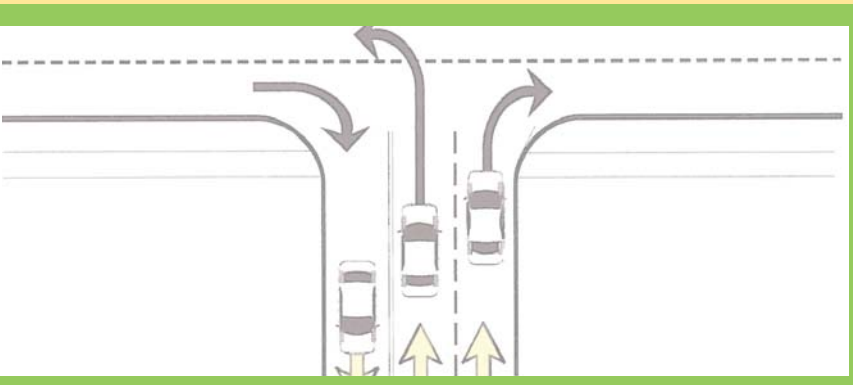

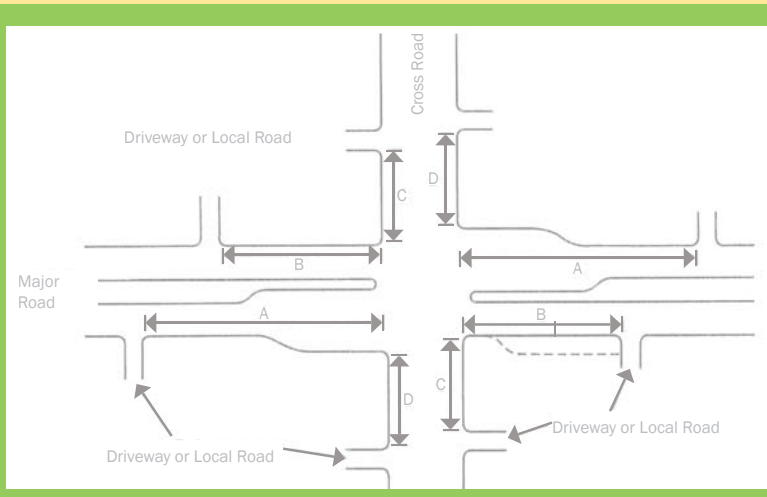

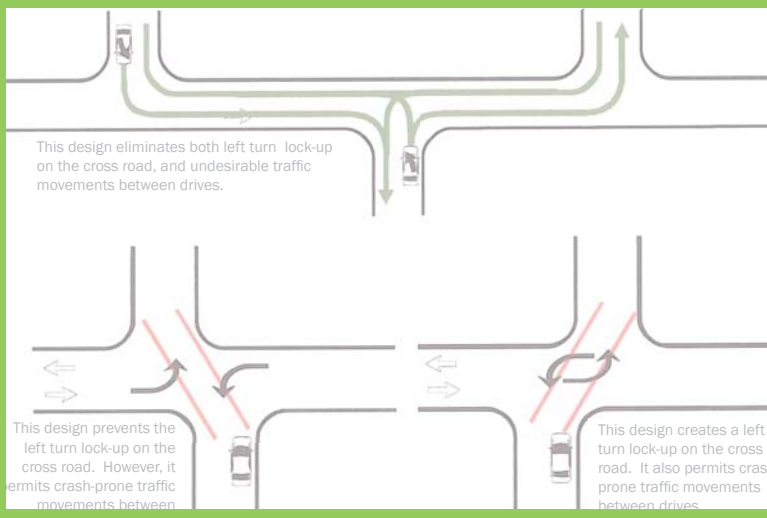

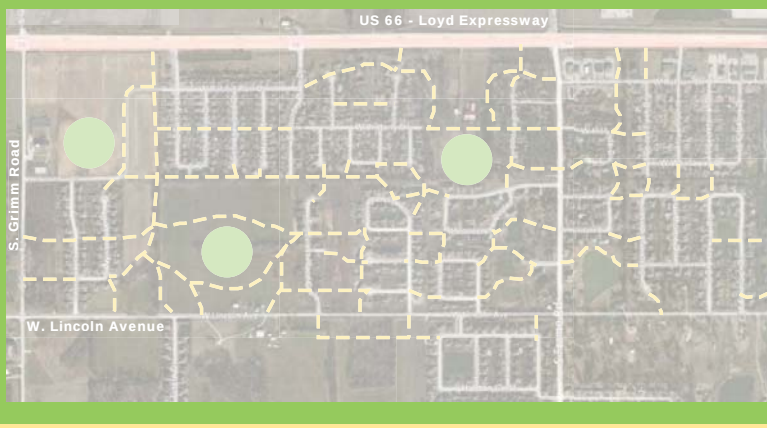

ACCESS MANAGEMENT MANUAL AND DEVELOPMENT GUIDE

Actions to Ensure the Efficient Use of Existing Road Space

Evansville Metropolitan Planning Organization

Evansville MPO
Henderson • Vanderburgh • Warrick

ACCESS MANAGEMENT MANUAL AND DEVELOPMENT GUIDE

Actions to Ensure the Efficient Use of Existing Road Space

Adopted July 7, 2016

EVANSVILLE METROPOLITAN PLANNING ORGANIZATION
1 NW Martin Luther King, Jr. Blvd.
Room 316 - Civic Center Complex
Evansville, IN 47708

Evansville MPO
Henderson • Vanderburgh • Warrick

This report was funded in part by the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the U. S. Department of Transportation.

RESOLUTION

RESOLUTION NO. 2016-01

A RESOLUTION OF THE EVANSVILLE METROPOLITAN PLANNING ORGANIZATION ADOPTING THE *ACCESS MANAGEMENT MANUAL AND DEVELOPMENT GUIDE*

WHEREAS, the Evansville Metropolitan Planning Organization is the organization designated by the Governor as the Metropolitan Planning Organization responsible, together with the State, for carrying out the provisions of 23 U.S.C. 134 (Federal Aid Highway planning requirements), and capable of meeting the requirements of 49 U.S.C. 1603(a) (Federal Transit planning requirements) in the Evansville Urbanized Area; and

WHEREAS, the Evansville Metropolitan Planning Organization ensured the planning process for the Access Management Manual and Development Guide was conducted in an open, participatory manner, as required by the Fixing America's Surface Transportation Act (FAST Act); and

WHEREAS, the Evansville Metropolitan Planning Organization provides guidance and assists in the decision making process regarding access to the public network for all modes of transportation for all people based on research, data driven performance, and sound engineering principles; and

WHEREAS, the endorsement of the Access Management Manual and Development Guide by the Evansville Metropolitan Organization is consistent with the Vision, Goals, and Objectives presented in the 2040 Metropolitan Transportation Plan, and the themes presented in The Millennial Plan for 2040: A Regional Plan for Sustainable Development, and the Complete Streets Policy adopted by the Evansville Metropolitan Planning Organization in 2012.

NOW, THEREFORE, BE IT RESOLVED, that the Evansville Metropolitan Planning Organization hereby adopted the Access Management Manual and Development Guide.

ADOPTED by the Policy Committee of the Evansville Metropolitan Planning Organization on this 7th day of July, 2016.

Jack Corn Jr

Mr. Jack Corn, Jr., Chairperson
Evansville Metropolitan Planning Organization
Policy Committee

ACKNOWLEDGEMENTS

EVANSVILLE MPO POLICY COMMITTEE MEMBERS

Mr. Jack Corn, Jr.	*Chairperson, Evansville City Council Appointment*
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(NV) = Non Voting

ACKNOWLEDGEMENTS

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Mr. Brent Schmitt *Chairperson, Evansville City Engineer*
Mr. Ron London *Vice Chairperson, Evansville-Vanderburgh Area Plan Commission, Executive Director*

The following organizations are represented on the Technical Committee:

American Medical Response
Carver Community Organization
CSX Transportation
Easter Seals Rehabilitation Center
Economic Development Coalition of Southwest Indiana
EnviroKinetics, Inc.
Evansville ARC
Evansville Bicycle Club
Evansville Board of Public Safety
Evansville Chamber of Commerce
Evansville City Engineer
Evansville Department of Metropolitan Development
Evansville Department of Transportation and Services
Evansville Department of Urban Forestry
Evansville Environmental Protection Agency
Evansville Parks and Recreation Department
Evansville Police Department
Evansville Regional Airport
Evansville Water and Sewer Department
Federal Highway Administration (Indiana)
Federal Highway Administration (Kentucky)
Federal Transit Administration (Region V)
Green River Area Development District
Henderson Area Rapid Transit
Henderson City Engineer
Assistant Henderson City Manager
Henderson County Engineer
Henderson County Riverport
Henderson-Henderson County Chamber of Commerce
Henderson-Henderson County Plan Commission
Henderson Judge Executive
Indiana Department of Environmental Management (Indianapolis)
Indiana Department of Transportation (Indianapolis)
Indiana Department of Transportation (Vincennes)
Indiana Southern Railroad
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Port of Indiana-Mount Vernon
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Qk4, Inc.
River City Taxi
St. Mary's Trauma Hospital
SIRS, Inc.
University of Evansville
Vanderburgh County Emergency Management Agency
Vanderburgh County Engineer
Warrick County Economic Development
Warrick County Plan Commission
Warrick County School Corporation
Westside Improvement Association

ACKNOWLEDGEMENTS

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Mr. John Stoll	*Vanderburgh County Engineer*
Mr. Ron London	*Evansville-Vanderburgh Area Plan Commission*
Mr. Steve Sherwood	*Warrick County Assistant Engineer*
Mr. Buzzy Newman	*City of Henderson*
Mr. Bill Hubiak	*Henderson County Engineer*
Mr. Khalil Dughaish	*INDOT*
Mr. Kenny Potts	*KYTC*
Mr. Bill Pedtke	*Southwestern Indiana Builders Association*

EVANSVILLE MPO STAFF

Mr. Seyed Shokouhzadeh	*Executive Director*
Ms. Pamela Drach	*Deputy Director*
Ms. Erin Schriefer	*Senior Transportation Planner: Non-motorized/MTP*
Mr. Craig Luebke	*Transportation Planner: TIP/Public Outreach/Rural*
Ms. Laura Lamb	*Transportation Engineer: GIS/Freight/Land Use*
Mr. Vishu Lingala	*Transportation Planner: Travel Demand Modeling/GIS*
Mr. Matt Schriefer, AICP	*Transportation Planner: Public Transportation/Transit*
Ms. Kari Akin	*Finance Officer*
Mr. Jeff Okes	*Transportation Technician*

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ONLY

Concerns over congestion, safety, and the increasing cost of upgrading our roads have generated a new interest in the effective management of our public transportation networks. As an area develops, the existing roads become ineffective at handling the demand and eventually the roads must be improved at taxpayer expense to make up for capacity lost to inefficient traffic operations. The new facility provides a good travel environment, which in turn attracts additional development. Again, the efficiency of this transportation system deteriorates as the investment in the roadway infrastructure is compromised. This cycle continues until it becomes physically or economically impossible to add more capacity to the roadways. Access management, together with land use strategies and the inclusion of alternative modes of transportation, is a sensible and relatively low cost method for preserving the traffic flow and safety of our roadway network.

INTRODUCTION

WHY ACCESS MANAGEMENT?

Land access and multimodal traffic movements are necessary and frequently conflicting functions. The property owner is entitled to reasonable access suitable to meet the needs of the highest and best use of the property, while the road user has the right to freedom of movement through the highway network and the efficient expenditure of public highway funds. The planning challenge is to provide suitable site access while maintaining safe and efficient traffic flow.

Access management refers to the design, implementation and management of entry and exit points between roadways and adjacent properties with the goal of preserving the flow of traffic on the surrounding road system in terms of safety, capacity, and speed. It involves coordinating land development and the management of the location, design, and operation of driveways, median openings, and street connections to a roadway.

Basic principles of access management include:

- Locating Driveways on the Appropriate Roadway Functional Classification;
- Limiting Driveways within the Functional Area of an Intersection; and
- Reducing the Number and Types of Conflict Points Created by a Driveway.

BENEFITS OF GOOD ACCESS MANAGEMENT

- Maintained efficiency and related economic prosperity.
- Reduced congestion.
- Reduced crashes.
- Increased roadway capacity.
- Preserved public investment.
- Improved air quality.

COSTS OF POOR ACCESS MANAGEMENT

- Deterioration of roadway efficiency.
- Increased traffic conflicts.
- Crashes and congestion.
- Higher insurance costs.
- Diminishment of public investment.
- Increased use of neighborhood streets to by-pass congestion.

HOW DOES THE MPO FIT IN?

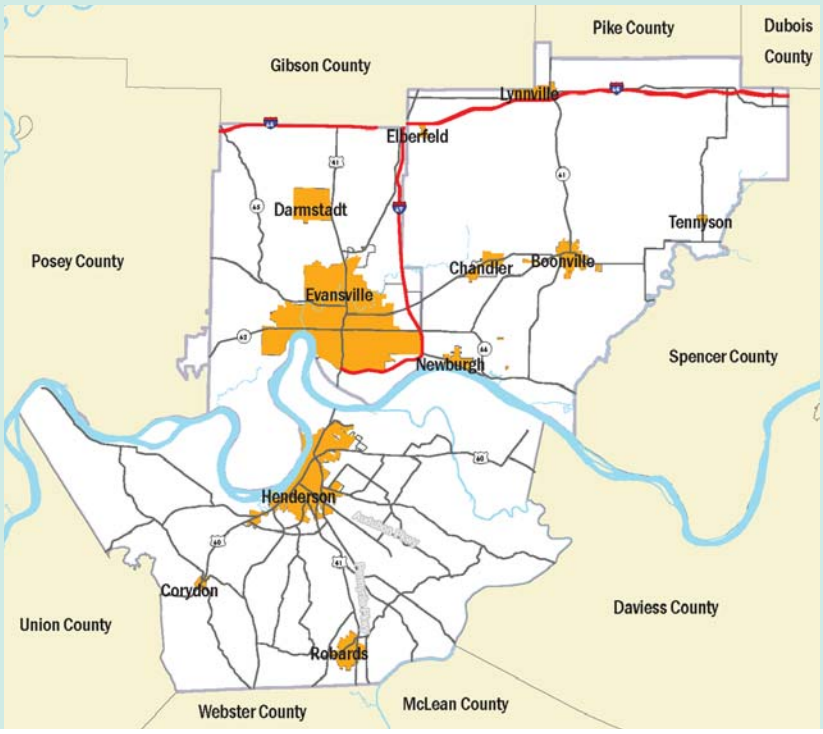
Federal law requires that all urbanized areas over 50,000 residents establish a Metropolitan Planning Organization to undertake a "3-C" transportation planning process. This Continuous, Cooperative and Comprehensive planning process is required for a region to receive federal highway planning and improvement funding.

Established as the Evansville Urban Transportation Study (EUTS) in 1969, the Evansville Metropolitan Planning Organization (EMPO) is the designated agency responsible for conducting the 3-C transportation planning process within the Evansville-Henderson urbanized area. Effective transportation planning requires an organization with a regional focus and the ability to operate independent of city, county, and state lines. Accordingly, the MPO is an independent transportation policy body that is comprised of elected or appointed officials from the metropolitan area and representatives from state and local transportation agencies.

The EMPO Metropolitan Planning Area (MPA) contains approximately 650 square miles in Indiana, including the City of Evansville, Vanderburgh County, Warrick County, and a very small area of eastern Posey County. In Kentucky, the Study Area encompasses approximately 440 square miles which includes the City of Henderson and Henderson County. With a population that exceeded 200,000 in the 2010 Census, the Evansville-Henderson urban area has been designated as a Transportation Management Area (TMA).

The 1990 Clean Air Act Amendments strengthened provisions requiring that all urban and suburban areas attain federal standards for air pollutants. Non-attainment areas would not be permitted to construct new roads or build additional lanes to existing roadways until established air quality standards are met. Reducing the number of vehicles idling along existing roadways, through such methods as access management, promotes improved air quality within the study area.

Figure 1: MPO Metropolitan Planning Area



The Transportation Equity Act for the 21st Century (TEA 21), signed into law on June 9, 1998, began the focus on preservation of the existing transportation system rather than construction of new roadways through the use of management systems such as the Congestion Management Systems (CMS). The current funding bill, Moving Ahead for Progress in the 21st Century Act (MAP-21), continues the focus of sustaining existing roadways. The Congestion Management Process (CMP) is intended to efficiently manage existing and new transportation facilities through the use of transportation demand management (ridesharing, public transit, non-motorized mode improvements, etc.), transportation system management (intersection and lane improvements, signal improvements, incident detection and management, land use strategies and access management, etc.) and finally, added capacity.

To further emphasize the importance of preserving the existing transportation system, MAP-21 also mandates the incorporation of eight Planning Factors into the metropolitan transportation planning process that focus on the role of transportation in a community. These factors are:

1. Support the economic vitality of the United States, the States, and metropolitan areas, especially by enabling global competitiveness, productivity and efficiency.
2. Increase the safety of the transportation system for motorized and non-motorized users.
3. Increase the security of the transportation system for motorized and non-motorized users.
4. Increase the accessibility and mobility options available to people and for freight.
5. Protect and enhance the environment, promote energy conservation, and improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.
6. Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight.
7. Promote efficient system management and operation.
8. Emphasize the preservation of the existing transportation system.

While these factors are addressed in the 2040 Metropolitan Transportation Plan, they can also be addressed through proper access management.

REGIONAL PLAN FOR SUSTAINABLE DEVELOPMENT

With a focus on preserving and sustaining existing investments, Housing and Urban Development's (HUD) Office of Sustainable Housing and Communities, in close coordination with the US Department of Transportation (DOT) and the US Environmental Protection Agency (EPA), created the Sustainable Communities Regional Planning Grant. This program was created to support metropolitan and multi-jurisdictional areas in the development of a Regional Plan for Sustainable Development (RPSD), with the intention of developing partnerships and integrating planning for housing, land use, economic and workforce development, transportation, and infrastructure across the region. The EMPO applied for and was awarded this grant in 2010, being in the first round of awardees in the country to receive the grant.

To help the Sustainable Communities Regional Planning Grant recipients, HUD, DOT, and EPA established six livability principles to guide their planning efforts. The EMPO focuses on these principles from a transportation standpoint:

- Provide more transportation choices: Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.
- Promote equitable, affordable housing: Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- Enhance economic competitiveness: Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets.
- Support existing communities: Target federal funding toward existing communities – through strategies like transit-oriented mixed-use development and land recycling – to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.
- Coordinate policies and leverage investment: Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.
- Value communities and neighborhoods: Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods – rural, urban, or suburban.

Livability based solutions carry multiple co-benefits. Livable communities encourage regular walking, cycling, and transit use, reducing the need for auto travel, while decreasing congestion for those that do drive. As a partner in the Sustainable Communities Regional Planning Grant Program, the Evansville MPO embraces these principles as an opportunity to envision a broader range of solutions to the transportation challenges in the region.

The EMPO is involved in the access review process as requested by the Responsible Authority.


Main

RESPONSIBLE AUTHORITIES

Access between public rights-of-way and private properties by necessity involves various land use and engineering considerations, such as zoning, trip generation, construction standards, drainage, and geometrics. Any applicant seeking permission to access the transportation network must insure compliance with local zoning, subdivision, city, and county ordinances, as well as applicable state statutes; in addition to obtaining necessary building permits, certificate of occupancy, and/or driveway approval from the appropriate city/county/state governmental agencies. These permitting agencies are the Responsible Authorities.

PROCEDURAL GUIDELINES

ACCESS MANAGEMENT GOAL

To balance the need to provide efficient, safe, and timely travel within the public rights-of-way while preserving reasonable access to abutting private property.

The policies, standards, and procedures in this manual have been established in cooperation with and to aid the Responsible Authorities in protecting through traffic movement, improving safety, reducing conflict points, and promoting a shift to alternative modes of transportation which extend the life of the vehicular roadways.

The Responsible Authority reserves the right to deviate from the standards outlined in this document when it is determined to be in the best interest of the traveling public.

It is the sole decision of the Responsible Authority to approve any method of analysis used in any development under their jurisdiction.

GUIDING DOCUMENTS

Since no one set of regulations can be expected to apply to all situations, it is recommended that the guidelines contained herein should be used in conjunction with field investigations, sound transportation engineering judgment; and best management practices presented in the most recent editions of the following documents:

- AASHTO's *A Policy On Geometric Design of Highways and Streets* (the Green Book)
- *Traffic Engineering Handbook*, Institute of Transportation Engineers
- *The Manual of Uniform Traffic Control Devices (MUTCD)*, state approved version
- INDOT Driveway Permit Manual - (http://www.in.gov/indot/files/Permits_Driveways.pdf)
- State Access Management Guides.
    - Indiana - (http://www.in.gov/indot/files/guide_total.pdf)
    - Kentucky – included as a section in the Kentucky Highway Design Manual
- ITE's *Trip Generation Manual*
- INDOT's Applicant's Guide to Traffic Impact Studies
    - (http://www.in.gov/indot/files/Permits_ApplicantsGuidetoTrafficImpactStudy_2015.pdf)
- Kentucky Transportation Cabinet Traffic Impact Study Guidelines.
    - (http://transportation.ky.gov/Permits/Documents/2012%20POLICY-TIS%20Requirements.pdf)
- *Traffic Control Devices Handbook*, Institute of Transportation Engineers
- State approved design manuals
    - Indiana - (http://www.in.gov/indot/design_manual/)
    - Kentucky - (http://transportation.ky.gov/highway-design/pages/highway-design-manual.aspx)
- Current Draft *Public Rights-of-Way Accessibility Guidelines (PROWAG)*
- Other documents as approved by applicable State and Federal agencies

APPLICATION ELEMENTS

The Responsible Authority for any element of accessing public rights-of-way may require any or all of the following procedures:

- Any person, firm, corporation, or developer requesting to construct a driveway or approach connecting with any public roadway, or in any way alter, relocate, or remodel any curb along such roadway, within the jurisdiction of the Responsible Authority must adhere to the requirements outlined in this manual or listed Guiding Document.
- The Responsible Authority may establish other appropriate requirements and restrictions for driveways and approaches as necessary to provide for drainage, preservation of the network, and for the safety and convenience of the traveling public.
- Any requirements established by the Responsible Authority necessary to facilitate vehicle storage on private property with a driveway connecting to a public street might include a minimum distance between any structure limiting vehicle storage on the property and the edge of the roadway.
- When there is a change in the type of business, land use, or off-street parking facilities for an existing property, the adequacy of the existing access will be reviewed by the Responsible Authority for approval of existing driveway(s) or for the determination of changes in the location, design, or number of access points that are required.
- Access drives and interior parking must be designed so that vehicles will not be forced to stop on the public roadway due to congestion at the driveway or on the parking lot. It will be the responsibility of the owner to examine alternatives for improved access to alleviate congestion if problems occur at the site on a frequent basis. However, if significant congestion and traffic delays develop and the owner takes no action to address these problems, the Responsibility Authority may contact and present recommendations to the owner on how these problems should be addressed. Approval of future permits can be withheld until the issue is resolved.
- The property owner shall be responsible for maintaining and keeping in repairs all driveways, drainage structures, and rights-of-way. No driveway or approach shall be constructed or maintained in a manner as to obstruct or interfere with the roadway, the traffic thereon, or with any drain or ditch which has been constructed on or which serves a roadway.
- All work on driveways and approaches shall be done under the supervision and to the satisfaction of the Responsible Authority. The entire expense of constructing driveways and approaches shall be borne by the person, firm, corporation, or developer to whom such permit is granted.
- The expense of relocation or replacement of any and all improvements within the right-of-way shall be the sole responsibility of the applicant.
- When any roadway is constructed or substantially improved, the construction of all public road approaches, existing private approaches and drainage structures required for roadway protection, shall be included as a part of the improvement of the roadway. The Responsible Authority may require a change in the location of any existing drives in the interest of safety to the motoring public when the roadway is constructed or reconstructed.
- The angle of approach for any proposed driveway/roadway shall be 90 degrees unless otherwise approved by the Responsible Authority.
- All access geometrics including location, spacing, and auxiliary lanes shall be in accordance with the current Access Management Manual and Development Guide.

- Where the placement of a curb cut or driveway/ roadway requires construction activities be performed within the public right-of-way, advanced warning and traffic control shall be provided at the expense of the property owner in conformance with the appropriate state Manual on Uniform Traffic Control Devices (MUTCD) or another applicable standards adopted by the Responsible Authority.
- The Responsible Authority reserves the right to remove or barricade nonconforming access installations.
- Before granting a permit, the Responsible Authority may require a construction bond or letter of credit to insure that representations by a developer concerning a permit and any conditions of permit approval will be carried out.
- Any person, firm, corporation, or developer violating any of the provisions of this section may be subject to a "penalty" as allowed for by appropriate local codes.

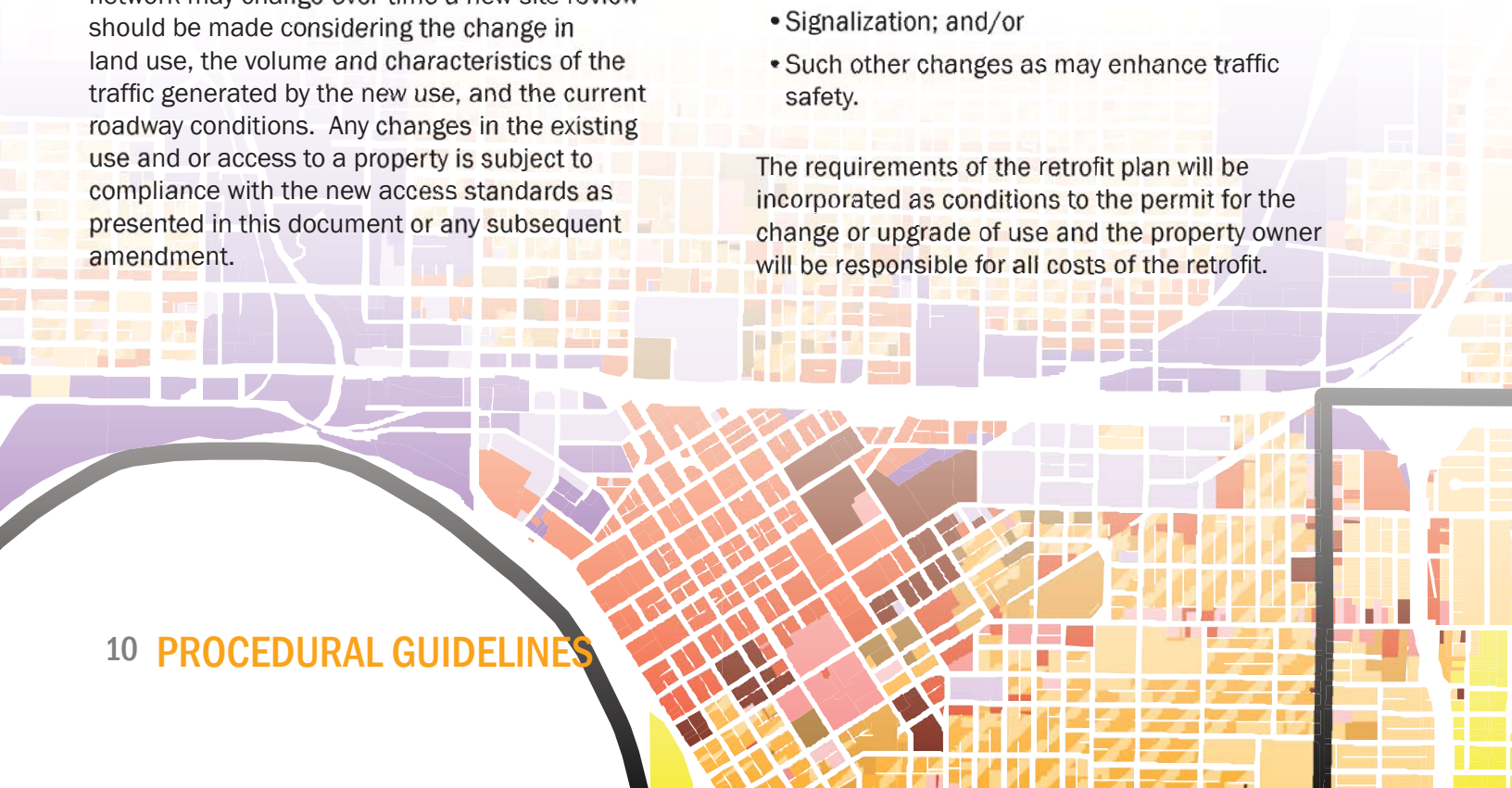
CHANGES IN LAND USE AND ACCESS

Because the character of the transportation network may change over time a new site review should be made considering the change in land use, the volume and characteristics of the traffic generated by the new use, and the current roadway conditions. Any changes in the existing use and or access to a property is subject to compliance with the new access standards as presented in this document or any subsequent amendment.

When a permit applicant is requesting to change the use of a property with existing driveways, the Responsible Authority will determine whether it is necessary and appropriate to reconstruct and/or retrofit the existing driveways depending on the proposed use. The property owner may be required to establish a retrofit plan – the objective of which is to minimize the traffic and safety impacts of the development by bringing the number, spacing, location, and design of the driveways into conformance with the current standards, to the extent possible without imposing undue or inequitable hardship on the property owner. The retrofit plan may include, but not be limited, to:

- Elimination or consolidation of driveways;
- Realignment or relocation of driveways;
- Provisions of shared driveways and/or cross access driveways with abutting property;
- Reversal of directional driveways (e.g. entrance only becomes exit only);
- Relocation of parking – impose property-layout and parking requirements, which allow for the circulation of traffic on-site and/or between abutting properties;
- Traffic demand management (e.g. reduction in peak hour trips);
- Signalization; and/or
- Such other changes as may enhance traffic safety.

The requirements of the retrofit plan will be incorporated as conditions to the permit for the change or upgrade of use and the property owner will be responsible for all costs of the retrofit.



REQUIRED INFORMATION FOR SITE PLANS

Because this manual is used by various governmental agencies, the information required for submittal on site plans will vary. The applicant is responsible for supplying the information required by the applicable Responsible Authority. In all situations at least one drawing or one set of drawings shall be submitted for review. Said drawing(s) shall include a plot plan drawn of the entire tract of land as recorded in the office of the local county recording agency, with the proper dimensions of all proposed improvements, location, and intended use. Said plot plan or additional attached detailed plans shall depict the following:

a. All site drawings shall be drawn to scale (engineer's scale, i.e.: 1:10, 20, 30, 40, 50, and 60).
b. Distance and name of nearest intersecting roads, streets, or railroads on both sides of the proposed improvements shall be shown and may be shown on a smaller scale location map.
c. Indicate accurate lot dimensions and property lines, as well as the relationship of the lot with neighboring properties. Indicate the location and widths of all easements.
d. Show all street and alley right-of-way widths from the original property boundary line, the centerline of the roadway, and from the physical center of pavement.
e. Include dimensions and location from property lines on all existing and proposed additions or structures. Show distances between all structures, including gasoline pumps, signs, barriers, landscaping, etc.
f. Indicate proposed and existing areas of pavement, gravel, and/or green space.

If applicable to the subject site improvements, the following details relating to traffic movements must also be included:

a. The geometric design features of the road, including road width, median width, shoulders, parking lanes, sidewalks, bike lanes, transit features and road surface type.
b. Indicate size and location of existing drives and approaches within 50 feet of the project area. Include the distance between drives and corner clearances. Indicate all existing radius of applicable approaches and intersections.
c. Include size and location of proposed curb cuts or access drives, as well as proposed approach radii and grade of approaches and driveways.
d. Include proposed length, width, and surface type of acceleration and deceleration lanes, if required.
e. Include internal parking details and movements, including aisle widths, parking stall dimensions, and angle of parking proposed as well as drive-thru stacking areas.
f. Show loading areas. Include location of overhead doors and loading patterns and indicate size of loading vehicles expected.
g. Indicate placement of solid waste containers and any surrounding screening.

TRAFFIC IMPACT STUDY

A Traffic Impact Study (TIS) is a report that describes the transportation related impacts for a proposed development.

Based on these objectives, it should be determined early in the development process whether a TIS is warranted so the resulting information can be used to guide land use planning decisions.

A Traffic Impact Study shall be required when it is determined that a development will generate 100 trips or more during the peak hour of adjacent street traffic or of generator traffic OR 750 trips per day.

Any subsequent development proposed after this threshold is met and utilizing the same access location will automatically require a TIS and mitigation measures to maintain or improve the level of service.

Guidelines for conducting a TIS are outlined in INDOT's Applicant's Guide to Traffic Impact Studies (http://www.in.gov/indot/files/Permits_ApplicantsGuidetoTrafficImpactStudy_2015.pdf) and Kentucky Transportation Cabinet Traffic Impact Study Guidelines (http://transportation.ky.gov/Permits/Documents/2012%20POLICY-TIS%20Requirements.pdf). The TIS shall be prepared by a transportation professional with training and experience in traffic engineering and transportation planning. A scoping meeting shall be required with the Responsible Authority to determine the extent of the analysis. The report shall document the purpose, procedure, data sources, assumptions, findings, conclusions and recommendations of the study. The TIS might include, but will not be limited to, the following:

- Trip generation estimates;
- Study of proposed driveway locations, resulting sight distance, queuing provisions, etc.;
- Safety analysis;
- Traffic signal warrants and progression analysis;
- Delay analysis;
- Gap studies;
- Internal circulation (e.g. private drives, public rights-of-way, frontage/backage roads, etc); and/or
- Neighborhood impacts.

TIS OBJECTIVES

1. Determine the appropriate location, spacing, and design of access points necessary to mitigate the traffic and operational impacts on the existing roadway network.
2. Determine the need for any improvements to the adjacent and nearby roadway system to maintain a satisfactory level of service and safety and to protect the function of the existing roadway network while providing appropriate and necessary access to the proposed development.

The TIS shall examine the existing conditions, as well as conditions within the study area before and after the proposed development for the anticipated year of opening and design year 10 years after opening. (e.g. existing conditions; No-Build scenario at opening & opening +10 yrs; Build scenario at opening & opening +10 yrs) These time periods may change with a proposed phased development. Analysis shall be completed to a degree sufficient to document the operational and safety impacts of the proposed development and access plan.

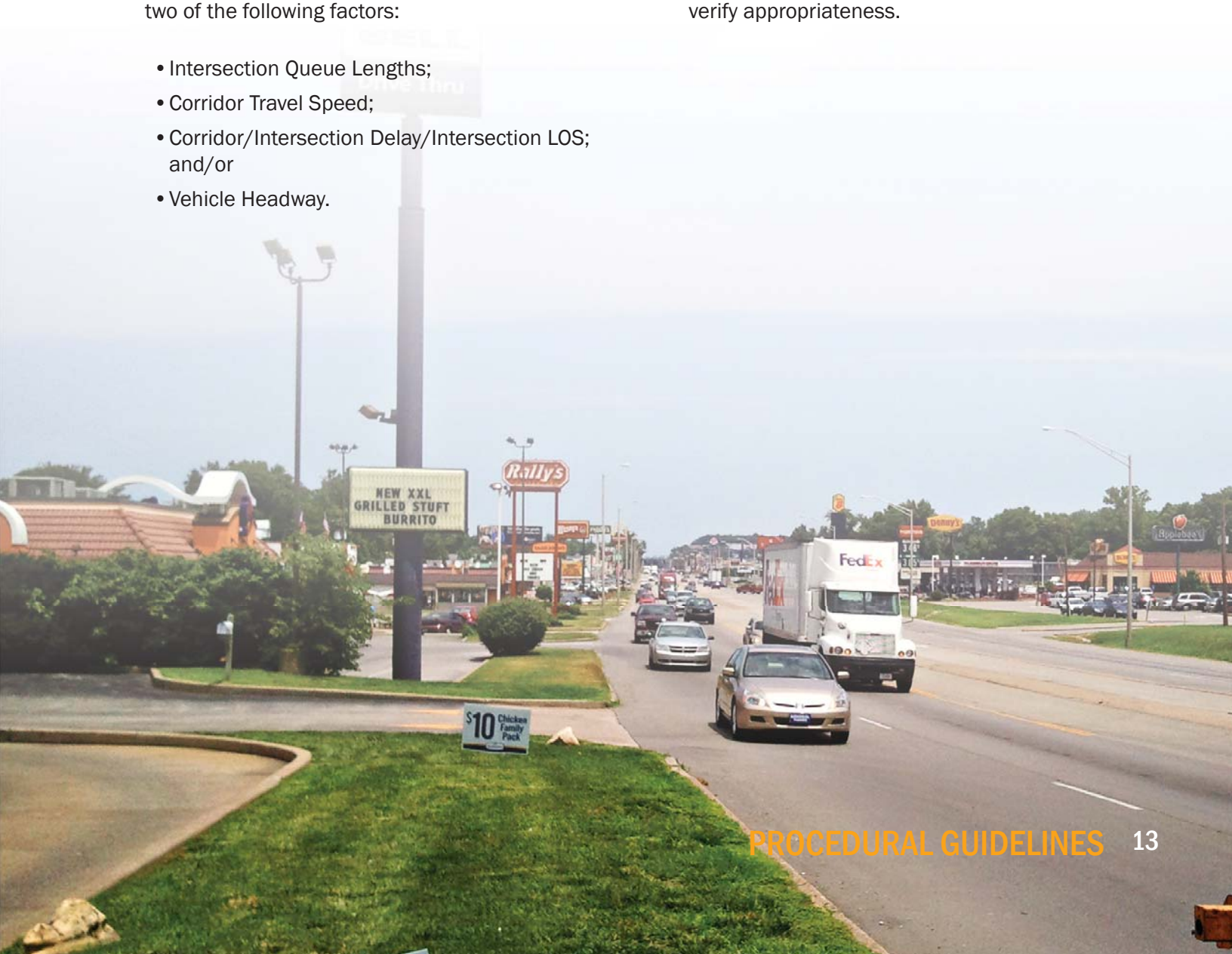
The existing conditions analysis shall include existing traffic volumes and traffic control. The existing conditions (field verified) shall be used to calibrate and validate the analysis model. Calibration shall be made with regard to at least two of the following factors:

- Intersection Queue Lengths;
- Corridor Travel Speed;
- Corridor/Intersection Delay/Intersection LOS; and/or
- Vehicle Headway.

Should discrepancies exist between the existing conditions analysis output and observed values, modifications to the analysis procedures shall be established in cooperation with the Responsible Authority to accurately reflect the conditions in the field.

All scenarios evaluated shall include analysis of the weekday AM and PM peak hours. When a proposed development is anticipated to generate a high volume of traffic during non-traditional peaks, such as a noon peak, late night or weekend peak period, these periods shall also be examined.

Any deductions in trip generation estimations for pass-by trips, diverted link trips, and/or internal trips shall require regional supporting data to verify appropriateness.

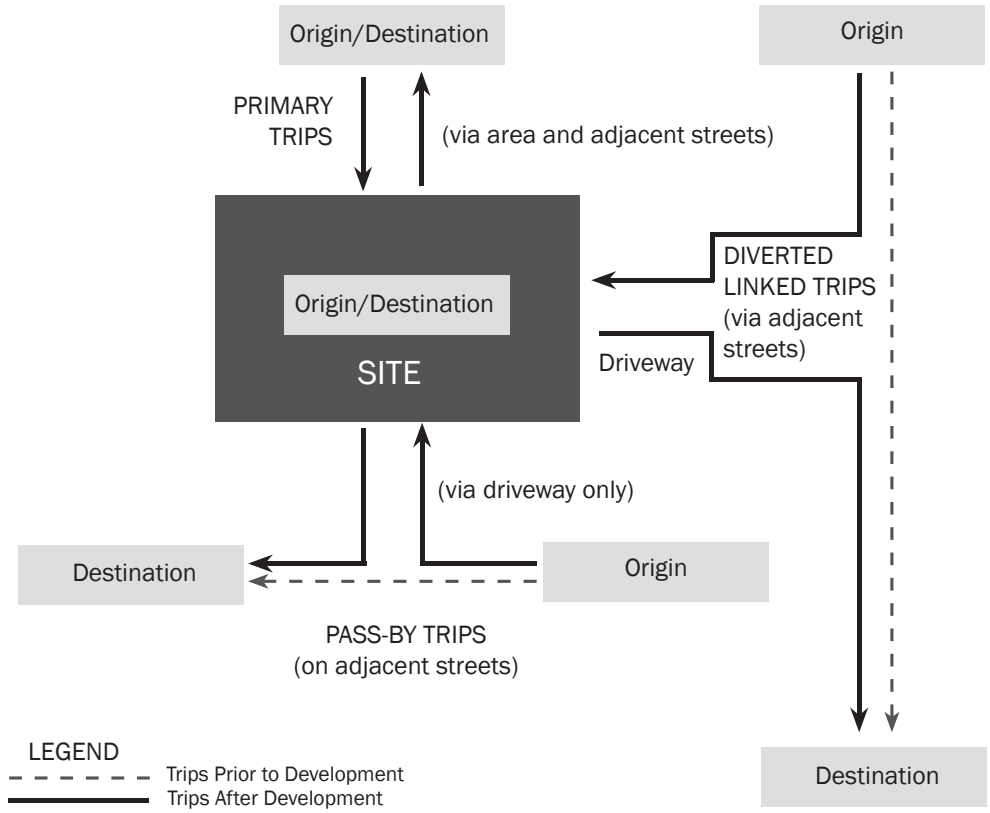


TYPE OF TRIPS

"Pass-by trips are closely linked to the size of the development and the volume of traffic on the adjacent street that can deliver the pass-by trip. However, predictive mathematical relationships have been elusive"

Source: ITE Trip Generation Manual, 9th Edition, Volume 1, User's Guide and Handbook

Figure 2: Types of Trips



Source: ITE Trip Generation Manual

Decisions regarding trip distribution shall be data driven, approved ahead of time by the Responsible Authority and supporting data shall be clearly outlined in the TIS document.

Mitigation measures used to correct detrimental impacts to the network may include, but are not limited to, any of the following:

- Installation of traffic signals;
- Installation of traffic control signs;
- Addition of through lanes;
- Addition of acceleration, deceleration, and turn lanes;
- Restricted turning movements;
- Adjustment of cycle lengths; and/or
- Introduction of additional signal phases.

Design of improvements shall seek to maintain a Level of Service (LOS) of C or better. A down-graded LOS D is acceptable if bike, pedestrian and transit considerations are being proposed.

For existing facilities with unacceptable LOS (D-F), improvements shall be designed to maintain the current LOS and all possible alternatives must be considered before the development is allowed to proceed. Alternatives shall include:

- Increased transit usage;
- Carpool/vanpool programs;
- Congestion pricing;
- Reduced parking or increased parking fees; and
- Staggered work schedules.

The cost of the TIS shall be borne by the developer requesting the permit. Once the TIS is completed it shall be submitted to the Responsible Authority allowing at least two weeks for review prior to any administrative meeting. The Responsible Authority will make recommendations as to required traffic system improvements that will be required of the developer. Costs for these required improvements will be borne by the developer.

ACCESS LOCATION CONSIDERATIONS

Driveways shall be located so as to minimize the degradation of the safe and efficient traffic flow and operation on the abutting roadway. Primary consideration will be given to driver/pedestrian safety when evaluating locations. The position of the driveway must provide the most favorable vision, grade, and alignment condition for vehicles using the roadway and the access point and will take into consideration the functional classification of the roadway, proximity to intersections, and the location of adjacent auxiliary lanes.

DID YOU KNOW?

AASHTO considers driveways as intersections.

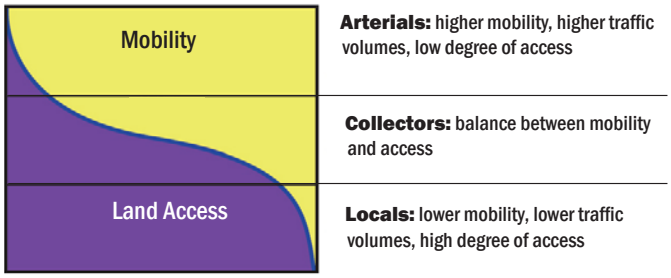
TECHNICAL APPLICATIONS

FUNCTIONAL CLASSIFICATION

The roadway network serves two functions: movement of traffic and property access. Roadway classification serves to define the primary purpose of a specific roadway. Figure 3 illustrates the relationship between access and movement function of basic roadway classification categories.

Contact the EMPO to determine functional classification.

Figure 3: Relationship between Functional Classification, Mobility, and Land Access

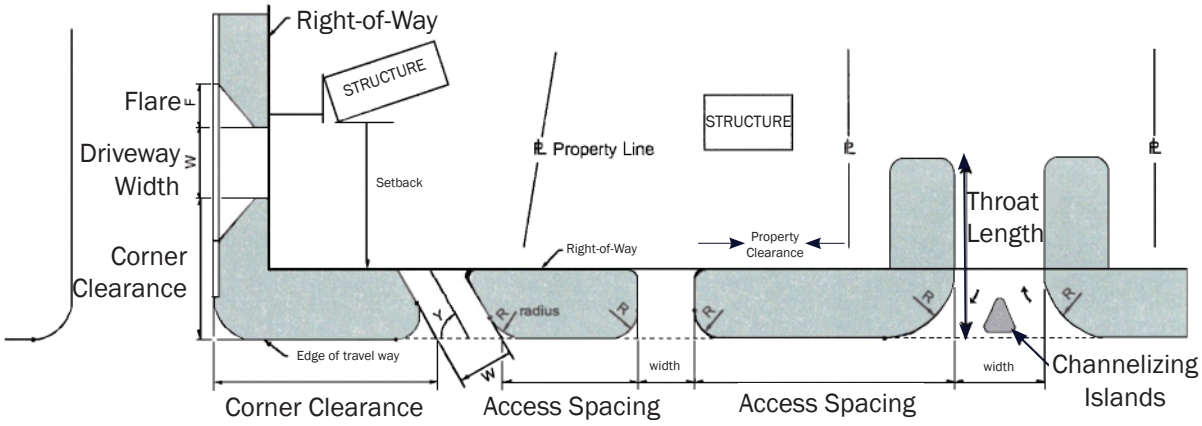


Source: Safety Effectiveness of Highway Design Features, Volume 1, Access Control, FHWA, 1992

CRITICAL DIMENSIONS

In order to assure that access points are designed to provide for safe and efficient movements, it is necessary to pay attention to their critical dimensions and design features. Figure 4 should be used to determine how to measure particular aspects of access design.

Figure 4: Critical Dimensions



Source: FDOT Driveway Information Guide, 2008

NUMBER OF DRIVEWAYS – LOT DEVELOPMENT

Lots shall be provided access as follows:

- The number of driveways shall be the minimum number necessary to provide reasonable access to the property.
- Properties with frontage on two or more roads shall only be provided access to the road with the lowest functional classification (or lowest traffic volume if they are the same functional classification).
- One-way directional pairs shall be considered as two individual drives. Only one (1) pair of one-way driveways may be used per street frontage.

When in the opinion of the Responsible Authority it is in the interest of good traffic operations at the driveway and it will not adversely affect the safety, operation, or capacity of the roadway(s), additional access locations may be permitted. All access points shall meet the minimum spacing, corner clearance and property clearance requirements presented in this document.

ADDITIONAL DRIVES

A second access may be permitted on local roads when lot frontage is 200 feet or greater or on collector roads and above with 300 feet of frontage or greater.

SIGHT DISTANCES

Sight distance standards are utilized from two different perspectives, that of the vehicle exiting a driveway onto a roadway and the amount of area a vehicle traveling along the roadway must monitor for safe passage. To provide the optimal safety and efficiency at a driveway, the drive location shall be placed at the location within the property frontage with optimal intersection and stopping sight distances in accordance with AASHTO standards. There may be situations where visual obstructions, the curvature of the roadway, the angle of the intersection, and terrain may physically limit the obtainable intersection sight distance. If adequate intersection sight distance cannot be achieved, at a minimum, sufficient stopping sight distance shall be required.

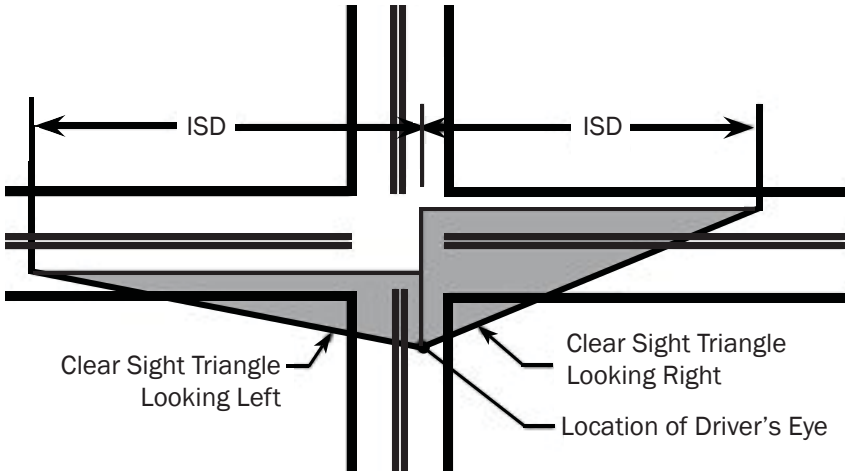
Intersection Sight Distance

Intersection Sight Distance (ISD) is the distance necessary for drivers to safely approach, cross and/or turn right or left at an intersection. The ISD is the most appropriate criteria for driveway operations since this allows the drivers both on the driveway and the roadway to adjust speeds and position to merge into traffic rather than requiring someone to make an emergency stop. The recommended dimensions of the clear sight triangle varies depending on the design speed of the roadway to be entered and driver gap-acceptance behavior. The Intersection Departure Sight Triangles shown in Figure 5 (on page 20) use the ISD in Table 1 for a driver's eye located 3.5 feet above the roadway surface and 17.8 feet back from the curb line. It is necessary to have an area created by a sight distance triangle free from all obstructions between two and eight feet above the curb including parked vehicles, signs, fences, and landscaping.

These values assume a passenger car can turn right or left into a two-lane roadway and attain 85% of the posted or design speed without being overtaken by an approaching vehicle that reduces speed to 85% of the posted or design speed. Increased sight distance is needed for the left-turn maneuver because the driver of the vehicle entering the roadway must evaluate traffic approaching from both the right and the left.

The minimum intersection sight distances shown in Table 1 were developed for 0% grades; therefore, values should be adjusted appropriately to account for the affects of grade on vehicle operation. In addition, adjustments to these minimum distances should be made for design vehicles other than passenger cars and for roadways with more than two travel lanes. Adjustments shall be made in accordance with AASHTO policies.

Figure 5: FHWA Intersection Sight Triangles



Source: AASHTO 2001 A Geometric Design of Highways and Streets

Table 1: Intersection Sight Distances

Intersection Sight Distance		
Posted Speed Limit (mph)	Left Turn From Stop (ft)	Right Turn or Crossing From Stop (ft)
30	335	290
35	390	335
40	445	385
45	500	430
50	555	480
55	610	530

Source: AASHTO 2001 A Geometric Design of Highways and Streets

Stopping Sight Distance

The safe stopping sight distance, defined as a minimum distance necessary for vehicles traveling on the adjacent street to perceive, react, and stop for any potential conflict in the roadway, is the minimum requirement at every driveway. It is the sum of two distances (AASHTO, Green Book) (see Table 2):

1. Reaction distance – the distance traveled by the vehicle from the instant the driver sees an object necessitating a stop to the instant the brakes are applied; plus
2. Braking distance – the distance traveled by the vehicle from the instant the brake is applied to the instant when the vehicle has come to a complete stop.

The reaction distance is based on the reaction time of the driver and the speed of the vehicle. The braking distance is dependent upon the vehicle speed and the coefficient of friction between the tires and roadway.

Figure 6 shows an example of where the minimum stopping sight distances are obstructed by horizontal and vertical curves, and vegetation.

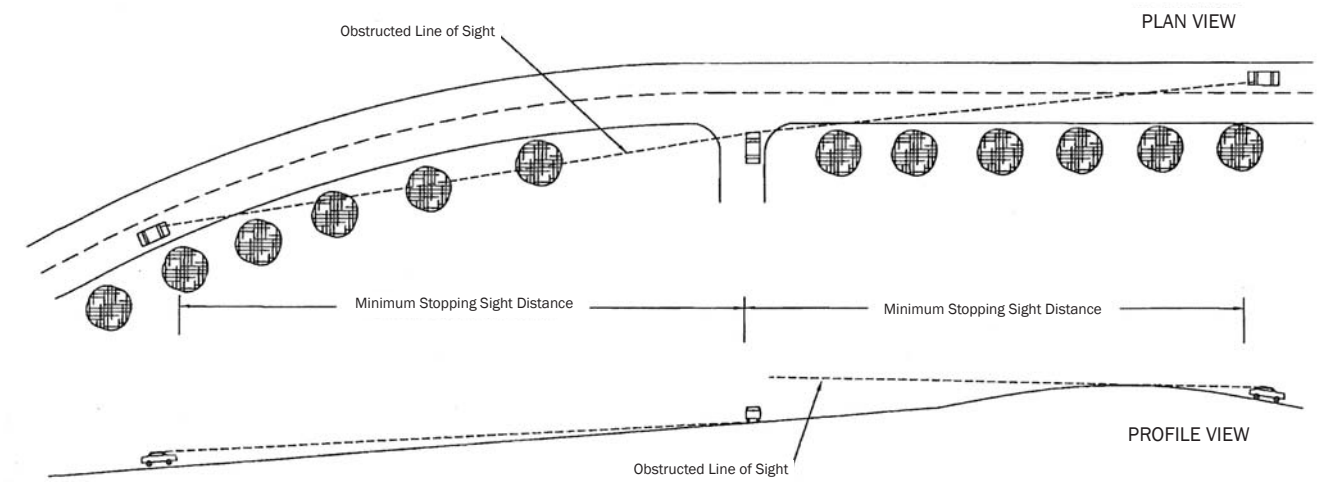
If the minimum stopping sight distance requirements for a driveway cannot be met due to on-site placement of shrubbery, signs, or other objects that obstruct driver vision, then the applicant will be required to remove the obstruction(s).

After sight distance requirements are met and the access permit issued, the driveway area must remain free from any visual obstruction to the required sight distance including, but not limited to, signs, fences, landscaping and parked vehicles.

If the minimum sight distance requirement cannot be met for a specific turning/crossing movement(s), the access driveway shall be designed to prohibit such movements, or the proposed land use may be denied. Direct access to a parcel will be denied when the required sight distances cannot be obtained and when restrictions to turning movements to/from the proposed development are not practical or acceptable. If such conditions occur, indirect access to the property may be allowed, at the expense of the owner, in one of the following ways:

1. Compensation to an adjacent property owner to acquire indirect access to the subject parcel through an access easement.
2. Construction of a frontage road serving the subject property and connection with the public roadway at a point where safe access can be provided that meets the requirements of the manual.
3. Development of access to another roadway (in the case of a corner property).

Figure 6: Stopping Sight Distance Examples



Source: Access Management Guidelines for Activity Centers, NCHRP Report 348. Transportation Research Board. National Research Council. Washington, D.C., 1992

Table 2: Stopping Sight Distances

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking distance on level (ft)	Calculated (ft)	Design (ft)
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.5	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

Source: AASHTO 2001 A Geometric Design of Highways and Streets

Note: Many assumptions including level grade, 2-lane roadway, undivided facility, stop controlled minor approach and a passenger vehicle.

CORNER ACCESS AND CLEARANCE

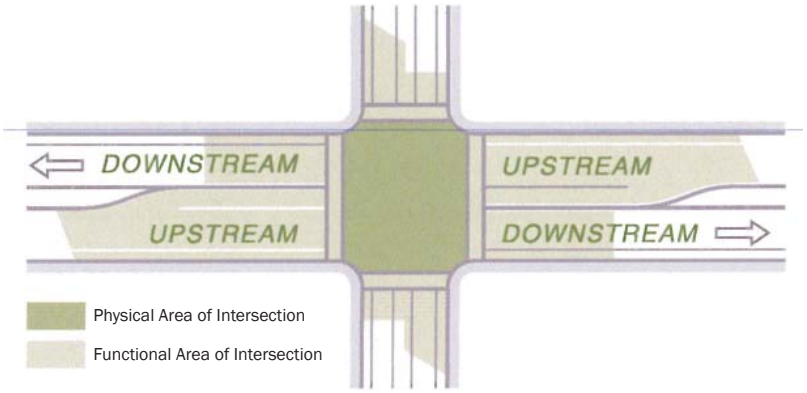
First and foremost, access to corner properties shall be permitted on the roadway having the lower functional classification. In cases where the two roadways have the same functional classification, the access point will be located on the roadway having the lower traffic volume. When in the opinion of the Responsible Authority, it is in the interest of good traffic operation at the driveway and it will not adversly affect the safety, operation, or capacity of the roadway, additional access locations may be permitted.

The purpose of corner clearance is to separate the driveway conflict area from the intersection area. Driveways (or proposed roadways) shall not be situated within the functional area of at-grade intersections. The functional area extends beyond the physical intersection of the major roadway and the crossroad as shown in Figure 7 to include the upstream approaches where deceleration, maneuvering and queuing takes places, as well as the downstream departure area beyond the intersection where potential driveway conflicts can occur that could generate queues backing up through the intersection. Unlike the physical area of an intersection, the functional area of an intersection is variable and consists of these basic elements:

Upstream: perception-reaction distance, maneuver distance, and queue-storage distance
Downstream: stopping sight distance

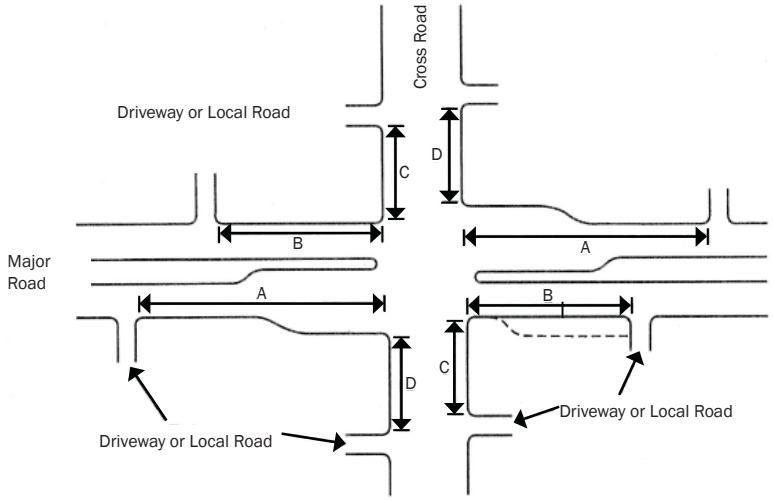
Corner clearance shall be measured from the edge of pavement of the intersecting street to the edge of pavement of the access drive, as shown in Figure 8.

Figure 7: Intersection Functional Area



Source: FHWA's Access Management

Figure 8: Corner Clearance



Source: INDOT Access Management Guide, September 2009

Table 3: Corner Clearance Distances

		Major Road = **Arterial**	
			minimum
Major Road	A	(PIEV + Maneuver distance) + Queue	AASHTO Stopping Sight Distance
Major Road	B	B = A*	AASHTO SSD
Crossroad	C	Queue length	AASHTO SSD
Crossroad	D	AASHTO stopping sight distance	AASHTO SSD

* if non-transversable median is present (RI/RO only), then B = AASHTO stopping sight distance

		Major Road = **Collector**	
			minimum
Major Road	A	(PIEV + Maneuver distance) + Queue	AASHTO Stopping Sight Distance
Major Road	B	B = A*	AASHTO SSD
Crossroad	C	Queue length	100 ft.
Crossroad	D	AASHTO stopping sight distance	100 ft.

* if non-transversable median is present (RI/RO only), then B = AASHTO stopping sight distance

		Major Road = **Local**
		minimum
Major Road	A	50 ft.
Major Road	B	"
Crossroad	C	"
Crossroad	D	"

Source: modified from INDOT's Access Management Guide, September 2009

Table 4: PIEV and Maneuver Distances

PIEV + Maneuver Distance	
Speed (mph)	Distance (ft)
25	200
30	230
35	280
40	330
45	430
50	550
55	680

Source: INDOT Access Management Guide, September 2009

Table 2 from Page 21: Stopping Sight Distances

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking distance on level (ft)	Calculated (ft)	Design (ft)
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.5	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

Source: AASHTO 2001 A Policy on Geometric Design of Highways and Streets

Determine the Functional Classification (contact the EMPO for determination) of the roadways and follow the appropriate chart on the next page (Table Group 3) to determine the appropriate corner clearance.

Where:

PIEV distance = Distance traveled during Perception-Reaction-Evaluation-Volition (aka perception-reaction time)

Maneuver distance = Distance traveled while maneuvering and decelerating to a stop

Queue/Queue length = distance to back-of-queue for longest lane group during the peak hour (95th percentile queue length for model outputs)

The PIEV + Maneuver Distance is given in Table 4. The AASHTO Stopping Sight Distances for basic assumptions including level grade, 2-lane roadway, undivided facility, stop controlled minor approach and a passenger vehicle are found in Table 2 on page 21, but repeated below for convenience. Queue length is determined by field investigation for existing condition and model analysis for future conditions.

Note: Many assumptions including level grade, 2-lane roadway, undivided facility, stop controlled minor approach and a passenger vehicle.

If the corner clearances cannot be achieved due to insufficient frontage lengths, then one of the following measures shall be taken:

1. Left-turns shall be prohibited at the driveway, especially if the driveway traffic would be required to cross three or more lanes or two lanes and a center left-turn lane. Driveways with left-turn restrictions must be designed and constructed to physically prohibit left-turn and through movements. If space is not available for a non-traversable center median, the Responsible Authority can consider flexible traffic posts placed along the center line to prohibit left turns.
2. Access to the corner property shall be limited to the roadway having the lower functional classification and shall be located as far from the intersection as practicable.
3. Shared access with a neighboring property shall be sought.

FACT:

Prohibiting traffic movements at the drive through the use of traffic signs or pavement markings only shall not be considered as a restrictive measure.

Median openings shall be treated as intersections and an access shall be located so as to exceed the minimum corner clearance standard. This requirement may be waived where the median opening is specifically constructed or reconstructed to provide access to the property in question.

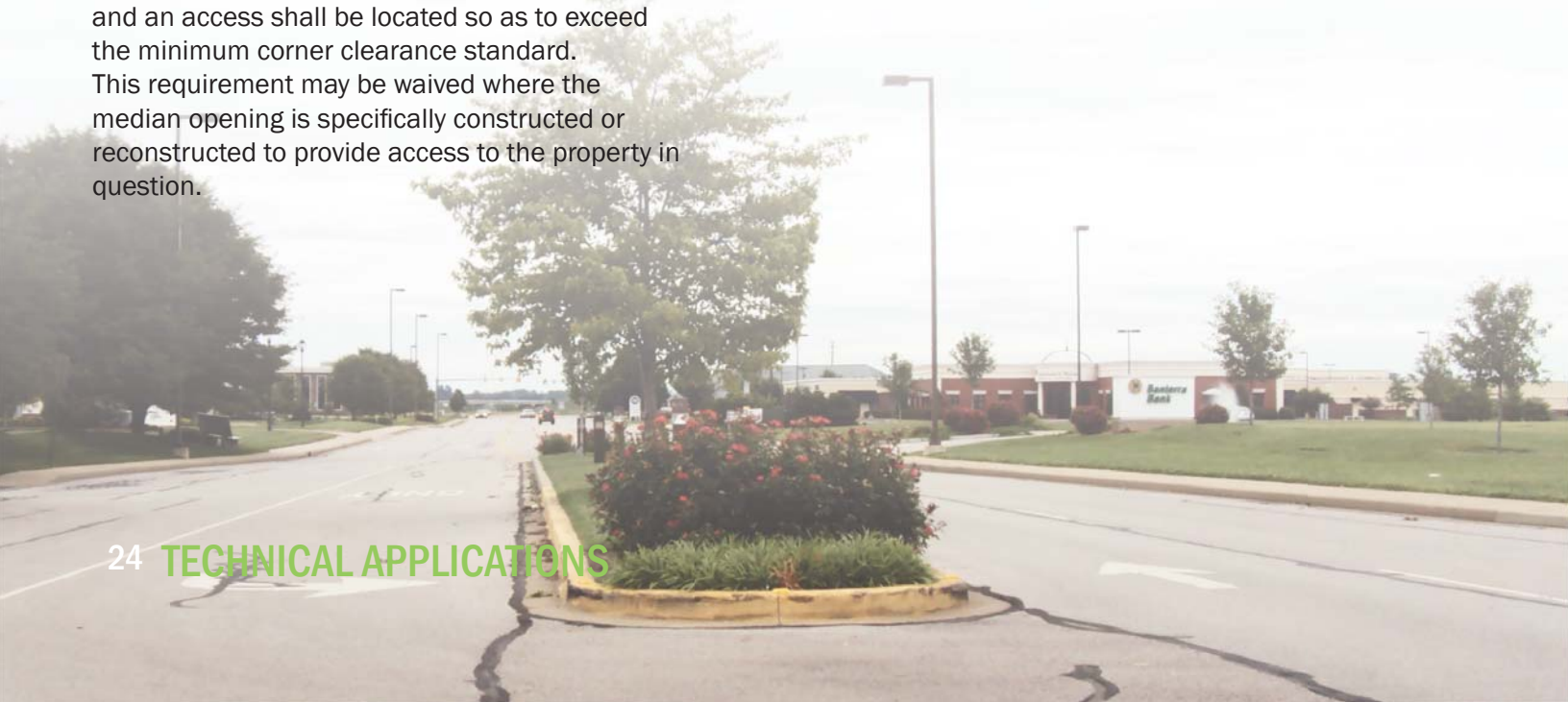
SPACING OF ACCESS POINTS

Minimum spacing is related to the operation characteristics of the roadway and the interactions between adjacent driveways. When adequate distance between access points exist:

- Delay is reduced;
- Stop and go driving is minimized;
- Allows adequate time for decision-making;
- Conflict points are separated;
- Separates conflicts for pedestrians; and/or
- Allows space for streetscaping.

If the minimum spacing cannot be achieved, joint/shared access between properties under the same ownership shall be required. Otherwise, joint/shared access will be encouraged and the access will be placed as close to the minimum spacing as practicable.

The ability to provide adequate access spacing is directly related to the amount of street frontage apportioned to individual properties. Therefore, the critical requirement of access spacing must be considered when subdividing land for development.



Same Side of Road

Table 5 indicates the minimum spacing for various roadway speeds to eliminate overlap of conflict areas thus allowing the driver of a through vehicle to monitor one access point at a time rather than two or more simultaneously. Access points shall be offset as shown in Table 5.

Opposite Side Alignment

Appropriate access spacing on the opposite side of the road reduces problematic jogging maneuvers. Access points shall be directly aligned on low volume, low speed roadways when practicable or be offset as shown in Table 5 to prevent the crash prone situations indicated in Figure 9. On high speed, high volume roadways, directly aligned access points should only be considered where future signalization would be appropriate or where an eventual median installation has been considered.

Table 5: Minimum Access Spacing*

Minimum Access Spacing*	
Speed (mph)	Distance (feet)
30	185
35	245
40	300
45	350
50	395
55	435

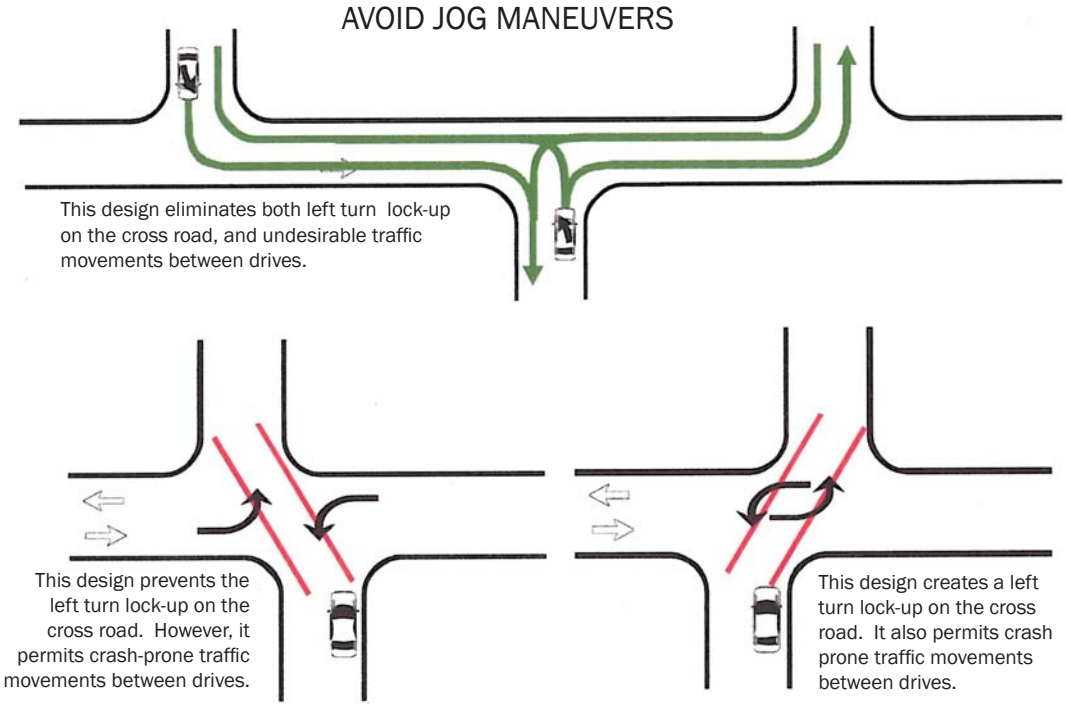
*Does not apply to lots supporting one single-family or one duplex dwelling unit on local roads.

Source: INDOT Driveway Permit Handbook 1996

RETROFIT OR INFILL

If the minimum spacing requirements cannot be met in a retrofit or infill situation, it must be maximized in coordination with the Responsible Authorities priorities for the roadway involved.

Figure 9: Sufficient vs. Insufficient Access Spacing



Source: FDOT Driveway Information Guide 2008

PROPERTY CLEARANCE

Property line clearance requirements are intended to assist in maintaining adequate driveway spacing should the minimum driveway separation distances be unattainable. The minimum property line clearance for various speeds are shown in Table 6.

These distances are intended to apply to neighboring property lines. Corner clearance distances are applicable on property lines running parallel to roadways.

Under no circumstance shall any part of a private access drive, including the approach radii, extend beyond an adjacent property line (extended perpendicular from the existing right-of-way line to the roadway centerline) without the written permission of the adjacent property owner (or as granted in a shared access agreement).

Table 6: Property Clearance Distances*

Property Clearance*	
Speed (mph)	Distance (feet)
20	40
25	50
30	60
35	75
40	90
45	115

*Does not apply to lots supporting one single-family or one duplex dwelling unit on local roads.

Source: INDOT Driveway Permit Handbook 1996

RETROFIT OR INFILL

If the minimum clearance requirements cannot be met in a retrofit or infill situation, it must be maximized in coordination with the Responsible Authorities priorities for the roadway involved.

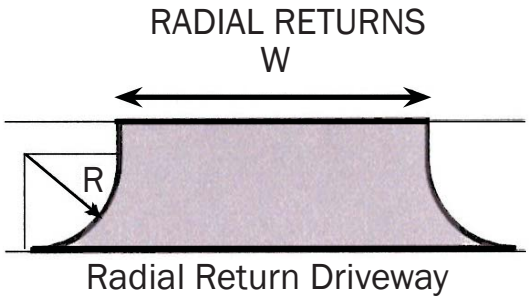
ACCESS DESIGN CONSIDERATIONS

Access design standards are developed to aid in producing efficient ingress and egress designs that can accommodate the access needs of the development, while maintaining the integrity of the surrounding roadways. The specific access design elements are influenced by several factors including the volumes and types of vehicles using the driveways, the adjacent roadway speed limit, and the through volumes on the public street.

THROAT WIDTH AND TURNING RADII

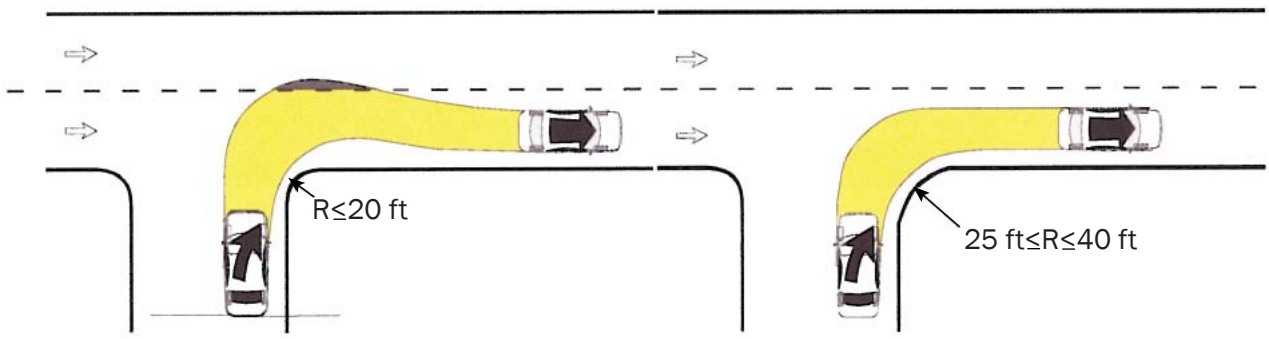
When designing the access approach, the selection of an appropriate throat width (W) must be coordinated with the return radii (R) selection. See Figure 10. Increasing the return radii at an approach provides for smoother right turns thus reducing the needed throat width. Figure 11 demonstrate the relationship between radii and throat width with respect to turning movements. Providing larger return radii, however, increases the time pedestrians are exposed to traffic and the speed at which a vehicle can execute egress and ingress maneuvers. Therefore, when determining appropriate access design, consideration should also be given to pedestrian safety and movement.

Figure 10: Components of Radial Return Driveways



Source: FDOT Driveway Information Guide 2008

Figure 11: Determining Appropriate Turning Radius



Source: FDOT Driveway Information Guide 2008

Throat width and return radii design requirements for two-lane, two-way drives are presented in Table 7. For one-way driveways, the minimum and maximum throat widths are twelve feet and eighteen feet respectively. Driveways intended for one-way operation shall be designed and constructed in a manner that will encourage proper use. The Responsible Authority will approve one-way access driveways only when design conditions ensure one-way operation. Commercial driveways with three or more entrance/exit lanes may be greater than the maximum shown in Table 7, if approved by the Responsible Authority.

NUMBER OF LANES

Where left-turns are permitted when exiting a commercial driveway, a separate, dedicated left-turn lane shall be considered. Even a small number of left-turning vehicles will cause significant delay to through or right-turning vehicles when only a single exit lane is provided. This 3-lane cross-section shall be required when expected daily volumes at the driveway exceed 600 vehicles. If through movements are necessary, they should be combined with the right-turning traffic or provided a separate through lane (with larger developments).

Consideration should also be given to the number of receiving lanes for a development. Larger developments with a dedicated right turn lane entering the site accompanied by left turn movements into the site should utilize two receiving lanes to ensure that all vehicles entering the site have adequate room for safe ingress.

THROAT LENGTH

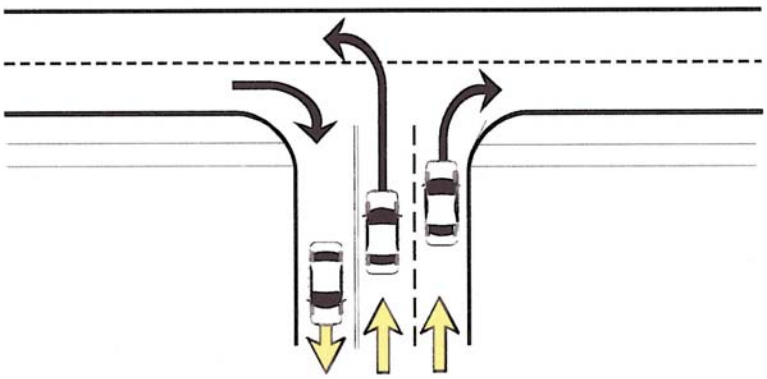
Throat length is the distance between the edge of the street pavement and the point where driveway traffic comes into conflict with the on-site traffic circulation including parking. Adequate distance is necessary to move the parking/circulation conflict area away from the driveway entrance/exit point. The depth of the throat length must be

Table 7: Minimum and Maximum Throat Width and Turning Radius for Two-Lane, Two-Way Drives

Throat Width and Turning Radius					
		Width		Radius	
	Driveway Class	Minimum	Maximum	Minimum	Maximum
Urban	Residential***	10	20	5**	15
	Commercial/Industrial	24	30*	20	40
	Field	12	24	20	40
Rural	Residential***	12	24	15**	15
	Commercial/Industrial	24	30*	20	40
	Field	12	24	20	40

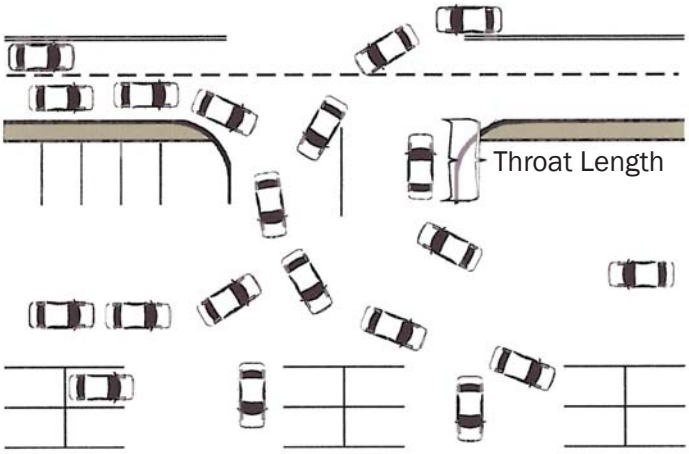
* Can be increased to 40 feet to accommodate commercial trucks.
** Rolled curbs = 0 feet
*** Applies to lots supporting one single-family residence or duplex only. Subdivision entrances follow the commercial standards.

Figure 12: 3-Lane Access Drive



Source: FDOT Driveway Information Guide 2008

Figure 13: Insufficient Throat Length



Source: FDOT Driveway Information Guide 2008

sufficient to allow on-site storage of vehicles to prevent "spillback" onto public streets or into site parking areas. Insufficient throat length is easy to identify (see Figure 13).

The minimum throat length shall be established by Table 8 or consideration to adjacent roadway volume, expected arrival and departure rates, size and possible trip generations of the development, and the design vehicle type, whichever is more restrictive.

Gated entrances shall provide entering storage for at least three design vehicles.

Table 8: Minimum Adequate Throat Length

Land Use	Throat Length
Any major entrance to a development with 4 or more total lanes in the driveway. (typically malls and "Big Box Centers")	300 or greater, based on traffic study
Regional Shopping Centers (over 150,000 sq. ft.)	250
Community Shopping Center (100-150,000 sq. ft.)	150
Small Strip Shopping Center	50
Smaller Commercial Developments (convenience store with gas pumps)	30

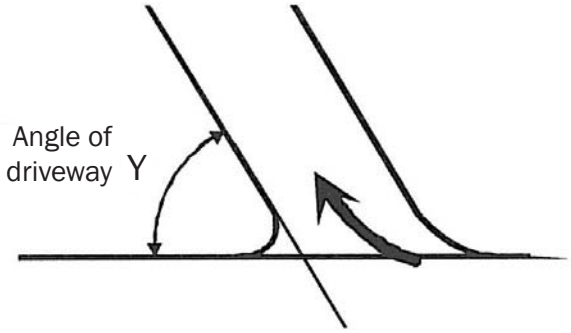
Source: FDOT Driveway Information Guide 2008

APPROACH ANGLE

The approach angle ("Y" in Figure 14), or angle of driveway intersection, directly affects the motorist field of vision and vehicular speeds as well as the selection of design features such as throat width, return radius and throat length. All driveways with unrestricted turning movements shall have an approach angle as close to 90 degrees as technically feasible. A minimum of 75 degrees can be permitted by the Responsible Authority when a greater angle has been determined to be infeasible. All one-way driveways shall have an approach angle as close to 90 degrees as possible with an acceptable minimum of 45 degrees but only when site restrictions are present. When a 90 degree approach angle is not possible, adequate compensation should be given to the throat width and return radius to meet the needs of all applicable vehicular maneuvers and pedestrian safety.

For a curved roadway section, the centerline of the driveway/roadway angle must be 90 degrees from a tangent to the curve at the point of access.

Figure 14: Angle of Driveway Approach



Source: FDOT Driveway Information Guide 2008

DRIVEWAY CHANNELIZATION

Channelization is the separation of conflicting traffic movements into definite paths of travel by traffic islands or pavement markings to facilitate the orderly movements of both vehicles and pedestrians. The results of proper channelization of traffic include:

- Increased capacity;
- Improved safety;
- Maximization of convenience; and/or
- Promoting driver confidence.

However, when channelization efforts are poorly designed, they may have a detrimental effect, worse than if no channelization was present. Over channelization has the tendency to confuse motorists and pedestrians by forcing the driver or pedestrian to view and comprehend multiple islands and pavement markings within a short distance of roadway along with surrounding traffic.

Often, simple traffic channelization measures can produce significant reductions in accident rates. Left-turn provisions often provide the greatest results because they provide the motorist with a safe and comfortable means for completing a left-turn. Consequently, the removal of a vehicle from through traffic lanes reduces the possibility of rear-end collisions.

Channelization of at-grade intersections is generally warranted for one or more of the following factors: (AASHTO's A Policy on Geometric Design of Highways and Streets, 2001)

1. The paths of vehicles are confined by channelization so that not more than two paths cross at any one point.
2. The angle and location at which vehicles merge, diverge, or cross are controlled.
3. The amount of paved area is reduced and thereby decreases vehicle wander and narrows the area of conflict between vehicles.
4. Clearer indications are provided for the proper path in which movements are to be made.
5. The predominant movements are given priority.
6. Areas are provided for pedestrian refuge.
7. Separate storage lanes permit turning vehicles to wait clear of through-traffic lanes.
8. Space is provided for traffic control devices so that they can be more readily perceived.
9. Prohibited turns are controlled.
10. The speeds of vehicles are restricted to some extent.

The design of a channelized intersections must consider the following factors: the type of design vehicle, the cross sections of the cross streets, the projected traffic volumes in relation to capacity, the number of pedestrians, the speed of vehicles, and type and location of traffic control devices. Physical constraints such as limited right-of-way and terrain must be considered to determine whether the channelization will be economically feasible.

Design principals should be followed when designing a channelized intersection. The extent to which the following principles are applied should depend on the characteristics of the total design plan.

- Motorists should not be confronted with more than one decision at a time.
- Unnatural paths that require turns greater than 90 degrees or sudden and sharp reverse curves should be avoided.
- Areas of vehicle conflict should be reduced as much as possible. However, merging and weaving areas should be as long as conditions permit. Channelization should be used to keep vehicles within well-defined paths that minimize the area of conflict.
- Traffic streams that cross without merging and weaving should intersect desirably at right angles with a range of 60 – 120 degrees acceptable.

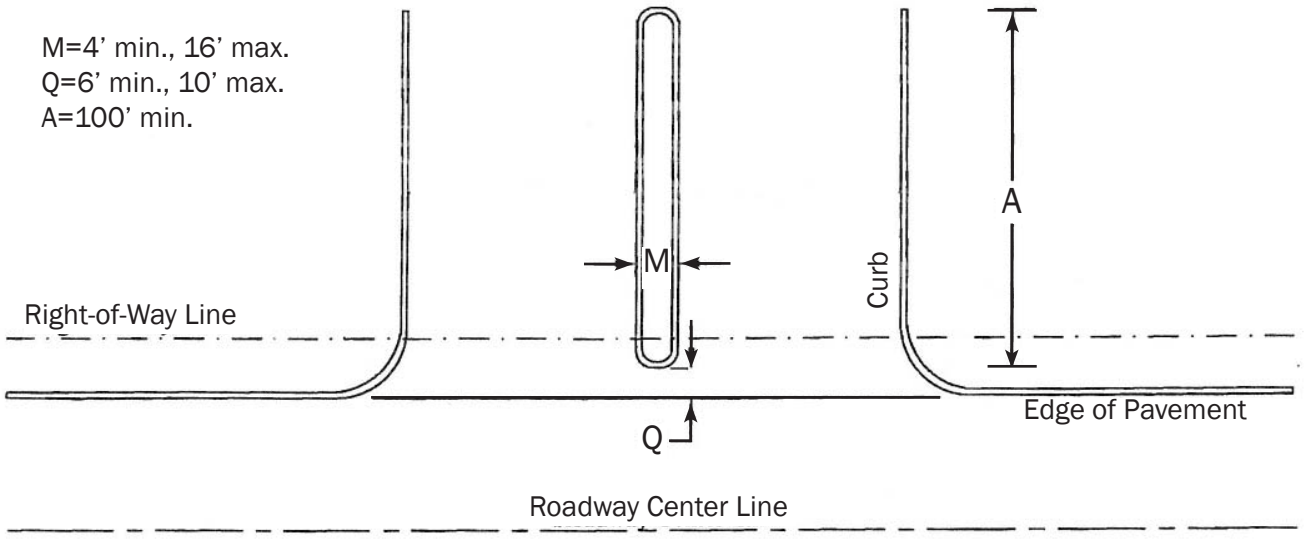
- The angle of intersection between merging streams of traffic should be appropriate to provide adequate sight distance.
- The points of crossing or conflict should be studied carefully to determine if such conditions would be better separated or consolidated to simply design with appropriate control devices added to ensure safe operation.
- Refuge areas for turning vehicles should be provided clear of through traffic.
- Prohibited turns should be blocked wherever possible.
- Location of essential control devices should be established as a part of the design of a channelized intersection.
- Channelization may be desirable to separate the various traffic movements where multiple phase signals are used.

Divided Driveways should be considered when the following are true:

- A large pavement area that may confuse drivers;
- Right in/Right out driveways where movements may be unclear;
- Traffic over 4,000 vehicles per day is expected;
- It is expected that a signal will be installed at the driveway in the future; and/or
- When the driveway has two or more receiving lanes

Typical divided entrances should follow the minimum and maximum diminsions in Figure 15.

Figure 15: Typical Divided Entrance Dimensions



In accordance with the AASHTO Green Book (2004), triangular curbed islands should be over 125 square feet with each side at least 15 feet in length. "Pork chop" channelization should not be used as the only means of preventing left turns. These can be useful on roadways with medians where the island is only there to guide the driver to the allowed movement.

The use of "pork chop" islands on high-speed facilities is not generally acceptable, and alternative designs should be considered.

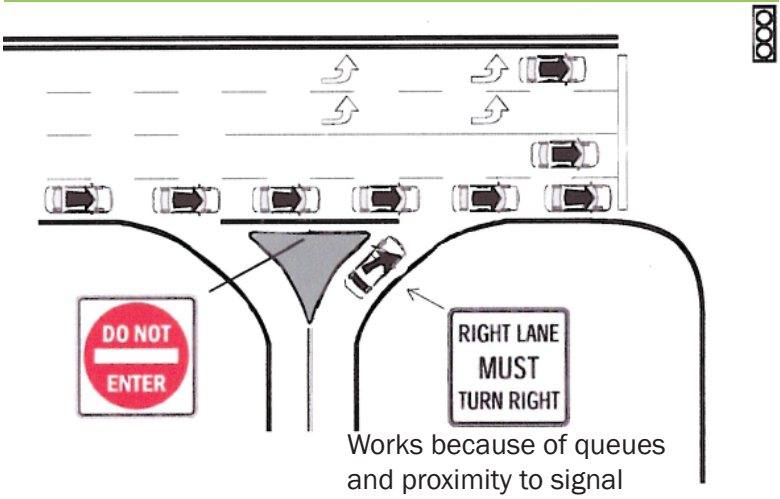
AUXILIARY LANES

An auxiliary lane is a portion of the roadway set aside for speed change, turning, storage, weaving, truck climbing and other purposes that are supplementary to the through movement of traffic.

Left and right-turn auxiliary lanes can significantly enhance the operation and safety of a roadway by allowing turning vehicles to reduce speed and wait to enter a driveway safely without creating unnecessary congestion for the roadway through traffic. If two or more successive driveways require the installation of a deceleration lane or if adjacent driveways are spaced so close that they would encroach on the deceleration lane, a continuous right turn lane shall be provided.

The purpose of an acceleration lane is to allow vehicles exiting from a driveway to accelerate to the speed of the through traffic prior to the merge maneuver. When the adjacent roadway speeds are 50 mph and above and/or right turn egress volumes are high, an acceleration lane may enhance the safety and capacity of the driveway area.

Figure 16: Appropriate Right-In/Right-Out Island Application



Works because of queues and proximity to signal

Source: FDOT Driveway Information Guide 2008

Passing blisters are intended to provide an additional lane so that through traffic can maneuver around left turning vehicles on a two-lane roadway in lieu of a left turn lane.

Auxiliary lanes shall be required when the conditions warrant as shown in Table 9, or for any or all of the following reasons:

- Projected roadway traffic counts;
- Accident experience;
- Existing traffic patterns;
- Number of existing roadway lanes;
- Sight distance;
- Existing speed limit; and/or
- Other specific traffic or site conditions.

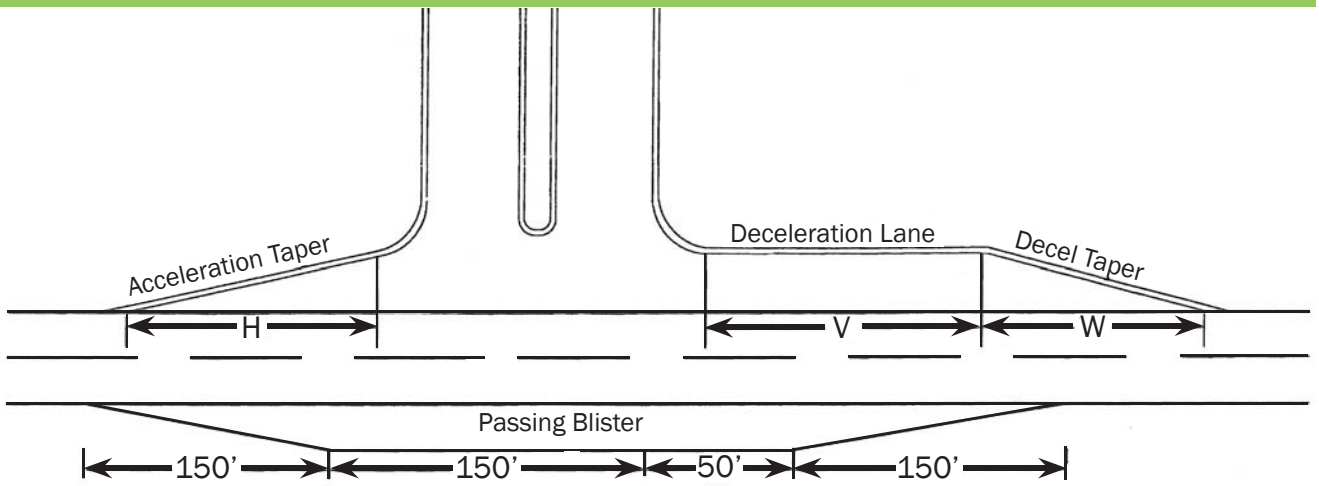
It is the responsibility of the applicant to submit the required study.

Table 9: Auxiliary Lane Warrants

Right and Left Turn Lanes				
Number of Through Lanes	Minimum Road AADT*	Minimum Peak Hour Entering Vehicles**	OR	Minimum Daily Entering Vehicles**
2	4,000***	30		300
4	8,000	30		300
Passing Blisters				
2	4,000***	30		300

* Includes existing plus proposed traffic volumes at the access point
** Includes existing plus proposed turns at the access point
***4,000 AADT existing plus proposed traffic volumes OR the adjacent roadway lane-width is 10 ft. or less

Figure 17: Auxiliary Lane Design



The minimum lengths are shown in Table 10 (also see Figure 17 on previous page). The lengths given do not include storage lengths and shall be amended when storage is required. Unsignalized right turn lanes would normally not have queues and therefore storage is generally unnecessary. As a minimum requirement, storage length for at least two passenger cars shall be provided. For locations where there is over 10 percent truck traffic, space shall be provided for at least one car and one truck. Any detailed study such as a traffic impact study shall design auxiliary lanes to AASHTO standards or the appropriate state guidelines as agreed upon by the Responsible Authority.

Table 10: Minimum Auxiliary Lane Design Lengths

Minimum Auxiliary Lane Design Lengths			
Speed (mph)	W = lane taper length (ft)	V = decel length (ft)	H = accel taper length (ft)
30	100	230	N/A
40	100	330	N/A
45	100	430	N/A
50	100	550	180

Source: modified from AASHTO 2001 A Policy on Geometric Design of Highways and Streets

MEDIAN ISSUES

Requests for private or commercial median openings will not be approved unless the proposed opening meets the minimum distance requirements shown in Table 11. If the requirements established are met, a median opening will be considered after review of the following conditions:

- Alternatives to crossover traffic;
- Safety and/or accident potential;
- Proximity of location and potential influence on adjacent intersection; and
- Potential of future signalization.

It is the responsibility of the applicant to prove to the Responsible Authority that a median opening will not be detrimental to the safety of the motoring public. The applicant is responsible for any additional right-of-way and construction of the opening and left turn lanes.

It is noted that a median crossover is not a property right and can be removed at any time if the Responsible Authority considers it a safety hazard. Failure of the median crossover including too many stored vehicles, excessive deceleration of vehicles in through lanes of traffic, and increased accident rates may be grounds for median closure. Median openings are also subject to closure where traffic volume and/or crash experience warrants a signal and signal spacing criteria cannot be met.

Table 11: Distance Between Median Openings

Distance Between Median Openings		
Speed (mph)	Absolute Minimum (ft)	Desirable (ft)
25	400	400
30	400	400
35	400	460
40	400	530
45	400	670
50	430	780
55	510	910

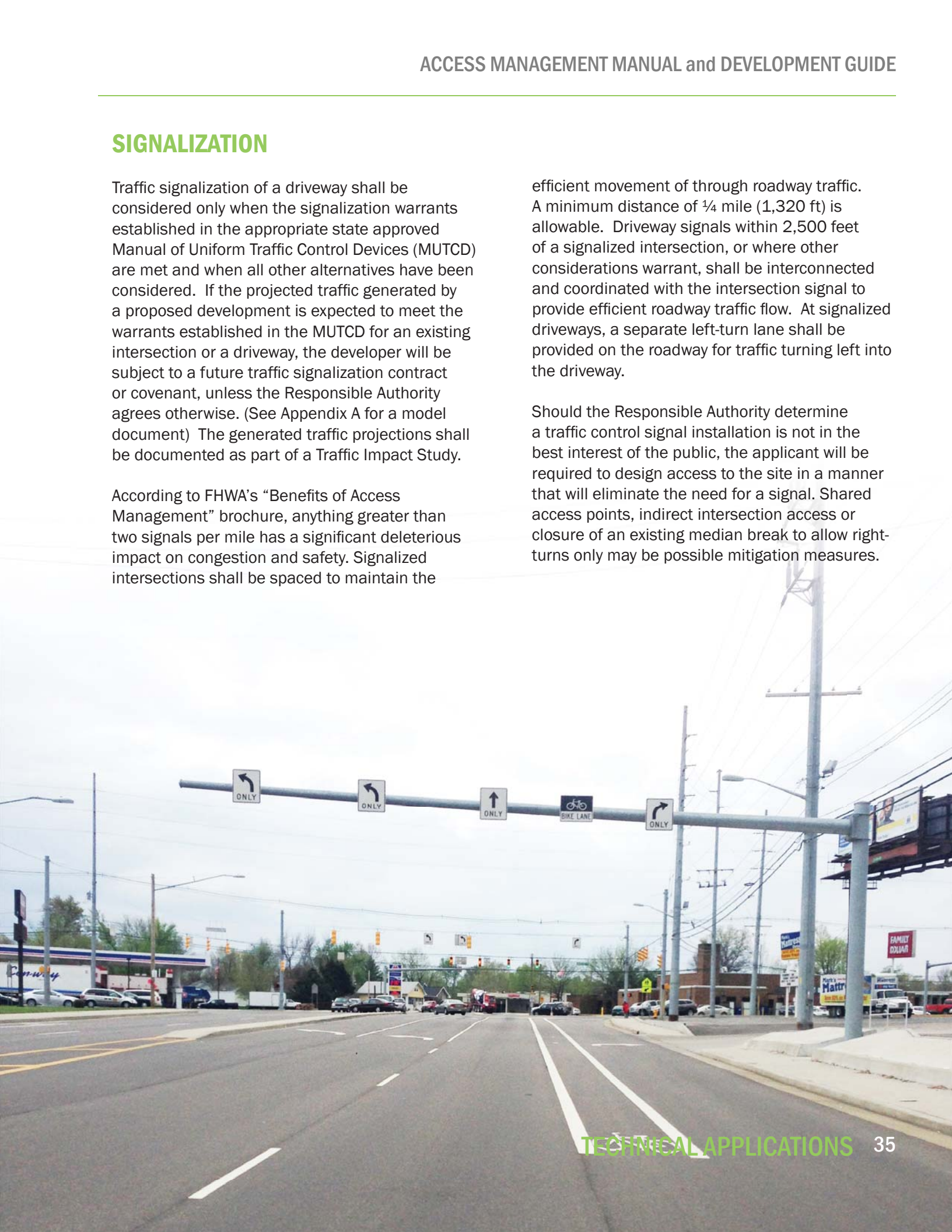
Source: Evansville Urban Transportation Study, Access Standards Manual, 1994

SIGNALIZATION

Traffic signalization of a driveway shall be considered only when the signalization warrants established in the appropriate state approved Manual of Uniform Traffic Control Devices (MUTCD) are met and when all other alternatives have been considered. If the projected traffic generated by a proposed development is expected to meet the warrants established in the MUTCD for an existing intersection or a driveway, the developer will be subject to a future traffic signalization contract or covenant, unless the Responsible Authority agrees otherwise. (See Appendix A for a model document) The generated traffic projections shall be documented as part of a Traffic Impact Study.

According to FHWA's "Benefits of Access Management" brochure, anything greater than two signals per mile has a significant deleterious impact on congestion and safety. Signalized intersections shall be spaced to maintain the efficient movement of through roadway traffic. A minimum distance of ¼ mile (1,320 ft) is allowable. Driveway signals within 2,500 feet of a signalized intersection, or where other considerations warrant, shall be interconnected and coordinated with the intersection signal to provide efficient roadway traffic flow. At signalized driveways, a separate left-turn lane shall be provided on the roadway for traffic turning left into the driveway.

Should the Responsible Authority determine a traffic control signal installation is not in the best interest of the public, the applicant will be required to design access to the site in a manner that will eliminate the need for a signal. Shared access points, indirect intersection access or closure of an existing median break to allow right-turns only may be possible mitigation measures.




Welcome
WBURGH, INDIANA
EST. 1803
Sprout
STOP

THE ROLE OF ACCESS MANAGEMENT

Access Management plays a major role in the development process as a tool to create safe and efficient ingress and egress to all types of development. Ideally, the first step in the site design process should be consideration for the location of the access point. Establishing a safe and reasonable access point for a development should be paramount. The safety of motorists and pedestrians should take precedent over the "ideal" location of a building or parking layout. The second step should be to explore parking layouts and on-site circulation according to the appropriate ingress/egress location. Finally, the building location should be established in accordance with the previous process. This process of developing from the outside in, will create safer access to the site so customers will be more willing to make subsequent returns, more efficient flow of traffic on the adjacent roadway network, and increased pedestrian safety and access.

DEVELOPMENT CONSIDERATIONS

PARKING AND ON-SITE CIRCULATION

Poor on-site circulation and access are detrimental to the public using the facility, the adjacent roadway, and the private capital invested in the development. It is imperative that the Responsible Authority address these components within the site development process. Often poor access and circulation design leads to the following problems:

- Inadequate access capacity;
- On-site congestion;
- Congestion on the public roadway network;
- High crash experience on the public street;
- High crash experience on-site;
- Pedestrian-vehicular crashes;
- Loss of customers;
- Unstable land use; and/or
- Decrease in property value.

To establish a good pattern of on-site circulation, internal connection between parking aisles and parking areas on opposite sides of the building or development should be provided. Situations where a motorist enters a parking aisle to find that not only are there no parking spaces available but there is no way other than backing out to exit the aisle creates a sense of confusion for the motorist and creates a potential on-site conflict. In general, dead ending a parking aisle should be avoided. But when necessary, there are appropriate treatments for providing a way to turn-around. See Figure 18 for an example of an appropriate treatment for a dead end parking aisle.

Figure 18: Appropriate Turn-Around Area for a Dead End Parking Aisle

The same holds true for motorists who enter one side of the development and find that no parking is available but instead of being able to drive to the other side of the building via on-site circulation, the motorist is forced to exit the site, accelerate for a short distance on the roadway and then enter the site once again at another location. Forcing motorists onto the adjacent roadway network, especially for short distances while driving slowly, creates a safety hazard for the motorist and for the through traffic on the roadway. Providing adequate maneuvering room on-site and connecting parking areas and aisles will create a safe and enjoyable experience for those visiting the development.

The intersections of parking aisles should be as close to ninety degree as possible to insure adequate site distance within the parking lot. Sufficient clearance should exist to prevent parked cars from blocking visibility at aisle intersections or at the access drive. Landscaped islands at the end of parking aisles and within the parking area add aesthetics to the overall development and shall be encouraged. However, the landscaping used shall not create site visibility restrictions for motorists or hinder on-site circulation.

Site design should also be considered from a pedestrian's point of view. The final design should not just accommodate walking, but should encourage it. See Pedestrian and Cyclist Considerations on page 45 for more information on how to ensure sites are designed for pedestrian use.

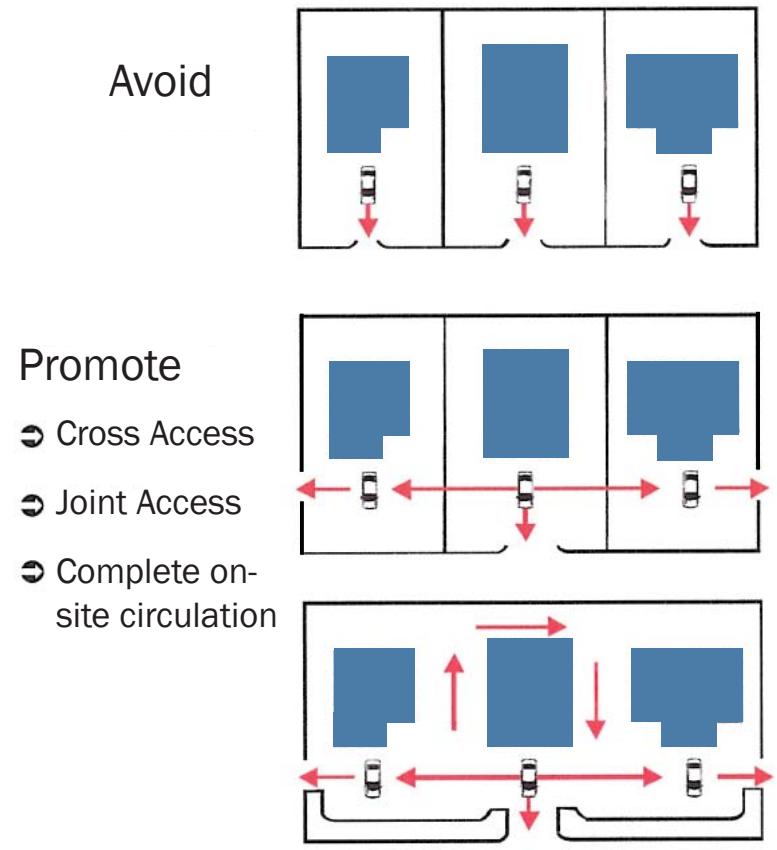
Figure 19: Appropriate On-Site Circulation

SHARED ACCESS

The use of shared access drives will reduce the number of conflict points and provide greater distance between conflict points on the roadway. The enhanced traffic flow on the roadway will increase egress capacity and reduce vehicular crashes.

Access points that are too close to each other tend to reduce the functionality of each drive. The use of shared access points allow right turn lanes to be installed which help motorists decelerate without hindering through movements. Developments on adjacent properties along major thoroughfares shall be asked to utilize shared access points when feasible. Shared access points shall be considered when subdividing property for all lots that cannot meet the spacing, sight distance, property clearance and/or corner clearance requirements when accessing public roadways.

Figure 20: Cross Access, Joint Access and On-Site Circulation



Source: FDOT Driveway Information Guide, 2008

INTER-PARCEL CONNECTIONS

Inter-parcel connections or cross access can improve vehicular and well and bicycle and pedestrian accessibility to and between adjacent developments depending on the type of installation. Inter-parcel connections reduce the need for patrons to leave the site and travel on a public roadway to reach an adjacent site and as such it increases the safety by reducing the number of conflicts on the roadway.

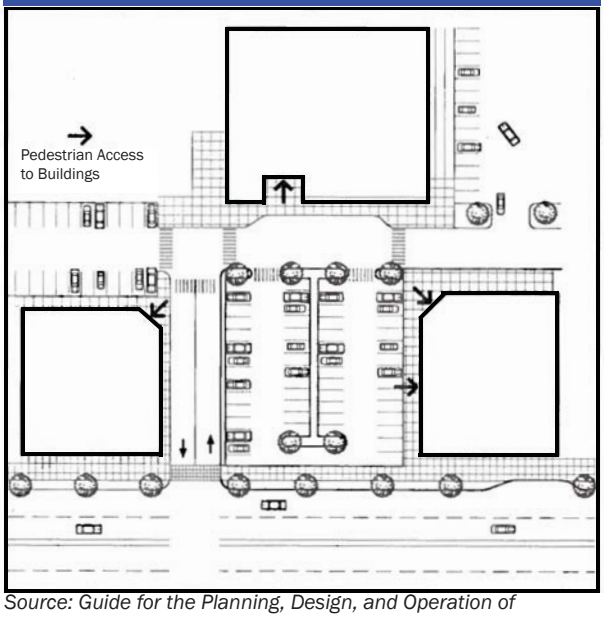
Figure 21: Vehicle Inter-parcel Connections

These connections can be in the form of driveway connections for vehicular traffic or pedestrian pathways for pedestrian and/or bicycle traffic. When considering these connections for pedestrian traffic, the distance between developments should be considered. Pedestrians may only be willing to travel a few hundred feet to an adjacent store. If distances exceed 200 or 300 feet, pedestrian interconnections may not be practical but vehicular interconnection shall still be considered.

Commercial subdivisions shall be required to provide vehicular inter-parcel connections. Pedestrian connections (utilizing pedestrian pathways) shall be provided when the structures between adjacent lots are separated by 100 feet or less and if sidewalks along the street are greater than 50 feet from the entrance of the building.

Shared parking lots can also reduce vehicular travel while providing accessible pedestrian connections to more than one commercial development or area. With shared parking, not only do motorists not have to drive from one site to another, but pedestrians will have shorter distances to walk between developments. Pedestrian walkways or connections shall be designated and marked/signed to alert motorists of where pedestrians will be present.

Figure 22: Shared Parking Lots



Source: Guide for the Planning, Design, and Operation of Pedestrian Facilities, AASHTO, 2004

DRIVE-THRU FACILITY QUEUING

All facilities that require the installation of a drive-thru to serve customers shall provide sufficient room for waiting vehicles to stack. For each specific land use, different queuing lengths are necessary to accommodate stacked vehicles. Table 12 outlines the recommended design queues based on land use. All other uses not listed shall provide space for a minimum of three vehicles.

These requirements are necessary to prevent drive-thru facilities from possibly interfering with traffic flow on adjacent streets and prevent undue congestion or confusion within on-site circulation. Depending upon use, it may be necessary to limit or remove parking that will back into the flow of drive thru traffic either before or after ordering and receiving.

Table 12: Drive-Thru Queue Distances

Drive-Thru Queue Distances		
Use	**Observed Queue** (# of vehicles)	**Queue Distance** (ft)*
Food/Drink Service	9	225
Bank	7	175
Car Wash (self-service)	2	50
Day Care	9	225
Dry Cleaner	2	50
Drug Store	4	100

* Based on 25 feet per queued vehicle

Source: FDOT Highway Information Guide, 2008

LOADING ZONES

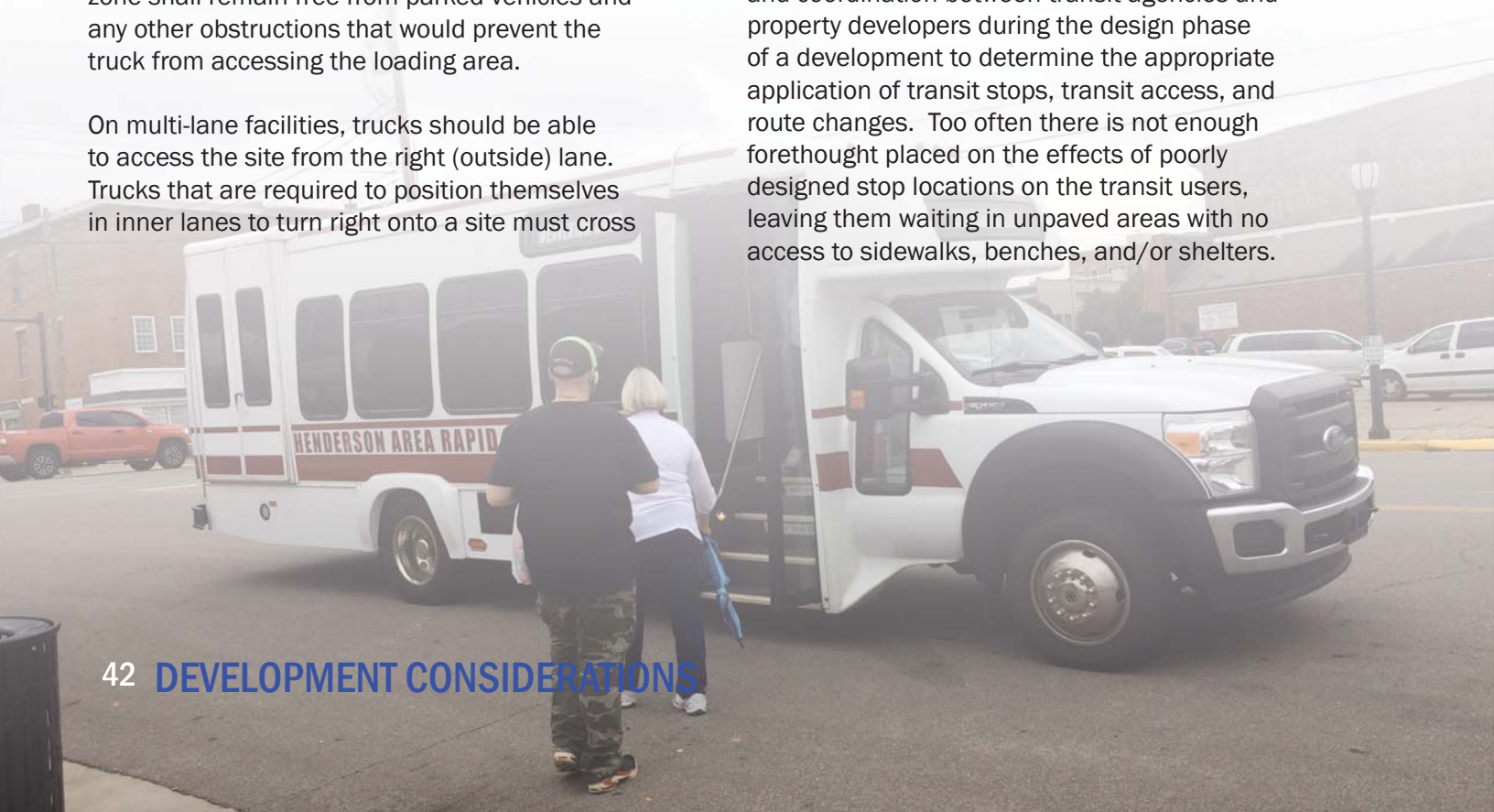
All developments requiring deliveries of goods either to or from the site shall provide sufficient room on-site for delivery maneuvering, loading and unloading. The space designated for a loading zone shall remain free from parked vehicles and any other obstructions that would prevent the truck from accessing the loading area.

On multi-lane facilities, trucks should be able to access the site from the right (outside) lane. Trucks that are required to position themselves in inner lanes to turn right onto a site must cross other through travel lanes creating an unsafe situation. While loading or unloading, the truck shall not park in or project into a street or alley, or encroach or overhang and sidewalk.

Under no circumstance shall a delivery vehicle back out into the street or onto the site from any street, alley or dedicated right-of-way or impede traffic flow on adjacent streets in any way.

TRANSIT CONSIDERATIONS

There has long been a need for cooperation and coordination between transit agencies and property developers during the design phase of a development to determine the appropriate application of transit stops, transit access, and route changes. Too often there is not enough forethought placed on the effects of poorly designed stop locations on the transit users, leaving them waiting in unpaved areas with no access to sidewalks, benches, and/or shelters.



Bus Stops

The bus stop is the first point of contact between the passenger and the bus service, and the impression that it leaves can say a lot about the transit agency and the adjacent businesses.

When a proposed development occurs on an existing bus route or where a decision has been made to implement a new route due to the proposed development, the transit agency will consider the placement and spacing of bus stops and amenities based on the standards of the transit agency. These standards provide an objective basis for decision-making concerning the need for stops and the installation of bus stop amenities.

Where no bus route exists along the frontage of a proposed development, the transit agency may consider implementing a new route or altering an existing route based on the size of the development, the proximity of the development to an established route, and the likelihood of transit users.

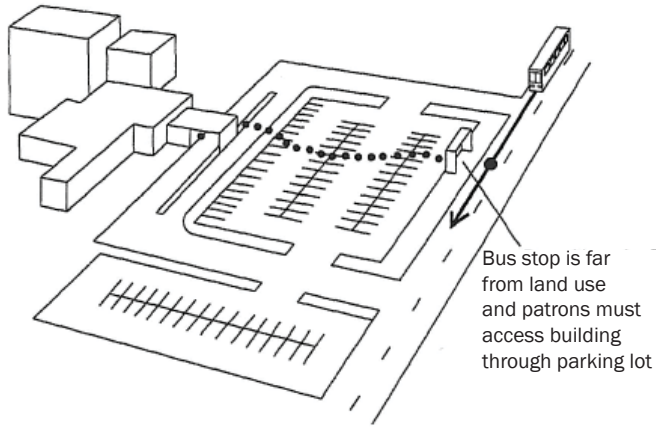
At a minimum, the development shall provide and maintain:

- ADA compliant sidewalks and curb ramps;
- Amenities such as a concrete bench or shelter pad; and
- An ADA compliant pedestrian connection to the business.

Transit Access Agreements

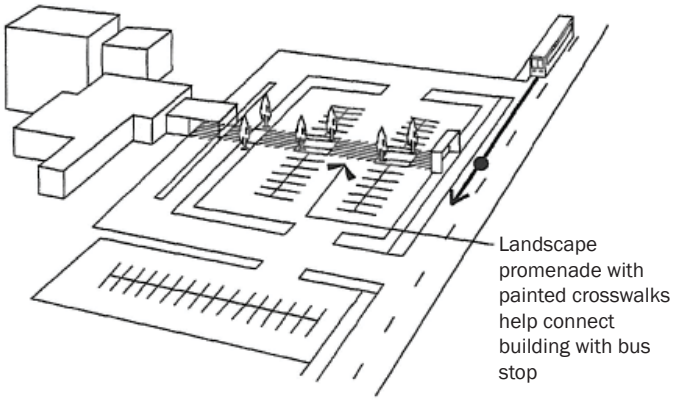
Without coordination between the developer and the transit agency, access between the development and a bus stop could be limited or cumbersome (see Figure 23). Coordination could help determine proper and adequate access between the development and on-street bus stops (see Figure 24). This is the preferred form of access. When on-street bus stop locations are not feasible due to lack of facilities such as sidewalks, bus bays, stop amenities, ADA accessibility and/or speed or volume of traffic on the roadway, it may be necessary to require a transit access agreement for a development which is likely to require transit services (see Figure 25). See Appendix B for a sample contract.

Figure 23: Transit Access without Cooperation and Coordination



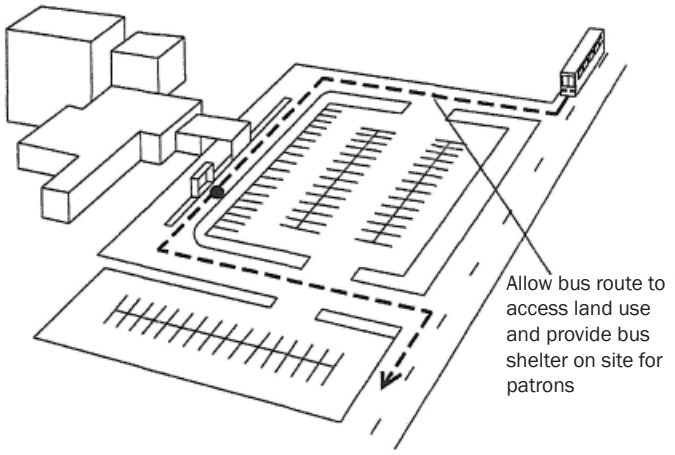
Source: Transportation Research Board, TCRP Report 19, Guidelines for the Location and Design of Bus Stops, 1999

Figure 24: Coordinated Transit Access and Pedestrian Pathways



Source: Transportation Research Board, TCRP Report 19, Guidelines for the Location and Design of Bus Stops, 1999

Figure 25: Coordinated Transit Access to Private Property



Source: Transportation Research Board, TCRP Report 19, Guidelines for the Location and Design of Bus Stops, 1999

Bus Bays

A bus bay (or turnout) allows through traffic to flow freely without the obstruction of stopped buses. These are normally provided on high-volume or high-speed roadways or in heavily congested areas where large numbers of passengers may be expected. According to the TCRP (Transit Cooperative Research Program) Report 19, 1996, bus bays should be considered when any of the following factors are present:

- Traffic in the curb lane exceeds 250 vehicles during the peak hour.
- Traffic speed is greater than 40 mph (posted or 85th percentile speed).
- Bus volumes are 10 or more per peak hour on the roadway.
- Passenger volumes exceed 20 to 40 boardings an hour.
- Average peak-period dwell time exceeds 30 seconds per bus.
- Buses are expected to layover at the end of a trip.
- Potential for auto/bus conflicts warrants separation of transit and passenger vehicles.
- History of repeated traffic and/or pedestrian crashes at stop locations.

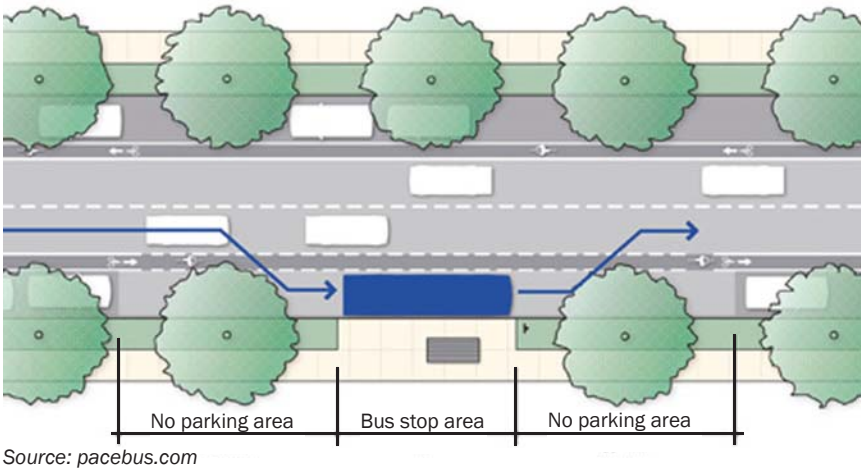
REMEMBER...

Every transit rider is a pedestrian at the beginning and end of their overall trip.

- Right-of-way width is adequate to construct the bay without adversely affecting sidewalk pedestrian movement.
- Sight distances (i.e. hills, curves) prevent traffic from stopping safely behind a stopped bus.
- A right-turn lane is used by buses as a queue jumper lane.
- Appropriate bus signal priority treatment exists at an intersection.
- Bus parking in the curb lane is prohibited.
- Improvements are planned for a major roadway.

Bus bays may be requested by the transit agency as part of the required improvements of a large development. Coordination with the transit agency is necessary.

Figure 26: Bus Bay



Source: pacebus.com

PEDESTRIAN AND CYCLIST CONSIDERATIONS

In an attempt to create a transportation environment that will accommodate all forms of travel, it is necessary to plan for not only the automobile, but also for bicyclists and pedestrians. While these modes are sometimes considered alternatives, for many people, walking or bicycling are their only means of travel. In order to accommodate bicycle and pedestrian travel in a safe and efficient manner, it may be necessary to rethink current site design strategies. Often minor changes or additions to a site plan can create an environment acceptable to all forms of travel.

The design of the built environment has a major impact on the safety, efficiency, and comfort of pedestrians and bicyclists. Design elements that provide for short and direct trips facilitate walking and bicycling. Straight and interconnected streets, shallow building setbacks, small blocks, trees and landscaping, public spaces, and continuous facilities encourage and accommodate pedestrian and bicycle activity, as do mixed-use developments.

REMEMBER...

Once an area has been developed with deficiencies for pedestrian and bicycle circulation, it can be difficult, and costly, to go back and add sidewalks, on-street bike facilities, or multi-use paths.

Pedestrian Facilities

To create an environment that will better accommodate pedestrian traffic, developments can be oriented to connect to off-site pedestrian facilities. This increases the walkability of the development by allowing for safe, easy access to the site. Elements of a pedestrian-friendly design may include:

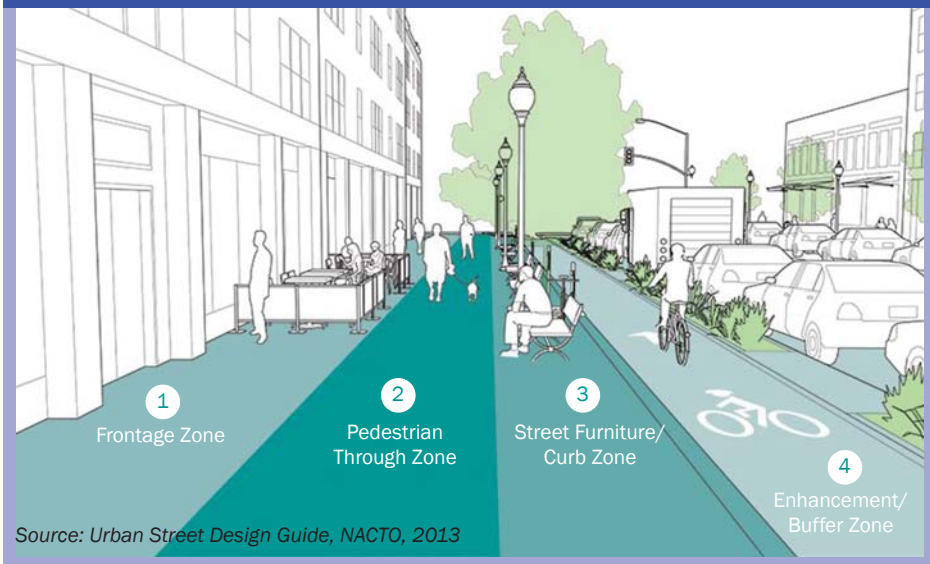
- Common walkways/pedestrian walkways through parking lots delineated with visible and tactile methods;
- Connections to transit stops;
- Connections to neighborhoods and surrounding areas;
- Easily identified building entrances and building frontages located along the street rather than across parking lots;
- Convenient and safe access to transit and adjacent sidewalks;
- Alignment of walkways for convenient and efficient pedestrian travel;
- Accessible public routes to travel to and from the site, as well as throughout the site;
- Unimpeded pedestrian travel (no walls, ditches, landscaping, or roads without safe crossings);
- Pedestrian signage and information in accessible formats;
- Street trees that provide shade and give a sense of separation from traffic; and/or
- Proper illumination.

Minimizing and/or consolidating driveways and conflict points along a roadway also increases walkability. To a pedestrian, each drive access is a possible location for an accident to occur with a motorist. Providing a reasonable, well-marked path through parking lots and between buildings will maximize the directness of pedestrian routes. Access to a commercial area from the adjacent street can be provided through conventional flared driveways or designs that resemble street intersections with turning radii. The conventional driveway type is preferred because this type of design encourages motorists to drive more slowly when entering the area, allowing for a more safe and comfortable pedestrian environment.

Providing direct, clearly defined pedestrian routes to safe crossing points and focused traffic control efforts will also enhance pedestrian circulation. On-site circulation systems shall be designed to reduce conflicts between pedestrians and motor vehicles. Examples include striped walkways, crosswalks, and walkways within raised parking aisle separator islands. On roadways, channelized vehicle paths with landscaping islands provide a point of pedestrian refuge while improving roadway aesthetics. Providing direct paths between commercial centers and abutting residential developments will encourage and accommodate pedestrian traffic.

To increase pedestrian safety, where a sidewalk is being constructed abutting an aisle, driveway or street, it shall be raised 6 inches and curbed along the edge and tire stops shall be used to prevent parked vehicles from encroaching into this area. A sidepath, separated but parallel with the street, on an uncurbed facility shall be separated by a minimum of 5 feet from the edge of pavement or protected by a physical barrier.

Figure 27: NACTO Sidewalk Zones



Source: Urban Street Design Guide, NACTO, 2013

1 Frontage Zone

The frontage zone describes the section of the sidewalk that functions as an extension of the building, whether through entryways and doors or sidewalk cafes and sandwhich boards. The frontage zone consists of both the structure and the facade of the building fronting the street, as well as the space immediately adjacent to the building.

2 Pedestrian Through Zone

The pedestrian through zone is the primary, accessible pathway that runs parallel to the street. The through zone ensures that pedestrians have a safe and adequate place to walk and should be 5-7 feet wide in residential settings and 8-12 feet wide in downtown or commercial areas.

3 Street Furniture/Curb Zone

The street furniture zone is defined as the section of the sidewalk between the curb and the through zone in which street furniture and ammenities, such as lighting, benches, newspaper kiosks, utility poles, tree pits, and bicycle parking are provided. The street furniture zone may also consist of green infrastructure elements, such as rain gardens or flow-through planters.

4 Enhancement/Buffer Zone

The enhancement/buffer zone is the space immediately next to the sidewalk that may consist of a variety of different elements. These include curb extensions, parklets, stormwater management features, parking, bike racks, bike share stations, and curbside bike lanes or cycle tracks.

Sidewalks/Sidepaths

Sidewalks/sidepaths are an integral piece of the alternative modes network. It is essential that sidewalks/sidepaths be well maintained to provide safe facilities for pedestrians, as well as wheelchair users and visually-impaired individuals. Sidewalks/sidepaths within commercial or mixed-use developments allow for pedestrian trips between businesses and reduce the number of short distance automobile trips made. Sidewalks/sidepaths within residential developments provide a safe place for children to walk or ride a bicycle and for pedestrian interconnection between developments.

DID YOU KNOW?

"According to pedestrian collision studies referenced in the NCHRP report, between 40 and 45 percent of crashes involve children. Further, nearly 80 percent of the pedestrian collisions involving children are the result of an unsafe or illegal act by the child. Residential areas other (rather) than intersections account for almost two-thirds of the pedestrian crashes involving children."

Traffic Control Deviced Handbook, 2001, Institute of Transportation Engineers, pg. 44

According to the AASHTO (American Association of State Highway and Transportation Officials) Guide for the Planning, Design, and Operation of Pedestrian Facilities, the majority of pedestrian trips are one-quarter mile or less, with one mile generally being the limit that most people are willing to travel on foot. With this in mind, the installation of sidewalks/sidepaths or any other approved pedestrian network facilities on both sides of the street shall be given the highest priority when any of the following are true:

- If the development is within 1/4 mile (1,320 ft.) of a public or private elementary school (K-5th grade).
- If the development is within 1/2 mile (2,640 ft.) of a public or private middle/junior high school (6-8th grade).
- If the development is within 1 mile (5,280 ft.) of a public or private high school or post-secondary/university.
- If the development is within 1/2 mile (2,640 ft.) of a public park; or within 1/2 mile of the intersection of a public shared use path/trail/greenway and a public roadway that does now or realistically would provide access to the greenway; or within 1/2 mile of a shared use path trailhead.
- If the development is within 1/4 mile (1,320 ft.) of a fixed route transit line.
- If the development is within 1/4 mile (1,320 ft.) of a public or private library.
- High-density residential developments (4 or more dwelling units per acre) with frontage on a collector roadway or higher.
- Within or adjacent to the adjusted urban area on file with the MPO.
- As outlined in an approved LPA Bicycle and Pedestrian Plan.
- If sidewalks/sidepaths exist in the area (to aid in a completion of the network).
- If the development is mixed-used including residential, commercial, cultural, institutional, or industrial uses.
- If the development does not provide through street connections, loop roads or large enough cul-de-sac radii to accommodate access for school buses, emergency vehicles, and sanitation vehicles to all lots.

Alternative pedestrian facilities such as trails can be considered in lieu of sidewalks/sidepaths only when they connect to a public street or right-of-way. If these alternatives are outside of the public right-of-way, they will be installed and maintained to ADA specifications, will be maintained to an acceptable level of service, and shall provide direct access to all lots. A guarantee or contract shall be in place that prevents these private property facilities from being removed at will.

Bicycle Facilities

People who bicycle vary in their physical abilities, experience levels, and the types of bicycle they ride. Creating a comprehensive bicycle network requires the establishment of comfortable, convenient, and safe facilities that accommodate the different types of expected users. Providing connections to on- and off-street facilities will encourage non-vehicle trips.

The type of bicycle facilities that could be included within residential and commercial developments will vary case by case. Often times, on-street facilities may not be necessary within every street of a residential development, but providing connections to the abutting street is essential in creating a bicycle network. A sidepath or trail around or throughout a development may double as a bicycle path, depending on the width.

While the expansion of the greenway and on-street bikeway network will encourage more people to bicycle, the lack of convenient, accessible, and secure bicycle parking may deter people from taking bicycle trips to local businesses, parks, schools, and other destinations in the community. In order to promote bicycle trips, commercial developments shall provide adequate bicycle parking.

CUL-DE-SACS AND TURNAROUNDS

Streets designed to provide singular access to multiple lots with no connection to adjacent streets shall be constructed with a proper means of traffic reversal. Cul-de-sac regulations and standards, must be consistent with the purposes of subdivision controls stated in enabling legislation. These purposes generally include promoting general safety, convenience, and health and welfare; ensuring sanitary conditions; providing roadways that are safe and convenient for travel; securing safety in case of fire, flood, panic, and other emergency; and securing adequate provision of services. Therefore, cul-de-sacs shall be installed to provide sufficient room for all vehicles that will utilize it to maneuver without performing multiple movements. The radius of the cul-de-sac shall be sufficient to provide room for emergency vehicles, school buses, delivery trucks, garbage trucks, snow plows and other large vehicles that will use the street on a regular basis. And while fire personnel have larger teams to help with backing maneuvers, school bus drivers do not.

Common practice is to require a 90-foot diameter, paved area free of on-street parking. This may not be enough to accommodate older fire equipment and garbage trucks that have a turning radius of 50 to 55 feet, but it would provide sufficient space for a multi-point turnaround. New fire equipment generally has a smaller turning radius. This diameter would be sufficient to accommodate a large school bus (S-BUS-40), snow plows and garbage trucks.

Subdivision developers wishing to limit the size of a cul-de-sac bulb to 80 feet in diameter or less, shall be required to limit the number of lots served to no more than 20.

LOT SIZE

When platting new lots, lot frontages shall be adequate to accommodate all access requirements set forth in this manual. Lots shall also be designed with sufficient depth to allow room for on-site circulation, parking, and driveway throat length. Wider residential lots provide more room for on-site maneuverability that encourages vehicles to exit without backing into the street. Lots on Collectors and above are more likely to be eventually converted to commercial uses.

Maximum lot length-to-width ratios prevent the creation of long and narrow lots that may hinder proper lot development. Long narrow lots do not provide adequate room for on-site maneuverability of traffic in commercial or residential developments. Lots that exceed a 3:1 length-to-width ratio should be avoided.

FLAG LOTS

Flag lots are typically developed as a means to provide access to multiple lots within a limited amount of roadway frontage. The development of flag lots for this purpose shall be prohibited especially within commercial developments. Flag lots may be permissible in residential developments on local roads where physical constraints create access problems, to preserve historical or archaeological amenities, or where necessary to eliminate access to a major thoroughfare.

Flag lot development does not provide adequate drive spacing on major corridors which increases conflict points. Flag lots shall be restricted to local roads unless a single shared access drive that meets spacing and clearance requirements is utilized.

FRONTAGE ROADS

Frontage roads are designed to separate local traffic from higher speed through traffic on major roadways by removing slower turning vehicles from through lanes. The implementation of frontage roads helps insure that the character of a roadway is preserved and unaffected by development by reducing the frequency and severity of conflict points. When constructed, frontage roads allow lots to have visibility from a main thoroughfare while having improved access from an interior street. Placing multiple drives on the frontage road provides the roadway to maintain adequate intersection spacing that facilitates the design and construction of auxiliary lanes for deceleration and acceleration.

For a frontage road to function in an efficient manner, it is crucial that sufficient outer separation exist between the main roadway and the frontage road. A separation of 300 feet shall be provided when feasible to insure the safe, efficient operation of the intersection, ensure sufficient storage and placement of traffic control devices and signs, and provide an area for pedestrian refuge. A narrower separation, no less than 150 feet, can be considered only where a traffic study shows the frontage road traffic will be very light, where frontage roads operate one-way only, or where some movements can be prohibited through traffic control devices, channelization, or medians.

DEVELOPMENT INTERCONNECTIONS – COMPLETING THE NETWORK

The interconnection of subdivision streets provides for a unified circulation pattern of vehicles on the internal street network and reduces the number of unnecessary trips on major corridors. The roadway network for proposed subdivisions shall be coordinated with the existing, proposed and planned network outside the subdivision to improve efficiency. A connected roadway network advances the following growth management objectives:

- Fewer vehicle miles traveled;
- Alternative routes for short trips;
- Improved accessibility of developed areas;
- Increased walking, bicycling and transit use;
- More environmentally sensitive layout of streets and lots;
- A sense of community;
- Safer school bus routes;
- Increased emergency access options which reduces delay; and
- Decreased congestion on major corridors.

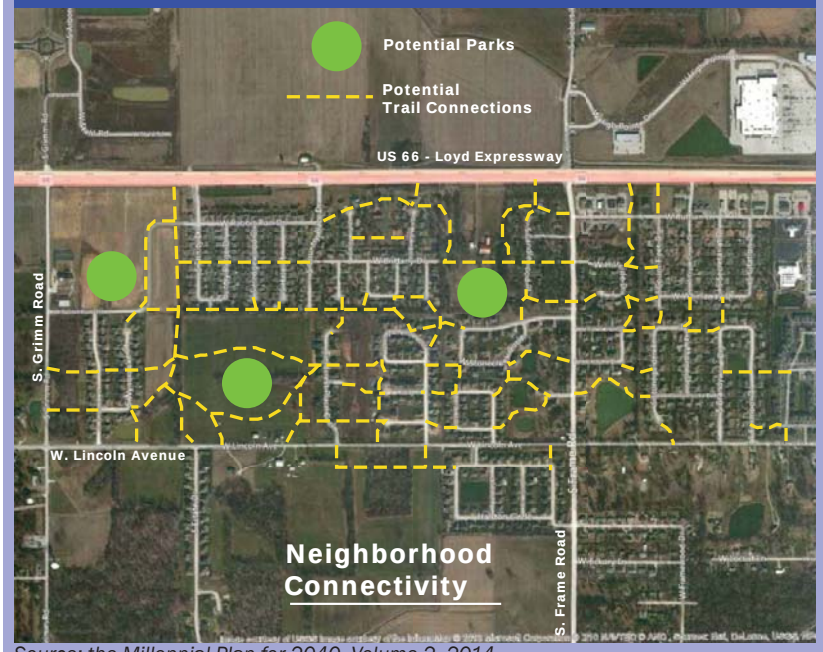
Dead end streets force more traffic onto collector and arterial roadways, increasing congestion during peak hours. This in turn will likely require more roadway improvements in the form of auxiliary lanes that the developer will be responsible for upon construction or the Responsible Authority will be required to install in the future to alleviate problems that this situation creates. To prevent this situation, a subdivision or combination of subdivisions and/or a multi-family residential development with a single access point shall serve a maximum number of 50 lots/units (Listokin and Walker, 1989).

Complaints of speeding and cut-through traffic will be addressed in the following section, Traffic Control and Calming. Speeding in residential neighborhoods still occurs on dead-ended streets.

TRAFFIC CONTROL AND CALMING

Street layouts within subdivision developments should be designed to easily be incorporated with the existing roadway network. New streets should be designed with provisions to accommodate further intersection improvements including the possibility of auxiliary lanes and traffic control devices.

Figure 28: Neighborhood after Greenway and Trail Connections



Source: the Millennial Plan for 2040, Volume 2, 2014

The present fragmented, stop and start character can give way to a more connected condition, just by adding a few walking and biking trails. These trails can link all of the amenities mentioned above. When neighbors get outside and use these trails, they will be better able to meet, greet, and socialize. A genuine neighborhood feel will begin to develop. Folks become healthier, happier, and more fulfilled.

The layout of subdivision streets should incorporate traffic calming devices to promote lower vehicular traffic and a safer environment for bicyclists and pedestrians. Traffic calming schemes should be utilized when roadway and pedestrian conflicts will be prevalent, when speed within the subdivision or on adjacent roads is high and when the devices will improve roadway circulation and safety. Often minor adjustments to existing roadway designs will improve roadway safety for motorists and pedestrians. Construction of roads that align with the existing topography that are curvilinear in nature, promote slower speeds within developments. Introducing roadside friction such as landscaping or street trees or narrowing of internal streets also typically has a calming effect on roadway speeds. Many other innovative measures can be implemented to create effective traffic calming.

Implementing traffic calming devices along with the interconnection of subdivisions can create a much safer atmosphere for pedestrians and motorists. The residents of subdivision will have fewer worries about speeding vehicles through a subdivision while providing and alternative route between developments.

Traffic Calming

The Institute of Traffic Engineers (ITE) defines traffic calming as, "the combination of mostly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized users". Traffic calming is building or retrofitting roadways with certain features and characteristics that induce drivers to slow down and pay more attention to their surroundings.

Speeding traffic has proven to be of significant concern in many residential areas. To be most effective, traffic calming should be considered during the design of subdivision streets and installed with the construction of a subdivision. When retrofitting a neighborhood with traffic calming measures, there are less options due to the density of existing driveways, conflicts with drainage, etc.

Traffic Calming Considerations

Traffic calming uses design features to encourage people to drive slower by creating physical and visual cues. The following factors shall be considered when incorporating traffic calming measures into roadway design:

- Vehicle speed is more critical than volume in terms of safety and should be addressed first where there are monetary constraints.
- Traffic calming and management measures should fit into, and preferably enhance, the street environment.
- Traffic calming designs should be predictable and easy to understand by drivers and other users.
- Devices that meet multiple goals are usually more acceptable. For example, a raised crosswalk may be more understandable to motorists than a speed hump. The former has a clear goal, whereas the latter may be perceived as a nuisance.
- Treatments need to be well designed and based on current available information on their applications and effects.
- Devices should accommodate emergency vehicles.
- Traffic calming areas or facilities should be adequately signed, marked, and lit to be visible to motorists.
- Treatments need to be spaced appropriately to have the desired effect on speed – too far apart and they will have a limited effect, too close and they will be an unnecessary cost and annoyance.

- Facilities should not be under-designed or they will not work. Keeping the slopes too gradual for a speed table or curves too gentle for a chicane will not solve the problem and will appear as a waste of money and may ruin chance for future projects.
- Traffic calming measures should accommodate bicyclists and pedestrians with disabilities.
- If a measure is likely to divert traffic onto another local street, the area-wide street system should be considered so as not to shift the problem from one place to another.
- Devices should be thought of as elements of a traffic-calming system and be placed to improve pedestrian conditions throughout an area.
- Traffic calming treatments may be used in combination and are often most effective this way.

How Is Traffic Calming Achieved?

Traffic calming is divided into three major categories of design measures:

1. *Narrowing the real or apparent width of the street.*
   - Pavement cross-section features including on-street parking, spot narrowing, bike lanes, travel lane width reduction, medians, islands, and road diets.
   - Placement along the street of buildings, trees, signage, and street furniture (e.g. lights, benches, bike racks, bus shelters, etc.).
   - Pavement edge treatments like raised curbs, neckdowns, chokers, and bulbouts.
2. *Deflecting (introducing curvature to) the vehicle path.*
   - Mid-block deflection measures including chicanes, lane offsets, short medians, crossing islands and mini-traffic circles.
   - Intersection measures including roundabouts, traffic circles, curb bulbouts, lane offsets, crossing islands, and neckdowns.
3. *Altering the vertical profile of the vehicle path.*
   - Speed humps and speed tables.
   - Raised crosswalks and intersections.
   - Textured pavement (e.g. pavers, stamped concrete, etc.).

What Traffic Calming is Not

Citizen complaints about speeding traffic are often accompanied by requests for new Stop signs, traffic signals, turn restrictions, speed limit signs and the like. These are not traffic calming devices, but rather regulatory traffic controls that are governed by either national engineering guidelines, state laws, or both.

The MPO reviews multiple requests every year for new Stop signs to “slow down traffic” and “improve safety” on a local street. Not only are Stop signs not a traffic calming measure, but research shows that installing unnecessary Stop signs can often result in more collisions and more speeding.

Another common request involves lowering of posted speed limits. This is another regulatory control that requires documented speed and engineering studies. Again, most research concludes that driver speed is less a function of posted speed limits and more a function of real or perceived driving conditions.

Unlike the aforementioned regulatory traffic controls that require some form of legal enforcement, traffic calming measures are designed to be self-enforcing. Drivers are slowed down by the physical characteristics of the roadway, not by an artificially imposed speed limit or Stop sign.

Traffic calming is also not specifically aimed at reducing the volume of traffic, though it may have that effect when installed on local streets subject to speeding cut-through traffic.

TRAFFIC CALMING MEASURES – PHYSICAL

Curb extensions (bulb-outs or bump-outs)

Curb extensions create safer and shorter crossings for pedestrians by physically extending the curb out into the roadway at intersections. The additional space created by curb extensions can be used for street furniture, benches, plantings, and street trees.

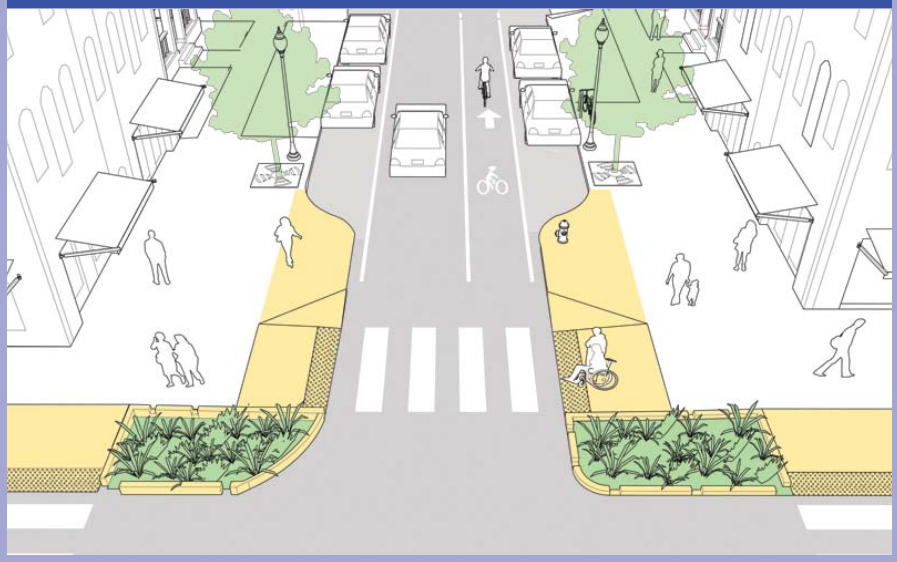
Curb extensions can be used for:

- Increasing safety for pedestrians and motorists at intersections.
- Increasing visibility and reducing speed of turning vehicles.
- Encouraging pedestrians to cross at designated locations.
- Preventing motor vehicles from parking at corners.
- Shortening crossing distance and reducing pedestrian exposure.

Keep in mind:

- Curb extensions should only be used where there is a parking lane, and where transit and bicyclists would be traveling outside the curb edge for the length of the street.
- If there is significant truck or bus traffic, curb extensions need to be designed to accommodate them. (However, it is important to take into consideration that those vehicles should not be going at high speeds, and most can make a tight turn at slow speeds.)
- Emergency access is often improved through the use of curb extensions if intersections are kept clear of parked cars. Fire trucks and other emergency vehicles can climb a curb, but would not be able to move a parked car.
- Ensure that curb extension design facilitates adequate drainage.

Figure 29: Curb Extensions



Curb extensions are often applied at the mouth of an intersection. When installed at the entrance to a residential or low-speed street, a curb extension is referred to as a "gateway" treatment and is intended to mark the transition to a slower speed street.

Source: Urban Street Design Guide, NACTO, 2013

Chokers (pinchpoints)

Chokers, or pinchpoints, are similar to curb extensions but are applied at a midblock location as opposed to an intersection. Chokers narrow the streets in certain points by widening the sidewalks. This helps to slow vehicles down, especially if several are placed throughout a long corridor.

Chokers can be used for:

- Slowing vehicles at a mid-point along the stretch.
- Create a clear transition between a commercial and residential area.
- Narrow overly wide intersections and midblock areas of streets.
- Add room along the sidewalk or planting strip for landscaping or street furniture.

Keep in mind:

- Consult with local fire and sanitation departments before setting a minimum width for the roadway location with a choker.
- Ensure that bicyclist safety and mobility are not diminished.

Figure 30: Choker

Curb extensions may be applied at midblock to slow traffic speeds and add public space. When utilized as a traffic calming treatment, midblock curb extensions are referred to as “pinchpoints” or “chokers”.

Source: Urban Street Design Guide, NACTO, 2013

Crossing islands (refuge islands or pedestrian islands)

Crossing islands are raised medians that are located in the intersection or midblock of a roadway. Islands help protect pedestrians that are crossing a roadway, enabling them to stop halfway across the street and wait for an adequate gap in traffic or the next crossing signal before crossing the second half of the street. Crossing islands, especially those located at midblock, commonly occur at schools, parks, museums, waterfronts, and other destinations that generate a high amount of pedestrian traffic.

Crossing islands can be used for:

- Enhancing pedestrian crossings, especially at unsignalized crossing points.
- Reducing vehicle speeds approaching pedestrian crossings.
- Highlighting pedestrian crossings.

Keep in mind:

- Bicycle access should not be reduced.
- Crossing islands should be illuminated or highlighted with street lights, signs, and/or reflectors to ensure motorists see them.
- Crossing islands should be designed to accommodate pedestrians in wheelchairs. The median cut-through must include detectable warnings.

Figure 31: Crossing Islands

Midblock crosswalks facilitate crossing to places that people want to go but that are not well served by the existing traffic network. These pedestrian crossings, which commonly occur at schools, parks, museums, waterfronts, and other destinations, have historically been overlooked or difficult to access, creating unsafe or unpredictable situations for both pedestrians and vehicles.

Source: Urban Street Design Guide, NACTO, 2013

Mini-circles (neighborhood traffic circles)

Mini-circles, or neighborhood traffic circles, are raised circular islands constructed in the center of residential intersection crossings. They lower speeds at intersections, making them ideal for uncontrolled intersections. Mini-circles are best applied in conjunction with plantings that beautify the street and the surrounding neighborhood, as long as they are properly maintained to not hinder visibility.

Mini-circles can be used for:

- Managing traffic at intersections where volumes do not warrant a stop sign or signal.
- Reducing crash problems at the intersection of two local streets.
- Reducing vehicle speeds at the intersection.
- Creating a traffic improvement program – a series of intersections along a local street that are treated with mini-circles will create a safe, inviting neighborhood.

Keep in mind:

- Do not make generous allowances for motor vehicles by increasing the turning radii – this compromises pedestrian and bicyclist safety.
- Larger vehicles that need access to streets, e.g., school buses and fire engines, may need to make left-hand turns in front of the circle.
- Use yield, not stop, controls.
- Mini-circle landscaping should not impede the sight distance.

Figure 32: Mini-Circle

Neighborhood traffic circles lower speeds at minor intersection crossings and are an ideal treatment for uncontrolled intersections. They may be installed using simple markings or raised islands, but are best applied in conjunction with plantings that beautify the street and the surrounding neighborhood.

Source: Urban Street Design Guide, NACTO, 2013

Speed humps and speed tables

Speed humps and speed tables are similar in their concept and purpose, but how they are designed differs. Both devices are vertical speed controls used to manage traffic speeds and reinforce safe, pedestrian-friendly speeds. They are typically used on streets where the target speed of the roadway cannot be achieved through the use of conventional traffic calming elements, such as medians, narrower roadways or lanes, and curb extensions. Streets with 30 mph speed limits and under are good candidates for speed humps and speed tables.

Speed humps are approximately 3 to 4 inches high at their center, extending the full length of the street. They usually taper near the drain and gutter to allow unimpeded bicycle travel. It is important to not confuse speed humps with speed bumps that are usually found in parking lots. Common designs for speed humps include a 12-ft hump for 15-20 mph and a 14-ft hump for a few miles per hour higher.

A speed table is a very long and broad speed hump, or a flat-topped speed hump, where sometimes a pedestrian crossing is provided in the flat portion of the speed table. A speed table is typically 22-ft and has a design speed of 20-30 mph.

Speed humps and speed tables can be used for:

- Reducing vehicle speeds – raised devices tend to have the most predictable speed reduction impacts.
- Enhancing the pedestrian environment at pedestrian crossings.
- Controlling speeds on both one- and two-way streets.

Keep in mind:

- Do not use on a sharp curve or in front of driveways or other significant access areas.
- If the street is a bus route or primary emergency route, the design must be coordinated with operators (snow removal, fire trucks, emergency responders, etc.).
- The aesthetics of speed humps and speed tables may be improved by using color and specialized paving materials.
- Noise may increase, especially if trucks use the route regularly.
- May create drainage problems on some streets.

Figure 33: Speed Hump and Speed Table

Source: Urban Street Design Guide, NACTO, 2013

Raised pedestrian crossings

A raised pedestrian crossing is essentially a speed table for the entire intersection. Construction involves providing ramps on each vehicle approach, which elevates the entire intersection to the level of the sidewalk. They can be built with a variety of materials, including asphalt, concrete, stamped concrete, or pavers. The crosswalks on each approach are also elevated as part of the treatment to enable pedestrians to cross the road at the same level as the sidewalk, eliminating the need for curb ramps. Detectable warnings should be used to mark the boundary between the sidewalk and the street.

Raised pedestrian intersections can be used for:

- Reducing vehicle speeds.
- Enhancing the pedestrian environment at the crossings.

Keep in mind:

- Do not use on a sharp curve or if the street is on a steep grade.
- May not be appropriate if the street is a bus route or emergency route.
- Detectable warning strips at edges enable pedestrians with vision impairments to detect the crossing.
- Steps must be taken to manage drainage.

See Figure 34: Speed Table.

Specific paving treatments

Varying paving materials, e.g., bricks or cobblestone, can act as traffic calming devices while improving the overall look and function of streets and sidewalks. Different colored pavement may also be used, giving the appearance of a different material. Stamped concrete or concrete pavers could be used in place of bricks or cobblestones in order to keep the pedestrian walkway free from trip hazards. If a crosswalk is textured, it should be marked with reflective lines since these types of crosswalks are less visible, especially at night or in inclement weather.

Specific paving treatments can be used for:

- Sending a visual cue about the function of a street.
- Creating an aesthetic enhancement of a street.
- Delineating separate space for pedestrians and bicyclists.

Keep in mind:

- Slippery surfaces, such as smooth granite and paint, and uneven surfaces, such as cobblestones bricks, should not be used in the primary pedestrian or bicycle travel path. Bumpy surfaces may be especially uncomfortable for wheelchair users and a tripping hazard for pedestrians.
- Coordinate choice and placement of materials with maintenance agencies.
- Design and maintenance must ensure crosswalk visibility over time.

Implementing traffic calming devices, along with the interconnection of subdivisions, can create a much safer environment for pedestrians, bicyclists, and motorists. Subdivision residents will have fewer worries about speeding vehicles through their streets, while also being provided with an alternative route between developments.

TRAFFIC CALMING MEASURES – NON-PHYSICAL

Non-physical measures are generally limited to pavement markings that visually narrow the lanes or chicane the driving path. More recently, transverse speed bars, colored pavement speed limit notification with dragon's teeth edgeline markings, and permanent dynamic speed signs have also found their way into the traffic calming portfolio.

RETROFIT

On existing roadways in residential areas, traffic control measures should be considered by the Responsible Authority when:

- The concerned residents are willing to share in the cost of the improvements;
- There is neighborhood consensus of widespread concern for speeding;
- Speed studies indicate speeding is significant (85th percentile speed is greater than 5 mph over the posted speed limit);
- When crash history indicates a speeding issue and/or;
- When enforcement efforts have failed to sustain a reduction in the 85th percentile speed.

DID YOU KNOW?

Using a Standard Acceleration Factor of 0.15, a passenger car entering a subdivision going 10 mph after turning will reach 30 mph in approximately 200 feet.

Basic Vehicle Motion Analysis: A Modern Accident Reconstruction Guide, David N. Dresser, 2001

NEW DEVELOPMENT

In the interest of public safety, traffic calming measures should be utilized in new developments on roads functionally classified as Local (or other classifications when the Responsible Authority deems it necessary) when speeding is likely to be an issue (i.e. for uncontrolled stretches of roadway greater than 600 ft.).

For more on establishing a traffic calming program, see Traffic Calming Manual, City of Northhampton, MA, September, 2008 (http://northamptonma.gov/DocumentCenter/View/4378).

OTHER SITE PLANNING CONSIDERATIONS

Various other components will be review within the guidelines of this section. The location of fire lanes should be reviewed to insure that proper attention has been provided for emergency vehicle access.

Special consideration to sites dealing with large vehicles on a daily basis will require additional review requirements as deemed necessary by the Responsible Authority.

The location of solid waste pick-up containers should not interfere with the normal flow of traffic or required parking on a given site. Even though garbage may be picked up "early in the morning before business hours," the site should be designed so that solid waste can be picked up at any time without creating an unacceptable traffic situation.

Access to unbuildable outparcels will be required to meet the same site development criterion that apply to all other lots.

APPENDIX A:
MODEL FUTURE TRAFFIC SIGNAL COVENANT

City of Evansville

Board of Public Works

Future Traffic Signal Covenant

This covenant is made and entered into this _____ day of _____, 20_____, by _____ (hereinafter referred to as PROPERTY OWNER) and the City of Evansville, acting by and through the Board of Public Works (hereinafter referred to as BPW).

In consideration for the BPW granting commercial driveway access through Improvement Location Permit #_____ for the construction of an approach from the property as described in Attachment "A" onto Roadway Name or Property Address_____, BPW in its sole discretion may require PROPERTY OWNER and his/her successors, or assigns to design and install a traffic signal at the above location when the minimum warrants for a traffic signal are met. BPW shall perform or cause to be performed a traffic signal analysis at the intersection of the driveway with the roadway. The traffic signal analysis shall be performed in accordance with the Indiana Manual on Uniform Traffic Control Devices.

The cost to design and prepare plans and specifications, cost of warrant analysis, cost of construction of traffic signal and appurtenances, cost to acquire any required right-of-way, cost of reimbursable utility expenses, cost to solicit and let bids, cost to inspect construction, and cost of electrical energy shall be borne by the PROPERTY OWNER. The cost of maintenance shall be borne by BPW. All the work shall be done as per current standards and by BPW approved Registered Professional Engineer/Contractor.

It is understood and agreed that this covenant shall run with the land and shall be binding upon the parties and all persons claiming under them. This covenant shall automatically terminate ten (10) years from the date of its execution.

A separate agreement shall be prepared by BPW to be entered into by PROPERTY OWNER for the installation of a traffic signal. The undersigned hereby represents that he/she has full authority to enter into this covenant on behalf of PROPERTY OWNER.

_____
President, Board of Public Works

_____
Vice President

_____
Member

_____
Owner's Name – Print or Type

_____
Signature

_____
Address

_____
City State Zip

_____
Telephone

City of Evansville

Board of Public Works

Future Traffic Signal Covenant

ACKNOWLEDGEMENT

State of _____, County of _____, SS:

Before me, the undersigned Notary Public in and for the said County personally appeared

_____

(Name of Signer)

And acknowledged the execution of the foregoing contract on the _____ day of _____, 20____.

Witness my hand seal the said last named date.

My Commission Expires

_____ _____

Notary Public

_____

County of Residence

ACKNOWLEDGEMENT

State of _____, County of _____, SS:

Before me, the undersigned Notary Public in and for the said County personally appeared

_____

(Name of Signer)

And acknowledged the execution of the foregoing contract on the _____ day of _____, 20____.

Witness my hand seal the said last named date.

My Commission Expires

_____ _____

Notary Public

_____

County of Residence

This Instrument Prepared By: _____

APPENDIX B:
MODEL TRANSIT ACCESS AGREEMENT

TRANSIT ACCESS AGREEMENT

THIS IS AN AGREEMENT made and entered into this _____ day of _____, 20___ (the Effective Date) by and between the City of Evansville, a political subdivision of the State of Indiana (hereinafter "City"), and _____ (hereinafter "Owner") whose mailing address is _____. City and Owner are sometimes referred to as "Parties" and individually as "Party."

W I T N E S S E T H:

WHEREAS, Owner owns real property located at _____, and identified on Exhibit "A" attached hereto and incorporated herein by this reference (hereinafter referred to as ("Owner's Property"); and

WHEREAS, City owns and operates a transit system and wishes to establish City transit system access and maintain a passenger bus stop and related passenger amenities on Owner's Property for the convenience of the public; and

WHEREAS, Owner wishes to derive transit service-related benefits from the public at large as a result of granting City a license to establish City transit system access and maintain a passenger bus stop and related passenger amenities on Owner's Property; and

WHEREAS, Owner and City agree that City transit system access, a passenger bus stop, and related passenger amenities located on Owner's Property will serve the public interest; and

WHEREAS, Owner and City agree that the term "related passenger amenities" may include without limitation, benches, shelters, concrete slabs, bicycle racks, trash cans, and wheelchair access ramps.

NOW, THEREFORE, in consideration of the covenants set forth herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, City and Owner agree as follows:

1. LICENSE GRANTED. Owner grants a license to City for the right to access Owner's property and for the right to use the not less than 16 feet by 8 feet area located on Owner's Property for the purpose of establishing a passenger bus stop and related passenger amenities.

2. PROPERTY ACCESS AND LOCATION OF PASSENGER BUS STOP. The travel route for City transit system access and passenger bus stop and related passenger amenities will be located as set forth in Exhibit "A".

3. USE AND OBSTRUCTION. Owner shall allow City and the public who use the transit system to use the passenger bus stop and related passenger amenities. Owner shall not obstruct or interfere with reasonable access to the passenger bus stop and related passenger amenities during the term of this Agreement and agrees to permit the use of other portions of

its property for vehicular and pedestrian access to and from the passenger bus stop and related passenger amenities as necessary and convenient for its use as such.

4. LIMITS OF USE. City shall not use the Owner's Property as a pick-up point for other than regularly scheduled public transportation services. Owner shall not permit use of the passenger bus stop and related passenger amenities as a pick-up point or drop-off point for any unspecified use that might generate an accumulation of automobiles that would not normally be associated with incidental public transportation services.

5. CONSTRUCTION AND MAINTENANCE. City shall be responsible for all costs and work associated with designing, building, and maintaining the passenger bus stop and related passenger amenities. City shall be responsible for obtaining all necessary permits and shall see that the construction, operation, and maintenance of the passenger bus stop and related passenger amenities are, at all times, in compliance with all applicable laws and regulations and are carried out in a neat and orderly manner so as to minimize any interference with Owner's use and enjoyment of Owner's Property. City shall not be responsible for maintenance beyond the area of the passenger bus stop and related passenger amenities.

6. NO PAYMENT DUE. Owner shall not require payment for the use of Owner's property on which the passenger bus stop and related passenger amenities shall be placed.

7. TERM AND RENEWAL OF AGREEMENT. Notwithstanding the date(s) of execution, this Agreement shall become effective and 12:01 a.m. on the Effective Date, and shall have an initial term of (1) year from that date. Unless either Party elects to terminate this Agreement as otherwise provided for herein, the Agreement shall automatically renew for successive one year terms without further action required of the Parties.

8. TERMINATION BY OWNER. Owner may terminate this Agreement at any time after an initial one (1) year period which shall commence on the effective date of this Agreement, provided that Owner has given City written notice at lease ninety (90) days prior to the date of termination.

9. TERMINATION BY CITY. City may terminate this Agreement at any time upon a finding that it is no longer in the best interest of the City, the public, or the users of the transit system to operate and maintain a passenger bus stop and related passenger amenities on Owner's Property. Nothing in the Agreement shall be construed as obligating City to continue to provide transportation services from or to Owner's Property.

10. REMOVAL OF PASSENGER BUS STOP ON TERMINATION. Upon termination of this Agreement, City shall have the right and obligation to remove the passenger bus stop and related passenger amenities and shall, at no cost to Owner, restore the area to the condition existing prior to the installation of the passenger bus stop and related passenger amenities unless Owner requests a lesser lever or restoration.

11. NOTICES. Notices required or permitted in this Agreement shall be deemed to have been given when received if hand delivered or when deposited in the U.S. mail, postage paid, to the following:

If to City:
METS
Attn: Executive Director
601 John Street
Evansville, IN 47713

If to Provider:
[*Notice contact name*]
[*Address*]
[*Address*]

12. NO WAIVER. No waiver of a breach of any provision of this Agreement shall be construed to be a waiver of any breach of any other provision. No delay in acting with regard to any breach of any provision of this Agreement shall be construed to be a waiver of such breach. Every right and remedy of each of the Parties shall be cumulative and either Party, in its sole discretion, may exercise any and all rights or remedies stated in this Agreement or otherwise available at law or in equity.

13. INDEMNIFICATION. Owner shall indemnify, defend, and hold harmless City from and against any and all claims, liabilities, or damages for personal injury or property damage resulting from the Owner's negligence on Owner's Property. Without waiving any defense of the limited waiver of sovereign immunity as provided for in Indiana Statues § [*Insert Section*], City shall indemnify, defend, and hold harmless Owner from and against any and all claims, liabilities, or damages for personal injury or property damage resulting from the City's negligence in the operation and use of the passenger bus stop and related passenger amenities. No Party shall be liable for or be required to indemnify the other for claims based upon the intentional or negligent acts of third persons. The Party claiming right to indemnification ("Claimant") will give the indemnifying Party ("Indemnitor") prompt notice of any such claim and the Indemnitor will undertake the defense thereof by representatives of its own choosing. In the event Indemnitor, within a reasonable time after notice of claim, fails to defend, the Claimant shall have the right to undertake the defense, compromise or settlement of such claim on behalf of and for the account and risk of the Indemnitor, subject to the right of the Indemnitor to assume such defense at any time prior to settlement, compromise or final determination thereof. Notwithstanding the foregoing, in the event either party reasonably believes that counsel defending any such action has unacceptable conflicts of interest of otherwise lacks the skill to adequately protect such party's interest, such party reserves the right to defend itself with its own counsel or retained counsel at the Indemnitor's expense, unless the Claimant is found negligent or otherwise responsible for the occasion of the litigation. Nothing herein shall be interpreted as a waiver by the City of its rights, including the procedural requirements and limited waiver of immunity, as set forth in Indiana Statues § [*Insert Section*], or any other statute, and the City expressly reserves these rights to the full extent allowed by law.

14. INSURANCE. In order to ensure it is capable of meeting its obligations under this Agreement, including its obligations to indemnify the City as provided for herein, Owner agrees to maintain, throughout the term of this Agreement and for a one year period thereafter, a general liability insurance policy of a value not less than $250,000 which could be used to satisfy said obligations or liabilities , naming the City risk management staff upon request.

15. COMPLIANCE WITH LAWS. The performance of this Agreement shall be in compliance with all applicable local, state and federal laws and regulations, including but not limited to all applicable building and land use codes.

16. APPLICABLE LAW, VENUE. The validity of this Agreement and of any of its terms and provisions, as well as the rights and duties of the parties hereunder, shall be interpreted and enforced pursuant to and in accordance with the laws of the State of Indiana. Venue for any action or proceeding to enforce or interpret the terms of this Agreement shall be brought in the City of Evansville, Indiana.

17. ATTORNEYS' FEES. In any action brought between the Parties to enforce or construe the terns of this Agreement, each Party shall bear its own attorneys' fees and cost, including any incurred on appeal, regardless of the resolution of the case or appeal(s).

18. AMENDMENTS. This Agreement may not be amended other than by a written instrument executed by the Parties hereto.

19. HEADINGS. All articles and descriptive headings of paragraphs in this Agreement are inserted for convenience only and shall not affect the construction or interpretation hereof.

20. NO THIRD-PARTY BENEFICIARY. This Agreement is for the benefit of the Parties and their respective successors and permitted assigns, and it is not the intent of the parties to enter this Agreement for any other person or entity's benefit.

21. SEVERABILITY. In the event that any term of this Agreement is adjudged by a court or competent jurisdiction to be invalid, such adjudication shall not affect or nullify the remaining terms thereof, nor shall it result in the failure of the Agreement unless the court finds that the remainder of the Agreement cannot be enforced absent the stricken term.

22. AUTHORITY TO EXECUTE. Each Party hereto covenants to the other Party that it has lawful authority to enter into this Agreement and that the Party's representative executing same is authorized to do so on behalf of the Party. In addition, Owner represents and warrants that as the owner or person or entity lawfully entitled to grant licenses for the use of the Property in question, Owner has obtained any and all approvals and authorizations for entering into this Agreement that may be necessary from any party who has an interest in Owner's Property including, but not limited to, any mortgagees, special districts, associations and lessees.

IN WITNESS WHEREOF, the Parties hereto have duly executed this Transit Access Agreement as of the day and year first above written.

OWNER

By: _____

Its: _____
(Insert title of signer)

CITY OF EVANSVILLE, a political subdivision of the State of Indiana

By: _____

Exhibit "A"

Legal Description of Parcel ID #_____

See Attached.

ACCESS MANAGEMENT MANUAL AND DEVELOPMENT GUIDE

Actions to Ensure the Efficient Use of Existing Road Space

Evansville Metropolitan Planning Organization

Evansville MPO
Henderson • Vanderburgh • Warrick