manual" by the ITE. When approved by the District Engineer, available local information may be substituted with appropriate documentation. The District Engineer may coordinate the analysis of the site trip generation with the Division Traffic Engineer. Trip generation reduction factors such as pass-by traffic, and internal capture shall be justified. Total traffic is to be re-calculated after site traffic is generated. All trip generation calculations and supporting documentation shall be included in the report appendix.

Project traffic analysis shall include any roadway network improvements that will be in place by the project build-out year, or stage in development, if appropriate. Any improvements planned by others shall be identified as such, and documentation describing the improvements, the entity that is to implement the improvements, and the schedule for such improvements shall be provided.

J. Roadway Network Improvements

The applicant shall be required to identify mitigation improvements to the roadway network if at least one of the following conditions exists when comparing base network conditions to project conditions:

- the total average delay at an intersection or individual approach increases by 25% or greater, while maintaining the same level of service,

- the Level of Service degrades by at least one level,
- or Level of Service is "F."

For turning lanes, mitigation improvements shall be identified when the analysis indicates that the 95th percentile queue exceeds the storage capacity of the existing lane. The District Engineer will be responsible for final determination of mitigation improvements required to be constructed by the applicant.

K. Conclusions/Recommendations

This section of the TIS shall summarize the findings of the analysis, identify all potential intersections or roadway segments that will be at an unacceptable level of service as identified in Section J, and identify all improvements meant to mitigate these potential problems. This includes a description of the improvements that the developer will construct or fund as part of the development proposal. Improvements to roadway segments and intersections not immediately adjacent to the project site may be required if significant traffic impacts are identified. Constraints to constructing such improvements shall be identified and discussed by the applicant with the NCDOT and any local government agency with jurisdiction.

L. Supporting Information

The applicant shall provide all supporting information to the District Engineer. This information may include but is not limited to the following: traffic volumes, analysis reports, signal warrant analysis, documentation of approved developments or proposed roadway improvements by others, and analysis data and output.

In lieu of printed pages, electronic copies of supporting data may be submitted. The submitted information may include data from traffic analysis, traffic volume, or signal warrant analysis software packages. If submitted, both input data and output reports shall be included. Data files should be named to facilitate identification of the contents.

All plans may be submitted electronically, with the exception that a copy of the proposed site plan must be printed and included with the application. If so provided, the plans must be in a format approved by the District Engineer.

CHAPTER 6
STREET AND DRIVEWAY ACCESS PERMIT APPEALS PROCESS

When an applicant objects to denial of a PERMIT, or objects to any of the terms or conditions placed on the PERMIT, the applicant may file an appeal in writing to the Division Engineer within 30 days of the applicant's receipt of the notice of denial or the transmittal of the PERMIT for the applicant's signature.

The first level of appeal is to the Division Engineer. The written appeal shall provide reasons for the appeal and may include changes, revisions, or conditions that would be acceptable for the applicant. The Division Engineer will review the appeal with all pertinent information and will render a decision on the appeal within seven calendar days of receipt of the written appeal, and respond to the applicant in writing of his decision.

The second level of appeal is to the Driveway Permit Appeals Committee. If terms and conditions of the PERMIT cannot be resolved at the first level of appeal, the applicant may forward a written appeal within 30 days of his receipt of the Division Engineer's response to the appeal to the Chairperson of the Driveway Permit Appeals Committee with a copy of the request to the Division Engineer. The Driveway Permit Appeals Committee is not meant to serve as a replacement for the normal process of obtaining a PERMIT through the District Office. In no case will the Committee act on a request until all actions to resolve the appeal at the first level have been exhausted and Division Engineer has rendered a decision on the appeal.

All information submitted to the Committee Chairperson for evaluation to render a decision on the appeal will be transmitted through the Division Engineer. The submittal may include the detailed site plan and any studies (signal warrant or traffic impact studies) that have been submitted by the applicant, a completed Street and Driveway Permit Appeal Checklist (Appendix 5, page 73), and a letter of transmittal. The letter should state any pertinent information relating to the site that may impact the terms and conditions of the PERMIT, the Division's terms and conditions for approval of the PERMIT, reasons for the appeal, and any changes or revisions to the PERMIT that would be acceptable to the applicant.

The Driveway Permit Appeals Committee meets monthly. The Committee is made up of the following members:

Voting Members:

- Deputy Chief Engineer – Operations – Chairperson
- Traffic Engineering – State Traffic Engineer or designee
- Program Development and Environmental Analysis – Branch Manager or designee
- Right of Way – State Negotiator or designee
- Roadway Design – Unit Head or designee
- Design Services – Unit Head or designee

Non-Voting Member:

- Federal Highway Administration Representative

All appeals received by the Driveway Permit Appeals Committee will be placed on the Committee's agenda. The NCDOT Chief Engineer's Office – Operations will review the agenda and, when necessary, may request additional information for the Driveway Permit Appeals Committee's benefit. Agenda items that are deferred due to a request for additional information can remain on the agenda for a period of up to six months. If the applicant fails to provide requested information within six months, the item will be removed from the agenda and considered dismissed. If activity on an agenda item occurs after six months, the information must be resubmitted through the Division Engineer.

The Driveway Permit Appeals Committee will review the appeal and assess its effect on the safety and operation of the State Highway System. The Committee will determine if there are any conflicts with future projects and transportation plans, as well as when appropriate, coordinating the review with the local planning jurisdiction. Representatives of the District/Division Office and local jurisdiction may address the Committee on an agenda item within their jurisdiction. When requested in advance by the applicant, the applicant or their representatives may also be provided an opportunity to address the Committee. The applicant or representatives will not be permitted to be present for the deliberation and vote by the Committee.

While the Committee will try to seek consensus whenever possible, decisions of the Committee will be determined by majority vote. In the event of a tie vote, the Chairperson will make the final decision.

A memorandum from the Chairperson is transmitted to the Chief Engineer – Operations requesting concurrence with the Committee's recommendation. Upon receipt of the Chief Engineer's concurrence or concurrence with stipulations, a memorandum from the Chairperson will be forwarded to the appropriate Division Engineer explaining the decision of the Committee. The Division Engineer will notify the applicant of the decision of the Committee. The decision of the Committee is the final agency action on the PERMIT request.

CHAPTER 7

STREET AND DRIVEWAY ACCESS DESIGN CRITERIA

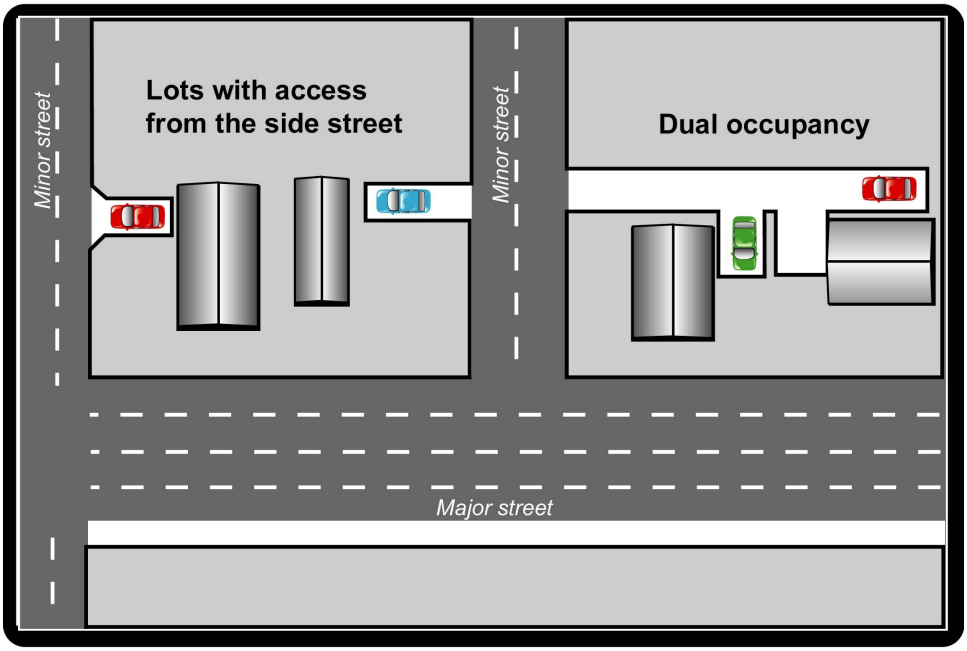
A. General

All work performed on the State Highway System under the terms of a PERMIT is subject to the design criteria of this section and all related NCDOT manuals and guidelines. Design criteria may relate to, but is not limited to, location, spacing, design vehicle storage, and drainage. Each component must be addressed in adequate detail to ensure public safety and mobility.

B. Site Requirements

Location **-** The location of street intersections and driveways is critical for minimizing potential impact to vehicular and pedestrian traffic. Street and driveway connections to the State Highway System should be clearly visible to all approaching traffic. The location of driveways should be related to nearby street intersections and adjacent driveways. In the interest of public safety and mobility, the NCDOT may prohibit, restrict, or modify the placement of a driveway or street along the property owner's frontage. The NCDOT may also prohibit or restrict access to a State Highway System roadway if alternate access is available through other adjacent public facilities.

Use of Side Street Access

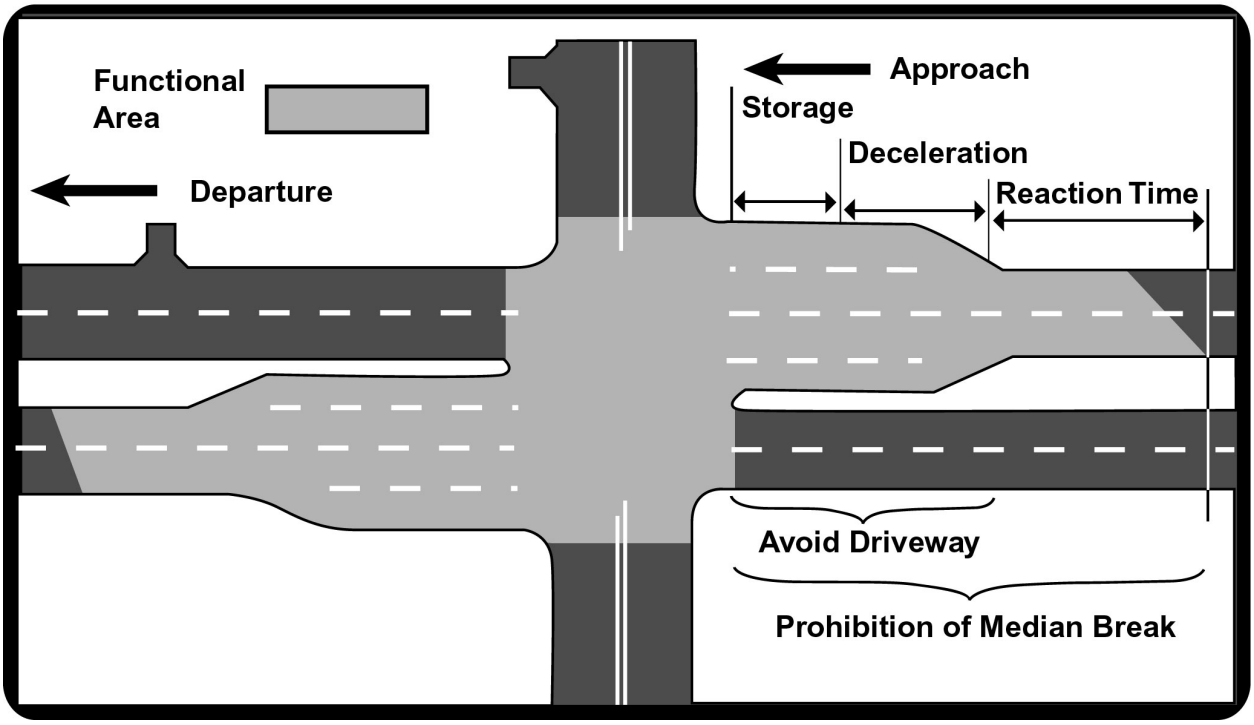


Every effort shall be taken to prevent access connections and median breaks within the functional area of an intersection. If access connections have to be located within the functional area due to limited property frontage, the NCDOT may restrict access to "right-in/right-out" or other limited movement treatments. Such driveways must still meet all location and minimum distance requirements.

Functional Area of Intersection - The functional area of an intersection consists of the distance traveled during reaction time, the deceleration distance, and queue storage length. The following reaction time and distances may be used:

Reaction Time and Distances				
Areas	**Sec.**	**35 mph**	**45 mph**	**55 mph**
Rural	2.5	130 ft	165 ft	200 ft
Urban	1.5	75 ft	100 ft	120 ft

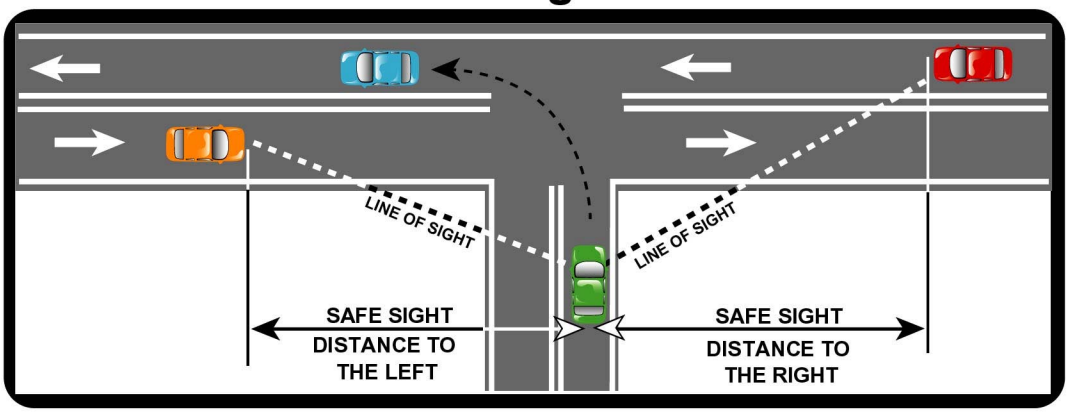
Functional Area of an Intersection



Sight Distance – Street and driveway connections should provide for adequate vertical and horizontal sight distance. The table on page 29 lists minimum sight distance values for various design vehicles. The table summarizes sight distance along arterial roads and streets necessary for a stopped vehicle to cross the arterial and any auxiliary lanes. If the access is located on a divided facility, the median width is not accounted for in the table. Median width may be ignored when the

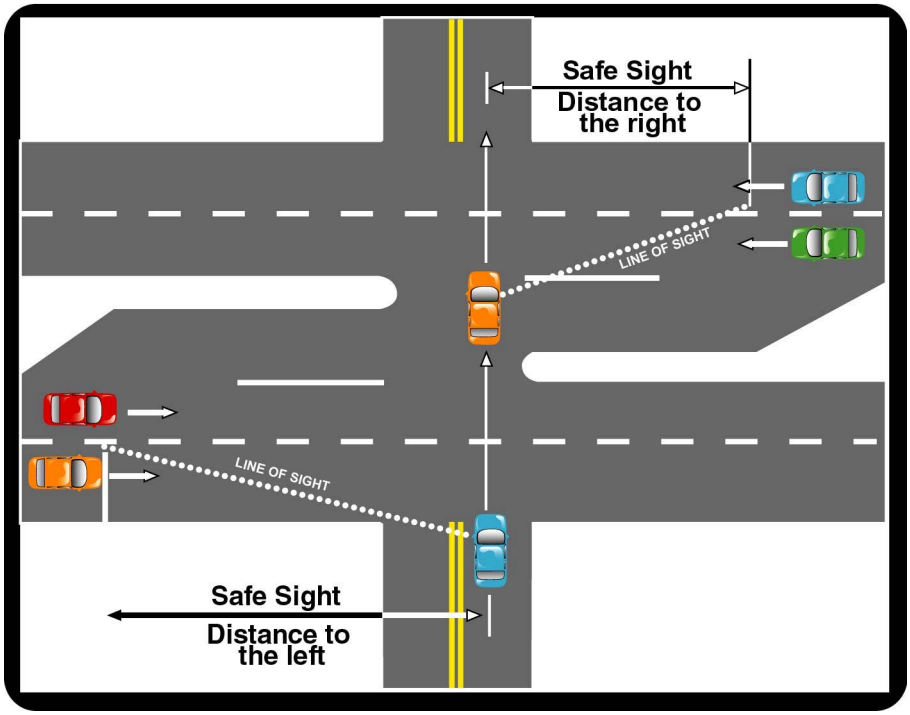
median width is 20 feet or more for passenger vehicle crossings or 40 feet or more for truck crossings. In these cases, sight distance may be based on a two-stop crossing with consideration given to the width of each one-way pavement.

Intersection Sight Distance



One Stop Crossing

Two Stop Crossing

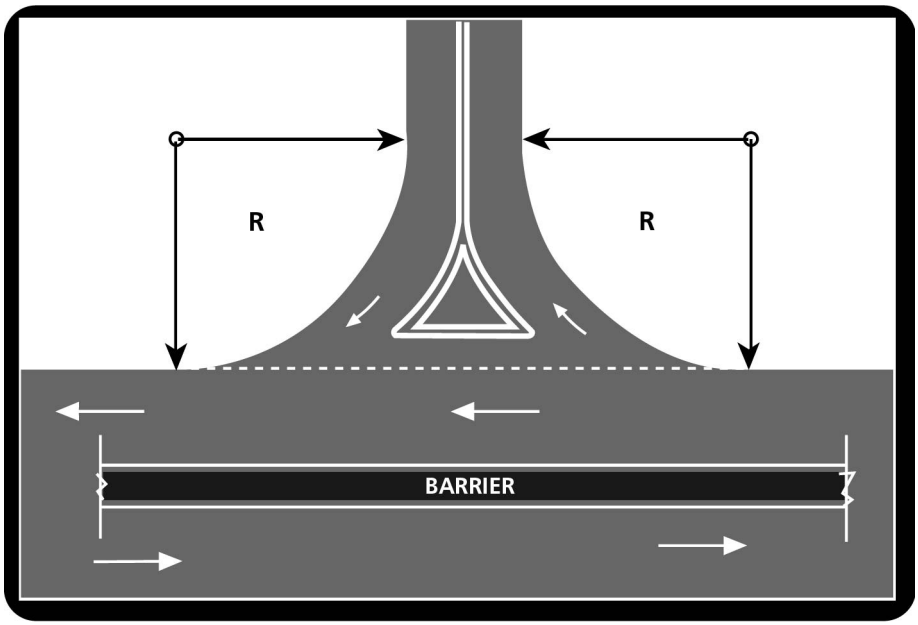


SIGHT DISTANCE (ft) PER 10 MPH OF ARTERIAL DESIGN SPEED FOR APPROPRIATE ARTERIAL WIDTH OF CROSSING			
Design Vehicle Crossing the Arterial	**Two Lanes**	**Four Lanes**	**Six Lanes**
Passenger Vehicle	100	120	130
Single Unit Truck	130	150	170
WB-50 Tractor Trailer	170	200	210

At signalized intersections, sight distance values should be maintained due to the possibility of signal malfunctions, late night flashing operations, right turns on red, and permissive turn movement phases. Limited sight distance shall not be used as sole justification for the installation of a traffic signal.

In locations where the sight distance cannot be met on both sides of the driveway location, the driveway may be denied. In some cases, the left turn movements into or out of the driveway may be prohibited; thus, restricting the driveway operation to right turns only.

Left turn prohibition channelization detail in a shoulder and ditch section



In addition, a deceleration lane and a right turn acceleration lane, designed in accordance with AASHTO standards, may be required where the sight distance cannot be met.

The available sight distance at street and driveway connections to the State Highway System shall not be restricted by landscaping, permanent or temporary signing, or in any other manner. In order to achieve adequate sight distance, the applicant may at a minimum be required to dedicate an easement near the entrance and to keep it clear of visual obstructions.

A clear recovery area should be preserved along the highway travel way. The clear recovery area is the area between the travelway and any hazardous fixed object, such as utility poles, monuments, markers, or trees. Refer to AASHTO Roadside Design Guide for specific dimensions.

The property owner or lessee having access to the State Highway System shall be fully responsible for providing and maintaining safe sight distances along their property frontage. If the property owner or lessee fails to comply with this requirement, the NCDOT may, upon written notice to the property owner or lessee, remove such obstacles from the right-of-way (at the property owner's expense) or barricade the driveway from further use until such corrections and improvements deemed necessary are made.

Identification Signing and Landscaping - Identification signing or landscape vegetation within the median and the sight distance triangle must not obstruct the driver's line of sight. No landscaping or signing will be allowed to exceed 42 inches in height, measured from the Edge of Pavement (EOP) within the median or sight triangle.

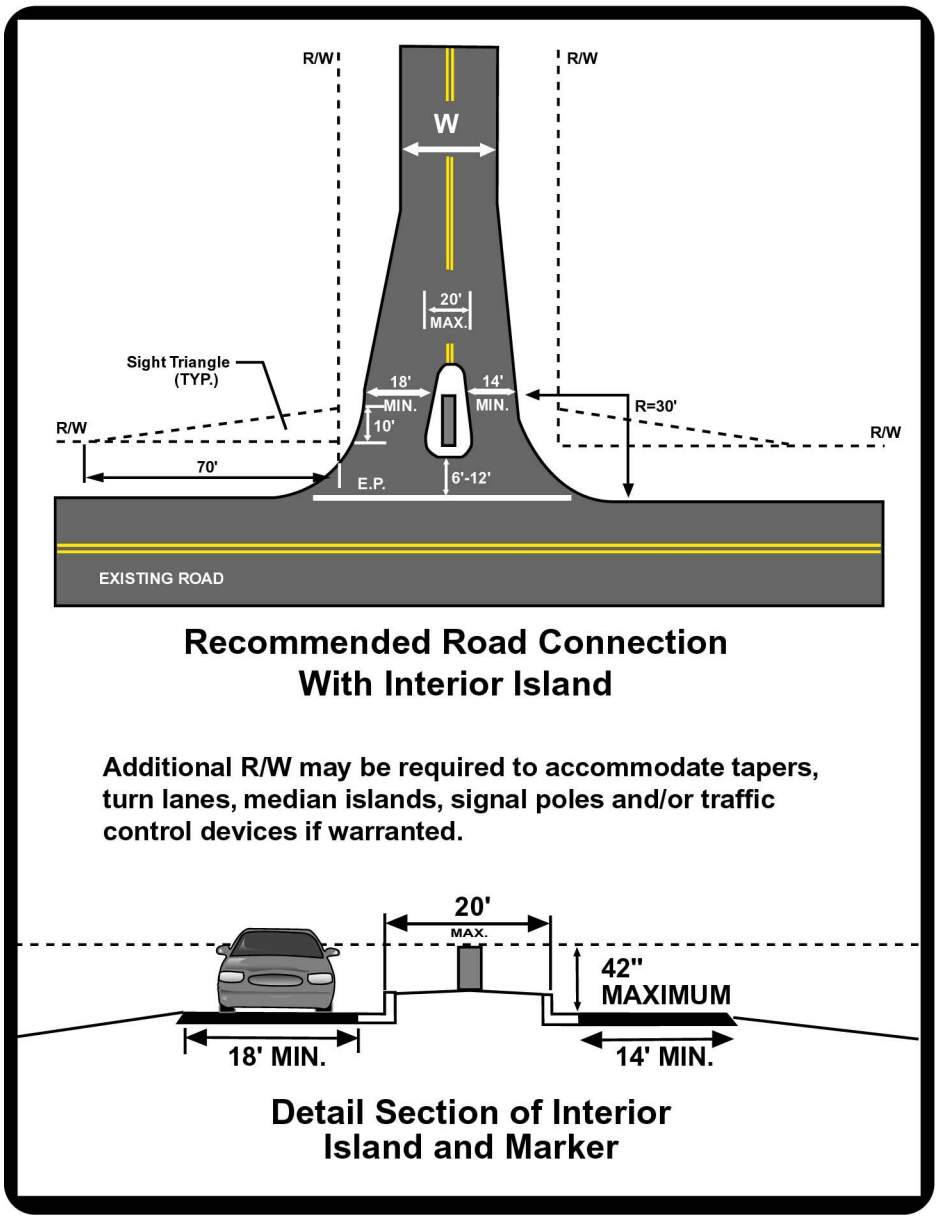
All pylon signs in the median or sight distance triangle must provide a vertical clear sight zone between 3 feet-6 inches and 10 feet-0 inches measured from the EOP. Signing located within a clear recovery area shall be of a "breakaway design."

Only low growing shrubbery, consistent with the NCDOT's landscaping policies, as contained in the publication "Guidelines for Planting Within Highway Right of Way," will be allowed within a landscaped median and the sight distance triangle at the entranceway to a development, whether the street or driveway connection to the State Highway System is designated as a public facility or not. Landscaping within the right-of-way and sight distance triangles may require additional approval by the District Engineer.

If the property owner or lessee fails to comply with this requirement, the NCDOT may, upon written notice to the property owner or lessee, remove such obstacles from the right-of-way or sight distance triangle at the property owner's expense or

barricade the driveway from further use until such corrections and improvements deemed necessary are made.

Identification Signing & Landscaping



Recommended Road Connection With Interior Island

Additional R/W may be required to accommodate tapers, turn lanes, median islands, signal poles and/or traffic control devices if warranted.

Detail Section of Interior Island and Marker

Controlled Access – No street or driveway access will be allowed where the NCDOT has acquired access rights. Any request for a break in this access must be approved by the Right-of-Way Disposal and Control of Access Committee.

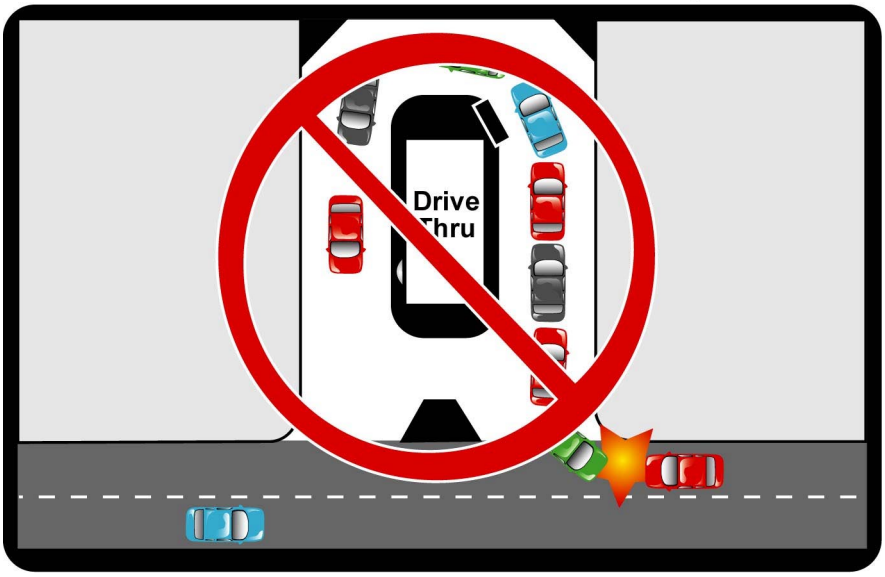
Vehicle Storage Space - In designing driveways, adequate internal storage must be provided within the confines of commercial sites so that vehicles do not queue onto the highway or public street right-of-way. This problem is most evident with

school drop-off loops and drive-in service developments that generate high volumes and require drivers to remain in their vehicles while being served or until service begins. Such operations must be carefully analyzed to ensure the site plan provides adequate internal storage. For purposes of this section, the storage space is 25 feet per vehicle for passenger vehicles. For certain situations, a different design vehicle may be required.

Specific storage areas shall be determined on a case-by-case basis; however, the following minimum storage areas are required. Dimensions should be measured from future right-of-way lines stipulated by the regional Transportation Plan, Transportation Improvement Program project plans, or other project plans.

a. For single-lane drive-in banks, storage to accommodate a minimum queue of six vehicles will be provided. Banks having several drive-in service windows will have storage to accommodate a minimum of four vehicles for each service lane.
b. For single-lane drive-through full-service car washes, storage to accommodate a minimum of 12 vehicles will be provided. Automatic or self-service car washes having a multi-bay design will have minimum vehicle storage to accommodate three vehicles for each bay.
c. For fast-food restaurants with drive-in window service, storage within the site to accommodate a minimum of eight vehicles per service lane from the menu board/ordering station will be provided.

Excessive Queues at Drive-Through



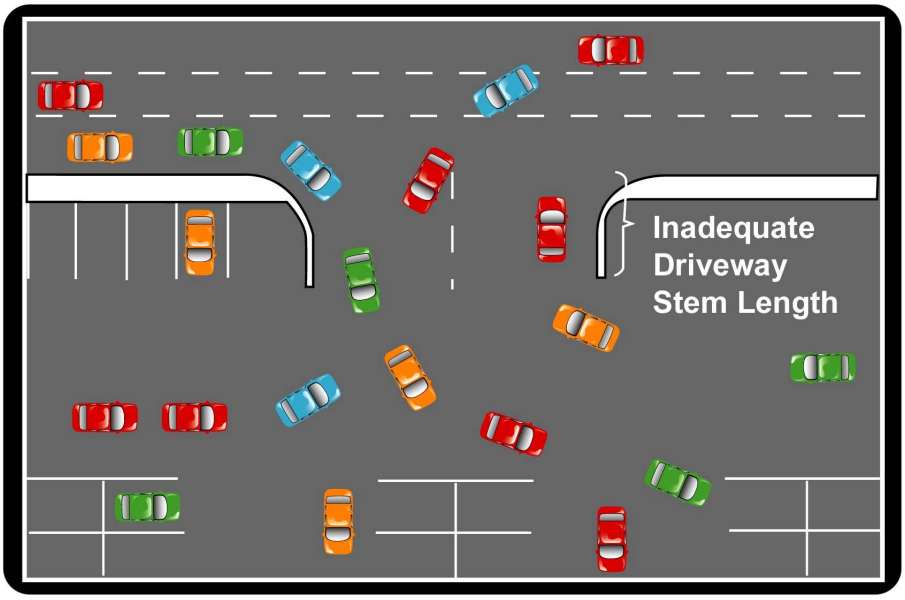
d. For service stations where the pump islands are parallel to the pavement edge, a minimum setback of 25 feet between the pump islands and the public right-of-way will be provided. For service stations where the pump islands are not

parallel to the pavement edge, minimum vehicle storage of 50 feet in length between the pump islands and the public right of way will be provided.

e. For land uses that require an entry transaction or have service attendants, gates or other entry control devices, the vehicle storage will be of adequate length so that entering vehicles do not queue back on the adjacent highway right-of-way. No portion of a parking area, attendant booth, gates, signing or parking activity shall encroach on the highway right-of-way.
f. For schools, adequate storage for parental drop-off and pick-up areas should be provided entirely on the school campus site.

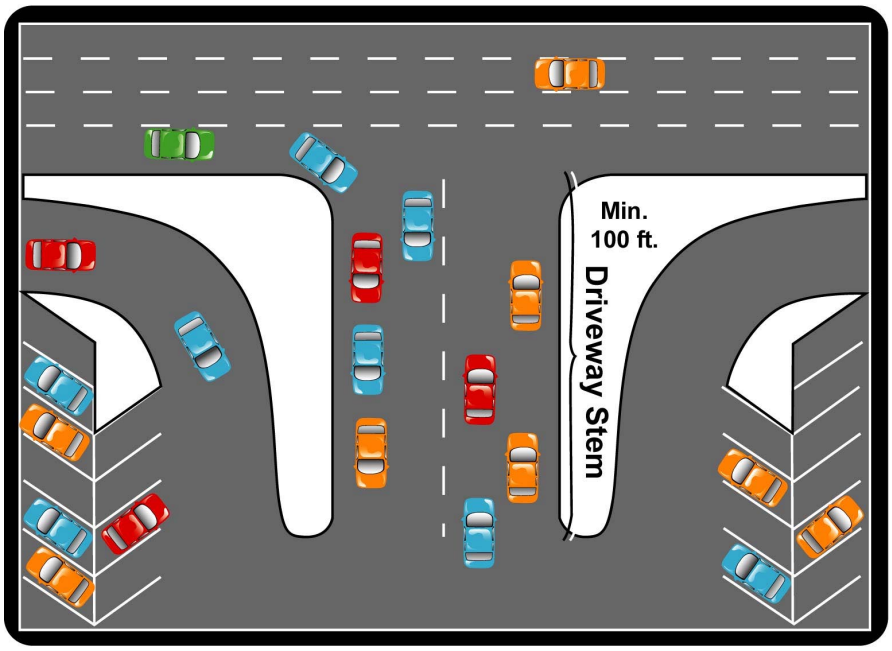
Driveway Stem **-** In order to protect the storage needs of the site and the operational needs of the driveway/street intersection, a protected driveway stem of a sufficient length may be required in the PERMIT. The NCDOT has the authority and the responsibility to require a sufficient length of protected stem (beyond the right-of-way limits) within the site for operational and safety needs of the adjacent roadway system. The length of the protected stem will be determined from the maximum vehicle storage required for the anticipated vehicular volumes. Dimensions should be measured from future right-of-way lines stipulated by the regional Transportation Plan, Transportation Improvement Program project plans, or other project plans. If a traffic signal is proposed at the driveway/street intersection, the cycle length will be considered, as well as any upstream or downstream traffic controlling devices that may impact vehicle storage. A driveway median may also be required in the PERMIT in order to preserve the length of storage, or to prevent cross access to out-parcel driveways within the storage area of the driveway.

Internal Site Design (Poor Design)



For any development with an internal roadway network, a minimum storage of 100 feet measured from the near edge of the right-of-way will be required before any crossing or left-turning conflicts are allowed.

Internal Site design (recommended)

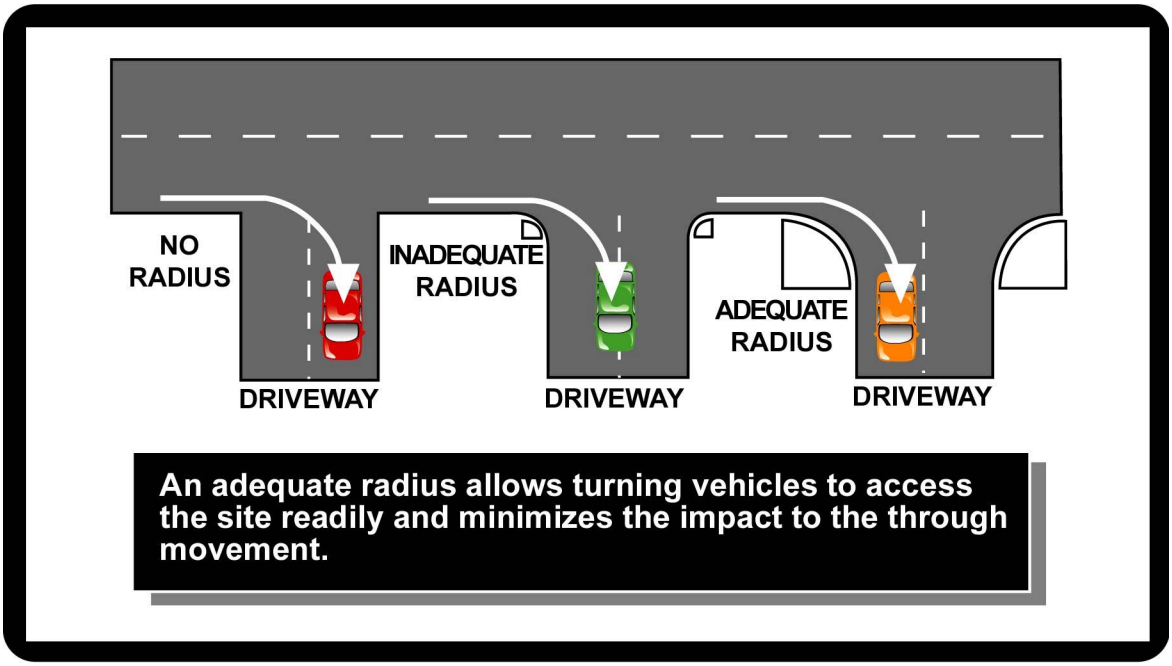


In addition to providing for better internal circulation, exceeding the minimum driveway stem will provide for future capacity and minimize congestion on the main roadway. The minimum driveway stem distance may be increased based on an analysis of the traffic operations of the internal roadway network.

Traffic calming measures or traffic control devices that slow or stop entering traffic must not cause vehicles to back into the public right-of-way.

Driveway Radius – A primary concept in designing a driveway connection is to minimize the interference with traffic flow on adjacent streets. To accomplish this, a driveway radius with the ability to handle the types of vehicles designated to use the driveway should be used. A properly designed driveway radius will minimize the impact of turning traffic on through traffic. The effects of a driveway radius on pedestrian travel must also be considered. The radius of the street-type driveway connection shall be within 20 feet minimum and 50 feet maximum.

Turn Radii



Subdivision Road Standards **-** Residential subdivisions shall be designed in accordance with the requirements set forth in the current edition of the NCDOT's "Subdivision Roads, Minimum Construction Standards."

Parking **–** The design of parking for a facility should provide enough area to accommodate the expected peak parking demand. Specific parking space requirements including number and dimensions are usually regulated by the local jurisdiction. Vehicles should be able to perform all necessary circulation within the parking area and not have to exit onto a street in order to re-enter the parking area.

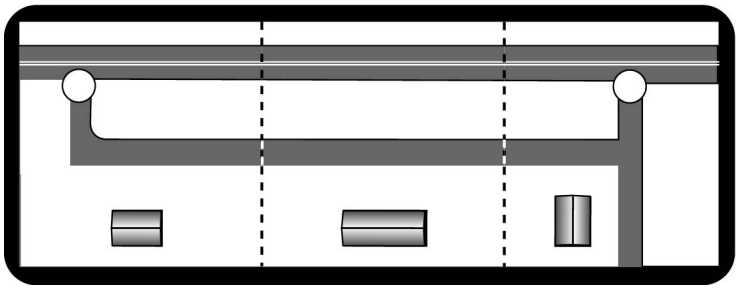
Parking maneuvers shall not restrict or impede the ingress flow of traffic from the highway. Vehicle circulation on the site may be either two-way or one-way, depending on site dimensions and the angle of the parking stall. Two-way circulation is generally allowed only with 90 degree stalls, and one-way circulation is generally used with stall angles less than 90 degrees. The needs of pedestrians should be balanced with the needs of vehicle flow.

Where angle-parking arrangements are planned or developed, vehicles will not be allowed to back into the driveway entrance or onto the highway right-of-way when entering or leaving the development.

Circulation Pattern - The geometrics of the internal circulation pattern should allow all desirable maneuvers to be made with ease including service, delivery, and emergency vehicle movements. For residential subdivisions, internal circulation shall be directed to one or more collector streets within the subdivision, and not access the State System road directly. Only the collector streets should intersect the State System road.

The NCDOT may require cross access (connectivity) between adjacent properties, if it is determined to be in the best interest of public safety or when repetitive vehicle trips to and from the adjacent public road can be reduced. Improved connectivity can also enhance the emergency services and public transit access between sites.

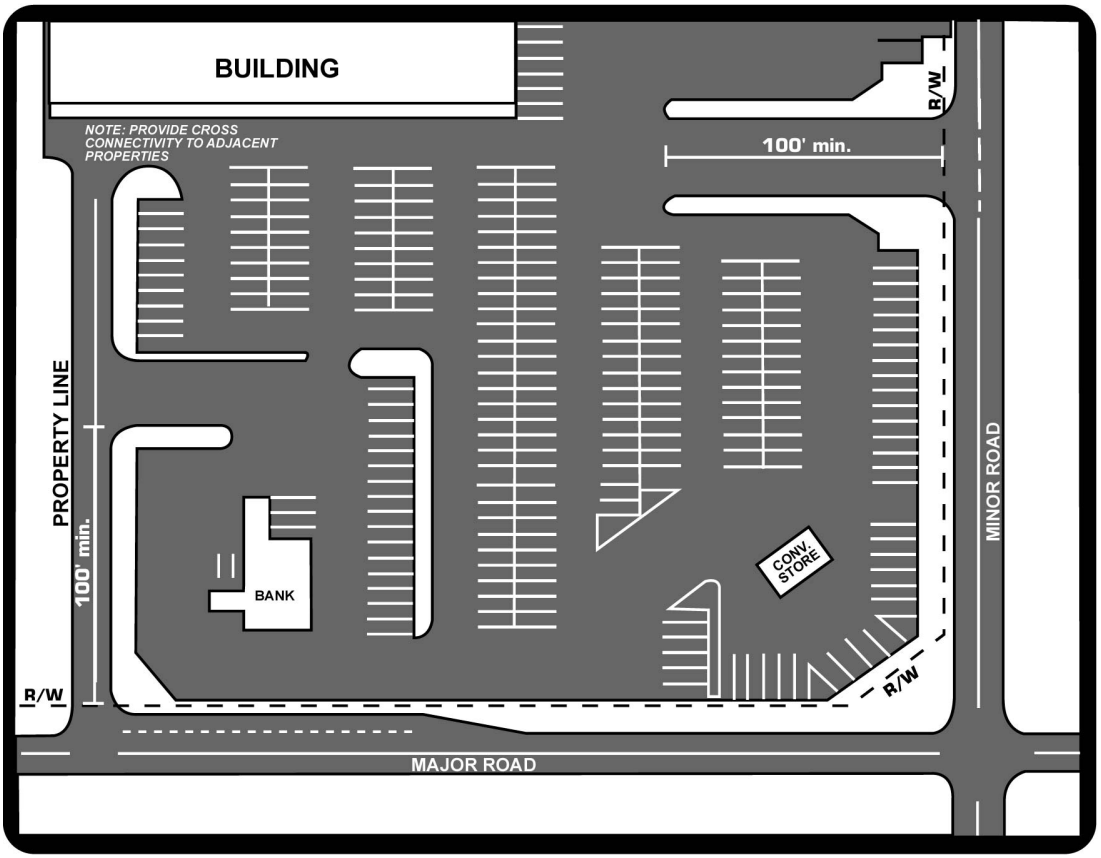
Encourage Connectivity with Neighbors



The NCDOT may deny access to the adjacent public roadway from "out lots" or "out parcels" of a larger development where reasonable access can be provided via the larger development's internal circulation system.

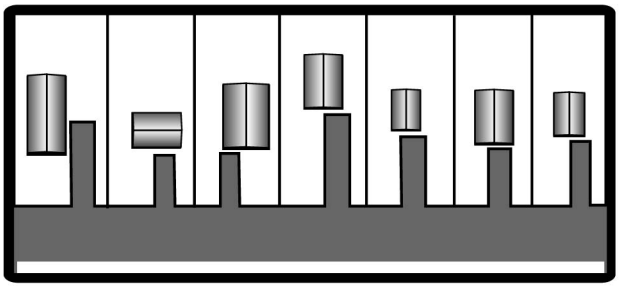
The NCDOT may require construction of an internal street system or service road to eliminate or reduce multiple lot access connections directly to the adjacent public roadway system.

Example of Shopping Center with out parcels



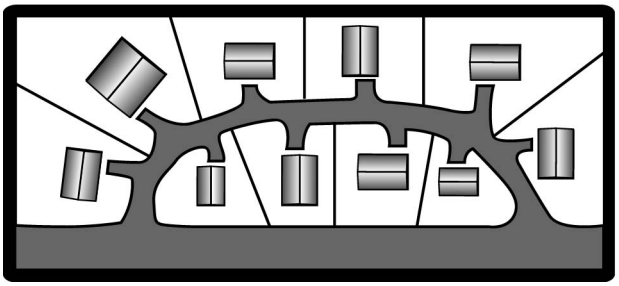
Set Backs - Improvements on private property adjacent to the right-of-way shall be located so that parking, stopping, storage, and maneuvering of vehicles on the right-of-way will not be necessary in order for the vehicles or patrons to be properly served, and shall not restrict the sight distance of adjacent drives.

Shared Residential Access



Avoid

- **Multiple lots with individual access connection to the adjacent streets.**



Encourage

- **Internal collector type facilities to reduce conflicts on adjacent streets.**

Signing - The property owner or lessee shall not place or erect any advertising sign, price list, flag, or other identifying marker for the purpose of attracting attention to the site, either fixed or movable, on or extending over any portion of the highway right-of-way or sight distance area except as allowed under Identification Signing and Landscaping.

Lighting - Lighting of commercial driveways used extensively after dark may be helpful to assist motorists in easily locating the entrances and may be erected on private property. No commercial lighting will be allowed on highway right-of-way. All lighting shall be in compliance with G.S. 136-32.2. Lighting shall not be similar to traffic control devices (i.e., signals or flashing beacons). All signs that have lights shall be effectively shielded so as to prevent light rays from causing glare or impairing the vision of motorists.

In some cases, it may be desirable for the developer to place highway or street lighting units to illuminate a part of the highway facility. Any lighting placed within highway right-of-way shall meet standards and specifications approved by the NCDOT through a separate encroachment agreement.

Railroad Corridors - If the applicant's property is within or crossing an active or preserved rail corridor, a rail corridor encroachment agreement must be obtained prior to the installation of any driveway or issuance of a PERMIT. Railroad encroachments are submitted, reviewed, and approved through the NCDOT - Rail Division Office.

Utilities - All utility installations within the highway right-of-way shall be consistent with the current edition of the NCDOT's "Policies and Procedures for Accommodating Utilities on Highway Rights of Way."

Right-of-Way Reservation/Dedication **-** Review of all plans for right-of-way including sight distance and easements required to accommodate additional needs will be by the District Engineer. Where additional auxiliary lanes are needed to accommodate site traffic, traffic control devices, sight distance areas, or drainage facilities, the applicant will be responsible for all necessary right-of-way dedication.

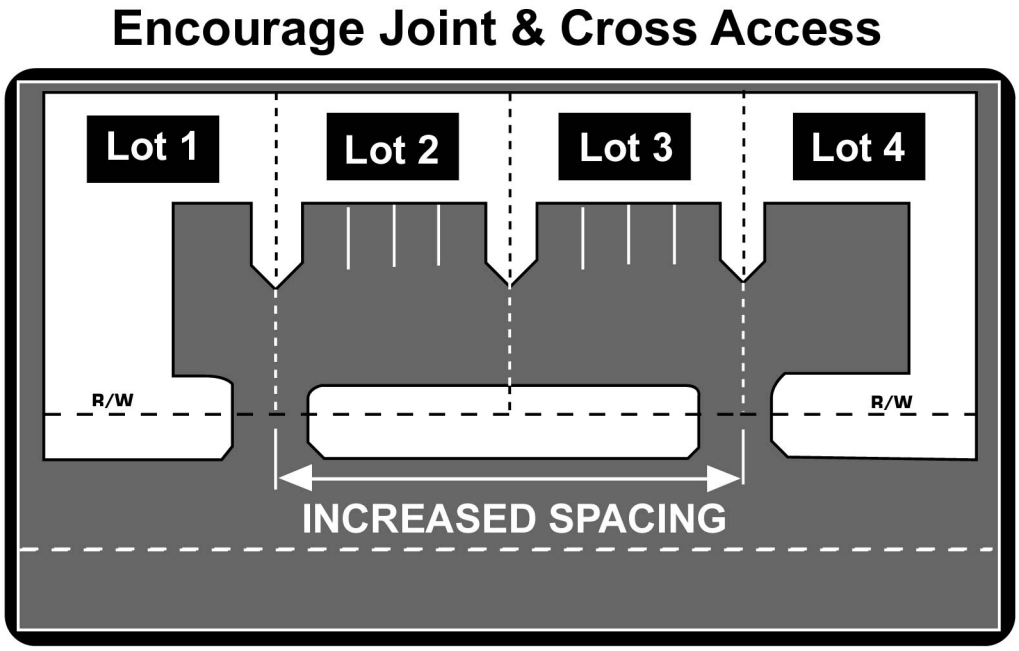
Parking Vehicle for Sale or Distribution of Goods- As set forth in the North Carolina Administrative Code (19A NCAC 02E.0414), it shall be unlawful for any person to park any vehicle on the right-of-way of any primary or secondary highway or road of the State Highway System for the purpose of using said vehicle for the sale or distribution of fruits, vegetables, goods, wares, or merchandise of any character, and it shall be unlawful for any person to erect any stand or structure on the right of way of any primary or secondary highway or road of the State Highway System or to sell from said vehicle, stand, or structure or from any place on the right of way of any primary or secondary highway or road of the State Highway System any fruits, vegetables, goods, wares or merchandise of any character.

In addition, obstructions shall not be placed within right-of-way, sight distance triangles and setbacks, or along roadside clear zones in order to protect the traveling public and to provide necessary sight distance at street and driveway intersections.

C. Number and Arrangements of Driveways

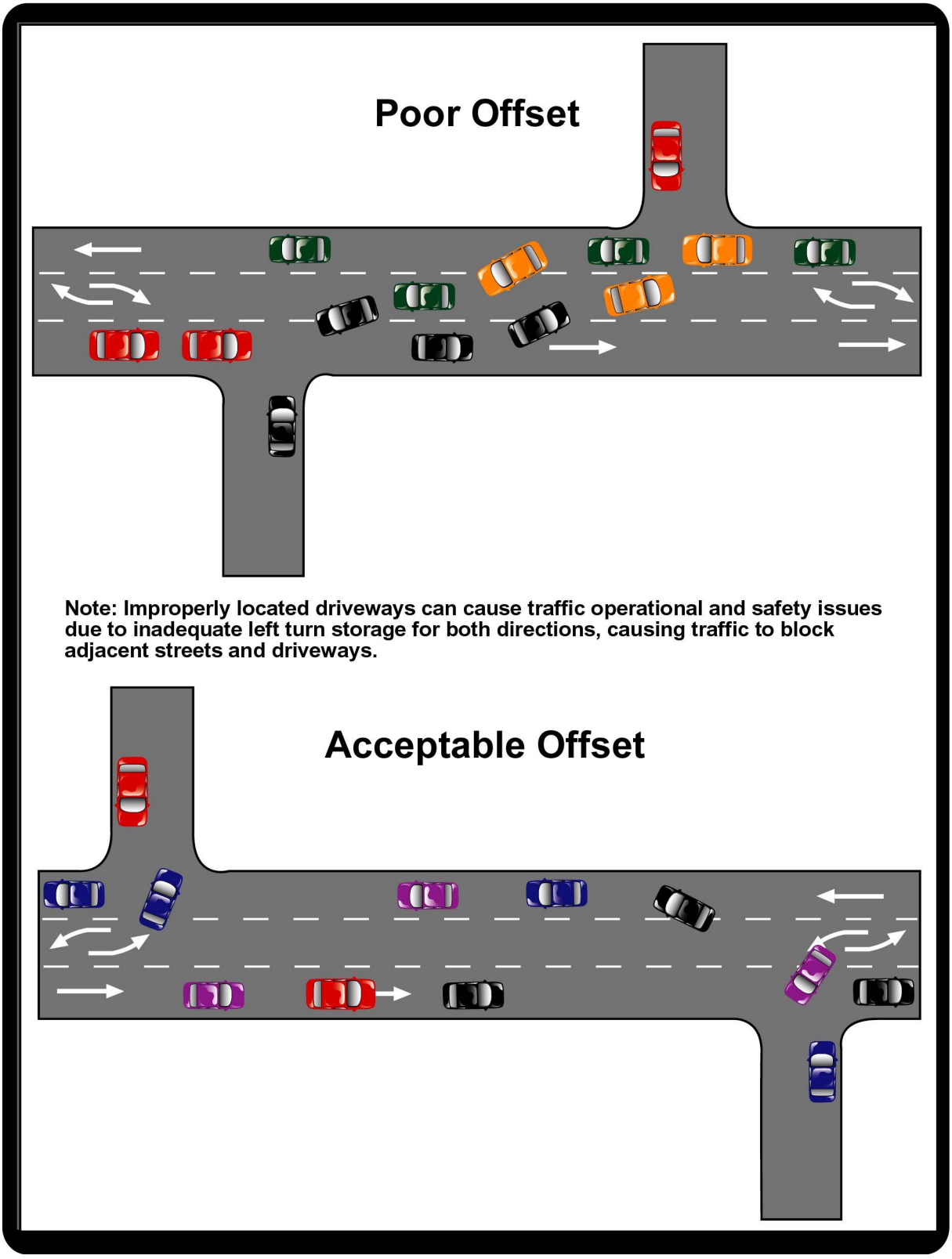
The number of street and driveway connections permitted to serve a single property or commercial development along a State maintained roadway will be the minimum deemed necessary by the NCDOT for reasonable service to the property without undue impairment of safety, mobility, and utility of the highway. Normally, one driveway connection will be permitted for a single property or commercial site. However, the NCDOT may consider additional entrances or exits as justified and if such access does not negatively impact traffic operations and public safety. Only one combined entrance and exit connection will be permitted where the frontage is less than 100 feet.

Adjacent property owners are encouraged to construct a shared driveway by written mutual agreement to serve both properties. Joint Access provides improved internal circulation and parking capabilities, as well as reduces conflict points and increases distance between driveways. Shared driveways are subject to all requirements of the "Policy on Street and Driveway Access to North Carolina Highways" except that the edge clearance dimension will not apply.



Care should be taken to avoid creating incorrectly offset left turn conditions. Opposite side drives should be aligned directly across from existing/proposed opposite side streets and driveways. When it is necessary to offset driveways or streets, care should be taken to provide adequate separation for vehicular storage/queuing and maneuvering between access points.

Example of Offset Driveways



On most State maintained routes, the minimum distance between the centerlines of full-movement driveways into developments that generate high traffic volumes should be at least 600 feet. However, on routes with safety, congestion, or operational problems, 1,000 feet or more may be required between the centerline of any left turn access points and any adjacent street and driveways. The minimum distance between drives does not apply to service drives not used by the general public.

Driveways for fire stations should be designed to accommodate maneuvering of fire trucks within the driveway stem in order to avoid conflict with traffic. Because of the size of fire trucks, station buildings that are within 100 feet from the edge of pavement will be allowed up to 15 feet of driveway width per bay up to a maximum of 75 feet total driveway width. For station buildings more than 100 feet from the edge of pavement, a driveway width of up to 12 feet-6 inches per bay is allowable up to a maximum of 50 feet of total driveway width. The PERMIT for this type of service will be reviewed and approved by the Division Engineer or their designee. The Division Engineer may deviate from the above standards on a case-by-case basis using sound engineering judgement.

D. Driveway Profile

Generally, all driveways shall have a grade that slopes away from the highway surface at a rate equal to the slope of the shoulder, but not less than 1/4 inch per foot nor greater than one inch per foot in a normal crown typical section. The slope shall continue for a distance equal to the prevailing shoulder width or longer so as not to cause a hump or a depression in the shoulder area. Beyond the shoulder, the grade of commercial driveways within the right-of-way should not exceed +/- ten percent. The slopes of drives shall be compatible with provisions for drainage of the designed cross-section. Where special circumstances require driveway grades in excess of these requirements, the NCDOT may approve deviation on a case-by-case basis.

Where a sidewalk is located close to the curb line and the driveway opening is to be provided across a depression or curb cut, the sidewalk should be constructed to conform to the driveway profile. Either one or both edges of the sidewalk may be depressed across the driveway provided the resulting sidewalk cross slope does not exceed 1/2 inch per foot. In some cases, it may be necessary to discontinue the sidewalk across the driveway and to construct a curb along each driveway edge. In such instances, the curb cuts and curb ramps must be constructed in conformance with the latest edition of the NCDOT "Guidelines for Curb Cuts and Curb Ramps for Disabled Persons."

Where curbs are cut for the construction of driveways, the entire curb and gutter section shall be removed. The removal of only the raised portion of the curb and paving over the gutter section will not be allowed. Cut curb ends shall be tapered from full height to ground level in a distance of approximately two feet or constructed with radii as required. Where drainage is carried along the curb, the driveway shall be constructed in such a fashion to prevent runoff from spilling into private property.

The maximum difference between the cross slope of the travel way (usually 1/4 inch per foot or approximately two percent) and the slope of the driveway to the sidewalk should not exceed five percent. Breakover (rollover) angles in excess of five percent may not provide for satisfactory driveway speeds. The maximum breakover angle also applies to roadways with shoulders especially on high-speed rural highways. On high volume driveways the access connection to the adjacent public roadway shall utilize a vertical curve.

For more details of driveway construction, see the latest edition of the NCDOT "Roadway Standard Drawings Manual."

E. Drainage

The District Engineer has authority over all construction and placement of structures and drainage facilities within a State maintained roadway right-of-way. All work performed and all materials used within the right-of-way shall meet or exceed the latest editions of the "North Carolina Standards and Specifications for Roads and Structures" and the NCDOT "Guidelines for Drainage Studies and Hydraulic Design."

Driveways must be constructed so that they do not adversely affect highway drainage or drainage of adjacent properties. Drainage and stability of the highway subgrade must not be impaired by driveway construction or roadside development. In no case may the construction of a driveway cause water to flow across the highway pavement, to pond on the shoulders or in the ditch, or result in erosion within the right-of-way.

Drainage collected by ditches, gutters, or pipes on private property shall not be discharged into the highway drainage system unless approved prior by the NCDOT. The applicant may be required to submit a drainage study to justify the proposed drainage system and pipe sizes.

Where the construction of a driveway necessitates crossing a highway ditch, an approved pipe size shall be installed in the ditch. The low point of the driveway

profile shall be at, or close to, the ditch line. Under no circumstances will existing ditches or gutters be filled without adequate alternate provisions for drainage being made.

Driveway pipe shall be of a size adequate to carry the anticipated flow in the ditch as determined by the District Engineer. However, driveway pipe will not be less than 15 inches inside diameter unless otherwise directed by the District Engineer.

The length of the driveway pipe may be determined as the sum of the width of the driveway (surface width and shoulder) at the ditch line and the length needed to accommodate a sideslope of at least one vertical to three horizontal from the driveway grade to the ditch. A minimum 20 feet of driveway pipe shall be used on all commercial and residential subdivision driveways.

Where headwalls or wingwalls are constructed with drainage facilities, a minimum roadway clearance should be observed unless protected by guardrail or are designed as traversal drainage structures.

An approved list of pipe materials is available from the District Engineer.

Single-Family Residential Property

As set forth in the North Carolina Administrative Code (19A NCAC 2D.0421), the NCDOT will install at its expense, driveway pipe for single-family residential property if the pipe is furnished and delivered to the installation site by the property owner at the property owner's expense. The pipe size shall be adequate to carry the anticipated flow in the ditch as determined by the District Engineer. Pipe size shall be restricted to a minimum inside diameter of 15 inches and a maximum inside diameter of 48 inches unless otherwise directed by the District Engineer. When pipe size exceeds 48 inches, the property owners will be responsible for furnishing and installing the pipe at their own expense.

The minimum length of pipe to be installed shall be 20 feet.

If environmental permits are required, the property owner will be responsible for obtaining the appropriate permits and to furnish and properly install the pipe.

Commercial Property

All commercial drainage structures deemed necessary by the NCDOT, including incidentals, shall be furnished and properly installed by the applicant. The

installation of the driveway pipe by the applicant will require inspection by an authorized representative of the District Engineer's Office.

F. Paving Requirements

Paved Turnouts - Paved turnouts are permanent pavement beginning at the edge of the highway and extending into the property. Their purpose is to protect the edge of pavement of the highway, to smooth a vehicle's transition on and off the road surface, and to prevent tracking of mud or gravel on the state highway.

Paved turnouts shall be required for all permanent PERMIT classification connections to the State Highway System.

Paved turnouts for shoulder sections should extend 50 feet along the centerline of the new driveway.

Paved driveway turnouts in a curb and gutter section (three-foot radii) should begin at the edge of the state roadway and extend 20 feet along the centerline of the new driveway.

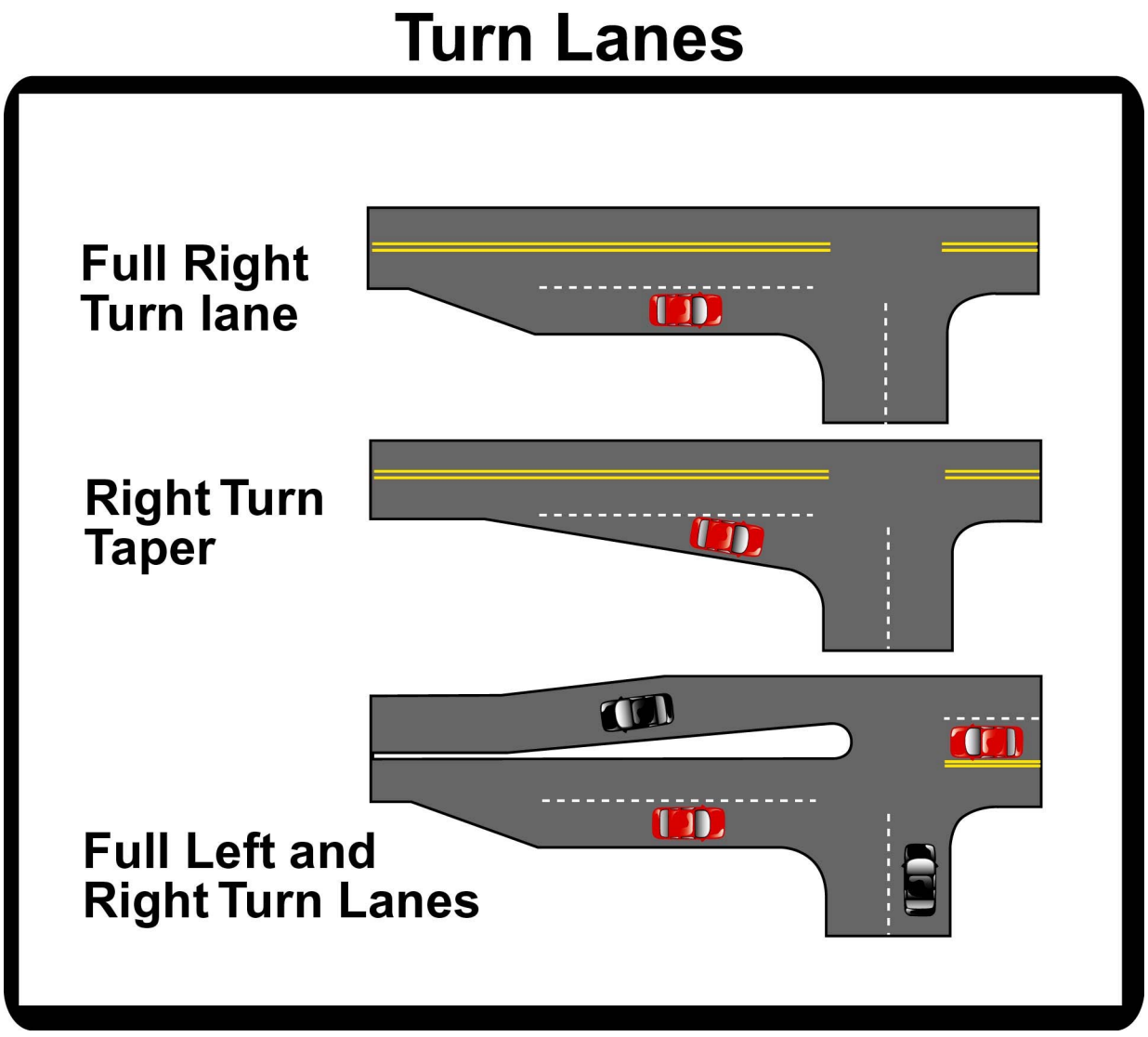
Paved street turnouts in a curb and gutter section should extend to the end of the turnout radius or back of sidewalk, whichever is greater.

The type and design of permanent pavement used on street and driveway turnouts shall be shown on the submitted site plan and shall provide at least the same structural strength as that of the adjacent public roadway. Truck usage shall be considered in determining the strength of the permanent pavement. Permanent pavement types include portland cement concrete, asphalt concrete and asphalt surface treatment. Gravel or other stabilization material without a permanent wearing surface is not recommended. The District Engineer will approve the paving requirements as shown on the plan, or modify the requirements as necessary to meet the needs of the development and the traveling public.

Turn Lanes and Auxiliary Lanes - Pavement design for all turn lanes and auxiliary lanes shall be a minimum of five inches Asphalt Base Course, three inches Asphalt Intermediate Course, and two inches Asphalt Surface Course; or equivalent. The District Engineer may modify the asphalt design based on proposed traffic generation and truck usage or more stringent local agency standards.

The property owner/developer may be required to resurface and reinstall all pavement marking for the entire roadway with one inch Asphalt Surface Course in

conjunction with auxiliary lane construction in order to provide a consistent surface for effective striping, improved ride-ability and maintainability, and improved night and wet pavement lane visibility. At a minimum, resurfacing will be required for the full length of widening. Milling associated with this resurfacing may also be necessary. All construction and pavement markings for turn lanes are the responsibility of the developer/applicant. New pavement markings and pavement markers should match the existing materials. However, long life pavement markings and pavement markers may be required as directed by the District Engineer.



G. Maintenance Limits

The NCDOT will only maintain and perform repairs on driveways when the maintenance pertains directly to the State maintained roadway, safety of the traveling public, or drainage along that roadway. In a ditch section, safety related maintenance will be performed on a driveway's surface approximately six feet from the edge of pavement. In a curb & gutter section, maintenance will only be performed immediately behind the curb so as to protect the structural integrity of the curb line. The NCDOT will not maintain any paved driveways and will not perform any maintenance on commercial driveways.

Driveway pipes and culverts properly installed on public right-of-way under a PERMIT become the property of the NCDOT. Drainage through such pipes and culverts will be maintained by the NCDOT.

For single-family residences, the NCDOT will provide new pipe to replace damaged pipe. For commercial development, it is the property owner's responsibility to maintain access to their property. Therefore, furnishing and installing pipe replacements for commercial driveways shall be the responsibility of the property owner.

The commercial property owner having access to a state highway shall be fully responsible for the routine maintenance of private streets and driveways. Proper routine maintenance shall ensure that the original driveway width and profile are retained, operational speed and safety is not reduced by rough surface, and no damage or deterioration to the public roadway pavement is incurred as a result of driveway conditions, including drainage provisions. The level of maintenance should also be adequate to ensure that deviation from the intended circulation pattern is not necessary because of surface irregularities. This maintenance responsibility includes the removal of snow and ice and keeping the portion within the public right-of-way in a safe condition. However, where turning lanes are constructed under the PERMIT, the NCDOT will provide routine maintenance and remove snow and ice on the portion of such lanes that constitute an integral part of the State Highway System. If the property owner fails to maintain the driveway or street connection to the satisfaction of the District Engineer, the District Engineer may, upon written notice to the property owner, barricade the driveway or street from further use until such repairs deemed necessary are made.

The NCDOT will maintain permanent traffic control devices on State right-of-way shown on the approved plans for a PERMIT. If traffic signal equipment, such as

detector loops, is located off the public right-of-way, the property owner shall enter an agreement authorizing NCDOT to maintain such equipment.

The NCDOT will review requests for the allowance of islands or driveway medians within the driveway as part of the PERMIT. Such islands or medians may be desired for aesthetics, or required by the NCDOT for traffic control and safety. The NCDOT will not maintain the island or the median section within the driveway. If an island or median is not maintained properly by the applicant, the island may be removed if serving only aesthetic purposes, or the District Engineer may, upon written notice to the property owner, barricade the driveway until such repairs deemed necessary are made.

H. Infrastructure and Channelization Requirements

Highway infrastructure improvements may be necessary for safe and efficient traffic operations when there are high roadway and/or turning volumes of traffic, when the roadway speeds are moderate or high, or where needed due to limited sight distance. Highway infrastructure improvements include, but are not limited to additional through lanes, acceleration lanes, and turn lanes for left and right turns associated with a driveway. As set forth in G.S. 136-18(29), the final determination for the need, extent, location, and design of turn lanes is the responsibility of the District Engineer.

The NCDOT may require the applicant to provide offsite roadway improvements on public facilities in order to mitigate any negative traffic impacts created by the proposed development. Boundaries for offsite improvements, including intersections and public roadways to be considered, will be identified in the TIS or determined by the District Engineer.

When adequate right-of-way does not exist to provide for required offsite improvements necessary to maximize the safety of the traveling public, the applicant shall exhaust all efforts to obtain the needed right-of-way. If the applicant is unsuccessful in obtaining the needed right-of-way and has demonstrated a good-faith effort, the NCDOT may, but shall not be required to utilize its power of eminent domain to secure adequate right-of-way to contain the improvements. As a minimum, a good-faith effort shall consist of a copy of a certified letter to all affected property owners and all responses received from those property owners. The applicant shall reimburse all costs incurred by the NCDOT to acquire the additional right-of-way.

In conjunction with the driveway request, the NCDOT may require the applicant to reserve or dedicate minimum right-of-way needs as identified by local government transportation plans for the state-maintained roadway along the property frontage. This may require that the driveway design and internal circulation be compatible with the future right-of-way location.

Generally left and right turn lanes and tapers shall be considered when:

- in accordance with G.S. 136-18(29), the average daily traffic meets or exceeds 4,000 vehicles per day on any secondary route (the average daily traffic should include both the existing traffic plus traffic generated by the proposed development) ;
- any US or NC route is being accessed;
- the District Engineer determines that such treatment is necessary to avoid congestion or unsafe conditions on the state-maintained roadway;
- or the TIS identifies a need for an auxiliary lane or taper.

Left and right turn lanes shall be constructed in accordance with the "North Carolina Standards and Specifications for Roads and Structures." On an undivided highway or a divided highway with a median width inadequate for a left-turn lane, it may be necessary to widen the highway in order to provide for required turn lanes. For greater detail, see the turn lane nomograph figure in Exhibits.

The applicant may be required to protect the integrity of the highway network by providing channelization to physically prevent improper or illegal turns into and out of a driveway or street. Channelization may include medians and raised traffic islands with curbs.

The District Engineer has final authority on decisions regarding infrastructure improvements.

I. Median Crossovers

Where a divided highway has been constructed with a median, no new crossovers in the median for driveways shall be permitted unless it is in conformance with the latest edition of the NCDOT "Median Crossover Guidelines for North Carolina Streets and Highways." New median openings should not encroach on the functional area of an existing median opening or intersection.

Left-turn access into the property should be by use of entrances along side streets adjacent to the property, from a frontage or service road, or by U-turn at downstream or upstream median openings.

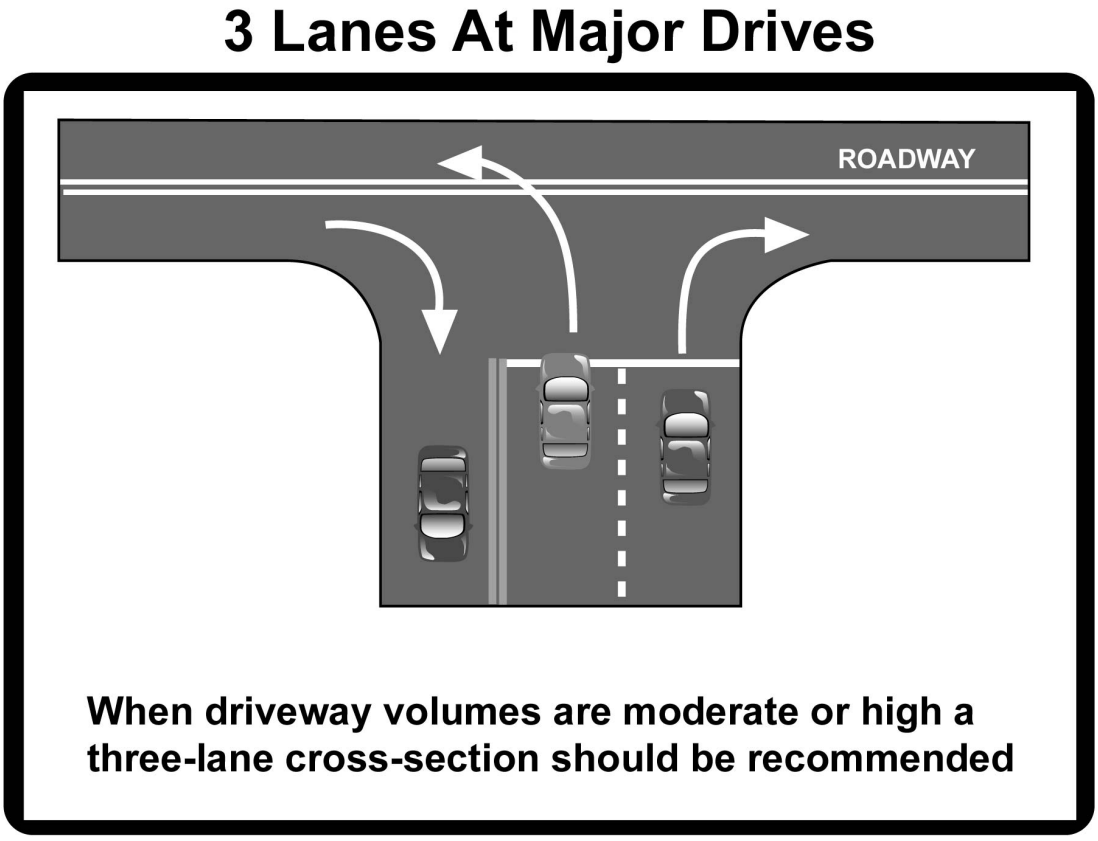
Requests for median crossovers in conjunction with the PERMIT application will be reviewed on a case-by-case basis. Approval for new median crossovers is the responsibility of the State Traffic Engineer for existing locations or the State Highway Design Engineer for roadways within an active TIP project. NCDOT retains authority to modify or close median crossovers in the event that traffic operations or safety considerations develop that compromise the integrity of the facility.

J. Control Dimensions

Street and driveway connections shall comply with the following control dimensions:

- **Width of Driveways (W)** - The width of driveways, W, measured parallel to the edge of travel way and from edge of pavement to edge of pavement at the narrowest width, shall be within the specified minimum and maximum limits.

  A driveway with two-way operations shall have a minimum 20 foot and a maximum of 36 foot width. A driveway with one-way operation shall have a minimum 12 foot and a maximum 24 foot width. The need for wider driveways will be considered on a case-by-case basis only after justification of actual necessity, but should not exceed 50 feet.



Street type connections with multi-lane ingress or egress may exceed 50 feet based on traffic operation requirements as demonstrated in the TIS. These values are based on edge of pavement dimensions not including the width of gutter if a curb-and-gutter section is proposed.

- **Driveway Angle (Y)** – The recommended driveway angle, Y, for a full access driveway is 90 degrees. The angle of the two-way operation driveway with respect to the pavement edge shall not be less than 75 degrees or greater than 90 degrees. For one-way or right-in/right-out driveways, driveway angles between 45 and 90 degrees may be allowed on a case-by-case basis.

- **Edge Clearance (E)** - All portions of a commercial driveway including the returns shall be between two frontage boundary lines of the current or future right-of-way line. The edge clearance, E, measured parallel to the edge of pavement from the frontage boundary line to the nearest point on the projected edge of the driveway shall be a minimum of 20 feet.

- **Driveway Return (R)** - The radius of the street-type driveway connection, R, shall be within 20 feet minimum and 50 feet maximum. However, the maximum radii dimension may be exceeded as an exception if larger radii are needed to accommodate larger vehicles expected to frequent a proposed development such as commercial service entrances, service stations being serviced by tanker trucks, or truck terminals.

- **Island Offset Distance (S)** - The near edge of an island area parallel to the highway shall be located a distance, S, from the edge of pavement along uncurbed roadways or from the curb line on curbed roadways no less than six feet and no more than 12 feet unless specifically instructed by District Engineer to be otherwise.

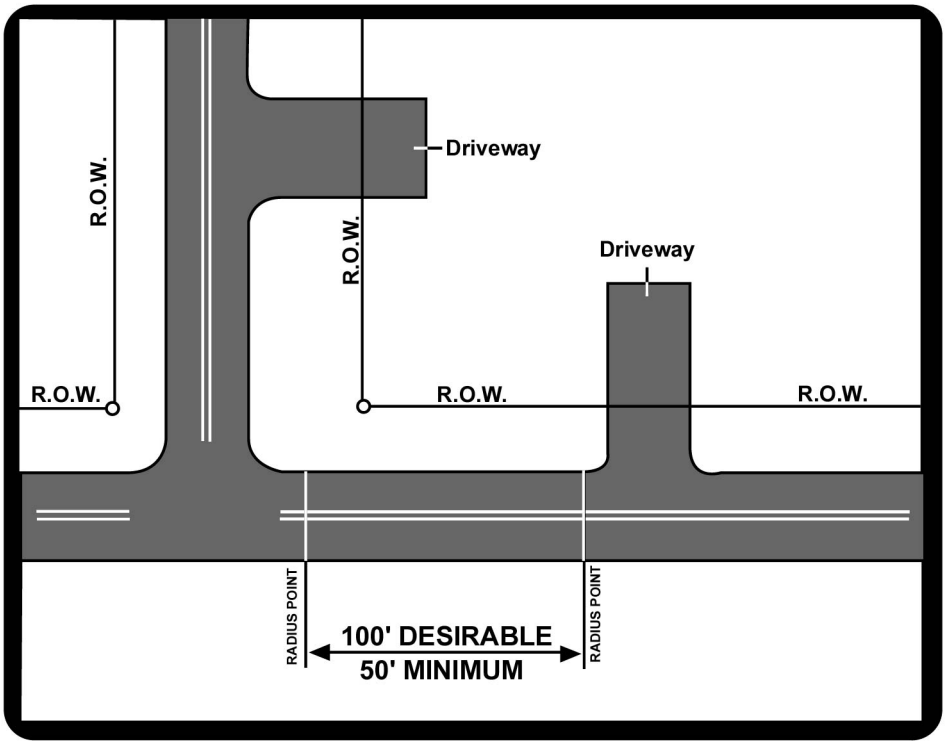
- **Distance Between Driveways (D)** - Where more than one driveway is permitted along a single property frontage, the distance, D, measured along the right-of-way line between the tangent projection of the inside edges of adjacent driveways shall be at least 100 feet. For high volume traffic generators, the minimum distance between the centerlines of full-movement driveways into developments that generate high traffic volumes should be at least 600 feet for most non-critical transportation corridors and a minimum of 1,000 feet for Major Thoroughfares, National Highway System and Intrastate Routes, Primary Routes, and Corridors with identified safety concerns. This minimum distance between driveways does not apply to service drives not used by the general public.

- **Set Backs (G)** - Set backs, G, of gasoline pump islands parallel to the pavement edge shall be a minimum of 25 feet outside the highway right-of-way. Set backs of gasoline pump islands not parallel to the pavement edge shall be a minimum of 50 feet outside the highway right-of-way.

  Buildings or other installations with one row of 90-degree parking between it and the highway right of way should be at least 50 feet outside the right-of-way. Buildings or other installations with one row of angle parking between it and the highway right-of-way should be at least 30 feet outside the right-of-way. All expected vehicular movements needed to serve a site must be accommodated internally.

- **Corner Clearance (C)** - Where the property's road frontage allows, the minimum corner clearance, C, to the proposed driveway should be at least 100 feet from the point of tangency of the radius curvature of the intersecting streets. At no time shall the corner clearance be less than 50 feet from the point of tangency of the radius curvature. For full movement driveway connections at signalized intersections, the corner clearance may be required to extend beyond 100 feet when the property's road frontage allows. This is to avoid interference with the traffic signal operations and resulting traffic queues. The radius of the driveway should not encroach on the minimum corner clearance.

Corner Clearance



Referenced and Related Publications

"Access Management Manual" published by the Transportation Research Board

"Access Management Policy" published by the NCDOT

"Guidelines for Agreement Process and Reimbursement to NCDOT by Municipality/Developer" published by the NCDOT

"Guidelines for Curb Cuts and Curb Ramps for Disabled Persons" published by the NCDOT

"Guidelines for Drainage Studies and Hydraulic Design" published by the NCDOT

"Guidelines for Planting within Highway Right-of-Way" published by the NCDOT

"Highway Capacity Manual" published by the Transportation Research Board.

"Manual on Uniform Traffic Control Devices" (MUTCD) published by the Federal Highway Administration

"Median Cross Over Guidelines for North Carolina Streets and Highways" published by the NCDOT

"North Carolina Standards and Specifications for Roads and Structures" published by the NCDOT

"North Carolina Supplement to the MUTCD" (NCMUTCD) published by the NCDOT

"Policies and Procedures for Accommodating Utilities on Highway Rights of Way" published by the NCDOT

"Policy on Geometric Design of Highways and Streets" (Green Book) published by the American Association of State Highway and Transportation Officials (AASHTO)

"Railroad Crossing Guidelines" published by the NCDOT

"Roadway Design Manual" published by the NCDOT

"Roadway Standard Drawings Manual" published by the NCDOT

"Roadside Design Guide" published by AASHTO

"Roundabout: An Informational Guide" published by the Federal Highway Administration

"Signals and Geometrics Design Manual" published by the NCDOT

"Subdivision Roads, Minimum Construction Standards" manual published by the NCDOT

"Traditional Neighborhood Development Street Design Guidelines" published by the NCDOT

"Traffic Signals Review and Approval Process for Private Developments" published by the NCDOT

"Transportation Improvement Program" published by the NCDOT

"Trip Generation Manual" published by the Institute of Transportation Engineers

Referenced Statutes and Codes

North Carolina General Statute 89C-16

North Carolina General Statute 136-18(5)

North Carolina General Statute 136-18(29)

North Carolina General Statute 136-18(29A)

North Carolina General Statute 136-30

North Carolina General Statute 136-32.2

North Carolina General Statute 136-93

North Carolina General Statute 136-102.6

North Carolina Administrative Code 19A NCAC 02D.0421

North Carolina Administrative Code 19A NCAC 02E.0414

Driveway Permit Frequently Asked Questions (FAQ)

- **What is a driveway permit?**

It is a document that is used by the North Carolina Department of Transportation (NCDOT) to document that any development submittal requesting access to the state's public highway system is designated, located and constructed to minimum State standards.

- **Who needs to obtain a driveway permit?**

Anyone that plans to develop property, redevelop property through expansion, change the use, or alter the existing access must obtain a driveway permit to obtain or modify access to the State Highway System.

- **Why is a driveway permit required?**

The public roadway system of the State of North Carolina is a vital asset to the safe, efficient movement of goods and services that promote and maintain a high quality of life for the State. Driveway/street connections are the leading cause of vehicle crashes, traffic congestion and impedance of traffic flow. Therefore, the traveling public has entrusted to the NCDOT the regulatory authority to assure that any driveway connection requested onto the public transportation system must be safe, efficient and minimize impedance to traffic flow.

- **What does the driveway permit cover?**

Normally all aspects of traffic flow and safety are addressed through the driveway permitting process. This includes all design, drainage, traffic impacts, and motorist safety aspects of the specific access request.

- **Is there a charge for obtaining a driveway permit?**

No fee is charged by NCDOT for applying for a driveway permit. Some charges may be incurred for such services as inspections, and traffic signal plan review.

- **How do I obtain a driveway permit?**

You must contact a local NCDOT District Engineer's office to obtain the permit (a list of all NCDOT District Engineer's offices is located within this document). You can also review the entire Driveway Manual (including the permit form) on the NCDOT web site at: http://www.doh.dot.state.nc.us/preconstruct/highway/dsn_srvc/value/manuals/pos.pdf

- **With which government agency (ies) should I contact/coordinate my access request?**

First you should contact the local governmental authority that controls land use/development approvals (city, county, other) in the area you desire to request access. We also encourage you to contact the local NCDOT District Engineer's office during this initial step of requesting access. See "Location of Division and District Offices" in this manual for the NCDOT office nearest you.

- **How long will it take to get my driveway permit reviewed and approved?**

This may vary depending on the magnitude and complexity of your request. Typically for small or simple requests, the permit can be processed in four (4) weeks or less after your formal submittal to the local District Engineer's office. If your request is complicated or complex, it could take as much as eight (8) weeks or more. Therefore, it is critical to make initial contact with the local authorities and the local NCDOT District Engineer's office in the very early stages of any anticipated request to access your property.

- **When should I contact local/state authorities to request a driveway permit?**

This initial contact should take place in the early stages of any request to obtain access. Local and local state authorities can assist you by providing preliminary insight/information to you to help guide you through this process.

- **Will I be required to make improvements to the public roadway serving my property?**

This may vary. If the transportation impacts of your request are determined to be insignificant, then little or no improvements to the adjacent public roadway will be required. If, however, the transportation impacts of your request are determined to be significant, then you can expect to be required to mitigate those impacts.

- **What types of developments meet the threshold of 3000 vehicles per day that would normally require a Traffic Impact Study?**

Typically, the following developments meet or exceed the 3000 vehicles per day threshold:

- 55,000 square feet retail
- 300 single family homes
- 250,000 square feet office
- 400,000 square feet industrial
- 350 room hotel

Definitions and Terminology

In the interpretation of the Policy on Street and Driveway Access to North Carolina Highways, the word "shall" is to be interpreted as being mandatory. Where certain requirements in the design or construction of access provisions are described with the "shall" stipulation, it is mandatory that these requirements be met. The word "should" is to be interpreted as being the recommendation of NCDOT and, where indicated, denotes a factor or principle to be considered by the applicant or NCDOT before a permit is issued. The word "may" is to be interpreted as being a permissive condition. No requirement for design and application is intended.

The following words, for the purpose of this Policy, shall have the following meanings ascribed to them:

Access - Ingress and egress to land fronting on the State Highway System.

Applicant - The individual or individuals (normally the property owner) requesting permission to construct a driveway connection to the adjacent public highway system.

Auxiliary Lane - The portion of the roadway adjoining the traveled way for speed change, turning, storage for turning, weaving, truck climbing or for other purposes.

Breakover Angle - The difference between the cross slope of the travel way and the slope of the driveway.

Change of Use – Any proposed property use that is different from the current use of the property, or current use that is different than the use identified in a pre-existing driveway permit.

Clear Recovery Area – The area between the travelway and any hazardous fixed object, such as utility poles, monuments, markers, or trees. Refer to AASHTO Roadside Design Guide for specific dimensions.

Commercial Driveway - A driveway serving a commercial establishment, industry, government or educational institution, business, public establishment, or other comparable traffic generator. (This classification includes single family residential streets, where required by the District Engineer.)

Connectivity – A term used to infer connections between adjoining properties for vehicular and/or pedestrian usage.

Contract Access Point – A driveway permit agreed to by NCDOT and the property owner in a legal document as part of a settlement in a property dispute. A driveway permit does not constitute a contract access point.

Control of Access - The condition in which the right of owners or occupants of abutting land or other persons to access the adjacent roadway when it is fully or partially controlled by public authority.

Corner Clearance (C) - At an intersecting street or highway, the distance measured from the edge of the pavement curb line or the intersection of the right-of-way lines to the beginning of outside driveway radius.

Curb Cut - A driveway connection normally associated with roadways that have curb and gutter.

Distance Between Drives (D) - The distance measured along the right-of-way line between the tangent projections of the inside edges of adjacent driveways to the same frontage:

Driveway - Every entrance and/or exit to serve vehicular traffic to or from property fronting the State Highway System.

Driveway Angle (Y) - The angle between the driveway centerline and the edge of traveled way.

Driveway or Island Returns (R & U) - Outside (R), the outside or larger curve radius on the edge of driveway, used where Y is 75 degrees or larger. Inside (U), the inside or smaller curve radius on the edge of driveway, used where Y is 75 degrees.

Driveway Reconnection - Normally, this occurs when a Transportation Improvement Project (TIP) requires widening or reconstruction of an existing public roadway and existing driveway connections may be re-established.

Driveway Stem – The portion of a driveway between the public roadway and the internal roadway network or area where parking maneuvers occur.

Driveway Turnout - This is considered the entire driveway area bounded by the adjacent public roadway, the driveway radii and the radius return within the property.

Driveway Width (W) - The narrowest width of driveway measured parallel with the edge of traveled way.

Edge Clearance (E) - The distance measured along the edge of the traveled way between the frontage boundary line and the tangent projection of the nearest edge of the driveway.

Frontage - The length along the highway right-of-way line of a single property tract or roadside development area between the edges of the property lines. Property at a highway intersection has a separate frontage along each roadway.

Frontage Boundary Line (FB Line) - A line, perpendicular to the highway centerline, at each end of the property frontage, extending from the right-of-way line to the edge of the through traffic lane.

Functional Area of Intersection - The sum of the distance traveled during reaction time, plus deceleration distance, plus queue storage length.

High Volume Generator – A land use or development that has an average daily traffic greater than 1000 vehicles per day. See North Carolina Administrative Code 19A NCAC 02B.0602 (b)(3)(C)

Internal Roadway Network **-** This is an internal circulation system of larger developments that allows vehicular travel within the property.

Intersection Returns - The radius of the edge of pavement between intersecting streets or highways.

Island Area - An area adjacent to the roadway which serves as a physical barrier to direct the flow of traffic and to separate highway traffic from the activity on private property.

Offset Distance (S) - Distance between the edge of pavement and the near edge of an island area parallel to the highway.

Off-site Improvements – Improvements required of an applicant at locations not located on the applicant's property.

Peak Hour – Highest volume of traffic in a continuous 60 minute period. May be referred to as AM or PM peak hour, which represents the highest volume hour for both the morning and evening periods.

Private Residential Driveway - A driveway connecting to a State-maintained street or highway to provide entrance to and/or exit from a private residential dwelling for the exclusive use and benefit of those residing within.

Residential Subdivision Driveway - A driveway connecting to a State-maintained street or highway to provide entrance to and/or exit form residential subdivisions, apartment complexes, mobile home parks and condominiums.

Right-of-Way - The land within legally defined property boundaries whose title vests in the State and is designated or intended for highway purposes.

Rural Area - All territory that is not urban as defined herein.

Set Back (G) - The lateral distance between the right-of-way line and gasoline pump curb base, display stand, building, or other fixed object, the use of which will result in space for vehicles to stop or park between such facilities and the right-of-way line.

Shopping Center - A development with more than one commercial or service establishment planned or constructed.

Sight Distance - This is the area that establishes a clear line of sight for a waiting vehicle to see oncoming traffic and make turning movements into or out of a street or driveway connection safely or for traffic to see entering or waiting vehicles.

Storage Area - Space used by queuing vehicles while being served or until service begins.

Traveled Way - The portion of right-of-way that is available and open to the public for vehicular travel.

Trip **-** A single or one direction vehicle movement with either the origin or destination inside the site.

Urban Area - Territory generally within an incorporated area or with frontage on a highway that is at least fifty percent built-up with structures devoted to business, industry, or dwelling houses for a distance of a quarter of a mile or more.

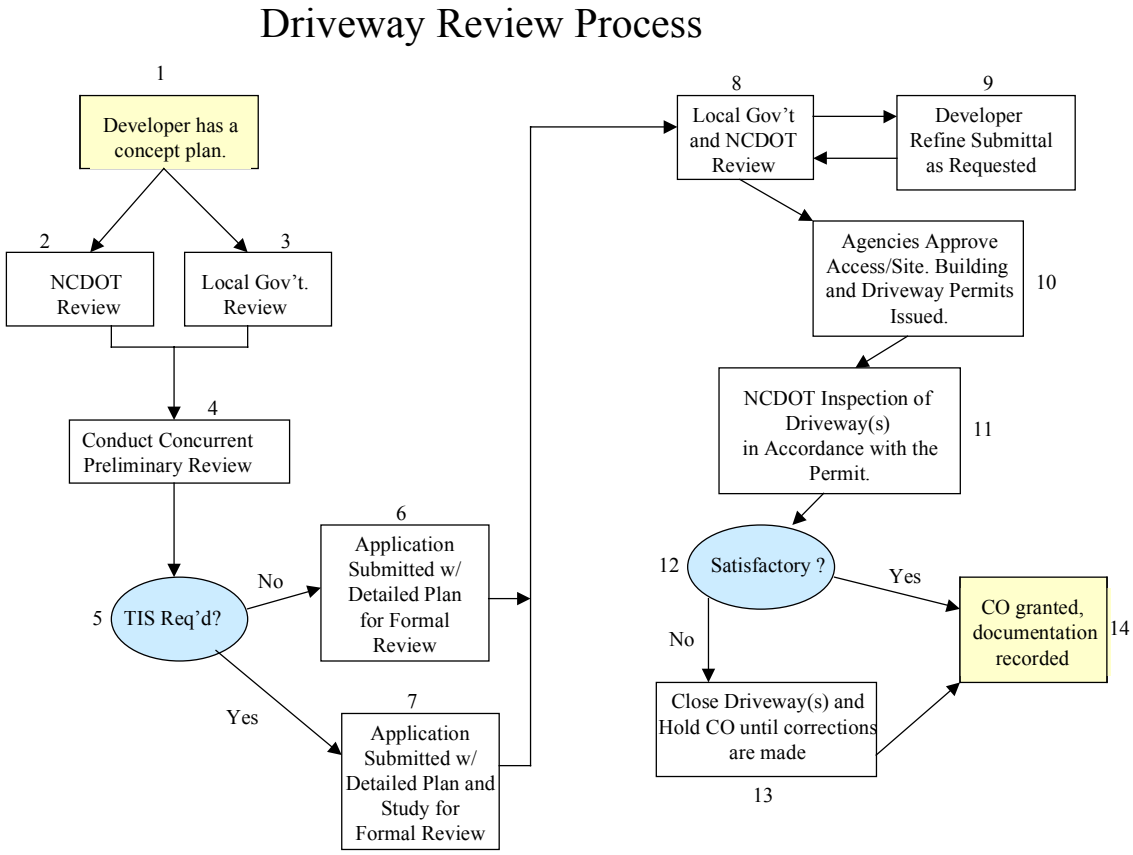
Common Acronyms

AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ADT	Average Daily Traffic
C/A	Control-of-Access
CL	Center Line
CO	Certificate of Occupancy
DTE	Division Traffic Engineer
EA	Environmental Assessment (document)
EB	Eastbound
EMS	Emergency Medical Services
EOP	Edge of Pavement
FAQ	Frequently Asked Questions
FBL	Frontage Boundary Line
FHWA	Federal Highway Administration
FS	Feasibility Study
Ft.	Feet/foot
GS	General Statute
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation System
LOS	Level of Service
MPH	Miles Per Hour
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
NB	Northbound
NCAC	North Carolina Administrative Code
NCDOT	North Carolina Department of Transportation
NCMUTCD	North Carolina Supplement to the MUTCD
PD&EA	Project Development & Environmental Analysis
PE	Professional Engineer
PUD	Planned Unit Development
R/W	Right-of-Way
ROW	Right-of-Way
RPO	Rural Planning Organization
RTE	Regional Traffic Engineer
S&G	Signals and Geometrics

SB	Southbound
SWP	Statewide Planning
TESSB	Traffic Engineering and Safety Systems Branch
TIA	Traffic Impact Analysis (aka TIS)
TIP	Transportation Improvement Program
TIS	Traffic Impact Study
TND	Traditional Neighborhood Development
VPD	Vehicles Per Day
VPH	Vehicles Per Hour
WB	Westbound

Appendix 1

Street and Driveway Access Permit Process Overview



Step 1: When a development is planned/proposed the applicant must submit a concept/preliminary plan to both the local authority and the local NCDOT District Engineer's Office. The applicant may request a pre-submittal conference at this point.

Step 2: The District Engineer solicits general feedback from the Division Traffic Engineer and other appropriate NCDOT personnel on any access requests that have the potential to significantly impact traffic safety or operations.

Step 3: The local government agency with jurisdiction identifies possible development conflicts with local zoning land use, transportation plan, overlay districts, Planned Urban Development (PUD), etc.

Step 4: Local and NCDOT authorities conduct concurrent reviews of the preliminary plan and form a consensus of future applicant submittal requirements. This step may also include any municipality, county, Metropolitan Planning Organization (MPO), or Rural Planning Organization (RPO).

Step 5: As a part of the concurrent review, a decision is made whether a Traffic Impact Study (TIS) is needed for submittal, or if other documentation or studies are necessary.

Step 6: If a TIS is ***not*** necessary for the development, an application with a detailed site plan in accordance with the "Policy on Street and Driveway Access to North Carolina Highways" is submitted by the applicant to the NCDOT and local government agency with jurisdiction.

Generally, four weeks should be allowed for review by DOT and the local agency.

All applicable fees due to the NCDOT are submitted at this time.

Step 7: If studies (including, but not limited to, hydraulic review, encroachment plans, TIS, traffic signal, rezoning, etc.) are deemed necessary for the development, an application with a detailed site plan in accordance with the "Policy on Street and Driveway Access to North Carolina Highways," is submitted with the studies to the NCDOT and local government agency with jurisdiction.

Additional review time, beyond the four weeks, may be required for the review of studies.

Any applicable fees due to the NCDOT are submitted at this time.

Steps 8 & 9: Any additional documentation required and any necessary revisions to the site plan or studies resulting from the review are submitted to the applicant for inclusion in a revised development plan and/or study.

Additional review time, beyond the original four weeks, may be required for review of the revised supplement and/or additional documentation.

If the applicant has concerns about proposed improvements, the applicant may identify these concerns and request further review with the NCDOT or local government agency.

All applicable Performance and Indemnity Bonds are submitted prior to issuance of the Street and Driveway Access Permit.

Step 10: Once transportation infrastructure needs have been identified and all studies are complete, final plans are submitted to NCDOT and approved with the access

point(s) described via the Street and Driveway Permit. The Permit is the applicant's notification of any special provisions pertaining to the site.

In general, it is mutually understood by the NCDOT and any local government agency with jurisdiction that building permits are withheld until a consensus is reached regarding the applicant's requirements for final driveway access approval.

Step 11: Once the driveway is constructed, the District Engineer inspects all work and materials within the state highway system right-of-way. The District Engineer may require the applicant to provide NCDOT verification certifying that improvements meet the approved plan, permit and NCDOT standards. Verification may include inspection reports, testing reports, or any supporting documentation and calculations. Verification may cover, but is not limited to, pavement structure, drainage, and traffic control items. A certification memo signed by a professional engineer is required in accordance with the "Policy on Street and Driveway Access to North Carolina Highways".

The NCDOT and local government agency with jurisdiction should have a mutual understanding that the Certificate of Occupancy (CO) will not be issued by the local agency until all the requirements of the Street and Driveway Access Permit have been met.

Steps12 &13: If a street or driveway connection does not comply with the Street and Driveway Access Permit, the NCDOT may close the driveway upon written notice until the corrections are made.

Step 14: If all requirements of the Street and Driveway Access Permit have been met, the CO may be granted by the local agency provided all other site development stipulations and conditions have been met to the satisfaction of the local government agency with jurisdiction.

A plan of record with the Permit and any associated stipulations may be required to be recorded in the local courthouse at the applicant's expense. Examples of reasons to record these documents include, but are not limited to, future TIP projects, sight distance issues, protected stems, phased development, restrictions to outparcels/flag parcels, conveyance of conditions of access to potential and future land owners, and changes in land use under the same landowner. Verification of recordation is provided to the District Engineer.

Appendix 2

LOCATION OF DIVISION AND DISTRICT OFFICES

Div.	Division Office	District Office	Counties Covered By District Office
1	Edenton	Elizabeth City	Camden, Currituck, Dare, Pasquotank, Gates, Perquimans
		Ahoskie	Bertie, Hertford, Northampton
		Plymouth	Chowan, Hyde, Martin, Tyrrell, Washington
2	Greenville	Washington	Beaufort, Pitt
		New Bern	Carteret, Craven, Pamlico
		Kinston	Greene, Jones, Lenoir
3	Wilmington	Jacksonville	Onslow, Pender
		Clinton	Duplin, Sampson
		Wilmington	Brunswick, New Hanover
4	Wilson	Halifax	Edgecombe, Halifax
		Nashville	Nash, Wilson
		Goldsboro	Johnston, Wayne
5	Durham	Raleigh	Wake
		Durham	Durham, Granville, Person
		Henderson	Franklin, Vance, Warren
6	Fayetteville	Lumberton	Robeson
		Fayetteville	Cumberland, Harnett
		Whiteville	Columbus, Bladen
7	Greensboro	Graham	Alamance, Orange
		Greensboro	Guilford
		Reidsville	Caswell, Rockingham
8	Aberdeen	Asheboro	Chatham, Randolph
		Aberdeen	Lee, Hoke, Moore
		Rockingham	Montgomery, Richmond, Scotland
9	Winston-Salem	Salisbury	Davidson, Rowan
		Winston-Salem	Davie, Forsyth, Stokes
10	Albemarle	Albemarle	Cabarrus, Stanly
		Monroe	Union, Anson
		Newell	Mecklenburg
11	N. Wilkesboro	Elkin	Alleghany, Surry, Yadkin
		Boone	Avery, Caldwell, Watauga
		N. Wilkesboro	Ashe, Wilkes
12	Shelby	Shelby	Cleveland, Gaston, Lincoln
		Statesville	Alexander, Catawba, Iredell
13	Asheville	Marion	Burke, McDowell, Rutherford, Mitchell
		Asheville	Buncombe, Madison, Yancey
14	Sylva	Horse Shoe	Henderson, Polk, Transylvania
		Bryson City	Jackson, Swain, Haywood
		Andrews	Cherokee, Clay, Graham, Macon

For address information and phone listings via the internet visit:
http://www.doh.dot.state.nc.us/operations/
or check local telephone directory state government listings for address and telephone numbers of offices

Appendix 3

NCDOT Street and Driveway Access Permit Application

APPLICATION IDENTIFICATION		N.C. DEPARTMENT OF TRANSPORTATION
Driveway Permit No.	Date of Application	STREET AND DRIVEWAY ACCESS PERMIT APPLICATION
Development Name:		

LOCATION OF PROPERTY:

Exact Distance ☐ Miles ☐ Feet N ☐ S ☐ E ☐ W ☐

From the Intersection of Route No. _____ and Route No. _____ Toward _____

Property Will Be Used For: ☐ Residential /Subdivision ☐ Commercial ☐ Educational Facilities ☐ TND ☐ Emergency Services ☐ Other

Property: ☐ is ☐ is not within _____ City Zoning Area.

AGREEMENT

- I, the undersigned property owner, request access and permission to construct driveway(s) or street(s) on public right-of-way at the above location.
- I agree to construct and maintain driveway(s) or street entrance(s) in absolute conformance with the current "Policy on Street and Driveway Access to North Carolina Highways" as adopted by the North Carolina Department of Transportation.
- I agree that no signs or objects will be placed on or over the public right-of-way other than those approved by NCDOT.
- I agree that the driveway(s) or street(s) will be constructed as shown on the attached plans.
- I agree that that driveway(s) or street(s) as used in this agreement include any approach tapers, storage lanes or speed change lanes as deemed necessary.
- I agree that if any future improvements to the roadway become necessary, the portion of driveway(s) or street(s) located on public right-of-way will be considered the property of the North Carolina Department of Transportation, and I will not be entitled to reimbursement or have any claim for present expenditures for driveway or street construction.
- I agree that this permit becomes void if construction of driveway(s) or street(s) is not completed within the time specified by the "Policy on Street and Driveway Access to North Carolina Highways".
- I agree to pay a $50 construction inspection fee. Make checks payable to NCDOT. This fee will be reimbursed if application is denied.
- I agree to construct and maintain the driveway(s) or street(s) in a safe manner so as not to interfere with or endanger the public travel.
- I agree to provide during construction proper signs, signal lights, flaggers and other warning devices for the protection of traffic in conformance with the current "Manual on Uniform Traffic Control Devices for Streets and Highways" and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the District Engineer.
- I agree to indemnify and save harmless the North Carolina Department of Transportation from all damages and claims for damage that may arise by reason of this construction.
- I agree that the North Carolina Department of Transportation will assume no responsibility for any damages that may be caused to such facilities, within the highway right-of-way limits, in carrying out its construction.
- I agree to provide a Performance and Indemnity Bond in the amount specified by the Division of Highways for any construction proposed on the State Highway system.
- The granting of this permit is subject to the regulatory powers of the NC Department of Transportation as provided by law and as set forth in the N.C. Policy on Driveways and shall not be construed as a contract access point.
- **I AGREE TO NOTIFY THE DISTRICT ENGINEER WHEN THE PROPOSED WORK BEGINS AND WHEN IT IS COMPLETED.**

2003-05 NOTE: Submit Four Copies of Application to Local District Engineer, N.C. Department of Transportation TEB 65-04rev.
61-03419

SIGNATURES OF APPLICANT

PROPERTY OWNER (APPLICANT)		WITNESS	
COMPANY		NAME	
SIGNATURE		SIGNATURE	
ADDRESS		ADDRESS	
	Phone No.		

AUTHORIZED AGENT		WITNESS	
COMPANY		NAME	
SIGNATURE		SIGNATURE	
ADDRESS		ADDRESS	
	Phone No.		

APPROVALS

APPLICATION RECEIVED BY DISTRICT ENGINEER

SIGNATURE **DATE**

APPLICATION APPROVED BY LOCAL GOVERNMENTAL AUTHORITY (when required)

SIGNATURE **TITLE** **DATE**

APPLICATION APPROVED BY DISTRICT ENGINEER

SIGNATURE **DATE**

INSPECTION BY NCDOT

SIGNATURE **TITLE** **DATE**

COMMENTS:

Use Additional Pages as necessary.

Appendix 4

North Carolina Department of Transportation
Street and Driveway Access
Contractor Certification Memo

_____
(Date)

_____
_____
_____
(NCDOT Division Office Address)

RE: IMPROVEMENT CERTIFICATION
County _____
Driveway Permit # _____
Route _____
Development / Project _____

I, (name), have reviewed the improvements within the state-maintained roadway required under the driveway permit for the above development and in accordance with the design drawings approved by the North Carolina Department of Transportation (NCDOT) on _____ (date). Improvements reviewed include the following: (list)

My inspection and attached testing report(s) and/or supporting documentation indicate the roadway improvements within the state right of way have been constructed in accordance with the standards established by ***NCDOT Standard Specifications for Roads and Structures,*** and with the approved plans.

Name: _____
NC PE #: _____

Signature: _____

Seal

Received by NCDOT:

Appendix 5

Street and Driveway Access Permit Appeal Checklist

(Use for submittal to the Driveway Permit Appeals Committee)

1. Name of applicant (note if owner):

_____

2. Type of development:
   _____Commercial
   _____Subdivision
   _____Educational
   _____Traditional Neighborhood Development
   _____Other (please specify) _____

3. County: _____

4. Route(s): _____

5. Is a project involved? ☐Planning/Design ☐Under Construction ☐Completed ☐N/A
   State Project No._____Other (specify)_____
   FA Project No._____
   Station:_____

6. Posted Speed Limit: _____

7. Average Daily Traffic: _____ Year: _____(if available)

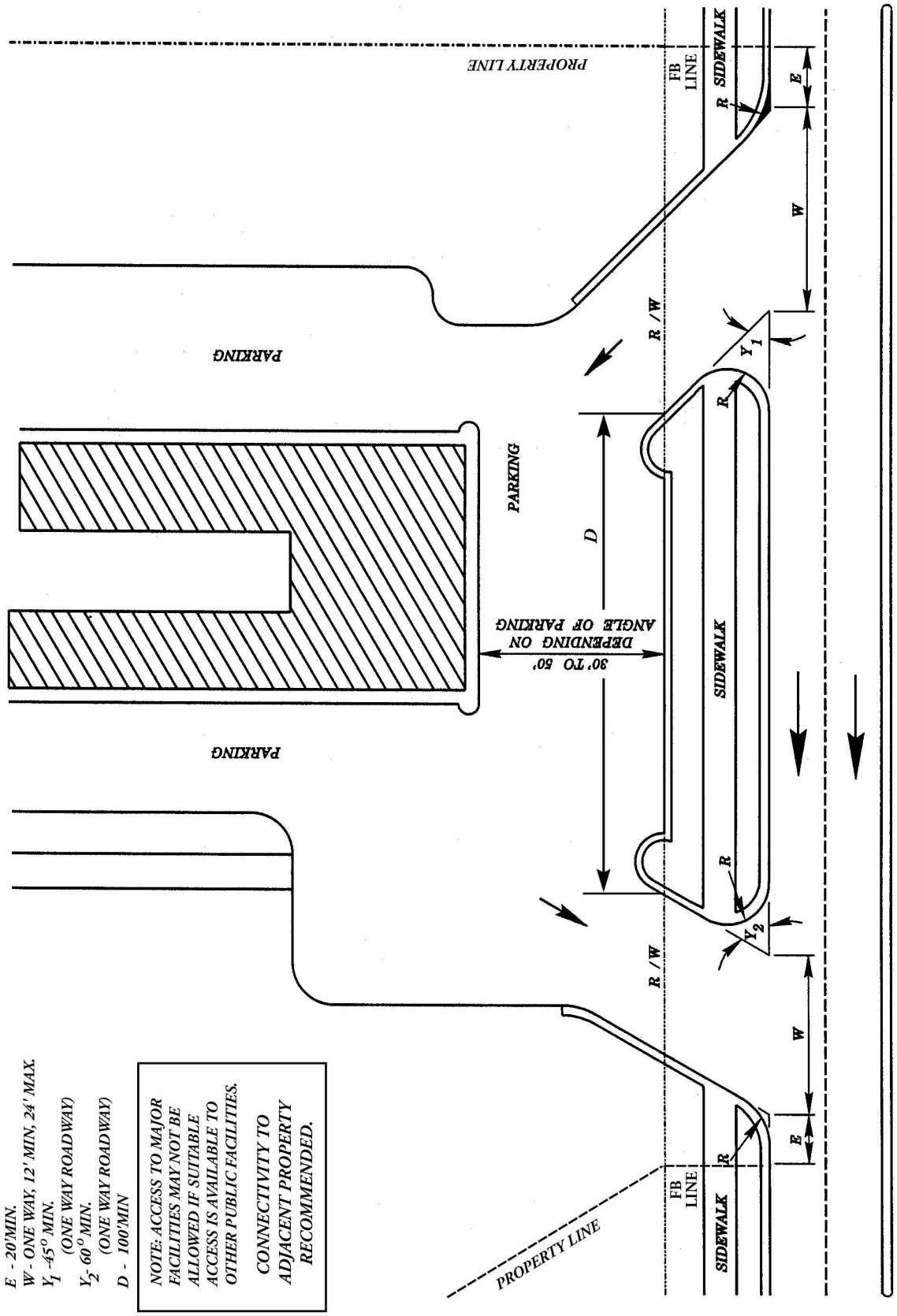
8. Do you anticipate problems with or are the following involved?

   _____Wetlands _____Sight Distance _____Right of Way
   _____Traffic Signals _____Environmental Permits
   _____Bridges/Culverts _____Utilities
   _____Railroad _____Other

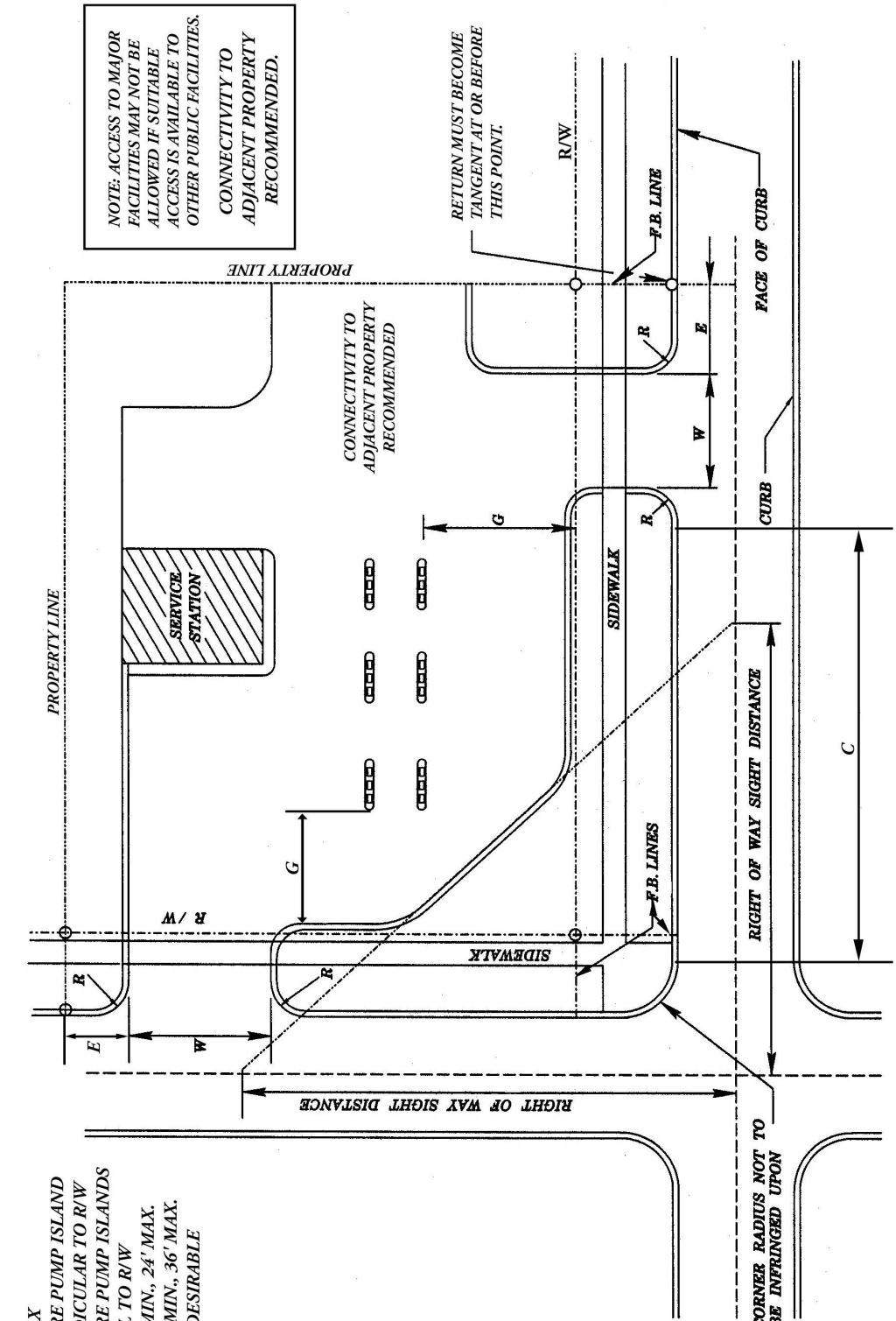
9. Is a local jurisdiction involved?
   (If yes, municipality recommendations):_____
   _____
   _____
   _____

10. Show information/request on a detailed site plan (please do not send a partial copy of a site plan sheet)

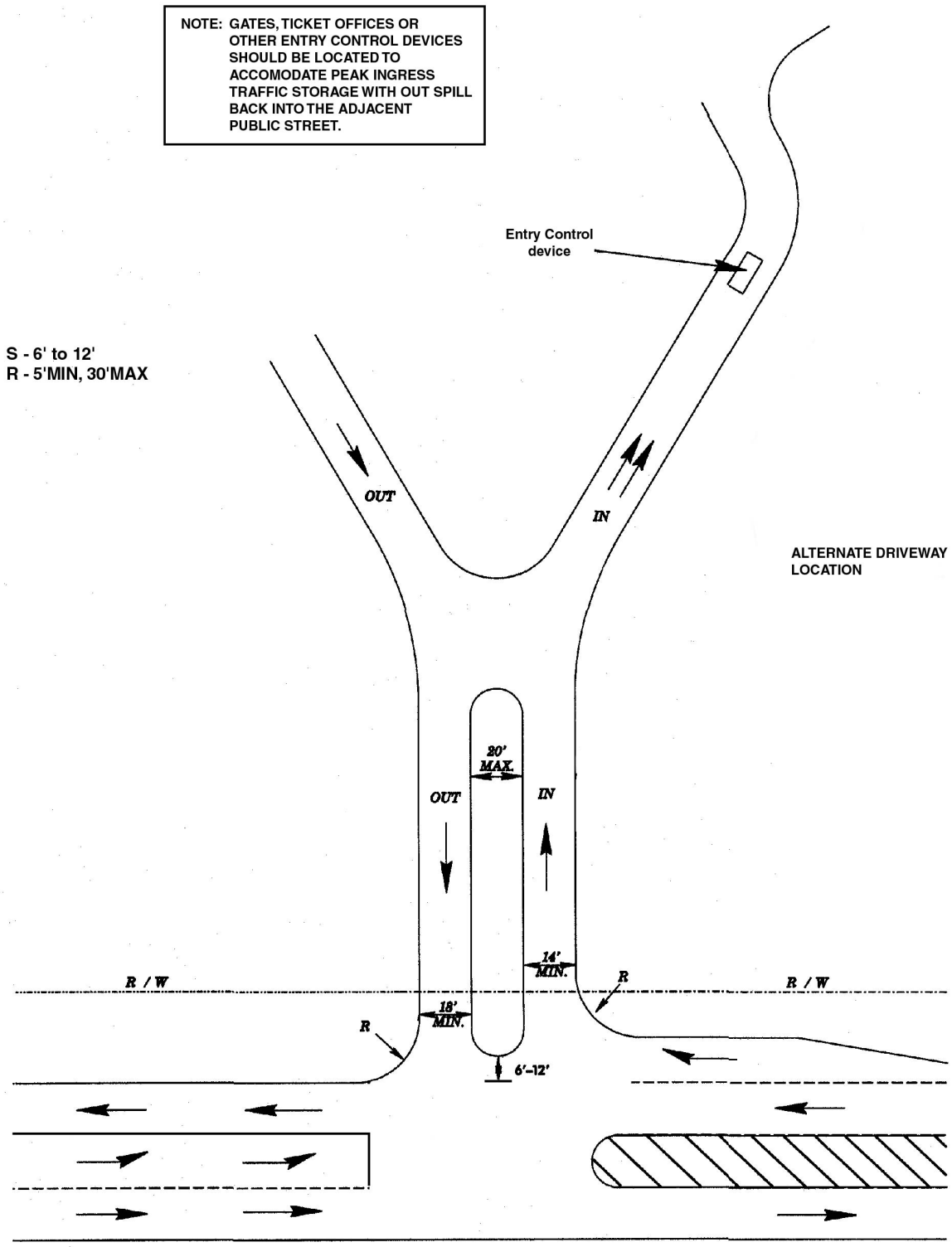
EXHIBITS



ANGLED DRIVEWAYS ON ONE–WAY STREETS



CORNER BUSINESS



Driveway with controlled or restricted entry

Recommended Treatment for Turn Lanes

Symmetrical Widening

Design Speed (mph)	Posted Speed (mph)	Minimum Deceleration Length (D)	Desirable Deceleration Length (D)	Bay Taper Length (T)
30	≤ 25	100′	150′	75′
35	30	100′	150′	75′
40	35	150′	200′	100′
45	40	150′	250′	100′
50	45	150′	300′	100′
55	50	200′	500′	150′
60	55	250′	575′	200′

Approach / Departure Taper (A)

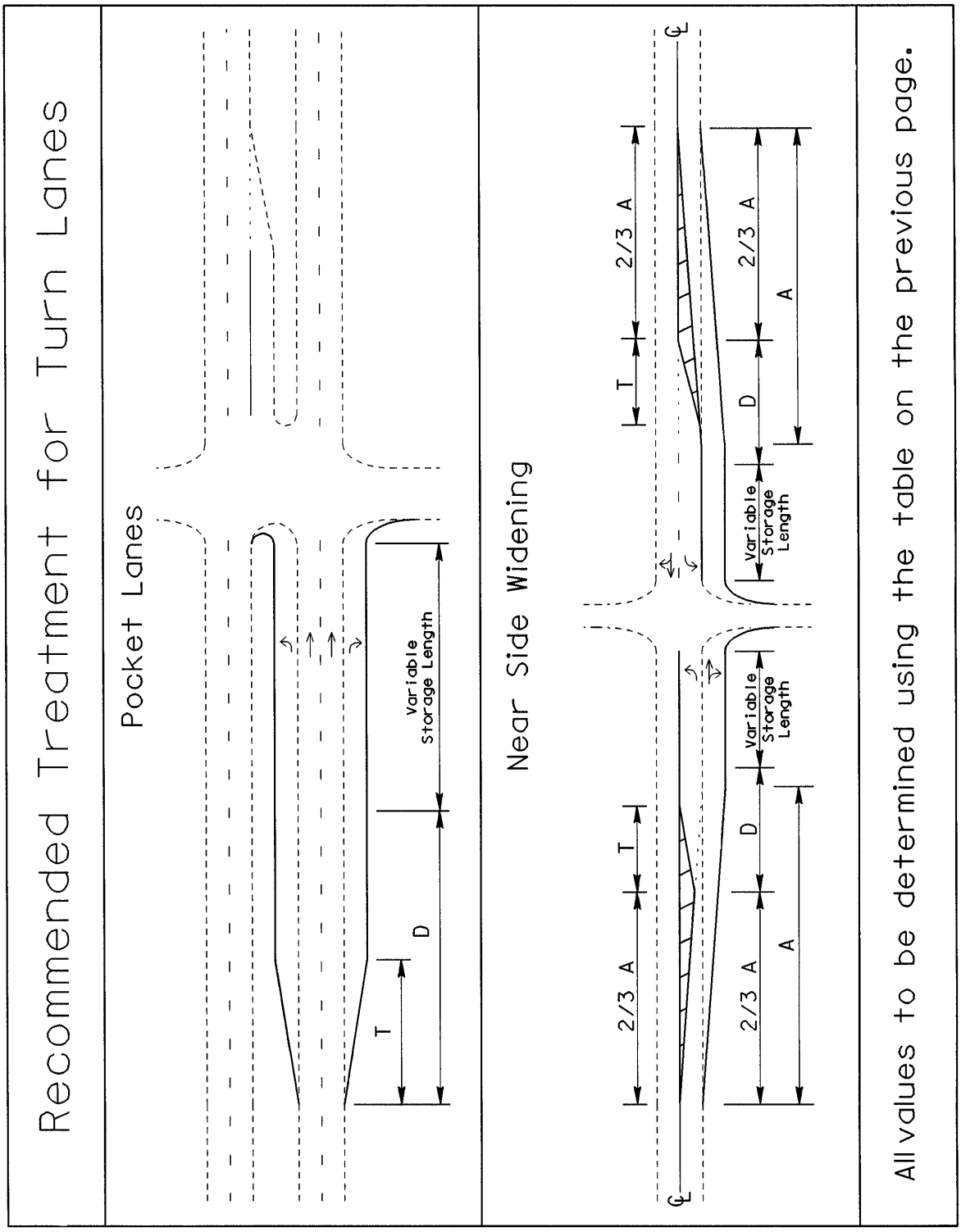
$A = WS^2/60$ (IF $S \leq 40$ MPH)

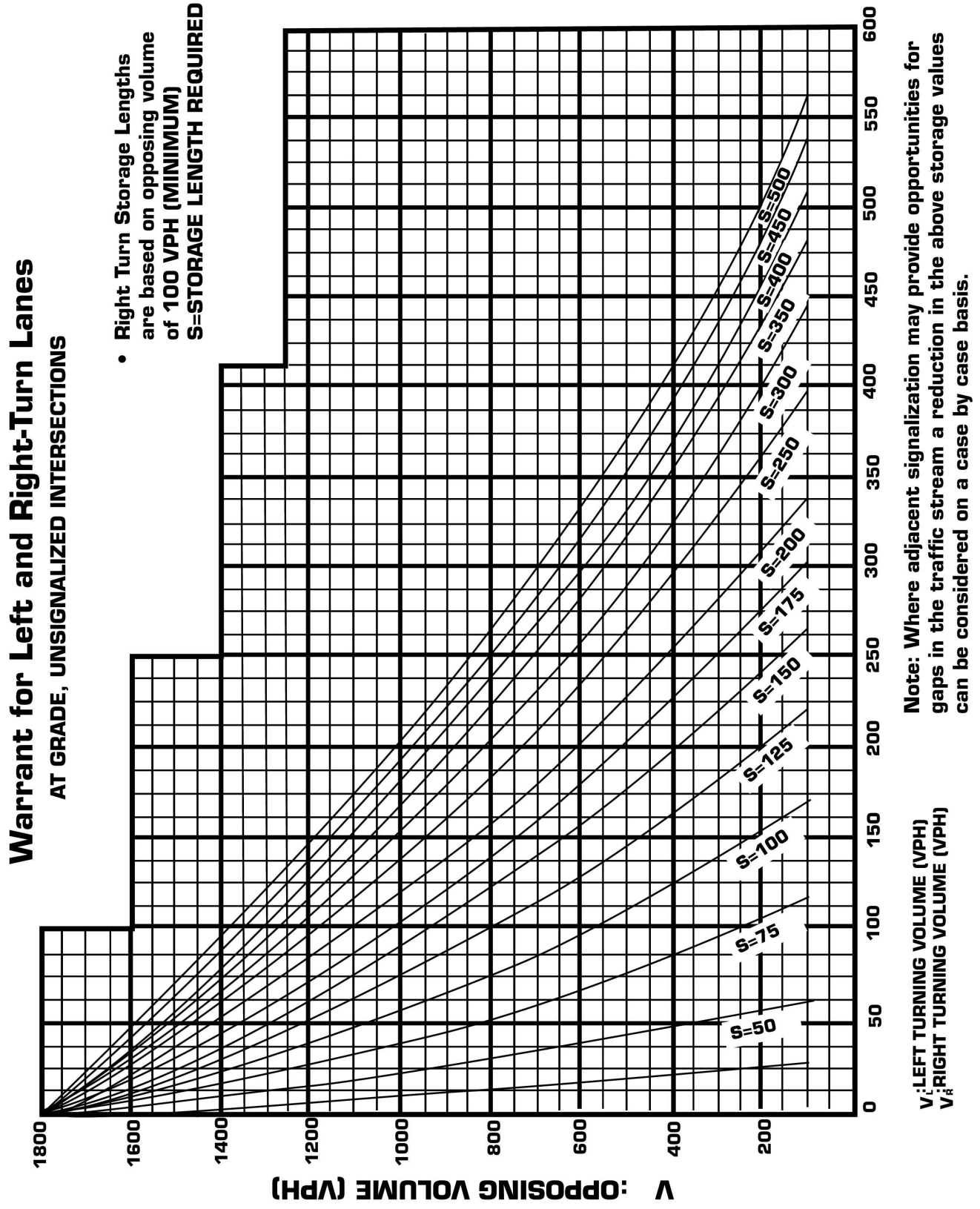
$A = WS$ (IF $S > 40$ MPH)

S = Design Speed

W = Width of Lateral Shift

* Storage length for waiting vehicles should be calculated based on the latest version of the Highway Capacity Manual or Policy on Street and Driveway Access to North Carolina Highways.


Recommended Treatment for Turn Lanes
Pocket Lanes
T
D
Variable Storage Length
Near Side Widening
2/3 A
T
D
A
Variable Storage Length
All values to be determined using the table on the previous page.


Warrant for Left and Right-Turn Lanes
AT GRADE, UNSIGNALIZED INTERSECTIONS
• Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED
V :OPPOSING VOLUME (VPH)
1800
1600
1400
1200
1000
800
600
400
200
0
50
100
150
200
250
300
350
400
450
500
550
600
S=50
S=75
S=100
S=125
S=150
S=175
S=200
S=250
S=300
S=350
S=400
S=450
S=500
Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.
V_L :LEFT TURNING VOLUME (VPH)
V_R :RIGHT TURNING VOLUME (VPH)