

**ACCESS MANAGEMENT:
A REVIEW OF RECENT LITERATURE**

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*Center for Transportation
Research and Education*

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ACCESS MANAGEMENT: A REVIEW OF RECENT LITERATURE

**Prepared for
Access Management Task Force
Iowa Department of Transportation**

**Prepared by
Center for Transportation Research and Education
Iowa State University**
Iowa State University Research Park
2625 North Loop Drive, Suite 2100
Ames, IA 50010-8615
Telephone: 515-294-8103
Fax: 515-294-0467
Internet: <http://www.ctre.iastate.edu>

Principal Investigator
Tom Maze

Project Manager
Marilyn Kuntemeyer

Principal Researchers
David Plazak
Tom Sanchez

Graduate Assistants
Chris Albrecht
Jeff Zogg

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I. Background

The Iowa Department of Transportation's Access Management Task Force was established as part of the Iowa Department of Transportation's overall Safety Management System (SMS) effort. The goal of the Access Management Task Force is to develop a program designed to educate and market the concept and benefits of access management to landowners and developers, professional planners and engineers, planning and zoning staff members, appointed and elected officials, and motorists.

The Task Force commissioned the Center for Transportation Research and Education (CTRE) at Iowa State University to conduct a review of the access management literature to assist it in refining its research agenda. This literature review was to include:

- Studies documenting the level of service, traffic accident and safety, and business "vitality" impacts of access management projects.
- Case studies of rural, suburban, and urban access management projects, including best practices, regulations, and guidelines from around the United States.
- Access management educational tools from other states and localities and materials on public involvement in access management planning and projects.

II. Definition Of Access Management

The Michigan Department of Transportation defines access management as:

"A process that provides or manages access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety, capacity, and speed."

Access management is pursued through the design and control of driveways, curb cuts, turning movements, interior circulation of parking lots, and public street connections and intersections. Usually, state highways or major urban and suburban arterial streets are the targets of access management projects. Access management is also a concern on main county roads when there is a transition from a rural environment to a town or city.

III. Summary Of The Literature

The literature on access management is extensive and is growing rapidly at this time. This is because access management strategies appear to be both a very effective and very appropriate strategy in these times of limited resources for new roadway construction.

Access management is an important tool for improving both the functioning and safety of highway transportation systems. Research indicates that effective access management programs have the potential to dramatically increase the safety of streets and highways and also to increase roadway capacity, reduce congestion, reduce air pollution emissions, and reduce average travel times for motorists.

Several states have adopted statewide access management policies that should be reviewed for applicability to Iowa. Many local governments have also adopted or substantially revised their access management regulations and guidelines in recent years. A considerable number of well-documented access management case studies exist which can also provide important ideas and lessons for Iowa.

Education of and marketing of access management are rather new themes. Until recently, public involvement in access management has tended to come late in the planning and design process, usually in the form of public hearings. However, as states and local governments have become more aggressive in promoting and using access management, the need to educate the public and involve them more fully in access management design and implementation has grown. As a result, the literature in this area is expanding.

The amount of literature on access management is voluminous; that is reflected by the length of this document. In order to gain an overview of the subject more quickly, readers may wish to first consult the selected references pointed out in the document by check marks (☑).

IV. Literature Review Methodology And Sources

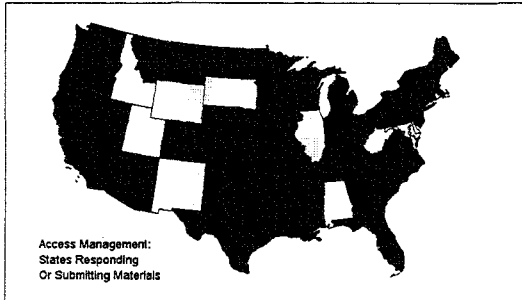
The literature on access management and access control was researched by CTRE using several different approaches to gain maximum results. These included:

- Attending the 1996 National Access Management Conference in Vail, Colorado, August 1996. This was the second such national conference to be held.
- An on-site search of the major libraries at Iowa State University.
- Mailing of letters of inquiry to all state departments of transportation (DOTs) and metropolitan planning organizations (MPOs). This mailing was followed up with telephone calls in cases where initial responses yielded promising results.
- A computer and Internet search of on-line literature on access management.

The major sources for the computer and on-line literature review were as follows:

- The PC-SPIRS 3.30 TRANSPORT CD-ROM, which contains the Transportation Research Board's Transportation Research Information System (TRIS) database. The latest addition available (with citations through May 1996) was used for the search.
- The Iowa State University on-line catalog system, "Scholar".
- The "Melvyl" on-line catalog at the University of California at Berkeley.
- The "Nucats" on-line catalog at Northwestern University.

- Several World Wide Web sites on the Internet, including those of the U.S. Department of Transportation's Bureau of Transportation Statistics (BTS), the American Planning Association (APA), the Institute of Transportation Engineers (ITE), and the American Public Works Association (APWA).
- Posting messages indicating an interest in finding out about access management resources on two Internet mailing lists: TRPLAN-L at Penn State University and DOT at the University of North Dakota.



All of these search mechanisms yielded valuable results in terms of literature identified. Responses of some kind were received from 37 of the 50 states (see map at left); the literature cited in this review covers access management in 25 states and one Canadian province. This indicates that access management has become a pervasive transportation system management strategy nationwide.

V. General Materials On Access Management

Together, these materials provide an overview of the current status and practice of access management in the United States. They present the state of the art in access management in the United States.

Demosthenes, Phillip, "Access Management: Lessons From Fourteen Years in Colorado," paper prepared for the 1996 National Access Management Conference in Vail, Colorado. Demosthenes presents an overview of the "whys" of access management and how the State of Colorado has approached the issue.

☑ Geiger, David, et. al, "An Overview of Access Management at Selected State DOTs," paper prepared for the 1996 National Access Management Conference in Vail, Colorado. This paper presents the results of a telephone survey of eleven state DOTs prepared for the Michigan Department of Transportation. This included three states (Colorado, Florida, and New Jersey) with formal access management codes. The strengths and weaknesses of various state approaches are discussed.

Gorman, Robert, "The National Highway System--Preserving Mobility for Tomorrow," paper prepared for the 1993 National Access Management Conference in Vail, Colorado. This paper discusses the need to preserve the integrity of the National Highway System through such techniques as access management.

Institute of Transportation Engineers, Transportation and Land Development, 1988. The basic reference on how highways and land development interact.

✓ Levinson, Herbert, "Access Management on Suburban Roads," Transportation Quarterly, Summer 1994. An overview of access management highlighting the actions of leading states of Colorado, Florida, New Jersey, and Oregon.

Layton, Robert, Functional Integrity of the Highway System, Background Paper #1, prepared for the Oregon Department of Transportation, Oregon State University, Department of Civil, Construction and Environmental Engineering, Corvallis, Oregon, August 1996. Layton provides an overview of the relationships between transportation, land use, and economic activities and discusses the importance of protecting the functional integrity of the various levels of the highway system through management of access.

Oregon Department of Transportation, Access Management, World Wide Web pages, http://www.odot.state.or.us/tdb/planning/access_mgt/index.html, viewed August 23, 1996. This is one of the few sites on the Internet devoted to access management. It contains general information, some brief slide presentations and some reference materials in Adobe Portable Document File (.pdf) format that can be downloaded.

U.S. Department of Transportation, Access Management for Streets and Highways, Implementation Package Report FHWA-IP-82-3, Washington, DC, June 1982. A report that provides a general introduction to the "whys" and "hows" of access management.

✓ U.S. Department of Transportation, Federal Highway Administration, First Annual Access Management Conference Proceedings, Vail Colorado, FHWA-PD-94-010, Washington, DC, 1994. One of the best single references on access management, this 300 page compendium contains over 35 papers, some of which are individually referenced below. The conference was designed to spread awareness of access management innovation, which was then concentrated in a handful of states.

VI. Research On Access Management

Research on access management falls into three distinct categories: impacts on traffic flow and congestion; impacts on safety; and impacts on businesses and area residents. These research studies clearly demonstrate the significant positive impact that access management can have on both traffic operations and accident rates.

National Cooperative Highway Research Program (NCHRP) Project 3-52, Impacts of Access Management Techniques, is a major research project currently underway and should be available in Spring 1997. It will address both the operational/traffic flow and safety impacts of access management.

A. Impacts Of Access Management On Traffic Flow And Congestion

Available research indicates that application of access management principles can have a significant and positive impact on the functioning of highways and other arterial roadways. Improved functioning can be measured in terms of roadway capacity, level of traffic service provided, delays, or travel time/speed.

"Benefits of Access Management," Public Works, February 1995. An article that categorizes and discusses commonly used types of access management techniques. Categories include highway design standards and driveway location. The benefits of each of the techniques are discussed.

Colorado Department of Highways, Final Report of the Colorado Access Control Demonstration Project, Denver, Colorado, Denver, June 1985. This report indicates that a high access controlled urban arterial can be expected to function about 30-50% better than same facility with no access control.

Institute for Transportation Engineers (ITE), A Toolbox for Alleviating Transportation Congestion, Washington, DC, 1989. A general reference on traffic congestion and the many potential strategies for dealing with it, including access management techniques such as turn prohibitions.

Shebeeb, Ousama, "Safety and Efficiency for Exclusive Left-Turn Lanes at Signalized Intersections," ITE Journal, 1995, pp. 52-59. This article analyzes the accident rates and traffic flow efficiency associated with four types of signalization phasing for left-turn lanes: protected, protected permissive, Dallas, and permissive only. Protected only approaches offer the lowest level of flow efficiency but are also the safest. Dallas approaches are more efficient and nearly as safe. If flow efficiency is the most important consideration, permissive only approaches can be used effectively. This article does a good job of highlighting the tradeoffs that can occur between operational efficiency and safety.

☑ Stover, Vergil, Richard Hawley, Donald Woods, and Richard Hamm, "Access Management as a Congestion Management Measure," paper prepared for the 1993 National Access Management Conference in Vail, Colorado. This paper thoroughly examines the relationship between access management and traffic congestion. It notes that increasing signalized intersection spacing to uniform intervals and installing non-traversable medians will increase the capacity of a four lane arterial by about 50%. This is the same effect as widening the arterial to six lanes.

Transportation Engineering, Inc., Median Opening Operational Analysis TRAF-NETSIM Evaluation for District Wide Median Evaluation and Public Involvement, prepared for the Florida Department of Transportation, Altamonte Springs, Florida, September 1995. This report analyzes the impacts of median treatments on traffic operations and air pollution emissions for several arterial corridors in Florida. In general, travel speeds increase, fuel consumption decreases, emissions decrease, and delays decrease as medians are made more restrictive (e.g., fewer medians spaced farther apart). Delays may increase for some drivers who have to make U-turns or take longer routes. An interesting result arose when an undivided roadway was modified to include a median with closely spaced openings; operational performance actually decreased until the spacing of openings was increased.

United States General Accounting Office, Traffic Congestion: Trends, Measures, and Effects, GAO/PEMD-90-1, Washington, DC, November 1989. This GAO "blue paper" provides an overview of the reasons for, severity of, and costs of traffic congestion in the United States. A

companion report (GAO/PEMD-90-2) discusses potential Federal solutions, including better management of the existing highway system.

B. Impacts Of Access Management On Safety

As with traffic operations, research shows that increased access control can play a significant role in reducing both the quantity and severity of traffic accidents.

"Access Management Slows Incidence of Traffic Accidents," Public Works, February 1995, pp. 39-41. This brief article provides an overview of the safety benefits of access management based on case studies in the Denver, Colorado metropolitan area. It notes that a typical four-lane road with a high level of access control can serve 10,000 more vehicles per day at double the average speed and with 50 percent fewer accidents than a similar road with a low level of access control.

Dart, O.K. and L. Mann, "Relationship of Rural Highway Geometry to Accident Rates in Louisiana," Highway Research Record, Volume 312, 1970. An early study that documented the strong relationship between an increasing density of access points and traffic accidents. Generally, a doubling of access points (driveways or curb cuts per mile) leads to a 20-40% increase in the accident rate.

Demosthenes, Phillip, untitled presentation materials on the safety and other benefits of access management, Colorado Department of Transportation, undated. This presentation contains a number of charts that summarize the safety experience with access management projects in Colorado. The presentation asserts that a large proportion of traffic accidents, injuries, and fatalities are access related.

"Effect of Control of Access on Accidents and Fatalities in Urban and Rural Areas," presentation materials based on U.S. Department of Transportation Report FHWA-RD-91-044, November 1992. This slide presentation indicates that average fatal accident rates for urban road facilities with full access control are half that of facilities with no access control (0.02 fatalities per million vehicle miles versus 0.04). The difference is even more dramatic in rural areas (0.03 versus 0.09 fatalities per million vehicle miles of travel). Roadways that serve only one function (either property access or mobility) are the safest. It also notes that four-lane undivided roadways have the worst accident frequency record of any type of roadway cross-section. Four-lane divided urban and three-lane undivided urban cross sections are roughly twice as safe as four-lane undivided cross-sections.

☑ Gattis, J. L., "Comparison of Delay and Accidents on Three Roadway Access Designs in a Small City," paper prepared for the 1996 National Access Management Conference in Vail, Colorado. This paper provides an intensive comparison of the accident and other characteristics of three arterial segments within a single small city (Muskogee, Oklahoma). All three segments had four lanes with some sort of median treatment and turning lanes, but differing amounts of access management in place. The segment with the highest level of access control experienced 40 percent lower property damage and injury accident rates than the two with less access control.

Micsky, Russell and John Mason, Jr., "Sight Distance for Vehicles Turning Left Off Major Roadways," paper prepared for the 1996 National Access Management Conference in Vail Colorado. This study is based on the results of extensive field observations of left turns off major roadways. It concludes that access management policies and designs need to emphasize sufficient at-grade sight distance for turning traffic.

Parsonson, Peter, "Prefabricated Medians to Reduce Crashes at Driveways Close to Intersections," paper prepared for the 1996 National Access Management Conference in Vail Colorado. A leading cause of roadway accidents is left turns into and out of driveways within 100 feet of intersections. This study reviews the effectiveness of various devices to control left turns, including narrow raised devices, triangular islands, and prefabricated raised medians. It concludes that the first two of these are generally not cost-effective while that latter approach often is effective.

Stover, Vergil, Medians: A Discussion Paper, prepared for the Florida Department of Transportation, Center for Urban Transportation Research, College of Engineering, University of South Florida, December 1994. A very thorough comparison of the accident experience with raised medians and continuous left turn lanes (CLTL). This report contains many useful tables and diagrams. One major conclusion is that left turns entering and exiting driveways account for the majority of total driveway crashes and also generate a substantial amount of motorist delay.

☑ Stover, Vergil, Samuel Tignor and Merton Rosenbaum, Synthesis of Safety Research Related to Traffic Control and Roadway Elements, Volume 1, Chapter 4: "Access Control and Driveways," FHWA-TS-82-232, Office of Research, Development, and Technology, U.S. Department of Transportation, Washington, DC, December 1992. This report chapter provides a general overview of safety issues related to access management. It indicates that management of driveway density and spacing is one of the most effective strategies for increasing traffic safety along with installation of non-traversable medians. Designs such as curbed, painted, raised, and depressed medians are discussed as are continuous two-way left turn lanes (CLTL).

Thorson, Bruce and James Valenta, Evaluation of the Traffic Operational Effectiveness of Access Control Techniques, Technical Memorandum Number 9, Project DOT-FH-11-8121, Midwest Research Institute, Kansas City, Missouri, September 1974. This report provides accident reduction factors for almost 70 different highway and driveway design techniques.

Transportation Engineering, Inc., Collision Analysis for District Wide Median Operations and Public Involvement, prepared for the Florida Department of Transportation, Altamonte Springs, Florida, October 13, 1995. A detailed "before and after" collision analysis with many collision diagrams for five corridors where non-traversable medians were installed in Florida.

Urbitran Associates, Inc., Access Management Study: Improvement Options, prepared for the Michigan Department of Transportation, May 1996. A very complete synthesis of access management safety research literature and a survey of access management practices of many states and localities.

C. Impacts Of Access Management On Business Vitality, Business Customers, And Area Residents

The literature review identified very limited literature on the subject of research on impacts of access management on business vitality, business customers, and area residents. Only a handful of researchers have ever attempted to examine this relationship. All of these studies use Florida examples and data. What seems clear from these references is although access management projects can lead to inconvenience and some business losses, most stakeholders recognize the value of these projects in terms of safety.

Florida Department of Transportation, Access Management. (various educational materials) Several closely spaced median openings on U.S. 1 in Stuart, Florida were closed to enhance safety; crashes were reduced by 22%. When stakeholders were surveyed, the majority of motorists and local residents expressed support for the project even though they were also inconvenienced by it. Most truckers also favored access control.

☑ Ivey, Harris & Walls, Inc., Corridor Land Use, Development & Driver/Business Survey Analysis, District Wide Median Evaluation Technical Memorandum, final report prepared for the Florida Department of Transportation, Winter Park, Florida, November 1995. This report includes a number of very well documented corridor case studies involving installation or modifications of raised medians in Florida. It is the only access management research study that includes survey results for both drivers and businesspersons. Postage-paid, mail-back surveys were handed out along the corridors, and a total of 180 were returned by drivers (23% response rate) and 228 by businesses (46% response rate). The driver survey results indicate that most drivers felt the inconvenience caused by raised medians on these corridors was more than offset by positive traffic flow and safety benefits. On the other hand, about 30 percent of the business owners felt that the projects had at least a small adverse impact on their businesses (business volume decline, truck delivery difficulties, etc.).

Long, Gary and Jeff Helms, Median Design for Six-Lane Urban Roadways, Transportation Research Center, University of Florida, Gainesville, Florida, October 1991. This research includes a case study for two "modest cost" access management retrofit projects in Ft. Lauderdale, Florida. It includes a "before and after study" of traffic operations (especially turning movements), traffic accident trends, and public opinion surveys of businesses and motorists. The surveys included through travelers, truckers (especially those making deliveries), residents, business customers, and merchants. The study notes that:

"the majority of through travelers, residents, customers, and business owners favored the retrofit despite some inconveniences...(t)hese opinions after project development contrast with those set forth at the two public hearings conducted by the Florida DOT during project development. These meetings were mainly attended by local merchants and residents who were opposed to the project."

Vargas, Freddie and Yogesh Gautum, "Problem: Roadway Safety vs. Commercial Development Access, ITE 1989 Compendium of Technical Papers, pp. 46-50. This paper reports similar results to those noted above in terms of impacts of access management projects on business profits based on a survey in southeast Florida. A total of 26% of business owners in that study reported either a "large loss" or "small loss" in profits after access management was implemented. On the other hand, about 5% reported a "small increase." In both the Vargas and Gautam study and other Florida corridor studies cited above, a large majority of businesses (61-69%) reported little or no negative impact in terms of number of customers, profitability, or property values. However, some businesses (10-12%) reported a "large loss."

VII. Access Management Case Studies

There are a number of well-documented access management case studies available from throughout the United States. They help to illustrate in detail various aspects of the process of access management planning, design and implementation. The case studies summarized here were selected because they illustrate typical access management issues and solutions in rural and suburban areas and mid-sized metropolitan areas. Many are from areas with a particularly pressing problem, for instance the need to accommodate growing tourist traffic.

Chew, Jonathan, et.al., "Access Management Practices in Connecticut," paper prepared for the 1996 National Access Management Conference in Vail, Colorado. An overview of the larger study referenced below as Urbitran Associates, Inc. (1996). Provides a summary of lessons learned from the U.S. 7 corridor in Southwest Connecticut.

☑ CH2M Hill, I-25/SH50/SH47 Access Management Plan: Pueblo, Colorado, prepared for Colorado Department of Transportation Region 2, April 1996. This report documents an access management plan for a major East-West corridor in Pueblo, a mid-sized metro area, which was a cooperative effort of the City of Pueblo and the Colorado DOT. It mainly contains recommendations and plan sheets; however, Appendix A documents in great detail the public involvement process for the project, including individual correspondence with business owners along the corridor.

Ferranti, Stephen R. and Benway, Geoff, "The Challenges (And Early Successes) of a Town-Initiated Access Management 'Retrofit' Program on Two State Highways," paper prepared for the 1996 National Access Management Conference in Vail, Colorado. This case study documents a comprehensive access management project implemented in Penfield, New York, a suburb of Rochester, around the intersection of two state arterial highways. The project was done in anticipation of later improvements by the New York State DOT on its routes and was coordinated with that agency's planning activities.

Geiger, David, Gluck, Jerome, and Wyckoff, Mark, "Access Management In Michigan: The Good, the Bad, and the Ugly," paper prepared for the 1996 National Access Management Conference in Vail, Colorado. This paper presents an overview of an effort to review and evaluate the driveway permitting process that the Michigan DOT uses on its 9,600 mile State Trunkline Highway System, especially the two-lane routes. The study is mainly safety-driven, in

that Michigan's experience indicates a strong relationship between intersections/driveways per mile and accident rates.

☑ Hart, Joseph A., et. al., U.S. 93, "Somers to Whitefish, Montana Access Management Issues," paper prepared for the 1996 National Access Management Conference in Vail, Colorado. This case study provides an overview of an access management project on a 30 mile long rural two-lane highway route serving a major tourism artery (both summer and winter) between Flathead Lake and Glacier National Park in Montana. It stresses "situational access control," with different standards and cross-sections being applied along different parts of the corridor.

Johnson County (Iowa) Council of Governments, Arterial Street Plan, Iowa City, February 1991. This plan from Iowa stresses low-cost operational improvements to arterial streets as opposed to widening.

Kern, Jeffrey, Arterial Street Access Control Study, Tri-County Regional Planning Commission, Lansing, Michigan, July 1980. This study takes a regional approach to access management issues in a mid-sized metropolitan area that is the state capitol and includes a major university, Lansing; it is partly a case study and partly a set of access management guidelines for the region.

McDonough & Scully, Inc., Corridor Management Study: Route 6 Transportation Study Wellfleet, Massachusetts, prepared for the Wellfleet Planning Board, Framingham, Massachusetts, June 1993. An access management plan for a portion of the major arterial serving the tourist region of Cape Cod. A plan for another portion of this corridor is referenced below as Vanasse Hangen Brustlin, Inc. (1995).

MRB Group, SRF and Associates, and Stuart I. Brown Associates, Routes 441 & 250 Land Use and Access Management Plan, prepared for the Town of Pennfield, New York, Rochester, New York, June 1995. The original source for the Ferranti and Benway (1996) article cited above.

North Kennebec Regional Planning Commission, Access Management Policies for the U.S. Route 201 Corridor, 1991. A case study from northeastern coastal Maine, another tourist-impacted area.

Vanasse Hangen Brustlin, Inc., Access Management Study: Route 6 Between Bourne and Orleans, Watertown, Massachusetts, August 1995. This case study represents an access management plan for the Old Kings Highway (Route 6), Cape Cod, Massachusetts. The Old Kings Highway is a scenic byway that serves 6,000-24,000 vehicles per day. It contains a series of "case studies" along the route, each with information and photos/graphics on existing conditions, conceptual improvements, costs, and implementation issues. The Massachusetts Highway Department Driveway Design Guidelines are appended.

Vobejda, Mary Jo, William Sweeney, and Alan White, Development and Administration of an Access Management Program for a Local Government, report prepared for Town of Parker, Colorado, undated. A well-documented case study from the Denver, Colorado metropolitan area stressing standards development.

✓ Urbitran Associates, Inc., I.K. Chan Associates, and Herbert Levinson, Final Report: Route 7 Driveway and Access Management Plan, prepared for the South Western Regional Planning Agency, Norwalk, Connecticut, June 1996. An extraordinarily well-documented access management planning study for the U.S. 7 corridor through a suburban area of Connecticut. It includes a major section on regulatory recommendations for local governments and an extensive number of air photos overlaid with physical planning recommendations.

VIII. Access Management Laws And Regulations

Several states, including Colorado, Florida, and New Jersey, have adopted statewide access management codes. The other references in this section include a variety of access statutes, ordinances, land use and subdivision regulations, administrative rules, design guides, and driveway permit forms, and variance processes from around the nation. Both state and local levels of government are represented.

✓ Colorado Department of Highways, The State Highway Access Code, August 15, 1985. This is Colorado's statewide access management code chapter.

Demosthenes, Phillip, "Statute and Regulation Prototypes," paper presented at the 1996 National Conference on Access Management, Vail, Colorado, August, 1996.

Evansville Urban Transportation Study, Access Standards Manual, Evansville, Indiana, June 1994.

Florida Department of Transportation, Median Opening Decision Process, Directive 625-101-120-a, Tallahassee, Florida, March 14, 1996.

Florida Department of Transportation, Administrative Rules Chapter 14-97: State Highway System Access Management Classification System and Standards, Tallahassee, Florida, December 1990.

Florida Department of Transportation, Administrative Rules Chapter 14-96: State Highway System Connection Permits, Tallahassee, Florida, July 1995.

✓ Florida, State of, Florida Statute 355--The Access Management Act, undated. This is Florida's statewide access management code.

Grand Forks, City of, Land Development Code, Chapter 18-0907, Grand Forks, North Dakota, undated.

Greensboro, City of, Department of Transportation, Driveway Manual, Greensboro, North Carolina, February 1994.

Iowa Department of Transportation, "Administration of Access Control on the Primary Highway System," Policies and Procedures Manual, Policy Number 730.02, revised September 16, 1994.

Iowa Department of Transportation, Iowa Primary Road Access Management Policy, Iowa, July 1995. The State of Iowa's current access management policy for primary routes.

Iowa Department of Transportation, Maintenance Division, Entrance Permit Application, Form 64004, December 1995.

Iowa Department of Transportation, Maintenance Division, Agreement for Revision of Access/Establishment of a Special Access Connection, Form 810052, December 1995.

Jacksonville, City of, Planning and Development Department, 2010 Comprehensive Plan: Traffic Circulation Element, Jacksonville, Florida, September 1990.

Kansas Department of Transportation, Access Management Policy, Topeka, Kansas, July 1994.

Nebraska Departments of Roads, Access Control Policy to the State Highway System, Lincoln, Nebraska, June 1993.

New Hampshire Department of Transportation, Administrative Rules for the Permitting of Driveways and Other Accesses to the State Highway System, Concord, New Hampshire, January 1993.

New Jersey Department of Transportation, New Jersey State Highway Access Management Code, 1992. This is New Jersey's statewide access management code.

North Dakota, State of, North Dakota Century Code, various chapters, Volume 13, 1995 Pocket Supplement.

Parker, Town of, Application for Town Access Permit, Parker, Colorado, undated.

Sokolow, Gary, Deviations from Median Opening Spacing Standards: A Procedure for Decision Making, prepared for the Florida Department of Transportation, undated.

South Carolina Department of Highways and Public Transportation, Traffic Engineering Section Access and Roadside Management Standards, Traffic Engineering Section, South Carolina, April 1995.

Tennessee Department of Transportation, Highway Entrance Permit, Nashville, Tennessee, revised September 12, 1995.

Texas State Department of Highways and Transportation, Regulations for Access Driveways to State Highways, Austin, Texas, Revised August 1996.

Tittabawassee Township (Michigan), Road Overlay Zoning Regulations, Saginaw, Michigan, September 6, 1992.

Topeka, City of, "Street Design Criteria," Section 1.2 of the Design Criteria and Drafting Standards, Topeka, Kansas, undated.

Topeka-Shawnee County Metropolitan Planning Agency "Street Design and Access Management," Chapter 5 from the Transportation Plan 2015, Topeka, Kansas, undated.

Tri-County Regional Planning Commission, Model Zoning Ordinance: Arterial Street Access Regulations, undated.

☑ Williams, Kristine M. and J. Richard Forester, Land Development Regulations that Promote Access Management, NCHRP Synthesis 233, Transportation Research Board, National Research Council, Washington, D.C., 1996. Both this work and the report cited immediately below are the best references on local land use regulations that support access management.

☑ Williams, Kristine M., Daniel E. Rudge, Gary Sokolow, and Kurt Eichin, Model Land Development & Subdivision Regulations that Support Access Management for Florida Cities and Counties, Center for Urban Transportation Research, University of South Florida and Florida Department of Transportation, Florida, January 1994.

IX. Access Management Best Practices And Guidelines

Several organizations and government agencies have published papers or guidelines on how best to implement certain aspects of access management. These cover the gamut from system planning and roadway/driveway design to access permitting.

American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets, 1990. The AASHTO "Green Book"--the "bible" for highway and street design in the United States. Page 108 discusses the value of access management in terms of preserving highway capacity and improving safety.

Eisdorfer, Arthur, Lorinda Lasus, and Robert Siley "Access Management and Highway Improvement Projects," paper presented at the 1996 National Conference on Access Management, Vail, Colorado, August, 1996. This paper describes in detail the application of New Jersey's 1989 State Highway Access Management Act.

Eisdorfer, Arthur J., "Access Permitting," paper presented at the 1993 National Conference on Access Management, Vail, Colorado. This paper explains New Jersey's permitting process and explains how the process is used to effectively control access.

Eisdorfer, Arthur, "Variances: An Important Part of Access Management Decisions," paper presented at the 1996 National Conference on Access Management, Vail, Colorado, August, 1996. A discussion of the process New Jersey uses to grant variances from its access management regulations.

Garber, Nicholas J. and Timothy E. White "Guidelines for Commercial Driveway Spacing on Urban and Suburban Arterial Roads," paper presented at the 1996 National Conference on Access Management, Vail, Colorado, August 1996. This paper presents recommended spacing of commercial driveways on arterial roads through the use of a methodology that optimizes safety (accident rates) and level of service.

Huntington, Del, "The Access Management Program Development in Oregon," Oregon Department of Transportation, paper prepared for the 1996 National Access Management Conference in Vail, Colorado.

☑ Institute of Transportation Engineers, Guidelines for Driveway Location and Design, 1987. Recommends in detail guidelines for the design and location of driveways to minimize conflicts and accidents and maximize traffic flow.

Iowa City, Iowa, Iowa City Interim Municipal Design Standards, Iowa City, March 27, 1996. This set of standards covers all types of municipal infrastructure for all six cities in the Iowa City urbanized area. Part 3 covers driveways. The City of Iowa City's Comprehensive Plan also includes a section on driveway access design guidelines for five functional levels of highways and streets.

Jacquemart Associates, Inc. A Guide to Driveway Consolidation, prepared for the Southwestern Regional Planning Agency, New York, June 1989. A guidebook from Connecticut on driveway consolidation stressing the "hows".

☑ Keopke, F.J. and Levinson, H.S., Access Management Guidelines for Activity Centers, National Cooperative Highway Research Program Report 348, Transportation Research Board, National Research Council, Washington, DC, 1992. The single most complete reference on access management guidelines and best practices.

☑ Layton, Robert D. and Vergil Stover, Discussion Paper 5: Access Management Classification and Spacing Standards, report prepared for the Oregon Department of Transportation, April, 1996. This report suggests a system of intersection and driveway spacing standards related to the functional classification of roadways in Oregon.

McKenna Associates, Inc. and the WBDC Group, Evaluating Traffic Impact Studies, handbook prepared for the Tri-County Regional Planning Commission, Michigan Department of Transportation, and the Southeast Michigan Council of Governments, Michigan, 1994. This handbook outlines when traffic impact studies should be prepared, what analyses should be included, and how such studies should be reviewed and used.

New York State Department of Transportation, Corridor Management Group, Best Practices in Arterial Management, Review Draft, Albany, New York, August 1996. A report that describes New York's approach to access management, including the "whys" and "hows"; it includes several case studies and a glossary of access management terminology.

Rompré, Yvan, Road Corridor Management and Access Control, report prepared for the Ministry of Transport, Québec, Canada, June 1996. This report documents a comprehensive approach to access management followed by the Québec Ministry of Transport on its 27,000 kilometer long network.

The Transportation Planners Council of the Institute of Transportation Engineers, "Traffic Access and Impact Studies for Site Development," pp.17-24, ITE Journal, August 1988. This paper describes the recommended practices for conducting traffic and site impact studies to support access management planning.

☑ Transportation Research Board, Driveway and Street Intersection Spacing, Transportation Research Circular Number 456, National Research Council, Washington, D.C., March 1996. The definitive reference on spacing of street intersections and driveways.

Transportation Research Institute, Oregon State University, Discussion Paper Number 3: Variances, prepared for the Oregon Department of Transportation, Oregon, January 1996. A thorough discussion of the decision process to allow exceptions to regulatory access standards.

X. Access Management Educational Materials

Materials designed to educate about access management can be subdivided into two categories: materials designed for the general motoring public, landowners and developers, and elected officials and those designed for professional engineers and planners. The first category stresses the "whys" of access management, the latter the "whats" and "hows".

A. Educational Materials Designed Mainly For The General Public And Elected Officials

Florida, Maine, New Jersey, Ohio, and Oregon agencies have prepared materials that could be useful models for Iowa in terms of educating the public and elected officials about access management. The State of Washington is currently producing a 10-15 minute videotape on access management aimed at the general public. The Federal Highway Administration will be releasing a similar video in the late Fall of 1996.

☑ Florida Department of Transportation, Access Management: An Important Traffic Management Strategy. (slide presentation)

☑ Florida Department of Transportation, How Can We Institute Access Management? (slide presentation)

☑ Florida Department of Transportation, What Is Access Management? (slide presentation)

Greater Portland Council of Governments, Conquering the Strip, a Handbook for Highway Corridor Planning, Portland, Oregon, 1991. (booklet)

Hougue, Barry, "The Uncontrolled Retail Strip--A Bad Investment," Development Strategies Newsletter, St. Louis, Missouri, undated. Describes the harmful impacts of uncontrolled strip development from a real estate developer/investor's standpoint. (short article)

Iowa Department of Transportation, Speed Zoning on Iowa Highways. Although not on the subject of access management, this is a simple brochure on a technical subject designed to educate the motorist and other non-professionals. It explains the "whys" of speed zoning in easily-understood language. (brochure)

☑ Licking County (Ohio) Area Transportation Study, Access Management Video, produced by AVS Video Productions, Westerville, Ohio, undated. A 20 minute overview of the "whys" of access management that includes both policy and technical issues. (videotape)

Maine Tomorrow, Access Management, Improving the Efficiency of Maine Arterials: A Handbook for Local Officials, prepared for the Maine Department of Transportation, 1994. An excellent 29-page overview of access management issues. (instructional booklet)

Michigan Department of Transportation, Are You Building on a State Highway? Do You Need a Permit?, Lansing, Michigan, undated. (brochure)

☑ Michigan Department of Transportation, Improving Driveway & Access Management In Michigan, Lansing, Michigan, undated. An attractive and well-written 12-page booklet on access management.

New Jersey Department of Transportation, Managing Transportation in Your Community--A Municipal Handbook, 1992. (booklet)

Sokolow, Gary and Karen Bryant, The Basics of Access Management, published in Transportation Policy Forum, undated. (one-page article)

☑ Sokolow, Gary and Kristine Williams, Land Development & Subdivision Regulations That Support Access Management. This slide show developed by the Florida DOT and the Center for Urban Transportation Research at the University of South Florida explains the benefits of access management and how it can be implemented through land development regulations in Florida. (slide show)

Wisconsin Department of Transportation, Access Management System Plan for Wisconsin's Highways, Madison, Wisconsin, August 1989. (brochure and map)

Wisconsin Department of Transportation, Managing Access to State Highways, Madison, Wisconsin, 1996. (draft brochure and map)

Wisconsin Department of Transportation, Planning Highway Access, Madison, Wisconsin, undated. An older 32-minute videotape (apparently from the 1970's) prepared for a general audience. Oriented toward land-use planning issues.

B. Educational Materials Designed Mainly For Professionals

A larger body of materials has been prepared to educate transportation engineers and planners about access management and related land-use issues.

☑ The Florida DOT, spearheaded by Gary Sokolow, has developed a wealth of educational materials on access management mainly written with the professional audience (engineers and planners) in mind. The following are all slide shows (also available in hard copy form) in Florida DOT's Access Management series; all are undated:

Florida Department of Transportation, Access Management: Authority & Guidance for the Designer.

Florida Department of Transportation, Access Management: Basic Site Planning.

Florida Department of Transportation, Access Management: Classification System.

Florida Department of Transportation, Access Management: Examples Using Access Management Standards.

Florida Department of Transportation, Access Management: Raised Medians Are Safer.

Florida Department of Transportation, Access Management: Legal Considerations.

Florida Department of Transportation, Access Management Standards.

Florida Department of Transportation, Deviations from Median Spacing Standards.

Florida Department of Transportation, The New Rule of 14-96: Access Management Permits.

Florida Department of Transportation, Use of the Access Management Standards.

Iowa Department of Transportation, Maintenance Division, Access Management: The Why's, The What's, and the How's, Draft, Ames, Iowa, December 1995. This draft seminar in booklet form is designed for DOT staff who work with customers on property access issues.

☑ Sokolow, Gary and Kristine Williams, Land Development & Subdivision Regulations That Support Access Management. This booklet provides the same information as the slide show cited above, but in much greater depth. (instructional booklet)

☑ U.S. Department of Transportation, Federal Highway Administration, National Highway Institute, Access, Location, and Design: Participant Notebook, Report FHWA-HI-93-055, Washington DC, September 1993. This notebook is a very large and comprehensive introduction to the practice of access management. (course materials)

U.S. Department of Transportation, Federal Highway Administration, Dynamic Design for Safety. (course materials)

Washington Department of Transportation, Access Management in Washington State, Olympia, Washington, July 1995. (brochure in highway map format with large graphics)

XI. Public And Stakeholder Involvement Materials

There is a growing recognition of a need to involve the public in access management planning more fully and earlier on in the process. One reason for this is that stakeholders' perceptions of the role of roadways may vary greatly. For example, a planner may see a roadway as an arterial street serving intracity traffic; a businessperson may see the same road strictly in terms of bringing customers to his or her door. The traditional way the public and stakeholders are involved is through public hearings on projects rather late in the planning and design process. As several authors note, the result may be an irate group of stakeholders who do not understand the need for the project. These materials suggest different and more comprehensive approaches.

Falconi, Xavier R., "Access Management: Relationship Between Developers, Local Government and State Government," in Compendium of Technical Papers, Institute of Transportation Engineers, 1991, pp.71-76. This paper presents a general discussion of some of the major stakeholders involved in access management issues and projects in Oregon and suggests ways to improve the relationships among them.

☑ Huntington, Del, "Marketing of Access Management," paper prepared for the 1996 National Access Management Conference in Vail, Colorado. Huntington provides an overview of the reasons why marketing access management is important and also ideas on how best to market the concept to the general motoring public. He notes that, "the audience will likely represent many years of driving experience...many will have developed solutions they believe would solve all the traffic problems...they will have a strong emotional tie to the issue."

☑ Parisi, David., "A Process to Obtain Public Buy-In for a Retrofit Access Management Project," paper prepared for the 1996 National Access Management Conference in Vail, Colorado. This paper suggests a systematic process for involving the public in corridor-level access management planning using advisory committees, focus groups, open houses, and easy to understand graphics, videos, models, multimedia slide presentations. It is built around a rural tourist-oriented Oregon case study, Highway 99W.

United States Department of Transportation, Federal Highway Administration and Federal Transit Administration, Innovations In Public Involvement for Transportation Planning, Washington, DC, January 1994. This report provides a useful overview of various alternatives to involvement through public hearings, including charettes, visioning, brainstorming, citizens, advisory committees, and focus groups. The Parisi paper cited above illustrates the use of many of these techniques.

Vargas, Freddie, "Access Control and Irate Public--Community Awareness," Conference Proceedings of the 1993 National Access Management Conference in Vail, Colorado, U.S. Department of Transportation, Federal Highway Administration, Washington, DC, 1994, pp. 101-104. Vargas describes a process of public involvement used in Florida that tailors the level of public involvement in access management planning to the level of controversy involved in the project. Projects that are likely to be highly controversial or significantly affect traffic flow or access to properties have more public involvement required.

☑ Williams, Kristine, Margaret Giery, and Janet Becker, A Public Involvement Handbook for Median Projects, prepared by the Center for Urban Transportation Research, University of South Florida for the Florida Department of Transportation, Tampa, Florida, October 1995. This handbook provides guidelines for planners and engineers to follow in involving the public in controversial access management issues and projects. A comprehensive guide to the "whys" and "hows" of public involvement, including a resource kit.

Williams, Kristine, "Public Involvement and the Politics of Access Management," paper prepared for the 1996 National Access Management Conference in Vail, Colorado. This paper identifies the need for planners and engineers to more fully involve citizens in the access management planning process to avoid the possibility of "intense political pressure to concede to demands for unrestricted access." It also suggests methods by which the public can be more involved and suggests a process for access management public involvement.