NCHRP
REPORT 548

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

A Guidebook for Including Access Management in Transportation Planning

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

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A Guidebook for Including Access Management in Transportation Planning

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

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FOREWORD

By Dianne S. Schwager
Staff Officer
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This report will be of interest to planning practitioners and access management proponents involved with transportation planning at the state, regional, and local levels. The guidebook is an easy-to-use reference for incorporating access management into the transportation planning process.

Access management is defined in the TRB 2003 *Access Management Manual,* as the "systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway." Application of the best practices of access management has benefits for motorists, bicyclists, pedestrians, transit riders, business people, government agencies, and communities.

The desired outcomes of access management are highways that

- Are safer for vehicular and pedestrian traffic;
- Allow motorists to operate vehicles with fewer delays, less fuel consumption, and fewer emissions;
- Provide reasonable access to properties;
- Maintain their functional integrity and efficiency, helping to protect the investment of taxpayer dollars;
- Reflect coordination between land use and transportation decisions; and
- Are used for the purposes (functions) for which they are designed.

Recognizing the differences among states and communities regarding access management, *NCHRP Report 548* provides guidance for implementing access management through the transportation planning process rather than prescribing a particular approach. The guidance is organized by type of plan (i.e., overall planning process, long-range plans, programming, and corridor and subarea planning) and jurisdictional level (i.e., state, metropolitan planning organization, and local). The guidebook includes a glossary that defines technical terms and industry acronyms.

CONTENTS

A GUIDEBOOK FOR INCLUDING ACCESS MANAGEMENT IN TRANSPORTATION PLANNING

PREFACE

The safety, mobility, and economic benefits of applying access management are documented, known, and compelling; yet, state and local agencies encounter many challenges in achieving desirable access management outcomes. There are many reasons for this. Successful access management requires effective cross-functional management, cooperation, and coordination among different units of government and decisionmaking at the system level. It is harder to be successful with access management when policy decisions are made at the point of implementation—when a permit is approved, a site plan reviewed, or a highway project designed.

In most agencies, there is an established policy and planning process that defines the authority and business rules for the development and operation of the transportation system. Our research finds that there is great opportunity to realize the benefits from access management when transportation agency managers, planners, and access management proponents use the transportation planning process to drive the implementation of access management. This guidebook shows how this can be accomplished and provides practical guidance to support implementation.

WHO SHOULD USE THE GUIDEBOOK?

This guidebook is for transportation agency managers, engineers, and planners who want their agencies to use the planning process to implement a systematic and consistent approach to access management. Who these individuals are varies from agency to agency depending on interests and the presence of access management champions. For employees who are dealing with the consequences of poor access management at the project and operational levels, the guidance provides a resource that outlines the specific steps their agencies can take to establish a policy and planning basis for implementing access management best practices. This guidance focuses on how to use the planning process to establish the implementing mechanisms that will result in the application of access management principles.

CONTENTS

This guidebook details where in the planning process the policy authority requiring access management can be established. Specific guidance is provided on how to implement access management through different elements of the planning process.

CHAPTER 1

INTRODUCTION

This guidebook is a resource for incorporating access management into the transportation planning process. It is to be used by planning practitioners and access management proponents involved with transportation planning at the state, regional, and local levels. The guidebook is easy to use, provides guidance on specific actions that the reader can take, and points the reader to the appropriate resources for more detailed information. The guidance has been developed through a research project funded by NCHRP.

GUIDEBOOK PURPOSE

The purpose of this guidebook is to provide transportation professionals with tools that will help them realize the benefits of access management through the transportation planning process. Please note that the focus is on establishing a foundation for the implementation of access management.

Access management is most effective when it is implemented at the system level and applied consistently by the different functional organizations within a transportation agency that are responsible for planning, designing, and operating the highway system. This requires a policy mandate through statute; administrative code; local ordinances; or agency policies, procedures, and design standards. This guidebook identifies how to establish a policy and planning basis for access management so that decisions are not made on a project-by-project or permit-by-permit basis. The guidebook can be used to address access management at the policy, system, and corridor planning levels. It further identifies how transportation planners can work to ensure that the land use planning and development review processes also address access management.

WHAT IS ACCESS MANAGEMENT?

The concept of access management has matured over the past 25 years. There is now an established body of knowledge and agreed-upon industry best practices and standards for planners and other practitioners. Access management includes policy, planning, design, and highway system operations. The vast majority of the access management efforts of state and local agencies are expended in response to a request for a permit to access a roadway.

Access management is the application of roadway design and traffic operations considerations to the location and design of access from the highway to adjacent land uses. The objective is to ensure roadway safety and efficient operations while providing reasonable access to the adjacent land use. The industry standard for best practice is the *Access Management Manual*, which provides a more specific definition of access management: "Access management is the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway" (*1*).

Following are they key components of an effective access management program:

- Developing and applying an access classification system that assigns access management standards to roadways in accordance with their level of importance to mobility. This system generally parallels the roadway functional classification system.
- Planning, designing, and maintaining road systems based on this access classification system and related road geometry.
- Defining the level of access permitted to each classification, which includes the following:
  - Permitting or prohibiting direct property access;
  - Allowing for full movement, limited turns, and median; and
  - Designating the type of traffic control required such as signal, raised median, or roundabout.
- Establishing criteria for the spacing of signalized and non-signalized access, as well as access setback distances from intersections (corner clearance) and interchanges.
- Applying agreed upon engineering standards that include appropriate geometric design criteria and traffic engineering measures to each allowable access point or system of access points.
- Establishing policies, regulations, and permitting procedures to implement the listed components.
- Ensuring coordination with and supportive actions by local jurisdictions exercising their land use planning authority as well as their development permitting and review authority.

WHAT ARE THE OUTCOMES OF ACCESS MANAGEMENT?

The desired outcomes from the application of best access management practices are a highway system that

- Is safer for vehicular and pedestrian traffic.
- Allows motorists to operate vehicles with fewer delays, less fuel consumption, and fewer emissions.
- Provides reasonable access to properties.
- Maintains its functional integrity and efficiency, protecting the investment of taxpayer dollars.
- Reflects coordination between land use and transportation decisions.
- Has motorists using highways for the purposes (i.e., functions) for which the highways are designed; one result of this is less cut-through traffic in residential neighborhoods from overburdened arterials.

The application of access management best practices has benefits for motorists, bicyclists, pedestrians, transit riders, business people, government agencies, and communities.

WHY ADDRESS ACCESS MANAGEMENT EXPLICITLY IN THE PLANNING PROCESS?

The reason to include access management in the planning process is simple: when implemented effectively, access management provides a cost-effective approach for accomplishing transportation plan goals. A well-established body of engineering research and practice shows that the implementation of access management principles to our highways provides a cost-effective means for supporting the mobility, safety, environmental, and preservation goals that are established in transportation plans at the state, metropolitan, and local levels. There are examples of access management being successfully incorporated into transportation planning in many states and locales. The guidebook identifies the most successful approaches to addressing access management through the planning process and enables planners to learn from experience in other jurisdictions.

HOW TO USE THE GUIDEBOOK

This guidebook provides a systematic approach for implementing access management through the planning process. It guides managers on how to incorporate access management into the planning process. Given the differences among the states and among the different appetites for access management, the guidebook does not provide a cookbook but rather a menu detailing the different implementing elements of access management and how to promote them through the planning process.

The guidebook should be used to support implementation and is organized to this end. To use the guidebook, follow the four steps below:

1. Understand the implementing mechanisms and identify opportunities,
2. Identify and access the right planning level for implementation,
3. Identify and select guidance area(s), and
4. Apply the guidance.

Understand the Implementing Mechanisms and Identify Opportunities

Access management is implemented through policy, statutes, administrative rules, engineering standards, ordinances, permitting, the budget process, and other mechanisms. Key starting points are understanding these implementing mechanisms and identifying opportunities available in the planning process to advance them.

Chapter 2: Access Management Implementing Mechanisms systematically lists all the mechanisms through which desired access management outcomes can be achieved. It shows where and how a consistent set of policy, planning, management, and engineering practices can be established. It also details the types of authority that can be used.

Identify and Access the Right Planning Level for Implementation

Many different transportation plans are produced—policy plans, system plans, corridor plans, modal plans, and community and subarea plans. These plans are produced by state, metropolitan planning organization (MPO), regional, and local agencies in partnership with many stakeholders and are coordinated with differing degrees of success in different parts of the country. The guidebook identifies the type of plan and the level of planning that provide the best mechanism for driving the implementation of access management. For example, a policy plan can be used to establish direction for an agency to develop and implement an access classification system. Through other plans such as corridor plans, planners can then apply the classification system.

Chapter 3: Access Management in the Transportation Planning Process provides an overview of the transportation planning process and explains which elements of the planning process are best suited for implementing different elements of a successful access management program.

Identify and Select Guidance Area(s)

The guidance is organized by type of plan and jurisdictional level. Chapter 4: Guidance for Addressing Access Management provides detailed guidance that can be used

to integrate access management into the planning process. The guidance areas are organized by the type of planning activity to which they are most applicable. Each guidance area is written to provide a stand-alone starting point or template from which an implementation plan can be tailored by the implementing agency. Guidance areas specific to MPOs and local governments are grouped together. Exhibit 1-1 lists the individual guidance areas addressed and specifies the jurisdiction levels to which they are applicable.

EXHIBIT 1-1 Guidance Areas

Guidance Area	Jurisdiction
Overall Planning Process	
1. Establish an owner for access management within the organization.	State, MPO, and local.
2. Integrate access management principles, benefits, and techniques into the public and stakeholder involvement processes.	State, MPO, or local (dependent on action presented to the public).
3. Establish a process to coordinate access management provisions developed at the system and corridor levels with operational activities.	State would generally take the lead, working with local jurisdictions to implement appropriate procedures.
4. Establish and resource a staffing, training, and technical assistance plan for access management support.	State, MPO, and local.
5. Monitor performance in implementing access management.	State, although partnerships can be formed with MPOs and local jurisdictions.
Policy and System Planning—Long-Range Plans	
1. Consider access management strategies as a mechanism for achieving broader policy goals.	State, MPO, and local.
2. Include specific policy statements related to access management in the long-range plan.	State, MPO, and local.
3. Consider and/or promote access management strategies as a complement to traditional approaches for increasing transportation capacity.	State, MPO, and local.
4. Establish and maintain an access classification system with access standards or guidelines.	State or local.
5. Evaluate the impact on roadway system performance of applying an access classification system and implementing associated access standards/guidelines.	State and MPO.
Programming	
1. Develop mechanisms to support the selection of projects that incorporate access management strategies and principles.	State for the Statewide Transportation Improvement Program, MPO for the Transportation Improvement Program, and local for Capital Improvement Plans.
2. Program stand-alone access management projects, such as for the acquisition of access rights in high-priority locations or for incorporating medians on multilane arterials.	State, MPO, and local transportation agencies.

(*continued on next page*)

EXHIBIT 1-1 (Continued)

Guidance Area	Jurisdiction
Corridor and Subarea Planning	
1. Prepare an access management plan as a component of an area-wide or corridor plan.	State, MPO, or local.
2. Address access management in corridor plans.	State and MPO.
3. Ensure that geometric design standards incorporate best practices for access management.	State, MPO, and local.
4. Ensure that traffic impact analysis procedures address access management.	State and local planning authorities, MPOs.
5. Ensure that traffic signal warrant criteria are consistent with the access classification system.	State and local.
Establishing MPOs as Advocates for Access Management	
1. Coordinate with agency decisionmakers to facilitate the integration of access management principles.	MPO.
2. Maintain the consistency of access management efforts in the MPO area.	MPO.
3. Support access management activities through the Unified Planning Work Program.	MPO.
Implementing through Local Governments	
1. Address access management in community planning as a means of accomplishing a broad range of transportation and land use goals.	Local planning department.
2. Establish a master street plan or thoroughfare plan that incorporates access management principles.	Local transportation planning or public works departments.
3. Support access management through land use planning; organize land uses into activity centers to support local street network development and alternative access.	Local planning department.
4. Strengthen local subdivision regulations and expand street design types to promote alternative access to major roadways.	Local planning department, public works, and development services/administration.
5. Use subarea and sketch planning techniques to facilitate the development of service roads and internal street networks for properties under multiple ownership.	Local planning department and development services/administration.
6. Integrate transportation safety and operations considerations into land use decision making.	Local planning or public works department.
7. Establish and apply a traffic impact analysis process to help ensure access management principles are applied in the planning of new developments.	Local transportation planning/public works.
8. Ensure coordination and consistency across local planning and development functions and among jurisdictions with regard to access management.	Local planning department.

Apply the Guidance

Each guidance area is organized to provide a prospectus, or a scope and implementation plan. The guidance identifies the implementation steps and issues that need to be addressed as part of implementation. Each guidance area contains sufficient detail to provide a work plan template.

Take the selected guidance area and use it as the basis from which to develop a project description and implementation plan that are tailored to individual agency circumstances. Use the examples to see what a successful access management implementation looks like, and benefit from the lessons learned elsewhere. Draw upon the resources for further information on how to carry out specific steps.

TERMINOLOGY AND DEFINITIONS

The guidebook is written, to the extent possible, with a minimum of abbreviations and unfamiliar terms. However, avoiding these terms completely is not always possible and the referenced resources include this terminology. A glossary is therefore provided at the end of the report.

REFERENCE

1. *Access Management Manual*, Transportation Research Board of the National Academies, Washington, DC, 2003.

CHAPTER **2**

ACCESS MANAGEMENT IMPLEMENTING MECHANISMS

There is a well-developed literature that provides detailed guidance on access management and its benefits. Best practices and the application of best practices are presented in the following technical assistance and resource documents:

- *Access Management Manual*, Transportation Research Board of the National Academies, 2003.
- *NCHRP Report 348: Access Management Guidelines for Activity Centers,* Transportation Research Board, National Research Council, 1992.
- *NCHRP Report 420: Impacts of Access Management Techniques,* Transportation Research Board, National Research Council, 1999.
- *NCHRP Synthesis of Highway Practice 233: Land Development Regulations that Promote Access Management*, Transportation Research Board, National Research Council, 1996.
- *AASHTO Green Book: A Policy on Geometric Design of Highways and Streets,* American Association of State and Highway Transportation Officials, 2001.

From this body of work, it is possible to identify the methods and procedures involved in access management and to identify the associated implementing mechanisms and agencies. These implementing mechanisms are summarized in Exhibit 2-1, which groups the implementing mechanisms according to what institutionally establishes the mandate or drives implementation. For example, statute, administrative codes, and ordinances can all be used to provide direct implementing authority for access management. To change this authority requires policymaker action. Other implementing mechanisms can be directly pursued through agencies' policymaking, resource allocation, and management procedures.

SUMMARY OF METHODS

Access management is achieved through the systematic application of policy, planning, regulatory, and design strategies. Methods include statutes, regulations, plans, land acquisition, and operational and geometric design standards. Access is managed both through the application of police powers that are the basis for access management regulation, design standards, and permit requirements and through the acquisition of access rights, which involves property acquisition.

Principal access management methods include the following:

- **Acquisition of access rights.** State and local transportation agencies have the authority to acquire access rights, which is typically the method used for controlling the access along freeways, expressways, parkways, and other types of major roadways. The acquisition of access rights is an effective and long-term solution to the problem of providing adequate and safe access, particularly at selected locations such as interchanges or close to planned interchanges. The acquisition of access rights is an especially important method for managing access where there is no statewide access code.
- **Access management regulations.** These regulations may be used to address various aspects of access management, such as permitting or prohibiting access; location, spacing, and design of access connections; spacing of median openings, signalized intersections, and interchanges; and the access permitting process. The regulations have the weight of law and are established under police powers that are expressly authorized or implied in state statutes. Regulations may take the form of access codes or of administrative rules and local ordinances. Examples of comprehensive regulations are found in Colorado, Florida, New Jersey, and Oregon. Because regulations have the weight of law, they can be more effectively enforced than guidelines and they can be an important complement to state and local planning efforts.
- **Policies, directives, and guidelines.** State and local agencies may adopt specific policies, directives, or guidelines that are directly or indirectly related to access management. Every state transportation agency and local government has statutory authority to control highway design and operations to protect public safety, health, and welfare. State agencies may establish formal policies, directives, and guidelines. A local agency may establish policies by resolution or in its comprehensive plan. Access management issues are sometimes addressed through guidelines without specific legislative

EXHIBIT 2-1 Access Management Implementing Mechanisms

Implementing Mechanism	Implementing Agency
Authority—enabled through statute, administrative rules, transportation board or commission action, and ordinance	
General police forces.	State and local agencies.
Statute addressing access control.	State legislatures.
Administrative code.	State and local agencies.
Driveway permitting standards and processes.	State and local agencies.
Development review and permitting requirements.	State legislatures and local elected officials.
Land use and related ordinances.	Local elected officials enact ordinance. State legislatures enact enabling authority for local governments.
Site plan review and permitting requirements.	Local elected officials set policy and, where required, enact ordinances specifying requirements. State legislatures enact enabling authority.
Agency policy—enabled through delegated authority and management policymaking authority	
Access classification systems/plans.	State, MPO, and local planning agencies.
System and corridor plans that specify level and/or location of access.	State, MPO, and local planning agencies.
Coordinated transportation/land use corridor and area-wide planning approaches that specify levels of access.	State, MPO, and local planning agencies.
Design standards and guidelines addressing access management.	State and local agencies.
Access management advocacy and technical assistance programs	
Organizational unit and/or access management champion.	All implementing agencies.
Internal training, communications, and assistance to ensure understanding of policies and standards.	All implementing agencies.
Advocacy, communications, and outreach regarding benefits of access management.	All implementing agencies and providers of technical assistance such as the Federal Highway Administration, National Highway Institute, and Technology Transfer centers.
Technical support and advocacy to local jurisdictions to support access management through land development regulations and development review.	State agencies, MPOs, and regional planning agencies.

(*continued on next page*)

EXHIBIT 2-1 (Continued)

Implementing Mechanism	Implementing Agency
Management accountability for consistent implementation of policies, procedures, standards, and guidelines	
Management oversight to ensure consistent implementation of standards and policies.	State and local agencies.
Implementation of performance measurement (e.g., to track the number of variances approved).	State and local agencies.
Project programming related to access management	
Dedicated funding program for acquisition of access rights and/or corridor preservation.	All agencies.
Access management projects addressed in programming process.	All agencies.
Accomplishment of access management objectives and criteria in programming and project prioritization.	All agencies.
Project development	
Project scoping addresses access management policies, standards, and objectives.	State, MPO, and local agencies.
Project design addresses access management objectives.	State, MPO, and local agencies.
Access management retrofit during reconstruction projects.	State and local agencies.

authority and without the mandatory status and enforceability of regulations.

- **Land development regulations.** Local governments usually address highway access management under their land use, development review, and permitting functions. In this way, local governments exercise their police powers to protect the safety, health, and welfare of the highway user. In addition to access management and driveway design requirements, local agencies establish a variety of land development regulations that affect access. Zoning regulations address lot dimensions and coverage, landscaping, parking, site circulation, development density, and the allowable use of the land. "Corridor overlay districts" are sometimes used to establish access requirements for a specific roadway corridor. In addition, subdivision regulations that govern the division of land into lots, blocks, and public ways can help ensure proper street layout for existing or planned roadways. State agencies rarely have the power to regulate land development.
- **Geometric design.** Elements such as medians, median openings, auxiliary lanes, driveway design, intersection channelization, frontage roads, and grade separations are used to help manage access. Design standards for these elements are set forth in state or local design manuals. Design standards are especially important for situations in which there is no comprehensive access code. In such cases, the design elements may be keyed to the road classification system to achieve access management.
- **Development review and impact assessment.** Access management is addressed in the site review stage following a developer's request for an access or connection permit. This may be accomplished through the access permitting process of state transportation agencies or through the subdivision or site plan review process of local agencies. Traffic impact studies are usually required for larger developments. When state or local access codes are in effect, these play an important role in deciding if, where, and how site access may be provided.

IMPLEMENTING AUTHORITY

State and local agencies gain implementing authority for access management through their general police powers to protect public safety, health, and welfare and through emi-

nent domain—the authority to acquire rights-of-way and private property for public use. In addition, transportation agencies are granted the authority under state transportation laws to manage all aspects of roadway design and operation to protect public health, safety, and welfare. Because the extent and nature of government's authority to regulate access and land development varies considerably from state to state, the use of implementing mechanisms for access management will vary from state to state.

Despite the differences among the states, all state and local agencies working together can develop and administer access management programs. In summary, these agencies can do the following:

- Implement new codes, ordinances, procedures, standards, and guidelines or update existing ones.
- Provide educational materials and public informational activities describing the principles, features, and benefits of access management.
- Develop transportation plans that directly address access management.
- Prepare land use plans and land development regulations that support access management.
- Address access management as part of the development review and permitting process.
- Allocate resources and provide funding to accomplish access management.

The planning process can provide a mechanism to establish the implementing authority, organizational direction, and facility-specific plans to accomplish all the activities listed above.

CHAPTER **3**

ACCESS MANAGEMENT IN THE TRANSPORTATION PLANNING PROCESS

The transportation planning process is a systematic, well-defined approach used by states, MPOs, and local governments to develop agreed-upon implementation actions that meet an agency's goals and objectives for the transportation system. The process is required and specified by federal law if federal funding is to be used. The transportation planning process involves many participants, and every state produces various types of transportation plans that differ in their specificity and geographic coverage. The plans range from policy plans that provide outcome-oriented goals, objectives, and policy statements to facility or corridor plans that provide a detailed master plan to guide project design. State transportation agencies, MPOs, and local governments coordinate, cooperate, and collaborate in varying degrees to produce the plans.

Transportation planning for higher functional classification roadways is primarily accomplished by state departments of transportation (DOTs) and MPOs, with technical assistance and some oversight by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). The planning process is multijurisdictional and involves many stakeholder organizations and interests.

Both state DOTs and MPOs are responsible for establishing long-range plans and short-term programs, as illustrated in Exhibit 3-1. The long-range plan establishes goals and objectives and identifies transportation investments over a 20-year period, perhaps with a broad staging of needs. The short-term programs are, in a sense, implementation documents and include specific programs and projects. Plans and programs are updated periodically, but project and program monitoring, needs assessment, and priority setting are continuous processes.

Local governments prepare long-range plans and corridor plans. They develop capital improvement plans and programs. Local jurisdictions also apply their development review and permitting authority to establish development regulations for site and building development. Ideally, development review activities and permitting decisions implement plans.

LAND USE PLANNING AND ACCESS MANAGEMENT

Land use planning and development review all take place at the local level where the authority resides. A key objective of the transportation process, therefore, is to coordinate transportation and land use. This is especially important for access management and corridor preservation. The actions of local jurisdictions in planning, reviewing, and approving land development can significantly impact the ability of other agencies to implement their transportation plans. A key feature of successful access management is coordination with land use decisions made by local jurisdictions. As illustrated in Exhibit 3-2, access management includes parts of both land use planning and traffic management.

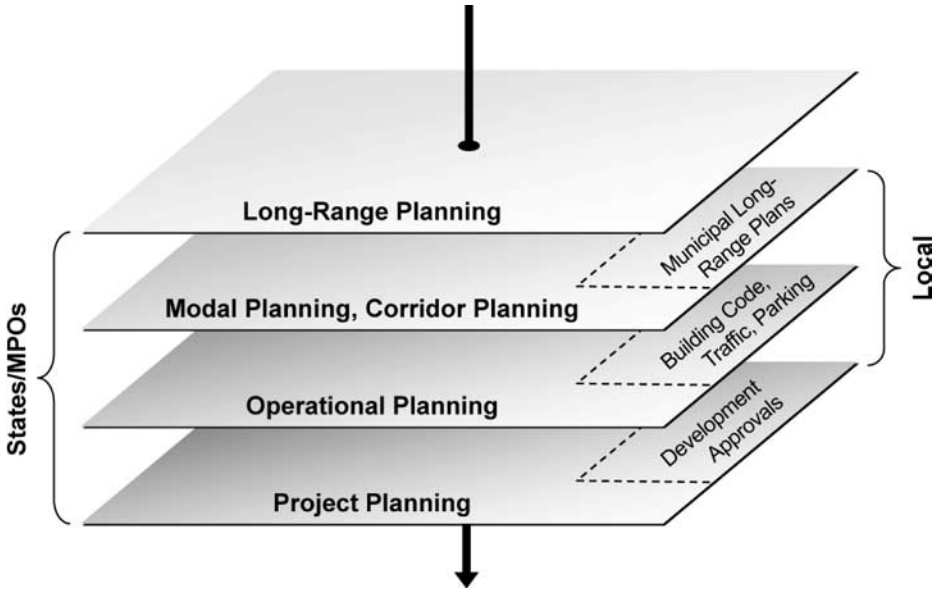
ADDRESSING ACCESS MANAGEMENT IN DIFFERENT TYPES OF TRANSPORTATION PLANS AND AT DIFFERENT PLANNING LEVELS

The planning process produces a number of different plans and improvement programs; access management can be incorporated into these different plans. It is important for advocates of access management to recognize that the planning process provides an effective implementing mechanism for access management. It is useful to understand how the different levels of the transportation planning process fit together. Exhibit 3-3 depicts this relationship to assist the practitioner in determining what elements of access management to address at different stages in this process; it shows conceptually how these different plans can relate when they are performed at different jurisdictional levels for different elements of the transportation system.

The discussion below identifies how access management considerations can be addressed effectively within the major components of the transportation planning process. Although these plans are coordinated with varying degrees of success in different parts of the country, it is essential throughout the entire transportation planning process that appropriate coordination, collaboration, and cooperation occur among the major participants. These include elected officials as well as agency officials. It is also very important that the process be open, allowing public input throughout.

The different elements of the overall transportation planning process, as well as how they address access management, are highlighted below. To aid the practitioner, the discussion focuses on how each element of the planning

EXHIBIT 3-1 Transportation Planning Activity



process can be used most effectively to drive desirable access management outcomes. The elements are as follows:

- **Policy planning.** Generally, the first steps in the transportation planning process occur at the policy level. Appropriate visions, goals, objectives, performance measures, and policies or guidelines are developed and documented. Best practice is for the goals, objectives, and policies to be outcome oriented. These goals, objectives, and policies are then adopted by the planning process participants (usually some type of policy body) and thereby guide the planning process. Access management considerations that might be addressed at the policy level include safety, mobility, corridor preservation aesthetics, land use, coordination, and the need for policy-level statements advocating access management.

  Output from this level of planning could include increased emphasis on the principles and benefits of access management. This is an important first step in incorporating access management into the planning process.
- **System planning.** Many states and all MPOs produce system plans. Those states that do not limit their long-range plan to the policy level, which is allowed under federal law and regulation, prepare system plans. Metropolitan areas are required by federal law to have a long-range system plan prepared and acted upon by the MPO. A system plan is composed of a network of transportation facil-

EXHIBIT 3-2 Access Management and Land Use Planning

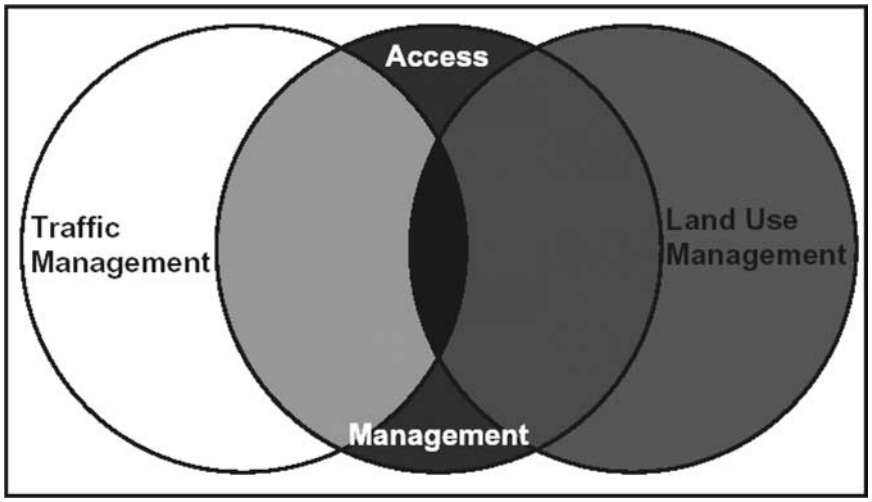
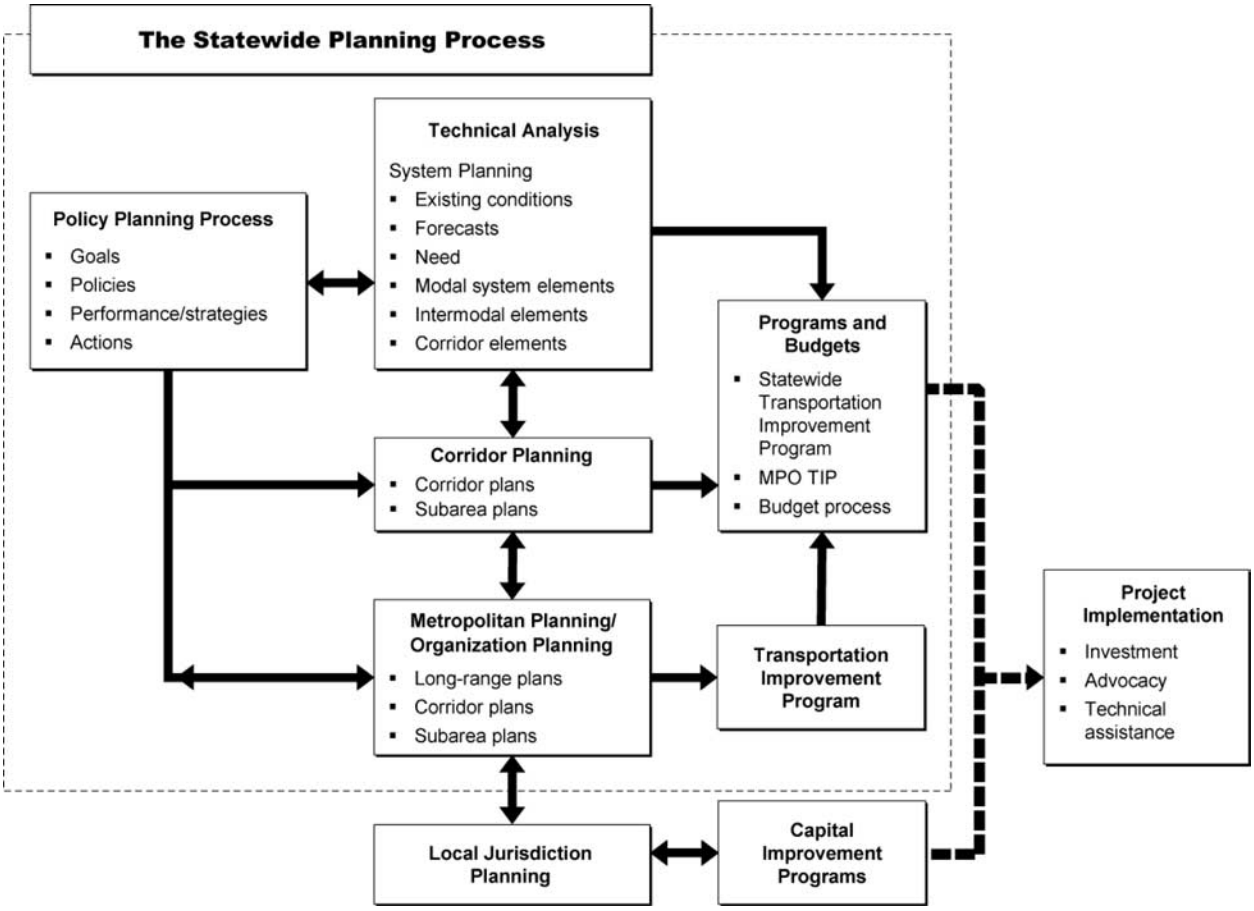


EXHIBIT 3-3 Relationship Among Different Types of Transportation Plans



ities that will provide a planned level of system performance. Typically, these plans address mobility, corridor preservation, economic development, and quality-of-life outcomes for a 20-year period. The plans specify how the transportation system will be developed, operated, and maintained to accomplish these outcomes. A long-range system plan is sometimes subdivided into mode-specific system plans, some of which might be more detailed than others. Access management is often an issue at the system planning level because the effectiveness of access management impacts safety and mobility at the system level. Output from this level of planning could include system-wide access classification and standards, as well as identification of possible access management actions and/or projects. A key element is setting the appropriate access and design standards.

- **Corridor and subarea planning.** Many metropolitan areas and states prepare corridor or subarea plans. Some local governments also develop subarea or corridor plans that directly or indirectly address access management. This is the level of planning in which access management issues are addressed in more detail. The corridor plans will result from a study focused on the interaction of transportation, land use, and development in a particular corridor. Access to the transportation facilities and the impact of this access on safety and mobility, as well as on land use and economic development, is very effectively studied here. Access management issues addressed at the corridor planning level include safety, mobility, land use, development, and the application of consistent access management guidelines and standards.

  Output from this level of planning could include identification of possible corridor access management actions and/or projects. The corridor plans may show the transportation network and related improvements, including access allowances and restrictions, as well as the expected land use and economic development for the corridor over a 10- to 20-year period. These may be in an access management plan or included as a component of the area plan.
- **Local transportation planning.** Many local governments prepare transportation plans that address county roads and city streets not typically addressed through the state and MPO processes. These local plans identify

project needs and program projects in the jurisdiction's capital improvement programs. The transportation element of a local comprehensive plan also typically includes a policy plan. Output from this level of planning could include identification of possible access management actions, projects, or both.

- **Programming and budgeting.** Transportation plans of whatever type are implemented through the programming and budgeting process. This process produces a program of projects for design and construction as well as for funded programmatic activities. The budgeting process funds operational budgets for non-capital elements of access management programs. The output is funded projects and programs. For example, access management features of projects, such as consolidation of driveways as part of reconstruction, can be defined in project scope and programmed or stand-alone purchase of access rights can be programmed.

  Within their programs, all states and MPOs must address federal regulations that require the agencies to relate the programming process back to the plan and to have a program of projects expected to be implemented over a minimum 3-year period. The program is called the Statewide Transportation Improvement Program (STIP) at the state level and the Transportation Improvement Program (TIP) at the metropolitan level. Projects cannot advance with federal funding unless they are included in these programs.
- **Prioritizing.** In general, there are many more projects than can be funded over the 3-year period described above, and states and MPOs must prioritize projects for inclusion in the STIP. Access management might be a factor in prioritizing projects, but access is always a factor in the design of projects, so states and MPOs are quick to point out that they all consider access management issues in their programming. Access management issues that might be addressed at the programming and budgeting level could include access management projects, funds, and prioritization factors. Output from this level of planning most likely would include access management projects or projects with access management features, such as medians and auxiliary lanes.
- **Implementing.** Plans are implemented through the following:
  - **Capital investment.** Investment decisions generally involve the prioritization and selection of highway improvement projects for inclusion in the state and metropolitan transportation improvement programs. These commit federal, state, and local funds to specific projects. This process is referred to as the programming process. Under best practice, there is a strong relationship between planning and programming so that the process defines and selects projects that most effectively implement the transportation plan.
  - **Operating budgets.** This involves non-capital or operating budget investments of employee time to provide advocacy and manage programs, as well as funding of education and other initiatives. Transportation agencies, through their programming and budget processes, allocate resources to influence or coordinate with other agencies to implement plans. For example, state and MPO plans address transportation/land use coordination, but these agencies have no authority over land use planning. Therefore, to implement this element of their plans, the agencies allocate resources to working with and coordinating with the local governments that have land use authority. Similarly, because so many levels of government are involved in successful access management planning, state and MPO staff time is a requirement for administering and providing advocacy for access management programs, the resources for which need to be budgeted.
  - **Technical assistance.** Different plans are often implemented through the funding and provision of technical assistance. For access management, examples include funding and providing assistance that enables multijurisdictional access management planning or the development of model ordinances, among other actions.

Planning for Safety

Access management can be an integral part of planning for safety. In many agencies, safety management activities for transportation projects often have involved a reactive engineering solution to identified problems after a project is completed. Planning and safety management identify clusters of accidents in particular areas or discrete roadway segments and then design solutions to those discrete areas without a broader system-level consideration of safety goals and measures.

Many times, safety improvements that utilize improved roadway designs and access management standards and specifications are made after problems are identified through traffic accident records. Reactive methodologies wait until accidents are recorded and do not assume the effects of growth in traffic that will impact safety or create future safety problems.

Access management can be an effective part of addressing safety in transportation plans by systematically applying the current body of knowledge about access management to assess the impact on crash potential of different plan alternatives. In short, access management can be considered when planning processes address safety at the system level and can go beyond simple projections of various accident rates or isolated applications of various countermeasures in order to assess the collective effects of various safety-related actions.

Understanding the Role of Access Management in Improving Safety

The consideration of safety in planning is a topic of current interest to researchers and practitioners. Access management is a key consideration. A good understanding of why unsafe conditions occur and what can be done about them is, therefore, the beginning of effective planning for safety. Poor access management creates unsafe outcomes and results in crashes. Effective safety planning is a process of thinking ahead about safety of the system, its users, and the environment for the purpose of generating a plan. This is to achieve the ultimate purpose of any planning activity: avoiding problems as much as possible (in contrast to management's function of solving problems when they occur).

This guidebook identifies tools and resources for transportation planners to use when assessing the safety impacts of poor access management or of travel demand growth and the continuation of current development patterns. The guidebook also identifies sketch planning tools for assessing the impact on safety outcomes of applying access management principles through the transportation planning process.

The guidance identifies the following actions for planning at all levels:

- **Quantify the impact on future safety outcomes of current land use, economic, population, and travel trends.** This involves quantifying the forecast safety outcomes based on population and travel trends applied to the current transportation system. This sets the agenda for the magnitude of the safety need to be addressed in the planning process. It can be expressed in traditional performance measures: fatalities, injuries, and property damage.
- **Provide mechanisms for identifying the order of magnitude of the safety benefits of actions related to the implementation of best access management practices.** These could be human factors or infrastructure.

There are a number of different analytical approaches that planners can take. Planners can assess the impact on safety performance of different access management outcomes. Methodologies may be applicable for specific geographical areas (e.g., statewide versus metropolitan, or urban versus rural). National crash rates can be compared with accident rates of specific areas, or metro-area crash rates (e.g., total or fatal) for one area can be compared with those for other areas in order to see whether the rates are above or below the norms. Another method could include stratifying roads by functional class; obtaining data on specific road characteristics and existing rates; and then modifying rates based on changes in geometry, access density (e.g., due to land division trends), or traffic control (e.g., signs or signalization). On corridor-level projects, planners can assess intersection conflicts and aggregate them over the length of the corridor or project to generate a measured index of the corridor's safety.

Procedures for Analyzing and Prioritizing Access Management Actions to Address Safety in Long-Range Planning

Potential tools or methodologies include stratifying roadways by general performance. This can involve the following:

- Stratify road networks and systems by degree of urbanization and functional classification. For example, a classification scheme would be urban freeways, rural freeways, urban expressways, rural expressways, and so on, for each type of roadway segment.
- Obtain the average crash rates per 1 million vehicle miles traveled for each classification.
- Identify the effects of various control measures on those roadways when controls were in place and when controls were not in place.

Another procedure may include developing a database for any given road then identifying and quantifying its crash rates and existing features, as illustrated in Exhibit 3-4.

EXHIBIT 3-4 Roadway Features Used to Evaluate Crash Rates

Data Item	Illustrative Value
Location	Rural
Lanes	2
ADT	10,000
ADT/lane	5,000
Design speed	50 mph
Sight distance	200 feet
Lane width	11 feet
Shoulder width	2 feet
Edge clearance	4 feet
Horizontal curvature	250 feet R
Vertical curvature	100 feet
Grades	2.4%
Access spacing (densities)	10 per mile
Signal frequency	1 per mile
Treatment of left-turn lanes:	
• Prohibited left-turn lanes	None
• Medians	None
• Two-way left-turn lanes	None
• Other	None

EXHIBIT 3-5 Accident Reduction Potential

Type of Improvement	Average Accident Reduction	Accident Base Rate
New signals with channelization	20	1.25 A/MVMT
Left-turn channelization	15	0.80 A/MVMT
At non-signalized intersections:		
• With curbs	65	0.40 A/MVMT
• Painted channelization	30	0.80 A/MVMT

A/MVMT = accidents per million vehicle miles traveled.

Accident Reduction Factors

New methods for incorporating access management into safety planning may utilize several accident reduction factors that have been developed and documented in journals and publications. Exhibit 3-5 provides an illustration.

Planning for Mobility and System Operations

Paralleling the discussion above regarding safety is the limited recognition and attention paid presently to the role of effective access management in improving mobility outcomes. Poor access management results in a less-productive roadway. The impacts are well documented and researched. At all levels in the planning process, access management can be evaluated as a component of planning for mobility. In short, the impact on system, corridor, and facility performance of different access management practices may be measured and modeled. In Chapter 4, Steps 3 and 5 under the guidance area of Policy and System Planning—Long-Range Plans identify how to accomplish this. In brief, sketch planning approaches can be used to model the improved mobility realized by applying access management at the corridor level.

Another element for planners to introduce into the consideration of access management is the analysis of time, money, and feasibility. In general, access management solutions can be implemented in a shorter time frame and at less cost, and these solutions may be more acceptable to communities than system expansion would be.

ACCESS MANAGEMENT IN THE PLANNING PROCESS

The key to incorporating access management into planning is to do so as part of each of the steps in the planning process. The objective is to ensure that the different transportation plans consider access management and that the transportation agency has an integrated set of policy tools, plans, standards, and practices to implement access management. Regardless of the type of plan or the level of government, most planning processes have the following generalized elements:

- Policy goal-setting.
- Technical analysis, which includes the evaluation and analysis of current and future conditions and usually results in the specification of needs.
- Plan development that specifies the plan, the capital program, and the operating budget.

The following subsections present the opportunities for addressing access management for each of the elements listed above.

Policy Goal-Setting

The policy goal-setting process is common to all transportation planning. Typically, it involves establishing the plan decisionmaking process. Most processes involve input and participation from various transportation stakeholders. These usually include the owners and operators of the facilities as well as transportation system users, among others. There is systematic public and stakeholder involvement.

Through this process, a series of policy goals and objectives for the development, management, and operation of the transportation system can be determined. These goals and objectives tend to address mobility, safety, quality-of-life, economic, and other outcomes. Under best practice, the goal-setting process establishes implementation priorities.

Exhibit 3-6 explains each step in the policy goal-setting process and highlights the opportunities for addressing access management through the statewide transportation planning process.

Technical Analysis (Needs and Conditions Assessment)

All levels of transportation planning include condition and needs analysis. This analysis is performed for an area-wide plan, a corridor plan, or an assessment of project alternatives.

EXHIBIT 3-6 Policy Goal Setting—Opportunities to Address Access Management

Planning Step	Access Management Opportunity
Establish policy goal-setting process and identify issues • Establishes the decisionmaking process for the plan. • Identifies issues to be evaluated. • Sets direction for technical analysis.	**Raise access management as a consideration to be addressed in the plan through one or more issue areas** • Land use/transportation coordination. • Corridor preservation. • Mobility. • Safety.
Provide ongoing participation • Establishes decisionmaking committees. • Designs and conducts stakeholder and public involvement.	**Make the case for access management through public and stakeholder involvement mechanisms** • Meets plan objectives in a cost-effective way. • Increases productivity of current system. • Improves safety. • Coordinates land use and transportation. • Promotes corridor preservation.
Establish goals, objectives, and policies • Considers results of technical analysis and public involvement. • Evaluates alternatives. • Sets overall plan goals, objectives, and policies.	**Use the policy plan to set agency direction for access management** • Includes access management policy goals and objectives. • Makes policy statements that drive access management implementation. • Specifies access management's role in meeting overall plan objectives.
Set implementation priorities and direct implementing actions • Takes policy and technical analysis as input to priority setting. • Makes trade-offs between categories of need. • Balances stakeholder, modal, and jurisdictional priorities. • Makes trade-offs and establishes priorities within categories of need. • Specifies implementing actions.	**Specify access management-related implementing actions** • Establish an access classification system. • Update access permitting and design standards. • Fund purchase of access rights in high-priority corridors. • Provide agency direction to fund access management implementation initiatives. • Work with local jurisdictions to address access management through development review and permitting. • Work with local jurisdictions to address land use/transportation coordination.
Measure performance; monitor and evaluate plan implementation • Monitors progress in meeting plan objectives. • Reports on a core set of system performance measures. • Provides oversight/accountability for plan implementation.	**Establish performance measures that provide accountability for access management** • Number of access-related crashes (or other safety-related performance measures). • Number of approach permit variances approved. • Number of driveway consolidations.

The technical approach and the tools used vary depending upon the planning level.

Exhibit 3-7 explains the generalized steps for the technical analysis conducted as part of any transportation plan and highlights the opportunities for addressing access management.

Plan Development, Programming, and Budgeting

Common to all levels of planning is a point at which decisions are made using the results from the technical analysis, from public and stakeholder input, and from the policy

EXHIBIT 3-7 Technical Analysis—Opportunities to Address Access Management

Planning Step	Access Management Opportunity
Designate transportation system to be addressed in plan • Determines which facilities are addressed in the plan. • Establishes different criteria for different plans. For highways, functional class and funding responsibility are usually key criteria.	**Address the level of access; include the access classification** • Identify parts of the system that have high crash rates and assess strengthened access management as a planning solution.
Measure/monitor existing conditions • Applies analysis techniques to measure the baseline performance of the system—usually safety, mobility, and preservation. • Monitors this performance over time against plan objectives.	**Include the level of access, such as miles of access-controlled facilities, for corridor and subarea plans as a performance objective** • Monitor accomplishment of access management objectives. • Assess the extent to which desired/planned access management outcomes are in place.
Forecast future conditions • Applies a variety of analytical procedures to forecast future conditions. • Models future against alternative plan scenarios—usually a forward forecast of performance of the baseline system against alternative plan actions.	**Model, at the system and corridor levels, the impact of the application of current access management practices on system performance, mobility, and safety** For example, the following can be modeled: • Increase in crashes and fatalities from increased traffic forecast on current (baseline) system over plan horizon. • Reduction in crashes and fatalities from system-level application of median policies. • Increased productivity of the system and improved mobility. • Impact of current access management practices and demonstration of level-of-service degradation where practices are poor. • Impact on arterial traffic, flow, operating speeds, and safety for corridor plans.
Evaluate gap between goals and objectives, and between current and future conditions • Applies analysis tools to evaluate gap between plan objectives and current and future conditions. • Involves reassessing goals in light of analysis results.	**Quantify the impact of access management on improving safety and mobility outcomes** • Perform sketch planning at the system, corridor, or project levels.

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EXHIBIT 3-7 (Continued)

Planning Step	Access Management Opportunity
Evaluate alternative solutions and actions to address gap • Identifies alternative strategies for meeting plan objectives. • Evaluates strategies against agreed-upon analysis criteria. Criteria often include cost, feasibility, and public- and policy-level support.	**Include consideration of the benefits and costs of access management strategies for meeting mobility, corridor preservation, and safety objectives** • Use the results of technical analysis. • Compare cost-effectiveness with other solutions. • Identify as component of other solutions.
Select solution/strategy/implementation action • Selects preferred solution, maybe a strategy or alternative. • Varies type of solution depending upon type of plan.	**Incorporate access management into a plan as an implementation strategy** • Ensure inclusion in: – Policy plans. – System plans. – Corridor plans. – Facility-specific plans.

process. It is at this point that plans specify what is to be done to accomplish the agreed-upon goals.

Exhibit 3-8 explains the generalized steps for plan development, programming, and budgeting and highlights the opportunities for addressing access management.

USING THE PLANNING PROCESS TO PROVIDE A MANDATE FOR IMPLEMENTATION

The elements of the transportation planning process as summarized above are a continuous process implemented at the state and MPO levels and are subject to periodic updates. The key to using the planning process to implement access management is to identify which aspects of the planning process can be used to provide the mandate for the different access management implementing mechanisms. The types of plans that can be used to implement access management and how these can be used are summarized in Exhibit 3-9.

CHALLENGES AND SUCCESS FACTORS

An assessment of current practice identifies both challenges and success factors to addressing access management in the planning process.

Challenges

There are a number of barriers that states, MPOs, and local governments face in addressing access management in the planning process. These barriers are addressed in the guidance areas provided later in the guidebook. The following lists the barriers and challenges so that they might be addressed when implementing the guidance:

- **A narrow view of access management.** This includes the mindset that access management is an engineering or implementation issue, not a planning concern.
- **A lack of specific funding for access management improvements.** A related challenge is the real and perceived cost of access acquisitions. This is not only an external challenge due to unresponsiveness of local agencies to access management needs, but also an internal challenge because varying priorities among state units often hamper and delay acquisitions. This is equally true of funding for stand-alone access management improvements in lieu of other transportation improvements and of funding for access management improvements as a design modification or add-on cost in traditional capacity or maintenance improvements.
- **A lack of guidelines, policies, and law or the existence of law that can limit access management.** Many planning practitioners see their state's legal and regulatory environment as a constraint. In some states, there may be a lack of enabling authority or court decisions that imposes limits on access management relative to property rights.
- **A fragmented ownership of access management.** While the planning process can include access management, implementation is fragmented across

EXHIBIT 3-8 Plan Development, Programming, and Budgeting—Opportunities to Address Access Management

Planning Step	Access Management Opportunity
Set overall investment level for the plan • Provides an agreed-upon financial constraint for the plan. • Bases investment level on a combination of revenue and policy.	**Demonstrate the cost-effectiveness of access management as a strategy, and factor it into plan analysis**
Establish priorities and balance investments between categories of need • Arrays need across different categories, such as mobility and safety. • Makes trade-offs between categories. • Prioritizes between categories.	**Ensure cost-effectiveness, timely implementation, programming, and plan prioritization criteria** When access management is considered as a plan alternative, it will be favored in a prioritization approach with the following criteria: • Cost-effectiveness. • Timely implementation. • Coordination with land use planning.
Specify implementing actions to address each category of need Includes: • Construction investments, such as programs and projects. • Non-construction investments, such as operations and management. • Policy actions that change requirements. • Institutional actions, such as work with local jurisdictions.	**Include any of the access management implementing actions listed in Exhibit 2-1 or include others** • Applicability is dependent on the type of plan. • Plans can be used to set policy direction in support of access management within an organization.
Program projects—select and prioritize within categories • Identifies candidate projects. • Prioritizes and selects projects. • Provides program listing.	**Establish a mechanism for funding access management projects and program elements** Where enabled by the policy and planning framework: • Establish a mechanism for specifying access management elements in projects. • Provide weighting for projects that support access management. • Establish suballocation to projects related to access management or prioritization for projects that advance retrofit of facilities. • Identify and fund stand-alone access management projects that include acquisition of access rights, driveway consolidation, and other mechanisms. • Where programming suballocates to safety projects, include access-related elements in prioritization. • Establish and fund access management projects that involve program development, such as new or updated regulations, design standards, and model ordinances for local governments.

jurisdictions as well as within agencies. For state transportation agencies, design, right-of-way, maintenance, and planning personnel each have a role in access management issues. Internal coordination among state offices is often seen as more of a challenge than is external coordination. The offices with the authority to grant access permits might not coordinate with the other offices within the department that are responsible for access management as it affects design, operations, and the like.

- **An inconsistent administration of access management policies and procedures.** A significant non-planning barrier to access management relates to management practices. The issues arise when depart-

EXHIBIT 3-9 Transportation Planning Level to Incorporate Access Management Element

Implementing Mechanism	Planning Level
Authority—enabled through statute, administrative rules, transportation board or commission action, and ordinance	
Statute addressing access control (typically at the state level).	Policy planning—as a strategy to accomplish plan objectives, the policy plan can • Establish need, support, and recommend implementation of statutory changes. • Fund study to evaluate and recommend statutory change.
Administrative code.	Policy planning—as a strategy to accomplish plan objectives, the policy plan can • Establish need and direct agency to change administrative code.
Driveway permitting standards and processes.	Policy planning—as a strategy to accomplish plan objectives, the policy plan can • Direct agency to evaluate and institute process to revise driveway permitting standards to implement access management best practice. Corridor and project planning—application of standards.
Development review and permitting requirements.	Policy planning process can define agencies' governance interest in participating in development review.
Land use plan and related development review and permitting ordinances.	State policy planning process can define state interest in local adoption and implementation of land development regulations that advance the accomplishment of access management objectives. On state system, corridor planning can involve local jurisdictions to enact ordinances to support access management.
Agency policy—enabled through delegated authority and management policymaking authority	
Access classification systems/plans.	System planning—access classification system or plan developed as stand-alone plan or as part of highway system plan. Corridor planning or stand-alone access management plans. Programming—fund through Statewide Planning and Research (SPR).
System and corridor plans that specify level and/or location of access.	System planning can • Designate levels of access. • Prioritize corridors for detailed plan. Corridor planning—address in access management plans.
Coordinated transportation/land use corridor and area-wide planning approaches that specify levels of access.	Policy planning can direct resources and/or require land use plans.
Design standards and guidelines addressing access management.	Policy planning can direct agency to address access management in design guidelines.
Access management advocacy and technical assistance programs	
Organizational unit and/or access management champion.	Policy planning can direct agency to establish access management unit. Corridor planning—incorporate outreach, coordination, and advocacy with local jurisdictions to support access management.
Internal training, communications, and assistance to ensure understanding of policies and standards.	Policy planning—define as an implementing action in the policy plan. Corridor planning—incorporate outreach, coordination, and advocacy with local jurisdictions to support access management.

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EXHIBIT 3-9 (Continued)

Implementing Mechanism	Planning Level
Advocacy, communications, and outreach regarding benefits of access management.	Policy planning—define as an implementing action in the policy plan. Undertake as part of corridor planning.
Technical support and advocacy to local jurisdictions to support access management through their zoning and development review.	Policy planning—define as an implementing action in the policy plan. Undertake as part of corridor planning.
Management accountability for consistent implementation of policies, procedures, standards, and guidelines	
Management oversight to ensure consistent implementation of standards and policies.	Provide accountability through the planning process.
Implementation of performance measurement (for example, to track the number of variances approved).	Establish performance measures as part of continuous planning process.
Project programming related to access management	
Dedicated funding program for acquisition of access rights and/or corridor preservation.	Establish as an implementing mechanism through policy plan.
Access management projects addressed in programming process.	Establish policy direction through plan.
Project development	
Project scoping addresses access management policies, standards, and objectives.	Address in project development.
Project design addresses access management objectives.	Address in project development.
Access management retrofit addressed and funded to consolidate driveways during reconstruction projects.	Address in project development.

ments do not follow standardized procedures or do not apply the standards in a consistent manner. This can be due to lack of training and/or inconsistency in the approval of variances for approach permits. For example, pressure by local jurisdictions and developers to either open new access points or not close existing access points can make effective access management difficult for states. A related challenge involves inconsistent treatment and coordination with local officials and developers by the different state DOT units.

- **A local government that doesn't understand the need to develop corridor access management plans in advance of development.** Local elected officials may not see the point of managing access between large tracts of agricultural or otherwise vacant land adjacent to state or county highways. But without a plan to guide development, the first large development projects (especially commercial ones) will often locate at the major intersections, where inadequate corner clearance results in long-term damage to the efficiency and safety of the roadway network.
- **A small land owner unfamiliar with access management techniques and benefits.** Small land owners tend to be more worried than national development companies about the impact on property values or business activity. In addition, small land owners often believe that direct access to the arterial network is a property right, which is not the case in many states.
- **An erroneous public belief that U-turns are dangerous.** This can be a challenge when considering median projects.

The following are additional barriers and challenges to integrating access management considerations into MPO transportation planning processes:

- **A lack of staff time and financial resources to stay involved in various state and local planning activities** (e.g., transportation and land use) in order to influence outcomes. This also impacts the ability of the MPO to get communities interested in the concept of access management and to then assist them in implementing access management concepts.
- **A limited authority on the part of MPOs to implement access management through the land development or roadway development processes.** These processes are typically controlled by state or local agencies.
- **A time-consuming and frustrating process of coordinating access management improvements** between state and local agencies and among individual departments of those agencies.
- **A lack of support in the state transportation agency culture for access management.** When this is this case, integration of access management concepts into new capacity or maintenance projects on the state system may not be embraced and may even be actively opposed.
- **A lack of awareness on the part of MPOs that access management strategies are a viable option for meeting regional transportation needs.** This is particularly true when the state has not implemented an access management program or developed access management guidelines, standards, or procedures. The MPOs may also be unwilling to take the lead in attempting to apply access management strategies on state roads.
- **A preconceived notion of the negative impact of access management strategies.** This can generate significant opposition, particularly from the business and development communities. Individual business owners may have negative ideas about the effects of specific access changes that may occur in front of their places of business.
- **An expectation of higher quality products while available funding is not keeping pace** with the rising cost of transportation improvements. This is particularly true for right-of-way costs.
- **A traditional capacity-first approach to addressing transportation issues at the state, MPO, and local levels.** The planning process is oriented to capital improvement projects.
- **A need to view access management as an operational activity.** This, however, is changing as planning increasingly considers system operations.

Success Factors

A variety of actions serve as major contributors to a state's success in considering access management in the planning process. These actions can be instrumental in overcoming the barriers and challenges detailed above. Generally, access management is being addressed to varying degrees across the nation. The levels at which it is being addressed, and the ways in which it is being addressed, also vary. Following are the success factors identified where access management is addressed effectively in the planning process:

- **Educating planners and process participants, including MPO participants, elected officials, stakeholders, and the public.** It is clear that education is a major component of an effective access management program. Knowledge about the benefits and principles of access management is essential, regardless of the level of planning—statewide system and policy planning, corridor planning, project planning, or programming. Many states emphasize that they have formal training programs and have trained internal as well as external personnel. Many states have an active public information program on access management, which results in informed stakeholders who bring this knowledge to the planning process. The more people who are exposed to access management principles and can visualize the benefits, the more acceptance there will be when it is time to implement access management improvements. This is particularly true of business owners. If the education component of the access management program is active and persistent, the rest will ultimately follow.
- **Recognizing the cost-effectiveness of access management in accomplishing mobility, corridor preservation, and safety objectives.** Most states and MPOs have a large backlog of mobility needs and tend to experience a continual degradation of level of service in their growing corridors. Where access management is recognized as a cost-effective approach to corridor preservation and enhanced mobility, it is more likely to be addressed through the planning process. Access management programs benefit highway safety, mobility, capacity, and operation of facilities, as well as economic development and growth. Safety, mobility (operations/congestion), and growth (economic development) are generally the driving forces for effective consideration of access management in planning at all levels.
- **Implementing more formal processes**, **which tend to be more systematic in addressing access management in the planning process.** Some states have more formal processes for dealing with access management than do others. These formal processes are structured around laws, regulations, policies, or guidelines. They help to define the roles of the various participants (both internal and external to the state DOT) in effectively considering access management.
- **Providing cross-functional ownership and multijurisdictional collaboration.** In state DOTs, access management is not implemented by planners. The

planning process can provide direction to broad-based, cross-functional implementation. Jurisdictions with effective access management have strong teamwork and collaboration between headquarters and the field offices, as well as with local agencies and staff, on access management issues. The planning process can increase the emphasis on the internal coordination of access management considerations throughout the department by creating mechanisms for ensuring the following:
  – Regular access management team meetings.
  – Cross-functional coordination among all those in the department who are involved in access management (e.g., design, permitting, planning, traffic engineering, and operations) to ensure the best program for addressing access management.
  – Intergovernmental coordination with and involvement of local governments. For example, this may be accomplished through cooperative agreements, educational workshops, and involving local governments in corridor access management planning.
- **Measuring access management performance.** Where the process monitors performance in implementing access management, there is a greater likelihood of success. If an agency establishes access management performance measures, it focuses work across different functional areas such as design, planning, right-of-way, and even maintenance. For example, in Minnesota, development and permit reviews are documented and closely monitored to identify needs for more training and to assess policy implementation; in South Dakota, there are established access management performance measures. A good database is critical for monitoring the success of access management activities.

The following are additional success factors that contribute to the integration of access management considerations into MPO planning practices:

- **Determining the appropriate level of access management consideration for the action being taken.** Is it at the system planning, corridor planning, project planning, or programming level?
- **Integrating access management as a supporting strategy** into every aspect of MPO activities; at every level of MPO decisionmaking; and into every MPO process including safety, air quality, and land development. This makes access management a tool in the MPO toolbox.
- **Promoting corridor access management initiatives** in lieu of road widening in political environments that are sensitive to potential changes in rural character or other unique aesthetic characteristics.
- **Developing MPO policies and practices that support roadway functional hierarchy**, particularly the concept of limiting access on higher order roadways.
- **Developing mechanisms to encourage appropriate access conditions on state and local roadways** through the coordination of transportation and land use decisionmaking processes. While most MPOs do not have decisionmaking authority for land use or roadway implementation, MPOs can develop mechanisms in their various processes (e.g., long-range transportation plan development, project prioritization for the TIP, implementation of the regional Congestion Management System, and identification of projects intended to meet Clean Air Act standards) that place significant emphasis on the coordination of land use and transportation decisionmaking. These may include such mechanisms as the following:
  – Requiring local jurisdictions to develop land use regulations supporting access management prior to including a project in the long-range transportation plan or the TIP.
  – Using a weighted formula in the project selection process to give emphasis to corridors that are access controlled by state or local policy.
  – Encouraging and facilitating opportunities for local jurisdictions and state DOTs to "reach across the right-of-way line" and help each other.
- **Placing available funds into separate budgets for different types of projects**, including budgets specifically intended to address access management issues or for other project categories that are supported by access management techniques (e.g., safety, congestion mitigation, and aesthetic and other targeted community enhancements).
- **Taking a leadership role in breaking down barriers to implementing access management strategies in the region.** Identifying regulatory, staffing, technical, and other obstacles to implementation at the state and local levels, and developing strategies to overcome those obstacles. This may come in a variety of forms and include such activities as the following:
  – Providing supplemental funding for a project that has already been programmed.
  – Preparing regulations for updating local subdivision regulations where the professional and technical capacity of local agencies is limited.
  – Coordinating activities and processes among various project stakeholders.
  – Developing a model contract for local agencies to use when retaining consultant services for a corridor access management plan.
- **Supporting access management activities through the Unified Planning Work Program**, for which the MPO represents the primary source of transportation planning expertise in the region. For example, conduct-

ing corridor studies and/or subarea studies in the region that focus on access management issues and that provide access management strategies for improving safety or capacity where it is appropriate to do so.

- **Designating a staff-level champion** to ensure appropriate consideration of access management strategies and techniques in MPO activities and practices. It is easy for individual MPO staff members and consultants to become focused on narrow subject areas. Assigning someone the role of champion creates an internal mechanism to remind MPO and consultant project managers who are responsible for conducting the various aspects of MPO planning to consider access management strategies in their deliberations.
- **Establishing policies, standards, and procedures that leverage the effort being made by the state,** if there is a statewide access management program. This includes taking advantage of studies and other work already performed by the state in an effort to maximize MPO resources.
- **Participating in conceptual design review and other project development-related activities being conducted by state transportation agencies** to ensure that access management principles and commitments made during the planning process are integrated into the final project. Also, encouraging access management strategies, when appropriate, for all projects, including roadway maintenance projects.
- **Attempting to conduct public involvement activities directed at small groups or in one-on-one venues.** Corridor management planning and access management are personal issues for business owners and residents. Taking the time to meet with neighborhood groups and to attend other small-group venues provides an opportunity to address concerns in a less hostile environment than the large public hearing format. Large group meetings tend to encourage vocal opponents who grandstand to cheers from the audience. This is not a good venue for a real discussion on the benefits of access management.

CONCLUSIONS

Policy and System Planning

States that have formal access management laws, regulations, and policies generally have more authority to effectively address access management issues in project planning and development. Those plans generally have identified poor access management outcomes and have defined necessary improvements.

Policy planning processes can offer an effective mechanism for addressing access management at the statewide level in order to provide guidance for access management actions at other levels within the state (e.g., urban area, county, corridor, or project).

Access management should be addressed as a statewide issue because, in practice, the concerns are equally applicable in the urban setting and the rural setting. However, the solutions and approaches may differ. In urban areas, the focus is primarily on retrofit and addressing access management during reconstruction projects. In developing and less developed areas, the focus is on prevention through coordination with local planning and development review processes, both through the application of good design and access permitting standards and through corridor planning and preservation.

Corridor Planning

States that most successfully implement access management establish statewide standards and tie projects to corridor plans and analyses that include access management features and advance access management requirements.

Access management guidelines that have been developed by many states whose statewide plans might not have effectively addressed access management tend to be applied at the corridor level. These states generally have identified the need for effective access management through corridor planning and analysis.

Some states have instituted a special funding program for access management. This has contributed to the advancement of access management throughout the state. This is especially true within corridors because most special funding is tied to projects that are consistent with corridor plans.

The business benefits of access management can be quantified and communicated to policymakers at the corridor level. This can result in support for requiring developers to take/fund appropriate measures (including access management) to maintain levels of service that can save the state millions of dollars.

Corridor planning can provide the impetus for effective coordination of the land use planning and development review processes with local jurisdictions. For example, Minnesota has developed and promotes a model access management ordinance by local governments for regulating access to development and redevelopment along a major highway corridor.

Programming

There is currently little direct focus on using the programming process to prioritize and implement access management, but doing so can be a particularly effective way for MPOs to address access management. Whether projects are specifically identified as an “access management project” or funded specifically with “access management funds,” a few states include access management in their programming.

A few states have program funds to acquire right-of-way and access rights before development pressures drive up costs.

Project Planning

States implement access management strategies and actions at the project level. Those that most successfully implement access management tie projects to corridor plans and analyses.

States that successfully implement access management strategies have a well-defined and consistent process for addressing access management as part of project-level planning. These states are most successful when policies, procedures, and standards are established and consistently applied or when specific access management plans to be implemented at the project level are defined through corridor planning.

CHAPTER **4**

GUIDANCE FOR ADDRESSING ACCESS MANAGEMENT

GUIDANCE AREAS

This chapter provides specific guidance in the areas listed below.

Overall Planning Process

The steps in the overall planning process are as follows:

1. Establish an owner for access management within the organization.
2. Integrate access management principles, benefits, and techniques into the public and stakeholder involvement processes.
3. Establish a process to coordinate access management provisions developed at the system and corridor levels with operational activities.
4. Establish and resource a staffing, training, and technical assistance plan for access management support.
5. Monitor performance in implementing access management.

Policy and System Planning—Long-Range Plans

The steps in policy and system planning for long-range plans are as follows:

1. Consider access management strategies as a mechanism for achieving broader policy goals.
2. Include specific policy statements related to access management in the long-range plan.
3. Consider and/or promote access management strategies as a complement to traditional approaches for increasing transportation capacity.
4. Establish and maintain an access classification system with access standards or guidelines.
5. Evaluate the impact on roadway system performance of applying an access classification system and implementing associated access standards/guidelines.

Programming

The steps for programming are as follows:

1. Develop mechanisms to support the selection of projects that address access management strategies and principles.
2. Program stand-alone access management projects, such as for the acquisition of access rights in high-priority locations or for incorporating medians on multilane arterials.

Corridor and Subarea Planning

The steps for corridor and subarea planning are as follows:

1. Prepare an access management plan as a component of an area-wide or corridor plan.
2. Address access management in corridor plans.
3. Ensure that geometric design standards incorporate best practices for access management.
4. Ensure that traffic impact analysis procedures address access management.
5. Ensure that traffic signal warrant criteria are consistent with the access classification system.

Establishing MPOs as Advocates for Access Management

The steps for establishing MPOs as advocates for access management are as follows:

1. Coordinate with agency decisionmakers to facilitate the integration of access management principles.
2. Maintain the consistency of access management efforts in the MPO area.
3. Support access management activities through the Unified Planning Work Program.

Implementing through Local Governments

The steps for implementing through local governments are as follows:

1. Address access management in community planning as a means of accomplishing a broad range of transportation and land use goals.

2. Establish a master street plan or thoroughfare plan that incorporates access management principles.
3. Support access management through land use planning; organize land uses into activity centers to support local street network development and alternative access.
4. Strengthen local subdivision regulations and expand street design types to promote alternative access to major roadways.
5. Use subarea- and sketch-planning techniques to facilitate the development of service roads and internal street networks for properties under multiple ownership.
6. Integrate transportation safety and operations considerations into land use decisionmaking.
7. Establish and apply a traffic impact analysis process to ensure access management principles are applied in the planning of new developments.
8. Ensure coordination and consistency across local planning and development functions and among jurisdictions in regard to access management.

GUIDANCE

Overall Planning Process

1. Establish an Owner for Access Management within the Organization

Where This Fits

Throughout the planning process.

Lead Agency

State, MPO, and local.

Background

Access management is implemented more effectively when there is an organizational unit or individual who is the focal point and/or business owner for it. The presence or absence of a champion is a significant factor that influences the degree to which access management is integrated into the planning processes; this is because there is a single point of contact and body of knowledge regarding best management practices. An individual may be the prime mover, but an organizational unit also may become the focal point for implementing access management.

Major Steps

- Provide an advocate and technical resource whose role is to provide influence and leadership for the consideration of access management.
- Make a member of the staff responsible in order to reinforce the importance of access management as a viable strategy.
- Give the access management champion time to consider how access management can be integrated into the planning process and provide support in this consideration.

Issues to Address

- Level and location within the organization.
- Knowledge, skills, and abilities required for the position.
- Ability to attract and retain a champion.
- Strong executive sponsorship will increase chances for success.
- Role, responsibilities, and authority of position.
- Ability to exert influence over the process.
- The structure of the organization will determine the best location (such as planning, design, right-of-way, and traffic engineering).
- Labor and budgeted resources.

Examples

Many state DOTs have established a staff position for this role, and some MPOs have part-time staff positions:

- Montana DOT has the position of Access Management Engineer within the Right-of-Way Bureau.
- South Dakota DOT has the position of Corridor Preservation Specialist within the Planning and Programming Division.
- The head of Florida DOT has exerted leadership to broaden the consideration of access management. This has been accomplished by requiring that access management considerations be included in master plans and through extensive public education.
- The access management overlay implemented for US Highway 19 in Levy County, Florida, was implemented through the initiative of a local planner and mayor. The overlay district will help manage access to US Highway 19 by controlling lot frontage, connection spacing, driveway design, and other dimensions of access. Implementation oversight was provided by a management review committee.
- The Ohio Kentucky Indiana Regional Council of Governments, which is the MPO in Cincinnati, Ohio, has been spearheading access management advocacy for more than 30 years. Its efforts have included the publication of a white paper and a number of guidance documents.

Resources

- *Access Management Manual*, Transportation Research Board of the National Academies (2003).
- *Benefits of Access Management*, FHWA, FHWA Document No. FHWA-OP-03-066.

2. Integrate Access Management Principles, Benefits, and Techniques into the Public and Stakeholder Involvement Processes

Where This Fits

As a standard part of the policysetting or project rationale that can be applied at public presentations.

Lead Agency

State, MPO, or local (dependent on action presented to the public).

Background

The public and those with a specific stake in the implementation of access management principles may have ambivalent feelings. While many may recognize the need for roadway improvements and support access management in general, they may doubt that the benefit will justify the sacrifices in access ease or convenience. Encouraging a more extensive understanding of access management principles and benefits by the public will allow participants in a public planning process to better weigh potential costs and benefits and to potentially offer access management suggestions that they feel are more appropriate to their circumstances. This action will increase understanding about the contribution that effective access management can make in meeting community and plan objectives.

Major Steps

- Develop access management outreach materials, such as brochures and PowerPoint presentations or videos that can be used by staff.
- Amend procedures manuals, where they are used as guidance for project design and approval, to incorporate the presentation of access management principles to the public. The level of detail provided in the guidance should take into consideration the project and jurisdictional level at which access management is applied in planning as well as the audience to whom the project is being presented. Be sure to provide continuity of public involvement in project planning and design as decisions are made about medians and median opening locations.
- Make the case to plan participants and stakeholders that access management strategies should be an integral part of the overall strategy for addressing transportation needs. Access management principles should be integrated into the overall transportation planning process. This will require a long-term commitment to comprehensively reach out to a variety of stakeholder and interest groups to educate them on the benefits of access management.

- Target general information related to overall benefits (for example, safety, capacity, or system preservation) primarily toward local elected officials, local government staff involved in both the land development and public works processes, and interested stakeholder groups such as chambers of commerce and other business interests.
- Consider adding more technical information for groups that may be interested in additional details, including meetings of local professional organizations such as the American Planning Association or the Institute of Transportation Engineers.
- Provide corridor- or project-specific education for individual business interests, property owners, neighborhood associations, and local elected officials as well as planners and public works staff for potentially impacted jurisdictions.

Issues to Address

- Stakeholders and participants in the process are a primary audience.
- Policymakers often have unwarranted concerns regarding potential developer opposition to access management. Public involvement can help mitigate such concerns.
- There is a mindset, even among some transportation professionals, that access management equates with driveway regulation. Before staff can educate the public, they must be educated themselves.

Examples

- Many states and some local jurisdictions have procedure manuals that detail each step in the highway approval and construction process. In such manuals, guidelines for presentation of access management principles may be integrated into procedures for public hearings.
- The Planning Division at Florida DOT (FDOT) developed several training modules and outreach brochures and has trained FDOT staff, local governments, MPOs, consultants, and numerous stakeholders across the state in the principles of access management. Through this training, stakeholders are more likely and better equipped to become involved in the planning process.
- The Berkshire, Massachusetts, MPO developed a publication on access management guidelines that was aimed at local planning board members and local public works superintendents.
- The Capital District Transportation Committee (CDTC) in Albany, New York, has conducted local workshops for several years. Local decisionmakers are now, for the most part, familiar with access management strategies.

Resources

- Many resources are identified on the access management website at www.accessmanagement.gov. The "Ten Ways" brochure and the FDOT brochure are particularly useful.
- *Access Management Manual,* Transportation Research Board of the National Academies (2003).
- Access management videos from FHWA; New Hampshire, Missouri, and Kansas DOTs; and the Licking County (Ohio) Area Transportation Study.
- *Access Management: Sensible Solutions for Tomorrow's Traffic*, FHWA, FHWA Document No. FHWA-OP-01-150.
- *Benefits of Access Management*, FHWA, FHWA Document No. FHWA-OP-03-066.
- *A Public Involvement Handbook for Median Projects*, prepared for the FDOT Systems Planning Office by the Center for Urban Transportation Research (October 1995).

3. Establish a Process to Coordinate Access Management Provisions Developed at the System and Corridor Levels with Operational Activities

Where This Fits

Linking planning to implementation.

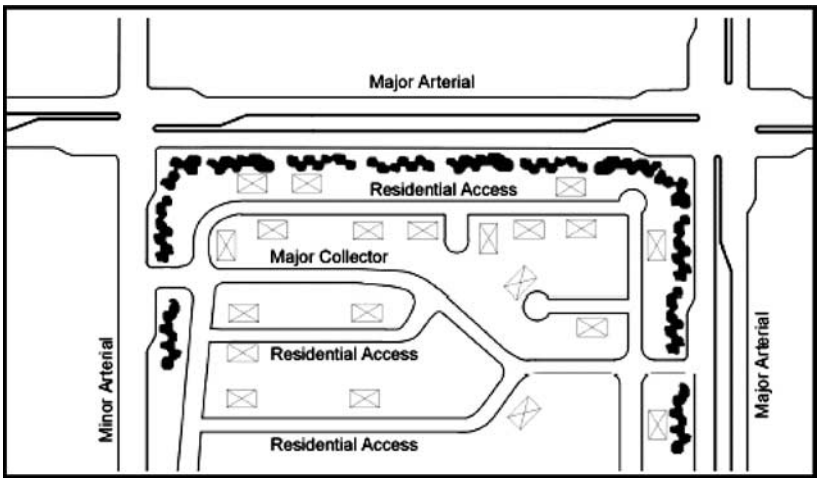
Lead Agency

State would generally take the lead, working with local jurisdictions to implement appropriate procedures.

Background

Some states have detailed access management codes. In these cases, the responsibilities of staff are clear, and coordination is achieved through adherence to the provisions of the code. Most jurisdictions, however, do not have such strong guiding documents and must work to achieve coordination among the different levels that have input regarding access management decisions. When an access management policy is initiated, it is often at a centralized planning office. Without a legislative requirement, it is up to that centralized office to ensure that the goals and methods of their initiative filter downward to such activities as access permitting, traffic impact reviews, and project development. The schematic of roadway hierarchy shows a desirable access management outcome (see Exhibit 4-1). This requires coordination between the agencies responsible for the different roadways and land use planning.

EXHIBIT 4-1 Roadway hierarchy schematic



Major Steps

- Institute regular education seminars/staff training. The keystone for an effective access management program is awareness and commitment among all levels of decisionmakers, particularly at state DOTs. In the survey performed to develop this guidebook, state planners repeatedly emphasized the importance of educating staff on access management strategies and on the extent of legal support for these strategies. A large proportion of states with successful programs had regular workshops and staff education programs.
- Prepare an access management guidebook to be used in conjunction with training for those with project responsibilities. This would be a handy reference source for both local planners and constituents. It would help coordinate state and local approaches and would help create a uniform approach.
- Institute local access management planning requirements. If plans are created locally, then there is likely to be greater "buy-in" and therefore greater adherence to plans during permit review, traffic study scoping, and project development. Local jurisdictions may, for example, be required to develop local corridor plans or to incorporate access management into local comprehensive plans.

Issues to Address

- Staff involved in planning, design, and permitting often do not communicate on a regular basis. Regular workshops or conferences would help improve communication. There could also be the establishment of a more formal procedure to ensure communication in the review process.
- Staff with different priorities may place different values on access management. Access management must have sufficient policy, administrative, and regulatory support to raise its importance at all levels.

Examples

- Minnesota provides conferences and workshops for district staff.
- Florida's administrative rules for growth management require access management to be incorporated into local comprehensive plans.
- Kansas DOT district offices prepare corridor plans that are subject to a process of joint review and agreement among city, county, and local DOT offices.
- Michigan requires that all corridor projects be based on a locally developed access management plan.

Resource

- *Access Management Manual*, Transportation Research Board of the National Academies (2003).

4. Establish and Resource a Staffing, Training, and Technical Assistance Plan for Access Management Support

Where This Fits

Planning for and implementing access management.

Lead Agency

State, MPO, and local.

Background

Advancing access management will require staff members who are knowledgeable about access management and who have the necessary technical resources.

Major Steps

- Get management support for proceeding with the integration of access management into the planning process.
- Determine the resources necessary to implement an access management program.
- Establish funding source.
- Appoint staff to lead the efforts for and champion access management.
- Train staff who are or will be leading the access management efforts and educate others who will be involved on the periphery.
- Provide the reference materials and other resources necessary for success.

Issues to Address

- Resource and budgetary constraints. The technical references identified below could be used to provide general justification or statistics from other locations. However, it is preferable to develop justification based on the conditions specific to the agency involved, such as lessons learned from examples where opportunities were missed or problems developed due to a lack of access management considerations in the planning process.
- Dedicated resources are needed for access management.
- The need to make a compelling business case for obtaining the necessary resources based on safety, highway preservation, and other benefits.
- Where to locate the staff within the organization and at what level.

Examples

- South Dakota and Montana have designated staff to lead access management efforts. This helps retain and apply acquired experience and expertise. Montana DOT has the position of Access Management Engineer within the Right-of-Way Bureau. South Dakota DOT has the position of Corridor Preservation Specialist within the Planning and Programming Division.

- Since 1981, Colorado DOT has dedicated units at headquarters and regional offices for daily access decisionmaking using guidance established by regulations and training. Access management training is offered to local agencies periodically. The Colorado DOT regions can participate in the local agency land use review process.
- Minnesota provides training and technical support to local communities.
- The FDOT Systems Planning Office holds periodic statewide coordination meetings on access management and provides extensive training. The training has focused on providing outreach to local governments on integrating access management into their planning and regulatory activities, as well as training for planners and engineers on how to incorporate good access management practices into corridor plans and roadway improvement projects.

Resources

- *Access Management Manual,* Transportation Research Board of the National Academies (2003).
- *Model Land Development and Subdivision Regulations That Support Access Management for Florida Cities and Counties,* prepared for FDOT by the Center for Urban Transportation Research (January 1994).
- *NCHRP Report 348: Access Management Guidelines for Activity Centers,* Transportation Research Board, National Research Council (1992).
- *NCHRP Report 420: Impacts of Access Management Techniques*, Transportation Research Board, National Research Council (1999).
- *NCHRP Synthesis of Highway Practice 233: Land Development Regulations That Promote Access Management,* Transportation Research Board, National Research Council (1996).
- *Transportation Research Circular 456: Driveway and Street Intersection Spacing,* Transportation Research Board, National Research Council (1996).
- Additional materials are available at www.accessmanagement.gov.

5. Monitor Performance in Implementing Access Management

Where This Fits

Part of ongoing access management program evaluation.

Lead Agency

State, although partnerships can be formed with MPOs and local jurisdictions.

Background

Performance monitoring is an integral part of most government programs. Most policies need monitoring to assess their value—monetary or otherwise. The results of the monitoring are used to maintain funding, quality, or relevance. First and foremost, the evaluation should compare the actual outcomes against the program's goals and intended outcomes. For some evaluation programs, the responsible entity will measure the level of access management implementation achieved against the level expected. To the extent that partial implementation along a corridor is achieved, monitoring should include both a before and an after assessment of accidents and travel delays.

Major Steps

- Ideally this will be led by the access management business owner, a state-level champion, with a more strategic orientation, who can play a major role in pushing for and using feedback to monitor performance.
- Determine the goals of the monitoring program. Monitoring programs can have limited goals of establishing the degree to which access management is being implemented or more ambitious goals of seeking ways to improve the results of those actions that are implemented.
- Establish tracking procedures to compile a record of new projects and decisions that involve access management issues/principles.
- Determine measures of access management success and how performance is to be judged. Some measures could include
  - Determining the rate at which access management is implemented when opportunities emerge.

  - Measuring impacts on speeds and accident rates where access management has been implemented.
  - Tracking the number of variances granted.
  - Tracking the number of driveways consolidated.
  - Tracking the number of miles of access rights acquired or controlled.
  - Learning the reasons access management could not be implemented where an apparent opportunity existed.
- Identify sources of data and come to agreement on data collection responsibilities.

Issues to Address

- Insufficient data to evaluate the impacts of successes and failures. The monitoring process must be designed to gather sufficient data while not creating onerous data collection and reporting requirements. Existing data collection and reporting mechanisms should be used to the extent possible. Access management often may be partially implemented along corridors with considerable benefit. The degree to which access management benefits accrue can be as important as the degree to which measures are implemented.
- Ability to determine whether planning policies are being implemented and whether the policies are working. The process should result in a dual feedback for planners. It should be designed not only to provide reinforcement where access management is successfully implemented, but also to provide feedback as to why implementation failed.
- Performance evaluations without some measure of benefit may not provide sufficient justification for the allocation of scarce budgetary resources. Monitoring should be tied to the project programming process, helping to establish cost-effectiveness and to set priorities.
- Highway projects need to evolve to reflect the benefits of access management performance measures. These should reflect that safe and efficient traffic movement is a fundamental goal of access management. Other performance measures may indicate how well access management is helping to preserve the functional integrity of the highway system and major investments made in the system. Other measures could consider economic impacts on the business community.

Examples

- CDTC in Albany, New York, has set up a "Level of Compatibility" measure ranging from A through F that assesses the success of access management on commercial corridors.
- Texas MPO (the Houston–Galveston Area Council) sets expectations for reductions in crashes and delays. It performs both before and after studies to determine whether those expectations are met.

Resource

- *Access Management Manual,* Transportation Research Board of the National Academies (2003).

Policy and System Planning—Long-Range Plans

1. Consider Access Management Strategies as a Mechanism for Achieving Broader Policy Goals

Where This Fits

Statewide long-range plan, MPO long-range plan, and local jurisdiction plans.

Lead Agency

State, MPO, and local.

Background

Some jurisdictions explicitly include broad policy goals directly related to access management in their transportation plans. However, an explicit reference to access management is not necessary for it to be relevant. In order to achieve their mandated policy goals, most jurisdictions have a toolbox of transportation planning approaches and methodologies that they apply. The tools may consist of different capital or regulatory measures grouped into thematic classes, often according to the goals they further (e.g., traffic calming or intersection control). Access management measures

are typically grouped into their own toolbox, but they may contribute to overall goals in a variety of areas such as the following:

- Preserving the efficiency and functionality of the existing transportation system.
- Supporting roadway functional hierarchy in the regional transportation network.
- Integrating land use and transportation decisionmaking.
- Enhancing vehicular and pedestrian safety.
- Increasing system capacity in a manner sensitive to potential community and environmental impacts.
- Maximizing the return from scarce transportation resources.
- Promoting desired economic development.

Major Steps

- Identify broad policy goals that are complementary to access management. Some policy goals may explicitly express a concrete objective such as the reduction of traffic accidents. Other policy goals may be less specific, such as aiming to increase the efficiency of public expenditures. Before the applicability of access management can be assessed, a policy goal has to be understood in terms of the outcomes expected from its application.
- Match the planning and implementation tools available with the types of outcomes desired based on the broader policy goals. While this task is often the responsibility of a single person, collaboration is essential for effectiveness. The most senior person involved in access management (a champion, preferably) should be part of the consultation.
- Build access management concepts into the mix of available transportation strategies under consideration to achieve broader policy goals; do this in a systematic manner.

Issues to Address

- Overall strategy development and implementation faces challenges including system operations and management.
- Need for data and workable technical analysis procedures to support alternatives analysis.
- Lack of awareness of access management, its objectives, and its benefits.
- Tendency to reach repeatedly for familiar transportation planning tools.

Examples

- Beginning in 1995, Montana's statewide transportation plan incorporated access management policy goals.
- Florida has experienced phenomenal growth over the last several decades and this pattern is expected to continue. The state views access management as part of a broader effort to manage growth.
- Maryland has had "smart growth" policies dating back at least 15 years. Like Florida, the state considers access management a key component of the broader goal of growth management.
- The Tri-County Regional Planning Council in Lansing, Michigan, has established a "wise growth" policy that identifies specific planning goals. At the core of this policy are the goals of maximizing efficiencies and of reducing conflicts between land uses and transportation facilities. The plan objectives specifically call for the inclusion of access management measures.

Resources

- *Access Management Manual,* Transportation Research Board of the National Academies (2003).
- *Benefits of Access Management*, FHWA, FHWA Document No. FHWA-OP-03-066.

2. Include Specific Policy Statements Related to Access Management in the Long-Range Plan

Where This Fits

Long-range policy and system plans.

Lead Agency

State, MPO, and local.

Background

While access management may be able to support many of the policy goals traditionally included in transportation plans, access management measures are frequently overlooked in pursuit of those goals. The best way to ensure that access management is incorporated into practice is to place it at the top of a transportation plan as one of the plan's goals.

The long-range plan can provide the mechanism for establishing policy direction. It can also direct the allocation of resources for implementation. Policy plans can define the need for policy and administrative changes that require legislative action or rulemaking to strengthen the implementing agencies authority. Policy or long-range plans can define the need to

- Establish policy at the beginning of the planning process.
- Establish access management plans at the system or corridor levels.
- Implement an access classification system.
- Review and, where needed, revise engineering standards and design policies to support access management.

In some states, the policy planning process provides a mechanism to secure organizational and stakeholder commitment to fund programmatic, advocacy, and institutional actions that can implement access management. This includes

- Designating an access management champion.
- Using statewide planning and research funds to develop an access classification system.
- Providing technical assistance and advocacy resources to local jurisdictions. This can take the form of training or providing assistance in drafting local regulations or ordinances.

Major Steps

- Raise access management as a policy issue.
- Introduce consideration of access management into the policy goal-setting process.
- Address in issue analysis.
- Prepare policy alternatives.
- Seek adoption.
- Set overall policy direction for access management through the planning process.

Issues to Address

- Achieving agreement on potentially major changes to goals and procedures, which agencies have historically included in their transportation plans.
- It can be difficult to drive organizational, administrative, and non-construction change through the planning process.
- The need to assign responsibility for implementation outside of planning.
- The need to tie policy implementation to funding.

Examples

- Metroplan—the MPO for Little Rock, Arkansas—recently finalized its long-range plan, "METRO 2025." The plan was expanded to include more detailed objectives such as those relating to access management. The plan called for maximizing the efficiency of existing facilities and the development of access management plans on key corridors.
- CDTC in Albany, New York, provides a noteworthy approach: holistic planning that ties land use/development to related transportation issues. The CDTC planning process calls for the calculation of a "level of compatibility." This is designed as a measure of conflict between land access and through-traffic. It allows the MPO to optimize access while incorporating the consideration of land use issues.
- FDOT has integrated access management into a variety of statewide transportation planning activities. On a policy level, the 2025 Florida Transportation Plan is specifically identified as a strategy for preservation and management of the state transportation system. The Florida Intrastate Highway System (FIHS) plan, part of the FDOT Strategic Intermodal

System plan, sets forth access management design and classification criteria for highways of statewide importance. FIHS roadways must be classified for high levels of access management (Access Classification of 1, 2, or 3) and must demonstrate how the desired level of access control will be achieved.

Resources

- *Access Management Manual,* Transportation Research Board of the National Academies (2003).
- *Benefits of Access Management*, FHWA, FHWA Document No. FHWA-OP-03-066.

3. Consider and/or Promote Access Management Strategies as a Complement to Traditional Approaches for Increasing Transportation Capacity

Where This Fits

State and MPO long-range, corridor, and subarea plans. MPO congestion management systems.

Lead Agency

State, MPO, and local.

Background

Access management strategies can be applied to improve vehicular throughput as well as vehicular and pedestrian safety. These strategies generally present fewer potential impacts to the community and environment, and they cost less to implement. They may be implemented either alone or in concert with other strategies such as intelligent transportation system applications or transportation demand management. Access management strategies to consider as a complement to traditional capacity improvements include, but are not limited to, the following:

- Adding auxiliary lanes.
- Adding a raised median.
- Providing driveway consolidation and/or removal.
- Improving signal spacing and coordination.
- Limiting or redirecting left turns and cross access.

Implementing access management strategies in lieu of new or widened roadways is a particularly successful strategy in political environments that are sensitive to potential changes in rural or other unique aesthetic characteristics.

Major Steps

- At the system level, monitor and evaluate contribution of access management to safety and mobility improvement.
- Compare with other solutions.
- Sponsor training sessions/seminars to educate planners about access management.
- Implement access management guidelines.
- Incorporate access management goals into state corridor system or local transportation plans.
- Include access management in procedures manuals.
- Appoint an access management champion.

Issues to Address

- The need to develop and apply sketch-planning methods.
- The need to consider access management as part of operations and safety management.
- There may be data limitations.

Examples

- Florida has taken a number of steps to promote access management and, in so doing, has increased the likelihood that it will be used to complement traditional transportation planning tools.
- Kansas DOT has corridor management procedures that require a traffic impact study be performed for large commercial or industrial applications. These studies include the consideration of traditional traffic improvements, integrated with access considerations, as part of project planning.
- Colorado DOT regulations allow specific access management planning for corridors with a basis in regulatory law for specific permitting decisions.
- The City of Orlando, Florida, includes access management in the transportation element of its growth management plan. The plan shifts focus away from only looking at roadways to a more balanced multimodal approach to people and goods movement.
- The Berkshire MPO in Pittsfield, Massachusetts, uses access management approaches to help preserve roadway capacity. Local citizens prefer access management to roadway widening because it helps preserve the area's rural character.

Resource

- *Access Management Manual,* Transportation Research Board of the National Academies (2003).

4. Establish and Maintain an Access Classification System with Access Standards or Guidelines

Where This Fits

State and MPO system plans, local jurisdiction master plans.

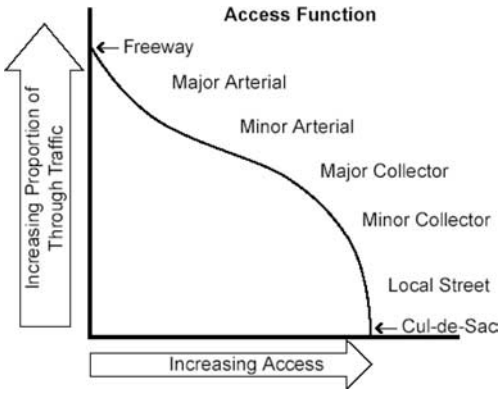
Lead Agency

State or local.

Background

An access classification system establishes the foundation for implementing access management on a system-wide basis (see Exhibit 4-2). Agencies can establish and maintain an access classification system with access standards or guidelines based on a functional hierarchy and operating environment with provisions for limiting access on higher-function roadways, possibly through the purchase of access rights. It correlates the level of access that should be allowed to a roadway's purpose and importance, functional characteristics, design features, and access spacing criteria.

EXHIBIT 4–2 Access function



This enables the application of access management in a reasonable and equitable manner that is consistent with the intended purpose of the roads under consideration. The classification system could be used as the basis for defining the following:

- Permitted and prohibited access between public highways and abutting properties.
- Any restrictions on certain turning movements.
- Minimum access spacing required and what to do in situations where this spacing cannot be achieved.

This guidance area involves the application of best practices for the development of an access classification system for state and regional roadways that is related to functional classification. The action applies at a roadway system level. One of the key principles of access management is that the allowable level of access permitted on roadways should be based on their intended function. Roadways intended to carry significant levels of medium- to long-distance trips at relatively high speed should be subjected to less interference from vehicles exiting and entering the stream of traffic than are lower-speed roadways that carry local traffic. This is achieved by managing direct access to adjacent land uses. Roadways intended to accommodate short trips at relatively low speeds should provide the primary access to adjacent land uses. Establishing access standards or guidelines for the roadway network based on accepted access management principles to maintain the integrity of the regional roadway network will result in improved overall operational efficiency and safety.

Major Steps

- Assess the applicability and effectiveness of access classification systems used elsewhere.
- Evaluate current system-level access plans, policies, and classification systems against best practices.
- Establish organizational mandate to implement best practices.
- Develop an access classification system to use as an administrative structure for applying access management criteria to roadways or roadway segments. This involves defining access classifications for various roadway types and functional characteristics. The variables to consider may include the following:
  - Functional classification, the travel distance of motorists (e.g., short versus long trips).
  - Nature of the travel (e.g., through versus local).
  - Travel speeds.
  - Land use.
  - Location of the roadway facility (e.g., urban versus rural).
  - Physical characteristics of the roadway (e.g., divided versus undivided).
- Establish access management criteria for each classification. This criteria could include the following roadway planning and design elements:
  - Permitted and prohibited access locations.
  - Driveway design and spacing.
  - Corner clearance.
  - Median opening design and spacing.
  - Signal location, spacing, and coordination.
  - Turn-lane location and design.
  - Auxiliary-lane location and design.
  - Service/frontage road location and design.
- Apply the access classification system to each roadway or roadway segment. The criteria identified above are thereby assigned to the roadway network.

Issues to Address

- Different methods for developing and applying an access classification system.
- Top-down policy direction and mandate for implementation is necessary to be successful.
- The level of authority for establishing the classifications. For example, Colorado's authority is part of the state's administrative code.
- The long-range plan can direct the agency to establish an access classification system.
- Situations in which the functional classification does not reflect the current or planned functional role. In these cases, the functional classification could be used as a starting point that needs to be modified in the access classification to reflect the actual or projected roadway function.
- The need to provide resources to enable the development and application of the access classification system. A potential source is federal statewide planning and research funds.
- Whether to develop an access classification system as part of system planning, a functional classification refinement, or a stand-alone study.
- Establishing access standards or guidelines for each access classification in the system. This should include locations where access is permitted or prohibited.
- How to implement access classifications in the day-to-day operation of the transportation department.

Examples

- Colorado has established four categories based on a highway's level of importance and degree of urbanization: freeway interstate system, expressway, regional highway, and frontage road. The regional highway category is divided into rural and non-rural. Rural highways are further divided into Subcategories A and B, based on the roadway's capacity to accommodate traffic volumes and higher speeds and their access function. Similarly, non-rural highways are divided into Subcategories A, B, and C.
- Florida has seven categories: (1) limited access; (2) highly controlled access; (3) controlled access with nontraversable medians; (4) controlled access without nontraversable medians; (5) controlled access with nontraversable medians, but in a more developed area than above; (6) controlled access without nontraversable medians, but in a more developed area than above; and (7) controlled access for fully built out urban areas. Each access classification is defined in terms of road function, type of access permitted, and access spacing.
- New Jersey's system of access categories is more finely divided. State roadways (that are not fully access controlled) are classified first as having urban or rural characteristics. Within each of those two classifications, roads are further categorized using a matrix of rows defining functional/access roles and columns defining various physical characteristics and posted speeds. Each cell of the matrix is assigned one of five access levels to indicate the allowable access for new developments along segments of state roadways with those characteristics.
- Montana has a system that reflects whether a roadway is on the National Highway System (NHS) (non-Interstate NHS and principal arterials) or the Primary System (minor arterials); divided or undivided; and located in a rural area (with a separate classification for a very low-volume roadway), developed area, or "intermediate" area (an area that is not developed, but in which there is concern that development will significantly impact roadway system performance).

Resources

- *Access Management Manual*, Transportation Research Board of the National Academies (2003). Appendix B contains examples for establishing roadway classification and access categories from five states (Colorado, Florida, New Jersey, Oregon, and Delaware) and from five localities (Austin, Texas; Licking County, Ohio; Washington County, Oregon; Orlando, Florida; and Waushara County, Wisconsin).
- *NCHRP Report 348: Access Management Guidelines for Activity Centers,* Transportation Research Board, National Research Council (1992).

5. Evaluate the Impact on Roadway System Performance of Applying an Access Classification System and Implementing Associated Access Standards/Guidelines

Where This Fits

Part of system planning.

Lead Agency

State and MPO.

Background

Along with the acquisition of access rights, the implementation of an access management code/regulation, through the application of an access classification system and related spacing criteria, is one of the most proactive measures a transportation planning entity can take. Such measures, however, often involve a significant new layer of review that is applied to the plan approval process for property owners. Performance evaluation can help improve the effectiveness of the process by identifying where future refinements may be beneficial.

The principal objective of the evaluation process should be to provide useful information about the effectiveness of the access classification system and associated access standards/guidelines. This information could then be applied to help refine the process accordingly. An evaluation program preferably would be developed under the direction of a champion with a broad perspective regarding access management and its role within the specific agency involved.

Major Steps

- Establish the goals of the program. Evaluation programs can be focused on establishing the degree to which an access classification system is being implemented. More ambitious goals could be established to seek ways to improve the results of those actions that are implemented.
- Compare existing procedures with different scenarios for implementation of access management classifications, design standards, and the like. Lessons learned elsewhere should be applied to the access classification system being developed.
- Assess and compare the impacts on system performance of different access management classifications, design standards, and other potential program requirements.
- Establish a tracking procedure to compile a record of how the access classification system is being implemented. One example may be tracking the decisions regarding new developments to identify how the classification system has influenced the decisionmaking process.
- Identify sources of the information that would be used in the performance evaluation process.

Issues to Address

- Insufficient information to measure implementation. The process must be designed to gather this information while not creating onerous reporting requirements. Existing reporting mechanisms should be used to the extent possible.
- Ability to determine whether access classifications are being implemented and whether the policies are working.
- There may be resistance to enforcing/implementing access requirements associated with significant costs unless benefits are clearly identified.

Examples

- CDTC in Albany, New York, has set up a "level of compatibility" measure ranging from A through F that assesses the success of access management on commercial corridors.
- Texas MPO (Houston-Galveston Area Council) sets expectations for reductions in crashes and delays. It performs both before and after studies to determine whether those expectations are met.

Resource

- *Access Management Manual,* Transportation Research Board of the National Academies (2003).

Programming

1. Develop Mechanisms to Support the Selection of Projects that Address Access Management Strategies and Principles

Where This Fits

TIP and other project plans.

Lead Agency

State for the STIP, MPO for the TIP, and local for Capital Improvement Plans.

Background

In general, there is little direct focus on using the programming process to prioritize and implement projects directly related to access management. Although access is a factor in the design of projects, access management may or may not be a factor in prioritizing projects. The implementation of projects that address access management could be facilitated by including this element in the programming process. Projects that implement access improvements could receive prioritization during the evaluation process in terms of both funding and timing.

Project selection to support access management can be achieved by setting aside funds for implementing stand-alone access management projects, for integrating access management enhancements in other capacity or maintenance projects, or for

developing other project categories that are supported by access management strategies (e.g., safety, air quality mitigation, economic development, or aesthetic and other targeted community enhancements). Additionally, setting aside funds to address issues identified in the Congestion Management System process, typically addressed through operational improvements, can support the implementation of access management projects.

More typically, project selection mechanisms take the form of weighted formulas that distribute emphasis either to corridors that hit a certain threshold (e.g., high crash locations) or to a segment of roadway with a projected failure in level of service. Examples of mechanisms for supporting access management strategies in a weighted project selection formula include, but are not limited to, giving extra weight to alternatives that

- Are relatively low cost.
- Require no or limited less right-of-way.
- Limit potential impact to the environment or the community.
- Can be implemented relatively quickly.
- Limit conflicts.
- Remove turning vehicles from through lanes.
- Improve traffic progression.
- Enhance safety.
- Preserve the public investment in the existing infrastructure.

Major Steps

- Establish policy direction to address access management in programming.
- Consider alternatives such as whether to allocate to an access management program and/or include access management criteria in programming.
- Establish criteria.

Issues to Address

- Addressing access management in programming requires policy direction because programming allocates resources and the basis for this allocation is policy driven.
- Criteria for considering access management as part of project selection and prioritization must be developed and incorporated into the programming process.

Examples

- Kansas has an access management set-aside program with projects selected annually based on ranking. These projects are included in the state's program.
- Florida indicates that access management is incorporated into its programming because each highway has an access management classification. Therefore, each project programmed for that highway has an access management element.
- Maryland indicates that it considers access management in the state's program by including lump-sum funds for access management plans. This impacts the budgeting as well as the programming process.
- The TIP screening process used by the CDTC in Albany, New York, has a number of land use consistency requirements. Each reinforces the fact that the MPO will not entertain highway capacity projects without land use planning and access management commitments.
- The screening process used by the Duluth-Superior Metro Interstate Committee in Duluth, Minnesota, also supports the selection of projects that incorporate access management elements. Applicants are required to categorize and rate projects in project categories that include access management goals.

Resources

- The Kansas Corridor Management Policy, Kansas DOT, establishes specific corridor plans. These, in turn, constitute a resource for fundable projects.

- Delaware established a corridor preservation plan in 1996 (Delaware Code, Title 17, Section 145) and the Governor's Cabinet Committee on State Planning Issues adopted the Strategies for State Policies and Spending.
- J. Poorman and D. Jukins, "Innovative Tools and Techniques for Successfully Achieving Access Management Through the MPO Process," Capital District Transportation Committee, Albany, New York, in *Proceedings of the Fourth National Conference on Access Management,* Portland, Oregon (2000).

2. Program Stand-Alone Access Management Projects, such as for the Acquisition of Access Rights in High-Priority Locations or for Incorporating Medians on Multilane Arterials

Where This Fits

Project management plans and programs, and as part of corridor planning.

Lead Agency

State, MPO, and local transportation agencies.

Background

As part of continuous efforts to monitor traffic crashes and operations, as well as development patterns, high-priority locations could be identified for programming stand-alone access management projects. This could involve the proactive acquisition of access rights in potentially "high growth" areas along critical facilities as well as in the vicinity of highway interchanges. Access along the corridor could then be negotiated as development occurs to help protect the functional integrity of the facility and guide the establishment of a supporting network of roadways.

Major Steps

- As part of the system planning process, identify arterials and key corridors that are or will become a high priority for mobility.
- Establish a high level of access control on these corridors, in both urban and developing areas.
- Prioritize these corridors for purchase of access rights, retrofit, and other investment actions.
- Identify the priority of this roadway network in the long-range transportation plan along with supporting goals and policies.

Issues to Address

- Identifying priority corridors for mobility preservation and for active management triage.
- Establishing standard policies for and approaches to directing access to the appropriate roadway classes.
- Making retrofit actions, such as driveway consolidation or purchase of access rights, an integral element of reconstruction projects.

Examples

- Maine has targeted some corridors for access improvements, including the acquisition of access rights. The local jurisdictions have not moved to interfere with that planned activity.
- Montana has found that access management can be most effectively implemented where development is planned rather than in an already developed area. Therefore, the philosophy of Montana regarding access management is to regulate and provide reasonable access and to purchase access rights where appropriate and possible.
- Delaware has a $5 million per year corridor capacity preservation program. This funding is used for a range of access management projects including purchase of access rights as part of corridor preservation efforts.

Resources

- *Land Development and Access Management Strategies for Florida Interchange Areas*, prepared for FDOT by the Center for Urban Transportation Research (March 2000).
- *NCHRP Synthesis of Highway Practice 332: Access Management on Crossroads in the Vicinity of Interchanges,* Transportation Research Board of the National Academies (2004).

Corridor and Subarea Planning

1. Prepare an Access Management Plan as a Component of an Area-Wide or Corridor Plan

Where This Fits

Stand-alone or as part of subarea or corridor plans.

Lead Agency

State, MPO, or local.

Background

An access management plan (AMP) is useful for dealing with areas that are undeveloped or areas where redevelopment is possible. It may focus on a specific area, and it is smaller in geographic scale than a statewide or MPO plan. It may address, for example, several communities or areas with roadways that are projected to be or are in need of improvement. An AMP is prepared as an integral component of area-wide plans or as an independent effort. The AMP should incorporate provisions for coordination of area growth with development of the roadway network and any required traffic mitigation.

An AMP relates to both comprehensive (that is, area-wide) transportation planning and to detailed construction plans. An AMP has several important features:

- It is designed to achieve better long-range planning for highway access. It enables state and local jurisdictions to specify, in advance, where access in a given area or along a given stretch of highway can be provided. It also enables these agencies to identify current access problems and to work toward their alleviation.
- It provides a coherent frame of reference for developers and local governments. It provides a predictable and consistent basis by which to plan and locate access points, thereby introducing access considerations into the local planning process. It gives property owners guidance for sharing access between two adjacent lots; consolidating access for contiguous lots; and obtaining alternative access via collector streets, local streets, or frontage roads.
- It can lead to a higher density of development from the improved road capacity resulting from better traffic management. This translates into higher land values.
- It can facilitate the administration of access regulations and the issuance of permits. It assists municipalities and developers by defining the conditions under which access permits will be issued. A developer can use the plan to establish permissible access points and can be assured that access permits will be forthcoming where access conforms to the plan.

The AMP should be a clear and concise document. It should include a map and an accompanying report showing where and how access can be provided, specifying how development and associated roadway network changes should be implemented, and indicating who is to be responsible for which elements.

Major Steps

- Identify the study area and participating agencies/stakeholders.
- Develop a public involvement plan that will engage interested parties and consider different opinions for the future of the corridor to shape a realistic plan.
- Establish a vision and supporting goals and objectives to provide a basis for weighing various options.
- Perform policy, land use, and traffic analyses to provide a basis for the development of alternative options and the selection of the components to include in the access management plan. The following questions should be explored:
  - What problems need to be resolved?
  - What methods of access management may be used to help resolve these problems?
  - Are auxiliary lanes needed in certain locations?
  - Are there problems with traffic signal locations and traffic progression?
  - Does an existing median need to be improved or should a non-traversable median be incorporated into the roadway design?
  - Is there a supporting street network?
  - Are there opportunities for shared access or interparcel circulation?
  - How can the supporting street and circulation system be modified or developed to improve corridor safety and operations?

- Evaluate options based on potential social, economic, and environmental impacts as well as specific impacts on the following:
  - Roadway safety.
  - Roadway efficiency and operation.
  - The supporting road network.
  - Accessibility of neighborhoods and commercial areas.
  - Diversion of non-local trips through an existing residential area.
- Establish the responsibilities of each of the participants for the improvements contemplated by the plan.
- Identify the manner in which the timing and sequence of construction of the improvements are to be implemented.
- Provide, if necessary, for temporary access pending completion of the improvements.
- Identify expected future mitigation measures, including traffic limitations and lots with "nonconforming" access (as in Florida and New Jersey).

Issues to Address

- Interjurisdictional collaboration. The defining characteristic of a successful AMP is the level of cooperation achieved among affected property owners and agencies involved in carrying out the plan.
- Access plans can also be incorporated into the project through the National Environmental Protection Act, road design, and public involvement processes and documents.
- Providing incentives that encourage local governments to initiate and develop plans. Incentives could include state and local sharing of costs and facilitation of the permit review process.
- Requires supporting land use actions by local jurisdictions.
- Phasing in new access approaches. The issuance of temporary access permits is one strategy for phasing and adjusting access as an area develops or is redeveloped. A temporary permit can specify when a temporary driveway is to be removed and a permanent driveway installed. This requires careful planning and coordination and a clear understanding of who pays for what.

Examples

- Oregon's *A Guide Book for Access Management* shows how an AMP can be implemented over time as development occurs (as presented in Figures 3-1 through 3-4 of *NCHRP Report 348*, *Access Management Guidelines for Activity Centers*, Transportation Research Board, National Research Council, 1992).
- In Colorado, an access management plan is a regulatory-based, binding interagency agreement. It consists of a resolution of adoption signed by local officials and the state highway agency. The plan is an attachment to the agreement that is written in very direct terms. Although it does not include a map, the text locates each and every current, temporary, and future access. This includes access points subject to future closure. Supporting information is maintained on file, which keeps the plan simple and direct.

Resources

- *Access Management Manual*, Transportation Research Board of the National Academies (2003).
- *Reducing Traffic Congestion and Improving Traffic Safety in Michigan Communities: Access Management Guidebook,* Michigan Society of Planning (no date). This contains a potential outline for an access management plan, followed by a brief description of each major section. However, communities need to adapt the outline to fit their unique circumstances.
- *NCHRP Report 348*, *Access Management Guidelines for Activity Centers*, Transportation Research Board, National Research Council, (1992).

2. Address Access Management in Corridor Plans

Where This Fits

State and MPO corridor plans.

Lead Agency

State and MPO.

Background

Traditional roadway improvement plans typically rely on a limited repertoire of improvement options. The process usually begins with the projection of future, long-term land use development scenarios and the traffic loads that can be expected to be generated by them. Roadway improvement planning, then, has generally involved designing the capacity to accommodate those projected loads. The corridor plan could go beyond this traditional roadway improvement approach to address land and economic development, as well as access management considerations. Broadening the traditional approach will increase safety, improve flows, and increase the longevity of the capacity improvements implemented. The land use study elements will address the appropriate access for the types and intensities of future land uses. The roadway elements may involve medians, signal locations, auxiliary lanes, land use concepts, and improvements to the supporting roadway network. Establishing a corridor overlay zone could provide a legal basis for establishing access spacing requirements.

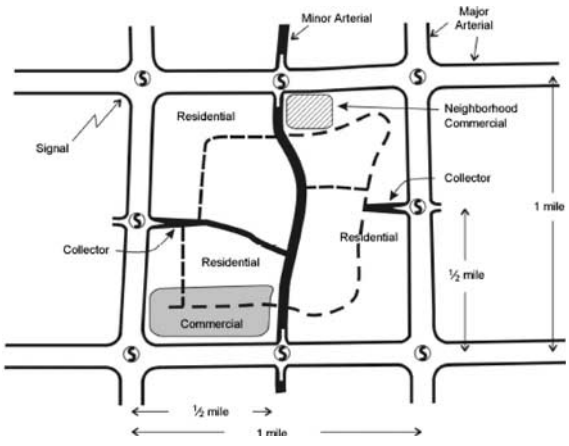
The approach to including access management in highway improvement and corridor plans need not differ greatly from the typical approach to highway improvement plans. The major differences are in the range of design tools that are incorporated and in the degree to which the use/access of properties abutting the roadway enters into design considerations.

Because access management involves implicitly (if not explicitly) establishing a hierarchy of roads and managing access to land use, the effect on property owners and roads under various jurisdictions has the potential to increase. This increases the number of affected parties and the potential magnitude of these effects. In recognition of this, planning must ensure that the state transportation agency, all relevant local agencies, and any stakeholder groups are involved in this effort, as with other corridor studies. These groups may include the regional transportation agency (or MPO), local governments, and environmental and resource agencies with an interest in the corridor. Public participation and a vision for the corridor are essential.

The resulting plan should do the following (see Exhibit 4-3):

- Indicate the supporting street system (that is, which streets will receive access) and address the issue of whether there will be a parallel access street.
- Establish street hierarchy/classification relative to study corridor.
- Recommend median placement and openings (if applicable).
- Establish general left-turn policy.
- Recommend signal location and spacing.
- Assess future land use requirements and provide for sufficient access while optimizing corridor access location and spacing conditions.

EXHIBIT 4-3 Corridor plan example



Major Steps

- Conduct an outreach program to affected jurisdictions, being especially cognizant if the local jurisdiction is not the origin of the corridor plan. It is paramount that agreement be reached regarding
  - The balance of access between state and local roads.
  - Land use control changes.
  - Site-plan review coordination.

Consultation with local jurisdictions may require a formal partnering agreement. Outreach may need to include public involvement. This may help facilitate local buy-in and cooperation.

- Define the study limits. The study limits should represent a balance and
  - Extend far enough to create a significant length of corridor, where the benefits of access controls can be realized.
  - Reflect the length of corridor with a classification appropriate to access management.
  - Extend beyond the limit of current capital improvement plans.
  - Not overreach jurisdictional abilities to implement the corridor plan.
- Establish policy guidelines (that is, what level of services is the target).
- Perform land use projections.
- Perform traffic analyses, including accident data and delay analyses.
- Develop a vision of the corridor in its ultimate, fully developed condition.

Issues to Address

- Interjurisdictional coordination. Often major highways are under state jurisdiction, but land use and site-plan review for adjacent properties is under local jurisdiction. Furthermore, one highway segment may travel through several different communities within a relatively short distance.
- Reflecting community and business interests in the plan, due to potential impacts.
- Supportive land use action is usually required for the successful implementation of these plans.

Examples

- A corridor access management has been developed for 135th Street (formerly K-150 Highway) in Overland Park, Kansas. The plan provides a divided, multilane roadway with median breaks at one-half mile intervals, right-turn access at one-quarter mile points, and a system of parallel access roads. The plan was developed when the corridor was largely undeveloped, and the city enacted a moratorium on new development proposals within the study area during the 2-year study period. The corridor has since experienced substantial residential and commercial development.
- In Maryland, the major access management considerations occur at the corridor planning level. Most efforts are focused in rural areas where the opportunity exists to acquire access controls in a cost-effective manner. The plans for state highways are done in consultation with local governments.
- Many local jurisdictions do not have their own access management expertise. Consequently, they turn to the area MPO for corridor plans or for input into the preparation of local corridor plans. The Duluth-Superior Metro Interstate Committee in Duluth, Minnesota, acts as a consultant, often on a competitive basis, to prepare corridor plans for member jurisdictions. In a slightly different approach, the Tri-County Regional Planning Council in Lansing, Michigan, has developed a corridor overlay ordinance for some local jurisdictions and has formed a standing Management and Operations Task Force. This task force takes the lead in establishing priorities for regional congested corridors. It also applies a management and operation approach to address the full scope of corridor issues and possible improvements.

Resources

- *Access Management Manual,* Transportation Research Board of the National Academies (2003).
- Kansas Corridor Management Policy, prepared by Kansas DOT (2003).

3. Ensure that Geometric Design Standards Incorporate Best Practices for Access Management

Where This Fits

Policy plan and agency design policies and standards.

Lead Agency

State, MPO, and local.

Background

Geometric design criteria addressing elements such as medians, median openings, auxiliary lanes, driveway design, intersection channelization, frontage roads, and grade separations are used to help manage access. These criteria may be especially important in situations where there is no comprehensive access code. In such cases, they may be keyed to a road classification system to help achieve access management.

An implementing action may be established in the policy plan to review and revise an agency's geometric design standards to incorporate access management best practices. Geometric design standards, applied by state and many local agencies to roadways under their jurisdiction, typically are drawn from the *AASHTO Green Book: Policy on Geometric Design of Highways and Streets* and adapted to their needs. The standards address topics such as functional classifications, cross sections, horizontal and vertical alignment, intersections, interchanges, and frontage roads. Many jurisdictions, however, need to strengthen the access management provisions in their design standards. Guidelines can be specified for these areas even when there are no access code or design standards.

Major Steps

- Establish agency policy direction through the planning process to review and revise, where necessary, geometric design standards.
- Review the existing geometric design standards that are used to identify how well they incorporate access management. Key areas include the following:
  - Driveway and intersection location and spacing, including corner clearance.
  - Median provisions and openings, including directional and non-directional.
  - Traffic signal location and spacing.
  - Access separation distances at interchanges.
  - Supporting street systems, such as frontage roads.
- Identify areas where the existing standards can be revised to adopt access management best practices. Focus should be on applying the basic access management principles of
  - Limiting the number of conflict points.
  - Separating conflict points.
  - Separating through volumes from through movements.
  - Locating traffic signals to facilitate traffic flow.
  - Maintaining a hierarchy of roadways by function.
  - Limiting direct access on higher-speed roads.
- Adopt the revisions and educate the staff regarding why the changes have been made and how they should be implemented.

Issues to Address

- The adoption of revised standards, based on access management best practices, will need to follow an agency's established process for amending its design standards.
- The need for funding to evaluate current design standards and guidelines against best practices.
- The importance of piggy-backing on existing procedures for revising design manuals.

Examples

- To complement its design manual, New Jersey has appendixes for its access code that illustrate each access level with references to figures that contain details regarding the design elements.
- South Dakota developed supplements to its design standards and standard drawings to address access management as part of a statewide access management planning project.
- Nevada DOT has an extensive chapter on access management in its design manual.

Resources

- *Access Management Manual,* Transportation Research Board of the National Academies (2003)
- *AASHTO Green Book: A Policy on Geometric Design of Highways and Streets,* AASHTO (2001).

4. Ensure that Traffic Impact Analysis Procedures Address Access Management

Where This Fits

State and local authority policy plans, local comprehensive plans, and elsewhere whenever there is an opportunity in the transportation and land use planning processes to require and review traffic impact analysis.

Lead Agency

State and local planning authorities, MPOs.

Background

Traffic impact analysis (TIA) and access studies are usually required as part of the driveway permit process for larger developments that exceed a threshold that is established by the review agency. These analyses involve the assessment of transportation and traffic impacts of a proposed development or major redevelopment on the surrounding roadway system. A TIA should identify the design and roadway modifications necessary to minimize the impacts of new development on traffic. They assist public agencies and land developers in making transportation and development decisions. Allowing access is generally contingent on determining that the development traffic will not have a significant adverse impact on roadway safety and level of service. In addition, provisions for entry and exit maneuvers need to be adequate for maintaining traffic operations and safety.

Major Steps

- Review current traffic impact analysis procedures. Jurisdictions should examine their traffic impact requirements, including when the requirements are imposed and what the scopes of the assessments must cover. The degree to which access management measures may enter into the future corridor plans assessed by the TIA should be particularly noted.
- Identify access management measures that should be included in TIAs. In identifying these elements, a system for categorization of roadways may be useful. Different access management measures may be appropriate depending on the location, function, and other characteristics of the roadway.
- Compare current TIA considerations with the access measures/considerations that are considered desirable in order to identify deficiencies.
- Develop and implement the strategy. Strategies for restructuring TIA requirements to better consider access management will depend on where the TIA requirement is rooted (e.g., part of a policy, rule, or statute).

Issues to Address

- TIA typically deals with specific issues. As a result, the process often falls short in maintaining desired service levels on affected roadways. The broader system implications of additional traffic signals and driveways are often not addressed.
- The cumulative impact of a series of developments needs to be identified to ensure appropriate decisions are made and the necessary mitigation is provided.
- With respect to safety, the TIA should identify a proposal to minimize the safety impacts or improve the current safety conditions along the roadway impacted by the development.
- The "single site approach" to minimizing impacts commonly results in varying road cross sections rather than achieving a coherent and consistent roadway design. A process is needed that deals with collective, rather than individual, access requirements. Access management codes and ordinances can address these concerns by bringing a "new dimension" to impact assessment and driveway permit procedures. By systematically classifying roadways and establishing criteria for location, spacing, and access provision/denial for each classification, they can specify where access will and will not be allowed as well as where alternative access should be provided.

Examples

- Colorado's decision diagram for access and traffic control.
- The Tri-County Regional Planning Council in Lansing, Michigan—as part of the updated Congestion Management System—will require corridor and traffic impact studies that include consideration of non-capacity improvements to address congestion as the primary strategy, including improved access conditions in the study corridor.
- Major developments classified as "developments of regional impact" in Florida must have FDOT approval of a transportation impact study that addresses access management and related transportation improvements.

Resources

- *Access Management Manual*, Transportation Research Board of the National Academies (2003). The manual describes in detail the access permitting process, providing case examples from four state departments of transportation (Colorado, Florida, New Jersey, and Oregon) and one county (Washington County, Oregon).
- *NCHRP Report 348: Access Management Guidelines for Activity Centers,* Transportation Research Board, National Research Council (1992).
- The New Jersey State Highway Access Management Code has checklists of what is required for the various levels of access permits.

5. Ensure that Traffic Signal Warrant Criteria Are Consistent with the Access Classification System

Where This Fits

State, MPO, and local planning in application of traffic signal warrant criteria.

Lead Agency

State and local.

Background

Transportation plans are increasingly addressing operations. There needs to be consistency between the access classification system and traffic signal locations. It is important that, at the planning and policy levels, mechanisms are used to prevent the need for signals on major arterials in the first instance because no matter how well signals are spaced, they adversely impact mobility and safety.

Preserving the quality of traffic flow and safety along roadway facilities requires spacing of traffic signals that ensure continuous, progressive movement. This normally entails relatively uniform spacing of traffic signals and sufficient distances between signals to allow vehicles to travel at reasonable speeds. The allowable spacing of the signals will be a function of the access class of the roadway. Higher function roadways will have greater limits on signal locations to help maintain progressive traffic flow. Lower function roadways will have greater flexibility for signal locations because signals are less important in terms of through traffic and speeds. Spacing standards for signalized intersections should achieve the objectives established for each access classification.

Major Steps

- Review the access classification system and determine what provisions there are regarding signal spacing. If there are no provisions that relate signal spacing to access class, the materials referenced below should be consulted for guidance on how to establish spacing criteria. The criteria should reflect a desirable spacing between signals as well as the bandwidth or progressive traffic flow that will need to be maintained.
- Apply the signal spacing criteria established based on the access classification. The review of a potential new signal location should identify whether the signal can be installed within the parameters identified both in terms of spacing and bandwidth. If it conforms and its location is consistent with other long-term plans of the transportation agency, a signal may be installed (if warranted). If it does not meet the spacing criteria, a further analysis is required in terms of how much

deviation there is and what the impact of the additional signal would be on the roadway facility. Alternatives to signal installation may need to be explored if the addition of a traffic signal is shown to have a significant adverse impact on traffic flow.

Issues to Address

- In areas that are built up with numerous traffic signals, maintaining effective traffic signal progression is more difficult and may be impossible.
- Install traffic signals only where they meet the *Manual on Uniform Traffic Devices* and would fit within the progression.
- Locate traffic signals where they provide the most benefit to the roadway system. It may be more advantageous to signalize an intersection that is used by a community and that carries more traffic than a private driveway that is used by one establishment and carries less traffic.
- There may be a need to establish criteria that will apply if signal spacing criteria cannot be achieved. There would be a greater tolerance for deviations from the spacing criteria for lower-function roadways.
- Consider roundabout installation as an alternative to a signal.
- New traffic signals serving private intersections become new crash locations. Need to determine whether the developer or the owner assumes the tort liability.

Examples

- South Dakota and Montana have identified the desired signal spacing in terms of both distance and bandwidth for the established access classifications.
- New Jersey has established signal spacing criteria based on access classification and whether the roadway is in an urban or rural area.

Resources

- *Access Management Manual*, Transportation Research Board of the National Academies (2003). Contains guidance to use in establishing spacing criteria for traffic signals.
- *NCHRP Report 348: Access Management Guidelines for Activity Centers,* Transportation Research Board, National Research Council (1992). Contains guidance to use in establishing spacing criteria for traffic signals.
- *NCHRP Report 420: Impacts of Access Management Techniques,* Transportation Research Board, National Research Council (1999). Contains a procedure for estimating the effect of traffic signal density on travel speeds.

Establishing MPOs as Advocates for Access Management

1. Coordinate with Agency Decisionmakers to Facilitate the Integration of Access Management Principles

Where This Fits

Various MPO processes and activities including the following:

- Policysetting.
- Project prioritization for both the long-range transportation plan and the TIP.
- Unified Planning Work Program development.
- Public involvement/education activities.
- Other transportation planning activities in which the MPO has an opportunity to advocate for access management strategies as a feasible solution for identified safety, capacity, or other problems on the transportation system.

Lead Agency

MPO.

Background

Most MPOs have limited authority to implement access management strategies. Instead, many MPOs use the tools and opportunities available to them through the standard MPO process to facilitate the implementation of access management strategies. In many cases, given its role as the regional forum for transportation decisionmaking, the MPO is better situated to bring multiple parties together to achieve a mutually beneficial result than is any single transportation agency in the region. These MPOs often view their role as one of breaking down barriers.

Major Steps

- Identify barriers to implementing access management principles in the region.
- Identify any changes in legislation, policy, procedure, process, practice, and/or public opinions that would remove barriers to implementing access management. Provide advocacy in support of such changes.
- Identify and fund appropriate advocacy activities. These include, but are not limited to, the following:
  - Establishing a general policy that identifies access management as a key strategy for improving safety and efficiency on the regional transportation network.
  - Providing technical assistance to local governments in corridor and subarea planning.
  - Conducting training workshops.
  - Producing model regulations that integrate access management concepts.
  - Preparing model scopes of services for access management projects.
  - Applying access management considerations in project prioritization (in both the long-range planning and programming project selection processes).
  - Conducting public outreach and involvement activities that focus on the benefits and cost-efficiencies of access management.
  - Spearheading legislative changes that enable local governments to implement access management strategies through local land development and other regulatory processes.
- Identify agencies and stakeholder groups with similar interests in strengthening access management; coordinate activities as appropriate.
- Monitor results and modify advocacy activities accordingly.

Issues to Address

- Lack of planning and/or project funding.
- Resistance to non-traditional capacity improvements.
- Resource-intensive nature of coordination among the MPO, state, and local transportation agencies, as well as with other stakeholder groups.
- Lack of understanding of access management benefits and, on occasion, opposition to access management strategies among stakeholders, including other transportation agencies.

Examples

- Numerous MPOs have adopted policy statements identifying access management as a primary strategy for addressing safety and capacity deficiencies on the regional transportation network. One example of such a policy statement, from the Androscoggin Transportation Resource Center (ATRC) in Auburn, Maine, reads as follows: "ATRC will continue to pursue access management within the urban compact areas as a measure to preserve available highway capacity, reduce crashes and avoid, minimize and hopefully delay costly roadway improvements."
- In Albany, New York, CDTC requires the consideration of access management through its long-range transportation plan project selection process. CDTC established a policy that no specific recommendation or project would be identified in the long-range transportation plan until a local study looking at transportation and land use issues, including access management, was completed. These studies are required to look at a variety of issues including access between the transportation system and local land uses. CDTC sets aside funding for projects intended to improve the level of compatibility between the transportation system and the surrounding land uses. Access management is clearly recognized as a strategy for achieving improved levels of compatibility.

- In 2002, the Ohio Kentucky Indiana Council of Governments (OKI)—which is the MPO in Cincinnati, Ohio—spearheaded an effort to modify Ohio state statutes to grant authority to counties and townships to develop and implement access management plans and policies. This effort was prompted by the insistence on the part of local jurisdiction legal staff that managing access was not supported by the existing state constitution of Ohio. Because of the modification in state statutes, several local governments in the Cincinnati area have integrated access management requirements into their land development processes. OKI also prepared "A Scope of Services for Developing an Access Management Plan for the _____ Corridor," a model access management plan scope of services. This model scope of services was developed to help local governments solicit consultant services for the preparation of access management corridor plans.
- Metroplan, the MPO in Little Rock, Arkansas, prepared roadway cross-section design standards as an element of its long-range transportation plan. The roadway cross-section design standards were developed using access management principles. The MPO included the design standards in the long-range transportation plan for the "use of all jurisdictions to incorporate standards into locally adopted plans (for example, master street plans and subdivision regulations)." These standards were established to ensure regional continuity and to protect the development of the transportation system. The long-range transportation plan encourages flexibility in the application of these standards, particularly where a retrofit is involved, and stresses that exceptions can be made when justified on an individual basis.
- For state transportation projects, Metroplan engages in conceptual design review to promote access management and other regional goals and objectives. Metroplan staff regularly review state highway project conceptual designs in the region to ensure that median treatments, sidewalks, or other desired access management and corridor treatments are incorporated in a manner consistent with the goals and objectives of the MPO long-range transportation plan.
- In 2002, the Berkshire MPO in Pittsfield, Massachusetts, developed a publication titled "Corridor Access Management Guidelines." This resource introduces the principles of access management, provides a range of specific techniques, and includes local examples for applying those techniques. This is one among several tools the Berkshire MPO uses in its public outreach/education activities, and it is aimed primarily at local planning board members and local public works superintendents.
- The Tri-County Regional Planning Council in Lansing, Michigan, has developed corridor overlay ordinances for a number of local jurisdictions. These typically include a variety of requirements related to access management.
- The Duluth-Superior Metro Interstate Committee in Duluth, Minnesota, solicits ideas for corridor plans every year from its member local governments. The MPO receives an average of 20 requests a year and generally conducts three to four corridor plans a year. Access management improvements often play a key role in the recommended strategy for addressing identified corridor deficiencies.

Resources

- www.planning.dot.gov. The website for the U.S.DOT Transportation Capacity Building has a variety of information related to MPO processes, planning, public outreach, and policy development. Much of the information is general but applicable to the integration of access management into transportation planning.
- A variety of information related to access management is available on the websites of the MPOs mentioned in the case examples:
  - www.ardc.org/mic/ (Duluth-Superior Metro Interstate Committee, Duluth, Minnesota).
  - www.atrcmpo.org (Androscoggin Transportation Resource Center, Auburn, Maine).
  - www.berkshireplanning.org/3/index.php3 (Berkshire MPO, Pittsfield, Massachusetts).
  - www.cdtcmpo.org (Capital District Transportation Committee, Albany, New York).
  - www.metroplan.org (Metroplan, Little Rock, Arkansas).
  - www.oki.org/transportation/index.html (Ohio Kentucky Indiana Council of Governments, Cincinnati, Ohio).
  - www.tri-co.org (Tri-County Regional Planning Council, Lansing, Michigan).

2. Maintain the Consistency of Access Management Efforts in the MPO Area

Where This Fits

Various MPO processes and activities including the following:

- Policysetting.
- Project prioritization for both the long-range transportation plan and the TIP.

- Unified Planning Work Program development.
- Public involvement/education activities.
- Subarea and corridor study development.

Lead Agency

MPO.

Background

Several states have established access management programs that include access standards, policies, procedures, and guidelines. The MPO should, to the maximum extent feasible, integrate those elements of the statewide access management program into its own planning activities to leverage work already completed by the state. Additionally, this would limit the number of conflicts that may arise between project planning and project implementation. This would be particularly appropriate where a state transportation agency provides specific new funding for access management projects identified by the MPO. In states without an access management program, the MPO could facilitate consistency of access management efforts on a regional transportation network.

Major Steps

In states with an active access management program,

- Ensure that MPO and local staff understand the specific requirements of the state access management program.
- Develop and adopt MPO goals, policies, and objectives that support the state access management program goals, policies, and objectives.
- Coordinate MPO and state activities to reinforce access management requirements.
- Modify MPO processes (e.g., project prioritization and congestion management system) and activities (e.g., subarea and corridor planning, as well as public involvement and education programs) to support access management program requirements.
- Establish access management guidelines for the region consistent with those of the state, and work with local governments to incorporate those guidelines into local practice.

In states without an active access management program,

- Increase MPO and local staff understanding of access management principles and strategies.
- Develop and adopt MPO goals, policies, and objectives that encourage state and local implementation of access management principles and strategies.
- Modify MPO processes (e.g., project prioritization and congestion management system) and activities (e.g., subarea and corridor planning, as well as public involvement and education programs) to facilitate state and local implementation of access management program strategies.
- Establish access management guidelines for the region, and work with local governments to incorporate those guidelines into local practice.

Issues to Address

- On occasion, poor coordination among MPO, agencies, and stakeholder groups.
- On occasion, lack of understanding of access management benefits and opposition to access management strategies among affected agencies and stakeholders, including the state DOT.

Examples

- The primary motivation behind the integration of access management principles and considerations into existing transportation planning practices for ATRC in Auburn, Maine, was to maintain consistency with the Maine DOT (MDOT) access management program. The MDOT access management standards and guidelines are applied primarily in rural parts of the state, but MPOs are encouraged to incorporate access management into their own planning processes. Additionally, MDOT is offering to help fund projects on congested urban corridors where access management improvements are among the primary measures to combat congestion. ATRC has developed access management goals and policies in

the long-range transportation plan and conducts subarea studies focused, in part, on the integration of land use and transportation through improved access management.

- The primary motivation for integrating access management into existing transportation planning practices and processes for Metroplan in Little Rock, Arkansas, was to encourage the application of consistent access management strategies on the regional transportation network. Metroplan formally adopted general guidelines in the long-range transportation plan prohibiting the installation of continuous center-turn lanes/two-way left-turn lanes on major roads. For state transportation projects, Metroplan engages in conceptual design review to promote access management and other regional goals and objectives. Metroplan regularly reviews state and local highway project conceptual designs in the region to ensure that median treatments, sidewalks, or other desired access management and corridor treatments are incorporated in a manner consistent with the goals and objectives of their long-range transportation plans. Metroplan also now funds preliminary engineering as part of the TIP, so projects are planned with consistent access management design elements.

Resources

- www.atrcmpo.org (Androscoggin Transportation Resource Center, Auburn, Maine).
- www.metroplan.org (Metroplan, Little Rock, Arkansas).

3. Support Access Management Activities through the Unified Planning Work Program

Where This Fits

The Unified Planning Work Program development process.

Lead Agency

MPO.

Background

MPOs identify and fund their annual work activities through the Unified Planning Work Program (UPWP) development process. All activities undertaken by an MPO, including staff and consultant activities, are identified and funded through the UPWP. Access management goals and policies can be advanced in the region by allocating MPO resources (time and money) through the UPWP. This is of particular value where the MPO represents the primary source of transportation planning expertise in the region. Various activities and products intended to support access management can be funded through the UPWP, including the following:

- Corridor and subarea studies that emphasize access management strategies.
- MPO staff participation in project oversight and review committees where they can advocate access management strategies when appropriate.
- MPO staff participation in local professional organizations where they can educate their colleagues from other agencies and the private sector in regard to the benefits of access management.
- MPO staff and elected official presentations to various stakeholder groups (e.g., neighborhood associations, chambers of commerce, and local environmental groups) about the benefits of access management.
- Model regulations that support appropriate access management practices through the land development process.
- Model access standards and guidelines for inclusion in local and regional comprehensive plans.
- Model contracts for local agencies to use when hiring a consultant to conduct an access management study.
- Access management overlay districts.

Major Steps

- Identify barriers to implementing access management principles in the region.
- Identify opportunities to advocate a change in policy, procedure, process, practice, and/or public opinion to diminish or remove the identified barriers.
- Identify appropriate advocacy activities.
- Fund appropriate advocacy activities through the UPWP using available MPO planning funds.

Issues to Address

- Lack of planning funding.
- Lack of staff experience in access management.
- Lack of understanding of access management benefits and opposition to access management strategies among interested groups and stakeholders.

Examples

- The Berkshire MPO in Pittsfield, Massachusetts, is the primary source of transportation planning expertise in western Massachusetts. In an effort to maximize the efficiency and safety of the existing infrastructure while preserving the rural character of the existing corridors, the MPO conducts numerous corridor access management plans for local governments. The corridor access management plans are conducted by MPO staff and funded through the UPWP.
- The Duluth-Superior Metro Interstate Committee in Duluth, Minnesota, views itself as a public-sector consultant (as is the case with many MPOs) and, as such, has developed a program to conduct corridor plans (often focusing on access management issues) for member jurisdictions on a competitive basis. The MPO solicits ideas for corridor plans every year, receiving an average of 20 requests a year and generally conducting three to four corridor plans a year. Additionally, the MPO conducts one or two subarea plans a year. Like the corridor plans, access management improvements are commonly identified as a primary component for addressing identified transportation deficiencies in the area. The corridor plans and subarea studies are funded through the UPWP using federal planning funds.
- The Tri-County Regional Planning Council in Lansing, Michigan, has developed corridor overlay ordinances for a number of local jurisdictions. These ordinances are funded through the UPWP and typically include a variety of requirements related to access management.
- OKI, which is the MPO in Cincinnati, Ohio, funded an effort to modify Ohio state statutes to grant authority to counties and townships in the state to develop and implement access management plans and policies through the UPWP.
- Metroplan in Little Rock, Arkansas, funds staff time through the UPWP to engage in conceptual design review to promote access management and other regional goals and objectives.
- The Florida-Alabama Transportation Planning Organization in Pensacola, Florida, allocates funds in the UPWP to have MPO staff speak to various stakeholder organizations (e.g., chambers of commerce, neighborhood associations, and boards of realtors) about the benefits of access management.

Resources

- www.ardc.org/mic/ (Duluth-Superior Metro Interstate Committee, Duluth, Minnesota).
- www.berkshireplanning.org/3/index.php3 (Berkshire MPO, Pittsfield, Massachusetts).
- www.metroplan.org (Metroplan, Little Rock, Arkansas).
- www.oki.org/transportation/index.html (Ohio Kentucky Indiana Council of Governments, Cincinnati, Ohio).
- www.tri-co.org (Tri-County Regional Planning Council, Lansing, Michigan).
- www.wfrpc.dst.fl.us/fatpo/ (Florida-Alabama Transportation Planning Organization, Pensacola, Florida).

Implementing through Local Governments

1. Address Access Management in Community Planning as a Means of Accomplishing a Broad Range of Transportation and Land Use Goals

Where This Fits

Local comprehensive (land use) planning.

Lead Agency

Local planning department.

Background

Local transportation planning generally aims to reduce crashes and traffic congestion on major roadways, to identify needs for new roadways, and to encourage use of alternative modes by promoting a more livable, pedestrian-friendly built environment with greater emphasis on transit. Land use planning generally aims to reduce urban sprawl, promote compact development, and protect the environment. Attention to access management principles in community planning activities is one effective way of focusing those efforts and improving coordination between transportation and land use planning. In addition to preserving the function of major roadways, access management advances a variety of quality-of-life goals such as multimodal transportation, compact urban form, energy conservation, aesthetics, and landscape preservation. It is also an effective way to contain costs and stretch transportation resources by "making more" out of the existing system.

Major Steps

- Take a multimodal view of access management and address connectivity of street networks and circulation systems, as well as the interactions between modes.
- Translate access management principles into policy statements in the comprehensive plan and supporting planning documents. Address the following policy issues:
  - Roadway classification and degree of access control.
  - Street networks and connectivity.
  - Continuous and interconnected site circulation systems.
  - Transit, bicycle, and pedestrian facility requirements.

Issues to Address

- Roadway facilities have different roles and functions, some being regional in nature and others being local. Regional facilities require higher levels of access control and more careful management of modal conflicts.
- Local street connectivity can create neighborhood concerns over through traffic. Acknowledge this issue in policies and design practices (e.g., T-intersections, jogs, and traffic calming).
- Conflicts between modes at points of access and interactions between modes.

Examples

- The City of Orlando's access management provisions are outlined within the Transportation Element of the city's Growth Management Plan. In 2003, the plan was updated and the element was transformed from a focus on roadways to a focus on providing a safe, convenient, and energy-efficient multimodal transportation system. The element now addresses all modes and seeks to develop "a balanced transportation system that supports building a livable community and improves access and travel choices through enhancement of roads, public transit, bicycle and pedestrian systems, intermodal facilities, demand management programs, and traffic management techniques." Toward that end, the Transportation Element includes several objectives and policies concerning access management.
- The City Plan of Fort Collins, Colorado, consists of "Vision and Goals," a structure plan, and principles and policies for land use, transportation, community appearance and design, and growth management. Each of these areas contains broad policy statements that directly or indirectly advance access management and multimodal principles.

Resources

- *Access Management Manual,* Transportation Research Board of the National Academies (2003). See Chapters 4 and 7.
- City of Fort Collins (Colorado) City Plan (1997).
- City of Orlando (Florida) Growth Management Plan, Transportation Element. See p. TE-1.
- *Model Regulations and Plan Amendments for Multimodal Transportation Districts*, Center for Urban Transportation Research (2004).

2. Establish a Master Street Plan or Thoroughfare Plan that Incorporates Access Management Principles

Where This Fits

City and county comprehensive plans.

Lead Agency

Local transportation planning or public works departments.

Background

Access management begins with the roadway functional hierarchy in the master street plan. The master street plan map is not a detailed engineering document and does not provide precise locations for new streets; it is a planning tool that represents general, conceptual-level alignments and connections only. The master street plan, or thoroughfare plan, is a tool for defining how the major street network will be designed and developed. It includes a map of existing and planned major streets, focusing on arterial, minor arterial, and some key collector streets. The map is supplemented with alternative cross sections, right-of-way widths, access management standards, and other street design standards that are applied as the street network expands. It is implemented through capital improvements programming, access permitting, street network and connectivity standards, right-of-way preservation requirements, and the development review process. Every community—no matter how small—should plan its desired major street system and should adopt alternative cross sections and access management and design standards for each street in the hierarchy.

Major Steps

- Space arterials and collector roadways to ensure effective signal coordination and to reduce accumulation of left turns at major junctions. Streets may be laid out in a general grid pattern or branch out to accommodate terrain or other natural features.
- Classify arterial and key collector roadways into a functional classification system that defines the relative emphasis on mobility/through traffic versus access.
- Emphasize high levels of access control for roadways most important for longer distance, regional travel (e.g., major high-volume arterial routes, freight corridors, and routes connecting economic activity centers). Small, rural communities may have only one or two such roadways. Other lesser arterial and collector routes can be planned for less access control, based upon their relative importance to through traffic movement.
- Designate corridors that require special treatment or access management plans. Special needs of selected areas can be addressed through subarea planning and context-sensitive street design.
- Identify functional classifications of each mapped roadway at the community border and work to coordinate street plans with those of neighboring jurisdictions.
- Develop access management and design standards for each functional classification of roadway. Address criteria for right- and left-turn lanes, medians, median opening spacing, connection spacing and corner clearance, signal spacing, bicycle lanes, sidewalks, and transit facility needs. Access management standards for state highways should be consistent with those of the state transportation agency, where state standards exist. Multilane, arterial routes should be designed with medians to control the location of left-turn movements.
- Develop alternative cross sections and map general right-of-way needs for functionally classified roadways.
- Update local land development and subdivision regulations to incorporate and implement the master street plan.
- Identify improvement priorities and funding options.

Issues to Address

- Coordination of street planning across jurisdiction boundaries.
- Inadequate attention to the importance of street networks to urban design and local mobility. Promote depth and density of local street networks to preserve the efficiency of through movement on major thoroughfares.
- Consider establishing a community signal plan to reduce signal installations because intersections within a plan that require traffic signal control have an impact on system capacity, delay measures, and crash rates.
- Overly low access spacing standards in urban areas. Access spacing standards should be consistent with roadway functional importance; the standards should also be high enough to improve upon existing access problems and to promote the use of alternative access measures as redevelopment occurs.

Examples

The City of Fort Collins, Colorado, adopted its master street plan (MSP) in 1981. The plan is a map-based representation of the long-range vision of the major street network in Fort Collins, based on the adopted land use plan. The MSP reflects the functional class of the ultimate street network and is used to guide the development of the future street system through the capital improvements program and the land development process. The functional classifications of several key regional roadways that lie outside of Fort Collins are also reflected for regional context. The MSP is a dynamic plan and is regularly revisited and amended to reflect new infrastructure as a result of approved development, newly approved long-range and subarea plans, or other relevant issues.

The city's Land Use Code specifies that "all development plans shall provide for or accommodate the streets and transportation facilities identified on the MSP that are associated with the development plan" (LUC 3.6.1 b). It further specifies that "streets on a project development plan or subdivision plat shall conform to the MSP where applicable. All streets shall be aligned to join with planned or existing streets. All streets shall be designed to bear a logical relationship to the topography of the land. Intersections shall be at right angles unless otherwise approved by the City Engineer" (LUC 3.6.2 a). Design standards for each category of street address right-of-way width, street width, medians, bicycle facilities, sidewalks, and so on and establish the basis for such compliance. Access management is also addressed through street spacing and connectivity standards in LUC 3.6.3, as well as in references to the Colorado State Highway Access Control Code or specific access control plans for state highways. The city has also enacted multimodal level-of-service standards, and traffic impact assessment addresses impacts on all modes.

The City Engineering Department also uses the MSP network and functional classification of streets to determine street oversizing fees. These developer-impact fees help pay for the cost of expanding beyond the local road portion of existing and planned roads with greater capacity to handle development-induced traffic. Street oversizing fees are determined in part by the number of lanes and miles reflected on the MSP street network. Fees are calculated for all streets, collector level and above. These fees are revisited on a regular basis and recalibrated depending on changes to the MSP network. (Source: fcgov.com/transportationplanning/.)

Resources

- *Access Management Manual*, Transportation Research Board of the National Academies (2003). See Chapter 5: Roadway Classification and Access Categories.
- "Access Management for Small and Medium-Sized Communities," *Proceedings of the 8th National Conference on Transportation Planning for Small and Medium-Sized Communities*, Cincinnati, Ohio (September 2002); CD-ROM produced by TRB Committee ADA30.
- *Benefits of Access Management,* FHWA, FHWA Document No. FHWA-OP-03-066.
- Williams, K.M., and R. Frey. "Corridor Preservation: Best Practices for Local Governments," *Transportation Research Record 1895*, Transportation Research Board of the National Academies (2004); pp. 156–162.
- Corridor Preservation Model Ordinance and Plan Amendments. www.cutr.usf.edu/index2.htm.
- *Growing Smart Legislative Guidebook,* American Planning Association (2002). See Chapter 7: Local Planning.
- *Managing Corridor Development: A Municipal Handbook,* Center for Urban Transportation Research (1996). www.cutr.usf.edu/index2.htm.
- *PAS Report 515: Planning for Street Connectivity*, American Planning Association (May 2003).
- *AASHTO Green Book: A Policy on Geometric Design of Highways and Streets*, AASHTO (2001).
- *Residential Streets*, 3rd ed., Institute of Transportation Engineers (2001).
- *The Subdivision and Site Plan Handbook*, Rutgers: The State University of New Jersey (1989).
- *Traditional Neighborhood Street Design Guidelines Recommended Practice*, Institute of Transportation Engineers (1999).
- *Transportation Engineering Handbook,* Institute of Transportation Engineers (1992). See Chapter 6: Roadway Geometric Design.
- *Transportation and Land Development,* Institute of Transportation Engineers (2002).

3. Support Access Management through Land Use Planning; Organize Land Uses into Activity Centers to Support Local Street Network Development and Alternative Access

Where This Fits

Local comprehensive plans and subarea or corridor plans.

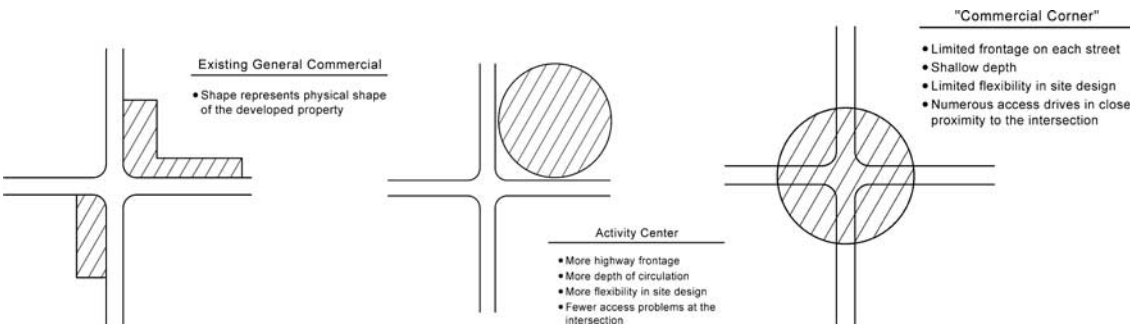
Lead Agency

Local planning department.

Background

Many communities have developed in strips or ribbons along major arterial roadways. Local and collector street networks are often underdeveloped, and major highways are used as access roads. The resulting conflicts between higher-speed traffic and turning vehicles, bicycles, and pedestrians have led to unsafe conditions and a greater dependence on driving. This pattern can be changed through policies that promote activity centers and the development of a connected network of local and collector streets. Organizing land uses into activity centers, or core areas, creates destinations that can be served with an internal roadway and circulation network. This land use arrangement facilitates pedestrian circulation between businesses, eliminates the need for vehicles to circulate on major roadways when moving from one establishment to another, increases the separation of driveways and street connections from signalized intersections or interchanges, and improves safety and operations of major roadways by reducing the occurrence of conflicts. See Exhibit 4-4.

EXHIBIT 4-4 Activity centers and access management



Source: K. Williams and V. Stover, *Proceedings of the 8th National Conference on Transportation Planning for Small and Medium-Sized Communities,* Cincinnati, Ohio (September 2002); CD-ROM produced by TRB Committee ADA30.

The guidelines for designating commercial and mixed-use activity centers are as follows:

- Establish different-sized activity centers for regional, community, and neighborhood commercial and employment/service centers. Direct commercial uses into shopping centers and onto pedestrian-oriented retail streets.
- Avoid shallow commercial nodes that straddle major roadway intersections.
- Provide enough frontage width and depth to accommodate internal circulation and/or street networks. Prohibit creation of shallow lots and narrow frontages with no alternative access.
- Land within activity centers, including developing interchange areas, should have sufficient width and depth to provide access and circulation to interior tracts.
- Provide for sufficient separation of access points from signalized intersections to avoid conflicts with queuing and turning traffic. Discourage development and land use proposals that would result in driveways and intersections in the vicinity of ramp entrances and terminals.
- Require the development of local streets and blocks, service roads, or unified on-site circulation systems as an alternative to direct site access to arterial roadways.
- Connect service or local roads with more than one surrounding roadway to enhance neighborhood accessibility.
- Coordinate block lengths and local or collector street spacing with desired access spacing on major arterial roadways.

Major Steps

- Designate commercial and mixed-use activity centers on maps in future land use plans and in subarea (including interchange area) or corridor plans, along with supporting policies and action strategies.

Issues to Address

- Orienting vehicular access and circulation systems away from a major arterial and onto minor roadways protects the safety and operation of the arterial system. Promoting activity centers reinforces alternative modes of transportation by creating opportunities for walkable destinations that can be served by transit with services and shopping in close proximity.
- Separating left turns at key points of vehicular access can reduce congestion and safety problems at activity center entrances.
- For interchange area activity centers, work with the state transportation agency and collaborate where possible on the acquisition of additional limited access right-of-way on the interchange crossroads to supplement access management plans and policies.

Examples

In an effort to counter urban sprawl and strip development along major roadways, the future land use plan for Orange County, Florida, designates and reinforces key activity centers. The plan calls for strategic development plans to be prepared for each activity center that identify strategies for serving activity centers with transit and integrating transportation modes. Policy 2.1.1 of the transportation plan states, "Where there are opportunities Orange County shall ensure that existing and new residential developments are connected by roadways, bikeways, and pedestrian systems that encourage travel between neighborhoods and access to transit without requiring use of the major thoroughfare system." The strategic development plans identify minimum and maximum densities and a desired mix of land uses in an effort to support transit use and increase internal capture. The county is also developing corridor "enhancement" plans and overlay districts for several major transportation routes. Together, these various land use and transportation planning efforts represent a comprehensive, multimodal approach to access management that aims to redirect access off of major roadways and into activity center areas.

Resources

- *Land Development and Access Management Strategies for Florida Interchange Areas,* prepared for the Florida DOT by the Center for Urban Transportation Research (March 2000).
- *Model Regulations and Plan Amendments for Multimodal Transportation Districts*, Center for Urban Transportation Research (2004).
- *NCHRP Report 348: Access Management Guidelines for Activity Centers*, Transportation Research Board, National Research Council (1992).
- *Planning for Transit-Friendly Land Use: A Handbook for New Jersey Communities*, NJTransit (June 1994).
- *Ten Principles for Reinventing America's Suburban Strips,* Urban Land Institute (2001).
- *Transportation Planning Handbook,* 2nd ed., Institute of Transportation Engineers (1992). See Chapter 8: Activity Centers.

4. Strengthen Local Subdivision Regulations and Expand Street Design Types to Promote Alternative Access to Major Roadways

Where This Fits

Subarea planning, neighborhood planning, corridor access management planning, subdivision regulations and review procedures, and public works/street design standards.

Lead Agency

Local planning department, public works, and development services/administration.

Background

Many communities have developed access management plans and programs aimed at reducing the number of driveways on major arterial routes. These plans often involve the provision of access roads, shared driveways, and interparcel connections that reduce the need for individual sites to have direct, driveway access to an arterial; yet, accomplishing alternative access can be challenging if the local street network is sparse and the land along the major roadway has already been extensively subdivided. Alternative access is best accomplished when new lots are being created on major roads or land is being subdivided for development. Unmanaged land division and subdivision activity on major roadways is a key constraint to accomplishing street networks and alternative access. Even with effective subdivision regulations, communities can face access problems from minor land division activity that is exempt from the subdivision review process. Strengthening subdivision regulations to restrict strip lots on major roads and to preserve necessary right-of-way, as well as providing a greater variety of street types and design options for commercial and residential subdivisions, can help support the use of street networks for property access.

Major Steps

Evaluate and update existing comprehensive plan policies, subdivision regulations, and related ordinances to accomplish the following:

- Increase minimum lot frontage requirements on major roadways for consistency with access connection spacing (allow smaller frontages for lots with alternative access).
- Require properties consolidated for development or those under common ownership to develop a unified access and circulation system.
- Require outparcels to be tied into the on-site circulation system of the larger shopping center.
- Incorporate street network and connectivity standards. Provide for the development of local and collector roads at established intervals that conform with access spacing standards for major roadways. Establish criteria for preservation of right-of-way as development occurs.
- Incorporate standards for shared access and parking-lot cross access for properties under separate ownership.
- Establish a streamlined review process for lot splits and other minor subdivision activity that would otherwise be exempted from subdivision review. This ensures that lots have appropriate access without placing an unnecessary review burden on the property owner.
- Revisit design standards and cross sections for neighborhood streets and local thoroughfares, and expand the diversity of road types and design options, particularly for local and collector roads, to allow a denser and more connected street network that provides alternative access.

Issues to Address

- Inadequate funding for implementing access management plans, particularly in regard to service roads and local road improvements or connections. Opportunities to partner with the state transportation agency or property owners can increase the ability of smaller communities to create service roads on state highways.
- Overly narrow or shallow lots on major roadways limit circulation and economic development opportunities. Preserve parcels of adequate width and depth for a range of developments and circulation needs. Restrict the intensity of use/trip generation on small corner lots or narrow frontage lots with no alternative access.
- Many communities have a “one size fits all” standard for local roads. Expanding the diversity of street types and design options provides flexibility to accomplish a denser and more connected circulation network and can reduce the need for direct site access to arterials. Consider adding options for rural residential lanes, alleys, and other street types to provide greater flexibility of site and circulation design.
- Inadequate subdivision and site plan review requirements. It is important to regulate commercial and residential subdivisions, as well as to require site plans with site access details. Establish a subdivision and site plan review process for all developments.

Examples

- Licking County, Ohio, handles many access issues through the land division process for major and minor land divisions. A minor land division includes actions that will (1) result in no more than five lots, including the remainder of the original lot; (2) not involve the opening, widening, or extension of any street or road or easement of access; and (3) not be located on a roadway classified by Licking County as a minor or major arterial. Major land divisions include all other land divisions and any development activity that will involve multi-family, commercial, industrial, and quasi-public land uses. Both application processes involve the submittal of a site plan that outlines the proposed site circulation system and access points within and between the proposed lots, as well as to the external roadway network.

  (Source: K. Williams, *NCHRP Synthesis of Highway Practice 304: Driveway Regulation Practices*, Transportation Research Board of the National Academies, 2002.)
- The Florida Multimodal Districts Model, a planning and regulatory model for multimodal transportation districts (MMTDs) in Florida, applies concepts similar to those of Fort Collins, Colorado. The model is aimed at achieving a more pedestrian- and transit-friendly environment, in part by improving street networks and connectivity:

  Policy 8: Street Network and Connectivity. MMTDs shall provide a dense, interconnected network of local and collector streets that supports walking, bicycling and transit use, while avoiding excessive through traffic in residential neighborhoods, in accordance with the following:

  a. The street network shall be comprised of a system of interconnected and direct routes with a connectivity index of 50 or more polygons per square mile as measured in the Florida Department of Transportation *Multimodal Transportation Districts and Multimodal Areawide Quality of Service Handbook*.
  b. For MMTDs with a street connectivity index below 50, the missing links in the street network shall be identified and eliminated where feasible through the development and capital improvement process.
  c. Each MMTD shall be subject to a maximum block (length or perimeter) requirement to advance connectivity as development and redevelopment occurs.
  d. Connections of new local and collector streets and driveways with arterial streets shall conform to adopted access spacing intervals of the agency with jurisdiction.
  e. The local street circulation pattern shall maximize access to individual lots and activity center destinations (e.g. schools, commercial areas, parks). At the same time, the circulation pattern shall discourage cut-through traffic in residential areas through designs such as curving roads, jogs, T-intersections, roundabouts, gateway treatments, and traffic calming techniques.

Resources

- "Accomplishing Alternative Access on Major Transportation Corridors," *Proceedings of the 9th National Conference on Transportation Planning for Small and Medium-Sized Communities*, Colorado Springs, Colorado (September 2004); CD-ROM produced by TRB Committee ADA30.
- *Creating Livable Streets: Street Design Guidelines for 2040*. Portland, Oregon: Metro (1997).
- *How Much Development Is Too Much? A Guidebook on Using Impervious Surface and Gravel Road Capacity Analysis to Manage Growth in Rural and Suburban Communities*, Huron River Watershed Council/Planning & Zoning Center Inc. (August 2003). www.hrwc.org/pdf/PAL_Guidebook.pdf.
- *Model Land Development and Subdivision Regulations That Support Access Management for Florida Cities and Counties*, prepared for Florida DOT by the Center for Urban Transportation Research (January 1994).
- *Street Design Guidelines for Healthy Neighborhoods*, Center for Livable Communities (January 1999).
- *The Subdivision and Site Plan Handbook*, Rutgers, The State University of New Jersey (1989).
- *Traditional Neighborhood Street Design Guidelines Recommended Practice,* Institute of Transportation Engineers (1999).
- Williams, K. *NCHRP Synthesis of Highway Practice 304: Driveway Regulation Practices*, Transportation Research Board of the National Academies (2002).

5. Use Subarea- and Sketch-Planning Techniques to Facilitate the Development of Service Roads and Internal Street Networks for Properties under Multiple Ownership

Where This Fits

Subarea/activity-center planning, neighborhood planning, and corridor access management planning.

Lead Agency

Local planning department and development services/administration.

Background

Subarea plans (also known as sector plans, special area plans, or district plans) are detailed development plans for a specific geographic area. Sketch plans are conceptual graphic representations of land uses and transportation facilities in a subarea and can serve as general guidelines or as an early step toward more detailed subarea plans. Subarea plans are highly participatory and are generally developed with oversight of a special advisory group that represents area stakeholders. These plans often focus on a particular neighborhood, commercial district, activity center, or high-growth undeveloped area. They should include access management strategies for primary corridors and strategies for accomplishing a balanced street network and multimodal facilities. The level of detail relates to available planning resources and the purposes of the plan. Subarea plans are often implemented with special district or overlay district regulations.

Major Steps

- Organize area stakeholders and involve area leaders and property owners in a participatory planning process.
- Identify guiding principles for plan development based upon stakeholder input and any guiding policies and principles in the local comprehensive plan.
- Identify alternative street networks for desired land use. Build upon existing street networks. Try a sketch planning approach to identify potential street network layouts for undeveloped areas under several owners. Reach out to property owners directly and work with them on a cooperative site circulation plan.
- Develop service road concepts for major arterial corridors, where appropriate, to complement the desired future street network. A system of parallel roads or service roads could run behind corridor properties with side streets intersecting the arterial at reasonable spacing intervals.
- Establish implementing ordinances and capital improvement priorities and funding strategies.

Issues to Address

- Inadequate funding for implementing access management plans, particularly in regard to service roads and local road improvements or connections. Opportunities to partner with the state transportation agency and private developers or property owners can increase the ability of smaller communities to create service roads on state highways.
- Many communities have a "one size fits all" standard for local road development. Expanding the diversity of street types and design options provides flexibility to accomplish a denser and more connected circulation network, which thereby reduces the need for direct site access to arterials.
- Avoiding individual driveway access to single-family homes along rural highways. One strategy is to provide property owners with low-cost alternatives to shared access and internal streets. Techniques include working with property owners on small concept plans for shared access drives and allowing shared gravel driveways built to appropriate standards.

Examples

- The City of Nashville, Tennessee, is engaging in an extensive subarea/neighborhood planning effort to accomplish 10 principles and supporting goals of its comprehensive plan. Among these are the goal to achieve physical connections among the neighborhoods and downtown by means of a rational network of streets and avenues and the goal to reconfigure roads and streets into a balanced, multimodal network that distinguishes between the mobility needs of high-speed through traffic and the access needs of local traffic. Subarea plans are being developed that aim to accomplish a cohesive organization of neighborhoods with strong centers and boundaries, a mixture of land uses and residential diversity,

and a hierarchy of streets. The neighborhood plans provide for a variety of street design types and cross sections, and the plans incorporate connectivity goals.
(Source: www.nashville.gov/mpc/.)

- The North Ridge Selected Area Plan was prepared for a developing corridor in Polk County, Florida. The plan seeks, in part, to "optimize the capacity of US 27 and US 17/92 as the primary transportation roadways." Supporting policies call for (1) increasing internal-capture rates by encouraging developments with a full range of activities and by promoting town centers; (2) requiring connections between adjacent parcels and proposed arterial and collector roads; and (3) requiring service roads, internal roads, and/or internal tram circulation where conditions warrant. The county is directed to designate "cross-access corridors" as necessary during subdivision review, site plan review, or as part of the overall planning program. The North Ridge Selected Area Plan includes a capital improvements plan for development of a multimodal collector road system. All development plans must accommodate these roads, which are identified in the Comprehensive Plan. It goes on to specify that the capital improvements, including right-of-way acquisition, "shall be financed substantially from development within the North Ridge SAP either through impact fees or other appropriate funding instruments such as the establishment of a Municipal Service Benefit Unit or a Community Redevelopment Area." The plan notes that compensation will be provided for improvements and right-of-way needs that are not attributable to the impacts of the project.
(Source: www.polk-county.net/InternetV4/county_offices/planning/docs/NORTHRIDGE.pdf.)
- Fort Collins, Colorado, implements access management principles through subarea planning. Principle LU-4, Land Use Principles and Policies, and Principle Policy CCD-1.2, Community Commercial District Principle and Policies, permit the creation of "subarea plans" that implement the City Plan by applying general, citywide policies to a specific subarea. More than 10 subarea plans that target specific corridors or neighborhoods within the community have been adopted by the City of Fort Collins. (Source: www.ci.fort-collins.co.us/advanceplanning/city-plan.php.)

Resources

- *Effective Strategies for Comprehensive Corridor Management,* Center for Urban Transportation Research (October 2004); www.cutr.usf.edu/research/access_m/access_mgmt_pubs.htm.
- *Guidelines for Preparing Urban Plans*, American Planning Association (1995).
- "Improving the Subdivision Review Process," *Planning Commissioners Journal*, No. 50, pp. 12–15 (Spring 2003).
- *Neighborhood Planning: A Guide for Citizens and Planners*, American Planning Association (1990).
- *The Subdivision and Site Plan Handbook,* Rutgers: The State University of New Jersey (1989).

6. Integrate Transportation Safety and Operations Considerations into Land Use Decisionmaking

Where This Fits

Land use planning, development review and permitting, land development and subdivision regulation, and transportation planning/public works.

Lead Agency

Local planning or public works department.

Background

The safety implications of land use decisions on the transportation system should be addressed during land use planning and development review—particularly in regard to the cumulative impacts of access on system safety. Instead, most communities focus on traffic (e.g., speeding, congestion, and cut-through), density, and livability issues. Adding traffic safety to the checklist of issues to consider in land use planning and regulation could help local government planners focus on the safety implications of various land use and site-development alternatives. Identifying crash rates associated with high access density on existing corridors helps to inform policymakers and the public about the safety impacts of access. Monitoring actual impacts of access management plans or projects will establish the value of access management to transportation decisionmakers, local elected officials, the business community, and the public. It will also uncover impacts that may not have been anticipated and could be avoided in the future.

Major Steps

- Evaluate the traffic safety implications of commercial zoning practices, land division and subdivision practices, and the adopted future land use plan. Determine whether they adequately discourage strip development or support alternative access. Summarize the potential increases in access density on major roadway corridors and translate that into potential crash rates using the *NCHRP Report 420* Impact Calculator or crash indexes (see Resources below).
- Conduct a site access and circulation review of all development proposals.
- Acknowledge during planning reviews that new traffic signals have an impact on community safety, and conduct a comprehensive analysis of the safety as well as the operation and fiscal impacts of each new proposed traffic signal.
- Use the crash rates by access density in *NCHRP Report 420* (see Resources below) as a tool for evaluating proposed deviations from access spacing on major roads. Consider the potential impact of deviations on crash rates and on operations.
- Document existing safety problems and show how these correlate with areas of poor access design. Consider establishing a crash management system that documents the crash experience on key corridors and that can be used to diagnose safety problems.
- Initiate a process for monitoring actual impacts of access management projects or plans, and document this information for future use. For example, studies can be conducted of crashes and congestion on corridors before and after a major reconstruction project to improve access (such as medians and turn lanes). Crash data can be collected annually on corridors where access management plans or standards are being applied to determine whether crash rates are declining.

Issues to Address

- Plan evaluations and monitoring studies require staff time and resources. These tasks often take a backseat to other more pressing needs. Consider ways to partner with the MPO, regional planning agency, or state transportation agency to obtain funding or other resources for impact assessment and monitoring activities. Identify opportunities to incorporate access-related data into existing local, MPO, or state-transportation safety monitoring efforts.

Examples

- A review of the 3-year accident history along two corridors in Penfield, New York, revealed that 43 percent of the total accidents occurred at uncontrolled access locations. These findings were instrumental in obtaining business and property owner support for medians at the intersections and local adoption of an access management plan for the area.

  (Source: S. Ferranti and G. Benway, "The Challenges (and Early Successes) of a Town-Initiated Access Management 'Retrofit' Program on Two State Highways," *Proceedings of the Second National Conference on Access Management*, TRB/FHWA/Colorado DOT, 1996. www.accessmanagement.gov.)
- Engineering staff in the City of Tallahassee, Florida, collected crash data and video logs of actual operations on a segment of Appalachee Parkway with a continuous two-way left-turn lane (TWLTL) and compared this with a median-controlled segment on the same corridor to illustrate safety problems associated with the TWLTL. This information, along with a study of crash rates for the median and TWLTL segments funded by FDOT, helped in obtaining public support for a raised median.

  (Source: Discussions with staff.)
- Fort Collins, Colorado, is one city that has integrated access management throughout its planning and regulatory program. Access management is supported in the broad policies and principles of the City Plan and is further advanced through the adoption of subarea plans that target specific corridors or neighborhoods, a Master Street Plan for the development of a balanced street network, and corridor access management plans for state highways that are adopted in coordination with the Colorado DOT. The city also promotes a supporting street network on arterials through street spacing and connectivity requirements in its land development code. The requirements are implemented mainly in developing areas through the development review process and applicants are required to submit an access management plan that advances the standards.
- CDTC—the MPO for the Albany-Schenectady-Troy region in New York—has created incentives for local access management through its long-range planning and programming functions. CDTC screens projects for land use planning and access management linkages before moving a project from the long-range transportation plan to the TIP. The screening process includes consistency requirements related to access management and land use. CDTC will not consider highway capacity projects unless land use planning and access management commitments are already in place. In addition, the Albany area long-range transportation plan does not identify specific projects until a local study focused on land use and transportation issues is completed, including detailed consideration of access management strategies.

- At the state level, FDOT has integrated access management into a variety of statewide transportation planning activities. On a policy level, the 2025 Florida Transportation Plan is specifically identified as a strategy for preservation and management of the state transportation system. The Florida Intrastate Highway System (FIHS) plan, part of the FDOT Strategic Intermodal System, sets forth access management design and classification criteria for highways of statewide importance. FDOT also requires an Interchange Justification Report for new interchanges and an Interchange Modification Report for interchange reconstructions. The reports must identify how the interchange plan will provide access management on the cross street to achieve safe and efficient operations, such as through police power, special corridor agreements, or the acquisition of additional access control. In addition, all major developments classified as "developments of regional impact" in Florida must have FDOT approval of a transportation impact study that addresses access management and related transportation improvements. The FDOT Systems Planning Office holds periodic statewide coordination meetings on access management and provides extensive training. FDOT training has focused on providing outreach to local governments on integrating access management into their planning and regulatory activities, as well as training for planners and engineers on how to incorporate good access management practices into corridor plans and roadway improvement projects.

Resources

- *Access Management Manual*, Transportation Research Board of the National Academies (2003). See Chapter 2: Effects of Access Management.
- Urbitran Associates, *CRP-CD-24: Impact Calculator: Impacts of Access Management Techniques*, Transportation Research Board of the National Academies (2002).
- *NCHRP Report 420: Impacts of Access Management Techniques*, Transportation Research Board, National Research Council (1999).
- *Toolbox on Intersection Safety and Design*, Institute of Transportation Engineers (September 2004).
- *Traffic Access and Impact Studies for Site Development: A Recommended Practice*, Transportation Planners Council, Institute of Transportation Engineers (September 1989).

7. Establish and Apply a Traffic Impact Analysis Process to Ensure Access Management Principles Are Applied in the Planning of New Developments

Where This Fits

Development review and permitting.

Lead Agency

Local transportation planning/public works.

Background

A site transportation impact analysis (TIA) assesses the effects of a proposed development on the surrounding transportation network; the ability to get traffic on and off the site; and the need for off-site mitigation, which may include access management measures. The TIA is an essential part of the development review process to assist developers and public agencies in making land use and transportation improvement decisions. These studies are conducted during access permitting and are also important during review of requests for subdivision, rezoning, and other development activities that may have a substantial adverse impact on transportation operations. The type of analysis can depend on the size, impact, and/or complexity of the development.

Major Steps

- Establish or update traffic impact assessment requirements and procedures so that some level of review is provided for all rezoning and development proposals, as follows:
  - A tiered approach for traffic impact assessment and a pre-application process that specifies different levels of analysis for different size developments is recommended. As the size of developments increase, they will have greater impacts on the transportation system. Therefore, it is suggested that different criteria/requirements be adopted for small developments, medium developments, and larger developments.
  - Small developments (e.g., fewer than 100 trips/h) are typically exempted from TIA requirements, but a site access and circulation review should still be conducted to ensure that access connections are safely located. Traffic impact analy-

sis may be desirable when fewer than 100 new peak-hour trips are estimated. Bellevue, Washington, for example, has been identified in the reference literature as using 30 peak-hour trips with good success.

– Condition approval of access on the access spacing and design standards for the affected roadway, as established in the state or local access classification system.
– Conduct a site access and circulation review of all development proposals to identify and prevent hazards caused by problems with sight distance at access points, inadequate on-site storage, inadequate corner clearance, inadequate driveway design or spacing, and excessive conflict points.
– Evaluate proposed mitigation measures and their effectiveness.

Issues to Address

- Unexpectedly changing or expanding traffic study requirements during the review process leads to developer frustration. Establish a pre-application process to discuss the proposed development and establish the information required for a complete application, including the contents and requirements for traffic impact analysis.
- Developers are reluctant to change site plans after they have been designed. Encourage all applicants to request a pre-application review to determine the viability of the site access concept before they initiate the site design process.
- The larger the development, as measured by the number of trips generated, the larger the area that may experience measurable traffic impact caused by the development. For rezoning proposals, the extent of the study area would be based on the potential intensity of the proposed change in use.
- Staff time and technical assistance needs for site impact review can be substantial for larger developments. Enact or increase permitting fees so that they are sufficient to address processing of TIAs.
- Smaller communities often lack professional transportation planning or engineering staff. These areas will need to obtain the services of a qualified consultant.

Examples

There are numerous examples of local TIA requirements and procedures. Below are examples of some key access considerations of the TIA:

- Is the number of access points the minimum necessary to serve the project without adversely impacting roadway safety and operations?
- Are access points a sufficient distance from intersections to minimize conflicts?
- Is the proposed access spacing for locally maintained thoroughfares consistent with adopted standards of the state transportation agency for state highways or the local government?
- Should left turns be restricted?
- Is sight distance adequate at proposed access points?
- Are changes needed to driveway design to accommodate expected vehicles and volumes (e.g., radii for trucks or buses or deceleration lanes)?
- Is the design sensitive to pedestrian needs?

Resources

- *Access Management Manual*, Transportation Research Board of the National Academies (2003). See Chapter 12: Access Permitting.
- *Evaluating Traffic Impact Studies: A Recommended Practice for Michigan Communities,* prepared for the Tri-County Regional Planning Commission, Lansing, Michigan; Michigan DOT; and the Southwest Michigan COG, Detroit, Michigan, by McKenna Associates, Inc., the WBDC Group, et. al. (1994). Includes model TIA ordinance.
- *NCHRP Report 420: Impacts of Access Management Techniques,* Transportation Research Board, National Research Council (1999).
- *Traffic Access and Impact Studies for Site Development: A Recommended Practice*, Transportation Planners Council, Institute of Transportation Engineers (September 1989).

8. Ensure Coordination and Consistency across Local Planning and Development Functions and among Jurisdictions in regard to Access Management

Where This Fits

Comprehensive planning, subarea and corridor planning, thoroughfare or master street planning, modal planning, ordinance development, development review, and permitting.

Lead Agency

Local planning department.

Background

Effective access management requires coordination within the various divisions of a local government agency as well as with other local governments and the state transportation agency. For example, the public works department may take the lead in transportation planning and setting access management and roadway design standards, while the land use planning and development review functions are performed in other divisions. Standards and procedures for regulating access should be reasonably consistent across state and local agencies as well as among neighboring jurisdictions that share a common corridor.

Major Steps

- Consider restructuring the local planning, capital improvement, and regulatory functions to better integrate land use and transportation planning and decisionmaking (see the example below for Washington County, Oregon).
- Create frequent opportunities for educating partners and their stakeholders on the importance of access management.
- Communicate early and often with other agencies having jurisdiction over access management issues. For example, involve the state transportation agency and other affected jurisdictions when preparing access management policies, plans, or ordinances, or when considering a request for access to a state highway.
- Work with the MPO and state transportation agency to coordinate access management improvements with planned highway improvements. New roads, road widening, intersection upgrades, even resurfacing projects can provide a strategic opportunity for addressing access problems and incorporating improvements. Local governments can facilitate this by helping with early public involvement and collaborative decisionmaking on design alternatives—both of which will be key to achieving public support for access.
- Use corridor planning as a tool for proactive coordination with state transportation agencies on access management for major roadways.
- Consider establishing intergovernmental agreements or protocols with the state transportation agency and other jurisdictions on access management planning and implementation/review actions to help formalize coordination.
- Consider establishing a joint committee or multiparty amendment process for the administration of a corridor management plan that affects more than one jurisdiction or agency.
- Create frequent opportunities for educating partners and their stakeholders on the importance of access management.
- Establish a "variance" committee process to address properties that fail to conform to access spacing standards. Preferably, the process would distinguish between major and minor deviations in spacing, allowing minor deviations to be handled administratively. A major deviation could be put through a committee made up of representatives from different divisions and other agencies or jurisdictions, where applicable, to facilitate coordination and consistency in enforcement.
- Incorporate formal mechanisms and timelines for addressing needed changes to corridor access management plans. Establishing a monitoring or renegotiation clause provides a way to proactively address issues or problems that may be experienced in implementation and to budget for updates.

Issues to Address

- Conflicting priorities. Confront tough issues through direct involvement of affected parties. Be willing to compromise and work hard to build intergovernmental relationships and achieve a cooperative atmosphere.
- Local politics and changing priorities can impede internal and intergovernmental consistency and coordination. Staff preparation and ability to communicate the reason for controversial access decisions are important. Periodic education of elected officials and stakeholder groups on access management can help.

Examples

- Local governments in Broward County, Florida, formed the SR 7/US 441 Collaborative to work together on a plan for managing this deteriorating commercial corridor. The 26-mile state highway is shared by 14 jurisdictions. In 2001, each jurisdiction and seven agencies, including FDOT and the Broward County MPO, entered a cooperative agreement called the State Road 7 Partnership. The purpose of the effort is to provide a framework for multi-jurisdictional cooperation on the redevelopment and revitalization of the corridor. Goals are to coordinate local resources and planning to promote the economic vitality, aesthetic improvement, redevelopment, and safety of the corridor. Access management is being addressed through strategies to promote transit-oriented development at key nodes and to preserve the safety and operations of SR 7 for through traffic and bus rapid transit. Technical assistance and support for the effort is being provided by the South Florida Regional Planning Council.

  (Source: www.sfrpc.com/sr7/publications.htm.)

- In the mid-1980s, Washington County, Oregon, combined its planning, capital project management, engineering, and road maintenance responsibilities under one department. The Land Use and Transportation Department's mission is twofold: (1) to plan, build, and maintain the county's transportation system and (2) to prepare, implement, and enforce land use plans, policies, and related state and county mandates. Integrating planning and engineering functions strengthened internal coordination in access management.

  Washington County must coordinate with 12 municipalities to accomplish access management on county roadways within municipal boundaries. The county works hard to maintain open lines of communication and engages in other planning activities with municipalities that have helped improve coordination. For example, the county works with municipalities and the business community on establishing a major streets transportation improvement program and allocating a portion of the countywide tax revenue for transportation projects.

Resources

- *Access Management Manual,* Transportation Research Board of the National Academies (2003). See Chapter 13.
- *Effective Strategies for Comprehensive Corridor Management,* Center for Urban Transportation Research (October 2004). www.cutr.usf.edu/research/access_m/access_mgmt_pubs.htm.
- *NCHRP Synthesis of Highway Practice 337: Cooperative Agreements for Corridor Management,* Transportation Research Board of the National Academies (2004).

GLOSSARY

acceleration lane: A speed-change lane, including tapered areas, that enables a vehicle entering a roadway to increase its speed to a rate that enables it to safely merge with through traffic.

access category: A classification system for regulating access that is used to assign sets of access management standards to roadways or roadway segments.

access classification: See *access category*.

access connection: See *connection*.

access management: The systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway, as well as roadway design applications that affect access, such as median treatments and auxiliary lanes, and the appropriate separation of traffic signals.

access management plan: A plan showing the location, and in some cases the design, of access for every parcel on a major roadway segment or within an interchange area that is often jointly developed and adopted by the state (if the road is a state highway) and local agencies having jurisdiction over land development in the affected area.

access operation: Use of an access for its intended purpose, in terms of access volume, type of access traffic, access safety, time of the access activity, and the effect of such access on the roadway system.

access permit: A permit issued by a governmental agency for the construction, maintenance, and use of a driveway or public street connecting to a highway.

access point: See *connection*.

alternative access: The ability of any vehicle to enter a roadway indirectly through a roadway of lower functional classification.

approach: The set of lanes making up one leg of an intersection.

arterial: A major roadway intended primarily to serve through traffic, where access is carefully controlled. These are roadways of regional importance, intended to serve moderate to high volumes of traffic traveling relatively long distances and at higher speeds.

auxiliary lane: A lane striped for use, but not for through traffic.

average annual daily traffic or **AADT**: The total two-way yearly traffic volume on a section of roadway, divided by 365. This is often referred to as average daily traffic (ADT).

bandwidth: The time in elapsed seconds between the passing of the first and last possible vehicle in a group of vehicles moving at the design speed through a progressive traffic signal system. It is a quantitative measurement of the through traffic capacity of a signal progression system; the greater the percentage of *bandwidth*, the higher the roadway capacity.

capacity: The maximum rate of flow at which vehicles reasonably can be expected to traverse a point on a lane or road during a specified period under prevailing traffic, roadway, and signalization conditions, usually expressed as vehicles per hour. *Capacity* is most often considered the maximum amount of traffic that can be accommodated by a roadway during the peak hours of demand.

channelization: The separation or regulation of conflicting traffic movements into definite paths of travel by traffic islands or pavement markings to facilitate safe and orderly movement of both vehicles and pedestrians.

collector: Roads intended to move traffic from local roads to secondary arterials.

condemnation: The process by which property is acquired for highway purposes through legal proceedings based on the power of eminent domain.

conflict: A traffic event that causes evasive action by a driver to avoid collision with another vehicle, usually designated by a braking application or evasive lane change.

conflict point: An area where intersecting traffic merges, diverges, or crosses.

connection: Any driveway, street, turnout, or other means of providing for the movement of vehicles to or from the public roadway system.

connection spacing: The distance between connections, measured from the closest edge of pavement of the first connection to the closest edge of pavement of the second connection along the edge of the traveled way.

control of access: The condition in which the right of access of owners or occupants of land abutting a roadway is controlled by a public authority.

controlled access roadway: A roadway to which abutting properties have no legal right of access except in accordance with the requirements of the public authority having jurisdiction over that roadway.

corner clearance: The distance from an intersection of a public or private road to the nearest access connection, measured from the closest edge of the pavement of the intersecting road to the closest edge of the pavement of the connection along the traveled way.

corridor management: The coordinated application of multiple strategies to achieve specific land development and transportation objectives along segments of a transportation corridor.

corridor management planning: The process for identifying and addressing issues of strategic importance to the long-term functioning and character of a transportation corridor. Typical elements of the process include corridor designation, partnering agreements, visioning, corridor analysis, alternatives development and selection, and an implementation plan and agreements.

corridor overlay zone: Special requirements added onto existing land development requirements along a designated portion of a public thoroughfare.

corridor preservation: The coordinated application of various measures to obtain control or protection of the right-of-way for a planned transportation facility, as well as measures to preserve the capacity of existing roadways through access management.

cross access: An easement or service drive providing vehicular access between two or more contiguous sites so that the driver does not need to reenter the public street system.

crossover: See *median opening*.

crossroad: The lower-functioning roadway that crosses the main higher-functioning roadway.

curb cut: An opening along the curb line where vehicles may enter or leave the roadway.

deceleration lane: A speed-change lane, including tapered areas, that enables a turning vehicle to exit a through lane and slow to a safe speed to complete its turn.

dedication: A conveyance of property by a private owner to the public.

directional median opening: An opening in a restrictive median that provides for specific movements and physically restricts other movements.

diverging: The dividing of a single stream of traffic into separate streams.

diverted trip: A trip not new to a study area, but that uses a segment of the transportation system that previously had not been used to access a development site.

divided roadway: A roadway on which traffic traveling in opposite directions is physically separated by a median.

driveway: The physical connection for vehicular traffic between a roadway and abutting land.

driveway flare: A triangular pavement surface at the entrance of a driveway that facilitates turning movements and is used to replicate turning radius in areas with curb and gutter construction.

driveway return radius: A circular pavement transition at the entrance of a driveway that facilitates turning movements.

easement: A right-of-way granted, but not dedicated, for specific and limited use of private land and within which the owner of the property shall not erect any permanent structures.

egress: The act of leaving a place or exiting; the exit of vehicular traffic from abutting properties to a roadway.

eminent domain: The authority to acquire or take, or to authorize the taking of, private property, with just compensation, for public use or public purpose.

exception: Permission to depart from design standards in an ordinance due to unique circumstances of the site or project.

expressway: A principal arterial roadway designed for relatively uninterrupted, high-volume mobility between areas, access to which is limited and may include a mixture of intersections (at grade) and interchanges (grade separated).

freeway: A principal arterial roadway designed for relatively uninterrupted, high-volume mobility between areas, access to which is limited to grade-separated interchanges only. Interstate highways are *freeways*.

frontage road: An access road that generally parallels a major public roadway between the right-of-way of the major roadway and the front building setback line. The *frontage road* provides access to private properties while separating them from the principal roadway.

functional area: That area beyond the physical intersection of two controlled access facilities that comprises decision and maneuver distance, plus any required vehicle storage length, and is protected through corner clearance standards and connection spacing standards. See also *intersection*.

functional classification: A system used to group public roadways into classes according to their purpose in moving vehicles and providing access.

grade separation: A crossing of two roadways, or a roadway and a railroad, or a roadway and a pedestrian walkway at different elevations.

gradient or **grade**: The rate or percent change in slope, either ascending or descending from or along the highway. It is to be measured along the centerline of the roadway or access point.

impact analysis: A study to determine the potential direct or indirect effects of a proposed development on activities, utilities, circulation, surrounding land uses, community facilities, environment, and other factors.

impact fee: A fee imposed on a development to finance the cost of improvements or services.

improvement: The original work on a road and subsequent repairs. *Improvement* consists of location, grading, and surface and subsurface drainage provisions, including curbs, gutters, catch basins, foundations, shoulders and slopes, wearing surface, bridges, culverts, retaining walls, intersections, private entrances, guard rails, shade trees, illumination, guideposts and signs, ornamentation, and monumenting. *Improvement* also may consist of alterations to driveways and local streets, acquisition of right-of-way, construction of service roads, and other actions designed to enhance the functional integrity of a roadway.

ingress: Entry into a place; the entrance of vehicular traffic into abutting properties from a roadway.

interchange: A grade-separated system of access to and from highways that includes directional ramps for access to and from crossroads.

interchange management plan: A plan similar in nature to an access control plan but limited to the immediate influence area of an interchange for the protection of its functional integrity.

interparcel circulation: The ability of vehicular traffic to circulate between adjacent parcels without reentering a public roadway.

interrupted flow: A category of traffic flow that occurs on roadways having traffic signals, stop or yield signs, or other fixed causes of periodic delay or interruption to the traffic stream.

intersection: Any at-grade connection with a roadway, including two roads or a driveway and a road.

intersection (roadway): The location where two roadways cross at grade.

inverse condemnation: The taking or reduction in value of private property as a result of governmental activity, without any formal direct exercise of eminent domain.

joint use connection: A single access point connecting two or more contiguous sites to a public roadway that serves more than one property or development, including those in different ownership or in which access rights are provided in legal descriptions.

landlocked: A lot or parcel of land without access to a public road.

level of service or **LOS**: A qualitative measure describing the operational conditions within a stream of traffic. The measure uses factors including speed, travel time, ability to maneuver, traffic interruptions, safety, waiting time periods (delay), and driver comfort and convenience. *Level of service* is represented by one of the letters A through F—A for the freest flow and F for the least free flow.

limited access roadway: A roadway especially designed for through traffic and where owners or occupants of abutting land (or other persons) have no right or easement of access.

local road: A roadway with the primary function of providing access to adjacent properties and to roadways of a higher functional classification.

lot: A designated parcel, tract, or area of land established by plat, subdivision, or as otherwise permitted by law, to be separately owned, used, developed, or built upon.

major traffic generator: A land use that generates a high traffic volume to and from the site, usually defined in terms of vehicles per hour or vehicles per day. Volumes used to differentiate major versus minor vary widely.

median: That portion of a highway separating opposing traffic flows, not including center two-way left-turn lanes. Medians can be traversable or nontraversable.

median, nontraversable, or **restrictive median**: A physical barrier in the roadway, such as a concrete barrier or landscaped island, that separates traffic traveling in opposite directions.

median opening: An opening in a nontraversable median that provides for crossing and turning traffic.

median, traversable, or **nonrestrictive median**: A median that, by its design, does not physically discourage or prevent vehicles from entering upon or crossing over it, including painted medians.

merge: The process by which two separate traffic streams moving in the same direction combine or unite to form a single stream.

minor traffic generator: A land use that generates a low traffic volume to and from the site, usually defined in terms of vehicles per hour or vehicles per day. Volumes used to differentiate minor versus major vary widely.

non-use: The absence or lack of any significant and ongoing economic activity on a property or use of the access by the owner or authorized persons, in terms of the zoning and past use of the property or access. Non-use includes the occasional and inconsequential presence upon such property or access.

outparcel: A lot, adjacent to a roadway, which interrupts the frontage of another lot.

parkway: A type of limited access roadway that typically includes a landscaped median and landscaping or open space on either side.

peak hour: The largest number of vehicles passing over a designated section of a street during the busiest 60-minute period during a 24-hour period.

phase: That portion of a traffic signal cycle allocated to a specific traffic movement or combination of movements.

plat: An exact and detailed map of the subdivision of land.

protected turns: Left or right turns allowed by a signal at an intersection, where the signal simultaneously prohibits opposing or conflicting traffic movement.

rational nexus: A clear, direct, and substantial relationship between a particular development and the public improvement needs generated by the development.

reverse frontage: Frontage on an access road constructed at the rear of lots fronting on a major roadway.

right-of-way or **ROW**: A strip of land occupied or intended to be occupied by a road, sidewalk, crosswalk, railroad, electric transmission line, oil or gas pipeline, water line, sanitary storm sewer, and other similar uses. Generally meaning the right of one to pass over the property of another.

right-of-way line: The line that forms the boundaries of a right-of-way.

service road: A public or private road, auxiliary to an arterial roadway, that provides access to parcels surrounding an arterial roadway and that typically serves nonresidential development.

shared access: A single connection serving two or more adjoining lots or parcels.

shoulder: The portion of the roadway that lies between the edge of the traveled way and the curb line, excluding auxiliary lanes.

sight distance: The distance visible to the driver of a passenger vehicle measured along the normal travel path of a roadway from a designated location and to a specified height above the roadway when the view is unobstructed by traffic.

sight triangle: An area of unobstructed sight distance along both approaches of an access connection.

signal progression: The progressive movement of traffic, at a planned rate of speed without stopping, through adjacent signalized locations within a traffic control system.

signal spacing: The distance between traffic signals along a roadway.

speed-change lane: A separate lane for the purpose of enabling a vehicle entering or leaving a roadway to increase or decrease its speed to a rate at which it can more safely merge or diverge with through traffic. Acceleration and deceleration lanes are speed-change lanes. See also *auxiliary lane*.

stopping sight distance: The distance required by a driver of a vehicle traveling at a given speed to bring the vehicle to a stop after an object on the roadway becomes visible. It includes the distance traveled during driver perception and reaction times and the vehicle braking distance.

storage length: Additional lane footage added to a deceleration lane to store the maximum number of vehicles likely to accumulate during a peak period so as not to interfere with the through travel lanes.

strategic arterial: A designation for arterial roadways having strategic importance to the statewide transportation network that is used for planning purposes.

stub-out or **stub-street**: A portion of a roadway or cross-access drive used as an extension to an abutting property that may be developed or redeveloped in the future.

taper: The widening of pavement to allow the redirection and transition of vehicles around or into an auxiliary lane. There are two different types of *tapers*: (1) redirect tapers necessary for the redirection of vehicles along the traveled way, and (2) transition tapers for auxiliary lanes that allow the turning vehicle to transition from or to the traveled way, to or from an auxiliary lane.

temporary access or **conditional access**: Access that is permitted for use until alternative access becomes available.

throat length: The distance parallel to the centerline of a driveway to the first on-site location at which a driver can make a right turn or a left turn. On roadways with curb and gutter, the *throat length* shall be measured from the face of the curb. On roadways without a curb and gutter, the *throat length* shall be measured from the edge of the shoulder.

throat width: The distance edge to edge of a driveway measured at the right-of-way line.

through movement: The predominant direction of traffic flow through an intersection; although the predominant flow of traffic occasionally is in a right- or left-turning direction, it is straight on most major roads.

time-space diagram: A chart on which the distance between signals and signal timing is plotted against time. The chart indicates signal progression, efficiency, bandwidth, and speed of traffic. Efficiency is the width of the through band expressed as a fraction of the entire signal cycle. A 50 percent efficiency means that 30 seconds of a 60-second signal cycle is devoted to the movement of through traffic.

traffic characteristics: Parameters describing the distribution of vehicles in a traffic stream, such as planning analysis hour factor, direction distribution factor, peak hour factor, adjusted saturation flow rate, and percent turns from exclusive turn lanes.

traffic control device: Any sign, signal, marking, or device placed or erected for the purpose of regulating, warning, or guiding vehicular traffic and/or pedestrians.

traffic count: A tabulation of the number of vehicles or pedestrians passing a certain point during a specified period of time.

traffic impact study: A report analyzing anticipated roadway conditions with and without an applicant's development. The report includes an analysis of mitigation measures and a calculation of fair-share financial contributions.

traveled way: The portion of the roadway provided for the movement of vehicles, exclusive of shoulders and auxiliary lanes.

trip: A single or one-directional vehicle movement with either the origin or the destination inside a study area. A vehicle leaving the highway and entering a property is one *trip*. When the vehicle leaves the property, it is a second *trip*.

trip distribution: The measure of the number of vehicles or passenger movements that are or will be made between geographic areas.

two-way left-turn lane, continuous, or **TWLTL**: A continuous lane located between opposing traffic flows that provides a refuge area for vehicles to complete a left turn from a roadway.

undivided roadway: A roadway having no directional separator, natural or structural, to separate traffic moving in opposite directions.

uninterrupted flow: The category of traffic flow that occurs on roadways having no fixed cause of delay; examples of such roadways include freeways and non-signalized sections of rural highways.

unprotected turns: At an intersection, left or right turns through an opposing flow of vehicles or pedestrians not under the direction of a signal phase for protected turns.

vehicles per hour or **VPH**: The number of *vehicles per hour*, usually referring to vehicles in a peak hour.

waiver: Permission to depart from a regulatory standard where required conditions are satisfied.

warrant: The criteria by which the need for a safety treatment or roadway improvement can be determined.

weaving: The crossing of two or more traffic streams traveling in the same general direction along a significant length of highway without the aid of traffic-control devices. *Weaving* areas are formed where a merge area is closely followed by a divergent area or where an entrance ramp is closely followed by an exit ramp and the two ramps are joined by an auxiliary lane.

Abbreviations used without definitions in TRB publications:

AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
NASA	National Aeronautics and Space Administration
NCHRP	National Cooperative Highway Research Program
NCTRP	National Cooperative Transit Research and Development Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation